RSD-DOS

The Ultimate Hard disk Operating System for CoCo I CoCo II CoCo III

OWNED AND LICENSED EXCLUSIVELY BY

KEN-TON ELECTRONICS
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KEN-TON Electronics RGB-DOS

HARD DISK SYSTEM FOR COLOR BASIC

USERS MANUAL

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KEN-TON Electronics Inc.

HARD DISK SYSTEM FOR COLOR BASIC

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* FLEXIKEY was written by Colin J. Stearman, Copyright 1984 and is included in RGB-DOS with the written permission of the Author.

R E A D M E F I R S T !

Dear Customer:

You have purchased the finest Hard Disk System available for the Color Computer. Only the best quality components have been used. The Software contains the combined efforts and ideas of many people, carefully written over a two year period to ensure complete accuracy and reliability.

Most often, a person who has just purchased the RGB Hard Disk System calls us with a problem 30 minutes after the package arrives. The problem is not due to any failure of the Hardware, but rather due to the fact that the customer was so anxious to use the new Hard Disk that they NEVER READ THE INSTRUCTIONS!

The RGB Hard Disk System was designed to be as easy to operate and as reliable as possible, but you have to KNOW HOW TO USE IT if you expect maximum performance. We suggest that some time be spent reading the Users Manual before attempting to use the Hard Disk System. We at RGB are always more than happy to talk with you and solve any problems you may have, but it is frustrating for us and costly for you to make several long distance telephone calls to ask us a question that is PLAINLY ANSWERED IN THE MANUAL.

We have spent long hours at the keyboard writing the Software and the Users Manual, and we are proud of the result. Please spend a few minutes and read the manual first. It will save you time, money and frustration.

RGB-DOS contains the best ideas of many people. Countless ideas were given and countless suggestions made. Some ideas were great, and became part of RGB-DOS. Most ideas were rejected for technical reasons. Although we feel RGB-DOS is a fine product, we never consider it "finished". There is always something that can be improved. If you have an idea, comment or suggestion, please pass it along to us. Maybe we will reject it, or maybe it will be a super addition to RGB-DOS. If we use your idea, you will receive a free ROM containing the latest version of RGB-DOS with YOUR idea included on it.

Finally.... This User's Manual covers ALL aspects of the KEN-TON Electronics Inc. Hard Disk System and components. If you purchased only PART of a complete package, please disregard any sections that do not apply to the item(s) you own.

Thank You for your Purchase AND your Support!

KEN-TON Electronics Inc.
187 Greenacres Road
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KEN-TON Electronics Inc.
Hard Disk Operating System
FLEXIKEY - Last Line Recall & Edit

"FLEXIKEY" was written by Colin J. Stearman, (C) 1984, and is included in RGB-DOS with the written permission of the Author.

The basic function of Flexikey is to allow the RIGHT ARROW Key of the Color Computer to perform the OPPOSITE function of the LEFT ARROW. That is, the LEFT ARROW will DELETE ONE character at a time and a SHIFT-LEFT ARROW will delete an ENTIRE line at a time as usual. Flexikey now allows the RIGHT ARROW to RECALL ONE character at a time and the SHIFT-RIGHT ARROW to recall an ENTIRE LINE. Once the line has been recalled, pressing the ‹enter› key will re-execute that command line and it may again be recalled if desired.

The recalled command line may also be EDITED, if desired, before re-executing. Flexikey allows characters to be INSERTED into a recalled line using the SHIFT-UP arrow to begin insertion. After inserting the desired characters, the SHIFT-RIGHT ARROW will recall the remainder of the command line. Characters may also be DELETED using the DOWN ARROW KEY.

In order to continue to edit a command line without actually executing it, the SHIFT-DOWN arrow may be used to place the cursor at the beginning of the command line WITHOUT EXECUTING IT. Then, further insertions or deletions may be performed.

FLEXIKEY will recall up to 250 characters for editing or re-execution and will also allow a longer "Previous" line to be recalled, explained as follows:

(This was typed first:)
FOR X = 0 TO 255: PRINT CHR$(X); :NEXT X ‹enter›

The SHIFT-RIGHT arrow will RECALL the ENTIRE LINE for RE-EXECUTION.

