Vortex Computersysteme GmbH

athlet Controller Kit

without Hard Disk Drive

Article No.: 8340 SN: 0310161A

Made in West Germany

User Manual

Vortex Storage Systems for Amiga

Attention:

Warranty claims expire if:

1. The grey production seal is broken.
2. The original vortex serial number has been removed.
3. Our packaging regulations were not followed during return shipment.
4. No dated proof of purchase can be presented.

Further details can be found on a red instruction sheet included with every vortex product.
If this instruction sheet is missing, we will gladly send it to you upon request.

User Manual

for

- vortex SYSTEM 2000/PSM-NS
- vortex SYSTEM 2000/PSM-S
- vortex athlet
- vortex PSM-S

Falterstraße 51-53, D-7101 Flein

1st Edition / 1.3.1990

Table of Contents

1. Introduction

The vortex storage systems for the Commodore Amiga computer series are powerful and flexible system expansions.

Hard disk subsystems, hard disk subsystems with integrated RAM expansions, and RAM expansions with integrated hard disk connectors are available. A special feature of the vortex hard disk subsystems for Amiga computers is the automatic boot capability (Auto-Boot) of the operating system from the hard disk (without a floppy disk), under both Kickstart 1.2 and Kickstart 1.3. No hardware modifications to the computer are required.

All storage systems (except SYSTEM 2000/PSM-NS) are auto-configuring. On systems with an integrated RAM expansion, it can be deactivated.

The vortex RAM expansions operate with zero wait states (0-WaitState) and are available as "Fast Memory". All vortex storage systems with an integrated RAM expansion use standard, space- and power-saving 1MB Single Inline Memory Modules—so-called SIMMs. These modules can simply be plugged into the designated sockets. 2MB requires two SIMMs, and 4MB requires four SIMMs. (In contrast, many other RAM expansions are based on 256KBit RAMs. For 4MB, a total of 128 individual RAM chips are required; during an upgrade, one must ensure that 2048 pins are cleanly inserted into the sockets).

Storage Systems for Amiga 500 and Amiga 1000

The vortex storage systems for the Commodore Amiga 500 and Amiga 1000 belong to the vortex SYSTEM 2000 product family.

vortex SYSTEM 2000 is a universal hard disk subsystem concept based on a base unit that is independent of the computer system and a special Personality Module adapted to the respective computer system.

The base unit contains all system-independent components such as the 3.5" hard disk drive, power supply, and controller, whereas the Personality Module represents the actual interface to the computer system. PSMs are currently available for Amstrad PC, PPC, PCW, IBM PC/XT compatibles, Euro PC, and Amiga 500/1000.

The advantage of the SYSTEM 2000 concept is obvious:

when changing computer systems (e.g., from an Amstrad PC1640 to an Amiga 500), a completely new hard disk subsystem is not required as is usually the case, but only the corresponding Personality Module. This allows the already existing and proven hard disk subsystem to be continued to be used at a fraction of the cost of purchasing a complete new hard disk subsystem.

vortex SYSTEM 2000/PSM-NS

External hard disk subsystem for Commodore Amiga 1000 (also usable for Amiga 500) without RAM expansion.

External hard disk subsystem consisting of a base unit and a Personality Module, available in capacities of 20MB, 30MB, 40MB, and 60MB.

vortex SYSTEM 2000/PSM-S

External hard disk subsystem for Commodore Amiga 500 with integrated RAM expansion.

External hard disk subsystem consisting of a base unit and a Personality Module with integrated 0-WaitState "Fast Memory" RAM expansion, available in capacities of 20MB, 30MB, 40MB, and 60MB, populated with either 2MB (SYSTEM 2000-S2) or 4MB (SYSTEM 2000-S4) RAM. (Note: SYSTEM 2000/PSM-S is also available without unpopulated RAM).

vortex PSM-S

RAM expansion for Amiga 500 with integrated hard disk connector.

The Personality Module PSM-S, a component of the vortex SYSTEM 2000-S, can also be operated without a base unit as a "pure" 0-WaitState "Fast Memory" RAM expansion and can optionally be populated with 2MB or 4MB. A base unit can be retrofitted later, thereby upgrading the entire system to a complete hard disk subsystem with integrated RAM expansion. (Note: PSM-S is also available without populated RAM).

Storage Systems for Amiga 2000

Similar to an IBM PC, the Amiga 2000 computer has expansion slots into which expansion cards can be inserted. By utilizing state-of-the-art 3.5" hard disk drives with an integrated 16-bit controller and gate-array technology, vortex storage systems for the Amiga 2000 achieved the integration of the hard disk drive and RAM expansion onto a single plug-in card.

vortex athlet

Hard disk plug-in card for Commodore Amiga 2000 with integrated RAM expansion.Internal hard disk plug-in card with integrated 0-WaitState "Fast Memory" RAM expansion, available in capacities of 45MB, 90MB, 130MB, and 180MB, populated with 2MB or 4MB RAM (Note: athlet is also available without populated RAM).

This manual is divided into seven sections. Depending on which vortex storage system is to be connected and put into operation, **one** of sections 2, 3 or 4, as well as **all** remaining sections, must be worked through.

1. Introduction and Notes
2. Connection and commissioning of the hard disk subsystems vortex SYSTEM 2000/PSM-NS and SYSTEM 2000/PSM.
3. Connection and commissioning of the vortex RAM expansion PSM-S.
4. Connection and commissioning of the hard disk plug-in card vortex athlet.
5. The RAM expansion upgrade.
6. The utility programs HDSETUP and SHIP.
7. Technical Data.

1.1 Copyrights

vortex Computersysteme GmbH, Falterstraße 51-53, D-7101 Flein bei Heilbronn

Computersysteme vortex AG, Bundesplatz 3, CH-6300 Zug

1.2 Notes

1.2.1 General Notes

vortex assumes no responsibility regarding the suitability of the product for specific applications. In particular, vortex assumes no responsibility for the loss and/or destruction of data stored in this product or in connection with this product.

This manual was written taking into account all information available at the time of completion. Errors and/or incomplete information are possible. We are grateful for suggestions and proposals for improvement. Information not contained in this manual but which is important can be found in a file named "READ.ME" on the supplied "INSTALLATION" system disk.

> **The content of the READ.ME file must absolutely be read before using the device for the first time.** To do this, enter the following command line under the CLI:
>
> 1>TYPE READ.ME<RETURN>

All maintenance and service work should be carried out by vortex or a workshop authorized by vortex. vortex carries no responsibility for damages resulting from improper maintenance and/or service by unauthorized persons. Maintenance or service work can only be carried out if the device is sent to vortex via an authorized specialist dealer and a detailed description of the problem is enclosed. It is in the interest of the customer to ensure that the device is neither missing the original vortex serial number nor has a damaged original vortex production or service seal.

If the device (which contains a highly sensitive disk drive) is not properly packaged when sent to vortex or an authorized workshop for maintenance or service work, it must be assumed with very high probability that the disk drive will be permanently damaged and the data on it can no longer be considered secure. Proper packaging means the original vortex packaging (vortex retail box including vortex shipping box); other packaging must be equivalent.

The goods travel in all cases at the sole risk of the sender!

We recommend that any upgrade of the vortex RAM expansion (athlet, SYSTEM 2000/PSM-S, and PSM-S) be performed by a qualified specialist dealer.

The included utility program HDSETUP is operated under the CLI (Command Line Interpreter), not under the Workbench.

The driver software delivered with the hard disk subsystem only works under Kickstart versions 1.2 and higher. Newer versions can be obtained as an update from Commodore.

This manual explains the commissioning and setup of the vortex SYSTEM 2000, the vortex PSM-S RAM expansion, and the vortex athlet subsystem in connection with Amiga computers. Information on handling the Amiga computers or the Amiga operating system(s) can be found in the corresponding system manuals.

Technical information about the vortex SYSTEM 2000/PSM-NS/S and vortex athlet subsystems can be found in the "Technical Manual for Amiga Storage Systems". This manual can be purchased directly from vortex for a nominal fee.

1.2.2 Notes on Handling the Devices

The hard disk drive built into this device (also called magnetic disk storage or hard disk) is a highly sensitive precision mechanical instrument. For safe and permanent operation, the following must always be observed:

- Transport the device only when switched off and with "parked" read/write heads. Use the included transport lock program SHIP for this purpose. Always use the original or equivalent packaging for transport.
- Never expose the device to hard shocks and/or vibrations during operation.
- Always operate the device in such a way that a good outflow of cooling air to the rear is guaranteed.
- Never expose the device to direct sunlight or other direct temperature influences.
- Never bring the device near magnetic or electromagnetic fields.
- Never operate the device in a heavily contaminated environment (dust, smoke).

The data on the hard disk drive can be destroyed by incorrect operation in addition to the above-mentioned influences. Therefore, always observe:

Formatting or partitioning the hard disk drive irretrievably deletes all data located on this hard disk drive.
Plugging or unplugging the Personality Module while the computer or the base unit is switched on, or inserting/removing the vortex athlet hard disk plug-in card while the computer is switched on, is not permitted and will destroy the electronics of the computer and the vortex storage system!
The SYSTEM 2000 base unit must never be connected to the printer port!

1.3 Before First Use

1.3.1 Unpacking the Device

When unpacking the device, it is critical to ensure that it is not bumped or set down hard. Check the product for completeness according to the scope of delivery described below. If an item is missing, please consult the dealer from whom this device was purchased. Keep the retail packaging and shipping box in a dry place.

1.3.2 Scope of Delivery: vortex SYSTEM 2000/PSM-NS

The scope of delivery of the SYSTEM 2000/PSM-NS includes the following items:

1. The Personality Module PSM-NS for the Amiga 1000 (also usable for Amiga 500), a U-shaped bracket for installation on the Amiga 1000, this manual, the vortex Business Reply Card, a red leaflet, and two 3.5" floppy disks:

   A. "AMIGA WORKBENCH 1.3": Contains Workbench 1.3 and the FastFileSystem among other things.

   B. "INSTALLATION": Contains the utility programs HDSETUP and SHIP among other things.

2. The System 2000 base unit, the 220V power cable, the bus cable with which the base unit and Personality Module are connected, and the "Factory Sheet". This sheet is required, for example, for operation on a PC—keep it safe!

1.3.3 Scope of Delivery: vortex SYSTEM 2000/PSM-S

The scope of delivery of the SYSTEM 2000/PSM-S includes the following items:

1. The Personality Module PSM-S for the Amiga 500 without RAM, or already equipped with 2MB or 4MB, this manual, the vortex Business Reply Card, a red leaflet, and two 3.5" floppy disks:
    - **A. "AMIGA WORKBENCH 1.3"**: Contains Workbench 1.3 and the FastFileSystem among other things.
    - **B. "INSTALLATION"**: Contains the utility programs HDSETUP and SHIP among other things.
2. The System 2000 base unit, the 220V power cable, the bus cable with which the base unit and Personality Module are connected, and the "Factory Sheet". This sheet is required, for example, for operation on a PC—keep it safe!

1.3.4 Scope of Delivery: vortex PSM-S

The scope of delivery of the vortex PSM-S includes the following items:

1. The Personality Module PSM-S for the Amiga 500 without RAM, or already equipped with 2MB or 4MB, this manual, the vortex Business Reply Card, and a red leaflet.

