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JiffyDOS™

User's Manual

JIFFY DOS ON

1541-II SWITCH UP

64c SWITCH DOWN

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Command Summary

Standard DOS 5.1 Wedge Commands

`@`	Read the disk drive error channel
`@C:newfile=file`	Copy a file on the same diskette
`@I`	Initialize the disk drive
`@N:diskname,ID`	Format (NEW) a diskette
`@N:diskname`	Short NEW
`@Q`	Disable the JiffyDOS commands
`@R:newname=oldname`	Rename a file
`@S:file1[,file2]...`	Scratch a file (or files)
`@UJ`	Reset the disk drive
`@V`	Validate a disk
`@$`	Display the disk directory
`@#device`	Set the default device number
`/filename`	Load a BASIC program
`↑filename`	Load and run a BASIC program
`%filename`	Load an ML program
`←filename`	Save a BASIC program

Additional JiffyDOS Commands

`@B`	Disable/Enable the 1541 head rattle
`@D:filename`	List a BASIC program from disk
`@F`	Disable/Enable the function keys
`@L:filename`	Lock/Unlock a file
`@T:filename`	List an ASCII file from disk
`@U`	Un-NEW a BASIC program
`!filename`	Load an ML file (reset pointers)
`&filename`	Load an ML file (no pointers reset)
`£filename`	Load and run an ML file
`'filename`	Verify a file
`<Shift-RUN/STOP>`	Load & run first program on disk
`<Control-P>`	Screen dump
`SYS 58451`	Re-enable the JiffyDOS commands (C-64, SX-64, C-128 in 64 mode)
`SYS 65137`	Re-enable the JiffyDOS commands (C-128 in 128 mode)
`<Control-D>`	Default drive toggle

Example program using string variables:

```
10 REM SCRATCH A FILE
20 @"$"                    Display the directory
30 INPUT"FILENAME";N$      Get filename
40 @"I:"                   Initialize the disk drive
50 @"S:"+N$                Scratch the file
60 END
```

Default Device Override

In JiffyDOS, the current default device may be overridden by specifying a device number at the end of each command. There are two requirements for doing this: First, the command/filename string must be in quotes (as in program mode); and second, the device number must be preceded by a comma. Using the default override is convenient in multiple-drive systems where it eliminates the bother of having to switch the default device assignment back and forth (using the @# or *Control-D* commands) each time a command is sent to the secondary drive. The default drive override can be used in both direct and program modes.

Examples:

```
@"S0:filename",9           Scratch a file on device 9
@"$:*",9                   Display directory of device 9
@"",10                     Display device 10 error channel
```

The device number may also be assigned to a variable as in:

```
10 A=9                     A=device number
20 @"B",A                  Disable head bump, device 9
```


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When a volume is specified, the volume character (a "1" above) is inserted as the 16th character in the filename. In the above examples, the filename `TEST[1]` is sent to the drive as "`TEST 1`". Using volume specifications when saving files is convenient when working with large directories. Files of the same type can be grouped together by naming them to the same volume, and can be listed together by using the directory command `@$:*[vol]`.

Note: When using the volume option, maximum filename length (excluding the volume specifier) is 15 characters.

Enhancements to the DOS Wedge

JiffyDOS offers three major enhancements to the standard DOS Wedge command format:

Command Chaining

In program mode, the JiffyDOS commands may be chained with BASIC commands or other JiffyDOS commands within the same program line.

Examples:

`10 @"#9":@"S:TEST":@"#8"`	Switch default to device 9, scratch a file, and then switch the default back to device 8.
`20 @"$:*":PRINT:@`	Display the directory, print a blank line, and then display the error channel.

Note: Chaining is also possible to some degree in direct mode, as long as all filename/command strings are enclosed in quotes (as they are in program mode), and no standard BASIC commands are intermixed with JiffyDOS commands.

String Variables

With JiffyDOS, string variables may be used as part of the standard DOS Wedge and JiffyDOS commands. This feature makes it possible to input a filename, disk command string, etc., from the keyboard into string variable, and then use that variable within a command sent to the disk drive. This makes it easy to design short, memory-efficient, interactive disk "housekeeping" programs with JiffyDOS—something which is not possible with the Commodore DOS Wedge, which forces filenames to be hard-coded into your program.

Special Command Features

Using the Commands in Direct and Program Modes

All JiffyDOS commands may be used in BASIC direct mode or from within BASIC programs. When using the commands within programs, the command/filename string must always be enclosed in quotes. For example, `@S:FILENAME` is acceptable in direct mode only, while `@"S:FILENAME"` is the required form for program mode.

Examples of program-mode command syntax:

`10 @"$:*"`	Display the directory
`20 @"S0:filename"`	Scratch a file
`30 @"#9"`	Set the default device to 9
`40 @"D:filename"`	List a BASIC program from disk
`50 @"I:"`	Initialize the default drive

Drive Specification

All commands which perform a disk operation may specify a drive number (0 or 1) within the syntax of the command. This is useful if a dual-drive unit (i.e. MSD-2 or Commodore 4040) is sharing the serial bus with a JiffyDOS system. To specify the drive number, insert the 0 or 1 in front of the colon in each command.

Examples:

`@$1:*`	List the directory from drive 1
`@S0:filename`	Scratch a file from drive 0

When addressing 1541 and compatible drives, the 0 or 1 is not required, but a 0 may be used if desired.

Volume Option

JiffyDOS, like the Commodore DOS 5.1 Wedge, allows a file "volume" to be specified for any command which includes a file name. The file volume is a single character enclosed in brackets appended to the end of the filename.

Examples:

`%TEST[1]`	Load the ML file TEST (volume 1)
`@S:TEST[1]`	Scratch the file TEST (volume 1)

SECTION 1
INTRODUCTION

Getting Started

When you first receive your JiffyDOS system, you will probably be anxious to install it and to start taking advantage of the speed increases that JiffyDOS provides. Before beginning, however, please note that installing JiffyDOS requires the partial disassembly of your computer and disk drive(s). While this does not require a knowledge of electronics, it does require some manual dexterity to perform. Read through the installation instructions carefully before starting. If you do not feel confident about installing JiffyDOS yourself, refer installation to a qualified technician, or take advantage of Creative Micro Designs' installation service.

