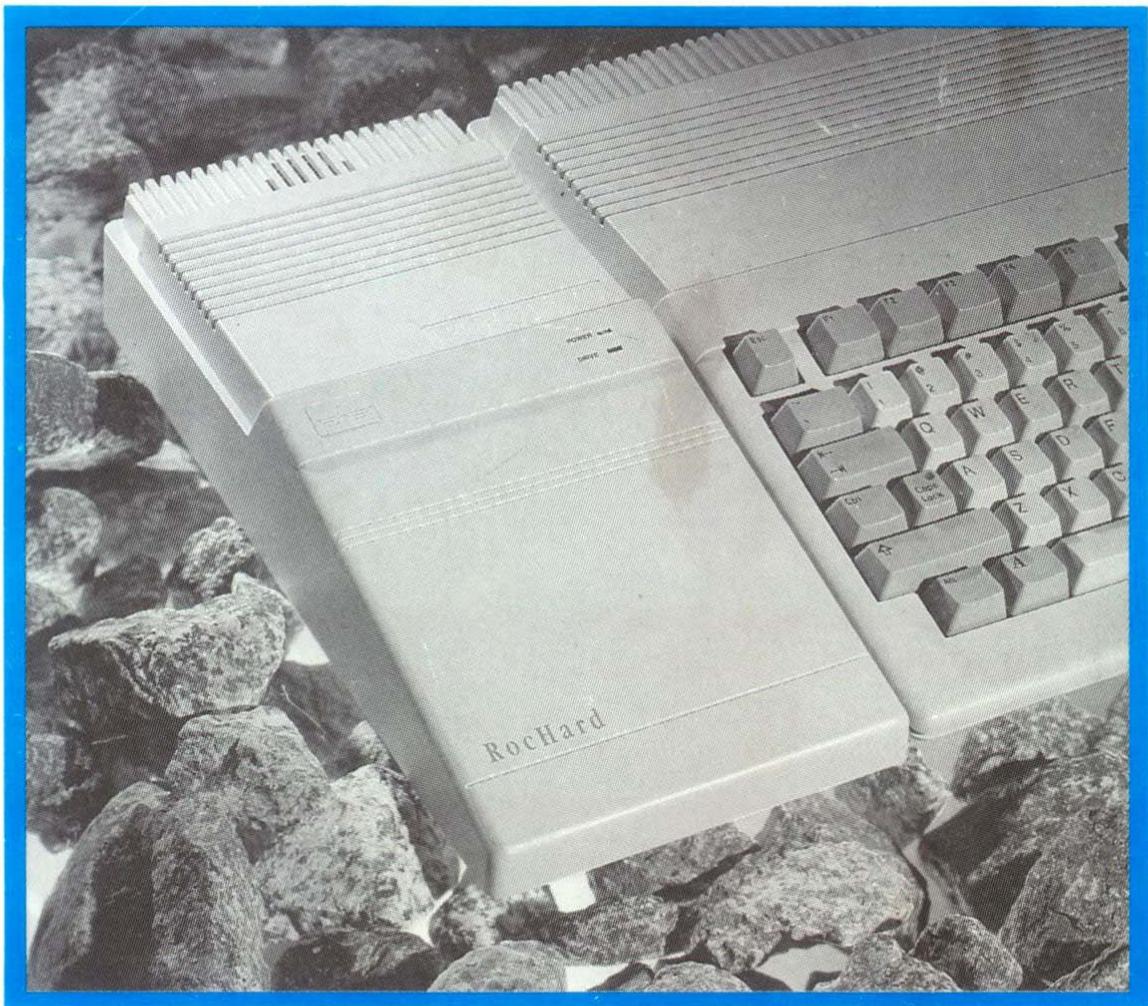


RH800C USER'S MANUAL

R o c H a r d



External Hard Drive
For your Amiga® 500



ROCTEC

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R o c H a r d



External Hard Drive
For your Amiga 500



ROCTEC

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INTRODUCTION

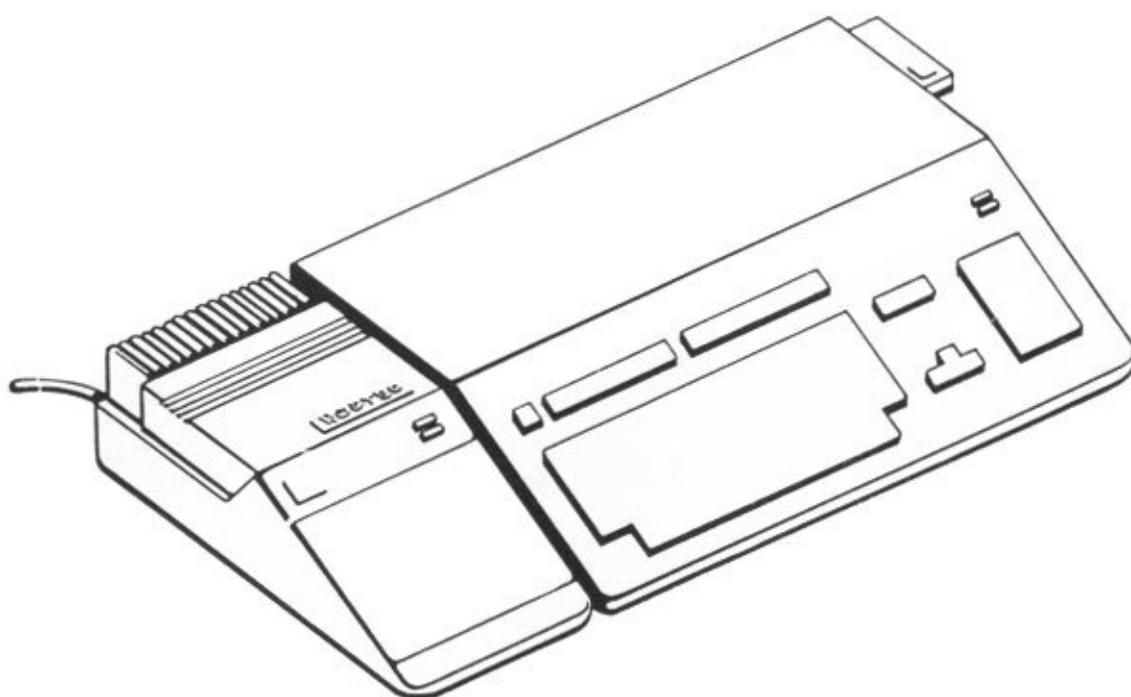
Congratulations on your purchase of RocHard - a versatile, high-performance rigid disk system for your Amiga® 500 computer. RocHard has been designed and built to a high standard and this manual will show you how to get the best from the system. Therefore, please read the instructions before using your RocHard for the first time. In order to help you to get started quickly the manual has been divided into several distinct sections.

