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NOTE:
Please remember to send in your warranty registration card.
The Great Valley Products (GVP) Impact A500 Series II product line offers a high performance add-on peripheral product for the Commodore Amiga computer system. This manual serves as the User's Guide for the Impact A500-HD Series II hard drive and RAM controller. A key feature of all GVP Series II SCSI/RAM controllers is the new GVP DPRC™. The DPRC™ is a custom Dual-Port RAM Controller chip that was designed exclusively by GVP and is currently only available on GVP Series II SCSI/RAM controller products. The DPRC™ allows GVP to achieve some of the fastest SCSI transfer rates of any controller in the Amiga market.

Another important feature of the Impact A500-HD Series II controller is the GVP MiniSlot™. This slot will allow Impact A500-HD Series II owners to expand their A500 like they never thought possible. Look in the near future for more exciting products from GVP using the GVP MiniSlot™.

Adding RAM to the Impact A500-HD Series II is relatively simple and requires only a few steps. The RAM that should be used is 100ns (nanosecond) or faster, page mode DRAM SIMMs. DRAM stands for Dynamic Random Access Memory while SIMM stands for Single In-line Memory Module. SIMMs are used because of the ease of installation as well as the space they save. The Impact A500-HD Series II uses 1Mx8 SIMMs for all the memory settings but the eight (8) megabyte setting. The 8 megabyte setting uses 4Mx8 SIMMs. When two of these SIMMs are inserted and the proper jumper settings are used, you will have 8 megabytes of expansion RAM in your Amiga system.

The more common SIMM is the 1Mx8 version. This SIMM comes in two different styles, and to avoid confusion, both of the SIMMs shown below can be used:

In order to install additional RAM in your Impact A500-HD Series II it is necessary to disconnect it from the Amiga A500 and follow the following steps:
**Step 1:**

Once the Impact unit has been disconnected from the Amiga A500 it is very important that you disconnect the external power supply from the Impact A500-HD before opening up its case. **Warning:** Disconnect the power supply from the Impact A500-HD Series II before removing its cover to install any additional options. Installing any product with the power connected could possibly cause injury to yourself and damage to the equipment. Great Valley Products cannot be held responsible for any damages or injuries caused by improper installation of any options installed in the Impact A500-HD Series II. Such improper installation will void all warranties both on the Amiga itself and on the Impact A500-HD Series II.

**Step 2:**

Turn the Impact A500-HD Series II unit over on its top surface so that the bottom of the unit is facing up. Remove the three (3) screws on the bottom of the unit that held the cover on. One of these screws is located in the front center of the bottom and the other two are in the rear corners (see diagram below). Put these screws in a safe place as they are needed to reassemble the unit later.

Now, carefully turn the unit over while holding the top and bottom together in order to prevent the bottom from falling out. Once the unit is resting on its bottom, it is safe to lift the cover off, being very careful with the two sets of wires running from the cover to the base. You can either leave these wires connected and have the cover of the unit rest on its side or you can disconnect these wires, making note of where they are connected to. If you decide to disconnect the wires, you should remove the wire from the base by pulling on the plug at the end of the wire, not on the wire itself.

Once the cover is off, you will be able to open up the RAM access compartment. The RAM access compartment contains the RAM expansion sockets and is covered by a thin metal shield. To open this compartment, all you have to do is lift off the metal cover. Once the cover is off, you will be able access the RAM expansion sockets and the RAM jumpers.

**Step 3:**

You should now set the proper jumper settings so that the Impact A500-HD Series II unit will know how much RAM you will be installing. Once you have located the proper jumpers it will be necessary to refer to the chart below to determine the jumper settings:

<table>
<thead>
<tr>
<th>Memory</th>
<th>SIMM Location</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
<th>J8</th>
<th>J9</th>
<th>J12</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>Front</td>
</tr>
<tr>
<td>2</td>
<td>CN9-CN10</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>Front</td>
</tr>
<tr>
<td>4</td>
<td>CN9-CN12</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>Front</td>
</tr>
<tr>
<td>8</td>
<td>CN9-CN10</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>Rear</td>
</tr>
</tbody>
</table>

The jumpers are set by moving the small black plastic blocks that cover their pins to the proper jumpers according to the chart above. Note that OFF indicates that the jumper is OPEN and that ON indicates that the jumper is SHORTED.