1.3.5 Scope of Delivery: vortex athlet

The scope of delivery of the vortex athlet hard disk plug-in card includes the following items:

1. The vortex athlet hard disk plug-in card for the Amiga 2000 without RAM, or already equipped with 2MB or 4MB, this manual, the vortex Business Reply Card, a red leaflet, and two 3.5" floppy disks:

    A. "AMIGA WORKBENCH 1.3": Contains Workbench 1.3 and the FastFileSystem among other things.

    B. "INSTALLATION": Contains the utility programs HDSETUP and SHIP among other things.

1.3.6 About this User Manual

To avoid damage caused by improper handling or operation, this user manual must be read carefully before using the device for the first time.

1.3.7 Checking the vortex Production or Service Seals

Maintenance and service work can only be carried out by vortex or an authorized workshop if these seals are present and undamaged. If you notice that these seals are missing or damaged upon unpacking the devices, contact the dealer from whom this device was purchased immediately.

1.3.8 Locating the vortex Serial Numbers

SYSTEM 2000: On the back of the base unit is a type plate where the serial number and the formatted storage capacity of this System 2000 base unit are entered. The Personality Module also carries a serial number.

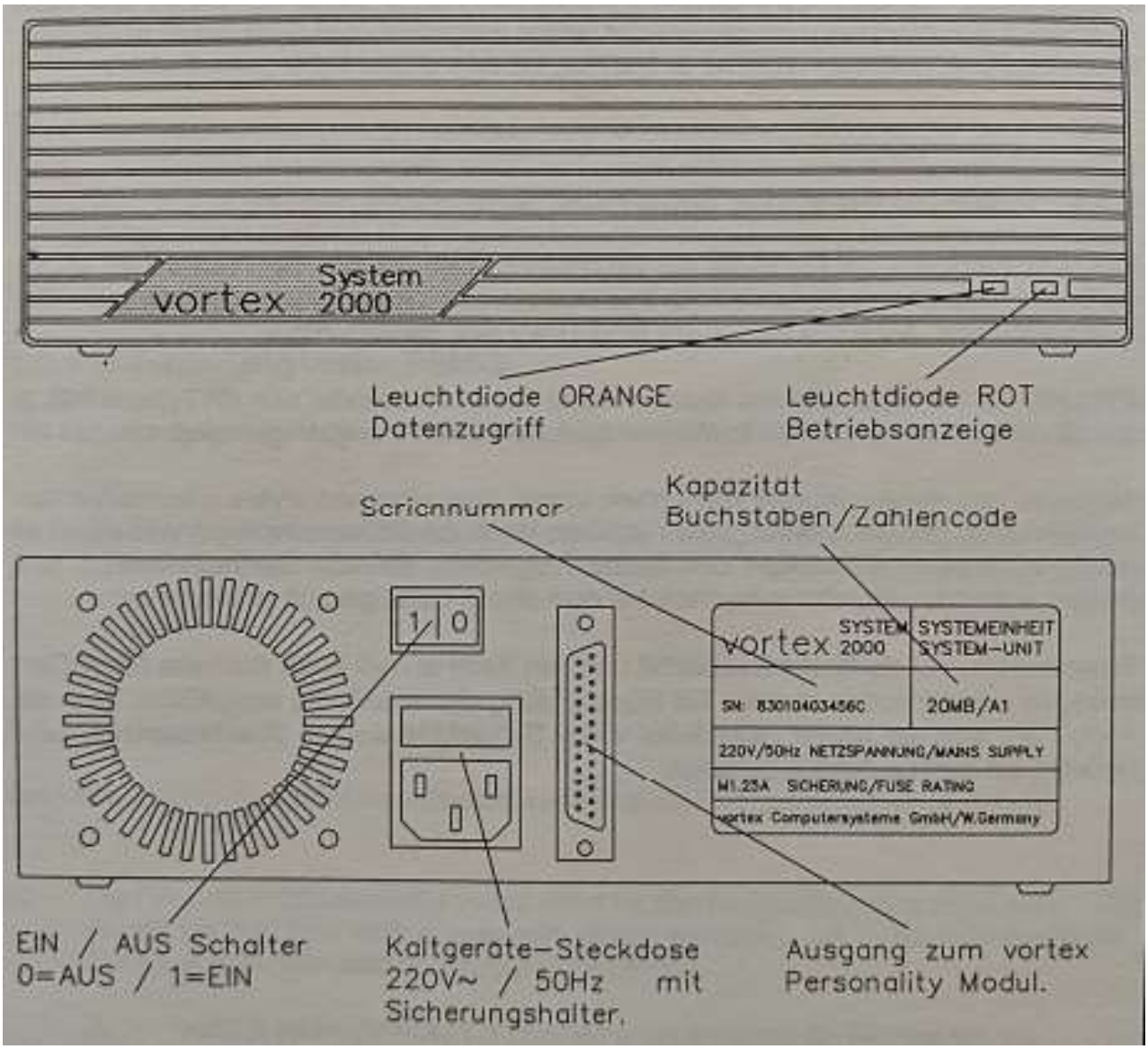
ATHLET: On the back of the metal frame of the athlet is a type plate where the serial number and the formatted storage capacity are entered.

Maintenance and service work can only be carried out if the serial number(s) is/are present. If you find that the serial number(s) is/are missing when unpacking the devices, visit the dealer from whom this device was purchased immediately.

Enter the serial number(s), storage capacity, and computer type into the Business Reply Card and send it to vortex. Upon returning the completed Business Reply Card, the buyer becomes a registered vortex user and will be kept informed about innovations and updates.

2. Connection and Commissioning of the Hard Disk Subsystems vortex SYSTEM 2000/PSM-NS and SYSTEM 2000/PSM-S

2.1 The SYSTEM 2000 Base Unit



(Picture 2.a)

Referencing Picture 2.a)

- **ORANGE LED**: Data Access
- **RED LED**: Power Indicator
- **Serial Number**: e.g., SN: 83010403456C
- **Capacity Letter/Number Code**: e.g., 20MB/A1
- **Mains Supply**: 220V/50Hz
- **Fuse Rating**: M1.25A
- **ON / OFF Switch**: O = OFF / 1 = ON
- **IEC Power Socket**: 220V/50Hz with integrated fuse holder
- **Output**: Connection to the vortex Personality Module

RED LED

This LED indicates that the System 2000 base unit is switched on.

ORANGE LED

This LED signals data access (reading and writing) to the hard disk drive. Whenever it lights up, data is being transferred between the computer system and the System 2000 base unit.

ON/OFF Switch

If this rocker switch is set to "0", the device is switched off. If it is set to "1", the device is switched on—provided it has been connected to the 220V/50Hz mains. After switching on, the device requires approx. 15 seconds until it is ready for operation (this is the spin-up time for the disk drive).

IEC Socket with Integrated Fuse Holder

The power cable supplied with the device fits into this IEC socket. The SYSTEM 2000 base unit is supplied with 220 Volt mains voltage via this socket (mains frequency: 50 Hertz). The device fuse is located in a small slider above this socket: M1.25A250V.

> **This slider must never be removed if the device is connected to the 220V mains!!**

Should it ever be necessary to replace the fuse, care must be taken that only a medium-blow (mittelträge) fuse with 1.25 Amperes is used.

Operate the device only on a 220V AC mains network (50Hz)! 220V~50Hz
Only use fuses of the type M1.25A250V!

Output to the vortex Personality Module

Connection socket for the vortex Personality Module. One end of the bus cable is plugged in here and locked with the two thumb screws. The other end is plugged into a corresponding socket on the vortex Personality Module.

The bus cable connecting the base unit to the Personality Module may only be removed or inserted when both devices (base unit and Amiga) are switched off!

Storage Capacity

This value is the formatted storage capacity of this System 2000 base unit. It must be entered into the Business Reply Card. This field also contains a letter/number code (e.g., "A1"). It is required if the System 2000 base unit ever needs to be low-level formatted again (see vortex utility program HDSETUP).

Serial Number

The serial number of this vortex System 2000 base unit is printed here. It must be entered into the Business Reply Card.

2.2 Connecting the SYSTEM 2000/PSM-NS to the Amiga 1000 (or 500)

1. Turn off the Amiga computer and all possibly connected peripheral devices and pull all power plugs out of the socket(s).

2. The following figures show the connection of the Personality Module PSM-NS to the Amiga 1000 (Figures 2.b to 2.d) or the Amiga 500 (Figure 2.e). The Personality Module is plugged onto the expansion port of the Amiga. The expansion port of the Amiga 1000 is exactly reversed relative to the expansion port of the Amiga 500. To ensure that the bus cable can also be routed to the rear on the Amiga 1000, there are two 25-pin D-SUB sockets on the PSM-NS. The choice of the socket is up to the user. To ensure a secure connection when operating on the Amiga 1000, the U-shaped bracket (included) must be screwed onto the Personality Module. Since the Personality Module has a bus pass through, it should be plugged into the expansion port as the first module.

   It is not possible to operate several PSM-NS simultaneously on the Amiga!
   A PSM-NS and a PSM-S can, however, be operated simultaneously.
   Only one base unit may be connected to a PSM-NS.

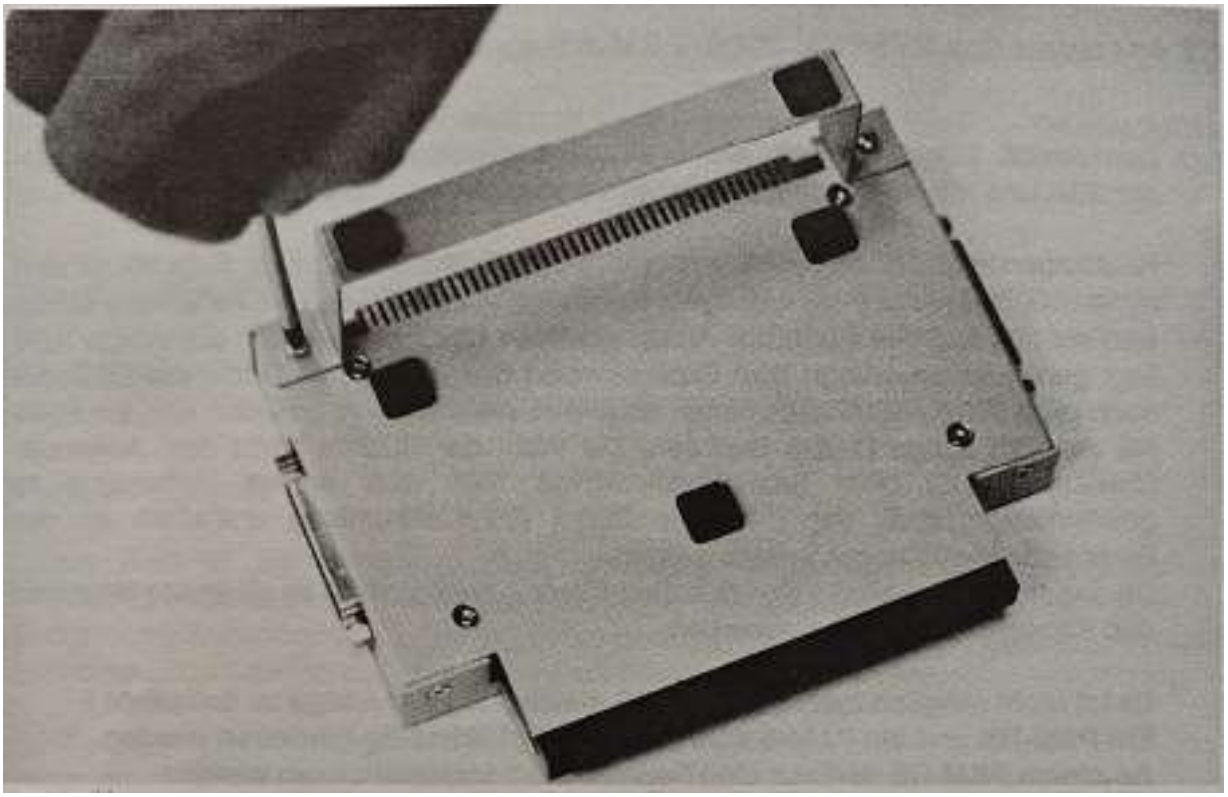
3. The base unit should be placed in a clean and safe location on the workspace.