Notes: Amiga AmigaDOS, Kickstart, Workbench, Unix, and MS-DOS are registered trademarks or trademarks of Commodore-Amiga, Inc., AT & T and Microsoft.

CHAPTER 1

Quickstart

1. Switch off your Amiga® and its peripherals.
2. Gently prise off the cover on the left side of the A500 to expose the 86-pin expansion port.
3. Plug the RocHard into the expansion port. Don't push too hard. When correctly aligned, the unit will mate with minimum force.



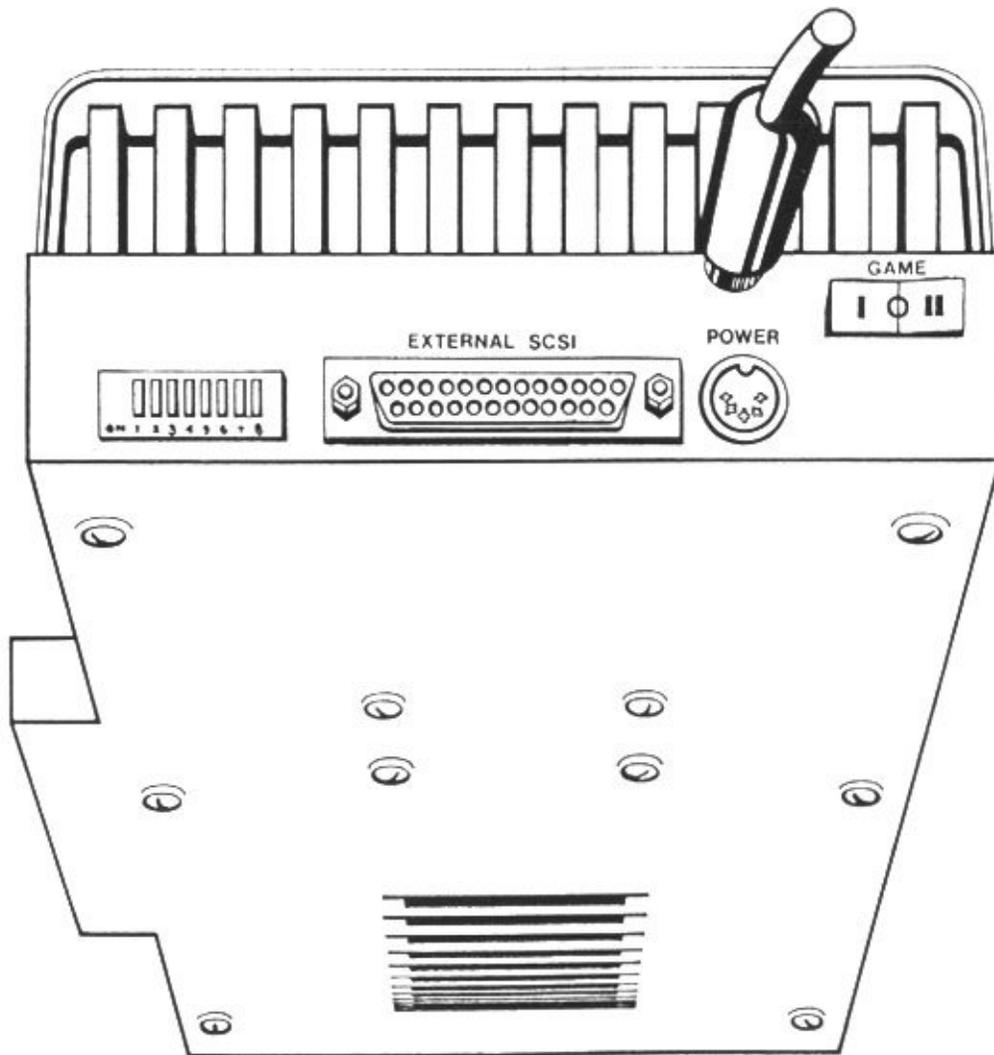
RocHard and Amiga® 500

4. Set RocHard's DIP switch and Game switch to enable the hard drive and/or the expansion RAM. (Your dealer should have already done this - but it's a good idea to check.)
5. Plug the power supply unit (the round 5-pin DIN plug) into the rear of the RocHard, and the mains lead into a suitable outlet. If your PSU has a switch, turn it on now.

6. If your machine is fitted with Kickstart™ 1.3 or higher, proceed to Step 8.
7. Insert the RocHard Boot Disk into Amiga® 500's internal floppy drive. The RocHard Boot Disk is created by the RocHard Formatter (See Section "For Kickstart™ 1.2").
8. Switch on your Amiga system and the machine should boot directly from the hard drive.

	1	2	3
	HDD	RAM	KICKSTART™
OFF	DISABLE	DISABLE	VER. 1.3 OR HIGHER
ON	ENABLE	ENABLE	VER. 1.2

GAME SWITCH		
I	O	II
DISABLE HDD ONLY	DISABLE HDD & RAM	ENABLE HDD & RAM



RocHard's Back Panel

CHAPTER 2

Kit Systems

The following instructions are only applicable to a home assembly system. If your RocHard has been supplied ready configured and assembled, these instructions may only apply when you wish to upgrade.

SECTION 1

Check List

Your RocHard should have been supplied with the following items. If any are missing please contact your supplier immediately:

1. This RocHard User's Manual.
2. The RocHard Controller unit.
3. The Power Supply Unit.
4. A 3.5" RocHard Formatter disk. (Do not use the original. Make a working copy and use that instead. Consult your A500 owner's manual for details of how to do this.)
5. One 40-way cable for IDE hard drive.
6. One 4-way power cable.
7. SCSI Upgrade Kit (Option).

The following items will also be required:

Drive: 1" high hard drive. RocHard supports most commonly available PC-AT IDE type hard drives, as well as SCSI type hard drives with SCSI Upgrade Kit.

