BIOS-8Ø(c)

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- PRODUCT DESCRIPTION -

BIOS-8Ø(c) is a modification to the Heath/Zenith CP/M 2.2.Ø3 BIOS which allows any combination of 4Ø track and 8Ø track single and dual sided disk drives to be used simultaneously with the standard H-17 hard sector disk controller. BIOS-8Ø(c) also allows reading of 4Ø track disks in the 8Ø track drives. BIOS-8Ø leaves completely intact all features and functions of the original Heath/Zenith 2.2.Ø3 BIOS including logical to physical mapping, boot from any drive, etc.

- COPYRIGHT NOTICE -

- WARRANTY INFORMATION -

This product is provided strictly on an "as is" basis. No warranty is made or implied as to merchantability, or its fitness for any particular application. Any such determination is the sole responsibility of the purchaser. This warranty is in lieu of all other warranties either express of implied, including, but not limited to any implied warranty of merchantability or fitness for any particular application. LLL will, under no circumstances, be liable for any consequential or incidental damages resulting from the use, or inability to use, this or any other product.

INTRODUCTION -

BIOS-8Ø(c) is a modification to the Heath/Zenith CP/M 2.2.Ø3 BIOS which allows any combination of 4Ø track and 8Ø track single and dual sided disk drives be used simultaneously with the standard H-17 hard sector disk controller. BIOS-8Ø(c) also allows reading of 4Ø track disks in the 8Ø track drives. BIOS-8Ø leaves completely intact all features and functions of the original Heath/Zenith 2.2.Ø3 BIOS including logical to physical mapping, boot from any drive, etc.

The important features of this release of BIOS-8Ø are:

* The BIOS.SYS file supplied with BIOS-8Ø is operable at any CPU clock speed up to 4 Mhz with NO PATCHING! Since CPU speed is measured and all pertinent timing constants calculated on each call to the disk drivers, BIOS-8Ø will even work with the new software switchable 4 Mhz conversions now being offered by several suppliers. (Please read the disclaimer on 4 Mhz operation at the end of this document.)

* Both FORMAT8Ø and MOVCPM8Ø have been revised so that they operate properly at both 2 and 4 Mhz. In addition, MOVCPM8Ø has been revised to integrate SYSGEN, and the famous ZCPR CCP replacement for Z-8Ø systems.

* CP/M can now be SYSGENed between any two H-17 disks regardless of formats, since both the boot loader and BIOS loader have been revised to detect disk format and react accordingly.

* Compatible with all existing 5" hard sector disk formats.

* Several very useful public domain utilities are now supplied to enhance system utility.

* "Mapped" disks need not be of the same type as the disk currently in the mapping unit.

* The Heath/Zenith CONFIGUR and FORMAT programs are used for system configuration and disk formatting.

* The program CONFIG8Ø is provided as a post-processor for the Heath/Zenith CONFIGUR to allow specification of drive type.

INSTALLATION -

Installation of BIOS-8Ø is very simple, but does require that the user be familiar with the CP/M operating system and it's utilities, and that all directions be followed EXACTLY. ALL CP/M files MUST be copied from your CP/M 2.2.Ø3 distribution disks. ALL BIOS-8Ø files MUST be copied from your BIOS-8Ø distribution disk(s). In the following instructions, when a reference is made to a Heath/Zenith or CP/M utility, refer to the Heath documentation if you are not ABSOLUTELY CERTAIN how to operate that utility. Livingston Logic CANNOT and WILL NOT take responsibility for educating the user in how to operate h computer or it's operating system and related programs. The follow instructions are VERY easy to follow provided you have READ and UNDERSTOOD all

of the Heath documentation, and you follow these instructions TO THE LETTER. If you have trouble, refer to the section entitled "IN CASE OF DIFFICULTY" near the end of this document.

It is assumed that the ENTIRE BIOS-80 setup proceedure will be carried out using ONLY the H-17 disk system, with a 2 Mhz CPU clock speed. If this is NOT the case, and you experience problems, DO NOT call LLL for help. Due to the large number of 4 Mhz conversions, BIOS modifications, and other possible incompatible hardware and software products on the market, LLL CANNOT AND WILL NOT PROVIDE ASSISTANCE IN BRINGING UP A SYSTEM WHICH CONTAINS ANY NON-HEATH HARDWARE OR SOFTWARE PRODUCTS. If you have ANY problems, refer to the "IN CASE OF DIFFICULTY" section near the end of this document.

