Linux Hardware Compatibility HOWTO

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This document lists most of the hardware supported by Linux and helps you locate any necessary drivers.

Contents

1 Introduction

1.1 Welcome

Welcome to the Linux Hardware Compatibility HOWTO. This document lists most of the hardware supported by Linux, now if only people would read this first before posting their questions on Usenet.

Subsections titled Others list hardware with alpha or beta drivers in varying degrees of usability or other drivers that aren't included in standard kernels. Note that some drivers only exist in alpha kernels, so if you see something listed as supported but isn't in your version of the Linux kernel, upgrade.

The latest version of this document can be found on the net at the usual sites where the Linux HOWTO's are kept.

If you know of any Linux hardware (in)compatibilities not listed here please let me know, just send mail or find me on IRC. Thanks.

1.2 Copyright

1.3 System architectures

This document only deals with Linux for Intel platforms, for other platforms check the following:

- ARM Linux
  <http://whirligig.ecs.soton.ac.uk/~rmk92/armlinux.html>
- Linux/68k
  <http://www-users.informatik.rwth-aachen.de/~hn/linux68k.html>
- Linux/8086
  <http://www.linux.org.uk/Linux8086.html>
- Linux/Alpha
  <http://www.azstarnet.com/~axplinux/>
- Linux/MIPS
  <http://www.waldorf-gmbh.de/linux-mips-faq.html>
- Linux/PowerPC
  <http://liber.stanford.edu/linuxppc/>
- Linux for Acorn
  <http://www.ph.kcl.ac.uk/~amb/linux.html>
- MacLinux
  <http://www.ibg.uu.se/maclinux/>

2 Computers/Motherboards/BIOS

ISA, VLB, EISA, and PCI buses are all supported.

PS/2 and Microchannel (MCA) is not supported in the standard kernel. Alpha test PS/2 MCA kernels are available but not yet recommended for beginners or serious use.

2.1 Specific systems

- Compaq Deskpro XL
  <http://www-c724.uibk.ac.at/XL/>
- IBM PS/2 MCA systems
  <ftp://invaders.dcrl.nd.edu/pub/misc/>

3 Laptops

- Linux Laptop Homepage
  <http://www.cs.utexas.edu/users/kharker/linux-laptop/>
- APM
  <ftp://ftp.cs.unc.edu/pub/users/faith/linux/>

- non-blinking cursor
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/console/noblink-1.5.tar.gz>
- power savings (WD7600 chipset)
  <ftp://sunsite.unc.edu/pub/Linux/system/Misc/low-level/pwrm-1.0.tar.Z>
- other general info
  <ftp://tsx-11.mit.edu/pub/linux/packages/laptops/>

3.1 Specific laptops

- Compaq Concerto (pen driver)
  <http://www.cs.nmsu.edu/~pfeiffer/>
- Compaq Contura Aero
  <http://domen.uninett.no/~hta/linux/aero-faq.html>
- IBM ThinkPad
  <http://peipa.essex.ac.uk/tp-linux/tp-linux.html>
- Linux and X on notebook computers
  <http://www.castle.net/~darin/>
- NEC Versa M and P
  <http://www.santafe.edu:80/~nelson/versa-linux/>
- Tadpole P1000
  <http://www.tadpole.com/Support/online/linux.html>
- Tadpole P1000 (another one)
  <http://peipa.essex.ac.uk/tadpole-linux/tadpole-linux.html>
- TI TravelMate 4000M
  <ftp://ftp.biomath.jussieu.fr/pub/linux/TM4000M-mini-HOWTO.txt.Z>
- TI TravelMate 5100
  <http://www.wri.com/~cwikla/ti5100.html>
- Toshiba Satellite Pro 400CDT
  <http://terra.mpikg-teltow.mpg.de/~burger/T400CDT-Linux.html>

3.2 PCMCIA

- PCMCIA
  <http://hyper.stanford.edu/~dhinds/pcmcia/>

PCMCIA drivers currently support all common PCMCIA controllers, including Databook TCIC/2, Intel i82365SL, Cirrus PD67xx, and Vadem VG-468 chipsets. Motorola 6AHC05GA controller used in some Hyundai laptops is not supported. And see Appendix B for list of supported PCMCIA cards.