4. The System 2000 base unit is now connected to the Personality Module via the supplied bus cable (25-pin D-SUB plugs on both ends). **Screw both plugs firmly to the sockets!** (see Figure 2.d).

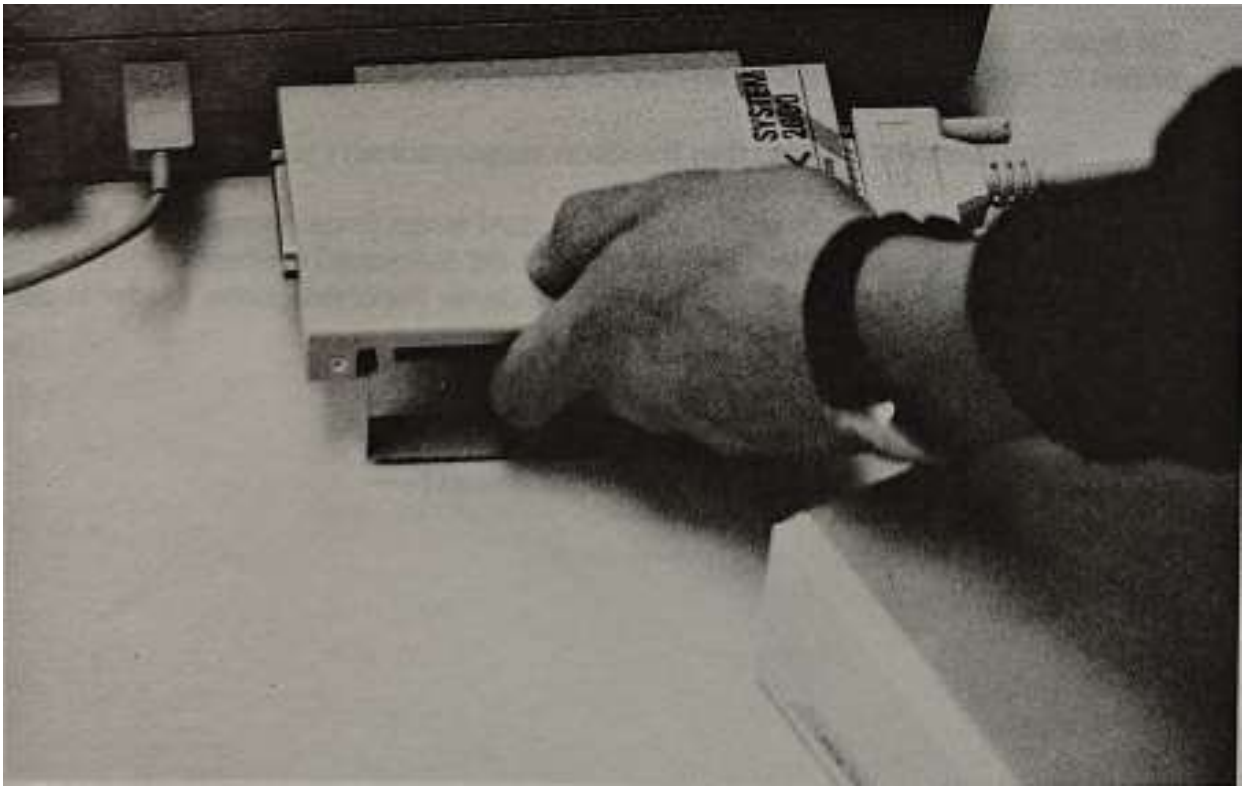
5. Then plug one end of the supplied power cable into the back of the System 2000 base unit and the other end into the wall socket. Plug the power cables of the Amiga and any existing peripherals back into the sockets.

Continue reading at Section 2.4.

---- Leave devices switched off! ----

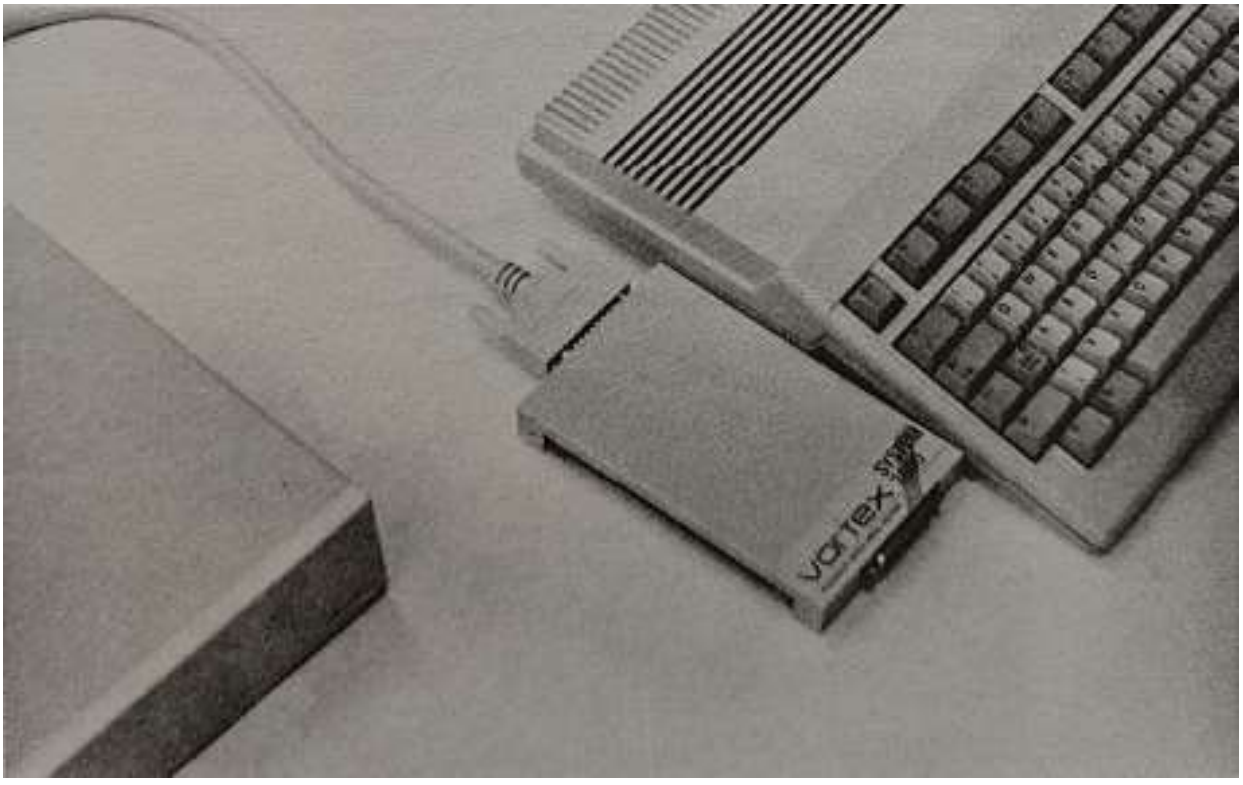


(Picture 2.b)



(Picture 2.c)

(Picture 2.d)



(Picture 2.e)

2.3 Connecting the SYSTEM 2000/PSM-S to the Amiga 500

1. Turn off the Amiga computer and all possibly connected peripheral devices and pull all power plugs out of the socket(s).

2. If the RAM expansion integrated into the PSM-S is to be upgraded, Section 5 must be processed now. After upgrading, continue reading at item 3 of this section.

3. Check the correct setting of DIP switch SW1 (see Figure 2.f).

4. The following figures show the connection of the Personality Module PSM-S to the Amiga 500 (Figures 2.g and 2.h). The Personality Module is plugged onto the expansion port of the Amiga. Since the Personality Module has a bus pass through, it should be plugged into the expansion port as the first module.

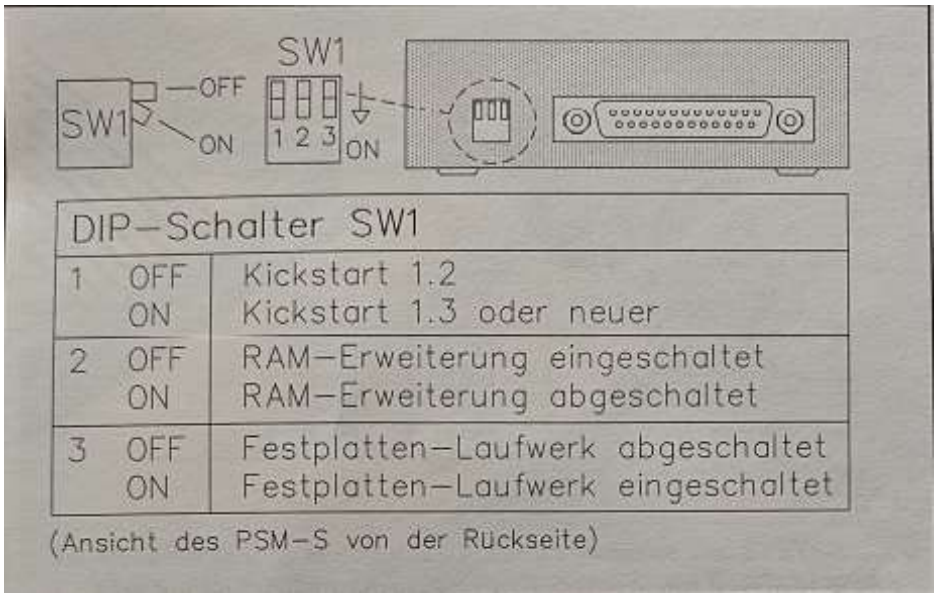
5. The base unit should be placed in a clean and safe location on the workspace.

6. The System 2000 base unit is now connected to the Personality Module via the supplied bus cable (25-pin D-SUB plugs on both ends). **Screw both plugs firmly to the sockets!** (see Figure 2.h).

7. Then plug one end of the supplied power cable into the back of the System 2000 base unit and the other end into the wall socket. Plug the power cables of the Amiga and any existing peripherals back into the sockets.

