SDISK / SDISK + BOOTFIX

ABOUT YOUR ORDER

Before you open the diskette package, examine the documentation to confirm you have received what you ordered. You should also determine from the documentation if the software you ordered will meet your needs. If you have received the wrong item, return the unopened disk package with all documentation and a note stating the problem and we will send you the correct item. If after looking at the documentation you feel there was a misunderstanding as to the function of the software, and it won't meet your needs you may return the UNOPENED disk package and documentation for a refund. No refunds will be given after the diskette package is opened (except for media that is defective according to the terms on the disk package).

ABOUT DOCUMENTATION

No amount of documentation will do you any good if you don't read it. The documentation included with this software assumes you have a basic knowledge of using your system and does not explain in depth information that is covered elsewhere (in your system manuals). We have tried to use terminology consistent with that used in the OS-9 system documentation. If you have not at least read through your OS-9 documentation that was included with your system we strongly urge you to do so. If you do not understand something about our documentation, first see if there is some word you skipped over that you did not understand (like "pipes", "device descriptor", "I/O redirection", etc.) that is explained in the OS-9 COMMANDS or OS-9 TECHNICAL MANUAL, study that manual then reread our documentation, if it still does not make any sense then try giving us a call.

DISKETTES

If you have difficulty reading the diskette supplied try it in more than one drive if you have more than one. If that doesn't work use the test program supplied with the RS OS-9 BOOT diskette to check your drives rotational speed. If the diskette has been exposed to temperature and humidity extremes it may need to sit for a day in your environment after you receive it to achive dimensional stability. Another factor affecting diskette compatability is the track alignment on the disk drives (yours and ours), if they are off a disk becomes unreadable. If after these attempts you can still not read the disk return it for a replacement.

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The diskette for **SDISK+BOOTFIX** contains the following:

```
Directory of Sdisk+Bootfix Release                    86/02/15  16:25:52
MODS            CMDS            DOC             readme
startup.1       startup.2

Directory of MODS                                     86/02/15  16:26:10
sdisk2          sdisk           sdisk.4         sdisk2.4

Directory of CMDS                                     86/02/15  16:26:27
install.2       install.1       install         descgen3
modbuster       fls             disktype        sformat
fastboot        bootfix
```

The CMDS directory contains only executable programs, refer to the documention with this package for their use. You will probably want to copy SFORMAT and BOOTFIX to your working CMDS directory on your system disk.

The DOC directory when present contains additional documentation text files with information that is not in the printed documentation. Read these files (use LIST command) for more information about using programs on this diskette.

The diskette for **SDISK** is identical to the SDISK+BOOTFIX release except for the ommision of the BOOTFIX command in the CMDS directory:

```
Directory of CMDS                                     86/02/15  16:26:27
install.2       install.1       install         descgen3
modbuster       fls             disktype        sformat
fastboot
```

USE OF SDISK

Sdisk is a disk driver module that will replace the module named CCDISK in the OS9Boot file on your OS-9 system disk. The device descriptors (D0 D1 D2 D3) in the OS9Boot file will be replaced also. Once you have created a new system disk with Sdisk installed, no further action on your part is required to use this software. Each time you boot from the new system disk (with SDISK installed) the Sdisk driver will automatically be active. To Simplify the creation of the new system disk an automated installation macro has been provided (follow instructions under NEW SDISK INSTALLATION).

BEFORE YOU BEGIN

If any of your disk drives are double sided be sure you meet the following requirements before beginning the installation:

You must have no more than 3 drives attached to your controller, and the cable connecting your disk controller to the drives must have all the connector pins intact. The old radio shack supplied drives accomplished drive unit select by removing three out of the four drive select contacts from the connector and leaving all select jumpers on the drive intact. One of these drive select lines acts as the side select so it must be intact. Look at the connectors on the flat ribbon cable that connects the disk controller to the drives, if any connector pins are missing then you must either add new connectors to the cable or get a new cable.