Next, you typed this: PRINT"HELLO ‹enter›

The SHIFT-RIGHT arrow will recall only the command PRINT"HELLO . However, if you type just PART of the OLD COMMAND PAST the end of the FIRST COMMAND, the longer command will be recalled. You type this:

FOR X = 0 TO (then press SHIFT-RIGHT)
FOR X = 0 TO 255: PRINT CHR$(X); :NEXT X ....will be recalled!

Finally, some of the ARROW keys which FLEXIKEY uses previously created printable characters such as Square brackets, etc... These characters may be generated by pressing SHIFT-CLEAR first to temporarily "Turn off" FLEXIKEY. Then the "Special" characters may be generated. FLEXIKEY automatically turns itself back "ON" after each special key is pressed.

COMMAND: RUN, RUNM

SYNTAX and USAGE: RUN"filename" or RUNM"filename" or RUNM"filename",offset

Just as the RUN command will LOAD and RUN a BASIC program automatically, so too will the RUNM command LOADM and EXEC a BINARY program automatically.

The DEFAULT EXTENSION for the RUN command is "BAS" meaning that it will LOAD and RUN any BASIC PROGRAM. The extension may be included in the filename if the program was saved with an extension other than "BAS".

EXAMPLE: RUN"PROGRAM" (enter) will load and run a BASIC program saved as "PROGRAM/BAS"

If the program were saved with a different EXTENSION other than "BAS", then that extension MUST be specified in the RUN command.

EXAMPLE: The program is BASIC, but saved with the name "PROGRAM/PRO" then
The BASIC command then MUST BE RUN"PROGRAM/PRO" (enter)

The same is true with the RUNM command. However, the DEFAULT EXTENSION for BINARY PROGRAMS is "BIN". Therefore, the RUNM"PROGRAM" command will look for a program saved with the filename "PROGRAM/BIN". If the Binary Program were saved with an extension OTHER THAN "BIN", then the Extension MUST be specified in the RUNM command.

As with the LOADM command, an optional LOAD OFFSET may be specified in addition to the FILENAME. To LOADM and EXEC a Binary Program with an Optional Offset, the following syntax is used:

EXAMPLE: RUNM"FILENAME",&H1000 or RUNM"FILENAME",4096 (enter)

Both of the above examples will load the Program 4096 bytes higher ($1000 bytes higher) than usual. The "EXEC" address is also moved accordingly. If the program is loaded with the Optional Load Offset it will, of course, run ONLY IF it was written in P.I.C. (Position Independent Code). Programs NOT written in P.I.C. will likely crash or run unpredictably if a load offset is used.

Finally, the RUNM command should be used with binary (Machine Language) programs which require an "EXEC" after loading. Programs which "Auto-start" MAY crash or run unpredictably, since the "EXEC" function ends up being done twice. If the RUNM command fails to properly load a program, try using "LOADM" and see if this solves the problem.

COPY"filename.ext:drv" TO drive	Allows copying of a file without theneed to specify destination "filename.ext:drv". The destination filename may be included if it is desired that the copied file have a DIFFERENT filename. Files which already exist may be over-written if desired.
DIR drive number	Displays DIRECTORY of drive number. Directory is now displayed with DISKNAME, CONTENTS, DRIVE NUMBER and FREE GRANULES.
DIR first TO last	Displays ALL directories from FIRST to LAST Pause with SHIFT-@ and Stop with (BREAK). FIRST and LAST may be variables if desired.
DOS or DOS n	The same as the usual DOS command, but an optional drive number "n" may be specified. If a valid OS-9 boot is not found, the DOS will attempt to find and run AUTOEXEC drive number "n".
DRIVE ON (default setting)	Drive numbers 0 to 3 access the HARD DISK.
DRIVE OFF or DRIVE OFF n	Drive numbers 0 to 3 access the FLOPPIES. If the optional Drive Number (n) is used, then only Drives 0 to (n) will access the Floppy Disk Drives.
DRIVE RESTORE or DRIVE RESTORE n	Causes the Hard Disk Drive to re-zero and re-calibrate itself. Legal values for "n" are 0 thru 15.
DRIVE # n	Allows setting the default access drive used. Legal values for "n" are 0 thru 15
DRIVE STOP or DRIVE STOP n	Parks the Hard Drive in the shipping zone. Use this command BEFORE powering off. If the optional DRIVE NUMBER (n) is specified, then DRIVE n will be parked. Legal values of "n" are 0 thru 15.
RENAME DRIVE drive number,"string"	Writes a DISKNAME on the specified drive. May also be used with variables such as: RENAME DRIVE X,A$ ...where X is the Drive Number and A$ is the Disk Name.
RUNM"filename.ext:drv",offset	LOADM's and EXEC's a BINARY file. If the optional offset is used, the program will be loaded offset bytes higher than usual. As always, offset can "wrap around"zero, thereby allowing negative offset loading.