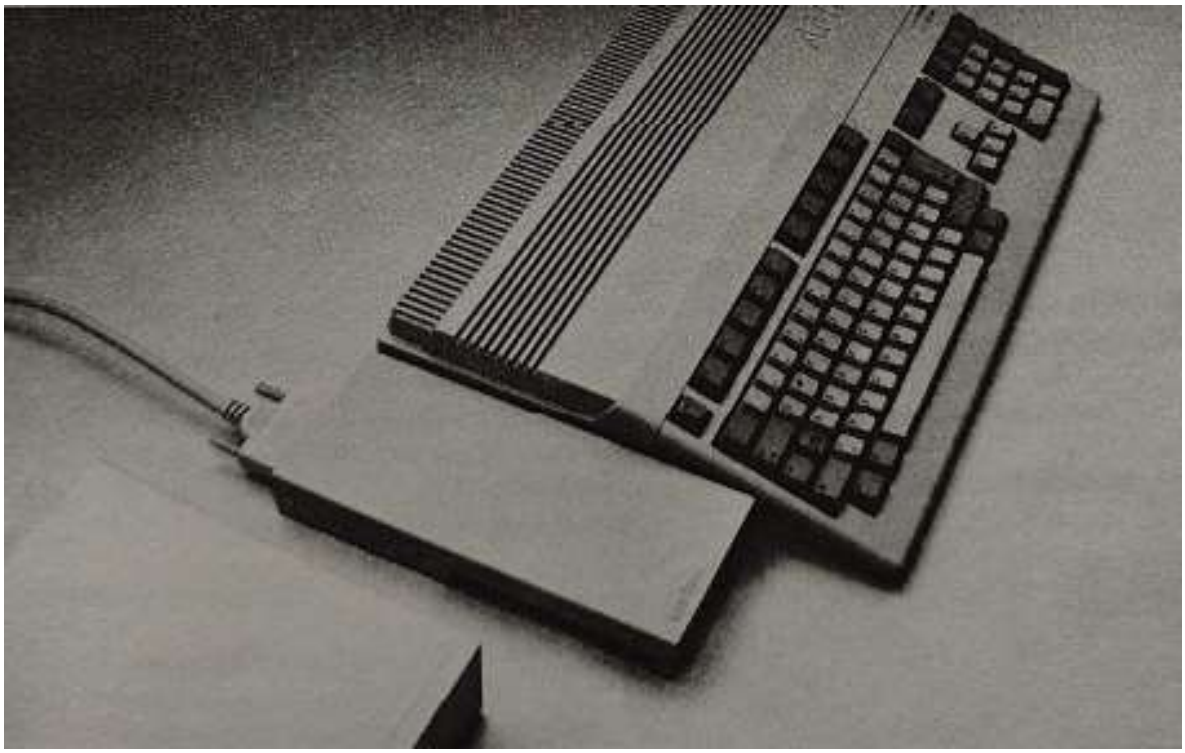
Continue reading at Section 2.4.

---- Leave devices switched off! ----

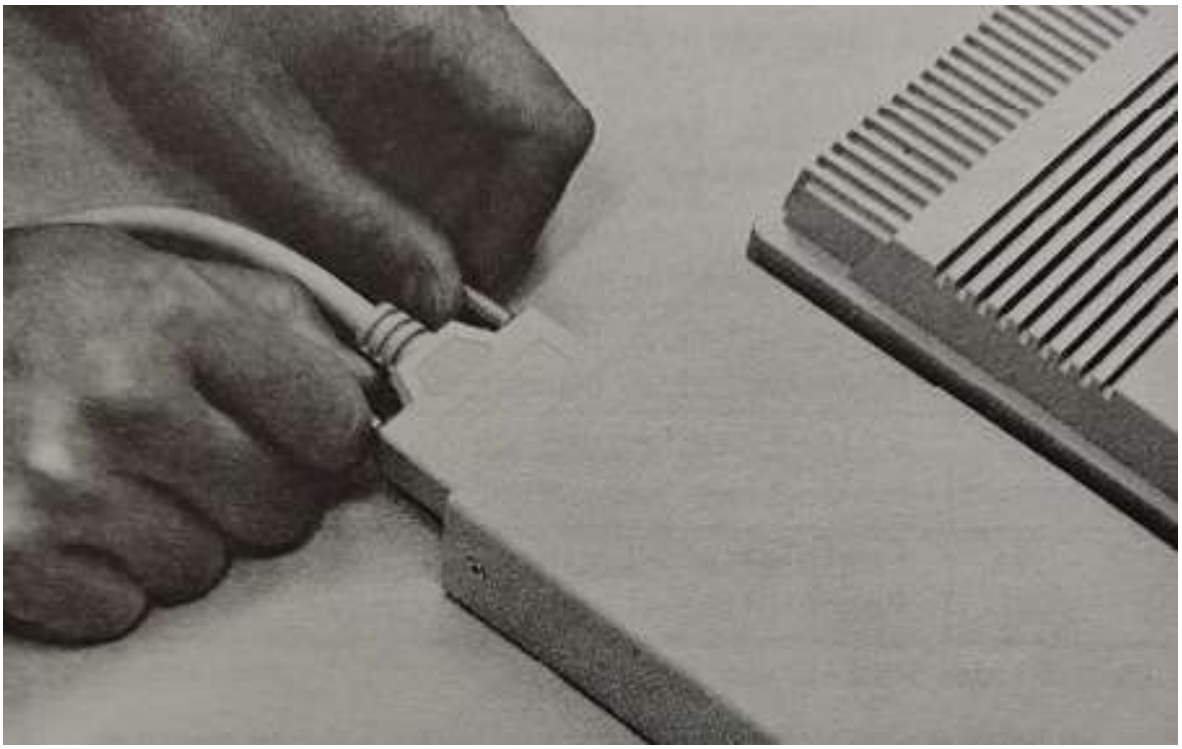


(Picture 2.f)

DIP Switch SW1 Settings		
Switch	**Position**	**Function**
1	OFF ON	Kickstart 1.2 Kickstart 1.3 or newer
2	OFF ON	RAM expansion enabled RAM expansion disabled
3	OFF ON	Hard disk drive disabled Hard disk drive enabled



(Picture 2.g)



(Picture 2.h)

2.4 Commissioning SYSTEM 2000/PSM-NS and SYSTEM 2000/PSM-S

The preparatory work for commissioning the System 2000 for Amiga 500/1000 under AmigaDOS has already been carried out at the factory. vortex SYSTEM 2000/PSM-NS and vortex SYSTEM 2000/PSM-S are ready for operation.

The default partitioning is:

System 2000 with	Part 1	Part 2	Part 3	Part 4
20 MB	10 MB	10 MB		
30 MB	15 MB	15 MB		
40 MB	10 MB	10 MB	10 MB	10 MB
60 MB	15 MB	15 MB	15 MB	15 MB

It makes sense to first familiarize yourself with how the SYSTEM 2000 works before making changes to the factory settings.

2.4.1 First Use

Power-on sequence:

1. Have two empty 3.5" floppy disks ready.
2. Switch on the System 2000 base unit.
3. Switch on the Amiga.
4. Insert the "INSTALLATION" disk into floppy drive DF0:.
5. Follow the instructions of the program now running (output of the READ.ME file and creation of backup copies of the INSTALLATION and WORKBENCH disks).
6. After successful completion of this program, remove the disk from the drive and reset the computer system.
7. The Workbench will now load. The hard disk drive can now be accessed via the hard disk icons.

Power-off sequence:

1. Start the program **SHIP**.
2. Switch off the Amiga computer.
3. Switch off the System 2000 base unit.

2.4.2 Normal Operation

Power-on sequence:

1. Switch on the System 2000 base unit.
2. Switch on the Amiga. In order for the operating system to be loaded from the hard disk drive, there must be no disk in a floppy disk drive! (Otherwise, the operating system will be loaded from the floppy disk).

Power-off sequence:

1. Start the program **SHIP**.
2. Switch off the Amiga computer.
3. Switch off the System 2000 base unit.

Note:

By pressing the left mouse button while switching on the computer, the hard disk drive can be prevented from mounting into the operating system. The computer then behaves as if no hard disk drive were present.

3. Connection and Commissioning of the vortex RAM Expansion PSM-S

3.1 Connecting the vortex RAM Expansion PSM-S

1. Turn off the Amiga computer and all possibly connected peripheral devices and pull all power plugs out of the socket(s).
2. If the RAM expansion integrated into the PSM-S is to be upgraded, Section 5 must be processed now. After upgrading, continue reading at item 3 of this section.
3. Check the correct setting of DIP switch SW1 (see Figure 2.f). Switch 3 of DIP switch SW1 must be set to **OFF**!
4. Figures 2.g and 2.h show the connection of the Personality Module PSM-S to the Amiga 500. The Personality Module is plugged onto the expansion port of the Amiga. Since the Personality Module has a bus passthrough, it should be plugged into the expansion port as the first module.

If the PSM-S is to be expanded into a full hard disk subsystem SYSTEM 2000/PSM-S, a corresponding base unit is required (20MB, 30MB, 40MB, or 60MB). The procedure for connecting and commissioning the SYSTEM 2000/PSM-S can be found in Section 2 of this manual.

3.2 Commissioning the vortex RAM Expansion PSM-S

The RAM expansion is available after loading the operating system. No further installation work needs to be carried out. (Information about the function of DIP switch SW1 and jumpers SW2 can be found in Section 5 of this manual.)

4. Installation and Commissioning of the Hard Disk Plug-in Card vortex athlet

4.1 Installing the athlet Hard Disk Plug-in Card into the Amiga 2000

1. Turn off the Amiga computer and all possibly connected peripheral devices and pull all power plugs out of the socket(s). Loosen the upper case by removing the 4 side screws (2 on each side) and the single screw on the back of the Amiga 2000, and remove it carefully.
2. If the RAM expansion integrated into the vortex athlet is to be upgraded, Section 5 must be processed now. After upgrading, continue reading at item 3 of this section.
3. Depending on which Kickstart version is available (either version 1.2 or higher), jumper SW1-3 of the athlet controller must be closed (Kickstart 1.3 or newer) or left open (Kickstart 1.2); see Figure 4.a.
4. The following figures show the installation of the athlet hard disk plug-in card into the Amiga 2000 (Figures 4.b and 4.c). Look for a free 100-pin slot for the hard disk plug-in card. Then remove the slot bracket belonging to this slot by loosening the single retaining screw. Insert the hard disk plug-in card into the free slot so that the 100-pin card edge connector of the athlet card snaps firmly into the socket of the Amiga 2000 motherboard and is guided cleanly by the guide rail at the front and the slot bracket at the back. Then tighten the retaining screw again.
5. Plug the cable for the hard disk LED of the Amiga 2000 into "Connector D" of the hard disk plug-in card (Figure 4.d).
6. Reassemble the Amiga 2000 top cover firmly and reconnect all cables.