SDISK Release #2 UPDATE

The Sdisk release #2 diskette contains versions of the sdisk driver for both the Color Computer OS-9 ver. 02.00.00, and the two previous releases. With this release the device descriptors have been changed from the prevous release (4 more bytes added), so if you had a previous release of sdisk DO NOT use the device descriptors from the previous release. Sformat and Bootfix have also been updated, and you should use ONLY the new versions on this disk. The Descgen and Descgen2 programs in previous releases have been replaced by the Descgen3 program to generate the new format device descriptors. The separate descriptors for standard format diskettes (/sd0 etc.) are no longer used, instead a new command (DISKTYPE) has been added to modify the device descriptor for the drive(s) on which you wish to access non-Color Computer OS-9 disks, this new scheme is more flexible and does not take up extra memory with device descriptors that are rarely used. This at least partially compensates for the extra memory taken up by the new driver.

INSTALLATION INSTRUCTIONS

Follow the instructions given on pages 4 and 5 of the documentation under "NEW SDISK INSTALLATION". The new INSTALL macros will work properly for both version 2.0 OS-9 and the prior versions (the macros will ask you at the appropriate time if you are installing OS-9 ver 02.00.00 or higher). Please note, if you have already customized your boot file by adding or deleting modules the INSTALL macro will still work for you, just use your current working system disk that has your customized boot on it for the SYSTEM MASTER disk referred to by the install macro.

If you wish to do the installation manually, read the DOC for the modbuster

command on this disk, it will make your job easier. The MODS directory contains the new sdisk driver modules:

SDISK --- for OS-9 ver. 01.xx.xx
SDISK2 --- for OS-9 ver. 02.00.00

You only need use the INSTALL macro once, after you have sdisk installed you may use COBBLER or OS9GEN to produce new bootable disks. To make a new bootable disk use SFORMAT to format it, then COBBLER or OS9GEN to install the boot, and then if it is a double sided disk use BOOTFIX before copying anything to the diskette. See details on Sformat and Bootfix elsewhere in the documentation.

If you have double sided disk drives and are already experienced with OS-9 you may wish to do "INSTALL" instead of "INSTALL DS" which will leave you with a single sided bootable disk with SDISK installed and only a subset of the cmds. You may then boot with this disk and create other systems diskettes as you see fit.

NEW SDISK INSTALLATION

A set of command macros is now included with the sdisk release to automate the installation procedure. These are the commands: INSTALL, INSTALL.1, and INSTALL.2 . The macros will do most of the work and prompt you when to change disks, etc. They will request the following disks:

SYSTEM MASTER --- This is your OS-9 System Master Disk or a backup. (Any disk with the OS9boot file and the cmds:load, link, unlink, copy, makdir, tmode, setime, dir, free, mdir, mfree, del, dsave, os9gen, rename, and cobbler will do). If the system disk you use already has modules added to the OS9boot file, these will be automatically included in the new boot generated by install.

SDISK RELEASE --- This is the SDISK or SDISK+BOOTFIX software release disk.

DISK A --- A blank disk.

DISK B --- Another blank disk, (they will be reformatted by install.

TO INSTALL SDISK:

(1) Select two blank diskettes (or ones you don't mind being reformatted), label one "DISK A" and the other "DISK B".

(2) Cold boot your SYSTEM MASTER DISK (cold boot means from power off, switch power on and boot).

(3) Type in the command: OS9: LOAD LOAD LINK

(4) Remove the SYSTEM MASTER DISK, and insert the SDISK RELEASE DISK in drive 0. Type in one of the following depending upon how many and what type of disk drives you have:

(a) if you have only one drive:
OS9: /DO/CMDS/INSTALL.1

(b) if you have two or three drives (drive 0 must be either a 35 or 40 track single or double sided drive, and the others may be 35, 40, or 80 track single or double sided).
OS9: /DO/CMDS/INSTALL

(c) if you have two or more drives and drive 0 is a double sided 40 track drive you can do (b) above which will leave you with a bootable single sided diskette or do:
OS9: /DO/CMDS/INSTALL DS
which will go through extra steps to create a double sided bootable diskette. (NOTE: You can only do this with SDISK+BOOTFIX not the SDISK release without the BOOTFIX program.)

