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Turbo Load and Save

Attention: Do not install or remove the cartridge while the computer is turned on.

Foreword

If you take the time to read it, this user's guide will provide a thorough and complete understanding of the functions of your new Turbo Load and Save cartridge. The Turbo Load and Save is far more than just a "fast load" cartridge, and all of it's HI-PRODUCTIVITY functions should be examined to realize the Turbo Load and Save's full potential.

The Turbo Load and Save cartridge is primarily intended to solve the two most annoying problems encountered in the operation of the Commodore 64 computer equipped with a Commodore 1541 single disk drive. The Commodore 64 computer lacks the powerful and time saving disk oriented commands of BASIC 4.0, and the Commodore 1541 single disk drive is sadly lacking in speed. In addressing these problems, Turbo Load and Save makes the Commodore 64/1541 combination a far more attractive, powerful and practical personal computer package.

We have included, in addition to the high speed DOS and BASIC 4.0, a few "extras" like fast single and dual drive backup commands to encourage you to keep your program and data disks safely backed up, a new command to conveniently read the disk drive error channel when something goes wrong, and a fast "Header" command to take the drudgery out of formatting new disks.

We believe that Turbo Load and Save is the most powerful and invaluable utility cartridge currently available for the Commodore 64, and we know that it will help you to unlock the true potential of your Commodore 64 and 1541 Disk Drive.

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GETTING STARTED

Your new Turbo Load and Save cartridge is encased in a durable plastic shell. You should never try to open the cartridge for any reason, as this would immediately void any and all warranty. If, in the unlikely event that the Turbo Load and Save cartridge should prove to be defective, Spinnaker Software will replace it free of charge within the warranty period, and for a reasonable service charge thereafter.

Before installing or removing your Turbo Load and Save cartridge, **TURN OFF YOUR COMPUTER.** We cannot stress this point strongly enough. If you plug in or remove a cartridge from your computer while the power is turned ON, serious damage to your computer and/or cartridge could result. **DON'T DO IT!**

With the labeled side facing up, firmly insert your Turbo Load and Save cartridge into the rear cartridge slot (on the far right of the computer; looking at it from the front).

There are two ways to power up your computer with the Turbo Load and Save Cartridge installed.

Simply turn on the computer as you normally would, and Turbo Load and Save is immediately ready to speed your loading and saving functions up to 500%, and will provide maximum compatibility with as many "off the shelf" computer programs as possible.

If you wish to power up with Turbo Load and Save in high gear, turn on your computer while holding down the Commodore Logo key. The screen will then look like this:

**** COMMODORE BASIC V4 ****

64K RAM SYSTEM   38911 BASIC BYTES FREE

READY.

At this point, the full power of your Turbo Load and Save cartridge is at your command with BASIC 4.0, single and dual drive backup and fast header functions alert and ready to perform as long as Turbo Load and Save remains enabled. Note that the startup message now shows "V4" instead of "V2".

Welcome to the world of convenience and high-speed disk processing with Turbo Load and Save and the Commodore 64!

LOADING AND SAVING PROGRAMS

Loading (and saving) programs with your Turbo Load and Save cartridge now takes place at approximately 500% of the speed of a conventional Commodore 64 and 1541 disk drive. Most commercial software will load at substantially increased speeds with your Turbo Load and Save cartridge enabled. The ones that don't, usually use their own specially-written loaders to load the main program and Turbo Load and Save will be defeated by them. Some of the more complicated disk-protection schemes can also trip up Turbo Load and Save, and there will also be times in which you will run across a program with an extremely picky loader that will absolutely refuse to load with your Turbo Load and Save cartridge in place. In such a situation, you can first temporarily disable the BASIC 4.0 section of your Turbo Load and Save cartridge with the following command:

DISABLE ⟨RETURN⟩

This will make the BASIC 4.0 section of your Turbo Load and Save cartridge completely transparent to the loader, but will not disable the fast load capabilities of the cartridge. If this method still doesn't satisfy the program you are trying to load, you can temporarily turn off the entire Turbo Load and Save cartridge with the simultaneous keystrokes:

⟨RUN/STOP⟩⟨RESTORE⟩

You will now lose the fast section as well, but at least it almost certainly insures that the picky program will now load into your computer!

