

Debian Linux 3.0 (woody) on a Gericom Masterpiece Per4mance (2GHz) Notebook

Reinhold Kainhofer, reinhold@kainhofer.com
<http://reinhold.kainhofer.com/Linux/GericomMasterpiece/>

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Chapter 1

Introduction

I recently bought a Gericom Masterpiece Per4mance 2400 notebook. I was a little afraid of how well it would work with linux, as a friend's notebook computer had a completely broken bios, the network card didn't work properly, and even the PCMCIA network card sometimes gave warnings and errors. However, I was really surprised how easy and flawlessly everything (I need) works now. In the following I will put more emphasis on what is not working than on what is working, so this work might sound more negative than it is supposed to be. I'm completely satisfied with the laptop and can only recommend it (for the things I use it for).

I hope this short summary of my setup experiences can help you either with your decision which laptop to buy, or with setup questions if you already have that computer.

If you have any suggestions, additions, solutions, or even found errors, don't hesitate to mail me at reinhold@kainhofer.com.

1.1 Debian woody

As soon as I got my laptop, I installed Debin GNU/Linux 3.0 (woody) using the FAI (fully automated installation) setup system at our department (Later I dist-upgrade'd to sid). There is nothing special about this, it's an ordinary linux installation, just that a few settings are done automatically, so I might miss some settings, although I try to be as precise and complete as possible.

1.2 The BIOS

While the Gericom logo is displayed on boot, you have to press F2 to enter the bios. It does not offer many settings, just the most important. Among

them is a setting for the OS (Either "Win 2000/XP" or "other"), which sounds interesting, but I haven't played with it yet.

1.3 Technical data

My laptop has a Intel Pentium IV 2.4 GHz Processor, 256 MB of RAM, an ATI Radeon Mobility 7500 (M7) graphics card with 64MB and a 15 inch TFT screen (1400x1050 pixel). The on-board sound is an ac '97 compatible chip, the ethernet adapter has a RTL 8139 chip, and a modem is also built-in. There is no built-in floppy (you can use an USB floppy, though), only a Combo drive (DVD/CR-RW) and one PCMCIA slot. It has four USB connectors, a firewire and a serial connector at the back, next to an infrared (IrDA) TODO(Schnittstelle). lspci reports the following:

```
00:00.0 Host bridge: Intel Corp. 82845 845 (Brookdale) Chipset Host Bridge (rev 04)
00:01.0 PCI bridge: Intel Corp. 82845 845 (Brookdale) Chipset AGP Bridge (rev 04)
00:1e.0 PCI bridge: Intel Corp. 82801BA/CA PCI Bridge (rev 05)
00:1f.0 ISA bridge: Intel Corp. 82801BA ISA Bridge (LPC) (rev 05)
00:1f.1 IDE interface: Intel Corp. 82801BA IDE U100 (rev 05)
00:1f.2 USB Controller: Intel Corp. 82801BA/BAM USB (Hub #1) (rev 05)
00:1f.3 SMBus: Intel Corp. 82801BA/BAM SMBus (rev 05)
00:1f.4 USB Controller: Intel Corp. 82801BA/BAM USB (Hub #2) (rev 05)
00:1f.5 Multimedia audio controller: Intel Corp. 82801BA/BAM AC'97 Audio (rev 05)
01:00.0 VGA compatible controller: ATI Technologies Inc Radeon Mobility M7 LW
02:02.0 Communication controller: Conexant HSF 56k HSF i Modem (rev 01)
02:03.0 Ethernet controller: Realtek Semiconductor Co., Ltd. RTL-8139/8139C (rev 10)
02:04.0 CardBus bridge: Ricoh Co Ltd RL5c475 (rev b8)
02:04.1 FireWire (IEEE 1394): Ricoh Co Ltd: Unknown device 0551
```

