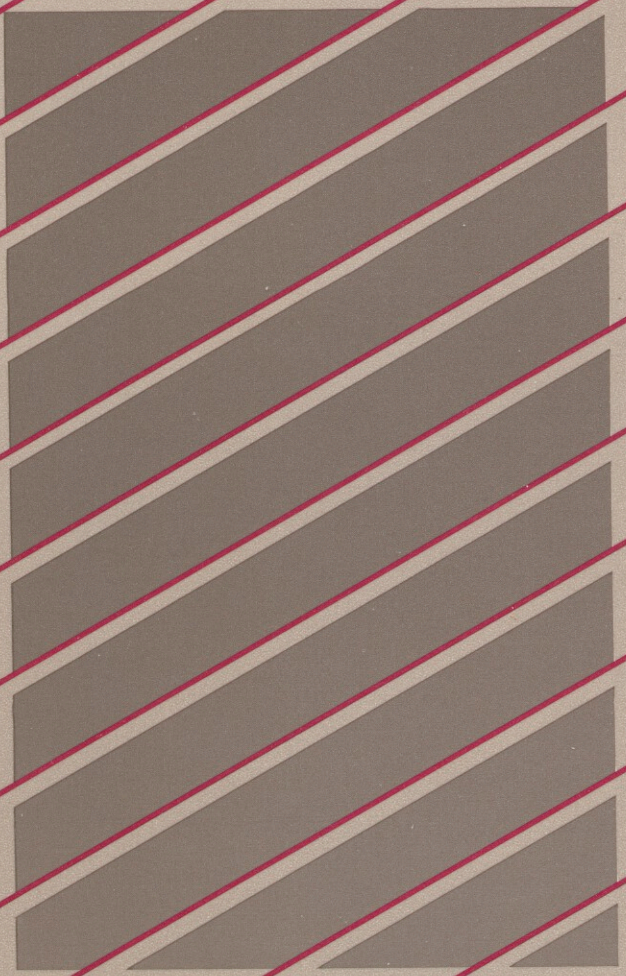
SmartDos

RanaSystems



Disk operating system
for Atari® computer systems

SmartDos

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Introduction

Thank you for buying SMARTDOS. Whether this is your first experience with a disk drive, or you're an old pro, you will soon discover that you now possess the finest, most friendly Disk Operating System (DOS) available for Atari computers!

Most Disk Operating Systems assume that the user is familiar with the ideo-syncracies of the original single density Atari DOS 2.0.

SMARTDOS assumes nothing. It has been written with YOU the user in mind. Its authors believe that DOS should be a tool which requires very little thought on the part of the user.

DOS's primary use is a to manage the way the computer and the disk drive interact with each other, and to manage information in the form of files. You naturally want to be able to manipulate those files in a quick and efficient manner, almost as a second thought.

You should not have to think about which command to use. That is the beauty and the simplicity of SMARTDOS. It does not rely on a series of HELP menues to guide you. The words that appear on the main menu, called commands, are chosen because they clearly define what is to be done. The first half of this manual shows you how to install and use SMARTDOS. It also explains the commands and functions in the Disk Utility Package. The second half is directed to the requirements of the experienced user. The Appendix contains useful reference information.

We hope you enjoy this manual and we welcome your written suggestions for improvement and additions in future releases of this product.

RANA SYSTEMS

WHAT IS DOS?

DOS means Disk Operating System. A floppy disk drive is a tremendous asset to computer programmers and end users. It provides convenient storage of programs and files, with a powerful set of commands and utility programs. It facilitates the control of multiple disk drives and other peripheral equipment. And even more important, it makes management of files and programs very simple.

Those of you who have used cassettes know how difficult it is to manage your growing collection of programs. And those of you who have used floppy disketes know the speed and convenience which they offer. A single diskette will store several files or programs.

The memory conscious user may initially be concerned because the DOS takes up several kilobytes of memory. This is true. But the advantages far outweigh the disadvantages. It is recommended that your Atari computer have at least 24K (kilobytes) of memory to make effective use of the Disk Operating System.

WHY SMARTDOS?

SMARTDOS gives you added power and flexibility compared to other disk operating systems for the Atari.

SMARTDOS will allow you to:

- Control four disk drives
- Format diskettes for data storage
- Select or change the storage density
- Store files and programs on diskettes
- Transfer data between disk and memory
- Transfer data from disk or memory to peripheral devices such as printers
- Maintain a directory of files on each diskette
- Retrieve and manipulate files and programs
- Create, edit, and combine files
- Make copies of whole diskettes

- Copy files and programs
- Copy diskettes to a different storage density
- Copy specified disk sectors
- Electronically write protect or unprotect files
- Rename files
- Delete Files
- Diagnose and (in some instances) correct disk problems
- Enable your computer to communicate with other computers via a modem
- Change computer and program defaults
- Load and save binary files
- Operate in memory with BASIC and ASSEMBLER EDITOR without needing to access DOS from disk.

If you have never used a Disk Operating System (DOS), you will find SMARTDOS is easy to learn. If you are familiar with other Disk Operating Systems, you will appreciate the power of SMARTDOS along with its elegant simplicity.

Setting Up Your System

For complete instructions on setting up your ATARI computer and your RANA 1000 disk drive, see your instruction manuals.

SYSTEM REQUIREMENTS

SMARTDOS is designed to be used with Atari personal computers, such as the Atari 400, Atari 800, and Atari XL. A color television monitor is assumed in the text which follows, but a monochrome monitor can be substituted if preferred.

The computer must have a minimum of 24 kilobytes (K) of Random Access Memory (RAM). This is because most application programs for the Atari require a minimum of 16K of RAM, and the Disk Operating System (DOS) requires approximately 9.5K of RAM.

SMARTDOS can be used with any disk drive made for the ATARI. With the RANA 1000, it can read and write in single or double density. SMARTDOS cannot make double density recordings on drives which are not designed for this purpose.

The Rana 1000 is recommended for its advanced design features. A write-protect switch on the drive provides double protection for your files and programs. The LED indicators on the front of the Rana 1000 display: power on, busy, write-protected, drive number, track number, density mode, and error codes.

SETTING THE DRIVE ADDRESS

Set the drive select switches as described in the instruction manual which came with your disk drive. Up to four disk drives are supported from the SMARTDOS menu. The drive address switch on the back of each disk drive must be set to 1 for the first drive, and 2, 3, and 4 for each additional drive. Under SMARTDOS you cannot have two drives with the same address (drive number).

The drive number of each RANA 1000 is identified on its display panel (Fig 1). If you are using a drive from another manufacturer, it is helpful to number the drive using a small gum backed label.

HANDLING AND STORAGE OF DISKETTES

Before installing SMARTDOS on your diskettes, some suggestions on taking care of diskettes are in order. The majority of diskette problems result from improper handling. Mechanical damage, or foreign substances on the surface of the diskette can destroy valuable programs and files.

Diskettes consist of a flexible mylar disk coated with a magnetic recording medium, enclosed in a sealed protective jacket. A write protect notch on the upper right side allows a disk drive to write information on a diskette when the notch is NOT covered.

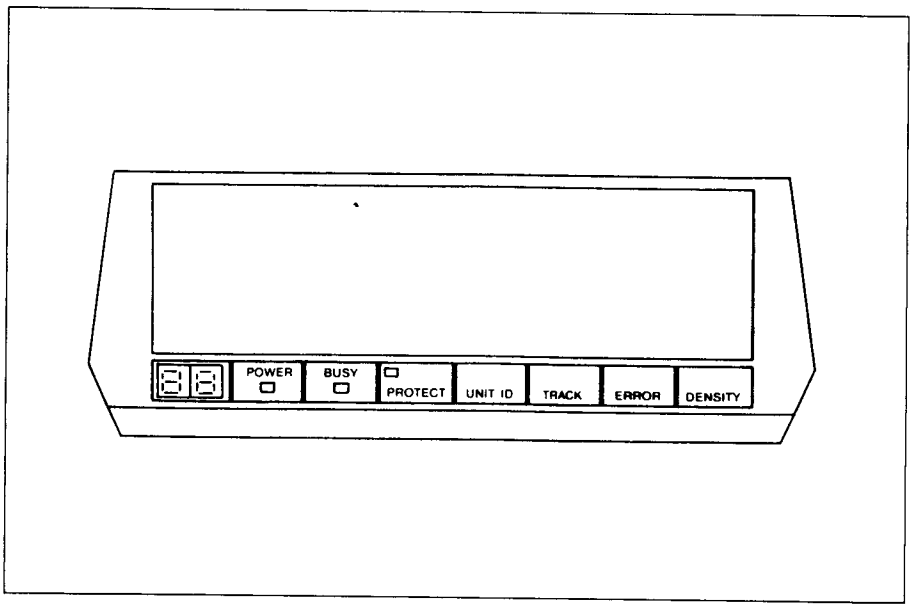

Figure 1. RANA 1000 display panel showing disk drive number.

If a write protect tab is placed over the notch (Fig 2), the computer cannot write to the diskette. Note that the same condition will occur if the write-protect feature of the Rana 1000 is enabled.

The long oval opening is where information is transferred between the diskette and read/write head. NEVER TOUCH THE DISKETTE WITH YOUR FINGERS, OR ALLOW ANY OBJECT OR SUBSTANCE TO COME IN CONTACT WITH THE DISKETTE SURFACE.