NOTE - BIOS-80 is continually being improved and upgraded. In order to avoid having to frequently change this printed documentation, any minor changes are documented on the diskette itself. Check the distribution diskette for any files with the ".DOC" extension. If such a file is present (it may not be) please take a few minutes to read the file before proceeding with the BIOS-80 installation.

1 - Use the Heath FORMAT program to format a blank 40 track single sided diskette. This is referred to as the "BIOS-80 system disk" throughout the remainder of this document.

2 - Using MOVCPM17 and SYSGEN, SYSGEN a 32K CP/M system onto the BIOS-80 system disk. THIS MUST BE A 32K SYSTEM!!!!

3 - Using PIP, copy the following files onto the BIOS-80 system disk from your BIOS-80 Distribution Disk:

BIOS.SYS
SDT80.HEX
SDT80.REL
MOVCPM80.HEX
FORMAT80.HEX
CONFIG80.COM
BIOS80.SUB

4 - If you DO NOT have a Z-80 CPU, OR you DO NOT wish to install the ZCPR Z-80 CCP, copy the following files onto the BIOS-80 system disk from your BIOS-80 Distribution Disk using PIP:

BOOT80.COD
BOOT80.REL

If you DO have a Z-80 CPU, AND you DO wish to install the ZCPR Z-80 CCP, copy the following files onto the BIOS-80 system disk from your BIOS-80 Distribution Disk using PIP:

BOOTZ80.COD
BOOTZ80.REL

5 - Using PIP, copy the following files onto the system diskette from your CP/M 2.2.03 Distribution Diskettes:

DDT.COM
SUBMIT.COM
XSUB.COM
FORMAT.COM
MOVCPM17.COM
SYSGEN.COM

6 - Reset the computer and perform a COLD BOOT from the system diskette. Remember that you are booting from a "fresh" BIOS, so it will probably be necessary to run CONFIGUR to set the terminal baud rate, drive step rates, and other BIOS options. If you wish, you may run CONFIGUR at this time, but DO NOT leave a copy of CONFIGUR on the BIOS-8Ø system disk when you done!!

7 - Run CONFIG8Ø to configure the new BIOS for the types of drives which you have. See the CONFIG8Ø documentation below for details.

8 - Run BIOS8Ø.SUB by typing "SUBMIT BIOS8Ø" from the CP/M command mode. Once BIOS8Ø.SUB has finished, the CP/M "A>" prompt will return.

At this point, you should find the following files on the disk:

CONFIG8Ø.COM
FORMAT8Ø.COM
MOVCPM8Ø.COM

If any of the above files are missing, then something has gone wrong, and it will be necessary to repeat the entire proceedure starting again from step 1.

9 - It is now necessary to run MOVCPM8Ø to re-SYSGEN your BIOS-8Ø system disk with a maximum size system. To do this, FIRST TYPE A CONTROL-C, then type:

A>MOVCPM8Ø

When the "DESTINATION DRIVE" prompt appears, enter "A" followed by a "RETURN". This will copy a maximum size CP/M system onto your BIOS-8Ø system disk. When the "DESTINATION DRIVE" prompt returns, reset computer and re-boot from your BIOS-8Ø system disk. The CP/M sign-on should properly indicate the amount of memory in your system.

1Ø - You can now generate bootable diskettes using the files on the system diskette. To do so, proceed as normally, except use FORMAT8Ø in place of the standard FORMAT, and MOVCPM8Ø in place of MOVCPM17. Any time you copy BIOS.SYS from the BIOS-8Ø Distribution Diskette onto a bootable disk, it will be necessary to run BOTH CONFIGUR and CONFIG8Ø to configure that BIOS for the hardware in your system.

Read the following sections THOROUGHLY before attempting to use the BIOS-8Ø Utility Programs.

BIOS-8Ø UTILITY PROGRAMS -

The BIOS-8Ø utility programs consist of the following:

FORMAT8Ø
MOVCPM8Ø
CONFIG8Ø

These files perform the following functions:

MOVCPM8Ø - used to generate bootable CP/M systems for both single double sided 5" diskettes. MOVCPM8Ø now incorporates SYSGEN and optionally the ZCPR Z-8Ø CCP.