The long version (lspci -vv) gives the following output for those who really want to delve into devices:

```
einstein:~# lspci -vv
00:00.0 Host bridge: Intel Corp. 82845 845 (Brookdale) Chipset Host Bridge (rev 04)
    Subsystem: Alpha-Top Corp: Unknown device b730
    Control: I/O- Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
    Status: Cap+ 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort+ >SERR
    Latency: 0
    Region 0: Memory at e8000000 (32-bit, prefetchable) [size=128M]
    Capabilities: [e4] #09 [9104]
    Capabilities: [a0] AGP version 2.0
        Status: RQ=31 SBA+ 64bit- FW+ Rate=x1,x2,x4
        Command: RQ=0 SBA- AGP- 64bit- FW+ Rate=x1

00:01.0 PCI bridge: Intel Corp. 82845 845 (Brookdale) Chipset AGP Bridge (rev 04) (prog-if 00)
    Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
    Status: Cap- 66Mhz+ UDF- FastB2B+ ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort- >SERR
    Latency: 96
```

```

Bus: primary=00, secondary=01, subordinate=01, sec-latency=64
I/O behind bridge: 00002000-00002fff
Memory behind bridge: e0000000-e00fffff
Prefetchable memory behind bridge: f0000000-f7ffffff
BridgeCtl: Parity- SERR- NoISA+ VGA+ MAbort- >Reset- FastB2B-

00:1e.0 PCI bridge: Intel Corp. 82801BA/CA PCI Bridge (rev 05) (prog-if 00 [Normal decode])
Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort- >SERR
Latency: 0
Bus: primary=00, secondary=02, subordinate=02, sec-latency=64
I/O behind bridge: 00003000-00003fff
Memory behind bridge: e0100000-e01fffff
BridgeCtl: Parity- SERR- NoISA+ VGA- MAbort- >Reset- FastB2B-

00:1f.0 ISA bridge: Intel Corp. 82801BA ISA Bridge (LPC) (rev 05)
Control: I/O+ Mem+ BusMaster+ SpecCycle+ MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
Latency: 0

00:1f.1 IDE interface: Intel Corp. 82801BA IDE U100 (rev 05) (prog-if 80 [Master])
Subsystem: Intel Corp. 82801BA IDE U100
Control: I/O+ Mem- BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
Latency: 0
Region 4: I/O ports at 1440 [size=16]

00:1f.2 USB Controller: Intel Corp. 82801BA/BAM USB (Hub #1) (rev 05) (prog-if 00 [UHCI])
Subsystem: Intel Corp.: Unknown device 244b
Control: I/O+ Mem- BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
Latency: 0
Interrupt: pin D routed to IRQ 5
Region 4: I/O ports at 1400 [size=32]

00:1f.3 SMBus: Intel Corp. 82801BA/BAM SMBus (rev 05)
Subsystem: Intel Corp.: Unknown device 244b
Control: I/O+ Mem- BusMaster- SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
Interrupt: pin B routed to IRQ 10
Region 4: I/O ports at 1450 [size=16]

00:1f.4 USB Controller: Intel Corp. 82801BA/BAM USB (Hub #2) (rev 05) (prog-if 00 [UHCI])
Subsystem: Intel Corp.: Unknown device 244b
Control: I/O+ Mem- BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
Latency: 0
Interrupt: pin C routed to IRQ 11
Region 4: I/O ports at 1420 [size=32]

