gsi™

GSI
Model 1C

**One Channel EIDE ISA Adapter
With BiosManager™ BIOS**

IMPORTANT!

Before installation see the 'READ ME 1ST' section!

Installation and Technical Reference Manual

     1539-1C-01-9

Table Of Contents

Section 1   Product Overview

1.1   Product Description

BiosManager™ **BIOS -** A universal BIOS controller that not only operates drives connected to the Model 1C adapter, but all drives attached to any and all IDE channels in the computer. This provides all IDE channels with the same features of the Model 1C**.**

Large drive support - The Model 1C handles high capacity EIDE hard drives larger than 528MB. Also the trademarked **BigaByte**™ technology supporting new drives greater than 2.5 gigabytes.

Cable Select ready - If you have a GSI cable select compliant cable (part number 1548-CS-xx-x), simply set all drives (on cable) to CSEL and there is no need to worry about master and slave.

Flexible IRQ settings - The Model 1C adapter can run at IRQ14 (primary), IRQ15, (secondary) or at an optional IRQ12 in secondary mode. The Model 1C's EIDE channel can also be disabled and yet still maintain BIOS support for the other IDE channels in the computer.

Flexible BIOS address settings - There are four (4) alternate BIOS address settings to allow co-existence with other BIOS adapters in your computer.

Co-existence with ESDI, MFM, RLL, and SCSI adapters - The Model 1C's IRQ and BIOS address settings are flexible to allow coexistence with many adapters and motherboards.

Automatic setup of hard drive - The Model 1C will auto detect all (E)IDE drives in the computer. In addition, the Auto-prep feature will offer to partition and format any new or clean drive.

ISA acceleration - Uses the IDE Read/Write Multiple commands to provide up to 80% data transfer rate acceleration for most (E)IDE hard drives, compared to standard passive IDE adapters.

EIDE CD-ROM - Supports the EIDE (ATAPI) CD-ROM drives.

IDE Tape drives - Supports EIDE (ATAPI) tape drives.

Compatibility - DOS, Windows® 3.xx, Windows®95, Windows®NT, Novell NetWare 3.x & 4.x and OS/2 Warp & 2.x.

1.2 Model 1C Adapter Layout
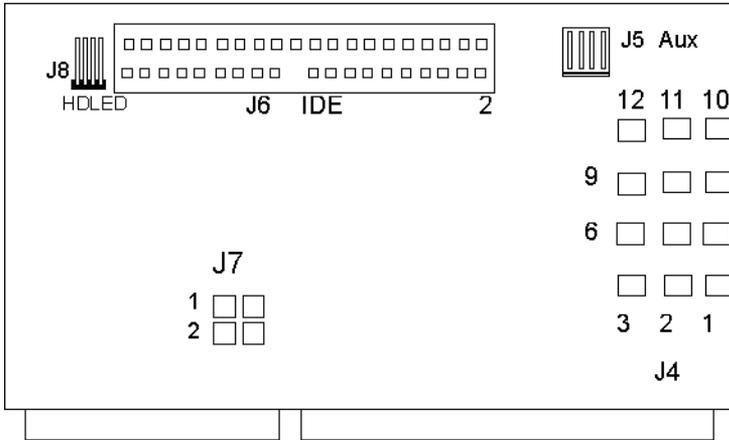
Figure 1 : Model 1C board layout

J4: Jumpers settings for:
        BIOS address
        Channel 1, 2 or disable
J5: Auxiliary power source
J6: EIDE 40 pin connection
J7: Alternate IRQ
J8: Hard drive LED connection (for 2 drives)

Note: Jumper settings are printed on the Model 1C adapter as well as in the manual (see Section **4.1**).

Very Important:
Please take this time to write down your 6 digit serial number in the space provided at the back of this manual. (Section 7)

The serial number can be found on the back of the GSI Model 1C or is shown in the banner during system boot up. The serial number is required to receive technical support.

Section 2   Read Me 1st

2.1   Disk Management Software

What is disk management software ?
Disk management software is a generic term for the software
provided by your hard drive manufacturer that allows the full
capacity of the drive to be utilized in computers limited to 504 Mb
hard drive support. Some specific names of disk managers are:

EZ-Drive, MaxBlast, and Ontrack Disk Manager

Should I use disk management software ?
GSI does not recommend it because disk management software
creates a non-DOS partition that is not compatible with a BIOS
that supports large drives (either a system or adapter BIOS.) The
Model 1C's BIOS allows the hard drive to be used to the full
capacity with a standard DOS partition and format.

What if a disk manager is already installed ?
You will need to remove that software from the hard drive before
using the Model 1C adapter. See Section **4.13** for removal instruc-
tions.

Do I need to change any jumpers on the Model 1C adapter?
In most cases the factory default settings should work.

**When would I need to make a change to the Model 1C jumper
settings?**
Adjusting the jumper settings may be necessary if your existing
IDE/EIDE adapter has more than one channel, or if you have
another device using IRQ15. (A sound card or ethernet card some-
times uses IRQ15.) The BIOS address may need to be changed if
another device (like a SCSI adapter) in your system has the same
BIOS address as the Model 1C adapter.

If needed, how do I make the adjustments to the Model 1C?
Both IRQ and BIOS address changes are done by changing the
jumpers on the Model 1C adapter (using jumper block J4, see
Figure 1). For appropriate changes, see section **4-4.3.**

What is the GSI BiosManager™ BIOS?
This Universal BIOS is stored in *Flash* memory on the GSI
adapter and controls ALL IDE Channels in the computer, allowing
your non-EIDE adapter to run EIDE Drives (drives greater than
504MB).

Follow the next section for Installation of the Model 1C EIDE Adapter

Section 3   Quick Installation

$\triangle$ **Caution!**

Do not use any hard drive partitioning software (Disk management software like: Ontrack, EZ-Drive, etc.) in conjunction with the Model 1C adapter. If a drive has already been prepared with the software, see section **4.13** for removal instructions.