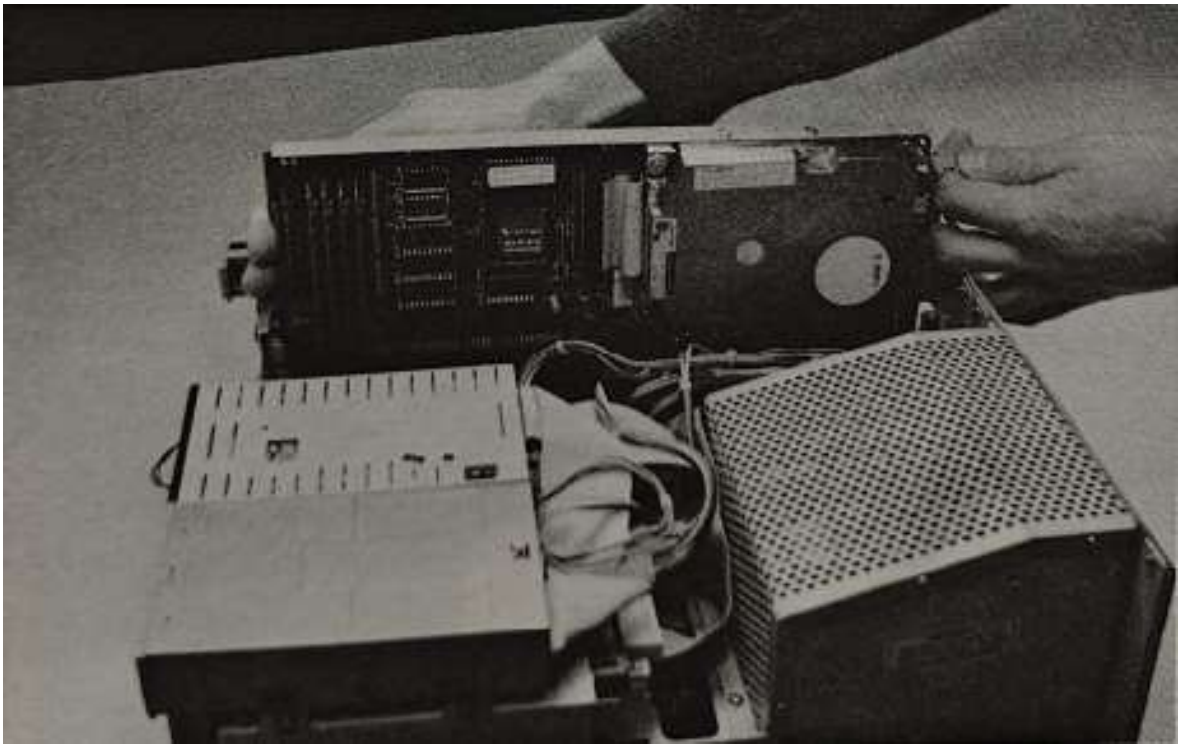
Continue reading at Section 4.2.

---- Leave devices switched off! ----

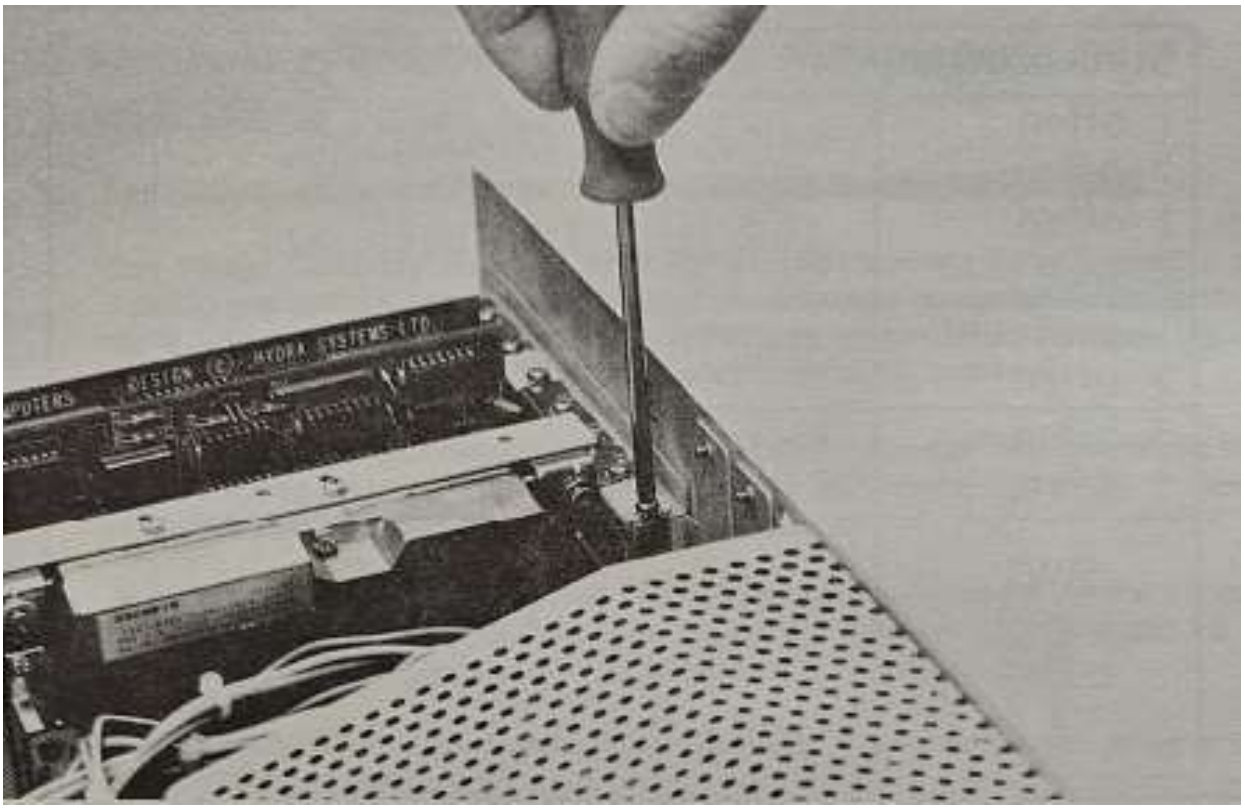
(Picture 4.a)

Jumper 1	Jumper 2	Jumper 3	Configuration	Kickstart Version
Open	Open		No RAM expansion	
Open	Closed		2MB (U11, U12 populated)	
Closed	Open		4MB (U11 to U14 populated)	
		Closed		Kickstart 1.3 or newer
		Open		Kickstart 1.2

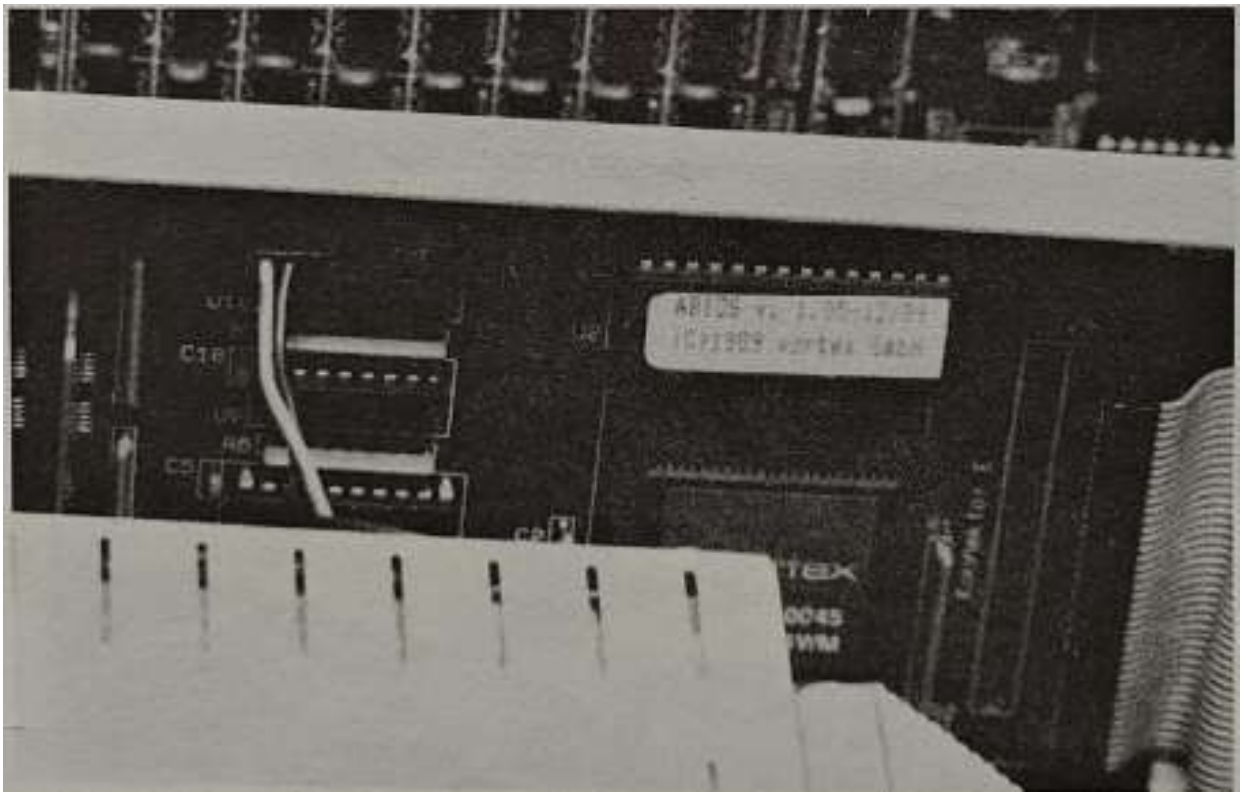
Note on Connector D: Contacts 1 and 3 are identical for the Hard Disk LED.



(Picture 4.b)



(Picture 4.c)



(Picture 4.d)

4.2 Commissioning the vortex athlet Hard Disk Plug-in Card

The preparatory work for commissioning the athlet hard disk plug-in card under AmigaDOS has already been carried out at the factory. vortex athlet is ready for operation.

The default partitioning is:

athlet	Part 1	Part 2
45 MB	10 MB	35 MB
90 MB	10 MB	80 MB
130 MB	10 MB	120 MB
180 MB	10 MB	170 MB

It makes sense to first familiarize yourself with how the vortex athlet hard disk plug-in card works before making changes to the factory settings.

4.2.1 First Use

Power-on sequence:

1. Have two empty 3.5" floppy disks ready.
2. Switch on the Amiga 2000.
3. Insert the "INSTALLATION" disk into floppy drive DF0:.
4. Follow the instructions of the program now running (output of the READ.ME file and creation of backup copies of the INSTALLATION and WORKBENCH disks).
5. After successful completion of this program, remove the disk from the drive and reset the computer system.
6. The Workbench will be loaded. The hard disk drive can now be accessed via the hard disk icons.

Power-off sequence:

1. Start the program **SHIP**.
2. Switch off the Amiga 2000.

4.2.2 Normal Operation

Power-on sequence:

1. Switch on the Amiga 2000. In order for the operating system to be loaded from the hard disk drive, there must be no disk in a floppy disk drive! (Otherwise, the operating system will be loaded from the floppy disk).

