

ACARD ATA-133 RAID
AEC-6880M

PCI-to-IDE ATA-133
RAID Controller for Macintosh

User's Manual

— Version:2.0 —



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Table of Contents

Chapter 1 Introduction	4
1.1 Introduction	4
1.2 Feature	5
1.3 Specification	5
1.3.1 Packing List	5
1.3.2 Parts Specification	5
Chapter 2 Hardware Installation	6
2.1 Quick start hardware installation	6
2.2 ACARD AEC-6880M adapter compatibility	8
2.3 What you should know before the installation	8
2.4 ACARD AEC-6880M cable & power installation	10
2.5 Configuring ACARD AEC-6880M	11
Chapter 3 System Installation	12
3.1 Normal Mode Installation	12
3.1.1 Mac OS 9.x installation	12
3.1.2 Mac OS X installation	14
3.1.3 Verify System Profiler	16
3.2 Striping Mode (RAID 0) / Mirroring Mode (RAID 1) Installation ...	21
3.2.1 Mac OS 9.x installation:	21
3.2.2 Mac OS X installation	23
3.2.3 Verify System Profiler	25
3.3 AEC-6880M RAID Utility Installation	30
Chapter 4 Troubleshooting	32
Appendix 1	33

Chapter 1 Introduction

1.1 Introduction

ACARD AEC-6880M is a high-performance Hardware RAID Ultra ATA-133 adapter for PCI PowerMac. Its on-board Open Firmware supports booting from IDE disks configured as RAID.

AEC-6880M supports all models of PowerMac which have a PCI slot, including PowerMac G3, G4. For PowerMac older than G4, *ACARD AEC-6880M* can boost the disk better. The performance can further be improved by using a 7200rpm big capacity drive. Compared with the original G4, the improvement can be as high as 300%. For PowerMac G4, *ACARD AEC-6880M* allows Mac to add more IDE drives or to use Hardware RAID by adjusting the easy RAID DIP Switch setting.

ACARD AEC-6880M adapter is the first Mac add-on card to support ANSI X3T9.2 CAM ATA4/ATA5. The data transfer rate is up to 133 MB/sec per channel, and meets the demand of multimedia, real time video.

ACARD AEC-6880M supports the true PnP function in Mac OS 8.5, OS 9.x and OS X. **No software driver is needed** for connecting an Ultra ATA 66/100/133 HDD. With the advanced function, the adapter is really user-friendly. It coexists with the on-board IDE controller. The on-board BIOS lets the system boot from ATA HDD.

Chapter 2 Hardware Installation

The hardware installation is a simple RAID host adapter installation. Please follow the instructions given below.

Before installing an IDE device into the *ACARD AEC-6880M*, the IDE device should be adjusted as “Master” or “Slave” mode through the jumper setting. Since the hard drive may contain some data that might cause the Mac OS installation difficult under **striping mode**, please adjust *ACARD AEC-6880M* DIP Switch to a **normal mode** at first.

When attaching an IDE hard drive to *ACARD AEC-6880M*, which already contains data or any version of Mac OS, it is strongly recommended to back up the old data before installing the adapter. The hard drive must be initialized first under the **normal mode** of *ACARD AEC-6880M*. After doing “initialize” under **normal mode**, adjust *AEC-6880M* DIP Switch to **striping mode** or **mirroring mode** to “initialize” drive again.

2.1 Quick hardware installation

1. Open the Mac case (please refer to Mac’s manual).
2. Choose an empty PCI slot and plug in *ACARD AEC-6880M*.
3. Install the hard drive into the Mac.
4. Connect the adapter and the hard drive with an ATA-133 cable.
5. Close the Mac case.

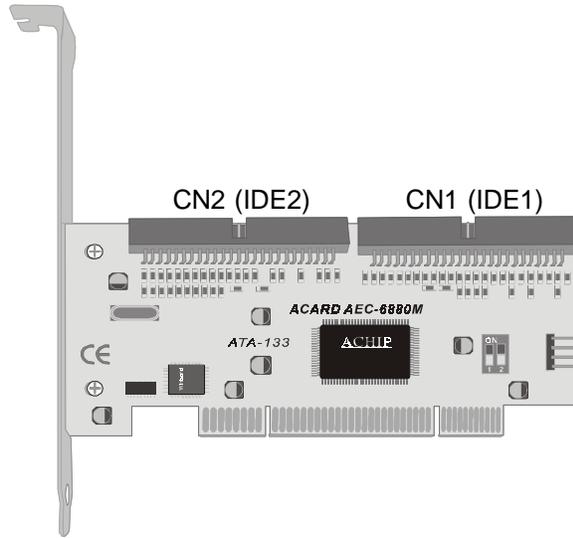


- Connect 2 hard drives in the same channel, check the Master / Slave jumper.
- Set *ACARD AEC-6880M* adapter DIP Switch to normal mode as an IDE extension port.