3.1   Physical Installation

Power off the computer and remove the case.

$\triangle$ **Caution!**

All electronic equipment is sensitive to static electricity at levels far below those that humans notice. Take care to ground yourself by either touching the metal case or using a grounding strap before touching any of the electronics in the computer.

Step 1: Install your Model 1C adapter and your (E)IDE drive

If there is only one drive attached to the IDE cable, the drive's default jumper setting should be used. However, if more than one drive will be attached to the same cable, you will need to change the drive's jumper settings. One drive will be set as a master and the other as slave (See drive documentation for settings and section **4.7-A** for information.)

$\triangledown$ **Note: If you have a cable that came *with* the Model 1C adapter with a part number of 1548-CS-xx-x then you can use the cable select setting on your EIDE drives. (See section 4.7-B for details)**

Step 2: Connect Model 1C Adapter and drive to the IDE cable

Attach the 40-pin IDE ribbon cable to connector **J6** on the Model 1C, with pin-1 on the cable connecting to pin-1 on the Model 1C adapter. Pin-1 on the 40 pin IDE ribbon cable is indicated by the colored band on the edge of the cable. Pin-1 on **J6** is indicated by the number 2 printed on the adapter and is the pin nearest the metal bracket. See the figure below:
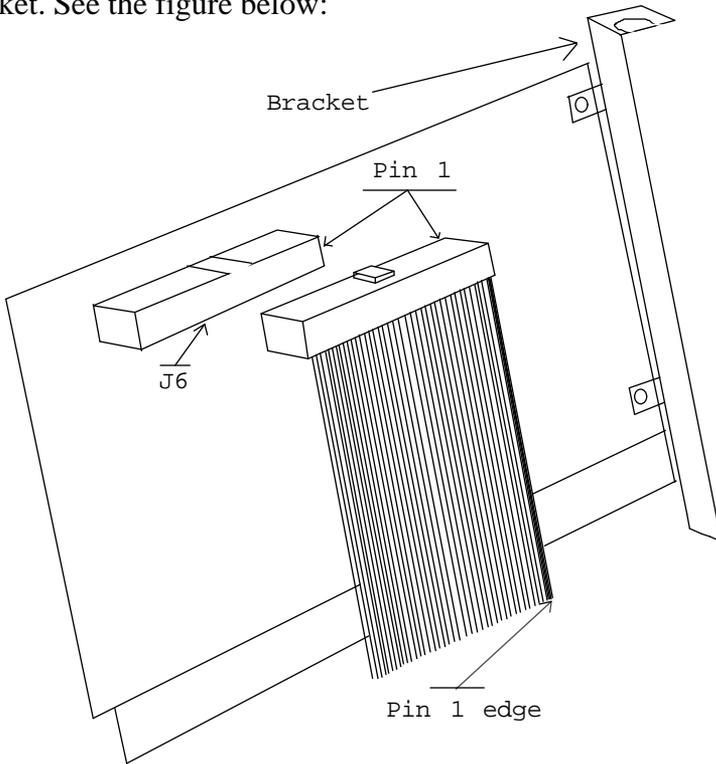
Figure 2 : IDE cable attachment

Attach the other end of the 40-pin IDE ribbon cable into the (E)IDE drive. Also have the colored band connecting to pin-1 on the drive. Pin-1 is almost always the pin closest to the power connection. If you are unsure about the location of pin-1 check the drive documentation.

Step 3: Connect power cable to the drive

The power cable comes from the computer power supply. It has 4 colored wires that are joined by a white header with 4 large pins.

If there are no free power connections from the power supply you can use the Model 1C's J5 auxiliary power connection.

⚠️ **Do Not Connect The J5 Auxiliary Power Source To The Computer's Power Supply!**

Step 4: Power on the computer.

3.2   System CMOS Settings

The setting for any drive attached to the Model 1C, or any other channel in the computer should be **none** or **not installed.**

The *only* exception is when using Windows®95 or Windows®NT, with a hard drive attached to your channel 1. In this case, set the drive to a 'Type 1' 10MB setting (306 cylinders, 4 heads, 17 sectors) for the drives attached to channel 1 only. (See sections **4.19** and **4.2** for details)

3.3   GSI Banner

During the boot process you should see the 'GSI banner'. The banner has information about the adapter specifications. For example: *BIOS address & BIOS version, primary or secondary mode, etc.:*

```
GSI BIOS MANAGER (tm) v5.03 at CC00-CDFF   Serial# K64194   (c) 1992-97 GSI
on Model 1C EIDE 1-Channel 2-Drive Adapter -- Model 1C Channels: - 2  - -
 + Hard Drive Support and ATAPI Detection for OFFboard Channels: 1  -  3  4

Ch#  D r i v e     V o l u m e    ParType   D r i v e
M/S  Type (MB)    (MB)   N a m e   FileSys   M o d e l    N a m e

2 M  Hard 2441   2012 WD32500LILO Pri/F16   WDC AC32500
3 S  Hard  813     97 CN850-PPar1 Pri/F16   Conner Peripherals 850MB - CFA
                  100 CN850-PPar2 Pri/F16
                  100 CN850-PPar3 Pri/F16
                  100 CN850-PPar4 Pri/F16
4 M  * ATAPI *
4 S  Hard  514    503 FAT32_Trial Pri/F32   Maxtor 7540 A

Exit GSI BIOS . . .
```

The top of the banner contains BIOS version and address information, the channel setting of the Model 1C and also what other (OFFboard) IDE channels the Model 1C's BIOS is controlling.

Drive Table Information:

On screen:	Explanation of abbreviation
Ch#	What channel the drive is on
M/S	If the drive is a **m**aster or **s**lave
Drive type	
Type	What kind of drive (HD or CD ROM)
MB	Size in megabytes
Volume	
MB	Megabytes
Name	Drive name
Par-type	Type of partition (Primary DOS, extended)
File sys	Type of file system (FAT 16 bit, NTFS)
Drive name	The drive's make and model name

3.4 Auto Preparation of the Hard Drive

If you are installing a new hard drive that has not been partitioned or formatted, the GSI BiosManager™ BIOS will offer to auto prep the drive. This feature will automatically create a partition and format the drive for you.