The following suggestions will protect your valuable programs and files for future use.

ALWAYS keep your diskettes in their protective envelope when not in use.

Store them vertically in a container designed for diskette storage.

Keep diskettes away from television sets, radios, telephones, and electrical or magnetic devices.

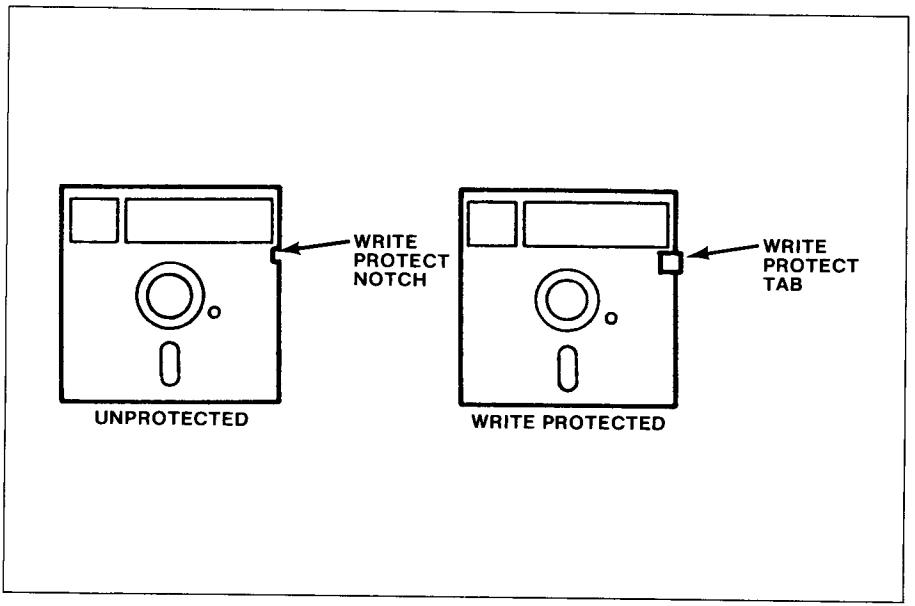

Figure 2. Diskette showing protective cover and write-protect tab.

Protect your diskettes against heat, moisture, or excessive dryness.

Do not allow fingers, dust, or foreign substances to touch the surface of the diskette.

Do not write on the diskette label with hard or pointed objects.

MAKING A WORKING MASTER DISKETTE

Read all of the instructions for this activity, then perform each action step by step. Section 3 of this manual, USING SMARTDOS, explains these operations in greater detail.

You will need the following items:

SMARTDOS Master Diskette
Blank Diskette and Diskette Envelope
Label, Pen, and Write-Protect Tab

DO NOT USE YOUR ORIGINAL COPY OF SMARTDOS AS A WORKING COPY. DUPLICATE IT NOW USING THE FOLLOWING PROCEDURE. THE FOLLOWING PROCEDURE REQUIRES ONLY ONE DISK DRIVE (DRIVE 1). START WITH THE COMPUTER TURNED OFF:

NOTE: The original system diskette is slightly different to the working copy. This is why it is so important to make and use the working copy instead of the original. The original contains the following programs:

DOS.SYS - ATARI DOS 2.0 under license from ATARI.

AUTORUN.SYS - converts ATARI DOS "DOS.SYS" in memory.

All other programs are the same.

When you make the working copy, the two files above are replaced by:

DOS.SYS - SMARTDOS disk operating system.

All other programs are the same. These include:

DUP.SYS
DEFAULT
ARCREATE.BAS
RS232.ARx

Booting the Master Diskette

Insert the SMARTDOS Master diskette in your disk drive, close the door and turn on the power to the drive.

Turn on your computer and monitor (or TV set), and wait for the SMARTDOS MENU to appear.

Format a Blank Diskette

Remove the SMARTDOS diskette from your drive and store it in its protective envelope. Insert a blank (unformatted) diskette into Drive 1.

NOTE: Do not use program or file diskettes you want to keep because this process erases all information on the diskette.

Press the letter "F" for Format on your keyboard. The screen turns amber. A prompt (special character or statement from the computer) appears on the lower left of the screen.

FORMAT DISK #?

Respond to the prompt by pressing the number "1". A second prompt is added to the screen:

PUSH X TO FORMAT DISK 1

Respond by pressing "X." The prompt states:

DISK 1 BEING FORMATTED, DENSITY SNG

(SNG is an abbreviation for SiNGle density data record.)

When the formatting process is finished, the screen turns Blue, and the following prompt appears:

PRESS CHOICE OR RETURN FOR MENU

Make System Master (Working Master)

To make the newly formatted diskette into your WORKING SYSTEM MASTER DISKETTE, press RETURN. The SMARTDOS menu is displayed (Fig 3).

Specific items are chosen from the menu by pressing the first letter for that option.

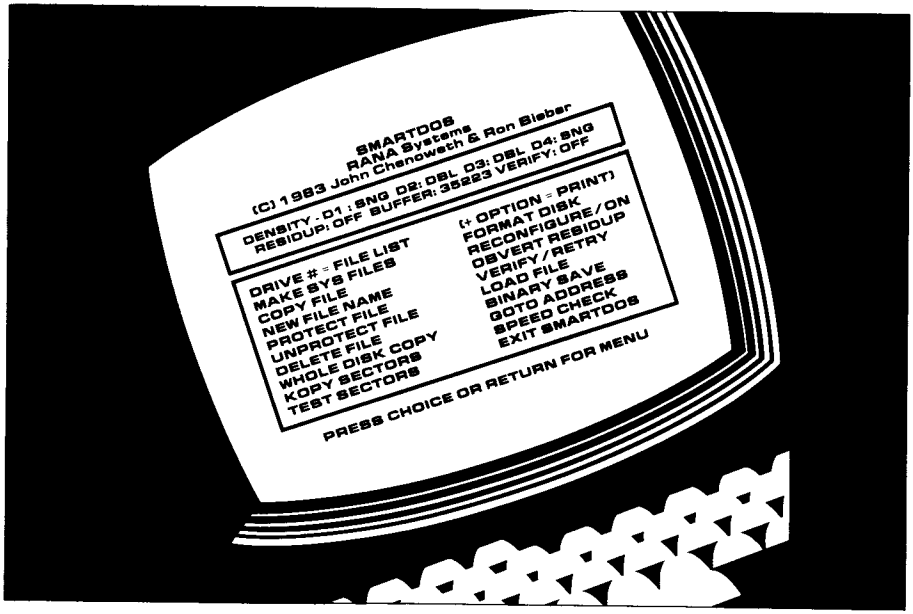

Figure 3. The SMARTDOS Menu of Commands.

Press "M" (Make System Files)

The screen returns the following prompt:

MAKE SYS FILES: DISK #? (OPTION=NO DUP)

Press "1" to make the system diskette in drive #1. SMARTDOS responds with the prompt:

PUSH "Y" TO WRITE DOS & DUP:DISK 1

Press "Y". This writes SMARTDOS and the Disk Utilities Package (DUP) on the diskette. The screen displays:

WRITING NEW DOS & DUP:DISK1

When the copy process is finished, the prompt returns:

PRESS CHOICE OR RETURN FOR MENU.

Copy Files.

Organize your workspace so you can store the SMARTDOS Master Diskette in its protective envelope on your left, and the Working Master Diskette in its protective envelope on your right. You will be alternating these two diskettes in your disk drive, when instructed by the screen.

Insert the SMARTDOS Master diskette in drive 1, and close the disk drive door.

Press "C" to copy all of the files on your SMARTDOS Master diskette onto your Working Master copy of DOS. The screen requests the drive number and name for source file and destination file.

COPY:SOURCE, DEST?

Single Disk Drive Method:

If you are using one disk drive, type:

.,1

Press RETURN to initiate the copy process.

With a single disk drive, it is necessary to change the source and destination diskettes when prompted to do so. After each diskette change, ensure that the drive door is closed, and press RETURN to continue.

Method Using Two Disk Drives.

If you have two disk drives, place the SMARTDOS Master diskette in Drive 1, and the Working Master diskette in drive 2, close the drive door, and type:

.,2

Press RETURN to initiate the copy process.

When the process is complete, the prompt reappears:

PRESS CHOICE OR RETURN FOR MENU

File the original SMARTDOS diskette in a safe place. Take your "WORKING MASTER" of SMARTDOS out of the drive. Attach a write protect tab over the notch on the right hand side of the diskette. Place the diskette in its protective envelope.

Write "SMARTDOS WORKING MASTER" on a label and attach it to the diskette. (Labels and write protect tabs are enclosed in each box of diskettes.)

CONGRATULATIONS! YOU HAVE JUST COPIED YOUR FIRST DISKETTE!

Now let's explore what this fine DOS can do for you.....

SMARTDOS
Commands and Functions

SMARTDOS is a powerful disk operating system for Atari computers. It has: a comprehensive menu of commands; a Disk Utility Program (DUP) to support file maintenance operations; and a series of programs that configure the system for special applications.

The Disk Operating System (DOS) manages the flow of information between the computer's memory, disk drive(s), and other peripheral devices such as the video monitor and a printer. DOS maintains the disk directory, diagnoses system problems, and prints error messages to the screen.