Also, please be aware that installing JiffyDOS will void any factory warranty applicable to your computer or disk drive. If you are concerned about voiding your warranty, you may want to delay installing JiffyDOS until your warranty period has expired (Commodore normally warrants their equipment for a period of 90 days).

After you have installed JiffyDOS

After you have installed JiffyDOS, please take the time to become familiar with this manual. It describes the many commands and features of your JiffyDOS system, and gives you instructions on how to use them. You will also find information that will help you get the most performance out of JiffyDOS. If you experience any problems when using JiffyDOS, please check the manual—it may provide you with the information that you need to solve the problem.

Getting Help

If you run into any problems or have any questions about the installation or operation of JiffyDOS, please feel free to contact Creative Micro Designs. We will be glad to assist in any way we can. Our address and phone number are listed below:

Creative Micro Designs, Inc.
P.O. Box 789
Wilbraham, MA 01095
(413) 525-0023

Installation Service

Creative Micro Designs offers a JiffyDOS installation service. If you would like us to install JiffyDOS in your computer and/or disk drive, please contact us for information and prices.

What this Manual Includes

This manual gives you complete instructions on how to use your JiffyDOS system.

Section 2, "What is JiffyDOS?", describes the performance and other features of JiffyDOS.

Section 3, "Using JiffyDOS", gives you instructions on how to enable and disable JiffyDOS, how to use the JiffyDOS function keys, how to control listings and how to get the most performance out of your system.

Section 4, "The JiffyDOS Commands", provides a description of each JiffyDOS command.

The JiffyDOS Guarantee and Warranty are included at the back of this manual.

Printing the Screen

<CONTROL-P>

The *Control-P* (PRINT SCREEN) command outputs the current text screen to a printer. Pressing **CONTROL-P** (holding down the CONTROL key and then pressing P) will cause the text displayed on the screen to be sent to a printer. The printer must be configured as device 4.

Disabling the JiffyDOS Function Keys

@F

The *@F* (FUNCTION KEY) command is used to disable (and re-enable) the JiffyDOS function key definitions. Typing **@F** with the function keys disabled will enable them. Typing **@F** with the function keys enabled (as they are upon power-up) will disable them. The JiffyDOS function key definitions are active only in BASIC direct mode and are disabled when programs are run in order to avoid conflict with any program-defined function keys assignments.

Disabling the JiffyDOS Commands

@Q

The *@Q* (QUIT) command disables all JiffyDOS commands and function key definitions and reinstates all stock BASIC vectors. The disk drive fast-access routines are not disabled, however, and will continue to operate at full speed.

Re-Enabling the JiffyDOS Commands

SYS 58451 (JiffyDOS/64)
SYS 65137 (JiffyDOS/128)

The *SYS* commands are used to re-enable the JiffyDOS commands. This can be necessary if the commands have been previously disabled via the @Q command, if the JiffyDOS Kernal has just been switched in while computer power is ON, or if an applications program has altered the BASIC tokenization or execution vectors. In any of these cases, the JiffyDOS commands will not be available.

SYS 58451 will restore the use of all JiffyDOS/64 commands on a C-64, SX-64 or C-128 in 64 mode. **SYS 65137** will restore the use of all JiffyDOS/128 commands on a C-128 in 128 mode.

Scratching (Deleting) Files

```
@S:filename                          (Scratch one file)
@S:file1,file2[,file3]...            (Scratch multiple files)
```

The *@S* (SCRATCH) command can be used to delete (scratch) a file or a number of files from a disk. Files can be scratched one at a time (by entering the exact filename) or in groups, by specifying filenames explicitly or by using pattern matching and/or wild cards. The error channel is read at the completion of the @S command, and the number of files scratched is displayed. For example, `01, FILES SCRATCHED,02,00` indicates that two files have been scratched; while the error channel message `01, FILES SCRATCHED,00,00` shows that no files were scratched.

`@S:TEST`	Scratches the file named TEST.
`@S:*`	Scratches all files from a disk.
`@S:T*`	Scratches all files that begin with the letter T.
`@S:?T`	Scratches all files with names two characters long that have a "T" as the second character.
`@S:BITS,BYTES,WORDS`	Scratches the files BITS,BYTES and WORDS

Locking and Unlocking Files

```
@L:filename
```

The *@L* (LOCK) command locks and unlocks files. Once a file has been locked, it cannot be accidently scratched and is marked with a "<" at the end of its directory entry (i.e. `32 "TESTFILE" PRG<`). The @L command works as a toggle—that is, if @L is used on an unlocked file, the file will be locked. If @L is used on an already locked file, the file will be unlocked.

`@L:TESTPROGRAM`	Locks the file TESTPROGRAM (if TESTPROGRAM is currently unlocked).
`@L:TESTPROGRAM`	Unlocks the file TESTPROGRAM (if TESTPROGRAM is currently locked).

SECTION 2
WHAT IS JIFFYDOS?

JiffyDOS is an enhanced Disk Operating System (DOS) for Commodore C-64, SX-64, and C-128 computers. Programmed onto ROMs that replace the Kernal ROM(s) in your computer and the DOS ROM in your disk drive, JiffyDOS provides the speed, commands and convenience missing on stock systems. Because it is ROM-based, JiffyDOS becomes an integral part of your system, and is able to provide performance without the compatibility problems of Cartridges and other speed-enhancement systems.

Features

Uses no ports, cabling, or extra memory

JiffyDOS installs without any extra cabling between your computer and disk drive(s), and does not tie up the Cartridge, User or Cassette ports. This enables compatibility with all hardware devices (such as modems, memory expansions, etc.), and gives JiffyDOS an advantage over cartridge speedups and other hardware upgrades (*RapiDOS, 1541 Flash!, DigiDOS, Dolphin DOS*) which require extra cabling that plugs into one of the ports on your computer. In addition, JiffyDOS does not use any extra RAM in your disk drive or computer, enabling it to provide maximum compatibility with all types of software.

Built-in DOS Wedge commands

JiffyDOS includes a complete, built-in implementation of the Commodore DOS 5.1 Wedge command set. The DOS Wedge provides simple, easy-to-learn commands that eliminate the need to type complicated instructions when you need to perform common disk operations such as scratching files and formatting disks. The JiffyDOS version of the Wedge also includes a series of enhancements that make it easier to use the commands within BASIC programs.