During the first boot with a new hard drive attached to the Model 1C adapter, the GSI banner will tell you that the "drive does not have a partition or format, would you like to make it ready?"

If you are going to install DOS, Windows®3.xx, or Windows®95 and want your hard drive to be one partition (up to the operating system's limit of 2.1 gigabyte) then hit the "Y" key to let the GSI BiosManager™ BIOS prepare the drive for you.

If you think you have information on the drive or if you are in doubt, press the "N" key and use the DOS utilities to prepare the drive.

If you want multiple partitions on the hard drive, or are using a filing system other than the DOS FAT, (Such as, HPFS or NTFS) hit the "N" key and use the partitioning software supplied with the operating system (usually called FDISK).

> ✔ **Note: There is a count down timer during the auto preparation initiation. If there is no response (either 'Y' or 'N') it will skip the auto preparation and continue the boot process. You can then manually create partitions on the hard drive with the operating system's FDISK program.**

When you let the GSI BiosManager™ BIOS partition and format the hard drive, *it does not make the hard drive bootable*. To make it bootable see section **4.6**.

3.5 Shadowing the GSI BIOS Address

Using your system CMOS or memory manager to shadow the GSI BIOS will help increase the performance of your drives. (see section **4.10-B** and **4.11**)

Your Model 1C adapter and hard drive should now be operational. If you want to boot from your new hard drive, you must first make the drive bootable. (See section **4.6**)

Please take this time to write down your serial number in the space provided at the back of the manual (section **6**) for future reference. The serial number can be found on the GSI banner and on the back of the adapter.

The following section is a Technical Reference.

Section 4   Technical Reference

4.1   Jumper settings

Setting	IRQ	I/O	Note
Primary	14	1F0-3F0	Most adapters default setting.
Secondary	**15**	**170-370**	**Industry standard for secondary. (Model 1C's default setting)**
Secondary	12	1E8-3E8	Optional (alternate IRQ) setting if IRQ15 is already used.


```
12  11     10
                          Bios   address
   9     8    7

   6     5    4           Primary  / Secondary

   3     2    1           IDE  ON  or  OFF

        J4
```

```
                          J 7

    1-2  IRQ  15           1   3
    2-3  IRQ  12           2   4
  (Secondary    only)
```
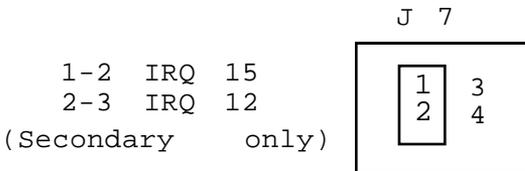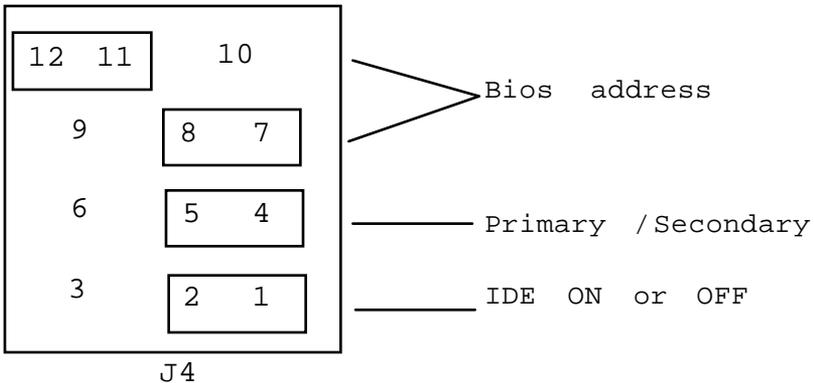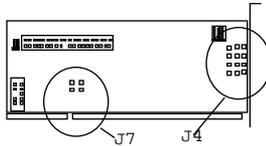
Figure #5: Default Jumper Layout

4.2   IRQ & Channel Jumper Settings

Jumper on:	Setting
1-2	**IDE on (Default)**
2-3	IDE off
4-5	**Secondary (Default)**
5-6	Primary
1-2 (on J7)	**IRQ15 (Default)**
3-4 (on J7)	IRQ12 (For Secondary Only)

4.3   BIOS Address Jumper Settings

BIOS address	Jumper setting
C800-C9FF	**7-8 and 10-11 (default)**
CC00-CDFF	7-8 and 11-12
D000-D1FF	8-9 and 10-11
E000-E1FF	8-9 and 11-12

The IRQ setting on jumper block **J7** should normally be left at the factory default setting. The only case when it would be necessary to use the alternate IRQ setting is if you have another adapter running at IRQ15. Some possible adapters that run at IRQ15 are: sound cards, network adapters, or a second IDE channel (on your motherboard or original adapter).

4.4   Drive Letter Assignment

Drive letter assignment for floppy drives:
Your operating system assigns the A: and B: to your first two floppy drives. If you are using only one floppy drive, it will be drive A: and the B: drive will be left unused.

Drive letter assignment for hard drives:
Primary DOS partitions receive drive letters first, and extended partitions second. Any other drives that are known to the operating system, *before* the config.sys file loads, will come third (a 3rd or 4th floppy drive is an example). Lastly, any drive that loads a driver in your config.sys (RAM drives, and CD-ROM drives for example) will be the last to receive a drive letter.

> ✔ **Note: In all instances if there are multiple drives that apply to any of the assignment categories (more than one primary partition, or CD-ROM drives) the letter assignment is applied in order of appearance.**

Example: System with two hard drives (504MB and 2.5GB), CD-ROM, and two floppy drives configured as:

2.5GB hard drive as master with two partitions. The first partition is a 2.1GB primary DOS partition and the second is a 400MB extended DOS partition.