```

```

00:1f.5 Multimedia audio controller: Intel Corp. 82801BA/BAM AC'97 Audio (rev 05)
  Subsystem: Alpha-Top Corp: Unknown device b730
  Control: I/O+ Mem- BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
  Status: Cap- 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Latency: 0
  Interrupt: pin B routed to IRQ 10
  Region 0: I/O ports at 1200 [size=256]
  Region 1: I/O ports at 1300 [size=64]

01:00.0 VGA compatible controller: ATI Technologies Inc Radeon Mobility M7 LW (prog-if 00 [VGA
  Subsystem: Alpha-Top Corp: Unknown device b730
  Control: I/O+ Mem+ BusMaster- SpecCycle- MemWINV- VGASnoop- ParErr- Stepping+ SERR+ Fa
  Status: Cap+ 66Mhz+ UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Interrupt: pin A routed to IRQ 4
  Region 0: Memory at f0000000 (32-bit, prefetchable) [size=128M]
  Region 1: I/O ports at 2000 [size=256]
  Region 2: Memory at e0000000 (32-bit, non-prefetchable) [size=64K]
  Expansion ROM at <unassigned> [disabled] [size=128K]
  Capabilities: [58] AGP version 2.0
    Status: RQ=47 SBA+ 64bit- FW- Rate=x1,x2,x4
    Command: RQ=0 SBA+ AGP- 64bit- FW- Rate=<none>
  Capabilities: [50] Power Management version 2
    Flags: PMEclk- DSI- D1+ D2+ AuxCurrent=0mA PME(D0-,D1-,D2-,D3hot-,D3cold-)
    Status: D0 PME-Enable- DSel=0 DScale=0 PME-

02:02.0 Communication controller: Conexant HSF 56k HSF i Modem (rev 01)
  Subsystem: Conexant: Unknown device 2003
  Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
  Status: Cap+ 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Latency: 64
  Interrupt: pin A routed to IRQ 10
  Region 0: Memory at e0100000 (32-bit, non-prefetchable) [size=64K]
  Region 1: I/O ports at 3400 [size=8]
  Capabilities: [40] Power Management version 2
    Flags: PMEclk- DSI+ D1- D2- AuxCurrent=0mA PME(D0-,D1-,D2-,D3hot+,D3cold+)
    Status: D0 PME-Enable- DSel=0 DScale=0 PME-

02:03.0 Ethernet controller: Realtek Semiconductor Co., Ltd. RTL-8139/8139C (rev 10)
  Subsystem: Alpha-Top Corp: Unknown device b730
  Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
  Status: Cap+ 66Mhz- UDF- FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Latency: 64 (8000ns min, 16000ns max)
  Interrupt: pin A routed to IRQ 10
  Region 0: I/O ports at 3000 [size=256]
  Region 1: Memory at e0110800 (32-bit, non-prefetchable) [size=256]
  Capabilities: [50] Power Management version 2
    Flags: PMEclk- DSI- D1+ D2+ AuxCurrent=375mA PME(D0-,D1+,D2+,D3hot+,D3cold+)
    Status: D0 PME-Enable- DSel=0 DScale=0 PME-

```

```

02:04.0 CardBus bridge: Ricoh Co Ltd RL5c475 (rev b8)
  Subsystem: Alpha-Top Corp: Unknown device b730
  Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR- Fa
  Status: Cap+ 66Mhz- UDF- FastB2B- ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Latency: 168
  Interrupt: pin A routed to IRQ 5
  Region 0: Memory at e0111000 (32-bit, non-prefetchable) [size=4K]
  Bus: primary=02, secondary=03, subordinate=06, sec-latency=176
  I/O window 0: 00000000-00000003
  I/O window 1: 00000000-00000003
  BridgeCtl: Parity- SERR- ISA- VGA- MAbort- >Reset- 16bInt+ PostWrite+
  16-bit legacy interface ports at 0001

02:04.1 FireWire (IEEE 1394): Ricoh Co Ltd: Unknown device 0551 (prog-if 10 [OHCI])
  Subsystem: Alpha-Top Corp: Unknown device b730
  Control: I/O- Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr- Stepping- SERR+ Fa
  Status: Cap+ 66Mhz- UDF- FastB2B- ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SE
  Latency: 64 (500ns min, 1000ns max)
  Interrupt: pin B routed to IRQ 11
  Region 0: Memory at e0110000 (32-bit, non-prefetchable) [size=2K]
  Capabilities: [dc] Power Management version 2
    Flags: PMEclk- DSI- D1- D2- AuxCurrent=0mA PME(D0+,D1-,D2-,D3hot+,D3cold+)
    Status: D0 PME-Enable- DSel=0 DScale=2 PME-

```

I also have a USB mouse, and use the touchpad at the same time (see the XF86 section).