Additional JiffyDOS commands

In addition to the standard DOS Wedge, JiffyDOS includes a number of special commands that make using your computer even easier. The JiffyDOS commands all use the familiar DOS Wedge syntax, and enable you to perform functions such as disabling the head rattle (bump) on 1541s, locking and unlocking files, listing files directly from disk, "un-NEWing" BASIC programs and dumping the screen to a printer.

Convenience features

JiffyDOS provides a full complement of convenience features that enable you to list the directory without disturbing memory; to load and run the first program on disk; and to pause, inspect and restart BASIC or JiffyDOS listings. In addition, JiffyDOS includes a full set of function key definitions that work along with the directory listing to eliminate the need to type lengthy filenames when loading, saving, or scratching files.

Does not bypass error checking

All JiffyDOS operations retain the built-in DOS error checking and correction routines that are a necessary part of any reliable data storage system. While other speedup systems and utilities (i.e. the ones boasting 10-second formats) bypass these routines, JiffyDOS provides speed without jeopardizing the integrity of your data.

Incorporates the latest Commodore upgrades

When you purchase JiffyDOS, the ROMs you receive have been programmed to include the latest Commodore upgrades. The JiffyDOS ROM for the 1571 eliminates bugs affecting Relative files, drive initialization, etc. and has also been modified to solve the problems with disk backup utilities (*Fast Hack'Em, Copy II-64/128*, etc.) caused by the Commodore upgrade. The JiffyDOS Kernal ROM for the C-64 is based on the latest version, as are the 64- and 128-mode Kernal ROMs for the C-128.

Performance

Speeds up all disk operations

JiffyDOS has been designed to speed up all operations on 1541, 1541 compatible, 1571 and 1581 disk drives. This includes the initial loading of all types of programs (including copy-protected software), saving, reading and writing files from within programs, autobooting (C-128 in 128 mode), scratching, validating, and formatting (1541 drives). JiffyDOS/128 speeds up disk operations in both 64 and 128 modes and is able to speed up the already-quick 128-mode operation of 1571 and 1581 drives.

Works within all types of software

Because of its ROM-based design, JiffyDOS is able to work from within all types of software to increase disk-access speed when you need it the most. Wordprocessors, databases, spreadsheets, programming languages, MIDI software and games all benefit from the built-in speed provided by JiffyDOS. Since JiffyDOS requires no extra RAM in your computer or disk drive and does not alter vectors, it can speed up the operation of all software that relies on the disk-access routines built into the Kernal ROM.

Disabling the 1541 "Head Rattle"

`@B` (JiffyDOS/64 only)

The *@B* (BUMP) command can be used to disable (and re-enable) the 1541 head rattle (bump) routine which occurs when certain disk errors are encountered. The @B command functions as a toggle—that is, if the bump routine is presently enabled (as it is upon power-up), entering `@B` will disable the head rattle; if the head rattle has already been disabled (via @B), entering `@B` again will re-enable the bump routine. A message indicating the new head rattle status is displayed each time @B is entered. `OFF` indicates that the head rattle has just been disabled, while `ON` indicates that the head rattle has been re-enabled. Note: To ensure accurate formatting, @B will not disable the head bump at the start of a disk NEW (format).

Copying and Combining Files

`@C:newfile=oldfile` (Copy)
`@C:newfile=file1,file2[,file3]...` (Combine)

The *@C* (COPY) command enables you to duplicate a file. @C can also be used to combine two or more files into a single file. Note that @C will duplicate a file under a different name on the same diskette, but will not copy or combine files from one diskette to another, or from one drive to another.

`@C:BACKUP=ORIGINAL`	Creates a new file named BACKUP which is an exact duplicate of the file named ORIGINAL.
`@C:DATA=BITS,BYTES`	Creates a file named DATA which is the combination of the files BITS and BYTES.

Renaming Files

`@R:newname=oldname`

The *@R* (RENAME) command can be used to rename a file on disk. When using the @R command, remember that the new name for the file is entered first (to the left of the = sign) and that the existing name of the file is entered second (to the right of the = sign).

`@R:REPORT=NOTES`	Renames the file NOTES as REPORT.

Formatting Disks

The *@N* (NEW) command is used to format a diskette. There are three versions of this command.

`@N:diskname,ID` ("Long" NEW)

This version of the @N command is necessary when formatting a diskette for the very first time. *Diskname* is any name you wish to assign to the disk and can be up to 16 characters long (the diskname appears at the top of directory listings). The *ID* can be any 2 characters and is written to the directory along with the diskname and also to all header blocks on the diskette. Remember to include the comma between *diskname* and *ID* when using this form of the command.

`@N:diskname` ("Short" NEW)

This version of the @N command performs a "short" NEW on a diskette that has already been formatted. A short NEW clears the directory and BAM of an already-formatted diskette and is much quicker than completely reformatting.

`@N2:diskname,ID` (JiffyDOS-equipped 1571 drives only)

This version of the @N command is used exclusively to format both sides of 1571 disks when the 1571 is in 1541 mode (the stock Commodore DOS allows only one side of a diskette to be formatted in 1541 mode). This command helps take advantage of the double-side 1541-mode operation provided by JiffyDOS. Note that the 1571 is in 1541 mode upon power-up, and will only switch to 1571 mode if used with a C-128 in 128 mode, or if the U0>M1 command is issued. The @N2 command is effective only on 1571's equipped with JiffyDOS— using this command on other drives will result in a syntax error (no formatting will take place).

`@N:NEWDISK,00` Completely formats (NEWs) a diskette and assigns the name "NEWDISK" and the ID code "00" to the diskette.

`@N:BACKUP` Performs a short NEW (clears the directory and BAM) and assigns the name "BACKUP" to the diskette.

`@N2:TWOSIDE,01` Formats both sides of a 1571 disk when the 1571 is in 1541 mode. Assigns the name "TWOSIDE" and the ID code "01" to the diskette.

Speeds up access of SEQ, REL, & USR files

Another important feature of JiffyDOS is its ability to speed up the access of all types of files. Program (PRG), Sequential (SEQ), Relative (REL) and User (USR) files can all be accessed faster on JiffyDOS systems. This makes JiffyDOS effective with software that uses these file types, and provides an advantage over cartridge speedup products which improve performance only with PRG files.