The Disk Utilities Package (DUP) facilitates "housekeeping" operations such as formatting disks, copying files, and protecting, unprotecting, and deleting programs. In SMARTDOS, you have the option of copying DOS with DUP, or DOS without DUP.

SMARTDOS includes some additional programs for the more advanced user. DEFAULT enables you to configure the system for more disk drives, or more available memory. ARCREATE.BAS enables basic programs to load automatically when the system is "booted." RS232.ARX enables you to use the serial port on the Atari 850™ Interface with SMARTDOS. Other programs enable you to diagnose problems in diskettes.

SMARTDOS gives you the file management capabilities of a large computer. It also facilitates communicating with other computer systems using a modem.

SMARTDOS can be booted on its own, or in conjunction with a computer language. Each option serves a specific purpose:

Application Programs

If SMARTDOS is used primarily to compile the directory, and manage flow of information between the computer and peripheral equipment, only the DOS need be copied to the program diskette.

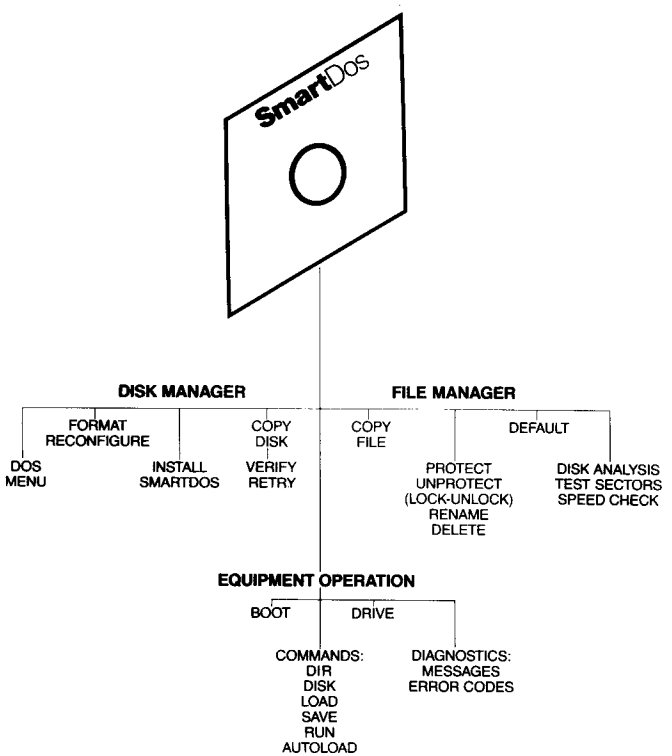

Figure 4. The functions and commands of SMARTDOS.

File Maintenance

SMARTDOS with the Disk Utilities Package is used to backup diskettes, copy files or change drive configuration. These operations do not require BASIC language to be loaded. For optimum memory utilization the BASIC cartridge can be removed from your computer during disk utilities operations.

When the computer is turned on and SMARTDOS is loaded from your diskette, the DISK UTILITIES PACKAGE (DUP.SYS) is automatically loaded. Then the SMARTDOS menu appears on the screen.

Making Program Changes

If you intend to write, modify, or manipulate specific lines in BASIC or ASSEMBLY language, install the appropriate cartridge prior to booting the diskette. This will cause a two stage boot.

If you are using BASIC, the FILE MANAGEMENT SYSTEM (FMS) is loaded, and the BASIC prompt READY is displayed.

Type: DOS to load DUP.SYS into memory and display the SMARTDOS menu.

If the ASSEMBLER EDITOR cartridge is used, the prompt EDIT appears.

Type: DOS to load DUP.SYS into memory, and the SMARTDOS menu is displayed.

The full power of SMARTDOS is now in memory. Remove the system diskette and use the disk drive for files and programs. (Unlike some Disk Operating Systems, SMARTDOS does not require the system diskette to remain in the drive.)

There are three ways in which SMARTDOS can be booted (Fig.5).

BOOTING DOS

Required: SMARTDOS Working Master diskette.
OR Any diskette with SMARTDOS installed.
BASIC or ASSEMBLER or other language (PILOT, etc.) cartridge if required.

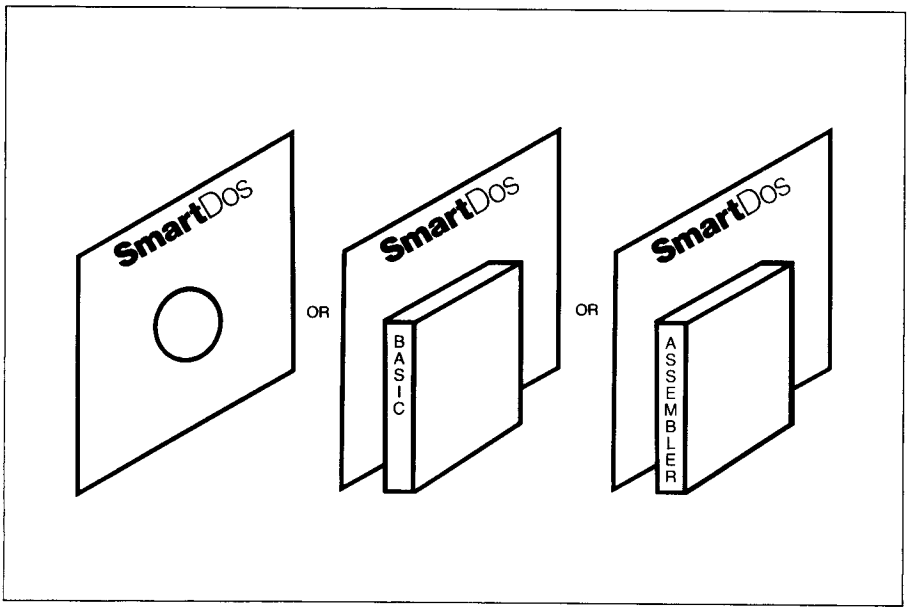

Figure 5. Boot SMARTDOS alone, or with BASIC or ASSEMBLER cartridges.

Procedure: Insert your diskette containing SMARTDOS in drive 1.
Turn on the drive, and turn on the computer.
Wait for the SMARTDOS prompt.

It is recommended that you install SMARTDOS on all of your program diskettes (see next section - INSTALLING SMARTDOS). The convenience of having DOS on each diskette far outweighs the small amount of diskette space used. It makes each diskette "self-booting", and greatly reduces the number of diskette changes required. The only reason to boot DOS from a separate diskette is when you need all of the space on the diskette for a file or program.

IMPORTANT: Without SMARTDOS on the diskette, you will need to boot the system with the Working Master diskette or another diskette that has SMARTDOS installed.

Unlike some Double Density Disk Operating Systems, when SMARTDOS is booted and the menu appears on the screen, you may take out the SMARTDOS diskette and store it away.

INSTALLING SMARTDOS

Required: SMARTDOS Working Master diskette.
Diskettes formatted at the required density (SNG/DBL).

A diskette with SMARTDOS installed is called a System File Diskette (SYS). There are two options:

Install DOS alone.

Install DOS with the Disk Utilities Package (DUP).

The menu includes both options under MAKE SYSTEM FILES.

The examples which follow assume a system with two disk drives, but a single drive can be used also. Enter "1" for the number of both source and destination drives in these examples.

Put a formatted diskette in the drive of your choice and press "M".

The following prompt appears:

MAKE SYSTEM FILES:DISK#? (OPTION=NO DUP)

SMARTDOS is asking two questions:

To what disk drive number should SMARTDOS be written?

Do you want the Disk Utilities Package (DUP) written also?

DOS with DUP

Press "2" to select drive number 2 as the destination drive. The screen message prompts:

PUSH "Y" TO WRITE DOS & DUP: DISK 2

Press "Y" to write DOS and the Disk Utilities Package from memory to disk 2. The prompt reads:

WRITING NEW DOS & DUP:DISK 2

SMARTDOS writes the files onto the diskette. When it is finished, the prompt reads:

PRESS CHOICE OR RETURN FOR MENU

This indicates that the files have been successfully copied onto the diskette in drive 2.

If the Disk Utilities Package is not required, questions 1 and 2 must be answered in a different way.

DOS without DUP

Hold down the option key "M" and then press the drive number "2". The screen prompt reads:

PUSH "Y" TO WRITE DOS ONLY:DISK 2

Press Y to start the copy process. The screen reads:

WRITING NEW DOS ONLY:DISK2

Again, SMARTDOS signals when the process is completed with the prompt:

PRESS CHOICE OR RETURN FOR MENU

By now you will have noticed it is not necessary to return to the main menu to use the different SMARTDOS commands. For example, if you wish to check the directory for disk 2, it is only necessary to press "2" on the keyboard.

WARNING

Before writing SMARTDOS to a diskette containing files or programs, be sure that the files were written under a DOS which is compatible with SMARTDOS. Boot the system with SMARTDOS and check each program or file type to ensure correct operation. Then copy these materials onto a diskette on which SMARTDOS has been installed.

CREATE/EDIT FILES

Required: Formatted diskette with SMARTDOS installed.
BASIC or ASSEMBLER EDITOR cartridge if required.

There are two classifications of files:

Program Files

Program files give instructions to the computer for specific applications such as accounting or word processing. A program can be something you created, or an application program which you purchased at the store.