FORMAT8Ø - used to FORMAT diskettes for all available disk formats supported by CP/M 2.2.Ø3 EXCEPT for the H-67 hard disk system.

CONFIG8Ø - used to specify the type of 5" drive at each physical drive address and each drives characteristics.

The following items are public domain software provided through the CP/MUG library. These programs are provided at no charge, and no support will be provided, except the documentation given below.

XDIR.COM - An enhanced directory listing program which displays an alphabetically sorted directory listing complete with the size of each file.

FINDBAD.COM - A non-destructive disk test and bad block lockout utility.

ZCPR - A CCP (console command processor) replacement which provides several new and useful system commands, as well as enhancing the user inteface. (Operable ONLY on Z-8Ø systems)

Before using any of these utilities, read the following THOROUGHLY:

FORMAT8Ø -

FORMAT8Ø works in exactly the same manner as the Heath FORMAT except that when used on a double sided drive, you will be prompted to enter the number of sides you want formatted (either 1 or 2). All other functions of the program remain intact except the H-67 FORMAT code which had to be overwritten to make room for e double sided code. If you have an H-67, use the standard FORMAT to format e H-67 disks.

NOTE - There is an undocumented feature of the CP/M 2.2.Ø3 FORMAT program which allows for "FAST" formatting of disks by skipping the media check which is usually performed. If you wish to use this option, simply type "FORMAT F" to enter FORMAT. This results in the disks being formatted in roughly 1/4 the usual time, however, keep in mind that this WILL NOT tell you if there are any bad sectors on the disk.

MOVCPM8Ø -

MOVCPM8Ø is a MOVCPM program for the BIOS-8Ø. It allows relocation of the CP/M system to any memory size from 32K to 64K. It is functionally and operationally IDENTICAL to the Heath/Zenith MOVCPM17, with the following exceptions:

1 - MOVCPM8Ø replaces the standard CP/M CCP with the ZCPR Z-8Ø CCP. This adds several new and useful commands, and improves the user interface to CP/M. See the section on ZCPR for more details on the expanded capabilities of this new CCP. (This only applies IF you have a Z-8Ø CPU AND you installed the ZCPR option in step 4 of the installation instructions.)

2 - MOVCPM8Ø "chains" itself to SYSGEN, so that SYSGEN is executed automatically when MOVCPM is done. This makes it unnecessary to explicitly run SYSGEN following a MOVCPM, as MOVCPM8Ø runs SYSGEN for you!

Note that MOVCPM8Ø still leaves a "saveable" system image in memory, so that SYSGEN can still be used as before. If you wish to save a system image, simply type:

A>SAVE 38 CPMxx.COM@

where xx is the CP/M system size. In addition, you may still wish to SYSGEN to copy a system from one disk to another, without using MOVCPM8Ø at all.

The CP/M system generated by MOVCPM8Ø has been revised so that a single system will now work with any supported disk format. This makes it possible to SYSGEN between dissimilar disk formats. This was not possible with previous releases of BIOS-8Ø.

Note that in order for MOVCPM8Ø to work properly, you MUST have cold booted CP/M from a BIOS-8Ø disk.

CONFIG8Ø -

CONFIG8Ø is a completely new program which is used for specifying the type of drive located at each physical drive address. The parameters which may be entered are:

Track Density - May be either 48 for 4Ø track drives or 96 for 8Ø track drives. Note that only the first digit needs to be entered (either 4 or 9).

Number of Sides - May be either "1" for single sided drives or "2" for double sided drives.

Step Rate - May be any value from 4 mSec to 4Ø mSec in increments of 2 mSec. Enter a carriage return after inputting the step rate.

Once all desired changes are entered, enter either "X", "Y", or "Z" to write the new BIOS back to the disk and re-enter CP/M. The "X", "Y", and "Z" commands work in exactly the same way as under CONFIGUR.