**Step 4:**

Once the jumpers have been set, it is time to install the RAM. The SIMMs must be inserted in a specific order. They go in from the socket closest to the front, to the socket closest to the rear of the unit. (CN9 - CN12).

The SIMMs can only be inserted in one direction since they are keyed. This key prevents the SIMMs from being inserted backwards and being damaged. Once the SIMM is in its socket, apply slight pressure to the top of the SIMM to ensure that it is properly seated. When the SIMM is being seated, it will generally snap into place and a small hook will show through
each hole on the end of the SIMM. Below is a representation of a properly and improperly inserted SIMM.

![SIMM Insertion Diagram]

**Step 5:**

Now replace the RAM access cover and make sure that the wires running from the unit's cover are attached properly (if you disconnected them). Next, replace the unit's plastic cover by gently pushing it over the metal base. Be careful not to catch any of the wires from the cover (especially from the fan) and be sure the power and hard drive LEDs are not bent when replacing the unit's plastic cover.

Once the cover has been placed over the metal base, turn the unit over being careful to hold it together until it is resting on a flat surface. Now replace the three screws that hold the cover down and re-install the unit as per Chapter 3.

---

**Installing the Impact A500-HD Series II on the Amiga A500**

The Impact A500-HD Series II was designed and styled to match your Amiga A500. Once installed, the Impact A500-HD Series II will look like it was originally part of your Amiga system. In addition, the Impact A500-HD Series II has been formatted for you at our factory prior to shipping. This means all you have to do is complete this simple physical installation and power up!

**Note:** It is very important to consult the manual that comes with any software you plan to install on the hard drive for any specific instructions regarding this installation.

**Step 1a:**

First it is necessary to remove the expansion cover on the Amiga A500. This is a small plastic cover on the left side of the Amiga A500. Please refer to your Amiga A500 users guide for more information on removing this cover.

**Step 1b:**

Before you attach your new Impact A500-HD Series II, you should install the enclosed metal shield in order to comply with FCC Class B regulations for radio interference. This shield is a metal grounding plate that should be installed in your Amiga A500's expansion port.

**Warning:** It is extremely important that the GVP shield be installed below the shield already in the Amiga. If the GVP shield is inserted above the Amiga's shield, and the Amiga is powered on, you will destroy your Amiga. Contact GVP tech support if you have any doubt.

This plate, when installed, fits very snugly between the computer's plastic bottom and its own metal grounding shield. This shield is shown on the next page.
The installation of this shield is very simple and requires no tools. The shield is slipped in below the metal shield already in the Amiga and the plastic bottom of the computer. The curved end will fit over the edge of the plastic computer case with the short end actually outside the computer. See the diagram below for detail:

Step 2:

In order to attach the Impact A500 unit to your Amiga A500 all that is necessary to do is slide the Impact unit into the expansion slot on the A500. The diagram below shows how this should be done:

Once the units are together, apply slight pressure to the side of the Impact unit to ensure that it is fully seated.

Warning: Never ship or move your Amiga A500 with the GVP Impact A500-HD Series II connected. Serious damage can occur if these units are shipped or moved together. Always disconnect the GVP Impact A500-HD Series II unit from the Amiga A500 when shipping or moving either of the units. Great Valley Products cannot be held responsible for damages or injuries caused by improper installation of the Impact A500-HD Series II. Such improper installation or transportation will void all warranties on the Amiga A500 itself and on the GVP Impact A500-HD Series II.
Step 3:

Once the unit is properly seated to the Amiga A500 you should connect the power supply. The power supply included with your GVP Impact A500-HD Series II has a round, five-pin connector on one end. This end is plugged into the back of the Impact A500-HD unit. Insert the connector as far as it will go and connect the other end of the power supply into a standard outlet.