Data Files

Data files store information created by program files. They contain information used by a program file to accomplish a specific task or a series of tasks. For example, a data file might contain the names and numbers of parts in an inventory.

Specific information on creating and editing programs will be found in your manuals on BASIC and ASSEMBLY LANGUAGE.

FILENAMES AND FILESPECS

Computer files must be assigned a name, called the filename. When a command is issued that calls one or more files, each is called by its own filename. The name used in the command is called a filespec.

The Disk Operating System (DOS) compares the filespec to the list of filenames currently residing on the diskette. A filespec may match one of the filenames, more than one of the filenames, or none of the filenames. In the latter case, an error message is given.

Filenames and filespecs share some common rules, but differ in one respect: filenames never use "wildcard" characters ("*", "=", and "?"), but filespecs often do.

> REMEMBER: Filenames are associated with files, and filespecs are associated with commands.

Filenames consist of a name and an optional extension. The name consists of 1 to 8 characters. Each character must be letters A through Z or numbers 0 through 9. The first character must be a letter, not a number.

The optional extension must immediately follow the name, and consist of a period (.) and 1-3 characters. Each character must be A-Z or 0-9. The first character of the extension must be a letter, not a number.

Some file extensions are reserved for special purposes. A few have special meanings for the computer, and determine the way in which your programs operate. Others are used throughout the industry to identify particular kinds of files. The standard extensions are:

SYS	system files (not copied by wildcards)
BAS	BASIC program files
AR1-AR9	SMARTDOS autorun files
DAT	data files
ASM	assembly language files
LST	files created by the list command
SVE	files created by the save command
OBJ	binary load files

Here are some examples of legal and illegal filenames:

LEGAL	ILLEGAL	REASON
CONTACTS	CONTRACTORS	(too many characters)
VISICALC.FIN	CALC#2	(# is invalid)
A12345.B23	317.BAS	(1st character not A-Z)
A1	A1.B234	(extension too long)

Filespecs follow the same rules as filenames, except that "wildcard" characters are allowed in both the name and the extension.

If you try to use a filespec with more than 8 characters, SMARTDOS will ignore the entire command. The same holds true if you try to use more than three characters in the extension.

WILDCARDS

A Wildcard, according to the NEW AMERICAN COMPUTER DICTIONARY is: a symbolic character in search of an argument!

In computer filespecs, a wildcard character can be substituted for a specific character, word or name. It can be used for whole words, parts of words, or filespec extension.

Suppose you wanted to search for a list of files with names similar to Smith. Rather than entering all similar names, enter the name Smith as Sm?th (? is the single character wildcard). This would give a listing of names such as Smith, Smyth, Smeth and any other name with a similar spelling.

SMARTDOS supports three wildcard characters:

? * =

The question mark (?) is used to substitute for a single character.

The asterisk (*) is used for word substitutions.

The equals sign (=) is used for substitution of whole filenames.

The following functions support wildcard use:

COPY
PROTECT
UNPROTECT
DELETE
NEW FILE NAME

We have already seen how we might use the "?" wildcard. Now let's see how to use the asterisk ("*") wildcard. Consider the files:

TEST.BAS
EXAMPLE.EXT
MINE.COM
EXE.BAS

To duplicate (copy) all files with the extension .BAS, you could enter each file one at a time (TEST.BAS, EXE.BAS). An alternative is to use the wildcard * in the following manner:

*.BAS

When this command is entered, it is interpreted as: "Copy all file names with extension .BAS.

SMARTDOS looks for all file extensions with the letters BAS and copies those it finds.

The asterisk is also used when the extension is the common denominator and the file name is different. Suppose you have ten files with the extension .EXE. There are two files you wish to copy from drive number i to drive number 2. These are NIGHT.EXE and MUSIC4.EXE. The catalog reads:

NIGHT.EXE
MUSIC1.EXE
MUSIC2.EXE
MUSIC3.EXE
MUSIC4.EXE

In this instance, the two files must be copied separately. The proper use of the wildcard would be:

NIGHT.*,2:NIGHT.*

Press RETURN. When the copy operation is finished, enter:

MUSIC4.*,2:MUSIC4.* [RETURN]

Another method of selecting files to be copied is the /Q option of SMARTDOS. It displays files that meet the selection criteria one at a time. You press Y for Yes for those files you want to be copied. The following entry displays all file names on disk 1. By using wildcards, SMARTDOS does the work for us. Here's how:

./Q,2:*.* [RETURN]

This is interpreted as: "List all file names with all extensions to the screen. Copy when there is a Y (yes) response to the prompt.

The first computer response after typing in the above wildcards is:

FILE NAME - D1: NIGHT.EXE
"Y" TO COPY?

If we hit any key other than "Y", the next file name is presented on the screen. A "Y" response copies the file from drive 1 to drive 2. Notice that it is not necessary to specify drive number one. SMARTDOS assumes the default drive if another drive is not designated!

Let's assume that you only have one disk drive and wish to copy all files to another formatted diskette.

The command using the asterisk as a wildcard is:

.

It is not necessary to specify a drive number since you only have one drive.

The wildcard equals (=) command, used alone, will copy all files from one diskette to another using one disk drive. The command to start the copy process is:

=

Put the source diskette in your drive, press C, and enter the wildcard =. The screen turns green, and the following prompt appears:

INSERT SOURCE DISK AND RETURN

When SMARTDOS finishes reading the file, or a portion of it, the screen turns red and the following message appears:

INSERT DESTINATION DISK AND RETURN

Insert your destination diskette and press RETURN.

Continue this process until the screen turns blue and you see the prompt:

PRESS CHOICE OR RETURN FOR MENU

IMPORTANT: We recommend that you protect your source diskette with a write-protect tab if you are performing single disk copy operations.

SPECIAL WILDCARDS

Either of these commands can be used to copy all files on a diskette:

= (or) *.*

Used alone, they copy files on a single drive system. They facilitate copying from one disk drive to another, and find use in many file management activities.

Wildcard Options: /Q /N

Wildcards are used for copying files selected by title and/or extension, or for copying all of the files on a diskette. Wildcards can also be used for copying whole diskettes between densities, locking and unlocking files, deleting whole blocks of data, or creating new file names.

Wildcards are powerful tools, and must be used judiciously. If used carelessly, they may get out of control and have a field day merrily copying, deleting, and renaming your files!

SMARTDOS has two special functions which force the wildcard to pause for you to accept (or refuse) a particular function before it is executed.

The Wildcard Option: /Q

The /Q stands for query. It is used only with the delete and copy functions of SMARTDOS.

The option /Q is used to pause during a copy operation for confirmation by the operator. Imagine you wanted to copy all but two files from the following list using a single disk drive:

STARTUP.EXC
DUPDSK.COM
PATTERN.COM
RPMTEST.BAP
DISKLAB
SYSCLOCK.X09

The wildcard *.* or = is entered followed by the /Q option.

./Q (or) =/Q [RETURN]

If two disk drives are used, the extension is always used for the source drive.

./Q,2:*.* (or) =/Q,2:= [RETURN]

The COPY command defaults to /N (no query). Unless specifically requested, files are normally copied without the /Q.

The DELETE command always defaults to /Q. Unless this option is changed by the user, SMARTDOS always seeks confirmation before deleting a file.

The Wildcard Option: /N

The /N option is used the same way as the /Q. However, its purpose is to turn-off the "query" function. To delete a set of files where wildcards are used, the "/N" option will complete that function without further input from the user.

THE DISK DIRECTORY

The Disk Directory lists of all the files on a diskette. To display the directory, enter the number of the disk drive to be queried. The directory lists each file by filename (and extension if used), its length in sectors, and the number of empty sectors remaining on the diskette.

Try this example:

Boot SMARTDOS.

Remove SMARTDOS from the drive.

Insert a files diskette.

Press "1" to see the directory.

Note the kinds of information presented:

disk drive number
density of recording (SNG/DBL)
filenames
filename extensions
sectors per file
number of free sectors on diskette

If you have more than one disk drive, repeat the process for drive 2 or other disk drives in your system.

PRINTING THE DIRECTORY

SMARTDOS will give you a hardcopy printout of the disk directory. The directory function is expressed by:

DRIVE#=FILE LIST (+ OPTION = PRINT)

To obtain the printout use the following procedure:

Turn on the printer

Hold down the option key, and press the number key for the drive directory to be printed.

If you do not have a printer (or it is not turned on), ERROR 138 is displayed on the screen.

When printing is completed, SMARTDOS displays the prompt:

PRESS CHOICE OR RETURN FOR MENU

This prompt indicates the command is completed, and SMARTDOS is waiting for a new command.

RECONFIGURE

This is a dual function command. It is used to reconfigure a drive between double and single density. The status of each drive is displayed on the SMARTDOS

menu. This function "toggles" back and forth between single and double density each time it is selected from the menu.

Press "R" for Reconfigure and the number of the drive to be toggled. SMARTDOS will change the density of that drive, if the drive is supports both single and dual density.

Reconfigure has the ability to bring a drive on-line without re-booting the computer. Normally, when SMARTDOS is booted, it checks to see which drives are available for it to use. It also notes them in memory.