KEN-TON Electronics Inc.
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: COPY

SYNTAX and USAGE: COPY"filename/ext:drive" TO "filename/ext:drive" OR...
COPY"filename/ext:drive" TO drive number

The COPY command has been improved. You may use the COPY command as usual, that is, to COPY a SOURCE Filename to a DESTINATION filename. Usually, the Source and Destination Filenames are the same. Therefore, the COPY command required you to type the SAME Filename TWICE! This is inefficient and time consuming.

With RGB-DOS, it is now possible to copy a file to another "Drive" by simply specifying the SOURCE FILENAME and the DESTINATION DRIVE NUMBER.

The entire Destination Filename MAY be used, if desired, but it is no longer NECESSARY. The Destination Filename is usually specified ONLY IF it is desired that the copied file have a DIFFERENT filename than the original.

RGB-DOS will also allow you to COPY over an existing file. You no longer are faced with an ?AE ERROR (File Already Exists) error. If the Destination Filenameis already in use, RGB-DOS will prompt you with the message:

FILE ALREADY EXISTS
OVERWRITE IT? (Y/N)

If you wish to replace the Old file with the New (If you wish to OVERWRITE the file), simply type "Y" for "YES" and the old file will be overwritten. Striking any other key will END the COPY function and NOT overwrite or copy anything.

This prompt is ONLY given when COPY is used in the "DIRECT" (keyboard) mode. If the COPY command is used WITHIN a Basic program, the already-existing file will be automatically replaced (overwritten) WITHOUT any warning. Also, any attempt to COPY a program to ITSELF on the SAME DRIVE is pointless and will result in an ?AE ERROR (File Already Exists) error.

This is an example of the usage of the improved COPY command:

COPY"GAME/BIN:51" TO 92 ‹enter›

That command will COPY the program called "GAME/BIN" on "Drive" 51 to the filename "GAME/BIN" on "Drive" 92. The following example will do the same exactly the same thing:

COPY"GAME/BIN:51" TO "GAME/BIN:92" ‹enter›

The Filename(s) and Destination "Drive" numbers may also be BASIC variables if desired. The following command example explains this:

A$="GAME/BIN": FOR X=0 TO 10 : COPY A$ TO X : NEXT X ‹enter›

This command would make a copy of the program "GAME/BIN" on each "Drive" from Drive Zero to Drive Ten.

KEN-TON Electronics Inc.
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: DRIVE
continued...

DRIVE STOP 0 thru 15 (enter)

This command will PARK the Hard Disk Drive in the "Safe Landing Zone" and should be used every time the Hard Disk System is to be turned off. If no DRIVE NUMBER is specified after the DRIVE STOP command, the system will Park the Drive LAST SPECIFIED with the DRIVE # command. If the DRIVE # command was not used, the system will Park Hard Drive ZERO. Attempting to access the Hard Drive AFTER it has been parked may result in an ?IO ERROR since the read/write heads are now in a non-data zone. The drive will AUTOMATICALLY re-calibrate the next time power is switched on. This command also internally does a "DRIVE #" command so that typing DRIVE #1 will park Hard Drive number 1, but will also leave the system set up on DRIVE #1. Typing DRIVE STOP 0 thru 15 will CLOSE all open files.

NOTE: Most new hard disk drives have an "auto-park" feature which automatically places the read/write heads in the safe landing zone upon power-down. It is not necessary to park such drives, but parking may be done if desired. It doesn't matter to the drive. However, drives which do NOT auto-park MUST be parked before powering down.