Step 4:

Now turn the power on for the Impact A500-HD Series II along with the power for any other peripherals followed by the A500 unit itself. Since the hard drive was formatted for you at the factory your Amiga is now ready. Please refer to Chapter 5 if you wish to change the partitions on your hard drive.

Note: The switch on the top of the Impact A500 unit is an Autoboosting switch. When this switch is to the left (Game Switch position) your hard drive will not autoboost. This position is used for people who do not have KickStart V1.3 or higher, and for programs that do not like autoboosting. When this occurs, reset your machine with this switch to the left and insert your program diskette in the floppy drive of the Amiga. Otherwise this switch must be kept to the right in the Autoboost position. When in this position, your hard drive will autoboost without the need for a boot floppy, providing you have KickStart V1.3 or higher in your Amiga. Also, when initializing a new hard drive, this switch must be to the right in the Autoboost position.

Installing Additional Hard Drives on the GVP Impact A500-HD Series II

Up to six additional SCSI peripheral devices can be attached to any GVP Impact Series II controller. These devices may be hard disk drives, tape drives, CD-ROMs, etc. There are a few concepts to understand about the SCSI interface that should be explained before you do the actual installation.

SCSI ID:

Each SCSI device, or peripheral, is connected to the host interface via a cable. Since all these devices are connected to the same interface board, they must be distinguished in some way. The method the SCSI standard calls for is to assign each device on the interface an ID number. These IDs, called SCSI IDs, range from zero to seven. The GVP Impact controller uses SCSI ID = 7, therefore no other device may use SCSI ID = 7. Please consult the appropriate user’s guide for setting the SCSI ID on any devices you may be adding. Please note that all hard drives installed by GVP are factory set for SCSI ID = 0 and that no two devices on the same interface can use the same SCSI ID number.

Terminating the SCSI Bus:

Since SCSI devices are chained one after another in a “daisy chain”, the last device needs some special attention. The end of the SCSI bus must be terminated with terminating resistors. Terminating resistors come in small packages called resistor packs. These are small plastic packages, usually with eight pins coming out of them. The figure below shows a typical resistor pack.
Note: Some SCSI peripherals do not have terminating packs, instead they have terminating plugs/ connectors which serve the same purpose. Please refer to the appropriate user's guide for more information.

Only the last SCSI device in the chain should contain the resistor packs. It is essential that the terminating resistor packs are removed from all but the last SCSI device. Note that GVP removes all terminating resistor packs on hard drives that are installed by us, and that removing them is not necessary.

Cabling:

When multiple external SCSI devices are used, there are special cabling considerations to be taken into account. The cable to be used is generally wrapped in a thin metal foil providing a shield as per FCC regulations. This is necessary so that the signals leaving your computer do not interfere with other electronic devices. This cable attaches to the back of the GVP Impact Series II controller through a 25-pin connector. The other end of the cable usually has a 50-pin shielded connector which attaches to the external SCSI device. Do not use cables in excess of three feet. Your GVP dealer can provide you with the necessary cabling.

Partitioning and Formatting Using FaasstPrep™

Included with your Impact A500-HD Series II from GVP is a disk called FaasstPrep™. On this disk is a program by the same name that is used to prep and format any SCSI hard drive.

In order to utilize the full power of FaasstPrep™, we will first give you a brief overview of this utility. When executing this utility by double clicking on the FaasstPrep™ icon, you will be presented with a start-up screen offering you several options. Your first choice is whether you are going to use this utility with a SCSI drive or an AT/IDE drive. Since this controller uses a SCSI interface you should not have to change the default, just make sure the gadget in the middle of the screen says SCSI. If this gadget is displaying “AT” then click on it once to change it to “SCSI”

The next option concerns automatic versus manual installation. The following is a brief description of both choices followed by a quick set-up guide:

Automatic: This is the easiest of the two selections when installing a hard drive. This option requires a minimum of input from the user and is the fastest way to set up your hard drive. The Automatic Installation mode is appropriate for novice users, as well as for those who desire a rapid hard drive installation without the immediate need for special options.