The 504MB hard drive is set as slave with a primary DOS partition of 504MB.

Drive Letter   Description

Drive Letter	Description
A:	floppy drive at end of floppy cable
B:	floppy drive at middle of floppy cable
C:	the primary DOS partition of 2.1GB on the 2.5GB drive set as master
D:	the primary DOS partition on the second 504MB drive set as slave
E:	the extended partition on drive 1 (400 mb size)
F:	the CD-ROM drive (initialized via driver)

4.5   How to Make a Boot Disk

If you have a FULL copy of DOS 5 or later, you can use it as your boot disk. Disk 1 is both bootable and has the necessary files. (Note: when booting with DOS disk #1, it will default to the DOS setup. Hit the F3 key twice to exit to the **A**:\>)

4.5-A   Making a Boot Disk in DOS

Step 1   Boot your computer from the existing hard drive.

Step 2   Put a blank disk in drive A:, and at the **C:\>** type FORMAT A: /S (there is a space after format)

Step 3   After the disk is done formatting, change to your DOS directory on the C: drive. (CD DOS)

Step 4   At the **C:\ DOS\>** prompt type COPY FDISK.EXE A:, and hit enter.

Step 5   At the **C:\ DOS\>** prompt type COPY FORMAT.COM A:, and hit enter.

Step 6   At the **C:\ DOS**\> prompt type COPY SYS.COM A:, and hit enter. This file will allow you to make another drive bootable.

   (After steps 4, 5 & 6, you should get the message *file copied*)

Step 7   Verify that you have the files on your floppy disk, type A: and hit enter. At the **A:\>** type DIR, and hit enter.

   You should have the following 4 files on your floppy disk: **Comand.com, Fdisk.exe, Format.com and Sys.com.**

Step 8   Test boot disk. Put bootable disk in the A drive and reboot the computer. If the computer booted from the A: drive, you should come to the **A:** and be prompted for both the date and time.

4.5-B   Making Boot Disk in Windows® 3.xx

Step 1   Start Windows, double click on MAIN.
Step 2   Double click on FILE MANAGER.
Step 3   Select DISK from the menu bar. Scroll down and select MAKE System Disk.
Step 4   Put a blank disk in drive A: and follow the on screen instructions.
Step 5   In file manager, change to the DOS directory and COPY fdisk.exe, Sys.com and Format.com to the A: drive.
Step 6   Double click the A: icon in FILE MANAGER, verify that **Comand.com, Fdisk.exe, Sys.com and Format.com are on the floppy disk.**
Step 7   Test boot disk. Put bootable disk in the A drive and reboot the computer. If the computer booted from the A drive, you should come to the **A:** and be prompted for both the date and time.

4.5-C   Making Boot Disk in Windows®95

Step 1   Start Windows®95, RIGHT mouse click on MY COMPUTER.
Step 2   Select EXPLORER.
Step 3   Place mouse cursor over your A: drive icon and RIGHT mouse click.
Step 4   Select FORMAT.
Step 5   Choose COPY SYSTEM FILES ONLY after disk is formatted.
Step 6   COPY Fdisk.exe, Sys.com, and Format.com files from the windows\comand folder to drive A:.
Step 7   Double click the A: icon in EXPLORER, verify that the files are on the floppy disk.
Step 8   Test boot disk. Put bootable disk in the A: drive and reboot the computer. If the computer booted from the A: drive, you should come to the **A:\.**

4.6   Making a Hard Drive Bootable

For DOS, Windows® 3.xx, and Windows®95 you need three elements to make your C: drive bootable:

> **1**. The drive must have a primary DOS partition.
> **2**. The partition must have an ACTIVE status.
> **3**. You must SYS the drive.

To SYS a drive is to COPY the system files to the hard drive. The system files consist of two hidden files and COMAND.COM. To COPY these files you need to add the parameter **/S** to your initial format of the drive. If the drive has already been formatted, you can boot from a floppy disk in your A: drive (see Section 4.5 to make boot disk). At the **A**:>\ type SYS C:. This will COPY the necessary files to your hard drive.

In order to set your partition status to ACTIVE, you must type FDISK at the DOS>\.. When FDISK comes up there should be a menu, #2 on the menu is 'Set Active Partition'. Choose #2 to make the partition active.

These steps are the same for DOS, Windows® 3.xx and Windows®95.

4.7 Master, Slave and Cable Select Settings

4.7-A   Master and Slave

Setting a drive as either a master or a slave applies only when two drives are on the **same** cable. The first drive should be set as a master and the second as a slave. (Master should be at the end position of the cable.) If a drive is alone on a cable it should be set as a single stand alone drive. In some cases this is the same setting as master, check drive documentation for settings. A single drive should also be placed at the end position of the cable.

4.7-B   Cable Select (CSEL)

With a GSI Cable Select-ready cable (part number 1548-CS-xx-x) you can set your drive(s) to the CSEL setting and not worry about master and slave jumper settings. With CSEL (Cable Select) the drive at the END position is "Drive 0" and the drive attached to the center position is "Drive 1". This is not to be confused with drive letter assignment (see Section **4.4.**) The operating system assigns drive letters according to partition type and order of appearance.

When we are referring to Drive 0 or Drive 1 (see figure #6 below), we refer to drives attached to this cable *only*.

For example:
You can have two hard drives attached to a primary adapter and two hard drives attached to the Model 1C (in secondary mode). A total of four hard drives in the computer, with drive 1 and 2 on the primary adapter and drive 3 and drive 4 on the Model 1C, using a GSI Cable Select cable. The drive seen first by the computer is the master on the primary adapter, second, the slave (primary adapter), third is Drive 0 at the end position on the CSEL cable. Last seen is Drive 1 at the center position on the CSEL cable.