In a worst case situation, in which even the completely disabled Turbo Load and Save somehow interferes with loading the program, you can simply remove the cartridge; but remember to TURN OFF YOUR COMMODORE 64 FIRST!!

Return Turbo Load and Save to service from the DISABLE condition with the command:

SYS 57254 ⟨RETURN⟩

Return Turbo Load and Save to service from the ⟨RUN/STOP⟩⟨RESTORE⟩ condition with the command:

SYS 57297 ⟨RETURN⟩

From Basic 4.0 you can clear the computer memory completely and return to a cold-start or power-up start condition by typing in the following command:

RESET ⟨RETURN⟩

.... and Turbo Load and Save will happily oblige.

INTRODUCTION TO BASIC 4.0

BASIC 4.0 was originally created for the 4032 and 8032 series PET computers by Commodore. This was done in order to simplify disk-related operations for the programmer. Instead of typing in **LOAD "TEST",8**, the simpler command **DLOAD "TEST"** was used. Obscure commands such as the one used to scratch a file on the disk like **OPEN1,8,15,"S0:TEST"** have been replaced with the much simpler **SCRATCH "TEST"**.

Until now, Commodore 64 users with 1541 disk drives had to suffer with the old cassette tape oriented BASIC 2.0, which was used on Commodore PET computers before disk drives became popular. The version of BASIC 4.0 in the Turbo Load and Save cartridge is very similar to that created for the Commodore PET computers. Two features have been omitted due to memory constraints within the cartridge, but enough compatibility has been maintained to allow most old PET BASIC 4.0 programs to run without difficulty on the Commodore 64.

Differences between PET BASIC 4.0 and Turbo Load and Save BASIC 4.0

The primary difference between PET BASIC 4.0 and Turbo Load and Save BASIC 4.0 is the lack of the disk status variable or DS$. In the old PET machines, DS$ held the current value of the disk error channel, and it was used to some extent in old BASIC 4.0 programs to read the error channel, to keep tabs on the disk drive. This could be some cause of any incompatibility with old BASIC 4.0 programs.

Another difference between the two BASIC's is the fact that the Turbo Load and Save BASIC 4.0 omits the COPY and CONCAT commands because these are used only with dual drives and would require too much memory to implement on a single drive system.

Turbo Load and Save BASIC 4.0 adds the variable names xx and yy to the BASIC 4.0 list of reserved variable names that must not be used in programs.

Abbreviations for BASIC Keywords

The standard command abbreviation convention has been followed by Turbo Load and Save BASIC 4.0 as follows:

APPEND	= a	⟨SHIFT⟩ P	BACKUP	= b	⟨SHIFT⟩ A
CATALOG	= c	⟨SHIFT⟩ A	COLLECT	= co	⟨SHIFT⟩ L
DCLOSE	= d	⟨SHIFT⟩ C	DIRECTORY	= di	⟨SHIFT⟩ R
DLOAD	= d	⟨SHIFT⟩ L	DOPEN	= d	⟨SHIFT⟩ O
DSAVE	= d	⟨SHIFT⟩ S	DSTAT	= ds	⟨SHIFT⟩ T
HEADER	= h	⟨SHIFT⟩ E	RECORD#	= re	⟨SHIFT⟩ C
RENAME	= re	⟨SHIFT⟩ N	SCRATCH	= s	⟨SHIFT⟩ C

ALPHABETICAL LISTING OF BASIC 4.0 COMMANDS

What follows is a description of the commands available in Turbo Load and Save BASIC 4.0. Contained in each command description will be examples of the command in use. Hopefully this will eliminate any confusion regarding how the command is used, and the context in which the command is used.

APPEND

The APPEND command is used to re-open an existing SEQUENTIAL file, and add data to it. Through the use of this command, data may easily be added to existing sequential files without the need to create a new data file.