DRIVE RESTORE 0 thru 15 (enter)

This command will cause the Hard Disk drive to re-calibrate itself and restore the read/write heads to cylinder zero. The number 0 thru 15 refers to one of sixteen possible storage devices attached to the system (See the DRIVE # command). The number 0 thru 15 is optional, and if omitted, the default Hard Disk drive will be restored. This command also internally does a "DRIVE #" command, so typing DRIVE RESTORE 1 will recalibrate Hard Drive number 1, but will also leave the system setup on DRIVE #1. Typing DRIVE RESTORE will CLOSE all open files.

KEN-TON Electronics Inc.
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: DSKINI

SYNTAX and USAGE: DSKINIdrive number

The DSKINI command is used to format and erase disks. However, the operation of "DSKINI" is somewhat different when applied to the Hard Disk Drive. The command DSKINIdrive number (enter) will ERASE the specified "Drive" in the Hard Drive. The Hard Drive is NOT "formatted" with this command, rather just erased. This is in contrast to the the floppy disks which are FORMATTED by this command. The Floppy Disk FORMATTING process does several things:

(1) It divides each floppy disk into 35 TRACKS
(2) It divides each floppy disk TRACK into 18 SECTORS
(3) It LABELS each SECTOR with an ADDRESS MARKER so that the system "Knows" which Track and Sector it is on.
(4) It fills each SECTOR with CHR$(255) characters (erases each sector).

The Hard Disk Drive comes from the factory "Pre-Formatted". That is, the process of defining tracks and sectors has already been done. The DSKINI command when applied to a Hard Disk "Drive" number simply ERASES that "Drive" so that it may be used again. All of the other "Drives" on the Hard Drive are NOT erased. The ENTIRE HARD DISK DRIVE may be FORMATTED AND ERASED using the HARD DISK DRIVE FORMAT PROGRAM which is included on the RGB Utilities Disk.

Finally, when the DSKINI command is applied to the Hard Disk Drive, the prompt:

ERASE HARD DRIVE number
ARE YOU SURE? (Y/N)

...will be presented. To begin erasing that "Drive", the "Y" (for "YES") key must be pressed. This is done for two reasons: (1) It allows you to be SURE that you are erasing a HARD DISK "Drive" and not a FLOPPY DISK and (2) It allows you the option to cancel the DSKINI and NOT erase the "Drive". This is important if, for example, you wanted to FORMAT a FLOPPY DISK in Drive Zero, but FORGOT to type DRIVE OFF (enter) to ENABLE the Floppy Disk Drives. The prompt would immediately alert you that you were really about to erase the HARD DRIVE'S "Drive" Zero and give you the chance to cancel the request. If you are formatting a FLOPPY DISK, the warning is NOT given and the DSKINI proceeds as usual.

The process of erasing a Hard Disk "Drive" is subject to the VERIFY command. If VERIFY ON is used, the erased Hard "Drive" will also be verified during erasure, insuring you that there are no data errors on the disk.

Finally, the DSKINI command has been fixed so that it no longer erases the Basic program in memory. Therefore, the DSKINI command may be PART OF a Basic program! It is now possible to format disks (floppy OR hard) totally under Basic program control. Since the DSKINI command requires some free memory to operate, a very large program with many variables may cause the DSKINI command to return an ?OM ERROR (out of memory error). If this happens, shorten the Basic program, or reserve less variable storage space (CLEAR and PCLEAR).

KEN-TON Electronics Inc.
Hard Disk Operating System
AUTO EXECUTE FEATURE

KEN-TON Electronics Inc. Hard Disk Operating System (RGB-DOS) has a unique feature which allows ANY program to be automatically loaded and running WITHOUT the need to even touch the keyboard! This feature is very handy for loading in utilities or menu programs, performing custom "Pokes", setting up special screen modes or any other operations that you wish to have done EVERY TIME the system is started. The "AUTOEXEC" feature can also make any Bulletin Board System (BBS) completely self-restarting, thereby minimizing downtime.

Whenever the Color Computer is first turned ON or a full "Cold Reset" is performed, the system will do the following things:

(1) Both Hard Drive Channels will be checked for the presence of a Hard Disk Drive and the Software will adjust itself to the characteristics of the type(s) of Hard Disk Drive(s) installed, if any.