XDIR -

XDIR is a utility which provides a greatly enhanced disk directory display. It will display all files on a disk, sorted in alphabetical order, with the size in Kbytes of each file, as well as a count of the number of files on the disk, number of directory entries used, number of directory entries left, total disk size in Kbytes, total space occupied by files, and total remaining space. XDIR is run with a command line of the same format as the standard CP/M DIR command:

```
A>XDIR@         - will give a display of ALL files on the
                  currently selected drive.
A>XDIR C:@      - will give a display of ALL files on drive C:.
A>XDIR B:*.COM  - will give a display of all .COM files on drive
                  B:.
A>XDIR E:A*.*   - will give a display of all files on drive E:
                  with names which start with "A".
```

FINDBAD -

FINDBAD is a non-destructive disk test and bad sector lockout program. FINDBAD can be run on ANY disk, at ANY time. It WILL NOT alter ANY data or files on the disk. FINDBAD reads the ENTIRE disk, including system and directory areas, to locate any unreadable sectors. If a bad sector is found, the following actions will be taken:

1 - If the bad sector is in the system or directory area of the disk, an error message will be displayed on the console warning the user of a bad system or directory sector.

2 - If the bad sector is in the file area of the disk, an error message will be displayed giving the number of the CP/M allocation block containing the bad sector. That block will then be allocated to the file [UNUSED].BAD so that it cannot be used by any other file operations. If the bad sector is already allocated to a file, it is NOT UN-allocated from the file, so that all remaining sectors of the file can still be read.

It is a good idea to run FINDBAD on a regular basis to keep track of the integrity of your disks. Should FINDBAD locate a bad sector on a system track, that disk will not be bootable, and cannot be SYSGENed, but should be otherwise usable. Should FINDBAD locate a bad directory sector, ALL files should be IMMEDIATELY copied to another disk, and the bad disk should be discarded. Bad sectors in the file area of the disk can be left allocated to the file [UNUSED].BAD, with no ill effects. However, any disk which shows a large number of bad sectors should be discarded.

ZCPR -

ZCPR is the Z-8Ø Console Command Processor prepared by members of the CP/M Users Group. It is a greatly enhanced CCP containing all of the features of the Digital Research CCP, as well as several new ones. The commands available are:

Familiar Commands:	New Commands:
DIR	GO
ERA	GET
REN	JUMP
USER	DFU
TYPE	LIST
SAVE	

The "Familiar Commands" operate in exactly the same manner as with the standard CCP, with the following exceptions:

ERA - Will display the names of all files ERAsed.
REN - If the new file already exists, you will be asked if it should be deleted before performing the REName.
TYPE - The file will be displayed on the console a screen (24 lines) at a time, and wait for a character from the console before scrolling to the next screen. This makes searching for something in a file much easier, since you needn't use CTL-S to stop the scrolling.
SAVE - The size of the area to be SAVEd can be optionally specified in CP/M sectors (128 bytes) rather than in pages (256 bytes). In addition, if the specified file already exists, you will be asked if it should be deleted before performing the SAVE.
USER - The current user number is always displayed in the system prompt following the drive identifier.

Examples:

A>ERA B:*.BAK@ - will cause ALL files with the .BAK extension on drive B: to be erased. The name of each file will be displayed on the console in DIR format as it is ERAsed.

A>REN C:OLDFILE.NEW=C:NEWFILE.OLD@ - will cause the file NEWFILE.OLD drive C: to be renamed to OLDFILE.NEW. If the file OLDFILE.NEW already exists on drive C:, you will see the message:

Delete File?

If you respond with a "Y", then the existing OLDFILE.NEW will be deleted before renaming NEWFILE.OLD to OLDFILE.NEW.

A>TYPE TXTFILE.TXT@ - will cause the file TXTFILE.TXT to be displayed a page at a time on the console. It will wait for a character from the console before going to the next page.

A>TYPE TXTFILE.TXT P@ - will cause the file TXTFILE.TXT to be displayed on the console WITHOUT pausing between pages. This is the same effect given by the standard CCP.

A>SAVE 4 JUNK.COM@ - will cause 4 PAGES (1Ø24 bytes) of memory starting at address ØlØØH to be saved to the file JUNK.COM.

A>SAVE 4 JUNK.COM S@ - will cause 4 SECTORS (512 bytes) of memory starting at ØlØØH to be save to the file JUNK.COM.

A>USER 5@ - will cause the system prompt to change from "A>" to "A5>".

The "New Commands" operate as follows:

LIST - works exactly like the standard TYPE command, except that the specified file is sent to the system LST: device.

DFU - specifies the default user number to be used in command searc discussed below. The default user is normally Ø.

GET - allows a file to be loaded into any location in memory. This can be very useful in certain assembly language debugging operations.