The APPEND command takes the following syntax:

APPEND# file number,"filename",D drive number

Notes on APPEND command:

1. If no drive number is specified, then drive 0 (or device #8) is assumed.

Examples of APPEND command:

APPEND#1,"TEST FILE"

- opens "TEST FILE" for appending data as file #1 on device 8

APPEND#5,"MAIL LIST",D1

- opens "MAIL LIST" for appending data as file #5 on device 9

BACKUP

The **BACKUP** command creates an exact duplicate of a disk. Your Turbo Load and Save cartridge provides two different types of disk **BACKUP** routines. You may backup a disk on a single disk drive, or if you have two disk drives, you may back up a disk between the two drive units.

The **BACKUP** command takes on the following syntax:

BACKUP D source drive number TO D destination drive number

If you wish to backup on a single disk drive, then the syntax for the command would be:

BACKUP D0 TO D0 on device #8 or

BACKUP D1 TO D1 on device #9

To perform a dual drive backup you would type in:

BACKUP D0 TO D1 to backup a disk in device #8 to device #9.

BACKUP D1 to D0 to backup a disk in device #9 to device #8.

NOTE: Watch the screen for continuing backup command instructions, the red disk drive light will remain on throughout the entire operation to save time.

IMPORTANT!!! For some peculiar and unexplicable reason, there seems to be a difference in creating a device 9 drive by cutting the traces on the 1541's PC board and creating a device 9 drive by software means. The dual disk backup routine works perfectly when backing up a disk from device #8 to a software modified device #9 disk drive; BUT not when backing up a disk from device #8 to a hardware modified device #9 disk drive.

For those with a hardware modified device #9 disk drive, don't despair; as the dual drive backup routine works fine when backing up from device #9 to device #8.

CATALOG and DIRECTORY

The **CATALOG** and **DIRECTORY** commands perform the identical functions of listing the files contained on your diskette. Your Turbo Load and Save cartridge has sped up this function too, and you will notice that it is much faster than on a standard Commodore 64 and 1541 disk drive. You may halt the directory listing temporarily at any time by pressing the **SPACE BAR.** Pressing the **SPACE BAR** again continues the listing. You may permanently halt the listing by pressing the RUN/STOP key.

An additional feature of this directory function are the colons placed before the file type specifiers at the far right of the listing. This enables you to cursor up to the desired file; and type DLOAD⟨return⟩ in front of it without having to cursor over to wipe out the file specifiers which would otherwise return a ?SYNTAX ERROR.

The syntax of the CATALOG and DIRECTORY commands are as follows:

CATALOG D drive number <u>or</u>
DIRECTORY D drive number

Examples:

DIRECTORY D0 gives you a listing of files on device #8

CATALOG D1 gives you a listing of files on device #9

c ⟨SHIFT⟩ **A** is a neat short cut you may wish to try...

COLLECT

The **COLLECT** command performs something analogous to "spring cleaning" of the disk. After many files have accumulated on the disk and have been re-written many times, a discrepancy may occur between the number of blocks allocated to files and the number of free blocks in the **BLOCKS FREE** message. Also, in case there is an unclosed file on the disk (indicated by an asterisk before the file type specifier), the only way to remove that file is to COLLECT the disk.

To the technically inclined; this is what the **COLLECT** command does:

The **COLLECT** function completely re-writes the BAM (Block Availability Map). The disk drive wipes clean the BAM, and reconstructs it by reading every file on the disk, and re-allocating in the map those sectors that the file uses. This insures that only those sectors that are actually used by files on the diskette are allocated; and all of those sectors that aren't actually used are freed for additional storage on the disk.

The syntax for the **COLLECT** command is as follows:

COLLECT D drive number

Notes on the **COLLECT** command:

- If no drive number is specified, then the **COLLECT** command proceeds to collect both disk drives; whether both are present or not; so don't be alarmed if a READY message does not immediately appear after command execution.

CONCAT and COPY

Due to insufficient room in your Turbo Load and Save cartridge, we were unable to implement a file copy routine. These two commands will return a ?SYNTAX ERROR if attempted. Although the concatenate files command still exists in your 1541 disk drive, we elected not to include the command as it would not have been possible to concatenate files across two 1541's. Therefore, we offer you a simple BASIC program to perform the same function as a CONCAT command would have allowed.

```
10 OPEN1,drive number,15
20 PRINT#1,"C0:name of combined file=file1,file2..."
```

DCLOSE

The DCLOSE command is the equivalent to the BASIC 2.0 command CLOSE. It performs an identical function to CLOSE except for a case in which no file number is specified to be closed. In this event, your Turbo Load and Save cartridge will close ALL currently open files to your disk drive.