(2) The Hard Disk Drive(s) will be tested to see if they are READY.

(3) The system will BEEP if the Hard Disk Drive(s) ARE ready. The system will NOT BEEP and give a HARD DRIVE(S) NOT FOUND message if the Hard Disk Drive(s) are NOT READY. The system will then attempt to find "AUTOEXEC/BAS" from Floppy Disk, Drive ZERO.

(4) The system will look for a BASIC program on Hard "Drive" ZERO called "AUTOEXEC/BAS". If "AUTOEXEC" IS found, it will be loaded and run by the system automatically. If it is NOT found, the system will return to the standard Color Basic Prompt (The "OK" Prompt).

The program "AUTOEXEC/BAS" may be saved in "Crunched" (Standard) format or in ASCII (the "comma-A") format. "AUTOEXEC/BAS" MUST be a BASIC program. It may NOT be a Machine Language Program. However, if you wish to automatically run a Machine Language Program upon startup, you may use the RUNM command in a BASIC program, then save that program with the name "AUTOEXEC" on drive ZERO. Basic will automatically assign the "BAS" extension if none is specified. Note that the program MUST be named "AUTOEXEC/BAS". If a different filename OR extension are used, the system will NOT find and auto-execute it.

Sometimes it is desireable to BYPASS "AUTOEXEC" and NOT run the usual program upon startup. The "AUTOEXEC" feature may be bypassed, if desired, by pressing and HOLDING either or both SHIFT keys during startup until the "OK" prompt appears.

KEN-TON Electronics Inc
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: BACKUP

SYNTAX and USAGE: BACKUP source TO destination

The usage and syntax of the BACKUP command has not been changed. However, the machine language code has been fixed so that the BACKUP command NO LONGER erases the Basic program in memory! Therefore, it is now possible to include the BACKUP command WITHIN a Basic program successfully. This feature, in combination with the repaired DSKINI command, allows TOTALLY AUTOMATED disk formatting and copying, all under the control of a Basic program!

This feature is perfect for mass producing disks, club and business use, or just simplifying your own Hard Disk backup program.

Since the BACKUP command now only uses FREE memory, the copy buffer size used may be smaller than it was before if a large Basic program is in memory, or if a great deal of variable storage space is allocated. This means that IF (and only if) you are making a SINGLE DRIVE backup, more disk swaps per backup would be required, since less is copied on each "pass". It is suggested (but NOT necessary) that a PCLEAR 1 statement be used prior to making a single drive backup. This will minimize the number of disk swaps necessary. On multiple drive or hard drive backups, this step is not needed since the system will simply switch back and forth as many times as it needs to. If, for example, a PCLEAR 8 statement were used prior to backup, very little memory would be available to the BACKUP function and it might require 50 or more disk swaps to copy a single disk! With multiple disk drives and/or a hard drive, the drive switching is automatic, and of no concern to the user. ADDITIONAL COMMANDS - QUICK REFERENCE GUIDE

KEN-TON Electronics Inc.
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: DOS

SYNTAX and USAGE: DOS number ("number" is optional)

The DOS command is normally used to start up an OS-9 floppy boot disk and run the OS-9 Operating System. This command still performs the same function as before, but with several improvements.

The new DOS command now allows the use of an optional drive number argument. For example, if you wished to start up an OS-9 disk which was backed up to hard "drive" number 35, the command DOS 35 ⟨enter⟩ would be used. Note that the command DOS used alone ALWAYS accesses drive zero, regardless of the default drive setting, thereby maintaining full compatibility with the original DOS command.

An additional feature of the new DOS command is that IF a valid OS-9 boot disk OR OS-9 type utility is NOT found on the requested disk, the system NEXT tries to run AUTOEXEC.BAS, if present, on the requested disk. This feature allows you to have MANY AUTOEXEC files on different disks, all starting up their OWN application or program. Then, to run AUTOEXEC on ANY disk, just type DOS n, where "n" is the drive number that contains the program(s) you wish to run.

NOTE: A special OS-9 type boot track is NOT required to use this feature. Since no boot track will be found, the DOS command will next try to run AUTOEXEC from that disk, thereby accomplishing the desired action.