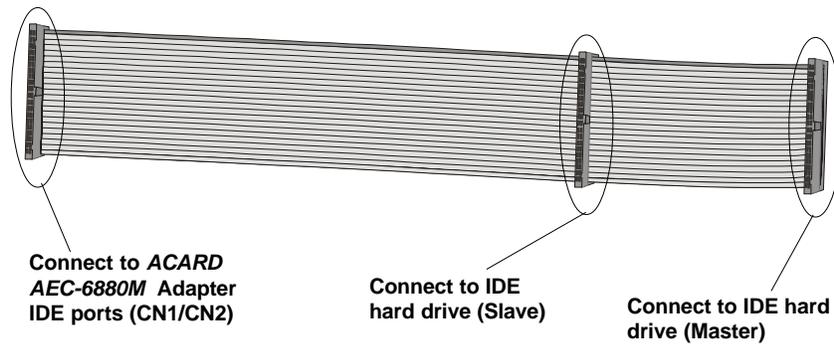
Board Layout:

CN1 (IDE1): The Primary IDE port

CN2 (IDE2): The Secondary IDE port



ATA-133 Cable Layout:



 For the hard drive's Jumper setting (Master / Slave), refer to hard drive's Manual

2.2 ACARD AEC-6880M adapter compatibility

ACARD AEC-6880M is designed specifically for DMA hard drive, and has been fully tested with many kinds of hard drives. *AEC-6880M* supports many ATA 66/100/133 hard drives produced by the following manufacturers:

- FUJITSU
- IBM
- MAXTOR
- QUANTUM
- SEAGATE
- WESTERN DIGITAL

2.3 What you should know before the installation

Before installing the *ACARD AEC-6880M*, please follow the instructions below to get the best performance:

Striping Mode

- If two hard drives are in different storage capacity, *ACARD AEC-6880M* will treat the smaller one as standard capacity, and double the standard capacity as total disk capacity.
- For **one pair of striping** connection using 2 HDDs, the jumper setting on each hard drive must be set as the same mode; that is, either "Master" or "Slave". The two hard drives must connect with two independent ATA-133 cables on *ACARD AEC-6880M*.
- For **two pairs of striping** connection using 4 HDDs, the jumper setting on every 2 hard drives must be set as "Master" and "Slave" on each IDE port (see Figure 1).

- For **two pairs striping** with 4 hard drives, the Jumper setting can not be set as both “Master” or both “Slave” in same connector cable.
- In order to get a better performance, use Ultra ATA 66, 100 or 133 hard drive in same model .

Mirroring Mode

- If two hard drives are in different storage capacity, *ACARD AEC-6880M* will treat the smaller one as standard capacity, and double it as total available disk capacity.
- For **one pair of mirroring** connection using 2 HDDs, the jumper setting on the hard drives must be set as the same “Master” or “Slave” mode. The two hard drives must connect with two independent ATA-133 cables on *ACARD AEC-6880M*.
- For **two pairs of mirroring** connection using 4 HDDs, the jumper setting on every 2 hard drives must be set as “Master” and “Slave” on each IDE port.

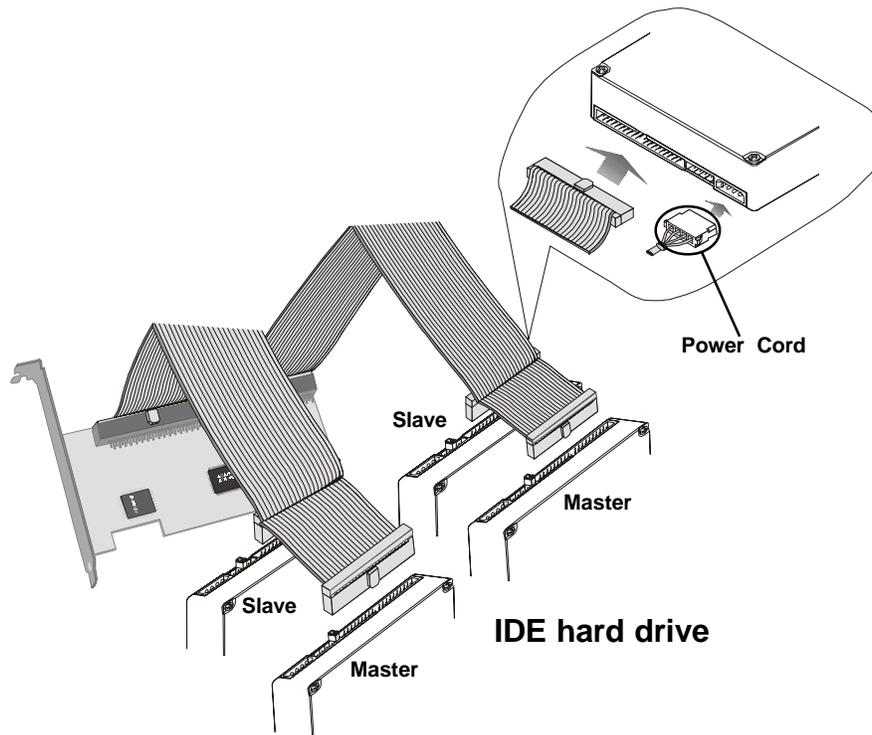
Normal Mode

- Two IDE connectors of *ACARD AEC-6880M* can be regarded as normal IDE port extension.
- When using two hard drives to connect to *ACARD AEC-6880M* at the same IDE port (on the same cable), the hard drives’ Jumper setting must be set as one “Master” and one “Slave” positions. The two hard drives cannot be set as “Master” or “Slave” at the same time on the same cable.
- In order to get a better performance, use Ultra ATA 66, Ultra ATA 100 or Ultra ATA 133 hard drives.