Power-off sequence:

1. Start the program **SHIP**.
2. Switch off the Amiga 2000.

Note:

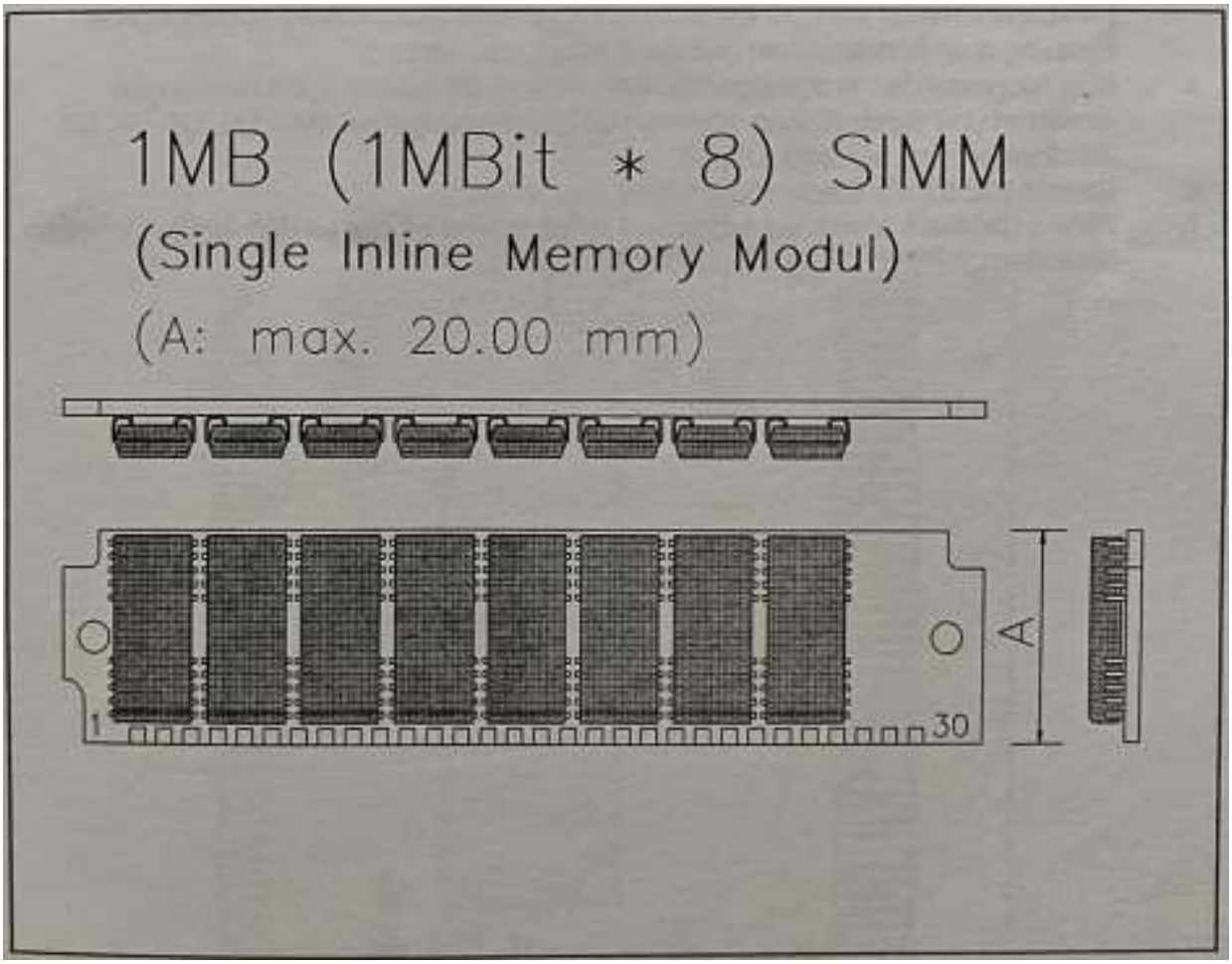
By pressing the left mouse button while switching on the computer, the hard disk drive can be prevented from mounting into the operating system. The computer then behaves as if no hard disk drive were present.

5. Upgrading the RAM Expansion

The "Fast Memory" 0-WaitState RAM expansion integrated into vortex athlet, vortex SYSTEM 2000/PSM-S, and vortex PSM-S can be operated either without RAM, with 2MB RAM, or with 4MB RAM.

1MB Single Inline Memory Modules with a maximum access time of 100ns are required: 1MBIT * 8, such as NEC MC-421000A8B-10 (see Figure 5.a). The modules must be compatible with the Molex SIMM socket 78859.

Two SIMMs are required for a 2MB RAM expansion, and four SIMMs are required for a 4MB RAM expansion.



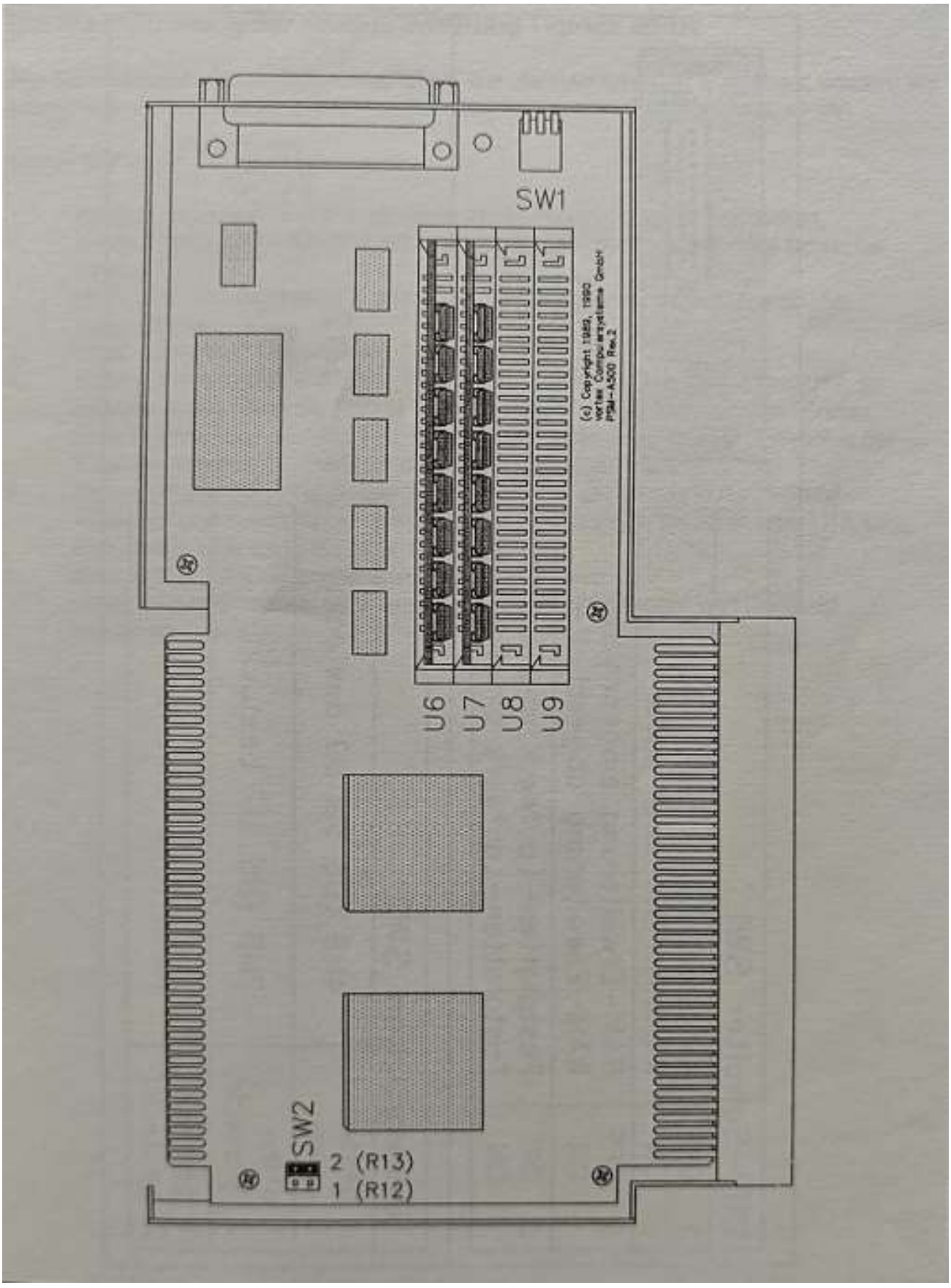
(Picture 5.a)

5.1 Upgrading the RAM Expansion - PSM-S

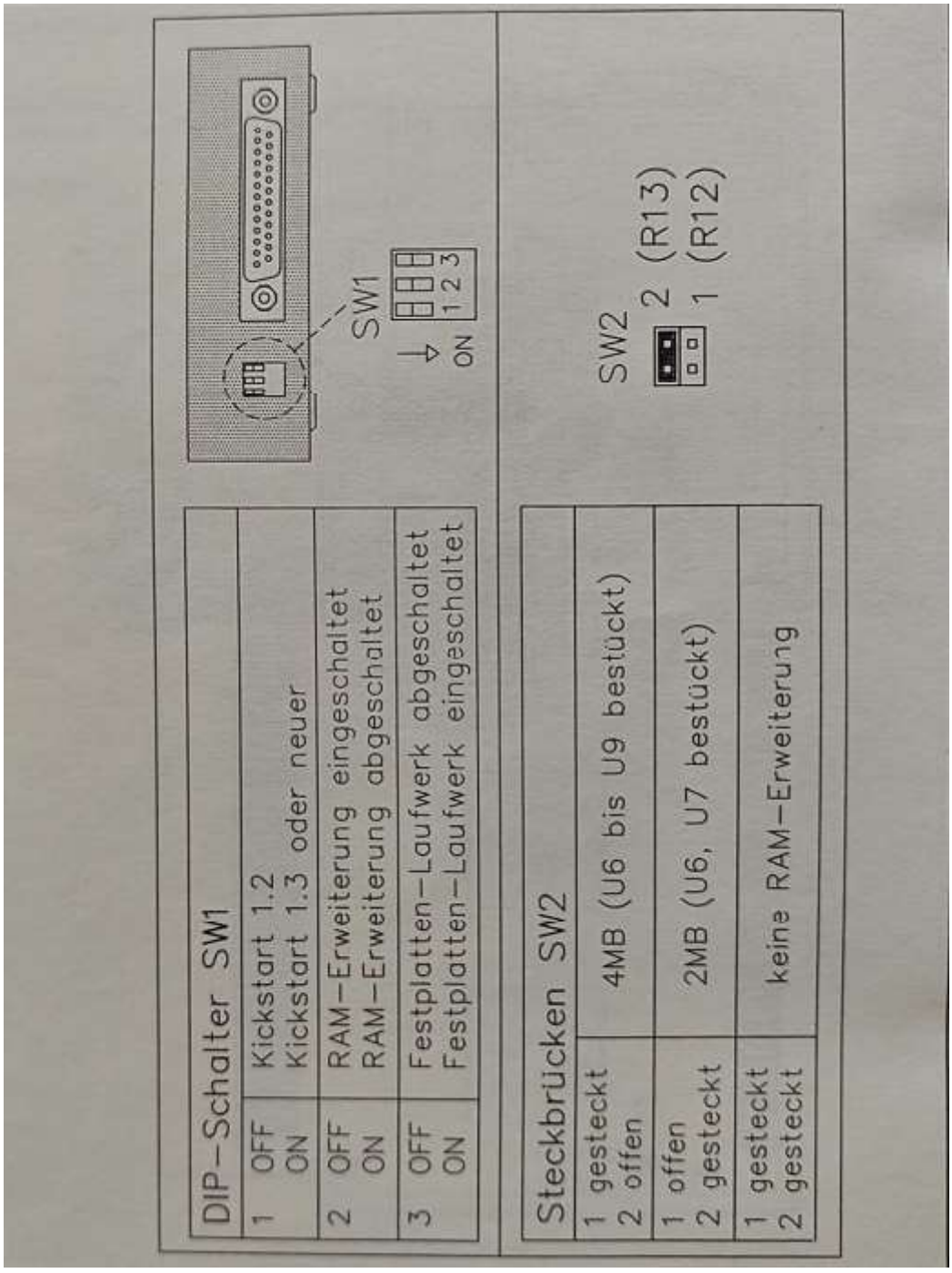
The case of the PSM-S must be opened for the following work. We recommend having this upgrade carried out by a qualified specialist dealer.