The following chart may help in understanding the actions of the new DOS command:

Step - Action

(1) - Type DOS 35 ⟨enter⟩
(2) - System looks for OS-9 boot on drive 35
(3) - Was OS-9 boot found?

(3Y) - Yes, go run OS-9 from drive 35 (done)
(3N) - No, see if AUTOEXEC.BAS is on drive 35

(4) - Was AUTOEXEC.BAS found on drive 35?

(4Y) - Yes, go run AUTOEXEC.BAS on drive 35 (done)
(4N) - No, go to Basic's OK prompt. (done)

The end result of all this? DOS 35 accomplishes the SAME thing as if you typed this command: RUN"AUTOEXEC.BAS:35" Which is easier?

KEN-TON Electronics Inc.
Hard Disk Operating System
DETAILED SUMMARY OF NEW COMMANDS

COMMAND: DRIVE

SYNTAX and USAGE: DRIVE number, DRIVE ON, DRIVE OFF, DRIVE STOP,
DRIVE #, DRIVE RESTORE

DRIVE number (enter)

Changes the drive DEFAULT to the drive number you specify. If you do not use the DRIVE command, the system will default to and use drive number ZERO.

DRIVE ON (enter)

Allows you to access Drive numbers ZERO through THREE from the HARD DRIVE. This is the default setting. That is, the system will automatically access the HARD DRIVE upon power-up or cold reset. Typing DRIVE ON will CLOSE all open files.

DRIVE OFF (enter) or DRIVE OFF 0 thru 3 (enter)

Allows you to access Drive numbers ZERO through THREE from the FLOPPY DISK DRIVE(S). If a NUMBER is included with this command, then ONLY Floppy Drive(s) ZERO to NUMBER will be enabled. Example: You wish to use ONLY floppy disk drive ZERO, and all the rest (1 thru MAX) Hard Disk. The command DRIVE OFF 0 (enter) would accomplish this. Typing DRIVE OFF will CLOSE all open files.

NOTE: Drive numbers FOUR to MAXIMUM will ALWAYS access the Hard Drive, regardless of the access specified by using DRIVE ON or DRIVE OFF.

NOTE: The command: DRIVE OFF 3 is functionally equivalent to DRIVE OFF used alone, with no arguments.

DRIVE # 0 thru 15 (enter)

Allows access to up to 16 Hard Disk Drive units or other SCSI devices if they are installed. The STANDARD RGB Hard Drive System comes with ONE Hard Disk Drive and typing DRIVE # 1 thru 15 will return an error or lock up the system. If the optional Hard Disk Drive(s) or SCSI device(s) are installed, the command DRIVE # 1 thru 15 may then be used to access these drives and/or devices. The system automatically defaults to the DRIVE # 0 setting upon power-up or cold reset. Typing DRIVE # 0 thru 15 will CLOSE all open files.

*** IMPORTANT NOTE TO SCSI DRIVE USERS Please READ !!! ***

RGB-DOS is not intended to be used with non-SCSI Interface boards!! The only board to date that is true SCSI with OPEN COLLECTOR OUTPUTS is the KEN-TON SCSI and the KEN-TON SCSI+RTC Packs Manufactured by KEN-TON Electronics Inc. We will not be responsible for consequencial or non consequencial dammages resulting from the use of so-called "SCSI-COMPATABLE" or SASI Interfaces sold by others.

KEN-TON Electronics Inc
Hard Disk Operating System
SYSTEM SETUP

System Setup is simple and straight-forward, but the instructions should be followed carefully if the best results are expected.

SYSTEM SETUP

(1) Turn OFF power to the Computer, Multi-Pack Interface and any other equipment connected to the computer.

(2) Locate the 34 conductor DRIVE INTERFACE RIBBON CABLE and connect it to the Hard Disk Interface Pack and the Hard Disk Unit. Be sure to install the cable properly (Pin 1 to Pin 1 etc.) If Purchased from Ken-Ton this will be KEYED and you should have no problem.