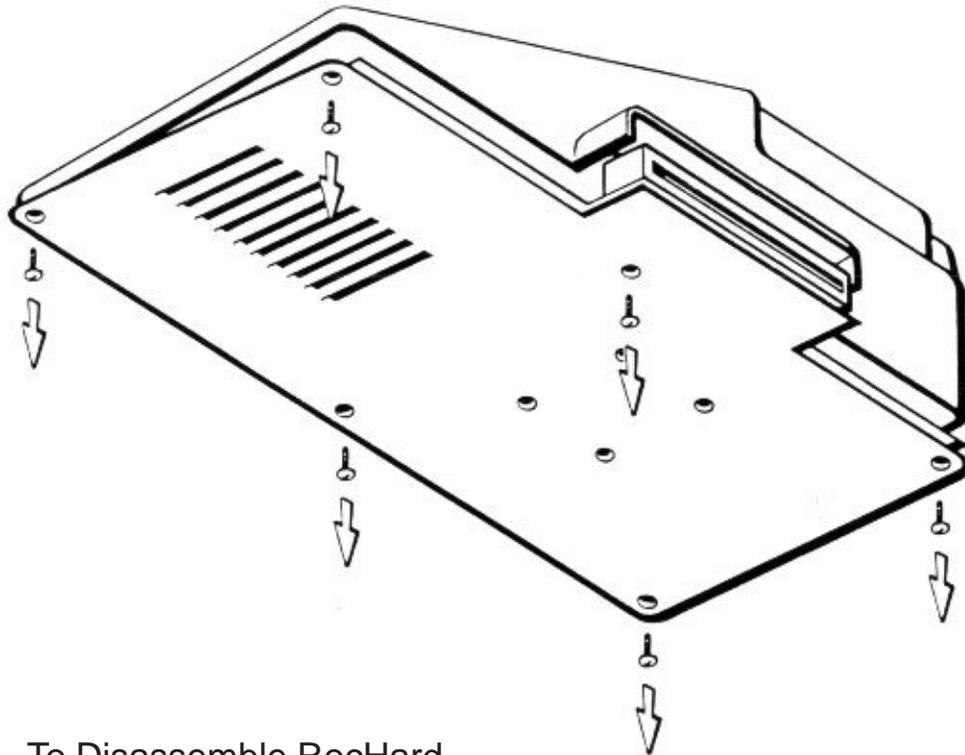
DRAM: 1 MB DRAM SIMM modules (2, 4 or 8 off). Extra RAM is not required for RocHard's operation, but it is advantageous to have.

SECTION 2

Fitting The Hard Drive

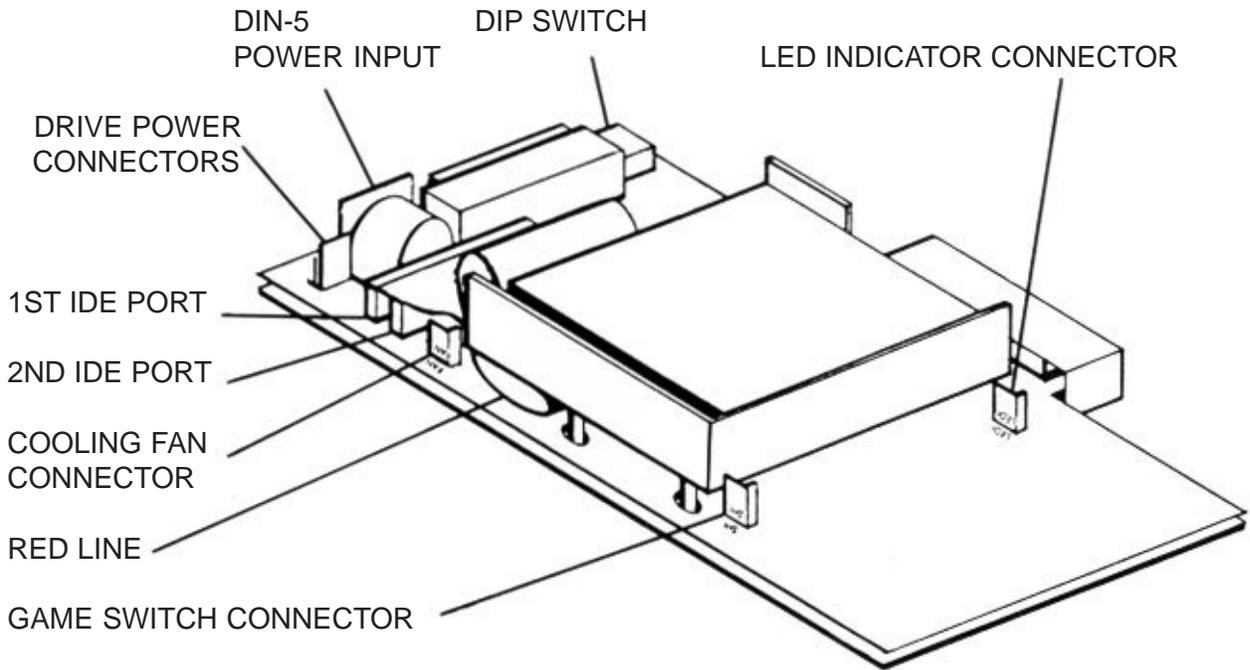
Please follow the diagrams to set up your RocHard system.

1. Use a medium crosshead screwdriver, remove the six screws securing the plastic casing and place these to one side where they won't get lost.