If a drive is by itself on the CSEL cable it **must** go at the end position. The only time the center position is used is if you have a second drive on the CSEL cable.
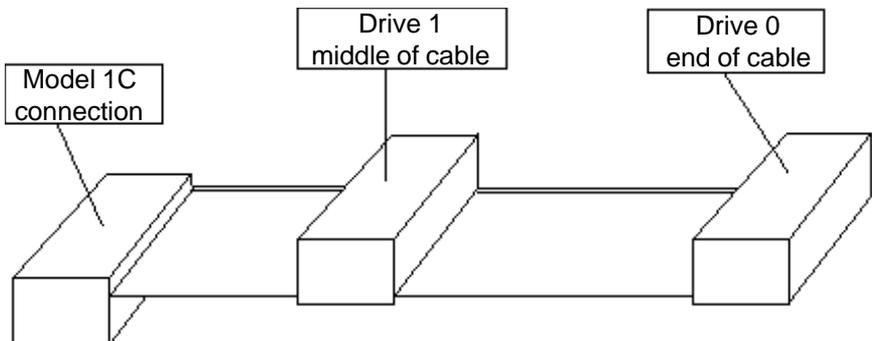

Figure #6 : GSI CSEL cable layout

4.8   CD-ROM Drives

4.8-A   Compatibility

The Model 1C supports CD-ROM drives that conform to the ATAPI standard (most EIDE CD-ROMs are ATAPI). A CD-ROM can run as a slave to another IDE drive, or by itself as a master.

4.8-B   CD-ROM Drive on GSI Banner

The Model 1C's banner identifies most ATAPI CD-ROM drives. However, during testing we have come across IDE/ATAPI CD-ROM drives that do not appear on the GSI banner. This happens when drive manufacturers do not conform 100% to the ATAPI standard. Despite not appearing on the GSI banner, these CD-ROM drives usually work fine. This is because drivers operate a CD-ROM, not a BIOS. The Model 1C simply acts as an interface card and the drivers supplied by the drive manufacturer that load during boot up (in config.sys) actually run a CD-ROM. Without the drivers properly loaded, your computer will not acknowledge that a CD-ROM drive is present.

4.8-C   Loading CD-ROM Drivers

For DOS and Windows® 3.xx systems, the driver should be loaded in the config.sys file. For Windows®95, you need to run the ADD NEW HARDWARE WIZARD, so Windows can assign a driver for the CD-ROM drive. Windows® NT automatically detects and sets up a CD-ROM.

4.9   IDE Tape Drive

The Model 1C supports IDE tape drives that conform to the ATAPI standard (most IDE tape drives do). An IDE tape drive can run as a slave to another IDE drive, or by itself as a master. The Model 1C's BIOS does not identify an ATAPI drive in the GSI banner. The driver supplied by the drive manufacturer will initial-ize the drive when config.sys loads. Without the driver properly loaded, your computer will not acknowledge that an IDE tape drive is present. For DOS and Windows® 3.xx systems, the drive should be loaded in the config.sys file.

For Windows® 95 you will need to run the ADD NEW HARD-WARE WIZARD, so the driver can be loaded. (Note that Windows®95 may not have built in support for your IDE tape drive. Contact the drive manufacturer for the latest driver.)

4.10   Memory Management Software

The first step in either excluding or shadowing the GSI BIOS address is to determine what the GSI BIOS address is set at. The easiest way is to hit the PAUSE key when you see the GSI banner during boot up. The banner will state one of four possible BIOS addresses: C800, CC00, D000 or E000. Hit the ENTER key to resume the boot.

4.10-A   Excluding GSI's BIOS Address

If you are using a *memory manager* such as DOS' emm386, (memmaker) Qemm, 386 Max, or Netroom you should **exclude** the GSI's BIOS address. If you are shadowing the GSI BIOS address with your *system CMOS* you **must** exclude the BIOS address. Note: If you are shadowing the GSI BIOS with your *memory manager* the BIOS does not need to be excluded.

Excluding the GSI BIOS address is done in your config.sys file. To access your config.sys file type `EDIT CONFIG.SYS` at the **C**:\>.

Now make your changes to the file: **Example:**

Memory Mgr.	Add this line:
DOS' Emm386	Device=C:\DOS\EMM386.SYS X=CC00- CDFF
Qemm	Device=C:\QEMM\QEMM.SYS X=CC00-CDFF
386Max	Device=C:\386MAX\386MAX.SYS EXCLUDE=CC00-CFFF

> **Note: The exclude statement should be on the SAME line as DEVICE = C:\............**

If the examples do not work for your memory manager, check the documentation for information on **excluding** a memory address.

BIOS address and corresponding exclusion region:

Address	Exclude region	**Address**	Exclude region
C800	C800-C9FF	**CC00**	CC00-CDFF
D000	D000-D1FF	**E000**	E000-E1FF

Note that some computer CMOS' may not support the E000 address.

4.10-B   Shadowing With a Memory Manager

Shadowing a BIOS allows the instructions to be carried out at a greatly increased speed, therefore increasing overall performance related to that BIOS.

Many newer CMOS's allow you to shadow a region of memory. The following information is for systems that do not have that available in the CMOS.

Shadowing the GSI BIOS address using a memory manager is done in your config.sys file. To access your config.sys file type EDIT CONFIG.SYS at the **C**:\> to make the changes to the file.

For Example, if you are using DOS' Emm 386, then type or add:

Device=C:\DOS\EMM386.SYS ROM=CC00-CDFF

Check your memory managers documentation for the statement needed for shadowing. Memory managers differ, so the **ROM=** may not be appropriate for your version of the software.

✔ **Note: if you use the memory manager to shadow the GSI BIOS, you do not need to exclude the address!**

4.11   Shadowing With Your System CMOS

Shadowing a BIOS allows the instructions to be carried out at a greatly increased speed, therefore increasing overall performance related to that BIOS.

In your system CMOS you may be able to shadow a region of memory (most 486, Pentium®, and some 386 systems have that option).