If you turn on a drive after SMARTDOS is loaded, it will not know the drive is there. On most DOSs, it is necessary to re-boot the system. With SMARTDOS, enter "R" and the new drive number and the drive will be brought on line. As an alternative, press "R" and RETURN. SMARTDOS will check to see which drives are on. This is especially useful if you are in the middle of a program!

FORMAT DISK

Required: SMARTDOS with Disk Utility Package.
Blank Diskettes
Labels, write-protect tabs.

WARNING: FORMAT erases the contents of the diskette. If you reformat used diskettes, first check the directory to be certain that important files are not destroyed. All program diskettes should have write protect tabs to avoid accidental erasure.

SMARTDOS can format diskettes in two densities:

single density
18 sectors per track
128 bytes per sector
40 tracks
90K bytes per diskette

double density
18 sectors per track
256 bytes per sector
40 tracks
180K bytes per diskette

Formatting writes a digital pattern on the diskette that allows the computer to store and retrieve information.

Preparation:

Turn off the write protect switch on the RANA 1000.

Remove the write protect tab from the diskette.

Determine the required storage density (SNG/DBL).

Set density using the Reconfigure command.

Check the menu on the screen to verify that the drive you plan to use is set to the proper density. (The current density of each drive turned on is displayed on the menu.)

Formatting:

Insert a blank unformatted diskette into the drive of your choice.

Press the "F" key. The screen turns to red, and the prompt at the bottom of the screen asks which disk you wish to format. In the case of a single drive system, answer with the number one (1). If you have more than one drive, respond with the number of the drive you wish to use.

SMARTDOS responds by telling you to press "X" to FORMAT. After pressing "X", a red "F" appears on the digital display on the front of the display on your Rana 1000 drive.

When formatting is complete, SMARTDOS turns the screen back to magenta.When SMARTDOS is completed the screen displays:

PRESS CHOICE OR RETURN FOR MENU

THE OPERATION IS NOW COMPLETE.

If your RANA 1000 encounters bad diskette sectors when formatting, it will attempt to format the diskette one more time. If it is unsuccessful, SMARTDOS will display an Error 173 (BAD SECTORS ON FORMAT) message.

Occasionally a diskette is encountered which will not format in one density, but will format in another. Diskettes with bad sectors, which cannot be formatted in either density, should be discarded.

COPY FILE

Required: SMARTDOS with Disk Utility Package.
Formatted diskette, write-protect tab, labels

One of the most used functions of SMARTDOS is the COPY/DUPLICATE command. This function copies files and programs from one diskette to another. In addition, SMARTDOS has three unique functions:

Copy a file to the same diskette using a different name.

Copy a file from a diskette in one density to a diskette of another density.

Copy to another density using a single disk drive.

SMARTDOS is able to distinguish between a single disk drive copying a file or files, at the same or different densities, and a multiple disk drive system. The importance of this increases as more users upgrade their drives and software to the double density format.

IMPORTANT: Individual files may be backed up on the same diskette, or on another diskette. Files may be copied to the same density, or to another density.

However, the files and programs saved or copied to a diskette must be in the density for which that diskette was formatted. It is not possible to store single and double density files on the same diskette.

COPY FILE can be used to duplicate a file on the same diskette (a backup file) using a different filename extension. For example:

SPEED.TST
SPEED.EXO

Both files are the same, but one is a backup file. The first file could have been copied to another diskette as SPEED.TST.

To make a copy using two disk drives, use the following procedure:

Insert the source diskette in drive 1.
(This diskette has the file(s) you wish to transfer or copy.)

Insert the destination diskette in drive 2.
(This diskette will receive the files copied from drive 1.)

NOTE: The diskette in drive 2 must be formatted and the drive configured for the desired density. The SMARTDOS menu displays the density for each drive. The Reconfigure command is used to toggle the density between SNG (single) and DBL (double).

C is the Copy file command. Type "C" and SMARTDOS will display:

COPY:SOURCE, DEST?

It is asking a number of questions:

Drive number of source?
File name(s) to be copied?
Drive number of destination?
File name(s) if different to source file name(s)?

The correct format for entering this information is:

D#:SOURCE FILE NAME, #:DESTINATION FILE NAME

Source Drive Number—D# is the number of the source drive (example D1: for drive one). The drive number can be used alone (e.g. 1: or 2:). If the source drive is the default drive (drive 1), the drive need not be specified.

Source File Name—this is the file on the source diskette you wish to copy to the destination diskette.

Destination Drive Number—#: is the number of the destination drive (e.g. 2:). This may be omitted if you are copying with one drive.

Destination File Name—this is the name you will give to the file on the destination diskette. It may be the same name or a different name at your option.

IMPORTANT: When files are being backed-up on the same diskette, a different file name (or file name extension) must be used.

The three examples below copy TEST.UTL from drive 1 to drive 2.

D1:TEST.UTL, 2:TEST.UTL
1:TEST.UTL, 2:TEST.UTL
TEST.UTL, 2:TEST.UTL

When the file is copied, the familiar prompt appears:

PRESS CHOICE OR RETURN FOR MENU

You can continue to copy files in the above manner until all files are copied. (A faster method is described under "Wildcards".)

WHOLE DISK COPY

Required: SMARTDOS with Disk Utility Package.
A formatted diskette.
Labels and write protect tabs.

The WHOLE DISK COPY option creates an exact duplicate of the source diskette.

> NOTE: This copy utility may not make useable copies of commercial programs that use a copy protection method.

When WHOLE DISK COPY is chosen, SMARTDOS asks for numbers of the origination and destination drives. If the user requests drive 1 for source, and drive 2 for destination, the prompt reads:

COPY WHOLE DISK

Source Drive is #1
Destination drive is #2

"E" TO EXIT: ANY OTHER KEY TO CONTINUE

When a key (other than "E") is struck, Whole Disk Copy is executed automatically. If one disk drive is used, prompts indicate when to insert the source and destination diskettes.

The duplication process copies the source diskette sector by sector. The data on the copy diskette occupies the exact same sectors, and uses the same number of sectors, as the original diskette.

> NOTE: The WHOLE DISK COPY function will operate in any density, so long as the density of the source and the destination disks are the same.

If you wish to copy from one density to another density, you must use the Copy function of SMARTDOS.

WHOLE DISK COPY USING A SINGLE DRIVE

Required: SMARTDOS with Disk Utility Package.
Formatted diskette.
Labels and write protect tabs.

You can use this option by manually swapping diskettes until the process is completed. SMARTDOS indicates when diskettes should be changed and which diskette should be inserted in the drive. In a single drive system both the source and the destination drives are drive 1.

IMPORTANT: Always write protect your source diskette with a write protect tab. This is a safety measure to guard against accidental erasure of the source diskette during the copy process.

If you accidentally insert your write protected source diskette during the copy process,if you will see an ERROR144 DEVICE DONE ERROR, but your source diskette will still be intact!

PROTECT FILE

Required: SMARTDOS with Disk Utility Package.
Diskette with files to be protected.

The PROTECT FILE function of SMARTDOS locks a file so that it cannot be deleted, renamed, replaced, or modified, without first being unlocked. Unlocking is accomplished with the UNPROTECT function of SMARTDOS.

PROTECT is a code on the file which prevents a file from being accidentally changed or deleted. It serves the same purpose as the write protect tab on a diskette. But unlike the write protect tab, a PROTECTed disk can be erased by a FORMAT or WHOLE DISK COPY command.

Protected files are identified by an asterisk (*) before the file name in the disk directory. This asterisk serves only as a marker. Its function is not related to the asterisk used as a wildcard, although wildcards can be used to perform the PROTECT and UNPROTECT functions.

The following example illustrates ways in which the file can be protected.

Before we begin, SMARTDOS must display:

PRESS CHOICE OR RETURN FOR MENU

Type: P

SMARTDOS displays:

WHAT FILE TO PROTECT?

Type: MUSIC.EXE [RETURN]

The PROTECT function is successfully completed when SMARTDOS displays:

SELECT ITEM OR RETURN FOR MENU

Check the disk directory. MUSIC.EXE now has an asterisk next to it.

Wildcards can be used to protect a series of files or all files on a diskette.

UNPROTECT FILE

Required: SMARTDOS with Disk Utility Package.
Diskette with files to be Unprotected.

The UNPROTECT function of SMARTDOS is the opposite of the PROTECT function.

Unprotected files do not show an asterisk (*) before the file name in the directory. Files which have never been protected are unprotected, and files which are protected can be changed by the UNPROTECT command. When protected files are edited, they cannot be saved on the same diskette under the same name unless the file is first unprotected.

DELETE FILE

Required: SMARTDOS with Disk Utility Package.
Diskette with files to be deleted
Labels and write-protect tabs

This command allows you to delete one or more files from a diskette directory. It is possible to delete a single file by pressing "D", typing in the name, and pressing RETURN.

Filenames may be selected, or all filenames displayed, by use of wildcards. The / Q query option is the default, so that only filenames you confirm with "Y" for yes are deleted. Pressing any other key will display the next file for consideration.

NOTE: Once a file is deleted from the file directory it cannot be recalled, and will be overwritten when new files are added to the diskette. (There are advanced programming techniques which can sometimes be used to recover deleted files, but this is beyond the scope of this manual.)

Care and common sense are especially important when using wildcards with this command to avoid accidental erasure of files!