Manual: This option gives the experienced user total control over their hard drive. Parameters such as boot priority, mask settings, and buffer size may be altered for any partition even after the drive has been previously partitioned and already contains data. Other parameters such as low and high cylinders are also alterable. The manual mode contains other features explained later on in this chapter and is recommended for the experienced user only.

Quick Set-Up:

Step #1:

Double click on the FaasstPrep™ icon.
Step #2:
Click once on the Automatic Installation gadget

Step #3:
Now enter the number of partitions you would like in the "Number of Partitions" gadget. Remember to enter a return after you enter the number for the amount of partitions. FaastPrep™ will automatically calculate the necessary information. If you do not know what a "Partition" is, simply enter "1" here, for creating a single partition.

Step #4:
Click once on the "Prep/Format" gadget. This will prep and format your SCSI drive. Note: This will completely erase all data currently on the drive. When this is finished FaastPrep™ will ask if you want to copy any disks to the hard drive - all you need to do is click once on the proceed gadget. This will copy the contents of the GVP install disk to your hard drive.

Note: FaastPrep™ will ask you if you want to copy disks to the first partition you created earlier. This is simply a disk copy and is offered as a convenience, not as a means to install software as some software requires special installation routines. If you do not want to copy any disks to your partition then just click on the "Abort" gadget.

Step #5:
Once FaastPrep™ has finished and you have acknowledged that there are no more "prepable" drives, click once on the "Quit" gadget.

Now eject the FaastPrep™ disk and re-boot your Amiga. Your A500 should now auto-boot directly off your newly installed hard drive.

Notes on the Automatic Mode: In the Automatic mode you may change some of the displayed features when performing an installation. For example, if you do not like the default partition names you may change them by positioning the cursor, with the mouse, over the gadget that displays the partition name that you wish to change and then click once. Just delete the old name and enter the new name followed by a return. You can also change the partition sizes if you wish by using the same method for changing the partition names. Just as a reminder- You must click on the "Prep/Format" gadget for this information to be sent to the drive. This will erase any data currently on the drive. If you wish to change information, such as partition name, and you wish to retain the data on the drive you must use the Manual Installation mode.

Manual Installation Features: The manual installation mode of FaastPrep™ was designed to give the advanced user total control over the hard disk. Rather than explaining how to do particular tasks we will explain and define all the features available to you via the manual installation mode.

Information such as partition name, buffer size, boot priority, and mask values can be changed without losing data on the drive. As you will see from the manual screen, there is a lot of data to look at. In the middle of the screen, on two lines, is information about the drive itself. This information includes: Name, ID, Rev, Size, LowCyl, HiCyl, Heads, Sectors, and Blocks. All the data displayed here is either returned from the drive or calculated by FaastPrep (e.g. Size is calculated from the total number of available blocks times the block size. Then the amount of cylinders required to store the RDB data is subtracted from the size and rounded down to give you the final formatted capacity. This value is then displayed in the size gadget). Located just below the general information about the drive is a grid of specific information about the drive’s partitions. Each row, or line, indicates an individual partition structure. This structure information includes: Size, FileSys, LowCyl, HiCyl, BootPri, Mem, Buffers, Mask, and Partition Name. Below are the definitions for these feature:

Size: Specifies the size, in megabytes, of each of the partitions.

FileSys: This is the files system type that is to be used on the partition. FFS-Fast File System, OFS-Old File System, AFS-Alternate File System (not implemented). Normally this is set to FFS.

LowCyl: This is the lowest logical cylinder value for the partition. This value is calculated automatically if the “Auto” gadget, in the lower right hand corner, is clicked on.

HiCyl: This is the high logical cylinder value for the partition. This value is calculated automatically if the “Auto” gadget, in the lower right hand corner, is clicked on.

BootPri: This specifies the booting priority of the partition. Boot priorities indicate to the system which device it must boot from.
Bootable devices have a priority assigned to them in order to determine what the system will boot from. Your Amiga will boot from the device with the highest BootPri value. Please refer to your Amiga manual for more information on boot priorities.