Now go into your system CMOS and enable the appropriate block of memory to shadow:

GSI BIOS Address	In system CMOS, choose if:		
	16kb block	32kb block	64kb block
C800	C800-CBFF	C800-CFFF	C000-CFFF
CC00	CC00-CFFF	C800-CFFF	C000-CFFF
D000	D000-D3FF	D000-D7FF	D000-DFFF
E000	E000-E3FF	E000-E7FF	E000-EFFF

If you are shadowing the GSI BIOS address with your system CMOS and you are using a **MEMORY MANAGER** (such as Qemm, DOS emm 386, or 386Max) you **MUST** exclude the GSI BIOS address from the memory manager. (See section **4.9-A** for instructions)

If your system CMOS does not have the option to shadow a memory address, you can use your memory manager to shadow. (See section **4.10-B** for more details)

4.12 Phoenix System CMOS

If you are using the Model 1C as a secondary adapter (factory default setting) and have your boot drive (C:) attached to the Model 1C, you may not be able to boot from the hard drive. It is not uncommon for the Phoenix CMOS, during boot, to only look to the primary adapter address for a bootable hard drive. Not to worry though, there are several ways around this problem.

1. With the GSI's BiosManager™ BIOS, you can attach your new EIDE drive to ANY IDE channel in the computer and have it work just as if it were attached to the Model 1C. So simply attach the hard drive to your primary adapter and boot up with no problems.

2. You may be able to disable your primary IDE adapter and then change the Model 1C to run in it's place, in primary mode (see 4.1 for instructions).

Either of these two solutions should get the Model 1C up and running with a system using the Phoenix BIOS.

4.13   Removing Disk Management Software

⚠️ **Caution! Removing disk management software will delete all data from your hard drive. Make sure to back up all data on your hard drive that can not be replaced.**

First you will need a bootable DOS disk with the fdisk.exe and format.com files on it. (See section **4.5** for instructions on how to make a boot disk.)

Step 1   Back up any data on the hard drive.
Step 2   Place Boot disk in the A: drive and reboot your computer.
Step 3   At the **A:** type `FDISK /MBR` and hit the enter key. (Note there is a space after FDISK)
Step 4   At the **A:** type FDISK and hit enter.
Step 5   You are now at the main menu of the FDISK program. Select #4 to display partition information)
Step 6   Make note as to what the TYPE and the VOL. LABEL are for the partition, then hit the ESCAPE key.
Step 7   Select #3 (delete partition) from the main menu.
Step 8   Delete the partition. (This is the partition you saw when you selected #4 from the main menu.)

Repeat steps 5-8 until no partition remains on the hard drive.

Now your hard drive is ready to be installed on the GSI Model 1C adapter. (See section **3** quick installation)

4.14   SCSI and ESDI Adapters

The Model 1C adapter is designed to co-exist with other adapters including an ESDI or SCSI. However, most ESDI and SCSI were designed with the assumption that there would never be another BIOS driven adapter in your system. As a result they may have an *ill behaved BIOS,* fortunately the Model 1C adapter has 4 BIOS address settings available to avoid such problems. If you are not seeing the Model 1C banner during boot up, try changing the GSI BIOS address to one that is higher than that of your other adapter (or the reverse). Also, check the IRQ settings of both adapters to make sure that there is no conflict.

4.15   EISA Bus Motherboard

EISA bus motherboards have a built in system configuration protocol that is intended to provide automatic setup of add-on adapters. This automated procedure deals with the add-on adapters one at a time, working its way from one side of the computer to the other. The sequence in which two add-on adapters get scanned for EISA bus setup may affect proper adapter operation for one or both adapters. Try interchanging slot positions of the Model 1C and other adapters that have a BIOS on them.

4.16   DOS Partition Limits

One limitation in DOS is the maximum size of the partition is limited to 2049 Megabytes. This is not a limitation of the GSI's BIOS but the operating system's. If you have a drive larger than 2 Gigabytes, you can create multiple partitions on the drive to utilize it's full size. An example is a 2.5GB drive (2500MB) that can be partitioned into one primary DOS partition of **2049MB** and an extended DOS partition of **451MB**.

Note that the GSI's auto-prep feature will create only one partition for the entire size of the drive up to the DOS limitation (2049MB). To create the extended DOS partition, you must use the FDISK program in DOS.

4.17   Windows® 3.xx

The Windows® 32-bit disk access driver only works for channel 1 and for drives less than 504MB. Replace the Windows® driver (WDCTRL.DRV) with the driver supplied from your drive manufacturer to use 32-bit disk access for your large hard drive (greater than 504MB).

If there is a CD-ROM attached to the same channel as a slave you may not be able to run 32-bit disk access. Some manufacturer drivers do not work with the CD-ROM on the same cable as a hard drive. Try running the CD-ROM from another IDE channel and re-install the CD-ROM drivers.

When a hard drive is on a secondary channel (IRQ15) even with no CD-ROM and the correct version of the drivers, Windows® will not be able to run with 32-bit disk access. Windows® 3.xx simply does not support 32-bit disk access for secondary IDE adapters.

Also, Windows® 3.xx is subject to the same limitations as DOS regarding partition size. (see section **4.16**)

4.18   Windows®95

4.18-A   CMOS SETTING

The GSI BiosManager™ BIOS does not need a setting in your systems CMOS in order to see and work with a hard drive. Windows®95 however, does need to see a setting for any hard drive attached to channel 1. The actual setting is not significant, so using the AUTO setting or TYPE 1 (306 cylinders, 4 heads, 17 sectors for 10 MB) will allow Windows®95 to operate properly.

4.18-B   DOS COMPATIBILITY MODE

If you notice in device manager that the (E)IDE drive attached to the Model 1C is running in DOS COMPATIBILITY MODE, run the ADD NEW HARDWARE WIZARD from the control panel.

4.19   Windows® NT

The GSI **BiosManager™** BIOS does not need a setting in your systems CMOS in order to see and work with a hard drive. Windows®NT however, does need to see a setting for any hard drive attached to channel 1. The actual setting is not significant, so using the AUTO setting or TYPE 1 (306 cylinders, 4 heads, 17 sectors for 10 MB) will allow Windows®NT to operate properly.