NEW FILE NAME:

Required: SMARTDOS with Disk Utility Package.
Diskette with file(s) to be renamed.
Labels and write-protect tabs.

This option allows you to change the name of a file or a group of files. There are two filespecs, OLD NAME and NEW NAME. The filespec OLD NAME is always the complete name of the old file including any file extensions that might be used.

If there is an illegal character in the name, the new filename will consist of all characters up to, but excluding, the illegal character.

WARNING: Wildcards may be used, but whenever you use wildcards in the OLD NAME filespec, it is possible to rename every file in the directory by the same name, and thus rendering the entire diskette unusable. Exercise special care in the the use of wildcards with the NEW FILE NAME function.

If you use the rename function of another DOS to change a filename on your diskette, it is possible that you will not be able to access that file under SMARTDOS.

Error Messages:

If you attempt to give a new name to a file on a write protected diskette, or if the WRITE PROTECT function of the RANA 1000 disk drive is turned on, you will get an error message ERROR 144 (DEVICE DONE ERROR) displayed on the screen.

If you try to rename a file which is not in the disk directory, you will get the error message: ERROR-170 (FILE NOT FOUND).

If the screen displays ERROR-167, you have tried to rename a locked file. It is necessary to unlock the file before you rename it.

"N" is the command for the New File Name option. The entry format is:

OLD FILE NAME, NEW FILE NAME

Example 1: (Change ASTRO.TXT to FUTURE.RUN)

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

Type: N [RETURN].

SMARTDOS displays:

NEW FILE NAME:OLD,NEW?"

Type: ASTRO.TXT,FUTURE.RUN [RETURN].

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

In this example we changed both the name of the file and the name of the extender.

Example 2:

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

Type: N [RETURN].

SMARTDOS displays:

NEW FILE NAME,OLD FILE NAME

Type: *.OBJ,*.RUN [RETURN]

The wildcard function is used for the filename, and all OBJ file extenders are changed to RUN.

NOTE: If you attempt to change the name of a file using wildcards, and you incorrectly enter a wildcard, then the following ERROR MESSAGE appears:

NEW NAME NEEDS WILDCARD TOO

WARNING * WARNING * WARNING

Because of the power of a wildcard, practice with files you no longer need before using them on important data.

REMEMBER: IT IS POSSIBLE TO RENAME
EVERY FILE ON YOUR DISKETTE THE SAME NAME!

Wildcards are one of the most powerful and important functions you can use with any disk operating system. Because of their power, care should be exercised in their use.

VERIFY RETRY

Required: Working Copy of SMARTDOS with Disk Utility Package.

If you have critical information to copy, the verify retry function should be used. Normally, data which is written to a diskette is not checked. This permits a higher copy speed. To guarantee a perfect copy, the VERIFY RETRY option should be used. It ensures that the data written to the destination diskette is identical to the data read from the source diskette. It reads and compares the copy to the source data after each sector is written.

Press "V" to select the VERIFY RETRY option. The screen message requires a Yes to confirm your choice, and asks for the number of retries (0-9). This is the number of attempts to read a bad sector before indicating it is bad.

VERIFY RETRY causes the RANA 1000 to verify each read and write. If there is a read or write error, SMARTDOS repeats the read-write-verify function for that sector the specified number of times. When verify indicates a copy sector is correct, the program advances to the next sector.

NOTE: When you copy the system files to another diskette, the current status of verify retry is copied also and becomes the default condition for that diskette.

RECOVERING FROM ERRORS

Requirements: None.

SMARTDOS has internal diagnostic techniques to determine errors in operation of hardware, firmware, and software. These are listed to your screen with a number code. The section entitled ERROR CODES in Appendix A lists each problem by code number.

Problems which can be easily corrected may be resolved by a prompt or menu option. For example, if your disk drive is accidentally turned off or disconnected, or does not respond correctly the following prompt appears:

CHECK DRIVE #[NUMBER OF DISCONNECTED DRIVE]

On some computer systems, this would be a catastropic error. With SMARTDOS, the problem can be corrected. DO NOT TRY TO ACCESS THE DRIVE OR TURN THE COMPUTER OFF.

When you first booted your program, an Input/Output Control Block (IOCB) was opened. It will remain open until closed by a command, either under program control, or by direct command from the keyboard.

If you have, or can borrow, a drive which operates, everything which you have stored in memory can be saved!

Turn on the power to the disk drive, wait for the the busy light to go out, connect the I/O cable to the drive and your computer, then save your file to diskette as if nothing had happened.

SPEED CHECK

Required: SMARTDOS with Disk Utility Package.
Formatted diskette

SPEED CHECK is a non-destructive test used to verify the speed of your disk drive. When "S" is pressed, a prompt requests the number of the drive to be tested. Press "1" to activate drive 1, and the display will read:

Disk Drive Speed:xyzRPM

xyz is the actual speed of the disk drive under test.

To test additional drives, press the number of the drive, and SMARTDOS will switch to that drive automatically. To end the program:

Press [RETURN] to return to the main menu.

The purpose of SPEED CHECK is to verify that the drives in your system are running at or close to 288 RPM, the standard for ATARI computers. Discrepancies greater than plus or minus 8 RPM, or widely fluctuating speed, require adjustment by a competent serviceman.

EXIT SMARTDOS

When you want to enter BASIC from SMARTDOS press "E". You should now see the READY prompt for BASIC.

If the BASIC cartridge is not inserted, you will see the message:

CARTRIDGE NOT FOUND: "E" TO EXIT MENU

If RESIDUP has been turned on, then the Disk Utility Package has been retained in memory. You can access SMARTDOS and use all of its functions while retaining your program in BASIC. Use the command "DOS" to access SMARTDOS commands, and press "E" to return to the BASIC file or program you were working on.

Advanced User Functions

This section is a continuation of the SMARTDOS commands and functions in Section 3. These commands require considerably more programming knowledge, and are separated here for advanced users.

KOPY (COPY) SECTORS

Required: SMARTDOS with Disk Utility Package.
Formatted diskette, labels, write-protect tabs

The KOPY SECTORS function of SMARTDOS is a valuable tool for salvaging files from a defective diskette. It allows you to copy specific sectors from one diskette to another.

Example 1: (one drive system, all sector copy).

Use the Kopy option to copy the useable files to a separate diskette.

Use a formatted diskette with no files on it for the copy sector routine. (In the menu, it is called Kopy sector to distinguish it from the file Copy option.)

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

Type: K. SMARTDOS displays:

COPY SECTORS

Enter first sector

Type: [RETURN] for all sectors. (Otherwise type the number of the first sector and, when requested by SMARTDOS, the last sector in the range you want to copy).

If RETURN is pressed, SMARTDOS displays:

SECTORS 1-720
Source drive # ?

Type: 1 for drive 1 (or the number of the drive where the source diskette is located).

SMARTDOS displays:

DESTINATION drive # ?

Type: 1 for drive 1 if you are using a one drive system. If more than one disk drive is used, type the number of the drive selected for the destination diskette.

SMARTDOS displays:

"E" TO EXIT; ANY OTHER KEY TO CONTINUE

Press any key but "E" (unless you have changed your mind and do not wish to copy the sectors).

With two disk drives, the copy sector option would proceed automatically. For single disk unit, SMARTDOS displays:

Insert source diskette and RETURN

When RETURN is pressed, SMARTDOS steps through approximately 139 sectors, indicating the sector it is reading, and the number of sectors already read. When the buffer fills up, the screen turns red and the prompt appears:

Insert DESTINATION diskette and RETURN

The sector counter restarts from zero, and indicates the number of the sector being written, and the total number of sectors written.

The diskette changes must continue until all requested sectors are written to the destination diskette.

If the read/write operation is successful, SMARTDOS ends the copy process when it encounters the last USED sector on the diskette. (The default value of 720 would be a full diskette.)

When the task is completed, a familiar prompt appears:

PRESS CHOICE OR RETURN FOR MENU

Example 2 (specific range of sectors on one drive system).

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

Type: K. SMARTDOS displays:

COPY SECTORS
Enter first sector

Type: 120 RETURN The first sector is sector number 120. SMARTDOS displays:

Enter last sector

Type: 218 RETURN The last sector to be copied is sector 218. SMARTDOS displays:

Source drive # ?

Type: 1. SMARTDOS displays:

DESTINATION drive # ?

Type: 1 for a one drive system, or enter the chosen drive number. SMARTDOS displays:

Source drive is #1
Destination drive is # 1

E TO EXIT; ANY OTHER KEY TO CONTINUE

Type: RETURN or any other key except "E".

Once again the screen turns green. This time SMARTDOS indicates it is currently on sector 120. The display reads:

Insert Source Diskette and RETURN

SMARTDOS reads the 99 sectors requested, then the screen turns red. The sector indicator resets to 120, and the prompt appears:

Insert DESTINATION diskette and RETURN

The SECTORS WRITTEN counter indicates the total sectors written. If there are no EMPTY SECTORS encountered, that register will remain 0. If there are no ERROR SECTORS encountered, that register will remain 0.

When the process is finished the following prompts appear:

DONE!
NO ERRORS

PRESS CHOICE OR RETURN FOR MENU

Example 3 (diagnosis of diskette read/write problems)

Let's assume that in the example above we encountered some defective sectors. These are displayed by the ERROR SECTOR register. The screen would read:

ERROR SECTORS: 017

DONE!