2.4 ACARD AEC-6880M cable & power installation

The cable connection methods:

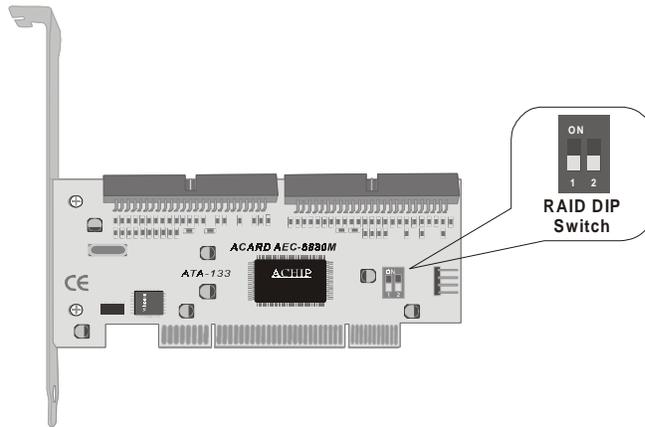
- Step 1. Find out pin 1 of the IDE connector on the IDE hard drive.
- Step 2. Find out a color line of the internal IDE cable indicating pin 1 of the connector.
- Step 3. Connect the internal IDE cable to the IDE hard drive aligning with pin-1 to pin-1.
- Step 4. Connect the 4-pin power cord to IDE the hard drive.



2.5 Configuring ACARD AEC-6880M (Jumper Setting)

RAID DIP Switch Setting

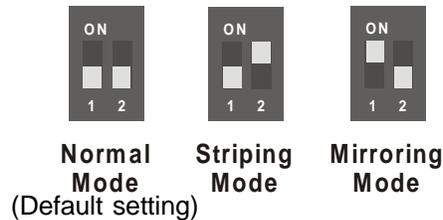
RAID configurations must be set up on ACARD AEC-6880M. Set RAID Mode by adjusting ON/OFF DIP Switch.



Please follow the instructions below and decide a suitable RAID DIP Switch setting.

- 1. Normal Mode.** When using the RAID adapter card as an IDE extension port to connect the IDE hard drive, set the DIP Switch 1 and 2 as OFF. The default is OFF.
- 2. Striping Mode (RAID 0).** RAID 0 is dedicated as a pair of hard drives that store striping data, but appears as a single drive on the computer. Set the DIP Switch 1 as OFF and 2 as ON, and the RAID 0 mode will be activated.

- 3. Mirroring Mode (RAID 1).** RAID 1 is a pair of hard drives that store mirroring data, and is regarded as a single drive. Set the DIP Switch 1 as ON and 2 as OFF, and the RAID 1 mode will be activated.

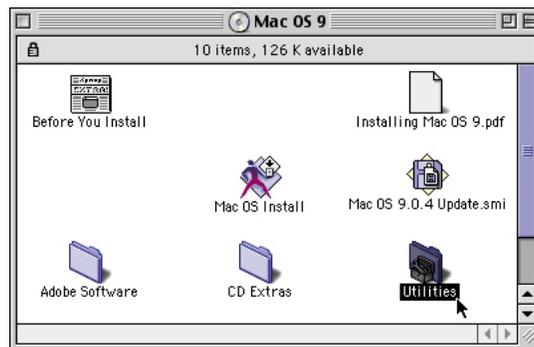


Chapter 3 System Installation

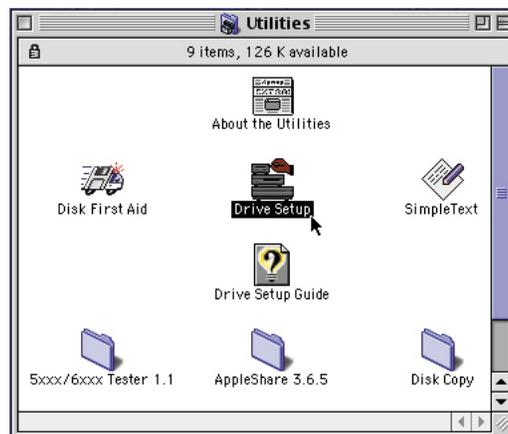
3.1 Normal Mode Installation

3.1.1 Mac OS 9.x installation

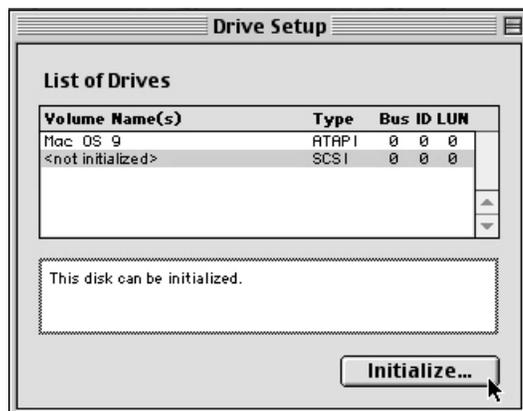
1. Be sure the hardware is installed correctly.
2. Insert Mac OS CD-ROM to Macintosh.
3. Power on Macintosh and press 'C' key.
4. Wait for Mac OS and the appearance of Mac OS CD window.
5. Double click on "**Utilities**".