Chapter 2

Drives, cards, connectors

2.1 CDROM, other drives

- + The built-in cdrom drive is a dvd/cd-rw combo drive (QSI DVD/CDRW SBW-161). After the installation from scratch, there is no ide-scsi configured, so the cdrom can be accessed as /dev/hdc. Using the "ide-scsi=/dev/hdc" lilo kernel parameter (add it to the append="..." line of /etc/lilo.conf) and the ide-scsi Kernel module, the cd burner can be accessed as /dev/sg0.
- o As I don't have a dvd disk, I have never tested the dvd capabilities of the drive.
- + The one PCMCIA slot has a Ricoh CardBus bridge. It worked out of the box with Debian's settings. I use netenv, and as soon as I insert a PCMCIA card, the network is started using the PCMCIA scripts and the settings from netenv.

2.2 Network card and modem

- + The ethernet card uses an ordinary Realtek 8139 chip, so the standard kernel module (rtl8139 for Kernel 2.2.x or 8139too for Kernel 2.4.x) works fine. Just add the line

```
alias eth0 8139too
```

to your /etc/modules.conf (or to /etc/modutils/eth0 on Debian and run update-modules). Unfortunately, the card doesn't seem to support link beat detection, so you cannot use laptop-net to automatically

start the network with the appropriate settings (depending on the other machines in the network).

- + The modem is a bit trickier. Windows reports it to be a "Generic SoftK56" and it works fine there at 33.6 kBit, but `lspci` shows more details and reports it as a "Conexant HSF 56k HSF_i Modem".

I downloaded the source package for the Conexant HSF modem drivers for Linux from <http://www.mbsi.ca/cnxtlindrv> (<http://www.mbsi.ca/cnxtlindrv>). Running `make install` and then `hsfconfig` (both as root) installed the kernel modules and set up `/dev/ttySHSF0` as `/dev/modem`. It also made the correct settings to `/etc/modules.conf` (or rather `/etc/modutils/hsf`) so the modules are automatically loaded.

The modem seems to work fine now, but I had to comment out the line

```
#auth
```

in the file `/etc/ppp/options` to be able to connect to my provider Lion.cc at home. This has probably nothing to do with the modem, but rather with the server of my provider.

2.3 Sound

- + The sound chip is a AC 97 compatible Intel chipset and uses the "i810_audio" kernel module. The installation automatically detected it and wrote the correct `modules.conf` lines.

2.4 USB, IrDA, PCMCIA

- + The USB ports work fine without any problems (it uses the `usb-uhci` host controller kernel module).
- The IrDA (FIR) is not automatically detected by "dpkg-reconfigure irda-common", and even "findchip" does not find a supported irda chip.
- + The PCMCIA adapter is reported as a "Ricoh R/RL/RT/RC/5C475(II). R5C520 or compatible CardBus-Controller" by Windows. The standard Debian PCMCIA utilities work fine with it.

2.5 Firewire

- o I don't have any firewire enabled devices, so this is another feature I haven't tried.

Chapter 3

XFree86 (mouse, keyboard, screen, graphics card, external monitor)

The graphics card is a "ATI Radeon Mobility 7500" and was not recognized by XFree86 4.1, so I had to install XFree86 4.2.

Using the (currently still unofficial) standard debian package `xserver-xfree86` (version 4.2.1-0pre1, deb-line:

```
deb http://people.debian.org/~branden sid/i386/  
deb-src http://people.debian.org/~branden sid/source/
```