"E" TO EXIT; ANY OTHER KEY TO CONTINUE

Instead of exiting the function, hit any key.

The following SUBMENU appears:

Disk Drive Speed:-- RPM

Drive # 1

PRESS:
C = check drive speed
L = list error sectors
P = print error sectors
Z = zero error sectors
E = exit to main menu

The "C" option provides a non-destructive method of testing the speed of the drive. Drive speed is a possible cause of reading errors. Press C to initiate the speed check. When the test is completed, SMARTDOS displays the speed. The revolutions per minute (RPM) should be between 280 and 296 RPM, and should not fluctuate rapidly. If the drive is above or below that speed range, or fluctuating rapidly, it must be serviced by a competent serviceman.

The "L" option lists the error sectors. Press L, and SMARTDOS could display, as an example:

Sector 685:DEVICE DONE-144
Sector 686:DEVICE DONE-144
Sector 687:DEVICE DONE-144
Sector 688:DEVICE DONE-144
Sector 689:DEVICE DONE-144
Sector 690:DEVICE DONE-144
Sector 691:DEVICE DONE-144

The "P" function lists all of the error sectors to a printer. This is especially useful when error sectors exceed the total number of lines available on the screen.

The "Z" function enables the readable sectors to be accessed. It truncates the file by replacing data in the bad sector with 0's.

When "E" (exit to main menu) is pressed, the sub-menu is replaced by the main menu.

TEST SECTORS

Required: SMARTDOS with Disk Utility Package.
Formatted diskette with sectors to be tested.

Test sectors is a diagnostic function of SMARTDOS.

If a program does not load or operate correctly, the problem can be diagnosed using TEST SECTORS. SMARTDOS lists all of the errors it encounters on the diskette it is testing. This includes bad sectors and problems related to disk speed.

SMARTDOS displays:

PRESS CHOICE OR RETURN FOR MENU

Type: T RETURN

SMARTDOS asks for the sectors you wish to check:

First sector?

If you respond by pressing RETURN, SMARTDOS checks all 720 sectors on the diskette.

If you type in a number and RETURN, SMARTDOS makes this the starting sector for the test. Next, it asks for the ending sector. Type in the number and press RETURN.

The number of each sector is displayed as it is read. When the operation is complete, the screen turns blue again.

If bad sectors are encountered, the sub-menu from Kopy sector is displayed. The options available include:

S Speed Check - verify drive speed.

L List bad segments and error number to the screen.

P Print the segment and error list on a printer.

Z Rewrite bad sectors so readable sectors can be accessed.

E Return to the main menu.

If you wish to ignore errors, press "E" or RETURN for the SMARTDOS menu.

OBVERT RESIDUP

Required: Working Copy of SMARTDOS with Disk Utility Package.
OR New working copy of DOS with DUP.

The SMARTDOS disk utility package can be locked into memory so that you can exit to basic, and have SMARTDOS available by using the command "DOS". When SMARTDOS is locked into memory, you don't need to have the SMARTDOS diskette in your disk drive when you issue the command "DOS" from the basic environment. In this case, RESIDUP is on.

As an alternative, the SMARTDOS disk utility package may be reloaded from disk when needed again. This allows the memory used by the disk utility package to be used for other purposes. In this case, RESIDUP is off.

The OBVERT RESIDUP command toggles between these two conditions, with the current status of RESIDUP being displayed in the SMARTDOS main menu.

LOAD FILE

Required: SMARTDOS with Disk Utility Package.

This command loads and binary files into RAM memory and executes them. There is an option which performs only the load operation.

NOTE: This is an advanced user function of SMARTDOS. If you are using this utility for the first time, you should first become familiar with assembly language programming techniques. The following description assumes the user is familiar with hexadecimal notation and general programming concepts.

File Format

The binary file to be loaded must have the following format:

It must consist of one or more "sub-blocks".

Each sub-block has a four byte header that contains the start and ending address of the data to be loaded.

The header is followed by the data to be loaded.

The header format is:

START ADDR - LOW
START ADDR - HIGH
END ADDR - LOW
END ADDR - HIGH

File Loading (with no options selected):

SMARTDOS maintains two vector addresses at $2E0 and $2E2. Each address is two bytes, with the low byte first, followed by the high byte. The vector at $2E0 is the start vector. The vector at $2E2 is the "init" vector. Prior to loading the binary file, SMARTDOS sets each vector to point to an "RTS" instruction. After each sub-block is loaded, SMARTDOS does a subroutine call to the init vector. If it has not been changed, control returns to the loader. If the sub-block just loaded made a change to the init vector, then control passes to wherever it now points. Usually the new program will return via an "RTS" to SMARTDOS, where the next sub-block in the original file is loaded.

After the last sub-block has been loaded (and the init vector call performed), a similar call is made to the start vector. Finally (assuming control returns to SMARTDOS), a jump to the first block address of the first sub-block header is made. The following options are available.

/R

When appended to the filespec in response to the LOAD FILE command, SMARTDOS does the loading as described above, but does not jump to the first address of the first sub-block header. This is useful to load and run Atari binary files that return control via an "RTS". (If loaded without /R, these programs would be run via the start vector, then control would pass to the first address of the first sub-block header. This may be a data block, or at best will cause the program to run a second time.)

/N

When appended to the filespec in response to the LOAD file command, SMARTDOS loads the sub-blocks, but does not call either vector, nor jump to the first address of the first sub-block header. This option is used when the user wants to load the file without executing any part of it.

BINARY SAVE

Required: SMARTDOS with Disk Utility Package.

This command saves a binary file image.

> NOTE: This option cannot be used to save ROM or hardware locations as a block if it is longer than the length of one sector. Burst I/O is invoked, which temporarily alters memory as part of the save function. An attempt to circumvent this rule will result in an unloadable file, and may render some sectors of the diskette unusable. This occurrence will not damage previously existing files.

The filespec is followed by from two to four hexadecimal addresses. The first address is the first address of the data to save, and the second address is the last address of the data to save.

If the third address exists, a short sub-block is created after the main sub-block. This second sub-block contains the init vector as the first and last address of the sub-block header, and the third address as the data. When the file is loaded, this

small sub-block will alter the init vector, giving control to the program at the third address immediately after it is loaded.

The fourth address, if it exists, creates a short sub-block after the main sub-block (or after the short sub-block from the third address.) This short sub-block contains the start vector as the first and last address of the sub-block header, and the fourth address as the data. When the file is loaded, this short sub-block will alter the start vector, giving control to the program after all sub-blocks in the file have been loaded.

To use the fourth address without a third address, use two commas between the second address and the fourth address.

Here are some examples:

JUSTLOAD.OBJ,4000,4FFF	creates 1 sub-block
LOADRUN.OBJ, 4000,4FFF,4020,	run at 4020
INITRUN.OBJ,4000,4FFF,4020,4040	runs at 4020, then 4040
ONLYRUN.OBJ,4000,4FFF,4040	runs at 4040 after entire file is loaded.

Address blocks can be appended to existing files using the /A option after the filespec. When saving a file, the RUN (2E0, 2E1) and INIT (2E2, 2E3) are optional.

Consider the following example:

We have an RS-232 loader program at $4800 to $48CD that runs starting at $4820 and ends in an RTS instruction.

Another program installs a non-standard printer handler. It is located between $4A40 and $4C00, begins its run at $4A40, then jumps to a program located from $680 to $6FF, runs at $6AB, and ends in an RTS instruction.

If these are in memory, they can be combined into a single file performing all the functions of the individual programs, using the following commands:

```
DOITALL.RUN,4800,48CD,4820
DOITALL.RUN/A,4A40,4C00,4A40
DOITALL.RUN/A,680,6FF,6AB
```

When this is loaded, it should be done with LOAD FILE. The file name DOITALL.RUN/R should be used, since a "jump to" instruction is expected, and

the first address in the beginning load block is not the address where the program will run.

GOTO ADDRESS

Required: SMARTDOS with Disk Utility Package.

When selected this function requests an address. Enter the hexidecimal address and press RETURN. SMARTDOS executes the routine or sub-routine that is located at that address. On encountering a RETURN or RTS, it will return to the main menu.

File Management Functions

The Working Master of SMARTDOS contains several files. The disk operating system resides in the DOS.SYS file. The disk utilities package is in the DUP.SYS file. These are the DOS components transfered when a disk is initialized. DOS.SYS enables the diskette to boot; DUP.SYS includes Copy and other functions for file managment activities controlled by he user. DOS.SYS and DUP.SYS have been elaborated upon in previous sections of this manual

The Working Master diskette has five programs:

DOS.SYS
DUP.SYS
DEFAULT
ARCREATE.BAS
RS232.ARx

The original SMARTDOS Master diskette has one additional file used to configure the system - AUTORUN.SYS. It will be described here, and some general information on setting up and using autorun files will be presented.

The DOS, utilities, and file management programs provide you with powerful commands to control system operations and functions.

DOS.SYS FILE

This file contains the FILE MANAGEMENT SUBSYSTEM (FMS) and MINI DOS. MINI DOS is controlled by FMS and contains the functions, DELETE FILE, LOCK FILE, UNLOCK FILE and FORMAT DISK. These functions also appear on the main menu.
DOS.SYS can be used with an AUTORUN file, independent of DUP.SYS, when space is at a premium on your program diskette.