6. Double click on "**Driver Setup**".



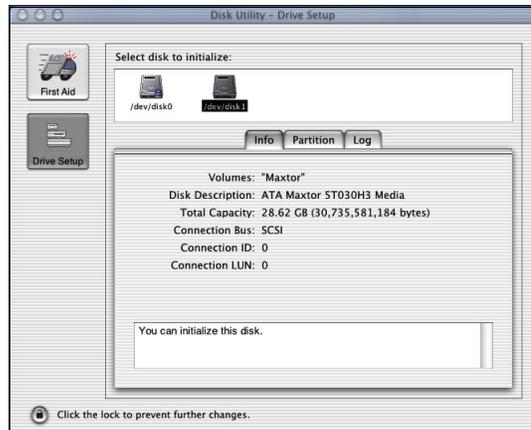
7. Choose the hard drive connected to ACARD AEC-6880M, then press **“Initialize”** button. For more detailed information of **“Drive Setup”**, refer to Mac OS manual.



8. Start to install a new OS on the hard drive.

3.1.2 Mac OS X installation

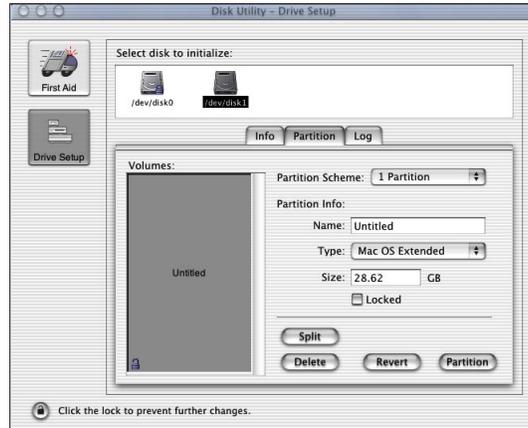
1. Be sure your hardware is install correctly.
2. Insert Mac OS X CD-ROM into your Macintosh.
3. Power on your Macintosh and press 'C' key.
4. After Mac OS X boots up, select "Installer" from the top selection tools.
5. Select "Open Disk Utility ..." to open it.
6. Select the hard drive which you want to initialize and choose "Partition" to decide the number of partitions you need.



7. After partitioning or erasing the volume, quit Utilities and begin the OS X installation.



8. Update your driver to version 1.5.1, which is on the support CD.



Note: For more information about Mac OS X installation guide, please refer to Mac OS X installation manual.

3.1.3 Verify System Profiler

For Mac OS 9 Environment

Make sure that the computer “**initialize**” the hard drive successfully. When you initialize the hard drive successfully, on the Mac window a new “**Untitled**” hard drive icon will appear.



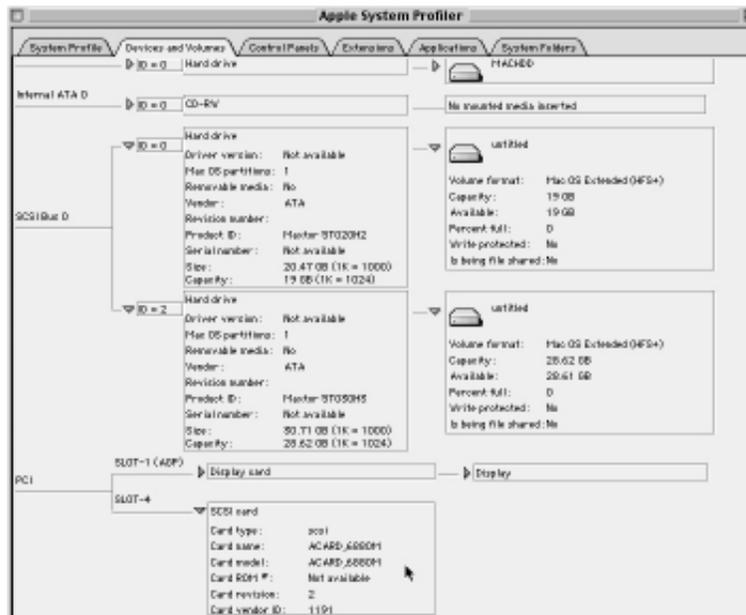
For advanced Mac users, find the system information under the Apple Logo pop up. Then choose “**Apple System Profiler**” to find the information. Check the information and see the computer system status. Follow the instructions below to check the system information.

Step 1. Click on Apple Logo and choose “**Apple System Profiler**” to show hard drive information.



Step 2. Under the “**Apple System Profiler**”, you will see the “**System Profiler**”. Choose “**Devices and Volumes**” to see the devices status.

Step 3. Under “**Devices and Volumes**”, please choose “**PCI**” item. You will find the SCSI card installation status.



For Mac OS X Environment

Make sure that the computer **“initialize”** the hard drive successfully. When you initialize the hard drive successfully, on the Mac window a new **“Untitled”** hard drive icon will appear.