) together with the hardware detection packages *discover*, *mdetect* and *read-edid* from the official sid archive, you can leave all the detection work to xfree (graphics card autodetect, monitor autodetect, mouse autodetect). The only settings I had to enter were the horizontal and vertical refresh rates (31.7-37.5 and 50-100) and of course select the desired screen resolution (where no 1400x1050 was offered, so I needed to edit XF86Config-4 manually afterwards). Here is my `/etc/X11/XF86Config-4`:

```
### BEGIN DEBCONF SECTION
```

```
Section "Files"  
FontPath "unix:7100" # local font server  
# if the local font server has problems, we can fall back on these  
FontPath "/usr/lib/X11/fonts/misc"  
FontPath "/usr/lib/X11/fonts/cyrillic"  
FontPath "/usr/lib/X11/fonts/100dpi:unscaled"  
FontPath "/usr/lib/X11/fonts/75dpi:unscaled"  
FontPath "/usr/lib/X11/fonts/Type1"  
FontPath "/usr/lib/X11/fonts/Speedo"
```

```
FontPath "/usr/lib/X11/fonts/100dpi"  
FontPath "/usr/lib/X11/fonts/75dpi"  
EndSection
```

```
Section "Module"  
Load "GLcore"  
Load "bitmap"  
Load "dbe"  
Load "ddc"  
Load "dri"  
Load "extmod"  
Load "freetype"  
Load "glx"  
Load "int10"  
Load "record"  
Load "speedo"  
Load "type1"  
Load "vbe"  
EndSection
```

```
Section "InputDevice"  
Identifier "Generic Keyboard"  
Driver "keyboard"  
Option "CoreKeyboard"  
Option "XkbRules" "xfree86"  
Option "XkbModel" "pc105"  
Option "XkbLayout" "us"  
EndSection
```

```
Section "InputDevice"  
Identifier "Touchpad"  
Driver "mouse"  
Option "CorePointer"  
Option "Device" "/dev/psaux"  
Option "Protocol" "PS/2"  
Option "Emulate3Buttons" "true"  
Option "ZAxisMapping" "4 5"  
EndSection
```

```
Section "InputDevice"  
Identifier "USBMouse"  
Driver "mouse"  
Option "SendCoreEvents" "true"  
Option "Device" "/dev/input/mice"  
Option "Protocol" "ImPS/2"  
Option "Emulate3Buttons" "true"  
Option "ZAxisMapping" "4 5"  
EndSection
```

```
Section "Device"
Identifier "ATI Technologies, Inc. Radeon Mobility M7 [LW]"
Driver "ati"
EndSection
```

```
Section "Monitor"
Identifier "Standardbildschirm"
HorizSync 31.9-37.5
VertRefresh 50-100
Option "DPMS"
EndSection
```

```
Section "Screen"
Identifier "LCDScreen"
Device "ATI Technologies, Inc. Radeon Mobility M7 [LW]"
Monitor "Standardbildschirm"
DefaultDepth 24
SubSection "Display"
Depth 1
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
SubSection "Display"
Depth 4
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
SubSection "Display"
Depth 8
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
SubSection "Display"
Depth 15
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
SubSection "Display"
Depth 16
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
SubSection "Display"
Depth 24
Modes "1400x1050" "1280x1024" "800x600" "640x480"
EndSubSection
EndSection
```

```
Section "ServerLayout"
Identifier "Default Layout"
Screen "LCDScreen"
InputDevice "Generic Keyboard"
InputDevice "Touchpad"
InputDevice "USBMouse"
```

EndSection

Section "DRI"

Mode 0666

EndSection

END DEBCONF SECTION

- + Note the two InputDevice sections for the USB mouse and the touchpad, which can be used at the same time.
- o The additional CD control keys at the front of the notebook, and the information and mail buttons next to the power button have keycodes (according to xev they are 162, 164, 144, 153, 174 and 176 for the CDRom buttons, 178 for the info and 236 for the mail button), but no keysym assigned, so they cannot be used out of the box (and they are not so important to me to dig into it).
- + Using a video beamer with the notebook works fine. Just plug in the VGA plug at the back of the notebook (the signal seems to be there all the time).

Chapter 4

Power management (APM / ACPI)

The board uses ACPI, while apm doesn't work at all.

- apm always reports "AC on-line, no system battery", and apm -s or apm -S work only on the shell (and only if you don't have apmd running), but in all other cases the laptop awakes after a second.
- o As the standard kernel does not come with acpi compiled in, you probably will need to recompile your own kernel – with acpi compiled in.
- o I was yet too lazy to recompile, so I can't say how well ACPI works.

4.1 lm-sensors

- I tried running sensors-detect, but that didn't find any supported sensors, so I left my notebook without running lm-sensors, but that is really not an issue.

Chapter 5

License

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