Also, Windows®NT is subject to the same limitations as DOS regarding partition size, (see section **4.16**) unless using the NTFS (NT's 32 bit filing system).

4.2   OS/2 2.x and OS/2 Warp

Currently OS/2 2.x and Warp using both FAT and HPFS partitions have no problems with the Model 1C. However on the Model 1C banner during boot up, the HPFS partition may be identified as NTFS. This happens as a result of the GSI BIOS inquiring the drives filing system and OS/2 responds the same as NTFS. Currently there is no way for the Model 1C BIOS to distinguish between the two. This does not affect the partition, performance or the filing system.

4.21   Novell NetWare

If you have a hard drive on your primary channel (IRQ 14), declare the drive in your system CMOS as a Type 1, 10 MB drive (306 cylinders, 4 heads and 17 sectors), and use the Novell **IDE.DSK** driver. You should use the most current version of the driver, and no older than the 9/94 release.

> **Note: Novell version 3.11 or earlier, does not come with a new enough driver. Contact Novell for a replacement or updated driver.**

> **CAUTION!**
> **DO NOT USE NOVELL'S COMPSURF OPTION!**

4.21-A   Installing Novell

Run Novell's SERVER. EXE and:

1. Issue LOAD IDE.DSK /L (Most current version of driver) using the parameters that your Model 1C has been configured to (IRQ & I/O address settings).

2. Issue LOAD INSTALL.MLM to run the Novell install and then: Do not choose the FORMAT option (Compsurf's format command does a LOW LEVEL format. This could damage an IDE drive).

3. Create a Novell partition. Check that Novell reports a cylinder count consistent with the hard drives default parameters.

4. Run Novell's surface test on each new Novell partition.

Section 5   Troubleshooting

The following is a basic trouble shooting guide. Possible solutions may be given by referencing other sections of the manual.

GSI banner not seen on the screen during bootup:

Is another adapter using the same IRQ as the Model 1C?
If so, either change the other adapter or the Model 1C. The Model 1C has the option of running as a primary adapter (IRQ14), a secondary adapter (IRQ15, or IRQ12) or you can simply disable the IDE channel and use it as a BIOS manager. (Some possible conflicts could come from another IDE adapter, sound card, CD ROM adapter or a network adapter.) See section **4.1-2** for optional Model 1C settings.

Is another BIOS at the same BIOS address as the Model 1C?
If so, you have 4 available settings for the GSI's BIOS address. Either change the GSI's BIOS address, or that of the other adapter's. (The most likely conflict would come from a SCSI adapter.) See section **4.3** for BIOS address options.

Do you have a SCSI adapter?
If so, it could cause an interference even if it is not at the same BIOS address. Some SCSI adapters have an ill behaved BIOS that were never designed with the possibility of coexisting with another BIOS driven adapter. Try setting the Model 1C's BIOS at a higher address than that of the SCSI's.

Is the Model 1C's BIOS at E000?
If it is, try changing it to a different BIOS address. Some systems do not have that memory address available to use. See section **4.3**.

Do you have a Plug-N-Play CMOS ?
If you do, try to disable the plug-n-play option in the system CMOS. Some P-N-P CMOS' will shut out another BIOS in the system.

If none of the above applies or works you may need to reinstall the

BIOS. To obtain a BIOS upgrade call technical support at (714) 261-9744 (M-F 8 to 5 PST) with your six digit serial number found on the back of the GSI Model 1C. Without the serial number we can not supply a new BIOS for your adapter.

32-bit disk access not working in Windows®3.xx:

Are you trying to use 32-bit disk access on a drive that is not on channel 1?
Windows® 3.xx only supports 32-bit disk access on channel 1. See section **4.17**.

Is your hard drive larger than 504MB?
The native Windows® driver only supports drives less than 504MB. You need to replace the Windows® driver with the one supplied by your disk manufacturer. See section **4.17**.

Is there a CD-ROM drive on the same channel as the hard drive?
Many replacement drivers (for large hard drives) do not work if there is a CD-ROM on the same channel. Move the CD-ROM to another location and reload the drivers.

Not able to utilize the full size of the hard drive:

Is there already a partition on the hard drive?
If there is an existing partition on the hard drive the Model 1C will not change it. To do so would delete all the data on the drive. Only when the Model 1C can see the drive with NO partitions will you be able to use it's full size. Even new and unused drives may have a partition. Some drive manufacturers ship drives with a small partition containing their disk management software. Follow their instructions for removing this partition and software.

Do you have the correct CMOS setting?
See section **3.2**.
Is your drive larger than the 2049MB?

DOS, Windows® 3.xx, Windows®95, Windows®NT (FAT partition only) and OS/2 (FAT partition only) have a maximum partition size of 2049MB. If your drive is larger than the operating system limitation, simply create multiple partitions on the drive to access it's full capacity. See section **4.16**.

GSI banner has error message ' odd partition found ':

Did you use the disk management software that came with the hard drive?
The GSI adapter is not compatible with that software, see section **4.13** for removal instructions. **Note: This will remove all data from your drive.**

Did you run an anti-virus lately?
There are viruses that change partition or boot records and effectively render the drive unreadable. The Model 1C is incompatible with the change, hence the error message. Run an anti-virus software. If that was not enough to restore your partition, follow the instructions in section **4.13. NOTE: This will remove all data from your drive.**

Drive not found by the Model 1C's banner:

Is the drive a CD-ROM?
The Model 1C's BIOS does not operate a CD-ROM drive, even though it is a compatible interface for ATAPI CD-ROM drives. The most important component in successful CD-ROM operation is for the proper drivers loading in your config.sys during the boot process. See section **4.8**.