Speed comparisons

The following tables illustrate the speed increases that can be obtained with JiffyDOS. Please note that the times shown are rounded off to the nearest second, and do not take into account the disk spin-up delay (approx. 1/2 second) and the time required for directory searching (which varies in relation to the size of the particular directory). Other factors may also influence the results that you obtain on your system. Refer to Section 3 for more information on these factors and for ways to obtain maximum performance when using JiffyDOS.

C-64, SX-64, C-128 in 64 Mode

	1541		1571		1581	
Disk Operation	**Stock**	***JiffyDOS***	**Stock**	***JiffyDOS***	**Stock**	***JiffyDOS***
Load 202-block program (PRG file)	124	12	124	9	102	8
Save 100-block program (PRG file)	75	24	75	20	40	15
Read 125-block SEQ or USR file	84	15	84	13	63	9
Write 100-block SEQ or USR file	81	27	81	24	44	17
Read 64 154-byte REL records	40	14	40	14	37	10
Write one 154-byte REL record	.350	.125	.350	.120	.325	.110
Read/Write 16K on command channel	47	9	47	9	47	9

C-128 in 128 Mode

Disk Operation	1541		1571		1581	
	Stock	JiffyDOS	Stock	JiffyDOS	Stock	JiffyDOS
Load 202-block program (PRG file)	124	12	14	9	12	8
Save 100-block program (PRG file)	75	24	48	25	26	14
Read 125-block SEQ or USR file	84	15	31	12	20	10
Write 100-block SEQ or USR file	81	27	48	33	20	11
Read 64 154-byte REL records	40	14	21	14	17	10
Autoboot 202-block program	125	13	54	10	13	9
Read/Write 16K on command channel	47	10	10	6	10	6

Compatibility

Works with virtually all software

We designed JiffyDOS to be fast—but not at the expense of compatibility. As a result, JiffyDOS will load and operate with virtually all software of every type (including copy-protected commercial programs). This includes programs that cannot be loaded by other speedup products such as cartridges, software-based "turbo" loaders, and other hardware-based systems. In addition, JiffyDOS is compatible with programs that utilize their own fast-access routines (such as *GEOS*) and will work with the non-standard file formats created by programs such as the *VORPAL* utility kit.

Compatible with all hardware

Because it does not use any ports, JiffyDOS can work in conjunction with all hardware devices available for C-64's and C-128's, including modems, RAM expansions, MIDI interfaces, hard disk drives, etc. JiffyDOS systems are also compatible with all serial bus devices (non-JiffyDOS disk drives, printers, printer interfaces, etc.). JiffyDOS can be installed on disk drives regardless of device number, and devices numbers can be changed on JiffyDOS drives via software or hardware with no problems. In addition, JiffyDOS-equipped disk drives can be used with stock C-64 and C-128 computers, if necessary.

"Un-NEWing" a BASIC Program

`@U`

The JiffyDOS *@U* (Un-NEW) command can be used to recover a BASIC program that has been accidentally "NEWed." Entering `@U` will also recover a BASIC program lost when the computer is reset. Note that the Un-NEW command is only effective if no new BASIC lines have been entered since the original program was lost.

Initializing the Disk Drive

`@I`

The *@I* (INITIALIZE) command initializes the disk drive. Initialization causes the drive to read the BAM (block availability map) and ID from a diskette and store this information in its internal memory. Initialization also clears the error channel and turns off the error LED on the drive (if it is flashing). At times (i.e. after a DRIVE NOT READY error), it will be necessary to initialize the disk drive before it can be used to perform any further operations. Remember that the @I command clears the error status of the drive, so if you wish to read the drive error channel after an error has occurred (see the @ command), do so before using this command. Note that it is a good idea to initialize the disk drive every time you insert a diskette into the drive.

Resetting the Disk Drive

`@UJ`

The *@UJ* command is used to reset the disk drive. Note that @UJ may not work properly with older 1541 drives. For this command to work with older 1541's, the alternate syntax @U; may be required.

Validating Disks

`@V`

The *@V* (VALIDATE) command is used to free unused blocks on a diskette. After a diskette has been in use for a while, more blocks may be free than the BAM and directory indicate. Primarily, this happens when unclosed files have been scratched. Using the @V command will make all free space on a diskette available for use. Note that this command may take some time to complete, depending on the amount and size of the files present on a particular diskette.

Listing ASCII Files from Disk

`@T:filename`

The most common use of the *@T* (TYPE) command is to list an ASCII text file (such as a wordprocessor file) to the screen or to a printer. When using @T, care should be taken to list ASCII files only—otherwise, the results may be unpredictable (for example, a BASIC program will display garbage if listed to the screen or to a printer via @T). The default output device for the @T command is the screen. To list a file to the screen, enter `@T:filename`. To print a listing, type `OPEN4,4:CMD4` prior to using the @T command. When the printout is complete, you can restore output to the screen by entering `PRINT#4:CLOSE4`.

Note: A listing produced by the @T command can be suspended at any time by pressing any key on the keyboard (except the RUN/STOP key). The listing can then be restarted by pressing any key again (except RUN/STOP). The @T command can be ended at any time by pressing RUN/STOP.

Copying a File with the @T Command The @T command provides a built-in means of copying files from one drive to another on multiple-drive systems. Although the method required to do this is slightly complex, it offers a more convenient alternative to having to load and run a copy utility program when only one or two files need to be copied.

To copy a file from one drive to another, first enter the command `OPEN2,n,2,"newfile,t,W"` (*n* is the destination drive device number, *newfile* is the name that you wish to assign to the new file, and *t* is the file type for the new file. In place of *t*, enter `P` for a Program file, `S` for a Sequential file or `U` for a User file). Next, enter `CMD2,;` (it is very important to include `,;` after `CMD2`—this prevents BASIC from writing a carriage return ($0D) as the first byte in the new file). To actually copy the file, enter `@T:filename`. After the file has been copied, enter `CLOSE2:CLR` to close the new file and to restore output to the screen.

```
@T:LETTER
```
Lists the file LETTER to the screen.

```
OPEN4,4:CMD4
@T:APPOINTMENTS
PRINT#4:CLOSE4
```
Lists the file APPOINTMENTS to a printer. Output is restored to the screen at the completion of the command.

```
OPEN2,9,2,"S1,S,W"
CMD2,;
@T:S1
CLOSE2:CLR
```
Copies sequential file S1 from the default drive to device 9. Output is then restored to the screen.