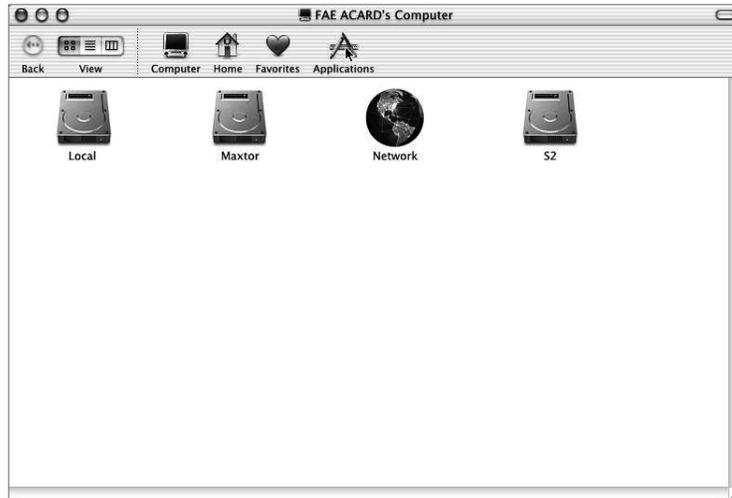


For advanced Mac users, find the system information under the Apple Logo pop up. Then choose **“Apple System Profiler”** to find the information. Check the information and see the computer system status. Follow the instruction below to check the system information.

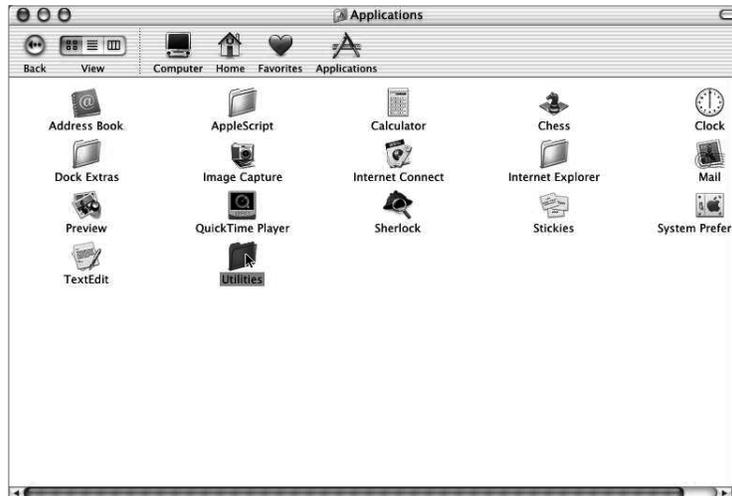
Step 1. Please find the **“Finder”** at the bottom of the Mac OS Screen, then click it.



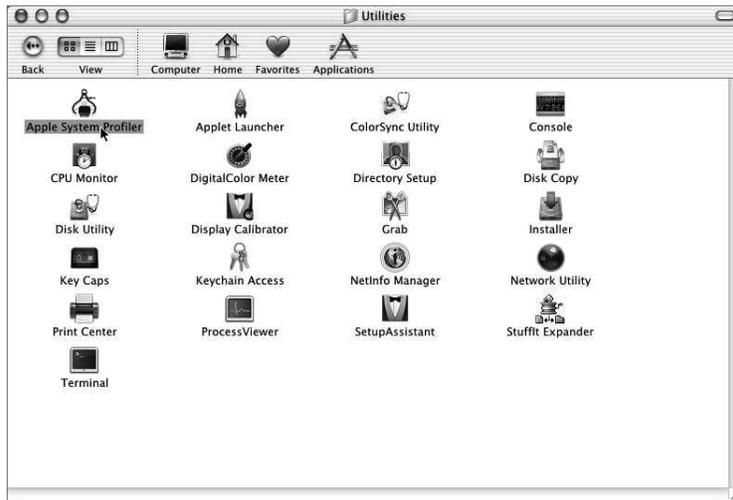
Step 2. Find the “**Application**” sign on the top of the screen and click it.



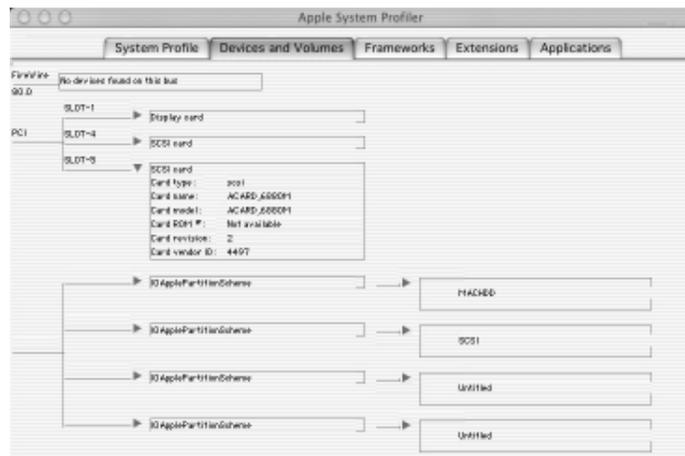
Step 3. Under the “**Application**”, find out the “**Utilities**” item and click it.



Step 4. Under the **“Utilities”**, you will see the **“Apple System Profiler”**. Click on **“Apple System Profiler”** to see the devices status.



Step 5. Under **“Devices and Volumes”**, please choose **“PCI”** item. You will find the SCSI card installation status.