DUP.SYS FILE

DOS functions not controlled by the FILE MANAGEMENT system, such as the DOS MENU, WHOLE DISK COPY, RESIDUP, BINARY SAVE, GOTO ADDRESS, LOAD FILE, SPEED CHECK, FORMAT DISK, and VERIFY/RETRY, are contained in this file. When it is necessary to perform any of these functions, DUP.SYS must be loaded into memory at the same time as DOS.

DEFAULT

This program allows you to change the default settings of SMARTDOS. The defaults that may be changed are:

Number of drives in the system.

Each drive on-line requires a 256 byte buffer in memory. The default is set at 4 drives from the factory. If memory is at a premium, change the default to the number of drives to be used.

Number of concurrent files.

Each open file requires a 128 byte buffer for single density, and 256 bytes for double density. Default is eight (8) single density files or four (4) double density files. This default can be adjusted to meet your program and memory requirements.

Number of AUTORUN files.

The purpose of AUTORUN files is explained in the next section. You may specify the number of such files your system will run before it ignores further files. This default is set to three (3).

The DEFAULT program does not require a basic cartridge to operate. Load the DEFAULT file from your SMARTDOS working diskette. Once the default parameters are changed, all future copies of that diskette will reflect those changes.

> IMPORTANT: Do not change the defaults on your working copy of SMARTDOS unless you wish all future files to conform to the new defaults. It is preferable to make the modifications on a new working master diskette. Attach a label which lists the default changes and date created on the label.

ARCREATE.BAS

This program allows basic programs to be AUTORUN from SMARTDOS. When this program is loaded, it requests one line of basic code (for example "Run D: TEST.BAS", a line of basic requesting to run the file called TEST.BAS).

When the basic argument is complete, press return. The program requests an ARCREATE file name (example: TEST.ARI). Enter the ARCREATE file name and press return. The file is converted into an ARCREATE file that will AUTORUN under SMARTDOS.

RS232.ARx

This autoload file should be renamed RS232.AR1 and included on any diskette that is intended for use with an 850 type device. It will cause the 850 device to download interface data to the computer. One benefit of SMARTDOS and the RS232.AR1 file is the that it supports both warm and cold re-boots of the system (warm re-boot is where the computer reinitializes without turning off power to the system).

AUTOLOAD FILES

AUTOLOAD files inform your computer, through the File Management Sub-system (FMS), that there is a program which must be loaded before control of the system is turned over to the user.

The diskette containing the files with .AR extenders is always loaded in drive one. This file, when present, is automatically loaded into RAM and executed every time the system is booted. When execution is completed, control of the computer is returned to the operator.

AUTOLOAD files can take several forms. It can be object code which is loaded and executed as soon as the load is completed, or loaded and waiting for an execution command to run from the keyboard. The AUTOLOAD file can also be DATA. It can be designed to boot the program with or without the BASIC Cartridge.

A properly designed AUTOLOAD file can be made so that the CPU locks up when all but the proper keys for program execution are pressed. Conversely, it can be made to re-boot the program when the system Reset key is pressed.

Autorun files do not have to be called AUTORUN.SYS, as with other Disk Operating Systems. With SMARTDOS you may give the autorun file any legal file name so long as the three character extension takes the following form:

Filename.AR1
Filename.AR2
Filename.AR3

For example: If you wish to boot the 850 communications interface first, assign .AR1 as the first autorun module, and assign .AR2 to the communications program. The resulting filenames would look like this:

RS232.AR1
MODEM.AR2

It is possible to set up a total of 9 separate autorun files, AR1 through AR9.

Appendix A

There are two sets of error messages which are common to the ATARI computer. ERROR MESSAGES 2 through 21 appear when running a BASIC program, and relate to problems with the program. A second set of error codes are related to peripheral devices such as disk drives, printers, and other accessories.

When DOS detects an error connected with either of the above, it prints out a number message on the screen. This section interprets these error codes.

The user should refer to a BASIC manual and ASSEMBLER manual for in-depth information on ERRORS encountered when using BASIC and ASSEMBLY LANGUAGE.

ERROR MESSAGES IN BASIC

CODE	MESSAGE
2	Insufficient Memory
3	Value Error
4	Too Many Variables
5	String Length Error
6	Out of Data Error
7	Line No Greater Than 32767
8	Input Statement Error
9	Array or String DIM Error
11	Floating Point Overflow/Underflow
12	Line Not Found
13	No Matching FOR
14	Line too Long

15 GOSUB or FOR Line Deleted

15 RETURN Error

17 Syntax Error

19 LOAD Program Too Long

20 Device Number Wrong

21 LOAD File Error

DOS ERROR MESSAGES (Peripheral Devices)

128 BREAK Abort

129 Input/Output Control Block Already Opened

130 Nonexistent Device

131 IOCB (Input/Output Control Block) Write-Only

132 Invalid Command

133 Device or File not Opened

134 Bad IOCB Number

135 IOCB Read-Only Error

136 End of File

137 Truncated Error

138 Device Timeout

139 Device NAK (not acknowledged)

140 Serial Bus Input Framing Error

141 Cursor Out Of Range (for the particular graphics mode)

142 Serial Bus Frame Overrun

143 Serial Bus Data Frame Checksum Error

144 Device Done Error

145 Read After Write Compare Error

146	Function Not Implemented in Handler
147	Insufficient RAM for Selected Graphics Mode
160	Drive Number Error
161	Too Many Open Files (no sector buffer available)
162	Disk Full, No Free Sectors
163	Unrecoverable System Data I/O Error
164	File Number Mismatch (sector link error)
165	File Name Error
166	POINT DATA Length Error
167	File Locked
168	Command Invalid
169	Directory Full (files)
170	File Not Found
171	POINT Invalid
172	Attempted to Append to DOS1 File Using SMARTDOS
173	Bad Sectors at Format Time
255	Attempted to Format a Write Protected Disk.

Appendix B

SMARTDOS COMMANDS

B=BINARY SAVE

This command saves the contents of a specified memory address or address block to diskette as a file.

C=COPY FILE

The Copy command is actually two commands:
A. Copy from disk or copy to same disk with different filename.
B. Duplicate a file when only one disk drive is available.

D=DELETE FILE

This command eliminates a file name from the disk directory, and makes disk space available for other files. This command should be used with extreme caution, particularly if wildcards are used with the delete command.

E=EXIT SMARTDOS

The command to exit SMARTDOS should be done with BASIC or other cartridge present in the system, otherwise control may be lost, and the system will have to be re-booted.

F=FORMAT DISK

This option is used to format a blank diskette. A disk must be formatted before information can be written to the disk. New diskettes must be formatted before they are used.

When disks containing programs or data are formatted, the information on the disk is erased. Check the directory of used diskettes to ensure that important programs or files are not deleted.

NOTE: This command erases all files on a disk, even if it is write protected by SMARTDOS. Format does not override the write protect tab on the diskette, or the write-protect switch on the RANA 1000.

G=GO TO ADDRESS

This option enters the hexadecimal starting address after an object program has been loaded into RAM with a BINARY LOAD.

K=COPY SECTORS

This command is used when a defective sector is encountered using WHOLE DISK COPY or DUPLICATE disk. When used in conjunction with TEST SECTORS and VERIFY/RETRY, this command can be used to retrieve information from damaged files.

L=LOAD FILE

This command is used to retrieve object files from a diskette. It is used for the manipulation of machine-language programs.

M=MAKE SYSTEM FILES

This command writes DOS or DOS and the Disk Utilities Package (DUP) to a diskette in any of four disk drives.

N=NEW FILE NAME

This command is used to change the name of an already existing file.

O=OBVERT RESIDUP

This command reverses the ON or OFF state of RESIDUP. When SMARTDOS is first booted, RESIDUP is off. RESIDUP is a buffer which can be used to store SMARTDOS or a program while file manipulation is being carried out.

P=PROTECT FILE

This Command prevents individual files from being erased, renamed or modified. SMARTDOS puts an asterisk in front of the file name in the directory to

inform the user that the file is protected. (This is an electronic program protection feature. It does not prevent erasing the file by formatting the diskette.)

R=RECONFIGURE

This is a dual function command. It is used to reconfigure a drive between double and single density. It can also be used to bring a drive on-line without powering down the computer.

S=SPEED CHECK

This is a non-destructive test which can be used to verify the proper rotational speed of a disk drive.

T=TEST SECTORS

This command identifies defective sectors on a diskette. An Error Number xyz message identifies the source of error.

U=UNPROTECT

This command removes the protection of the Protect File command.

V=VERIFY/RETRY

This command verifies the integrity of data transferred from one disk to another. The normal copy procedure used by SMARTDOS reads information from the source disk, and writes it to the destination disk. The VERIFY/RETRY option compares each sector of the source and destination disk during the copy process. If there is a discrepancy, the read-write-analyse process is repeated. The user determines the number of RETRYs, from 1 to 9, if errors occur.

VERIFY/RETRY is used to ensure extreme accuracy in copying critical or valuable files and programs. It will not ordinarily copy programs which have be COPY PROTECTED to prevent piracy.

W=WHOLE DISK COPY

This function makes an exact duplicate of the original diskette in the same density. It is used to make additional copies or backup copies of diskettes.

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