**Mem:** This indicates what type of memory the buffers are to be allocated from. F-Fast memory, C-Chip memory, or E-either chip or fast. The default setting for this is E for either type of memory. This allows the system to choose which is optimum at run time. *Do not choose Fast memory unless your system will always have Fast memory in it.*

**Buffers:** This is the amount of memory, in kilobytes, that the system will allocate for the buffers used in transferring data to and from the hard drive. This number should be entered in decimal, not hex.

**Mask:** This value specifies the Address Mask, which indicates the memory range that DMA transfers can use. This value should be entered in hex form.

**Partition Name:** This is the name that you choose to call your individual partitions.

To the right of the general drive information section are four gadgets. These gadgets include Disconnect/Reconnect, Synchronous, Last Disk, and Last LUN.

**Disconnect/Reconnect:** This option is useful for SCSI devices that have their own internal buffer. When this gadget is selected it allows the device to remove (or disconnect) itself from the SCSI bus while it writes from its own last internal buffer to the slower media of the device. This then frees up the SCSI bus for other tasks. When the device is finished writing, and it needs to access the SCSI bus, it then joins (or reconnects) itself to the SCSI bus in order to finish its task. While this is a desirable feature, most devices do not support it and it should normally be left off.

**Synchronous:** This option allows a hard drive to request a synchronous transfer of data. In some cases this makes for faster data transfers. Currently this is not implemented.

**Last Disk:** This gadget, when checked, tells the controller that the particular device in question is the last device on the SCSI chain. What this means is that the controller will not go looking for devices beyond this one when booting and will stop at this last disk. Consequently this will speed up boot times since the system does not have to seek SCSI IDs with no associated device. Keep in mind that if you add additional devices after the specified last disk then you must change this setting because the system will ignore any device after the Last Disk.

**Last LUN:** Each SCSI ID, as defined by the standard, is allowed to have eight logical subdivisions called Logical Unit Numbers (LUN). This is most common in SCSI devices that have only one on-board interface running several devices (e.g. two drive Bernoulli Box from Iomega). Enabling this option makes the boot process slightly faster and should only be turned off with drives that have multiple LUNs attached.

Near the top of the screen are the Dos Format, Read, and Write gadgets. These gadget functions are as follows:

**Dos Format:** Used to execute a standard Amiga DOS format. This will completely erase all current data on the drive.

**Read:** This will read the RDB mountlist information from the drive. This is useful when you have changed some data on the screen and wish to regain your original parameters. By clicking on the Read gadget, FaaastPrep™ will display the current parameters, as stated in the RDB mountlist, for the drive.

**Write:** This will write the information displayed on the screen to the RDB mountlist of the drive. Changing parameters such as size and cylinder values will destroy all data in those partitions. All other parameters relating to the partition will not destroy data if they are altered.

On the menu bar is a menu titled "Select". This will allow you to either quit or jump to the main screen. It also allows you to create a copy of your RDB in a mountlist format in RAM and generate a boot floppy for users who have V1.2 Kickstart.
In this chapter, we will explain some of the more technical details related to GVP's SCSI software which are useful to know if you want to program the SCSI driver or if you want to improve the performance even further. Some sections (and the example programs on the distribution disk) assume some familiarity with the Amiga's I/O system, especially the way the trackdisk.device works. For an introduction, see [3, Chapter 19 and Chapter 42].

Initialization

The GVP device driver must be opened via the exec.library's OpenDevice() call. It requires a standard I/O request, the "flags" parameter must currently be set to zero. Here is an example:

```c
struct MsgPort *mp;
struct IOSStdReq *io;

if((mp = CreatePort(NULL, 0)) != NULL)
    {
        if((io = CreateStdIO(mp)) != NULL)
            {
                if(OpenDevice("gvpscsi.device", UNIT, io, 0) == 0)
                    {
                        /* SCSI commands go HERE */

                        CloseDevice(io);
                        DeleteStdIO(io);
                    }
                DeletePort(mp);
            }
    }
```

GVP's SCSI driver adheres to the standard defined in the include file `<devices/scсидisk.h>`, so the unit number has the following meaning: The 100s digit is the board number (our driver supports any number of boards), the 10s digit is the logical unit number (LUN), and the 1s digit is the SCSI target ID. The host adapter itself currently uses target ID 7 (HPERR_SelfUnit on OpenDevice()), but this is subject to change. For further information, see [2, pages D-16 and D-17] and [2, pages E-17 and E-18]. The driver automatically recognizes all GVP SCSI controller boards in the system.