Are the jumpers on the hard drive set correctly?
Make sure that the drive has the proper jumper setting. There should be 2 or 3 settings available to you. The master setting is used when there is also a slave on the same cable. The slave setting is used when there is master present on the same cable. A third setting is single/stand alone, used when the drive is the only drive

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present on the cable (Note, some drives have this setting as master

changeable with the master setting.) For specific settings see your hard drive documentation. (Section 4.7)

Do you have the cable connected correctly?
For proper operation you must have pin-1 from the cable, connecting to the pin-1 on the Model 1C (or your other IDE channel). See section **3.1 step 2 and figure 2**.

Are the drives compatible to run as master and slave?
Not all drives are compatible to run as master and slave, even drives from the same manufacturer. Running a very old drive with a new drive is the most common incompatibility. To test this, try running the drives by themselves or on separate channels.

System error 'Turn off Shadowing' during boot:

Do you have the GSI's BIOS shadowed in your CMOS?
If there has been a change in your drive configuration the Model 1C's BIOS needs to save those changes to its flash BIOS. However if the BIOS is shadowed it can not do that, turn off the CMOS shadowing and reboot. See section **4.10-B** and **4.11.**

Is there another BIOS driven adapter in the computer?
Try removing the other adapter (i.e., SCSI adapter) and reboot the computer. This allows the Model 1C to save information about the hard drive (e.g. model number, etc.) in its Flash memory without interference from the other adapter. Then return the other adapter to the computer and reboot.

Hard drive controller failure message (HDC Failure):

Another controller\adapter at the same IRQ as the Model 1C?
If you run the Model 1C in primary mode it will conflict with your existing adapter (IRQ 14). In some cases, even running in secondary mode will conflict with a motherboard adapter if it has 2 IDE channels. In that case, either disable the Model 1C's IDE channel altogether or change the IRQ to 12 (secondary only). See **4.1-2**.

Do you have a setting for a hard drive in your CMOS when no

drive is attached to channel 1?
If you tell your CMOS that there is a drive on channel 1 by identifying and do not have a drive on channel 1 it will give you an error. For CMOS settings see section **3.2.**

Error message 'non system disk' after GSI banner:

Did you make your hard drive bootable?
You must follow the steps in section **4.6** to make the hard drive bootable.

Is your boot sequence in CMOS set to C then A?
If your system CMOS is set to boot from the hard drive first, and it finds your new drive there it will give you that error message, regardless if you have a boot disk in drive A: or not. Change your boot sequence to A then C and boot from the floppy and follow the steps in section **4.6** to make the drive bootable.

Is there a non system disk in drive A:?
Remove the non system disk from your A: drive.

If the above solutions did not solve your problem, please go to Section 7.

Section 6   Product Versions

The GSI Model 1C Enhanced IDE Adapter is distributed in two ways, bulk and retail (or VAR) packs. Below shows what is included with each:

1) in *bulk* (board, manual and registration card only) — GSI Part # 1533- 1C-xx-x, where *xx-x* is the Model 1C revision number
2) in *VAR packs* (board, manual, registration card, & GSI Cable Select (CSEL) 2-drive cable packaged in a GSI box) — GSI Part # 1533-1C-**V**x-x

6.1   Product Specifications

Model 1C Adapter Dimensions: 2.80" x 5.96"

Bus Slot Requirements:
16-bit ISA-compatible — conforming to IEEE-P996-ISA specification.

Power Consumption: 4 watts (board itself, without J5 drive-power load considered).

IDE Drive Compatibility: Supports any IDE drive which conforms to ANSI X3T9.3 ATA (IDE) specifications.

Western Digital (WD) Enhanced IDE Guidelines: Supports WD-defined Enhanced Drive Parameter Table to handle drives of up to 7.9GB capacity.

Drive Ribbon-Cable Connector: standard 40-pin (2x20) IDE connector, 3M 3417-7000 or equivalent For Interrupt, DMA, and I/O-Address usage, see Sections 4.1-4.3.

Section 7   Installation Notes

If for any reason you need to contact GSI TECHNICAL SUP-PORT you will need your GSI serial number. The serial number can be found on the back of the Model 1C adapter or on the GSI banner during boot up.

Technical support is available Monday through Friday 8 am to 5 PM PST at **(714) 261-9744, fax (714) 757-1778**.

Supplier Information

Date of Purchase:_____ Invoice #_____

Purchased FROM:_____

Phone Number:_____

GSI Product Information

GSI Model 1C Part # 1533-1C___-___

GSI Serial #:_____

Model 1C BIOS Version:_____

GSI BIOS Address:_____

All GSI information can be found on GSI banner (section 3.3).

Please complete and return the enclosed registration card. It must include the GSI serial number (section 1.2) in order to be a registered product.

GSI manufactures other I/O adapters including:

The GSI Model 12 — An 8-bit high-speed floppy-tape accelerator adapter capable of supporting data transfer rates up to 2Mb per second. Perfect accelerator for QIC-3010 and QIC-3020 tape backup drives or for adding more floppy drives to any system.

The GSI Model 2C – Dual-Channel EIDE adapter directly controls up to four EIDE drives. Similar to Model 1C, but adds another EIDE channel and increased flexibility of IRQ and I/O addressing of EIDE channels.

The GSI Model 4C — Quad-Channel EIDE adapter directly controls up to eight (8) EIDE drives. Adds more EIDE channels and increased flexibility of IRQ and I/O addressing of EIDE channels. Industry's first and only eight-EIDE drive adapter!

The GSI Model 21 – EIDE and Floppy-Tape Accelerator adapter. Supports two EIDE, four floppy (including 2.88MB) and one floppy-tape drive. Runs QIC-80, QIC-3010 and QIC-3020 tape backup drives at the faster 1Mb/s data transfer rate - twice as fast as standard floppy controllers.

The GSI Model 32 – EIDE, floppy, tape and I/O adapter. This 16-bit high-speed, multi-port adapter has all of the features of the GSI Model 21, plus two high-speed 16550 UART serial ports and one bi-directional parallel port!

GSI, Irvine, CA
(714) 261-7949 Sales
(714) 261-9744 Technical Support
(714) 757-1778 Fax

All GSI products are designed, manufactured and tested in the USA