Procedure:

1. Switch off the Amiga computer and all connected peripheral devices.
2. Unplug the PSM-S from the Amiga computer. If necessary, unplug the bus cable to the base unit.
3. Unscrew the 6 screws holding the PSM-S top and bottom parts together and remove the PSM-S upper case part (see Figure 5.b).
4. If there are already 2 SIMMs (2MB RAM) in sockets U6 and U7, these must be removed so that the SIMMs for U8 and U9 can be inserted. To do this, pull the two plastic tabs on the left and right of the socket apart and tilt the SIMM out.
5. Now insert the SIMMs into the sockets one after the other in descending order and snap them into place by tilting.
    - **Populating sequence for 4MB**: U9, U8, U7, U6.
    - **Populating sequence for 2MB**: U7, U6.
6. Populate the jumpers SW2 according to Figure 5.c.
7. Close the PSM-S case again and then plug it back onto the Amiga computer.



(Picture 5.b)



(Picture 5.c)

Jumpers SW2 Settings (Figure 5.c)

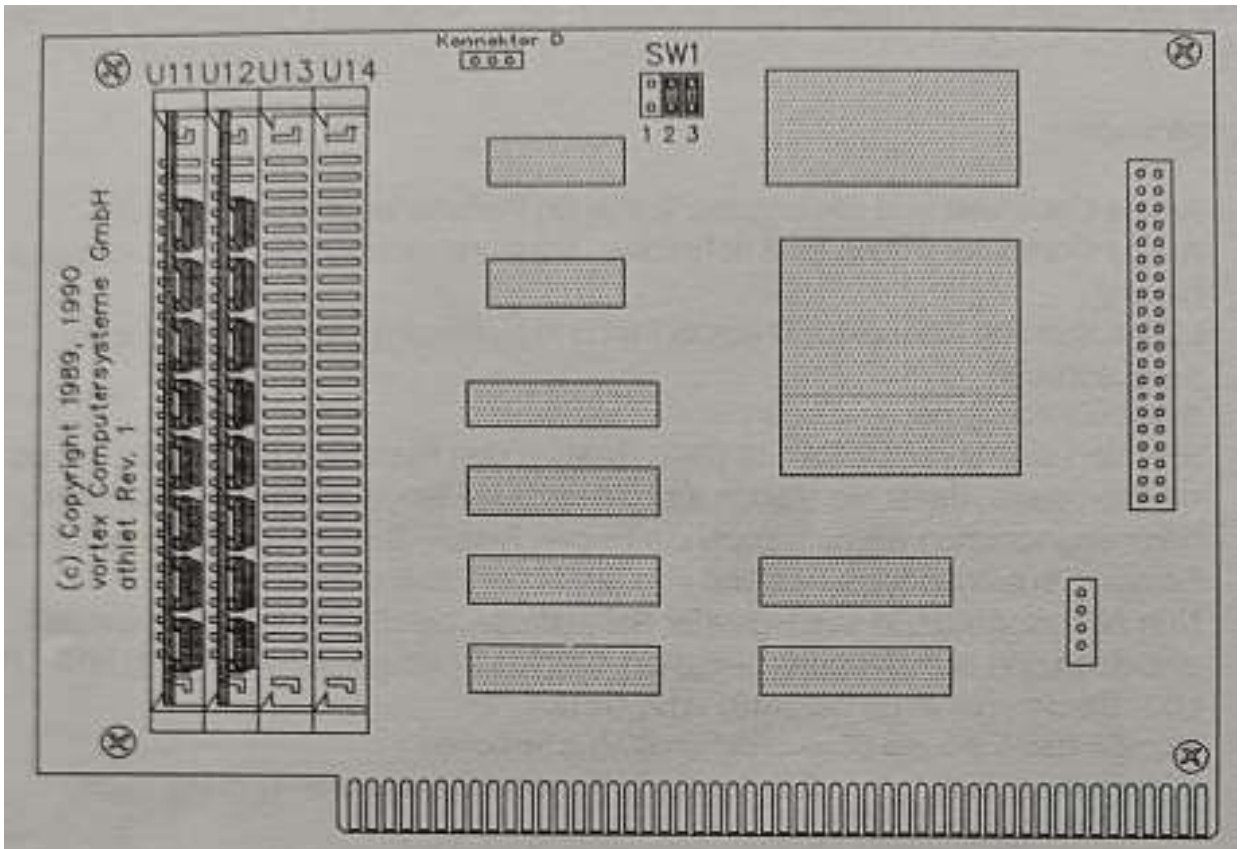
Jumper 2 (R13)	**Jumper 1 (R12)**	**Configuration**
Open	Closed	4MB (U6 to U9 populated)
Closed	Open	2MB (U6, U7 populated)
Closed	Closed	No RAM expansion

5.2 Upgrading the RAM Expansion - vortex athlet

The athlet must be removed from the Amiga 2000 for the following work. We recommend having this upgrade carried out by a qualified specialist dealer.

Procedure:

1. Switch off the Amiga computer and all connected peripheral devices.
2. Open the Amiga computer (2 screws each on the left and right, and one screw at the back).
3. Unplug the LED cable from Connector D and unscrew the retaining screw of the slot bracket.
4. Pull the athlet out carefully.
5. If there are already 2 SIMMs (2MB RAM) in sockets U11 and U12, these must be removed so that the SIMMs for U13 and U14 can be inserted. To do this, pull the two plastic tabs on the left and right of the socket apart and tilt the SIMM out.
6. Now insert the SIMMs into the sockets one after the other in descending order and snap them into place by tilting.
    - **Populating sequence for 4MB**: U14, U13, U12, U11.
    - **Populating sequence for 2MB**: U12, U11.
7. Populate the jumpers SW1 according to Figure 5.2 a (printed as 5.d).
8. Reinstall the athlet, plug the LED cable onto Connector D, and close the case again.



Steckbrücken SW1	
1 offen 2 offen	Keine RAM-Erweiterung
1 offen 2 gesteckt	2MB (U11, U12 bestückt)
1 gesteckt 2 offen	4MB (U11 bis U14 bestückt)
3 offen 3 gesteckt	Kickstart 1.2 Kickstart 1.3 oder neuer

SW1

1 2 3

Konnektor D

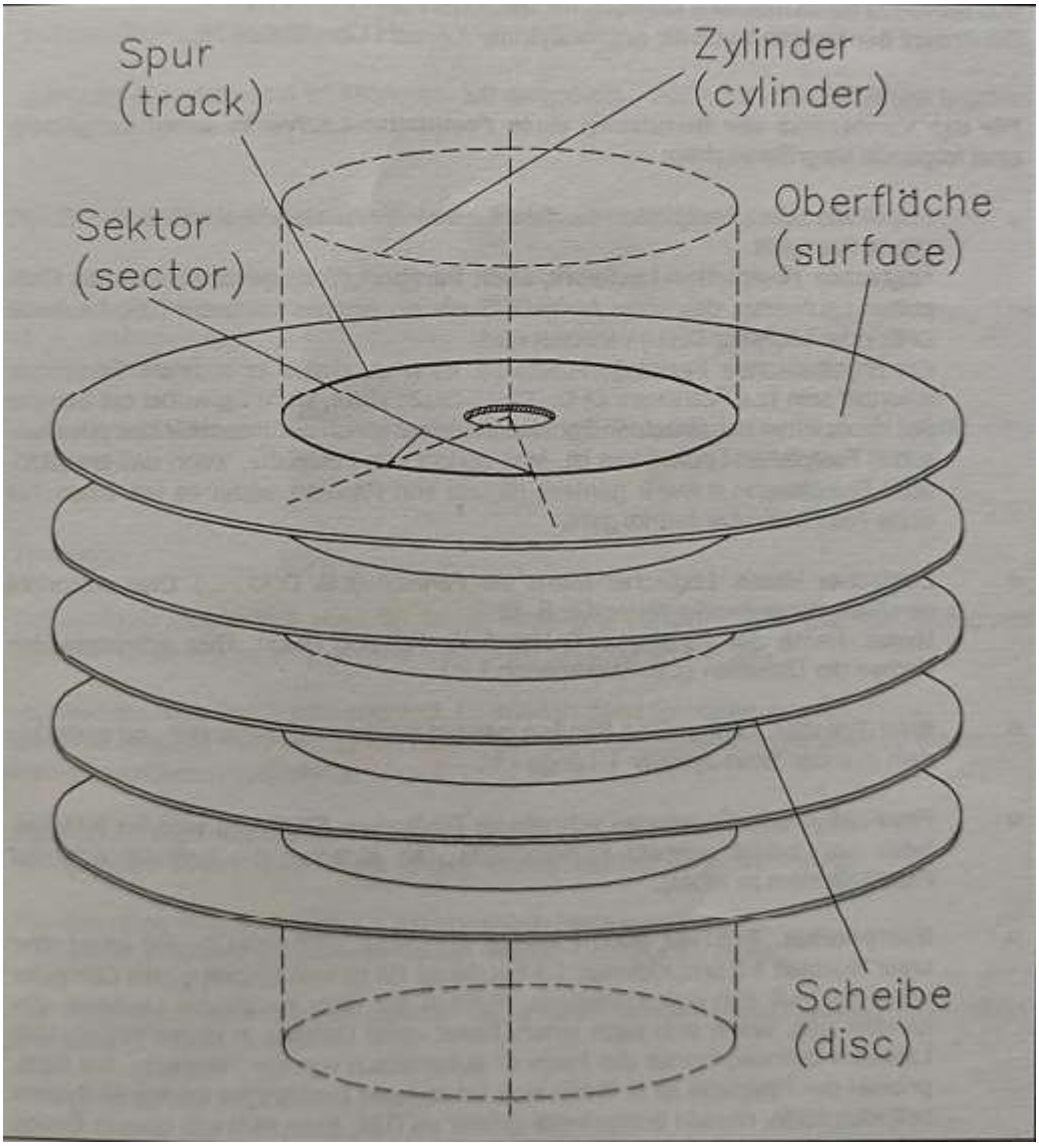
1 2 3

Hard Disk LED

Die Kontakte 1 und 3 sind identisch.

6. The vortex Utility Programs

6.1 Some Terms and Definitions



(Picture 6.a)

(Referencing Diagram 6.a - Disk stack with 5 platters and 10 surfaces)

Spur:	Track
Sektor:	Sector
Zylinder:	Cylinder
Oberfläche:	Surface
Scheibe:	Disc

Typical values for the number of sectors are 17 (MFM recording) or 26 (RLL recording). RLL stands for Run-Length Limited and is a method for increasing the capacity of hard disks. With RLL 2.7, the capacity is increased by 50%, e.g., from 20 MB to 30 MB.