The DCLOSE command takes on the following syntax:

DCLOSE (optional file number)

Examples of the DCLOSE command in operation:

DCLOSE1 - closes file number 1
DCLOSE5 - closes file number 5
DCLOSE - closes all open disk files

DLOAD

The **DLOAD** command is the equivalent to the BASIC 2.0 command **LOAD** "FILENAME",8,1. It allows you to load a program where it was originally intended to be loaded; without having BASIC relocate it to the start of BASIC text area which resides at address 2048 or $0800 hex. This is particularly desirable for machine language programs which do not start up by typing "RUN".

The **DLOAD** command takes on the following syntax:

DLOAD (optional D drive #), "filename", (optional D drive #)

Examples of the DLOAD command in operation:

DLOAD D0,"test file" loads test file from drive 0 or device #8

DLOAD "test file",D1 loads test file from drive 1 or device #9

DLOAD "test file" loads test file from drive 0; this is the default drive number if none is specified.

DOPEN

The **DOPEN** command opens a file to the 1541 disk drive unit. It allows you to open up any type of file, whether it be sequential, program, relative or user. It takes on a complex syntax which we will explain now:

To open a sequential, program, user or relative file for read; use the following syntax:

DOPEN# file number,"filename", (optional D drive number),

To open a sequential file for writing, use the following syntax:

DOPEN# file number,"filename", (optional D drive number),W

To open a relative file for writing, use the following syntax:

DOPEN# file number,"filename", (optional D drive number), L length of each record

Although many possible combinations of possible uses for the **DOPEN** command exist, we hope that the following examples will help clear up any confusion that may have resulted from the above syntax definitions.

DOPEN#1,"rel file"

- this opens as file #1, a relative file to the default drive 0 (device #8)

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for read; assuming that "rel file" is a relative file.

> DOPEN#5,"rel file",D1,L105

- this opens a relative file as file #5, to drive 1 (device #9) for writing; with a fixed record length of 105 bytes per record.

> DOPEN#6,"seq file",D1

- this opens as file #6, a sequential file for reading on drive 1.

> DOPEN#255,"seq file",W

- this opens as file #255, a sequential write file on drive 0.

✓ DSAVE

The **DSAVE** command is the BASIC 4.0 equivalent to the SAVE routine in BASIC 2.0; except that it saves only to disk drives. It takes on the following syntax:

> DSAVE (optional D drive #), "filename", (optional D drive #)

Note that if no drive number is specified; then drive 0 and device# 8 is assumed.

Examples:

> DSAVE "testfile" - saves "testfile" to drive 0
> DSAVE D1,"testfile" - saves "testfile" to drive 1
> DSAVE A$,D0 - saves the filename in A$ to drive 0

DSTAT

The **DSTAT** command prints out the current status of the disk's error channel. It may be used in a program to print out the current status of the disk's error channel, however, programs may not use it to check the error channel. Instead, they must do their checking manually by a method illustrated by the following example program.

> 10 OPEN1,drive number,15
> 20 INPUT#1,EN$,EM$,ET$,ES$

The variable EN$ returns the error number, EM$ returns the actual error message, ET$ and ES$ return the track and sector (if applicable) number that the error occurred on.

The **HEADER** command formats a blank disk in order to prepare it for use. There are three possible ways to format a disk.

The first is using your **Turbo Load and Save** cartridge's fast header routine which will format your disk in approximately 20 seconds. It takes on the following HEADER command variation:

HEADER (D drive number),(I 2 character disk ID),"disk name"

The header routine parameters may appear in any order; and the disk ID MUST be specified after the I disk ID identifier.