Uses stock disk and file formats

All files written under JiffyDOS are identical to standard Commodore files. Disks formatted on JiffyDOS systems are identical to those formatted on stock systems. This means that you will have no problems using the disks, programs and files you create with JiffyDOS on stock systems (and vice-versa).

Can be completely switched out

In the event that a program will not load or operate properly with JiffyDOS (this should be a rare occurrence—we know of only a few heavily copy-protected games that will not load), you can switch your system back to a completely stock configuration with the flip of a switch. As an added advantage, you can use the switching system to switch JiffyDOS in or out *with power on.*

Available for all 64's, 128's and virtually all drives

JiffyDOS systems are available for the following computers and disk drives:

C-64, 64"C", SX-64, C-128, C-128D

1541, 1541"C", 1541-II, 1571, 1581
FSD-1, FSD-2 Excelerator+, Excel 2001
MSD-1, MSD-2
Enhancer 2000

JiffyDOS can be ordered for any combination of the above computers and disk drives. Additional drive ROMs can be ordered if you wish to speed up second, third or fourth drives. JiffyDOS allows the use of multiple dissimilar drives (i.e. 1541, 1571, 1581) whether or not they are equipped with JiffyDOS ROMs. JiffyDOS-equipped disk drives can be used interchangeably on different JiffyDOS-equipped computers (for example, a C-64 and C-128), or with stock computers. Contact Creative Micro Designs if you are interested in expanding your JiffyDOS system.

Compatibility Guarantee

Because of our confidence in the compatibility of JiffyDOS, we back our product with a 30-day, Money-Back Compatibility Guarantee. The JiffyDOS guarantee is simple: If you are dissatisfied because JiffyDOS is not compatible with any of the hardware or software that you own, simply return the unit (within 30 days of purchase) for a complete refund. See the back of this manual for a complete description of the JiffyDOS Guarantee.

Loading and Running the First Program on Disk

<Shift-RUN/STOP>
<Commodore-RUN/STOP> (C-64, SX-64, C-128 in 64 mode)

The *Shift-RUN/STOP* or *Commodore-RUN/STOP* commands can be used to load and run the first program on disk. Using these commands displays the characters **!":*** on the screen and is identical to entering the BASIC commands **LOAD":*",8,1** and **RUN**. This provides a quick, convenient way of starting up most commercial software programs.

Verifying Programs

'filename

The ' (apostrophe) command verifies a file in memory against a file on disk. Using this command provides a shorthand method of entering the BASIC command **VERIFY"filename",n,1** (where n is the default drive device number). This command will work with all machine language files and with all BASIC programs that have been saved under the current BASIC environment (i.e. a BASIC program saved on the C-64 will verify properly on a C-64 but not on a C-128 in 128 Mode).

Listing BASIC Programs from Disk

@D:filename

The *@D* (DLIST) command enables a BASIC program to be listed to the screen or to a printer directly from the disk without loading it into memory first. The file listing can be directed to a printer by entering the commands **OPEN4,4:CMD4** prior to using this command. After the listing has been completed, output can be restored to the screen by entering the commands **PRINT#4:CLOSE4**. For legible results, take care to use @D to list only BASIC programs.

Note: A listing produced by the @D command can be suspended at any time by pressing any key on the keyboard (except the RUN/STOP key). The listing can then be restarted by pressing any key (except RUN/STOP). The @D command can be ended at any time by pressing the RUN/STOP key.

@D:GAME	A listing of the program GAME will be sent from disk to the screen.
OPEN4,4:CMD4 **@D:LOTTERY** **PRINT#4:CLOSE4**	A listing of the program LOTTERY will be output from disk to a printer. Output is then restored to the screen.

Loading Machine-Language Programs

JiffyDOS provides four powerful commands for loading machine-language programs.

%filename

The % command loads a machine language file. Typing **%filename** is the equivalent of entering the command **LOAD"filename",n,1** (where n is the default drive device number), except that the BASIC end-of-program pointers are not reset as a result of the load. This avoids OUT OF MEMORY errors, and also leaves the variable base pointers for any BASIC program currently in memory undisturbed.

!filename

The *!* command also loads a machine language file. Like the BASIC command **LOAD"filename",n,1** (and unlike the JiffyDOS % command) the BASIC end-of-program pointers are reset to the end of the ML file at the completion of the load.

&filename

The & command loads a machine language file without resetting any BASIC pointers. This means that OUT OF MEMORY errors are avoided and that the BASIC program pointer is not reset to the beginning of the current program. Thus, this command provides a way to load ML programs from within a BASIC program without resorting to the usual contortions. For example, instead of the cumbersome commands:

```
10  A=A+1:IF  A=1  THEN  LOAD"ML1",8,1
20  IF  A=2  THEN  LOAD"ML2",8,1
30  IF  A=3  THEN  LOAD"ML3",8,1
```

Simply use the & command as follows:

```
10   &"ML1":&"ML2":&"ML3"
```

£filename

The £ command loads and then runs a machine-language program. Typing **£filename** is a much more convenient alternative to entering **LOAD"filename",n,1** and then doing a **SYS** to start the program. At the beginning of a load, the £ command finds the starting address of the ML file and then begins execution at that address when the program has finished loading. Note: While this command will work properly with most machine language programs, it will not work with programs that have entry points that differ from their load addresses.

SECTION 3
USING JIFFYDOS

ROM Switching

JiffyDOS enables your computer and disk drive(s) to be switched back to stock mode, if necessary. You will probably be able to have JiffyDOS selected all of the time. However, in rare cases, your system may have to be switched back to stock mode to allow a program to load or operate properly.

C-64 and C-128

The normal procedure for switching Kernal selections on the C-64 and C-128 is to first turn your computer OFF, flip the selector switch to the desired position and then power the computer back ON. After your computer is powered back on, the sign-on screen will indicate which Kernal has been selected. If the JiffyDOS Kernal is selected, the sign-on screen will read:

```
***  JIFFYDOS  V5.0  ***
```

If the stock Kernal routines have been selected, the normal BASIC sign-on screen will be displayed.

SX-64

The procedure for switching JiffyDOS in or out on the SX-64 is the same as for the C-64. When JiffyDOS is selected, the sign-on screen will read:

```
***  JIFFYDOS/64-SX  VER  5.0  ***
```

Note that since there is only one selector switch on the SX-64, the Kernal and disk drive ROM selections are controlled simultaneously.