Trackdisk Commands

GVP's SCSI driver supports the following trackdisk.device commands (see [2, pages B-70 to B-76] for the official documentation on the trackdisk.device and [2, pages D-19 and D-20] and [2, pages E-20 and E-21] for the corresponding include file definitions):

```
CMD_READ
CMD_WRITE
TD_FORMAT
TD_MOTOR
TD_SEEK
CMD_UPDATE
CMD_CLEAR
TD_REMOVE
TD_CHANGENUM
TD_CHANGESTATE
TD_PROTSTATUS
TD_ADDCHANGEINT
TD_REMCHANGEINT
```

gvpscsi.device will automatically support any block size up to 64 kilobytes that is a power of two, so the io_length and io_offset parameters for the CMD_READ, CMD_WRITE and TD_FORMAT commands do not necessarily have to be multiples of TD_SECTOR (512) bytes, even though the 1.3 file systems (ROM and FFS) do not support other block sizes. It is possible, however, to use SCSI devices with a block size smaller than 512 bytes (e.g. 20-meg Iomega Bernoulli with 256-bytes sectors), since our SCSI driver will handle requests of any size as long as it is a multiple of the current logical block size as understood by the SCSI drive. This is also the reason our new driver does not require the MountList MaxTransfer kludge as most other drivers do (i.e. MaxTransfer is 0x7FFFFFFF). This results in much faster transfer of large data blocks.

In contrast to trackdisk.device V1.3 or earlier, TD_REMCHANGEINT does work! Use of TD_REMOVE is not recommended, since this might interfere with the file system. The current versions of the Amiga file systems do not make use of the TD_ADD/REMCHANGEINT calls, since many drivers do not support them or simply crash. Therefore you should not use more than one partition on any removable medium!
Always make sure the motor is turned off using TD_MOTOR after CMD_READ, CMD_WRITE or TD_FORMAT, since otherwise you might not be able to eject removable media cartridges (e.g. SyQuest).

Direct SCSI Commands

The Commodore SCSI standard provides for a way of sending raw SCSI commands that do not fit into the Amiga's I/O system to the device. This way, a programmer can use any command supported by the SCSI device's firmware. Here's an example on how this feature can be used:

```c
struct IOStdReq *io;
struct SCSICmd SC;
UBYTE command[12];

io->io_Command = HD_SCSICMD;
io->io_Length = sizeof(struct SCSICmd);
io->io_Data = (APTR)&SC;

SC.scsi_Data = (UWORD *)&scidata;
SC.scsi_Length = scsllength;
SC.scsi_Command = command;
SC.scsi_CmdLength = 6;
SC.scsi_Flag = SCSIF_READ | SCSIF_AUTOSENSE;
SC.scsi_SenseData = sensedata;
SC.scsi_SenseLength = MAXSENSE;
SC.scsi_SenseActual = 0;

command[0] = scsicmd;
command[1] = LUN << 5;
command[2] = 0;
command[3] = 0;
command[4] = scsllength;
command[5] = 0;

DoIO(io);
/* ... */
```

HD_SCSICMD is the name of the Exec command being used, io_Length is always set to sizeof(struct SCSICmd), io_Data points to the SCSICmd structure. The SCSICmd structure in turn points to the memory area for the SCSI data and the Request Sense data. It also contains fields for data length and SCSI status information.

For a complete example on HD_SCSICMD, see the distribution disk. Make sure you also read and understand the section “Memory Requirements”. One more restriction: Don't use HD_SCSICMD to perform block I/O on disk devices, use the trackdisk commands (CMD_READ, CMD_WRITE) instead!