(5) Once you do one of the above you will be prompted on the screen when to change disks, KEEP YOUR HANDS AWAY FROM THE KEYBOARD, because when you are asked to change disks the program will wait for you to type any key to continue.. if you hit a key before you change the disk it will go ahead with the next step which may reformat a disk that you didn't intend! For that reason its a good idea to put a write protect tape on your SYSTEM MASTER disk. At the appropriate time the install program will ask you the number of drives in your system and the number of cylinders (tracks each side), sides, and step rate for each drive. Only Cylinder counts of 35, 40, or 80 are accepted and 80 track drives are assumed to be 96 tpi. Valid step rates are <= 30ms. and a maximum of 3 drives is accepted.

Options on INSTALL.1 (single drive installation program):

The default for INSTALL.1 is to include only the modules: ccio, term, ioman, rbf, scf, sysgo, clock, shell, rs232, t1, printer, p, pipeman, piper, and pipe in to OS9boot file created along with sdisk and the new device descriptor modules. These are all of the modules included with release 01.00.00 of OS-9 on the color computer. To include other modules (e.g. new modules in later release of OS-9 or wordpak driver etc.) use the command form:

INSTALL.1 module1 module2 ... module7

When this form is used the module CCIO is not included unless it is listed on the command line, all other modules listed in the above paragraph are included along with those listed on the command line (these modules must be resident in memory when INSTALL.1 is invoked).

Example: A system that already has the Wordpak driver installed and running OS-9 release 01.00.00 would use:

OS9: INSTALL.1 WORDPAK

this will install the wordpak driver in place of ccio as part of the new boot.

For a system with the modules ACIA and T2 in addition to those listed in the

first paragraph use:

OS9: INSTALL.1 CCIO ACIA T2

(Note: CCIO is listed here because using this form of the command it would not otherwise be included, also for version 2.0 OS9 you would have to include either C032 or C080).

FINAL NOTE: Most but not all of the steps taken by the install programs will be echoed to the screen.

****
* The following is a description of the manual installation procedure, if you
* have used one of the install macros you can skip this section.
****

SDISK

OVERVIEW: The software in the SDISK package will allow you to fully use any type of minifloppy drive with the Color Computer under the OS-9 operating system. This includes using up to three drives each with its own step rate and characteristics independent of the others. Each drive may be single or double sided, with 35, 40 or 80 tracks and step rate of 6, 12, 20 or 30 milliseconds. You will be able to read/write and format disks in the CoCo OS-9 format on any of these drives, and also read/write and format the standard OS-9 single and double density formats used on most other OS-9 systems.

USING SDISK

Before attempting to use the sdisk software you should have read the red "OS-9 COMMANDS" manual up to where the command descriptions start (page 60) and be familiar with the terminology and basic features of OS-9 as explained in that manual, also read this document entirely once before beginning any of the procedures given.

The SDISK module is a "device driver". Read the blue "OS-9 Technical Information" manual for a complete expanation of the functions of a device driver module.

For each disk drive you have attached to your system you have a device descriptor module (these are named D0 D1 D2 and D3). These device descriptor modules contain the names of the device driver module (CCDISK on the stock release disk) and the file manager module (RBF) which are used by the IOMAN module when ever you access your disk drives.

To make use of SDISK you will generate a new system disk using OS9gen to replace the original disk driver and descriptor modules with SDISK and new descriptor modules created by DESCGEN3. Several utilities have been included with this package to simplify this procedure, these include MODBUSTER, DESCGEN3, and FLS. Keep in mind that until you have completely finished creating a new system disk AND HAVE REBOOTED from that disk that you are still using CCDISK to access the drives, for this reason you can not yet format a

double sided disk. For this reason the first system disk you create with SDISK installed will have to be a single sided disk, after you have rebooted from this disk and are running with SDISK installed, then you will be able to format double sided disks using SFORMAT (assuming you have double sided disk drives).