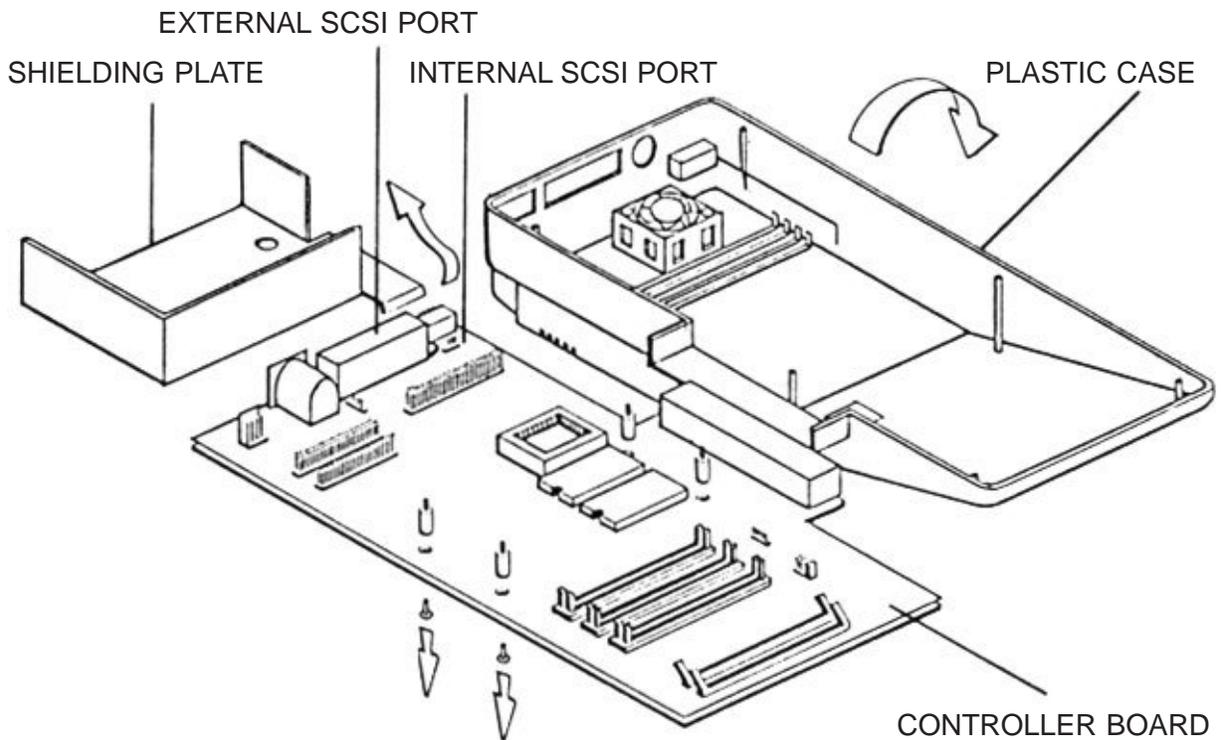
2. Using firm but gentle pressure, prise the plastic casing free from the base. A small screwdriver may be inserted in the slots and twisted to release the case. Do not attempt to lever the case away with a knife or similar implement.

- Unplug the LED Game switch and cooling fan connectors to separate the plastic casing from the controller assembly.
Note the positions and polarity when unplugging.



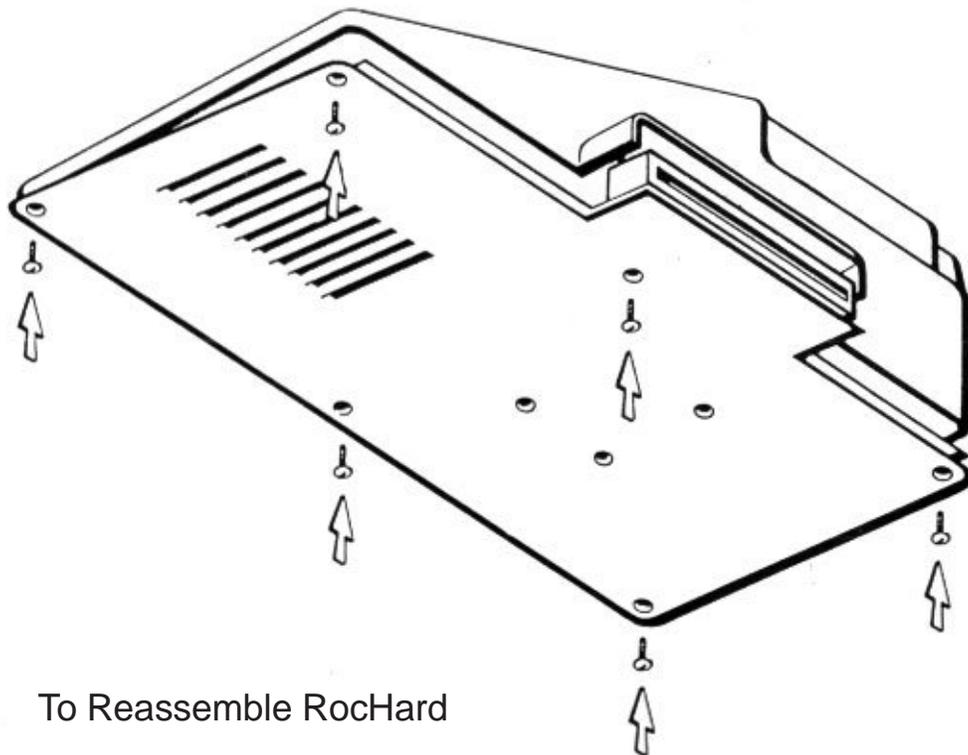
HDD, Shielding Plate and Controller Board Assembly

- Loosen the four studs to remove the shielding plate.



To Remove the Shielding Plate.

5. Plug the 4-way power cable and IDE interface 40-way flat cable (a red stripe on the ribbon cable indicates pin-1) into the hard drive. Place the hard drive on the shielding plate and use the four studs to mount it onto the controller board.
6. Replace the connectors for the cooling fan, game switch and the LEDs correctly; then replace the plastic casing on the controller board and base plate assembly.
7. Replace and tighten the six screws to complete assembly. Take care not to over-tighten the screws.