(3) Plug the Hard Disk Interface Pack into the Multi-Pack Interface or "Y" cable. The Hard Disk Interface may be plugged into ANY slot. If using the Multi-Pack Interface, set the selector switch to the slot that contains the RGB-DOS EPROM. If your RGB-DOS EPROM is installed in your FloppyDisk controller, set your slot selector switch to the Floppy Disk Controller's slot. If the EPROM was pre-installed in the Hard Disk Interface, set your slot selector switch to the Hard Disk Interface's slot.

(4) Plug any other accessories you may have into the Multi-Pack Interface or "Y" cable, including the Floppy Disk Controller.

(5) Plug the Floppy 4 pin power cable into the SCSI Drive.

(6) Plug the 50 pin Cable end into the SCSI Drive UNIT
If Purchased from KEN-TON This cable is KEYED, (otherwise..be careful)

(7) Visually inspect the setup for loose or forgotten connections. A few seconds double checking the setup NOW will save hours of grief LATER!

(8) Switch on all components. The computer should start up as normal, but there will be no cursor UNTIL THE HARD DISK REACHES OPERATING SPEED. It is usually better to switch on ALL components at once using an "Outlet Strip" or other multi outlet device. Otherwise, switch the HARD DISK UNIT on FIRST and wait until the Hard Drive light goes off before switching ON the computer.

(9) When the Hard Drive is READY, a "BEEP" will be heard from the Computer if the volume is up sufficiently. At this time, the "OK" prompt and the usual blinking cursor should be seen. The system is now READY TO RUN!

(10) If the computer does not act normally, SHUT IT OFF and re-check all wiring. REMEMBER that the computer will NOT display a cursor UNTIL the Hard Disk has reached full speed and passed self test. If the Hard Disk does NOT become ready after 30 seconds, the system will automatically switch to the floppy disk drives and the hard disk will NOT be available. This is, of course, not normally expected and indicative of a problem such as a bad Hard Drive, no Power on the Hard Drive, loose wires etc...

(11) Once the system is up and running, proceed to use it as you would a floppy disk. A good place to start is by copying a few of your favorite disks to the Hard Drive and see how they run. Programs which will ONLY run with drives 0 thru 3 can be easily transfered with the following method:

(11A) Type DRIVE OFF (enter) to ENABLE the floppy disk drives.
(11B) Insert your floppy disk into DRIVE 0
(11C) Type BACKUP 0 TO 4 (enter) to copy the disk to hard drive #4
(11D) Type DRIVE ON (enter) to ENABLE Hard Disks 0 thru 3
(11E) Type BACKUP 4 TO 0 to copy the data to Hard Drive 0
(11F) Type DSKINI4 (enter) to erase Hard Drive #4
(11G) The message ERASE HARD DISK 4...ARE YOU SURE? (Y/N) appears.
(11H) Respond by hitting the "Y" key for YES. Drive #4 will be erased.

Your floppy disk is now copied onto Hard Disk 0!

Now, have some FUN! Select a program that you would like running AS SOON AS the computer is turned on. Let us assume that the name of this program is "GAME/BAS". Type in the following program:

```
10 CLS ' just clear the screen
20 RUN"GAME/BAS" ' load in & run
```

Now, type: SAVE"AUTOEXEC" (enter)

Your "GAME/BAS" program will come up as soon as the computer is turned on without the need to touch the keys at all!

If your favorite program were BINARY (machine language), such as "GAME/BIN", line 20 would look like this: (note the new command, RUNM)

```
20 RUNM"GAME/BIN" ' loadm & exec at once
```