NOTE: If you have used the INSTALL macro as instructed earlier you do not need to perform the following operation. This outline of the manual installation procedure is provided for those who for some reason do not wish to use the INSTALL macro.

OUTLINE OF STEPS:

1. With a copy of a system disk in /d0 (make sure it has enough free sectors.. delete un-used files if necessary to make more room) copy all commands from Sdisk Release disk /CMDS directory to execution directory on /d0

2. Makdir /d0/MODS
   chd /d0/mods
   modbuster /d0/os9boot (these steps create a directory "MODS" with all the modules contained in the os9boot file from /d0)

3. Del ccdisk d0 d1 d2 d3 (delete old driver and descriptor modules from MODS directory... use appropriate name if other than CCDISK etc.)

4. DESCGEN3 (run descgen3 program and answer prompts to create new device descriptors in MODS directory).

5. With Sdisk Release disk in /d1 copy /d1/mods/sdisk (or /d1/mods/sdisk2 if using OS-9 version 02.00.00) to /d0/mods/sdisk.

6. Put a blank disk and /d1 and format it (use FORMAT at this point).

7. fls ! os9gen /d1 (will create new boot on /d1 using all modules in MODS directory).

8. Copy any files you want to the new disk which is now bootable, or use DSAVE /D0 /D1 ! (x -p) to copy everything from /d0 to /d1.

9. After booting this disk you will be running under sdisk and may format double sided disks if you have double sided drives, always use SFORMAT for formatting disks when running with sdisk installed. You may make other bootable disks by using the Cobbler command instead of the procedure in step 7. To make a double sided bootable disk first use SFORMAT to format it, Cobbler to install the boot, and BOOTFIX to reconfigure the disk to boot as double sided, e.g.

```
SFORMAT /D1
COBBLER /D1
BOOTFIX /D1
```

USING STANDARD OS-9 FORMAT DISKS

The device descriptors created by DESCGEN3 or the INSTALL macro will describe the drives as COCO format. To access a standard OS-9 format use the descgen command to dynamically modify the device descriptor to access the standard format on the desired drive.

DISKTYPE

SYNTAX: Disktype [-opts] /device [/device ..]

Used to modify a disk descriptor for various OS-9 formats. If no options are given then the current device setting is displayed only.

Options:
- -c Set for Color Computer OS-9 format.
- -j Set for Japanese OS-9 formats.
- -m Set for Mizar type OS-9 formats.
- -s Set for Standard OS-9 formats.

Examples:

```
Disktype /d0 /d1
   (identifies the current settings of d0 and d1).
Disktype -s d1
   (sets /d1 to access any Standard OS-9 format).
```

Once the descriptor is set for a particular OS-9 type, you may format that type with SFORMAT. (If you are using a Color Computer, you should use the Color Computer OS-9 format for all of your disks except when you need to transfer information to another system that uses one of the other disk types.)

Example: If you need to read/write a Standard OS-9 disk format, e.g. single density on /d1,

```
disktype -s /d1
```

would set the drive for this type, you could then do a dir, copy etc. to this disk, you can not use a Color Computer format disk in this drive again until you do

```
disktype -c /d1
```

to restore the drive to the COCO format.

SDISK GETSTT/SETSTT FUNCTION CALLS

The following I$GETSTT functions are implemented in the sdisk driver revision 2 or higher:

SS.DREAD (Function code $80) Direct Read function reads specified sector into user buffer. Any length double density sector may be read, single density sectors must be 128 or 256 bytes long.