The second method is what is known as the "short header". This is a quick way to "erase" a disk by simply erasing the directory track. In order to use the "short header", one must be erasing a previously formatted disk. If your disk was never formatted, the "short header" will not work; as no sectors have been created on the disk. It takes on the following HEADER command variation:

HEADER (D drive number),"disk name"

The third method is the conventional 1541 header. This format routine is torturously slow; and we see absolutely no reason for using it, but it does exist and for those of you who wish to use it, it takes on the following syntax:

HEADER (D drive number),"disk name,2 character disk id)

Examples of the HEADER command in action:

HEADER D0,"TEST DISK"
- a short header command naming the re-formatted disk "TEST DISK"

HEADER D0,ITD,"TEST DISK"
- a fast header command giving the new disk the ID "TD".

HEADER "TEST DISK,TD"
- a conventional format giving the new disk the ID "TD."

RECORD#

The RECORD# command is for use with relative files. It allows the programmer to easily access different records from within a relative file. It's syntax is quite simple:

RECORD# file number,record number,optional byte position

The easiest way to understand the RECORD# command is through the following examples:

RECORD#1,10
- positions file 1 to the start of record number 10

RECORD#5,20,5
- positions file 5 to the 5th byte of record number 20

For a more detailed explanation of how relative files work, we would suggest that you read your Commodore 1541 Disk Drive manual.

RENAME

The RENAME command changes the name of the specified file to a new name. It's syntax is quite simple:

RENAME "original name" TO "new name" (,optional D drive number)

The drive number parameter may appear anywhere within the command.

Examples of the RENAME command in action:

RENAME "file1" TO "file 2"
-renames "file1" to "file 2" on drive 0

RENAME "abc",D1 TO "xyz123"
-renames "abc" TO "xyz123" on drive 1.

᷍ SCRATCH

The **SCRATCH** command removes a file from the directory, and frees up the sectors that it uses for additional files. Note that the file is not physically removed from the disk, it's still there, and it is only a matter of looking for it if you have accidently scratched a file. Note that the sectors which formerly held your scratched file's data are now available to be written to by new files, and if any additional files have been added to your disk since you scratched your file, chances are some if not all of the data sectors of your scratched file have been overwritten. The syntax for the **SCRATCH** command is:

SCRATCH "filename" (,optional D drive number)

The drive number is optional, and can appear anywhere in the command.

Examples of the **SCRATCH** command:

SCRATCH "file1"
- scratches "file1" on drive 0

SCRATCH D1,"stuff"
- scratches "stuff" on drive 1

USING TURBO LOAD AND SAVE WITH WORDPRO

Wordpro is a new version of the highly sophisticated and successful WordPro 64 word processing program for the Commodore 64 computer, written specially to take advantage of the speedy functions provided by the Turbo Load and Save HI-PRODUCTIVITY cartridge. Your Turbo Load and Save cartridge transforms Wordpro into the fastest wordprocessor ever made for the Commodore 64. All disk related functions including Wordpro's global file copy, RECALL, MEMORIZE, and INSERT functions are sped up. Global outputs to a printer are executed at lightning speed. The only two output functions not sped up significantly are **global double column output** and a **global output to disk.** Since these two functions are rarely used, We hope that they won't inconvenience you too much.

Loading Wordpro with your new Turbo Load and Save cartridge in place is extremely easy. Simply insert your Wordpro program disk into your 1541 disk drive, close the drive door, and then turn on your Commodore 64 computer while holding down the **w** key. After about 15 seconds, Wordpro will be loaded into your computer and you will be looking at Wordpro's startup screen.

If you did something wrong, one of two error messages will confront you.

If a **DEVICE NOT PRESENT. RESET COMPUTER.** message appears on the screen, you may not have switched on your disk drive. Your Turbo Load and Save cartridge expects the Wordpro disk to be in a 1541 disk drive configured to be device #8.

If a **WORDPRO FILE NOT FOUND. CHECK DISK AND RESET COMPUTER.** message appears on the screen, you either have the wrong disk in the disk drive, or you have a defective Wordpro disk in the disk drive. Your Turbo Load and Save cartridge expects to find a file called "wpgt" on the disk, and in failing to find it, gets terribly upset.