1541 and compatibles

The normal procedure for switching JiffyDOS in or out on 1541 and compatible drives is to power the drive OFF, set the selector switch to the desired position and then power the drive back ON. Reading the disk drive error channel immediately after power-up will indicate which ROM selection has been made. If JiffyDOS has been selected, the message is:

```
73,JIFFYDOS  5.0  1541,00,00
```

If the stock ROM routines have been selected, the message is:

```
73,CBM  DOS  V2.6  1541,00,00
```

1571 and 1581

On 1571 and 1581 drives equipped with JiffyDOS, a software switching scheme is used to select between JiffyDOS and the stock DOS. With JiffyDOS installed, the drives sense whether the computer they are connected to is in stock or JiffyDOS mode and subsequently select the corresponding DOS routines automatically. No manual switching is required.

Switching ROMs with power on

JiffyDOS has been designed to allow ROM switching while your system is powered on. This is especially useful in cases where a heavily copy-protected program will not load with JiffyDOS selected, but will perform high-speed drive accesses properly if JiffyDOS is switched in once the program is up and running.

Precautions The only precaution necessary for switching ROM selections on your computer or disk drive with power on is to be sure that no disk accesses are taking place at the time (switching while a disk drive is being accessed will cause the system to hang up). Take note, however, that switching Kernal ROM selections on your computer while running a program may not be 100% reliable—that is, the program running at the time may crash when the switch is toggled or may hang up when a device access is attempted (some programs will respond better than others).

Switching to the Stock Kernal while in BASIC To switch from the JiffyDOS Kernal to the stock Kernal while your computer is in BASIC direct mode, first disable the JiffyDOS commands by using the *@Q* command and then flip the Kernal Selector Switch to the stock position.

Switching to the JiffyDOS Kernal while in BASIC To switch from the stock Kernal to the JiffyDOS Kernal while your computer is in BASIC direct mode, first flip the Kernal Selector Switch to the JiffyDOS position and then type in one of the following commands:

`SYS 58451`	(C-64/SX-64/C-128 in 64 mode)
`SYS 65137`	(C-128 in 128 mode)

Using a Tape Drive with JiffyDOS

It is not possible to use a tape drive (Commodore DATASETTE, etc.) while the JiffyDOS Kernal is selected. If tape access is attempted, an ILLEGAL DEVICE NUMBER ERROR will occur.

To use a tape drive with JiffyDOS, select the stock Commodore Kernal ROM routines first by using the Kernal Selector Switch. See "ROM Switching" earlier in this section for instructions.

Reading the Disk Drive Error Channel

JiffyDOS makes it easy to find out what has happened when the error light on your disk drive starts flashing. Instead of having to type in a program (like on a stock systems), you can enter a single character to display the error messages output by your disk drive.

`@`

The @ command is used to read and display the disk drive error channel. This is useful in determining what type of error has occurred when the red error light on the disk drive is flashing (you will also be pleased to find that issuing the @ command will also shut off the distracting flash of the error light). If `@` is typed when the error light is not flashing, the drive "OK" message will be displayed (`00, OK,00,00`).

If the @ command is entered when the system (or your disk drive) has just been powered up or reset, the disk drive's DOS type and version number will be displayed.

Loading BASIC Programs

JiffyDOS provides two commands for loading BASIC programs: The / command is a shorthand form of the LOAD command; the ↑ command loads and then automatically runs a BASIC program.

`/filename`

The / command provides a shorthand method of loading a BASIC program. Typing `/filename` is identical to entering the BASIC command `LOAD"filename",n` (where n is the default drive device number).

`↑ filename`

The ↑ command loads and runs a BASIC program. Typing `↑filename` is the same as entering the BASIC commands `LOAD"filename",n` (where n is the default drive device number) and `RUN`.

Saving BASIC Programs

The JiffyDOS ← command provides a convenient alternative to the BASIC SAVE command.

`← filename`

The JiffyDOS ← command saves a BASIC program. Typing `←filename` is equivalent to entering the BASIC command `SAVE"filename",n` (where n is the default drive device number).

<CONTROL-D>

The *Control-D* command is used on multiple-drive systems to switch the default disk drive device number for all JiffyDOS commands. Pressing **CONTROL-D** (holding down the CONTROL key and pressing D at the same time) will switch the default device assignment and display the new device number on the screen. For example, if device 8 is the current default, **CONTROL-D** will make device 9 (if present) the default, and display a "9" on the screen. If device 9 is the current default, pressing **CONTROL-D** will make device 8 the default, and display an "8" on the screen. CONTROL-D offers a much more convenient means of changing default devices than the @# command.

Displaying the Directory

JiffyDOS provides a quick, convenient way to display disk directories without disturbing your computer's memory. JiffyDOS directories can be easily printed, suspended or ended at any time.

@$[:filename]

The *@$* command displays the disk directory. Typing **@$** with no filename displays the entire directory. **@$** followed by a colon and a filename will display the specified file in the directory listing (if it exists). A selective listing can be displayed by using pattern matching or wild cards as part of the filename. The directory can be printed by entering **OPEN4,4:CMD4** prior to issuing the @$ command, and after the listing has been completed, output can be restored to the screen by entering the commands **PRINT#4:CLOSE4**.

Note: Directory listings can be suspended at any time by pressing any key on the keyboard (except the RUN/STOP key). The listing can then be restarted by pressing any key again (except RUN/STOP). The directory listing can be ended at any time by pressing RUN/STOP.

@$	Displays the entire directory.
@$:TEST	The directory listing will display the file TEST if it exists on disk.
@$:T*	All files having a "T" as the first letter in their filename will be displayed in the directory listing.
OPEN4,4:CMD4 **@$** **PRINT#4:CLOSE4**	Lists the directory to a printer. Output is then restored to the screen.

Function Key Definitions

JiffyDOS offers the convenience of function keys defined with JiffyDOS Wedge commands and BASIC keywords. The function key definitions are active only in BASIC direct mode and are automatically disabled when a BASIC or ML program is run, in order to avoid conflict with any program-defined function key assignments. The JiffyDOS function key definitions are:

f1 = @"$0:*	Display the directory
f3 = /"0:	Load a BASIC program
f5 = ↑"0:	Load and run a BASIC program
f7 = %"0:	Load an ML program
f2 = @"S0:	Scratch a file
f4 = ←"0:	Save a file
f6 = RUN	RUN a BASIC program
f8 = LIST	LIST a BASIC program

Using the function keys with the directory listing

The JiffyDOS function key definitions have been designed to work along with the filenames in the directory listing. Once the directory has been listed, the cursor can be moved to the line of the desired filename, the appropriate function key can be pressed, and then RETURN can be pressed when it is OK to proceed with the command.