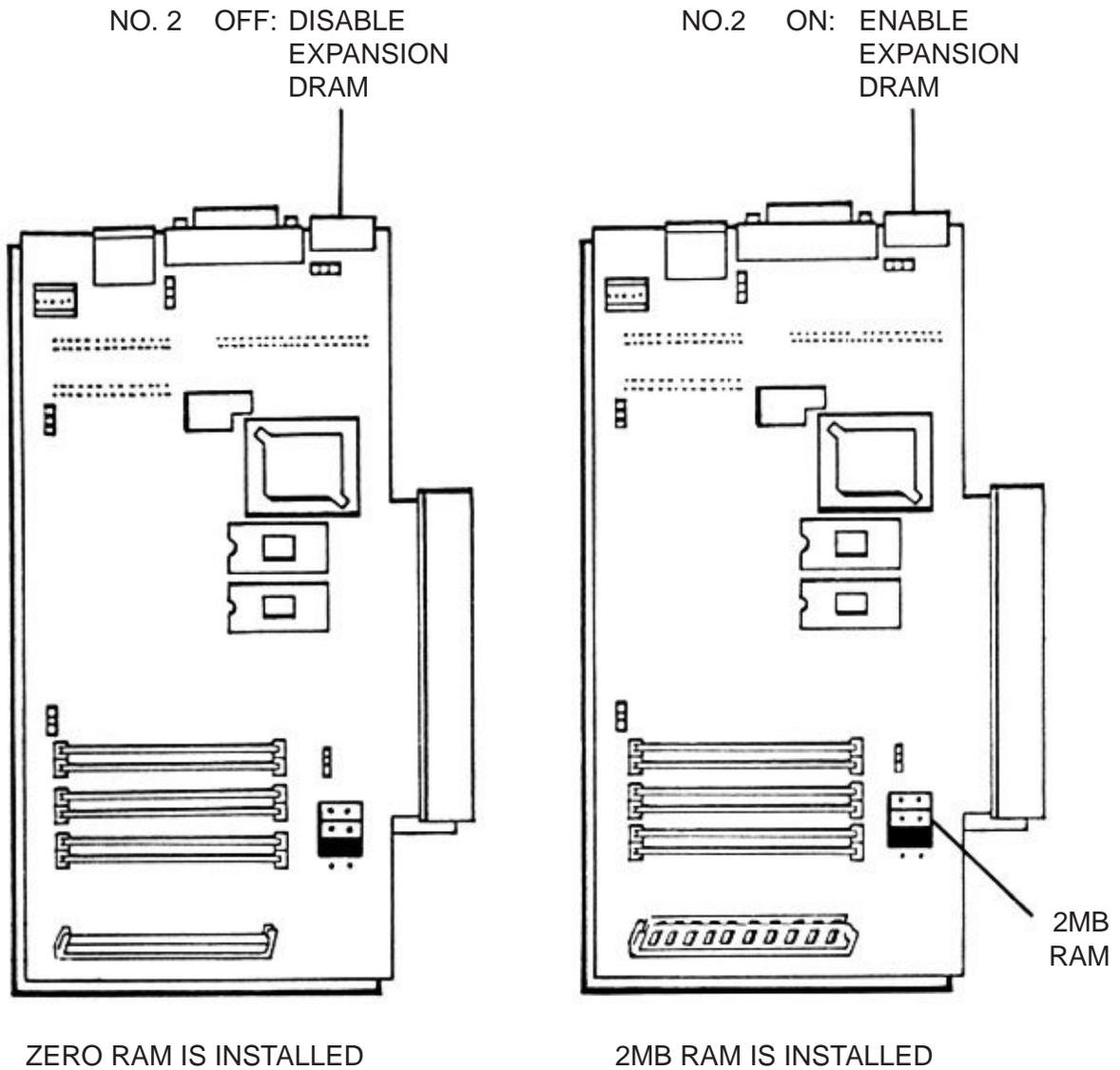


SECTION 3

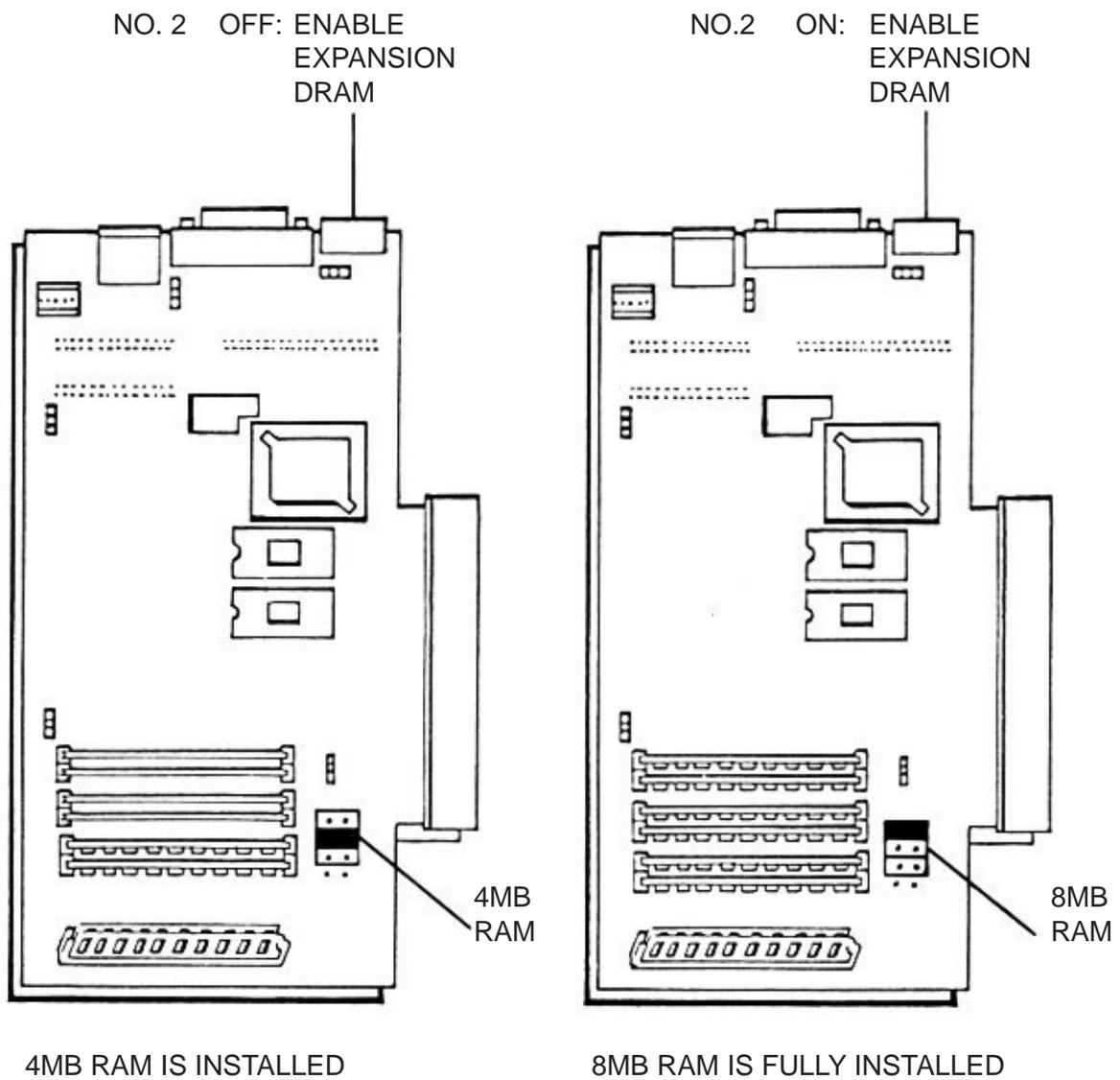
RAM Upgrade

1. Follow steps 1 to 3 in section "Fitting The Hard Drive" to disassemble the case.

2. Carefully insert 2MB, 4MB or 8MB SIMM DRAM modules.
NOTE: Wrong polarity could cause damage to your system.
Check and setup the RAM-configuration jumper correctly.