Please note that you should not attempt to use Wordpro without the Turbo Load and Save cartridge in place and enabled. You will not be able to recall or memorize any text files without it as Wordpro relies on the Turbo Load and Save cartridge to handle those aspects of it's operation.

15 41 DISK DRIVE TIPS

The Commodore 1541 Single Disk Drive is a much maligned unit, really quite undeserving of it's poor reputation. Once you have recognized the 1541's weaknesses and have separated the facts from the war stories, Commodore's neat little single disk drive becomes quite reliable and easy to live with.

TIP #1.   KEEP YOUR DISK DRIVE COOL!!!

Heat is the 1541's single biggest enemy. It is a neat looking package that matches the Commodore 64 very nicely. However, for the 1541 to function properly, cooling air must be able to flow freely into the bottom of the case and freely out the top. If you put papers on top of the case, no cooling air can get through. If you set the drive on top of your monitor, hot air from the monitor will help heat up the drive mechanism. If you place the drive on top of anything, or in anything that might restrict free air flow, watch out, here comes trouble.

Here's what happens. The main drive pulley between the electric motor and the disk drive turntable is sweated onto it's shaft. That means that the pulley is heated up until it expands enough to slip over the shaft and then allowed to cool down. The cooling process lets the pulley shrink back to it's original size which tightens it onto the shaft. If you allow the drive to get too hot, the pulley will expand, slip on the shaft, away goes your alignment, and here comes loading problems and a trip to the service shop.

The 1541 has always had a rather noisy method of orienting itself to track 1. It sounds like a machine gun going off in about a seven shot burst. Programmers have long suspected that anything that noisy must be doing some damage to something. It was, but only if the disk drive was in an overheated condition.

TIP #2.   USE A "1541 PHYSICAL EXAM" PROGRAM!!!

We had heard all the war stories about the 1541, and were inclined to believe them because our own fifteen or twenty 1541's often had difficulty loading programs reliably, and were cycled through Commodore's service department regularly at about thirty-five bucks a trip for "re-alignment". Recently, we bought a program from Cardinal Software called the "1541 PHYSICAL EXAM". This program allows you to very simply check disk speed, alignment and head stop adjustment with an absolute minimum of effort or expertise.   Two of our 1541's passed the tests with flying colors.   The other dozen or so failed.   Mis-alignment, right?   Surprisingly, ... NO!   THEY ALL FAILED THE SPEED TEST.   That was the reason for their unreliability, not mis-alignment as we had always believed.   Now the good news is, that speed is the easiest adjustment of all, and requires only a Phillips medium head screwdriver and a small slot blade screwdriver to adjust.   A ten minute job at the most, and the test program costs less than one trip to the shop.   Now we get real annoyed when we think of all those "re-alignments" for thirty-five bucks a pop.

If you are even a little bit handy with tools, you can install the new, quiet head stops that come with the program.

TIP #3. KEEP YOUR 1541 AWAY FROM THE MONITOR!!!

Next comes one that we had previously blamed on "EVIL SPIRITS" because there seemed no logical explanation. If you are using a Commodore 1701 or 1702 color monitor, keep the disk drive at least a foot away from it. Sounds silly, but take our word for it. This may hold true for other monitors as well, but we have not had occasion to test them. We discovered, again using the "1541 PHYSICAL EXAM" program from Cardinal Software, that if a 1541 disk drive was placed in close proximity to the left side of a 1702 color monitor, the drive could not read track 35. Tracks 1 and 16 were ok, but as far as the drive was concerned track thirty-five did not exist until the drive was moved at least a foot away. Track thirty-five is some software companies favorite spot to put their disk protection routines. Guess who's software wouldn't load properly if the drive was too close to the monitor.

It has something to do with inadequate high frequency shielding, or "EVIL SPIRITS", or something.

This is the best advice you'll ever get regarding your 1541 drive.

KEEP IT COOL!

CHECK IT OUT!

KEEP IT AWAY FROM THE MONITOR!

Now for tip number four....

TIP #4. SPEED UP YOUR 1541 WITH A TURBO LOAD AND SAVE CARTRIDGE FROM SPINNAKER!!!

Goes without saying, eh!