Using the JiffyDOS function keys with the directory listing eliminates the possibility of filename misspellings. And, there is no need to enter a colon (:) after the filename or erase the filetype characters manually in order to avoid a syntax error. After the function key has been pressed, the filename can be altered if desired, or the drive specification can be changed (0 is displayed as the default).

Note: When accessing 1541 (or compatibles), 1571 or 1581 drives, the "0:" does not have to be changed or removed except in the rare instances where certain ML loader routines are confused by the "0:".

Disabling the function keys

The JiffyDOS *@F* command may be used to toggle the function key definitions on and off while in BASIC direct mode. Refer to Section 4, "The JiffyDOS Commands", for a complete description of the @F command.

Listing Freeze

One of the unique convenience features of JiffyDOS is its built-in ability to freeze and restart listings that would otherwise scroll down the screen uninterrupted. This enables you to halt a long listing at any point, scan the screen, and then restart or end the listing as desired.

BASIC listings

With JiffyDOS, BASIC program listings produced by the LIST command can be temporarily suspended by pressing any key on the keyboard (except the RUN/STOP key) and then restarted by pressing any key again (except the RUN/STOP key). The RUN/STOP key can be used to end a listing at any time.

JiffyDOS listings

Three JiffyDOS commands (*@D*, *@T*, *@$*) list information from the disk drive to the screen or to a printer. The listings produced by these commands can be controlled in the same way as BASIC program listings (see above).

Getting Maximum Performance

As a general rule (with 1541, 1571, and compatible drives), programs and files saved with JiffyDOS will load faster than programs and files saved on stock systems (or with JiffyDOS switched out). In some cases, re-saved files can be loaded up to 3 times faster. With programs (or files) that already load quickly with the 1571 in 128 mode, re-saving files may be the only way to obtain a discernable speed increase.

Re-saving files under JiffyDOS does not alter the file's format or contents in any way—it merely rearranges the data more efficiently on disk, which allows JiffyDOS to find each block (sector) more quickly. Re-saved files remain compatible with stock Commodore systems.

Also, please remember that *re-saving files is only effective on 1541, 1571, and compatibles—it will not improve performance on the 1581.*

Re-writing files

To get the maximum possible speed increase when loading files from within other programs (i.e., wordprocessors, MIDI sequencers, etc.), start up the program, load in the desired file, and then re-save it. For example, to increase the load speed of a MIDI sequencer file, load your MIDI sequencing program with JiffyDOS enabled and then load the file you want to speed up into the sequencer. After the file has been loaded, simply save it back to disk. In many cases, this procedure can double the speed at which files can

SECTION 4
THE JIFFYDOS COMMANDS

JiffyDOS offers the convenience of a complete, built-in implementation of the Commodore DOS 5.1 Wedge command set. Also included are a set of additional commands that provide functions that are not accessible on stock systems or through the standard DOS Wedge. All JiffyDOS commands can be entered in BASIC direct mode or used from within BASIC programs.

Command Descriptions This section gives a complete description of each JiffyDOS command. The commands are listed by their function, along with the syntax of each form of the command. Square brackets [ ] are used to enclose information which is optional to the command syntax. Examples are provided after the command descriptions to illustrate the use of each command in its basic and optional forms. If no example is given, the only form of the command is as listed in the syntax line.

Note: The @ character, which prefixes many of the following commands, may be substituted with the > character, if desired. For example, the command `@S:TESTFILE` may also be entered as `>S:TESTFILE`.

Setting the Default Device

Two commands are available for switching the JiffyDOS default device on multiple-drive systems: The standard DOS Wedge command @#, and the convenient JiffyDOS *Control-D* device toggle.

`@#device`

The @# command is used in multiple-drive systems to specify the default disk drive device number for all JiffyDOS commands. When this command is entered, an attempt is made to access the drive with the device number specified within the command. If the access succeeds, the specified drive becomes the new default drive. If the access fails, a `DEVICE NOT PRESENT` error will be displayed, and the default drive will remain unchanged.

`@#9`	Sets the default drive device number to 9 (if device 9 is present).

1571 drives

If you are using a JiffyDOS-equipped 1571 drive with a C-64, SX-64, or a C-128 in 64 mode, you will obtain maximum performance *only if the 1571 is in 1541 mode*. With JiffyDOS installed, your 1571 can access (and format) both sides of a disk in 1541 mode—making it unnecessary to switch to 1571 mode to benefit from the increased dual-side storage. This means:

1. You should not use the "U0>M1" command to switch into 1571 mode when using a C-64, SX-64 or C-128 in 64 mode (this will reduce performance). C-64/SX-64 owners: Note that the 1571 is automatically in 1541 mode upon power-up.

2. When switching from 128 mode to 64 mode on a C-128, *use the reset switch and hold down the Commodore key*. Do not use the "GO64" command. Using GO64 will leave the 1571 in 1571 mode, resulting in reduced performance in 64 mode.

If a Program won't Load or Operate

Although we have made every effort to ensure compatibility with as much software as possible, you may occasionally run across a program that will not load or operate properly with JiffyDOS. Loading problems are almost always caused by extravagant copy-protection schemes that rely on stock head step rates, serial bus timing, and particular ROM versions (these copy protection schemes are the same ones that cause loading problems on 1571 and 1541C drives). Unfortunately, it would be necessary to reduce the performance of JiffyDOS in order to provide compatibility with these programs.

Another very rare type of program will load OK under JiffyDOS but will not operate properly once loaded. This type of problem is caused almost exclusively by bad programming practices (i.e. the indiscriminate use of ROM routines without regard to normal entry points, jump tables, etc.). This misuse of ROM routines has become so widespread that Commodore is now very reluctant to change (even fix or improve) their own ROMs for fear of introducing compatibility problems. Since JiffyDOS relies on carefully selected ROM changes to enhance performance, undoing any of these alterations to provide compatibility with just one program would unfortunately reduce performance, features, or both.