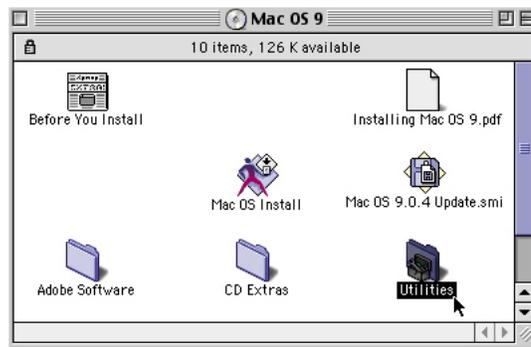


3.2 Striping Mode (RAID 0) / Mirroring Mode (RAID 1) Installation

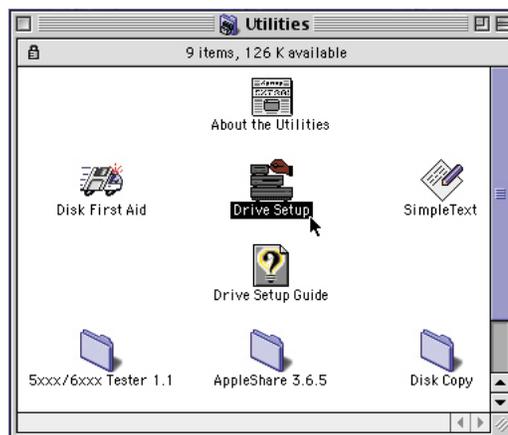
Use clean hard drives for the ACARD AEC-6880M striping mode. Before doing the striping mode/ mirroring mode installation, do the “initialize” under **normal mode** first, then turn off the computer to set the DIP Switch as striping mode.

3.2.1 Mac OS 9.x installation:

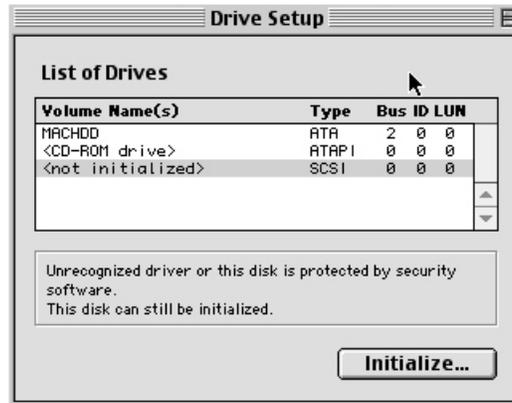
1. Be sure the hardware is installed correctly.
2. Insert Mac OS CD-ROM to Macintosh.
3. Power on Macintosh and press ‘C’.
4. Wait for Mac OS and the appearance of Mac OS CD window.
5. Double Click on “Utilities”



6. Double click on “Driver Setup”.



7. Choose the hard drive connected to *ACARD AEC-6880M*, then press **“Initialize”** button. For more detailed information of “Drive Setup”, refer to Mac OS manual



8. Start to install a new OS on the hard drive.

3.2.2 Mac OS X installation

1. Be sure the hardware is installed correctly.
2. Insert Mac OS X CD-ROM to Macintosh.
3. Power on your Macintosh and press 'Option' key.
(Don't skip the step otherwise RAID mode will be wrongly detected.)
4. After Mac OS X Boot up, select "Installer" from the top selection tools.
5. Select "Open Disk Utility ...", and open it.
6. Select the hard drive which you want to initialize and choose "Partition" to decide the number of partitions you need.



7. After partitioning or erasing the volume, quit the Utilities and begin the OS installation.



8. Update your driver to version 1.5.1, which is on the support CD.

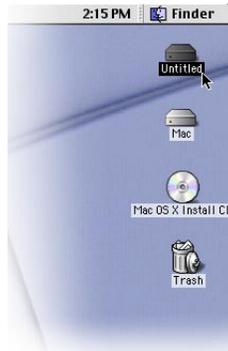


Note: For more information about Mac OS X installation, please refer to Mac OS X installation manual.

3.2.3 Verify System Profiler

For Mac OS 9.x Environment

Make sure the computer “initialize” hard drive successfully. When you initialize the hard drive successfully, on the Mac window a new “**Untitled**” hard drive icon will appear.



For advanced Mac users, find the system information under the Apple Logo. Then choose “**Apple System Profiler**” to find the information. Check the information and see the computer system status. Follow the instructions below to check the system information.

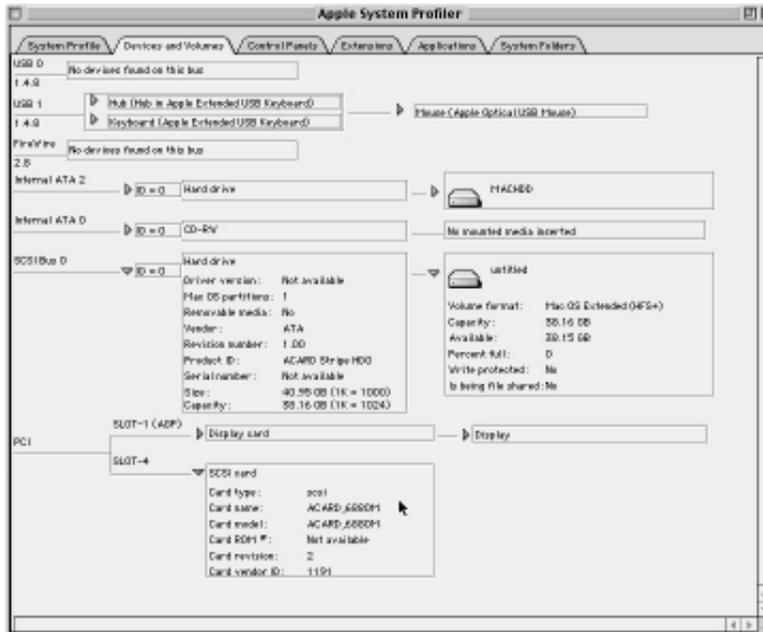
Step 1. Click on Apple Logo and choose “**Apple System Profiler**” to show hard drives information.