Expansion RAM Configuration and Jumper Setting



Expansion RAM Configuration and Jumper Setting

3. Follow steps 6 to 7 in section "Fitting The Hard Drive" to reassemble the drive.

SECTION 4

SCSI Upgrade

Please follow SCSI Kit instructions.

CHAPTER 3

The Basics of Partitioning and Formatting

SECTION 1

Introduction

What is a partition and why is partitioning needed?

A hard disk drive is actually a very large disk - even a small one, say 52MB is equivalent to nearly 60 floppy disks! By partitioning a drive, you can separate this large space into more manageable chunks or segments; and each chunk is called a partition.

The decision whether or not to partition a drive, is entirely up to you. One reason for partitioning is to allow several operating systems to reside on a single drive. For instance, you can store AmigaDOS™ in one partition; Unix™ in another and MS-DOS™ in another.

A more common usage of partitions is to make more efficient usage of the disk space available. As far as AmigaDOS™ is concerned, every partition is a separate disk. So you might keep one partition for Workbench™ and Workbench™ Extras; another for applications programs and another for files. This has the advantage of making the tortuous process of backing up a lot simpler, and, because less redundant information is being stored a lot more efficient too.

Workbench™ 2 users can even store copies of Workbench™ 1.3 and 2.0 in different partitions to retain some degree of compatibility with older software. The best way to do this is set up two small partitions and one (or more) larger ones, the first partition - say 5MB will only be used for Workbench™ 2 and its vast array of tools; the second, say 3MB, reserved for Workbench™ 1.3; and the rest of the disk left for applications. You can choose the boot partition on Workbench™ 2 machines by holding down both mouse buttons as the machine starts up - consult your User's Guide for more information.

SECTION 2

More About Partitions

AmigaDOS stores a set of attributes for each partition. The following are the most important:

System ID: this is an identity assigned by the AmigaDOS™ for the partition, from DH0 to DH9. If you have a reference to AmigaDOS™, consult the ASSIGN command for more information.

Capacity: memory size of the partition.

Name: partition name freely assigned by user.

Flag: BOOT/MOUNT/NOMOUNT

(1) System ID

This code is used by the AmigaDOS™ to recognize each partition so it knows how to access it.

You may have a maximum of 10 partitions, no matter how many physical hard drives (IDE type or SCSI type) you have. The system ID of each partition will be dh0:, dh1: ...dh9: (Disk Hard 0, Disk Hard 1 and so on). If you set up a single partition, the entire drive is used and its system ID will be dh0:

(2) Capacity

Each partition can be of different capacity. Of course, the total disk space for all partitions can not exceed the physically available memory space of the hard disk.

If you are familiar with the layout of hard disk drives, you may choose the capacity by setting lower and upper cylinder values. This is also a method to handle “bad sectors” found in the hard drive during formatting.

You can partition the disk so that cylinders containing bad sectors will

not be included. For example, if cylinder 300 has bad sector, you can partition the disk as partition 0 start from cylinder 1 to cylinder 299 and the second partition, partition 1 from cylinder 301 to largest available cylinder.

(3) Name

You can choose your own name for the partition. This is akin to a disk's Volume name or title.

(4) Flag

Each partition has a flag to indicate if it is bootable, auto-mounting or a manual-mounting partition.

Autoboot: A partition with this flag set can be booted by the system. On early machines, only the first partition is made bootable, but with the arrival of Kickstart™ 2, you may have several boot partitions and boot from whichever you choose at startup.

Automount: This flag defines a normal data partition; that is one which does not contain a Workbench. These partitions are made available automatically when the system boots.

ManualMount: These partitions are used by advanced users for other operating systems. A ManualMount partition may contain a completely different operating system or even have a non-Amiga DOS™ format. Such partitions could get in the way of AmigaDOS™ so by not mounting them automatically they never appear on the Workbench™.

SECTION 3

Why Format A Hard Disk Drive?

Nowadays, hard disk drive are usually pre-formatted by the manufacturers. We refer to this type of format operation as the LOW LEVEL FORMAT. Its purpose is to write information to the disk so that the heads can align with the cylinder boundary and starting point of sectors. When disk drive becomes bad due to mis-alignment or sector information lost, you may perform another low-level format to recover from it - this is rarely necessary or viable.

The AmigaDOS™ format is sometimes called the high-level format. It writes information to the disk so AmigaDOS™ can read and write.

CHAPTER 4

Using The RocHard Formatter

If your RocHard came pre-configured with a hard disk drive built in and you are satisfied with its set-up, you can ignore this chapter. If you want to change anything, you should do so now to avoid losing important data. In any case, before attempting to use the formatted in anger, make sure you have a copy of everything on the drive.

SECTION 1

For Beginners

If you are new to hard disk drives or you just want to get going quickly, you will need two disks:

- i. The RocHard Formatter Disk
- ii. The Workbench™ Disk

Now follow the steps shown below:

1. Make a backup of your RocHard Formatter disk. Details of how to do this are in your A500 owners manual.
2. Insert the RocHard Formatter in DF0: and power on the system. Important - the RocHard Formatter must be booted from cold and NOT started from Workbench™. This ensures it knows where to find the required commands and libraries.
3. Wait until the Formatter screen appears. The screen is divided into four areas:
 - 1 - shows the manufacturer information, capacity of the hard disk drive, and which IDE connector has been used.
 - 2 - shows the current partition information of the hard disk drive.

IDE	Drive Manufacturer	Size
1	Conner Peripherals 40MB	41 M
2		

AREA 1

Partition Information :	
ID	0
Size	41 M
Name	RocHard0
Flags	Boot
BootPri	1
Surfaces	4
BlocksPerTrack	26
LowCyl	1
HighCyl	803
NumBuffers	30
BufMemType	Any
MaxTransfer	0x7fffffff
Mask	0xfffffe
DosType	FFS

AREA 2



Help Message
Exit the program

AREA 3



Save Part Info

Format

Exit

AREA 4

3 - the help message area. This gives a short reminder about what the gadget being pointed at does.