What to do if a program won't load JiffyDOS includes a switch which will return your system to a 100% stock configuration to ensure compatibility with the few programs that do present problems. Refer to "ROM Switching" earlier in this section for information on how to switch JiffyDOS out in order to provide compatibility with problem programs.

be loaded. Another method is to use a file-copy utility to re-write files. See "Using file-copy utilities" below.

Re-saving BASIC programs

Speeding up the loading of BASIC programs saved under the stock Commodore DOS is easy. With JiffyDOS enabled, simply load the BASIC program, scratch that program from disk and then re-save it. Doing this will nearly double the speed at which the program loads.

Re-saving machine-language programs

Re-saving ML programs (such as commercial programs) can be tricky. If you have a machine-language monitor (and know how to use it), you can probably load in and then re-save the majority of the ML programs that you own. If you are not sure of how to do this, your best bet is to try copying the program with a file-copy utility (see below).

Using file-copy utilities

Using a file copy utility to help reduce the load time of your files can be your most convenient route. However, file-copy utilities can give good or indifferent results. For example, files copied with *Fast Hack'Em* will not be speeded up (*Fast Hack'Em* ignores DOS rules for writing files to disk).

Your best bet is to use a "slow" file copier (one which uses the stock DOS when reading and writing files). In most cases, JiffyDOS greatly improves the speed of these standard copiers, making their performance bearable. The file copy programs found on the utility disks that come with Commodore disk drives will yield good results when used with JiffyDOS.

If you're not getting top Performance

When using certain programs, you may feel that JiffyDOS is not increasing performance as much as it should be. In these cases, the problem is most likely related to the particular software in use. There are also some considerations to note when using 1571 drives.

Programs with built-in fast loaders

Some programs utilize their own built-in fast loaders. Some examples are *GEOS*, the *Mastertracks* MIDI sequencer, *Fast Hack'Em*, and disks created by certain types of "freezer" cartridges. These programs contain their own DOS which bypasses the disk-access routines in the Kernal and DOS ROMs. Since JiffyDOS resides in these ROMs, any program which bypasses the disk-access routines renders JiffyDOS ineffective. As a result, JiffyDOS can provide little, if any, performance gains with such programs.

In these cases, the only way to enable JiffyDOS is to alter the software so that it uses the disk-access routines provided in the Kernal ROM. This can be a difficult job, even if you have the programming know-how. Another option is to contact the software manufacturer to see if any versions of the program exist that do not incorporate the built-in fastloader, or if there is an easy way to disable it. If you own the *Mastertracks* MIDI sequencer, contact Creative Micro Designs to obtain a free conversion utility which disables the built-in fastloader and enables JiffyDOS to take charge of disk accesses.

BASIC programs

Programs written in BASIC will produce mixed results with JiffyDOS because of the slowness of the BASIC interpreter. The interpreter spends most of its time figuring out what each instruction is and what it should do with it—making disk access time insignificant when compared to this software overhead. As a result, the speed increases you notice when using JiffyDOS will vary according to the way the BASIC program was written.

JiffyDOS performs best when loading another program from within BASIC (i.e. LOAD"TEST.ML",8,1). Because the entire file is accessed by a single instruction (the LOAD command), JiffyDOS can perform at 100% efficiency. On the other hand, reading a file byte-by-byte by means of the GET# instruction is the least efficient method of accessing a file. Because of the amount of software overhead involved in interpreting the GET# instruction and the other instructions in a typical GET loop (and because of the disk-access characteristics of GET#), you will probably notice no better than a 2x speed increase with JiffyDOS. Whenever possible, use the INPUT# instruction to read files. INPUT# will perform much better than GET#—especially if you read in a long string each time INPUT# is executed (the longer the string, the better the performance).

Compiled BASIC (i.e. programs compiled using *Blitz!*) will perform better with JiffyDOS than uncompiled BASIC (the elimination of interpreter overhead is the main reason). However, the degree of speed increase will still depend upon how the original program was written. See the above paragraph for a discussion of the GET# and INPUT# instructions.

Machine-language programs

JiffyDOS performs best when disk accesses are handled by efficient, well-written machine-language routines (JiffyDOS performance specifications are based on results obtained using ML routines). However, not all machine-language routines are efficiently written—which means that the speed increases you experience using JiffyDOS can vary greatly from program-to-program.

Fragmented files

"Fragmented" files have their data scattered across a disk in a non-orderly fashion. This usually occurs on disks that have had a number of files "scratched", or erased. When a file is saved to such a disk, the DOS first fills up the empty areas left by the scratched files. If the file being saved is long, it may be written to many of these randomly-located areas. When it comes time to read the file, the DOS is forced to search across a wide area of the disk in order to retrieve all the data, which can add significantly to the amount of time it takes to read the file.

To eliminate file fragmentation, copy the files from the fragmented disk to an empty disk. You can transfer the files one-by-one from within the program which created the files, or to make the job easier you can use a file-copy program. See "Getting Maximum Performance" earlier in this section for more information.

Sprites

"Sprites" are graphic display items that can be moved around quickly and easily on screen. Although sprites are used primarily in games (Pac-Man is a sprite), they are also found in other types of programs (the *GEOS* pointer is also a sprite). While it seems unlikely that a screen graphic could affect disk-access performance, sprites present a real problem for serial-bus communications routines. Sprites are hardware-generated by the VIC-II chip, and displaying them requires the VIC-II to "steal" cycles from the 6510/8510 microprocessor. Cycle stealing makes it impossible to use high-speed software timing loops to transfer data over the serial bus (JiffyDOS uses timing loops). Even the stock Commodore C-64 DOS is prone to hang up when sprites are displayed during serial I/O.

The solution to the problem is to disable sprites (shut them off) whenever serial bus communications are taking place. This is the approach used by *GEOS* (you'll notice the pointer disappear during disk accesses). Unfortunately, few programs imitate *GEOS* in this regard. Because of such programs, JiffyDOS is forced to disable sprites on its own (Commodore also does this in their 128-mode DOS). When JiffyDOS has to disable sprites for each byte read or written over the serial bus, data transfer slows down to the turtle-like speed of stock systems (this slowdown also occurs, by the way, with Commodore's 128-mode DOS).

Unfortunately, there is not much you can do if sprites are causing JiffyDOS to slow down (unless, of course, you have written the offending program yourself and can change it).