NOTE:
The Hard Disk holds the equivalent of MANY floppy disks all inside itself. Neither the Hard Disk System or the USER are infallible and mistakes CAN happen. Therefore, the WISE USER will keep BACKUP COPIES of important work on FLOPPY DISK! It is VERY EASY to forget that floppy disks even EXIST once you get used to the Hard Drive. So, as always, remember to KEEP BACKUPS of important work!

```
* PROGRAMMING EXAMPLE: HOW FAST IS YOUR HARD DISK?

        ORG     $0              POSITION INDEPENDENT

START   CLRA                    SET THE "Z" BIT
        JSR     $A910           CLEAR THE SCREEN

        LEAX    MSG1-1,PCR      "TIMING" MESSAGE
        JSR     $B99C           PRINT IT

        LDX     #$1000          POINT TO TEST BUFFER
        STX     $EE             TELL DSKCON

        LDB     #64             READ 64 BIG BLOCKS (MAKES 1 MEGABYTE)
        PSHS    B               PUT COUNT ON STACK

        LDA     #$08            SCSI READ COMMAND
        LDB     #0              LSN 0 HI BYTE
        LDX     #0              LSN 0 LO WORD
        LDY     #(64*256)+0     64 SECTORS/RESERVED

        SYNC                    WAIT FOR INTERRUPT
        STX     $112            TIMER = 0

        JSR     [$D932]         SETUP COMMAND PACKET

LOOP    JSR     [$D930]         READ 64 SECTOR BLOCK
        DEC     ,S              DECREMENT COUNT
        BNE     LOOP            READ IT 64 TIMES = 1 MEGABYTE

        LDD     $112            D = TIMER

LOOP2   INC     ,S              BUMP UP SECONDS COUNT
        SUBD    #60             DIVIDE BY 60
        BHI     LOOP2           MAKES IT IN SECONDS

DONE    LEAX    MSG2-1,PCR      "ONE MEG" MESSAGE
        JSR     $B99C           PRINT IT

        CLRA                    ZERO TOP OF "D"
        PULS    B               GET SECONDS
        JSR     $BDCC           PRINT SECONDS

        LEAX    MSG3-1,PCR      "SECONDS" MESSAGE
        JMP     $B99C           PRINT IT & RETURN TO BASIC

MSG1    FCB     $0D
        FCC     /TIMING, PLEASE WAIT.../
        FCB     $0D
        FCB     0

MSG2    FCB     $0D
        FCC     /ONE MEGABYTE IN /
        FCB     0

MSG3    FCC     / SECONDS./
        FCB     $0D
        FCB     $0D
        FCB     0

        END     START
```

```
* KEN-TON Electronics Inc.
* RGB-DOS HARD DISK OPERATING SYSTEM
* SIMPLE PROGRAMMING EXAMPLES FOR THE
* UNIVERSAL DISK I/O ROUTINES

* ROUTINE ADDRESS EQUATES

DISK    EQU     $D930       UNIVERSAL I/O ROUTINE
SETUP   EQU     $D932       SETUP A 6 BYTE COMMAND
BEEP    EQU     $D934       CAUSE A BEEP TONE

* EXAMPLE: READ HARD DISK, SECTOR ZERO INTO
* THE 32 COLUMN SCREEN AT $400
* MAKE A "BEEP" IF IO ERROR OCCURS

READ    LDX     #$400       POINT TO SCREEN RAM
        STX     $EE         SET DSKCON BUFFER POINTER
        LDA     #$08        READ COMMAND OPCODE
        LDB     #0          SECTOR ADDRESS HI BYTE (00)
        LDX     #0          SECTOR ADDRESS LO WORD (0000)
        LDY     #(1*256)+0  READ 1 BLOCK / RESERVED
        JSR     [SETUP]     SETUP COMMAND BLOCK
        JSR     [DISK]      EXECUTE COMMAND (READ SECTOR 0)
        TST     $F0         CHECK DSKCON ERROR STATUS
        BNE     ERROR       ERROR IF NON-ZERO STATUS
        RTS                 NO ERROR, SO RETURN
ERROR   JMP     [BEEP]      SIGNAL ERROR & RETURN

* EXAMPLE: PARK HARD DISK IN LANDING ZONE
* BY USING THE START / STOP COMMAND
* NOTE THAT SINCE NO DATA IS TRANSFERED, THE
* DSKCON BUFFER POINTER AT $EE DOES NOT NEED
* TO BE SET TO AN ADDRESS.

PARK    LDA     #$1B        START/STOP COMMAND OPCODE
        LDB     #0          RESERVED (0)
        LDX     #0          RESERVED (0)
        LDY     #0          RESERVED (0)
        JSR     [SETUP]     SETUP COMMAND BLOCK
        JSR     [DISK]      EXECUTE COMMAND (PARK DRIVE)
        TST     $F0         ANY ERRORS?
        BNE     ERROR       YES, SIGNAL ERROR & RETURN
        RTS                 NO ERROR, RETURN
```