GO - causes a direct CALL to any location in memory. This command, along with the GET command, allows execution of programs which operate at some address other than ØlØØH. Any program entered in this way can simply execute a RET instruction to return control directly to the CCP without doing a warm boot, providing the CCP is not overwritten, and the CCP stack is preserved.

JUMP - same as the GO command, except this command causes a direct JUMP to a memory location rather than a CALL. Return from any program entered with this command MUST be by a warm boot.

Examples:

A>LIST TXTFILE.TXT@ - will caused the file TXTFILE.TXT to be printed on the system LST: device.

A>DFU 3@ - sets the current default user to 3. See the section below on command searches for details.

A>GET 4ØØØ B:ALPHA.BET@ - causes the file ALPHA.BET from drive B: to be loaded into memory starting at address 4ØØØH.

A>GO 4ØØØ@ - causes a CALL to location 4ØØØ, beginning execution of whatever program is located there.

A>JUMP 4ØØØ@ - causes a JUMP to location 4ØØØ, beginning execution of whatever program is located there.

COMMAND SEARCHES -

One of the most useful features of ZCPR is its "heirarchical search" capability. Suppose you are logged onto drive B:, under user 5 and you enter the following:

```
B5>MBASIC@
```

If MBASIC.COM is located on your A: drive, or on drive B: under a different user, you will get the message:

```
MBASIC?
```

which is the CCP's way of saying it couldn't find MBASIC.COM on your B: drive. ZCPR, however, would have found MBASIC.COM, even though it is NOT on the currently logged drive. ZCPR will search several places for a .COM file before giving up, while the standard CCP will search the current drive under the current user number only. ZCPR will search in the following order:

First: On the current drive, under the current user number
Second: On the current drive, under the default user number
Third: On drive A:, under the default user number

The default user number can be set with the "DFU" command described above. Suppose we go back to the above example. You are logged onto drive B:, under user 5. The file you wish to load is on drive A: under user 3. With ZCPR you could enter the following:

```
B5>DFU 3
B5>MBASIC
```

And MBASIC.COM would be loaded from drive A: user 3. The search would take place as follows:

First: Search drive B: under user 5 - can't find it
Second: Search drive B: under user 3 - can't find it
Third: Search drive A: under user 3 - found it

With the standard CCP, you would have to first select drive A:, then switch to user 3, THEN enter the command. When MBASIC finally loaded, drive A: would be the default drive.

In most cases, all operations take place under user Ø, so there is no need to use the DFU command, as Ø is already the default user. This means that you need not worry about what drive you're logged onto when you try to load a program from drive A:, ZCPR will find it. You will find this to be a very convenient feature.

NOTES ON 4 MHZ OPERATION -

An number of 4 Mhz conversions have become available in the past several months for the H-89 computer. Unfortunately, they vary widely in their completeness and technical correctness. For the most part, these are poorly executed "quick and dirty" conversions, and little or no consideration has been given to any compatibility problems which might arise with existing hardware and software. Because of this, Livingston Logic, as well as many other vendors, have been experiencing a large increase in the number of complaints from customers who have installed these conversions. To date, NOT ONE of these complaints has proved valid. Tracking down such problems has begun taking up a great deal of our time, when, in fact, the problem is NOT ours! With the wide variety of ifferent conversions and clock switching schemes available at the present time, is simply not possible to provide software which will work in all cases. For this reason, we are forced to take the following position:

1 - LLL CANNOT and WILL NOT provide ANY assistance, either hardware or software, to anyone converting ANY system to 4 Mhz operation.
2 - LLL CANNOT and WILL NOT provide ANY support for any customer experiencing ANY problems with our products when operated in any system with ANY 4 Mhz conversion installed, whether the problem also occurs at 2 Mhz or not.

For the benefit of those who STILL wish to convert their systems to 4 Mhz, we would strongly recommend the KRES Engineering conversion as the most complete, professional and technically competent conversion. All LLL products have been verified as working with the KRES conversion. However, the above policies STILL apply.