The SCSIF_AUTOSENSE feature requires the use of the latest version of <devices/scsidisk.h>, which is, unfortunately, not included with the Version 5.05 of the Lattice C compiler. It can, however, be obtained from Commodore Applications and Technical Support (CATS) as part of the Native Developer Update Kit 1.3.

Memory Requirements

There are certain restrictions on the memory regions that can be used when dealing with SCSI DMA controllers. These restrictions do not necessarily apply to the GVP SCSI controller boards and/or drivers, they should, however, be taken into account when writing software that is supposed to work with other manufacturer's SCSI controllers.

Memory regions used for DMA should be at least word-aligned, some controllers (none of GVP's though) even require longword-alignment. This is easily achieved with the AllocMem() call. The other requirement is related to the type of memory used. Since most SCSI controllers are Zorro-II devices (i.e. designed for the A2000 with its 24-bit address bus), they can only DMA into the lower 16 megabytes of the Amiga's address space. If you happen to have a RAM expansion board that is located outside the address range $00000000 to $00FFFFFF or one that does not support DMA, you must restrict all SCSI data transfers to those regions of memory that do support DMA. In the worst case, this is Chip memory only, so you should allocate data buffers with the MEMF_CHIP attribute and set the MountList Mask parameter to 0x1FFFFF (Chip memory only). Unfortunately, there is no way a programmer can request Zorro-II memory without traversing the free-memory list. None of these restrictions apply to the GVP Impact Series I SCSI controllers, and usually it is
sufficient to use a Mask value of 0xFFFFFE. Please refer to your RAM expansion manual for further information.

Summary: For CMD_READ, CMD_WRITE and TD_FORMAT, io_Data should be at least word-aligned and point to DMA-able memory. io_Length should be an even number of bytes. For HD_SCSI_CMD the same restrictions apply to scsi_Data, scsi_SenseData, scsi_Length and scsi_SenseLength. scsi_Length should not exceed the 24-bit limit.

Mount List and the Rigid Disk Block

GVP’s SCSI software adheres completely to Commodore’s Rigid Disk Block standard. This allows automounting/autobooting with alternate file systems (non-ROM file systems). We also support the FileSystem.resource and file system version numbers, so the SCSI driver will automatically use a later ROM file system if one is available. This enables you to use the Kickstart 2.0 ROM file system and all of its new features, even though the drive might have been prepped with the 1.3 FFS. It also requires much less memory.

One other advantage of the RDB standard is that you can move hard drives and cartridges between different manufacturers’ controllers and boot from them without having to re-prep anything.

VUPrep

The RDB standard is defined in [2, pages D-5 and D-6], [2, pages E-6 and E-7], and [3, pages 538-545].

Speeding up the Autoboot Process

During autoboot, the SCSI device driver scans the SCSI bus for all devices currently connected. Unfortunately, this takes a few seconds, so you might want to break out of this loop if you do not have the maximum of seven SCSI devices connected to your Amiga. This can be done by setting the “Last Disk”, “Last LUN” or “Last TID” flags of the RDB, which will result in a slightly faster autoboot process.

Removable Media

gvp_scsi.device fully supports removable media (e.g. SyQuest, Iomega Bernoulli, Ricoh) by implementing the trackdisk commands TD_REMOVE, TD_ADDCHANGEINT and TD_REMCHANGEINT. The 1.3.2 Fast File Sys-

tem, however, does not make use of them, so you would really have to use the old ROM file system if you wanted to use removable media. Since this is not an acceptable solution, our SCSI driver uses some special tricks to tell the FFS about media changes. One drawback, however, still applies: Workbench icons might change to “BAD” instead of disappearing after you remove a cartridge.

GvpMount is a small utility that can be used to mount removable media that have not been inserted at boot-time. Simply call it without any command line options. Option “-s” will cause GvpMount to stick around until all SyQuests etc. have been mounted (default if you start it from Workbench). This way it can be “Run” in your “Startup-Sequence”.