In principle, there are no typical values for the **number of cylinders**. However, many hard disks have 615 cylinders.

The **number of platters** can range between 1 and 8.
Consequently, the **number of surfaces** can range between 2 and 16.
Formula: Number of Discs * 2 = Number of Surfaces
The number of heads (read/write and servo heads) is usually identical to the number of surfaces.
The **number of tracks** is therefore: Number of Cylinders * Number of Surfaces

The following terms are important for understanding the use of a hard disk drive under AmigaDOS:

- **Physical Hard Disk Drive**: The hard disk drive hardware with, for example, 60 MByte capacity.
- **Logical Hard Disk Drive (Partition)**: A section of the hard disk drive that is managed under AmigaDOS like its own drive (e.g., drive DH0: or drive DH1:). A physical hard disk drive can easily be divided into several partitions (e.g., drive DH0:, DH1:, DH2:, HD0:, HD1:...), whereby the sum of the capacities of the individual partitions is less than or equal to the capacity of the physical hard disk drive. We speak of "hard disk" when the physical drive is meant and of "partition" when it concerns a part of a hard disk drive.
- **Logical Name**: Logical name of the partition (e.g., DH0:, ...). This corresponds to the floppy disk drive names (e.g., DF0:, ...).
- **Name**: Name of the partition volume (e.g., Hard0 for partition DH0:). This corresponds to the names of floppy disks (e.g., "Workbench 1.3").
- **Start Cylinder, Length**: A partition starts at the start cylinder and ends at the cylinder $\text{Start Cylinder} + \text{Length} - 1$.
- **FastFileSystem**: Advanced faster FileSystem (DOS). It is loaded into RAM and therefore occupies memory space. (From Kickstart 1.4 onwards, the FastFileSystem is located in ROM).
- **Boot Priority**: SYSTEM 2000/PSM-NS, SYSTEM 2000/PSM-S, and athlet are bootable under Kickstart 1.2 and Kickstart 1.3. No modification to the computer is necessary; only a formatted partition must be present on the hard disk drive. If there is no floppy disk in a drive after a reset, the computer boots automatically from the hard disk. The boot priority of the hard disk is 0. If another bootable device whose boot priority is greater than 0 is in the system, it will boot from that device (for example, a reset-proof RAM disk).

6.2 The HDSETUP Utility Program

With the utility program HDSETUP, all installation work for the hard disk subsystems SYSTEM 2000/PSM-NS, SYSTEM 2000/PSM-S, and athlet can be performed.

The HDSETUP utility program is started from the CLI (Command Line Interpreter) by entering:

1>**HDSETUP <RETURN>**

(User inputs are shown in bold below. <RETURN> means pressing the Return key).

After starting the program, 4 menu items are available:

1. Low-Level Formatting
2. Initialization
3. Defect Search
4. Partitioning

On the following pages, the individual menu items are illustrated using examples.

Notes:

(a.) AmigaDOS requires about 30 KByte RAM per partition. This means that the more partitions are set up, the smaller the available memory becomes.

(b.) If new partitions have been created, they must be formatted. Formatting is performed in the CLI with one of the following commands (depending on the FileSystem used):

Partition with FastFileSystem:

1> FORMAT DRIVE Log. Name NAME Name QUICK FFS <RETURN>

Partition without FastFileSystem (= with normal FileSystem):

1> FORMAT DRIVE Log. Name NAME Name QUICK <RETURN>

The corresponding designations must be entered for "Log. Name" and "Name".

Screen Examples from HDSETUP

```
Setup Program HDSETUP
for vortex Hard Disk Subsystems for Amiga Computer Systems
(C) Copyright 1990 vortex Computersysteme GmbH

SUBSYSTEM NO.    SUBSYSTEM TYPE          STATUS, Code

0                ATHLET                  initialized, T1
1                ATHLET                  initialized, T1

(SYSTEM 2000-NS: no RAM expansion; SYSTEM 2000-Sx: with RAM expansion)

Please enter the number of the subsystem to be processed: 1<RETURN>
```

(Picture 6.b)

```
Setup Program HDSETUP
for vortex Hard Disk Subsystems for Amiga Computer Systems
(C) Copyright 1990 vortex Computersysteme GmbH

SUBSYSTEM NO.:          1
SUBSYSTEM TYPE:         ATHLET
STATUS, CODE:           initialized, T1

Choose one of the following options: 1 <RETURN>

1  Low-Level Formatting      The hard disk drive is formatted, examined for
                             defects, and initialized. Execution of this option
                             should normally not be necessary, as it has already
                             been performed at vortex.
                             ATTENTION: This option deletes all data on the hard disk!

2  Initialization            The hard disk drive is initialized. This means the
                             hard disk driver and system parameters are copied over.

3  Search for Defects        The hard disk drive is examined for defective areas.
                             These are replaced by spare tracks. As far as possible,
                             no data on the hard disk drive is destroyed.

4  Partitioning              The hard disk drive can be divided into logical
                             drives (so-called partitions).

5  Quit                      Exit HDSETUP
```

(Picture 6.c)

```
Setup Program HDSETUP

Low-Level Formatting

SUBSYSTEM NO.:          1
SUBSYSTEM TYPE:         ATHLET
STATUS, CODE:           initialized, T1

Please enter the letter/number code of the subsystem (e.g., A1). You can find this code for vortex
SYSTEM 2000 subsystems on the back of the base unit, for vortex athlet subsystems on the back
of the metal frame.

Letter/number code: T1 <RETURN>

Low-level formatting can take up to 60 minutes and runs in three steps:

1. Actual formatting
2. Initialization (copying hard disk driver and system parameters)
3. Searching and replacing defects

The hard disk drive present in this subsystem has the following parameters:

Formatted Capacity:             45MB
Number of Heads:                4
Number of Sectors/Track:        33
Number of Cylinders:            665

Should the hard disk drive really be low-level formatted (Y/N)? Y<RETURN>

Formatting in progress ...
Formatting completed successfully.

Initialization in progress ...
Hard disk driver is being copied.
FastFileSystem is being copied.
Initialization completed successfully.

Defect search in progress ...
Testing cylinder 0 Head 0
No new defects were found.
Please press <RETURN> <RETURN>
```

(Picture 6.d)

```
Setup Program HDSETUP

Initialization

SUBSYSTEM NO.:          1
SUBSYSTEM TYPE:         ATHLET
STATUS, CODE:           initialized, T1

Please enter the letter/number code of the subsystem (e.g. A1). You will find this code on vortex
SYSTEM 2000 subsystems on the back of the base unit, and on vortex athlet subsystems on the
back of the metal frame.

Letter/number code: T1 <RETURN>

The hard disk drive present in this subsystem has the following parameters:
Formatted capacity:             45MB
Number of heads:                4
Number of sectors/track:        33
Number of cylinders:            665

Should the hard disk drive really be initialized (Y/N)? Y <RETURN>
Hard disk driver is being copied.
FastFileSystem is being copied.
Initialization completed successfully.

Please press <RETURN> <RETURN>
```

(Picture 6.e)

```
Setup Program HDSETUP

Search for Defects

SUBSYSTEM NO.:          1
SUBSYSTEM TYPE:         ATHLET
STATUS, CODE:           initialized, T1

The hard disk drive present in this subsystem has the following parameters:
Formatted capacity:             45MB
Number of heads:                4
Number of sectors/track:        33
Number of cylinders:            665

Should the hard disk drive really be checked for defects (Y/N)? Y <RETURN>
Defect search running ...
Testing cylinder 0 head 0
No new defects found.
Please press <RETURN> <RETURN>
```

(Picture 6.f)

Setup Program HDSETUP

Partitioning

SUBSYSTEM NO.: 1
SUBSYSTEM TYPE: ATHLET
STATUS, CODE: initialized, T1

The hard disk drive present in this subsystem has the following parameters:
Formatted capacity: 45MB
Number of heads: 4
Number of sectors/track: 33
Number of cylinders: 665

Should the hard disk drive really be partitioned (Y/N)? Y <RETURN>

The existing partitions:
1st Partition: HD0 Dos StartCyl = 1, Length = 332
FastFileSystem
Boot priority 0
2nd Partition: HD1 Boot_Me StartCyl = 333, Length = 332
FastFileSystem
Boot priority 0

Please enter new partition data
Cancel by entering ENDE <RETURN> (instead of ENDE, E, e, ende, or Ende also work)
The first usable cylinder is 1
One cylinder corresponds to a capacity of 66KB
Start cylinder: 1 <RETURN>
Length: 664 <RETURN>
Logical name: HD0 <RETURN>
Name: Hard0 <RETURN>
FastFileSystem: Y <RETURN>
Boot priority: 0 <RETURN>

Start cylinder: e <RETURN>

The new partitioning of the hard disk drive:

1st Partition: HD0 Hard0 StartCyl = 1, Length = 664

FastFileSystem
Partition still needs to be formatted
Boot priority 0

Should this new partitioning be used (Y/N)? Y <RETURN>

Partitioning completed successfully.
The partitions shown in **bold** still need to be formatted under Amiga DOS. Formatting is done in

the CLI using one of the following commands:

Formatting a partition for which FastFileSystem was chosen:
FORMAT DRIVE Log.Name NAME QUICK FFS <RETURN>

Formatting a partition for which no FastFileSystem was chosen:
FORMAT DRIVE Log.Name NAME QUICK <RETURN>

Please press <RETURN> <RETURN>

(Figure 6.g)

6.3 The SHIP Transport Lock Program

To protect the hard disk drive of the SYSTEM 2000 or the athlet from damage during standstill or transport, it must be "parked".

This means that the read/write heads are moved to a specific track on which there is no user data. It should become a habit to start the **SHIP** program before turning off the Amiga computer, thereby parking the read/write heads.

It makes sense to transfer the SHIP program from the supplied "INSTALLATION" disk to drive DH0: into the system command directory C:

1>COPY DF0:SHIP DH0:C<RETURN>

The SHIP program is started under the Workbench by double-clicking it.

Upon successful execution, first the Amiga and then the System 2000 base unit should be switched off.

7. Technical Data

7.1 Technical Data: SYSTEM 2000

Formatted Storage Capacities:	20MB, 30MB, 40MB or 60MB
Average Access Times:	up to 30 ms
Integrated RAM Expansion:	only with PSM-S (optional 0MB, 2MB or 4MB with SIMMs)
Power Supply Unit:	40 Watt, switched-mode
Dimensions of Base Unit:	221 * 232 * 70 (L*W*H in mm)
Dimensions of PSM-NS:	169 * 98 * 22 (L*W*H in mm)
Dimensions of PSM-S:	235 * 104 * 33 (L*W*H in mm)

All specifications subject to change.

7.2 Technical Data: athlet

Formatted Storage Capacities:	40MB, 90MB, 130MB or 180MB
Average Access Times:	typical 25 ms
Integrated RAM Expansion:	optional 0MB, 2MB or 4MB with SIMMs
Power Consumption:	typical 14 Watt
Space Required:	typical 1 1/2 slots

All specifications subject to change.

vortex

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