ACARD AEC-6880M

Step 2. Under the “**Apple System Profiler**”, you will see the “**System Profiler**”. Choose “**Devices and Volumes**” to see the devices status.

Step 3. Under “**Devices and Volumes**”, please choose “**PCI**” . You will find the SCSI card installation status.



For Mac OS X Environment

Make sure the computer “initialize” hard drive successfully. When you initialize the hard drive successfully, on the Mac window a new “**Untitled**” hard drive icon will appear.

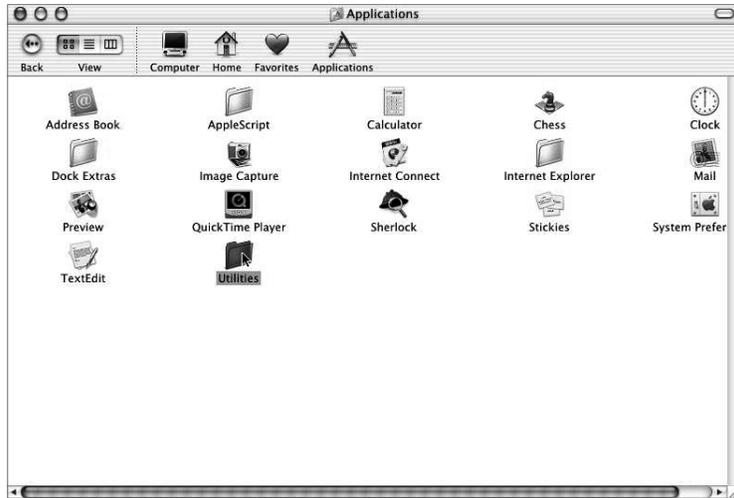
For advanced Mac users, find the system information under the Apple Logo. Then choose “**Apple System Profiler**” to find the information. Check the information and see the computer system status. Follow the instruction below to check the system information.

Step 1. Please find the “**Finder**” at the bottom of the Mac OS Screen, then click it.

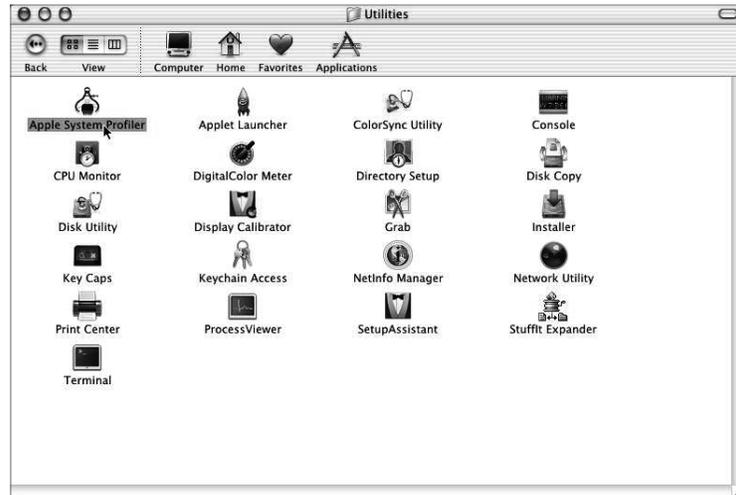


Step 2. Find the “**Application**” on the top of the screen and click it.

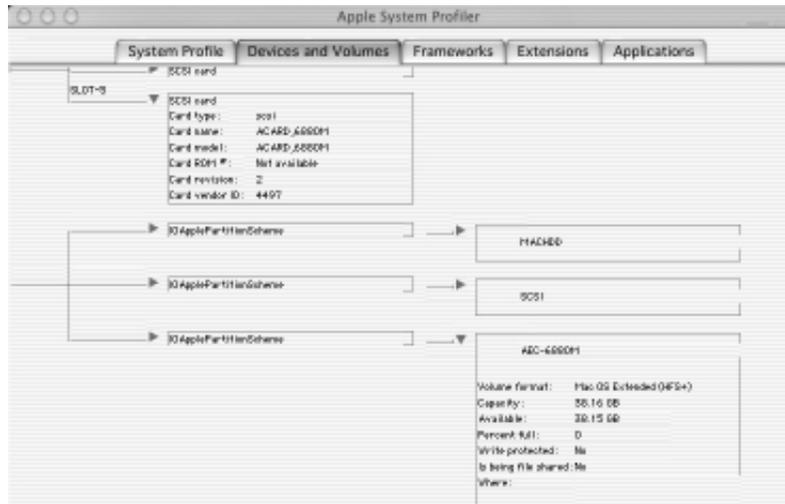
Step 3. Under the “**Application**”, find out the “**Utilities**” and click it.



Step 4. Under the “**Utilities**”, you will see the “**Apple System Profiler**”. Click on it to see the devices status.



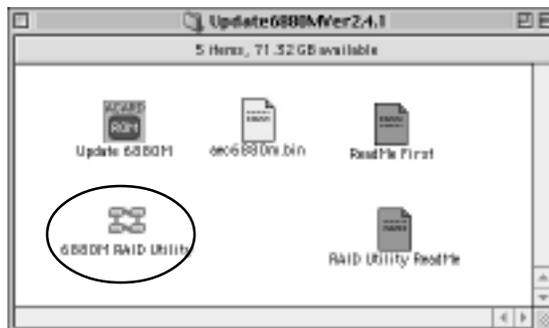
Step 5. Under “**Devices and Volumes**”, please choose “**PCI**”. You will find the SCSI card installation status.