Entry Conditions:

A = path number
B = $80
U = track (msb) / sector number (lsb)
X = buffer address to read data into
Y = sector size / FMT

Y-REGISTER CONTENTS															
Y15	Y14	Y13	Y12	Y11	Y10	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00
lsb sector size								ms bits size			x				
S07	S06	S05	S04	S03	S02	S01	S00	S11	S10	S09	S08	-	tpi	dns	sid

(Y contains following:)
bits 8-15 = least significant 8 bits of 12 bit sector size in bytes.
bits 4-7 = most significant 4 bits of 12 bit sector size with bit y-7 being the most significant bit of the count
bit 0 = side (0 or 1)
bit 1 = density (0=single, 1=double)
bit 2 = TPI (0=48 TPI, 1=96 TPI)
bit 3 = not used

Exit Conditions:
Buffer pointed to by X-reg contains data read from sector.

If error:
CC = C bit set
B = error code

Note: These functions in sdisk currently handle sector sizes of 128 and 256 bytes only in the SINGLE density mode. In double density any sector size up to 1024 bytes is supported.

The following special **I$SETSTT** functions are implemented in the sdisk driver (rev 2 or later):

SS.RST (Function code $03) Restore head to track 0.
SS.WTK (Function code $04) Format a track.
SS.FRZ (Function code $0A) Freeze DD. information.

The above function as described in the OS-9 Technical Information manual under the **I$SETSTT** function.

SS.DWRIT (Funtion code #80) Direct sector write. Writes data from user buffer to specified track, sector, and side of drive. Any sector size may be written in double density, and either 128 byte or 256 byte sectors for single density may be written.

Entry Conditions:

A = path number
B = $80
U = track (msb) / sector number (lsb)
X = buffer address to read data into
Y = sector size / FMT

Y-REGISTER CONTENTS															
Y15	Y14	Y13	Y12	Y11	Y10	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00
lsb sector size								ms bits size			x				
S07	S06	S05	S04	S03	S02	S01	S00	S11	S10	S09	S08	-	tpi	dns	sid

(Y contains following:)
bits 8-15 = least significant 8 bits of 12 bit sector size in bytes.
bits 4-7 = most significant 4 bits of 12 bit sector size with bit y-7 being the most significant bit of the count
bit 0 = side (0 or 1)
bit 1 = density (0=single, 1=double)
bit 2 = TPI (0=48 TPI, 1=96 TPI)
bit 3 = not used

Exit Conditions:
Data from buffer at X-reg is written to disk.

If error:
CC = C bit set
B = error code

NOTE: If sector sizes larger than 256 bytes are to be written then the verify option needs to be switched off. Use getstt and setstt functions $00 (SS.OPT) to do this after opening a path to the device and before using the SS.DWRIT function call.

SS.UNFRZ (Function code $81) Unfreeze DD. information. (Reactivates the reading of LSN 0 to DD.xxx variables after SS.FRZ call has shut it off.

Entry Conditions:

A = path number
B = $81

Exit Conditions:
none

BOOTFIX

SYNTAX: BOOTFIX devname

The bootfix command is used to make bootable **double** sided OS-9 CoCo disks. It is not necessary to use this command for any type of single sided disk. Bootfix must be invoked on a new disk Immediately after doing the cobbler or os9gen commands to create the bootfile. Bootfix works by rearranging the bootfile and the OS-9 kernal on track 34 to be located where the bootstrap program will find them, (OS9gen or Cobbler put the bootstrap file on a new disk).

Example: Assuming /D1 is a double sided disk newly formatted with Sformat;

OS9: Cobbler /D1
OS9: Bootfix /D1

will install the bootfile on the disk (cobbler), and move it so it will be bootable by the normal procedure, (of course drive 0 must be a double sided disk drive also in order to boot from this disk).

NOTE: The Bootfix command is an executable program and should be copied from the distribution disk to the CMDS directory of your working systems disk.