IN CASE OF DIFFICULTY -

If you experience any difficulties in setting up and running BIOS-8Ø and it's utilities, PLEASE do the following BEFORE requesting assistance:

1 - READ and RE-READ ALL DOCUMENTATION, including the Heath/Zenith CP/M documentation. Be sure you understand EVERYTHING you are doing.
2 - Start the proceedure over again FROM THE BEGINNING. Be VERY SURE that you follow all directions TO THE LETTER!! DON'T SKIP STEPS!! DON'T ASSUME THAT YOU KNOW ENOUGH TO LEAVE OUT OR MODIFY ANY STEPS!!
3 - If you are still experiencing trouble, have someone else try the proceedure, preferably someone with more CP/M experience and knowledge.
4 - If, at this point you're STILL having trouble, GO BACK TO STEP 1 AND DO IT ALL ONE MORE TIME!!
5 - If you've made it this far and you're STILL having trouble, then write down, in as much detail as possible, EXACTLY what the problem is, any symptoms or problems, EXACTLY WHEN and HOW the problem manifests itself, and EXACTLY what the configuration of your system is, including both HARDWARE SOFTWARE. Mail this letter, and, if possible, a bootable disk exhibit the problem, to the address on the front page of this document. Include a postage paid return envelope.

Livingston Logic has established a reputation as a supplier of high quality, reasonably priced hardware and software for Heath/Zenith computers. It is our policy to provide as much support as is practical, and we are always happy to recieve any comments or suggestions which our customers may have regarding the quality of our products or documentation, as well as any suggestions as to possible new products or improvements to existing products. We will also do whatever we can, within reason, to solve any problems which may occur, provided the customer has read and understood ALL supplied and suggested documentation, has followed all instructions faithfully, has made a reasonable effort to verify and isolate the problem, and has supplied enough information about any such problem for us to attempt to duplicate the problem on our systems. Most importantly, DO NOT phone for assistance unless you have BOTH your computer and our documentation in front of you when you call.

Our experience with customer complaints/problems has been:

1 - Over 6Ø% simply did not take the time to read and understand the documentation, and made little or no effort to isolate or verify the problem before calling for help. In many cases, we have been called upon to provide VERY BASIC information about the operation of the computer or the operating system. This is NOT our responsibility!
2 - Roughly 3Ø% have problems with hardware, other software, or simply have properly configured the hardware of software.
3 - In the last year, an increasing number of problems have centered around 4 Mhz operation. In EVERY case, the problem has been found to be either a

hardware caused malfunction due to an improperly executed conversion violating one or more hardware timing requirement, or some feature of the conversion which by it's very nature makes it incompatible with ANY standard disk driver.

4 - Far less than 1% have legitimate problems with "bugs", defective distribution media, or other manufacturing problems.

Because of the recent increase in the number of calls falling into the first three categories above, we have been forced to adopt the following policy regarding alleged "bugs":

1 - Reports of suspected "bugs" MUST be made in writing, stating the exact nature of the bug, ALL hardware and software in use at the time of the problem, and all pertinent system configuration information (step rates, drive makes and models, etc).
2 - The original distribution disk MUST BE RETURNED for inspection, along with the selling dealers name and purchase date.
3 - If possible, a bootable disk which exhibits the problem should also be returned with the report.
4 - Should we determine that a bug or problem does exist, we may or may not provide a correction, as we see fit. We may or may not incorporate any such fixes in future releases of the software. Any such updates may or may not be available at a reduced rate. Any such updates may or may not be announced in such publications as H-SCOOP, BUSS, and local club newsletters.

LLL has always tried very hard to maintain compatibility with other existing products, both hardware and software, and we have often updated our products to take advantage of some new products features, or enhance compatibility. Unfortunately, this attitude is not shared by most sellers, and, as a result incompatibilities may arise, particularly with products developed AFTER the release of ours. For this reason, we DO NOT provide ANY products on a trial basis, and we further make NO warranties as to compatibility or suitability of any of our products for any purpose whatsoever. All products are sold strictly on an "as is" basis. When incompatibilites are found, we may or may not update our product to provide compatibility, and we may or may not offer any such updates at a reduced rate.

LLL CANNOT and WILL NOT provide ANY of the following services, except on a prepaid hourly basis at our current consulting rate:

1 - Assistance in the installation, configuration debugging, or operation of ANY other companies products.
2 - Assitance in the location and identification of general system hardware or software problems.
3 - Assistance in the modification of any of our products for any purpose.
4 - General advice, technical information, or any other information not directly related to the operation of one of our products.

Further, any correspondence relating to the following subjects will not be acknowledged:

1 - Conversion of any system to 4 Mhz operation.
2 - Hardware or software problems which occur with 4 Mhz operation.
3 - Operation of ANY 80 track drive within the H-89 enclosure.