Disconnect

Version 3 of the GVP SCSI device driver automatically enables all SCSI devices to “disconnect” if more than one is connected. This means that if a SCSI device detects that an operation might take longer than usual (due to seeks etc.), it will release the SCSI bus and give other SCSI devices a chance to operate. Imagine an Amiga with a hard drive and a tape unit: Without the disconnect feature, every time your backup-software would rewind the tape, you could do absolutely nothing with your hard drive until the operation was complete! The same applies for example to low-level formatting of hard drives, which usually takes a few minutes. Under gvp_scsi.device, the SCSI will send the driver a message that it is releasing the bus and yet another message when the low-level format is done. Between these two messages, all other SCSI devices can operate normally, they could even disconnect as well. This is similar to the Amiga’s multitasking ability where one task releases the processor (i.e. “goes to sleep”) until an external event takes place, thereby giving other tasks a chance to run.

The disconnect feature has a slightly higher per-command overhead than the “nasty” mode which “holds” the SCSI bus until the command is completed. With the GVP Impact Series I SCSI controllers, writing very large blocks of data can also be slightly slower in disconnect-mode. If you do not normally operate with several SCSI devices at the same time, you might wish to disable the Disconnect/Reselect feature. If you only have a single SCSI device connected, the driver will use the nasty mode by default.
References:


Technical Specifications

- Combination eight (8) megabyte, zero-waitstate, Fast RAM controller and ANSI X319.2 compatible SCSI controller
- Supports up to seven (7) SCSI peripherals
- High performance DMA transfers to and from hard disk.
- SCSI data transfer rates of up to 3.58MB/sec for SCSI peripherals
- Amiga 500 expansion bus host interface
- Auto-configs both Fast RAM and SCSI controller
- Internal 50-pin SCSI connector
- External 25-pin SCSI connector (DB25). Macintosh-compatible pinout
- Power requirements: +5V, +/-5%, +12V, -2.2 Amps maximum
- Ambient temperature: 0° - 30° C
- Relative Humidity: 20% - 80%

![SCSI Connector Diagram]
### EXTERNAL SCSI CONNECTOR PINOUT

**DB-25** FEMALE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Pin</th>
<th>Name</th>
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<tbody>
<tr>
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<td>REQ</td>
<td>14</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>MSG</td>
<td>15</td>
<td>C/D</td>
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<tr>
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<td>I/O</td>
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<td>Ground</td>
</tr>
<tr>
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<td>RST</td>
<td>17</td>
<td>ATN</td>
</tr>
<tr>
<td>5</td>
<td>ACK</td>
<td>18</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>BSY</td>
<td>19</td>
<td>SEL</td>
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<tr>
<td>7</td>
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</tr>
<tr>
<td>8</td>
<td>DB(0)</td>
<td>21</td>
<td>DB(1)</td>
</tr>
<tr>
<td>9</td>
<td>Ground</td>
<td>22</td>
<td>DB(2)</td>
</tr>
<tr>
<td>10</td>
<td>DB(3)</td>
<td>23</td>
<td>DB(4)</td>
</tr>
<tr>
<td>11</td>
<td>DB(5)</td>
<td>24</td>
<td>Ground</td>
</tr>
<tr>
<td>12</td>
<td>DB(6)</td>
<td>25</td>
<td>TPWR</td>
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<tr>
<td>13</td>
<td>DB(7)</td>
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All odd pins, except pin 25, are ground. Pin 25 is not used.

### INTERNAL SCSI CONNECTOR PINOUT

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<td>ACK</td>
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<tr>
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<td>BSY</td>
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<td>34</td>
<td>NC</td>
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<td>32</td>
<td>ATN</td>
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<td>30</td>
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<tr>
<td>28</td>
<td>Ground</td>
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<tr>
<td>24</td>
<td>Ground</td>
</tr>
<tr>
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<td>Ground</td>
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<tr>
<td>20</td>
<td>Ground</td>
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<td>DB(1)</td>
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<tr>
<td>2</td>
<td>DB(0)</td>
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</table>

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