4 - is the execution gadgets area.

4. You are now ready to partition the drive. If you want to get started in a hurry, you can just accept the default settings. Click on the "Save Part Info" gadget.
5. Next, click the "Format" gadget.
6. Wait until the formatting process completes (this may take some time - especially with larger drives). You will then be asked to insert the Workbench in any drive and enter the name of the floppy drive [default df0:]. Move the cursor to the end of the name keyed in and press "Enter". This operation takes a little while because the disk must be copied file by file.
7. If everything goes according to plan, you click the "Exit" gadget.
8. If you are using Kickstart™ 1.2, run the CreateBoot Disk program from the RocHard Formatter disk. Note: this converts your RocHard Formatter disk into a boot disk required by Kickstart™ 1.2, so only work on a copy!
9. If you are using Kickstart 1.3 or higher, remove the Formatter disk to reboot the machine. The Amiga at this time will boot right off from the RocHard.

SECTION 2

Setting Up Multiple Partitions

If you are still unsure of what a partition is, read chapter three again. Then, you can follow the same procedure as the previous section. After Step 3 you can now proceed to create partitions following the steps shown below:

1. The manufacturer information area tells you how many megabytes your hard disk drive has. This is the maximum space that you can allocate to the partitions.

2. In the partition information area, the upper four fields are where you will enter partition parameters. Click on the "System ID" gadget. Delete the current number by pressing "DEL" or "Left Amiga and X". The System IDs go from 0 to 9 (ten in all) enter the number of the partition you want to change here. Remember to press "ENTER" to leave the field, otherwise the number you have keyed in will not be accepted.
3. Click on the "Size" gadget and enter the disk space you want to allocate to this partition. Partition size is measured in megabytes and the new value should be less than or equal to the value originally shown.
4. Next, choose the "Name" gadget and enter the name you want for the partition. A maximum of 16 characters can be used for the name.
5. Click on the "Flag" gadget until BOOT appears for partition 0. Generally, all other partitions should be set to MOUNT. Workbench 2 users can define more than one BOOT partition, but the Amiga will boot from the highest priority partition it finds.
6. Repeat steps 2....5 for all the partitions or until available disk space is exhausted.
7. Choose "System ID" gadget, enter 0 and press "ENTER"
8. Click on "Save Part Info".
9. Click the "Format" gadget.
10. Wait until the formatting process completes (this may take some time - especially with larger drives). You will then be asked to insert the Workbench™ in any drive and enter the name of the floppy drive [default df0:]. Move the cursor to the end of the name keyed in and press "Enter". This operation takes a little while because the disk must be copied file by file.
11. If all succeeds, you will be requested to remove the Formatter disk and reboot the machine. The Amiga® at this time, will boot directly from the RocHard!

SECTION 3

Controlled Partitioning

The Formatter has two menus: "SET UP" and "INFO". Here's what they do:

User Mode: the default position is BEGINNER. As has been discussed in previous two sections. If you choose GENERAL here, you can then have more control of the partitions. Notice that the masked items - NumBuffers, BufferType and DosType in partition information will be released as soon as you select GENERAL user mode. ADVANCE gives you ultimate control over the partitions - only use this option if you are confident of your abilities.

NumBuffers: refer to number of cache memory buffers you want AmigaDOS™ to allocate to this partition. You can assign certain number of blocks (512 bytes per block) for this item. 30-50 is quite sufficient, and remembering this memory is taken from the free memory pool so the more buffers you allocate the less memory you have spare.

BufferType: refers to the type of memory you want AmigaDOS™ to use for partition buffer. Three options are available to you, they are CHIP memory, FAST memory or ANY (let Amiga select) type.

DosType: toggles between FastFileSystem (FFS) and OldFileSystem (OFS). Fast file system is the current version of file system and Old File System is the original. Usually, FFS is selected because it has much higher data transfer rate than OFS. However, OFS has better data redundancy (it's easier to fix if something goes haywire) so you might want to use that for some applications.

SECTION 4

Advanced Partitioning

Select ADVANCE user mode if you want to have complete control of partition information. In this mode, all partitioning parameters can be altered. However, it is also very easy to corrupt the previous partition structure that has already been installed on your hard disk drive.

Compared to Section 3 of this chapter, four more items on partition information have been released. They are Surfaces, BlocksPerTrack, MaxTransfer and Mask.

Surfaces: The Surfaces refer to twice the number of platters inside the hard disk. Like a floppy disk, each platter has two magnetic surfaces - but a hard disk can have seven or more disks in a stack, or 14 surfaces.

BlocksPerTrack: is the number of sectors per track of the hard disk. These two parameters are hard disk dependent, each hard disk drive has its specific Surfaces and BlocksPerTrack structure. You should be careful to deal with it or else the hard disk will not work properly.

MaxTransfer: The maximum number of bytes to transfer in one AmigaDos I/O request. Only used by FFS and best left alone.

Mask: An address mask to protect areas of memory. Only used by FFS and, like MaxTransfer best left alone.

As we have mentioned, when bad sector is encountered, the user can then re-partition the hard disk drive so that the cylinder with bad sector will not be included in any partition. For example, if cylinder 300 has bad sector, you can partition the hard disk drive as partition

0 start from cylinder 1 to cylinder 299 and the second partition, partition 1 from cylinder 301 to largest available cylinder. This way, the bad sector is not included in any partition.

SECTION 5

Partition Information

If you just want to review the partition structure of your hard disk drive, you can enter the Formatter program following the first three steps mentioned in Section 1. You should then select "READ CONFIG" from the SET UP menu. This operation will order the program to retrieve the partition structure information previously stored in the partition blocks of the hard disk drive. If several partitions have been defined, you can enter the System ID, e.g. ID 3, the corresponding partition structure information will show up. The Formatter will give you warning if the partition does not exist.

SECTION 6

Re-sizing Partitions

Re-sizing partitions is dangerous for your data. So before attempting anything in this chapter, make sure you have backed up all of your important data.

Now, let's assume you have two partitions: A and B adjacent to each other, that is: the Low Cylinder of partition B is just next to High Cylinder of partition A. When partition A expands, then data in both partition A and B will be destroyed. If partition A shrinks, only data in partition A will be destroyed, partition B will not be affected. However, this latter state will leave a gap between the two.