3.3 AEC-6880M RAID Utility Installation

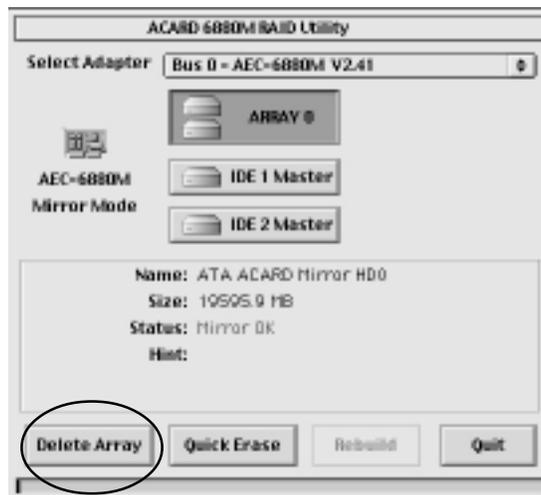
AEC-6880M RAID Utility lets you read the information of the hard drives connected to ACARD AEC-6880M, and RAID volume status in Mac OS 9.x. This program monitors the RAID volume status. A message will appear to inform you.

AEC-6880M RAID Utility must be used together with AEC-6880M firmware Ver. 2.42 or later. You may find them in ACARD Support CD.



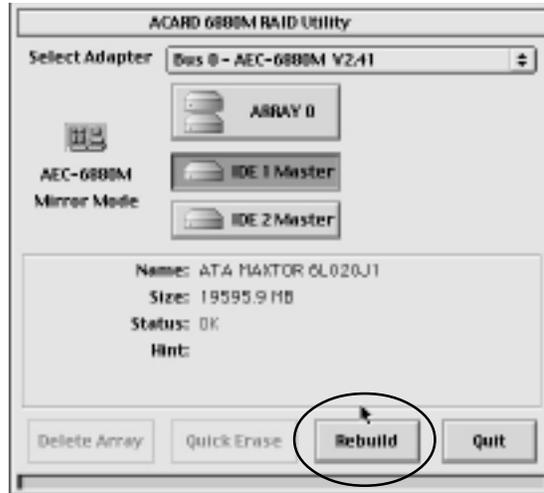
Delete Array

When a disk fails in disk array under RAID 1 (Mirror Mode), please replace it with a new one, then delete the original array setting. Then restart the computer to detect the new disk, and reset RAID mode.



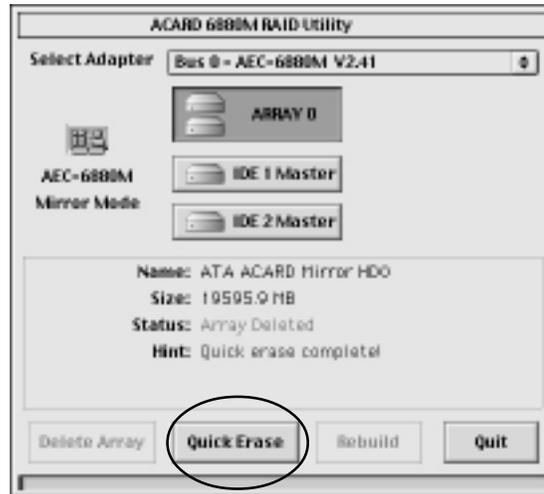
Rebuild

Copy data from an existing data disk in the array into a blank drive. When a failed drive has been replaced with a new one as part of a mirror array, the operation will be resumed.



Quick Erase

It can erase the data on hard drive content quickly. Please beware that the data and the partitions will be completely erased.



Chapter 4 Troubleshooting

After installation, if *ACARD AEC-6880M* cannot work properly, please follow the troubleshooting below.

1. Check power supply.

Whenever the device is malfunctioned, check the power status(ON/OFF)first.

2. Verify the IDE device.

Always let the IDE device function in proper mode before installing *ACARD AEC-6880M*.

3. Check host adapter.

Verify if the adapter is firmly inserted into the slot on the motherboard.

4. Check all connectors and cables.

Check if internal IDE connector, device power connector, and cables are connected well. Cables are easily damaged because of improper folding. Try a new cable, and make sure that no connector pins are bent. Pin 1 on the cable must be aligned with pin 1 on the hard drive and host adapter.

5. Verify the DIP switch setting.

Check if the RAID DIP switch setting on *ACARD AEC-6880M* is correct.

6. PCI Slot Position.

When you install *ACARD AEC-6880M* in Mac Clone computer that is not manufactured by Apple, you need to change the PCI slot for proper operation.

Appendix 1 Technical Support Form

Email: support@acard.com

<http://www.acard.com>

Model:	AEC-6880M	F/W Version:	
System Configuration			
Computer			
CPU			
Memory			
SCSI adapter			
Other I/O card			
Other Storage Device			
MAC OS version			
Hard Disk Configuration			
Model			
Type			
Manufacturer			
Firmware Rev			
Problem Description			

MALAE6880ME20-0