Example: copy /d1/cmds/bootfix /d0/cmds/bootfix

DESCGEN3

DESCGEN3 is a device descriptor generator program used to create device decriptors for use with the SDISK device driver module. One device decscriptor is required for each disk drive used with the system. Descgen3 will create device descriptor modules d0, d1 etc. in a file of the same name IN THE CURRENT WORK DIRECTORY. To run descgen enter:

OS9: DESCGEN3

The descgen program will then ask the number of drives, and the number of cylinders (tracks), and the number of sides and step rate for each drive. Answer the questions (follow each response with the "Enter" key).

Note: Most drives available today operate with a 6 Millsecond step rate, if in doubt you can use a slower step rate (up to 30) which will work with any drive but give slower performance if the drive is capable of the faster rate.

MODBUSTER

SYNTAX: MODBUSTER pathname

Performs the inverse function of the MERGE command, i.e. breaks a file containing several modules into separate files each containing one module.

Modbuster will create a file for each module contained in pathname in the current work directory with the file name being the same as the module name. If a file already exsists with the same name as the one being created, operation will be aborted.

example:

```
makdir MODS
chd mods
modbuster /d0/os9boot
```

This sequence separates each module contained in os9boot into a separate file in the directory MODS. This is useful for rebuilding the boot. If you have the LS command which is part of Filter kit #1 an easy way to build a new boot file containing all of the modules in the mod directory is:

```
chd mods
ls ! os9gen /d1
```

By first making sure the mods directory contains all modules you desire to be in the new bootfile, this sequence will install a new bootfile on /d1 (provided you have a blank disk there). If you don't have ls you can use fls which is on the sdisk distribution version, fls is a stripped form of ls which lists all files in the current directory.

e.g.:

```
chd mods
fls ! os9gen /d1
```

NOTE: Modubuster returns error #102 if there is insufficient memory to process the merged module, use the shell # parameter to allot more memory.

SFORMAT

SYNTAX: SFORMAT /devname [opts]

Sformat when used with SDISK intalled allows formatting COCO OS-9 format diskettes with one or two sides and any number of cylinders, up to the capacity of the drive. When the device name ("/devname") is for a standard OS-9 format it will also allow formatting of the standard single and double density formats. If the "R" option is not given SFORMAT will display a table of format parameters for the given drive "/devname" and wait for operator response to quit the program, continue formatting, or change the parameters.

```
opts:  S = Single density  (valid for OS-9 standard formats only)
       D = Double density
       R = Ready           (proceed immediately with formatting)
       1 = 1 side
       2 = 2 sides
       4 = 48 TPI          (to format 48 TPI on 96 TPI drive)
       "disk name"
       'no. of cylinders'
       :Interleave:
```

The above options will overide the default parameters taken from the device descriptor module for the format operation. If the "R" option is used, formatting will begin at once without waiting for the operator to enter (Y, Q, or N).

EXAMPLE:

```
 OS9: SFORMAT /D1

*** STANDARD DISK FORMAT ***
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FORMAT PARAMETERS:

    Double Density
 80 Cylinders
  2 sides
    Color Computer 5" format
 18 Trk 0 Sectors
 18 Sectors/Track

Formatting drive /D1
y (yes), n (no), or q (quit)
Ready?N

Change to 48 TPI?Y
Double Sided?N
No. of Cylinders=35

FORMAT PARAMETERS:

    Double Density
 35 Cylinders
```

```
  1 sides
    Color Computer 5" format
 18 Trk 0 Sectors
 18 Sectors/Track

Formatting drive /D1
y (yes), n (no), or q (quit)
Ready?Q
```

The "Q" entered above quits (exits) the program without formatting the disk on /D1, by entering "Y" the formatting operation would proceed. The parameters in the original table are determined by the drive capabilites defined in the drive device descriptor. These parameters can also be changed by options included on the command line when sformat was invoked. To format an OS-9 Standard Format disk one of the device descriptors must be configured for the standard type disk with the DISKTYPE utilitiy before SFORMAT is called.