To re-size the partition, select "READ CONFIG" from the SET UP menu described above. Now, enter the corresponding System ID of the partition you wish to change. This returns the previous partition

structure information. By entering a new value for LowCyl and HighCyl, clicking "Save Part info", the new partition structure will be effective.

Once you are happy with the setup, you must format the new partition using the procedure described earlier. The default behaviour of "Format" is set to format all the available partitions. If you already have data in certain partitions, disable ALL PARTITION option. Now, the "Format" operation will initialize only the partition with System ID shown on the screen at the time "Format" is activated.

SECTION 7

For KICKSTART™ 1.2 User

Old Amiga® 500's come with Kickstart™ operating system version 1.2 which is not capable of booting up the Amiga® from RocHard (or any other hard disk come to that). The preferred method to solve this problem is to upgrade to a later version of Kickstart™. Kickstart™ 2 is an excellent choice. However, as a stop-gap you can use the RocHard Formatter to create a special boot disk.

Following procedure shows the way to make Formatter disk as a boot up disk:

1. Set DIP switch position 3 to "on".
2. Prepare your RocHard partitions as explained previously.
3. If you have just completed formatting and partitioning your hard disk, select "EXIT" operation to quit the Formatter program. If your hard disk has already been prepared, boot up the Amiga with the Formatter disk and select "EXIT" straight away.
4. When the Workbench™ screen appears, double-click on the RocHard Formatter disk's icon.
5. Now double-click on the CreateBootDisk icon.
6. Wait for the program to finish. Now wait another five seconds before rebooting your machine.

7. Your Formatter disk will now work as a boot up disk.

SECTION 8

More Options ...

There are four options in the "FORMAT" sub-menu

Normal: Formats and tests the integrity of all blocks on the hard disk. If any bad sectors are found they are reported.

Quick: If you are sure that the hard disk drive has no bad sector, you can avoid the verify process, by selecting "QUICK" option. This option will skip the verify process and initialize the hard disk drive for you immediately.

All Partition: FORMAT will format all partitions one by one. This option is default and is used to prepare a hard disk from scratch.

Copy Workbench: Lastly, if "COPY WORKBENCH™" is activated, a process of copying Workbench™ disk to the partition with flag "BOOT" will be enabled. Otherwise, the process is disabled.

CHAPTER 5

Questions And Answers

Questions	Answer
What is the Boot Disk for?	Older A500 machines fitted with Kickstart™ 1.2 ROMs will not automatically recognise external devices such as hard drive. The Boot Disk contains special software to overcome this problem.
When I switch on RocHard the power light does not come on, why?	RocHard automatically senses the Amiga® 's power therefore: <ul style="list-style-type: none">• If the light doesn't come on when the Amiga® is turned on, check if the power supply unit is connected properly and switched on.• The green LED illuminates only When the drive is being accessed so it is normal for this to flash.
Why doesn't my A500P boot from external disks when RocHard is attached?	Kickstart™ 2 (A500 Plus machines) reads df0: first. Then checks for a hard drive and only after that looks for floppy disks in other drives. It is possible, although unwise to override df0: too.

<p>Why can't I get any expansion RAM?</p>	<ul style="list-style-type: none">• Have you run NoFastmem? This command disables all expansion RAM including any fitted to the RocHard.• Check the position of the Game switch. In position 0 the RAM and hard drive are disabled.• Check the position of DIP switch 2 - this enables or disables the memory expansion.
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REFERENCE

The DIP Switch:

	ON	OFF
1	Enable Hard disk	Disable Hard disk
2	Enable expansion RAM	Disable expansion RAM
3	For Kickstart™ 1.2 system	For Kickstart™ 1.3 or higher system
4	Reserved	Reserved
5	Reserved	Reserved
6	Reserved	Reserve
7	Reserved	Reserved
8	Reserved	Reserved

The Game Switch:

0	Both RAM and the hard drive are disabled
I	Only the hard drive is disabled
II	RAM and the hard drive are both enabled

Recommended add-on models:

DRAM: 1M x 9-bit or 1M x 8-bit 30-pin socket SIMM, access time less than or equal to 120ns, low power dissipation.

Hard Drives: All the following brands 1" high IDE-HDD are supported.

Conner CPxxx

Fujitsu M2611T

Maxtor STxxx

Quantum LS2AT, L10SAT

Seagate ST351AX, ST3120A

Western Digital Caviar 140/280

Compatibility Chart:

WORK ON \ FORMAT FROM	A500 WITH KICKSTART™ 1.2	A500 WITH KICKSTART™ 1.3	A500 PLUS KICKSTART™ 2.04
A500 WITH KICKSTART™ 1.2	OK	OK	OK, YOUR BOOT PARTITION MUST CONTAIN WORKBENCH 1.3
A500 WITH KICKSTART™ 1.3	OK (SET ONE OF THE PARTITIONS AS BOOT PARTITION)	OK (SET ONE OF THE PARTITIONS AS BOOT PARTITION)	OK, YOUR BOOT PARTITION MUST CONTAIN WORKBENCH 1.3
A500 PLUS WITH KICKSTART™ 2.04	OK (SET ONE OF THE PARTITIONS AS BOOT PARTITION)	OK (SET ONE OF THE PARTITIONS AS BOOT PARTITION)	OK (SET ONE OF THE PARTITIONS AS BOOT PARTITION)

Specifications

PSU

Input: 220VAC 50Hz (for Europe)
120VAC 60Hz (for U.S.A.)

Output: + 5V
+ 12V

Interface: Amiga 500 Computer 86-pin interface

Internal: IDE 40-way interface
IBM HDD 4-way power cable for internal HDD

SCSI port (option)

Expansion RAM: 0, 2, 4 and 8 Mbyte DRAM 1M x 8-bit SIMM
DRAM module or 1M x 9-bit SIMM DRAM
module 120ns or better.

PROM: Two 2764 auto-configure and auto-boot
ROM

Switch: DIP switch - 8 position SPST
Game switch - 3 position DPST

Indication: Red LED for power on
Green LED for HDD active

Dimensions: 145mm x 320mm x 63mm

(Specifications subject to change without notice)

Amiga Hardware World

Everything about Amiga hardware...

~

<http://amiga.resource.cx>