4 CPU/FPU

Intel/AMD/Cyrix 386SX/DX/SL/DXL/SLC, 486SX/DX/SL/SX2/DX2/DX4, Pentium. Basically all 386 or better processors will work. Linux has built-in FPU emulation if you don't have a math coprocessor.

Experimental SMP (multiple CPU) support is included in kernel 1.3.31 and newer. Check the Linux/SMP Project page for details and updates.

- Linux/SMP Project
  `<http://www.linux.org.uk/SMP/title.html>`

A few very early AMD 486DX's may hang in some special situations. All current chips should be okay and getting a chip swap for old CPU's should not be a problem.

ULSI Math*Co series has a bug in the FSAVE and FRSTOR instructions that causes problems with all protected mode operating systems. Some older IIT and Cyrix chips may also have this problem.

There are problems with TLB flushing in UMC U5S chips in very old kernels. (1.1.x)

- enable cache on Cyrix processors
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/CxPatch030.tar.z>`
- Cyrix software cache control
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/linux.cxpatch>`

5 Video cards

Linux will work with all video cards in text mode, VGA cards not listed below probably will still work with mono VGA and/or standard VGA drivers.

If you're looking into buying a cheap video card to run X, keep in mind that accelerated cards (ATI Mach, ET4000/W32p, S3) are MUCH faster than unaccelerated or partially accelerated (Cirrus, WD) cards. S3 Trio64 based cards with 2 megs DRAM go for around US$160 and S3 868 based cards with 2 megs DRAM are around US$200.

"32 bpp" is actually 24 bit color aligned on 32 bit boundaries. It does NOT mean the cards are capable of 32 bit color, they still display 24 bit color (16,777,216 colors). 24 bit packed pixels modes are not supported in XFree86, so cards that can do 24 bit modes to get higher resolutions in other OS's are not able to do this in X using XFree86. These cards include Mach32, Cirrus 542x, S3 801/805/868/968, ET4000, and others.

5.1 Diamond video cards

Most currently available Diamond cards ARE supported by the current release of XFree86. Early Diamond cards may not be officially supported by XFree86, but there are ways of getting them to work. Diamond is now actively supporting the XFree86 Project.

- Diamond support for XFree86
  <http://www.diamondmm.com/linux.html>
- Diamond FAQ (for older cards)
  <ftp://sunsite.unc.edu/pub/Linux/X11/Diamond.FAQ>
- Diamond Disgruntled Users Page (for older cards)
  <http://gladstone.uoregon.edu/~trenton/diamond/>

5.2 SVGALIB (graphics for console)

- VGA
- EGA
- ARK Logic ARK1000PV/2000PV
- ATI VGA Wonder
- ATI Mach32
- Cirrus 542x, 543x
- OAK OTI-037/67/77/87
- S3 (limited support)
- Trident TVGA8900/9000
- Tseng ET3000/ET4000/W32

5.3 XFree86 3.1.2

5.3.1 Accelerated

- ATI Mach8
- ATI Mach32 (16 bpp (does not work with all Mach32 cards))
- ATI Mach64 (16/32 bpp (support depends on RAMDAC))
- Cirrus Logic 5420, 542x/5430 (16 bpp), 5434 (16/32 bpp), 62x5
- IBM 8514/A
- IBM XGA, XGA-II
- IIT AGX-010/014/015/016 (16 bpp)
- Oak OTI-087
- S3 911, 924, 801, 805, 928, 864, 964, Trio32, Trio64, 868, 968

  - see Appendix A for list of supported S3 cards
- Tseng ET4000/W32/W32i/W32p
- Weitek P9000 (16/32 bpp)
  - Diamond Viper VLB/PCI
  - Orchid P9000
- Western Digital WD90C31/33

5.3.2 Unaccelerated

- ARK Logic ARK1000PV/VL, ARK2000PV
- ATI VGA Wonder series
- Avance Logic AL2101/2228/2301/2302/2308/2401
- Chips & Technologies 65520/65530/65540/65545
- Cirrus Logic 6420/6440
- Compaq AVGA
- Genoa GVGA
- MCGA (320x200)
- MX MX68000/MX68010
- NCR 77C22, 77C22E, 77C22E+
- Oak OTI-067, OTI-077
- RealTek RTG3106
- Trident TVGA8800, TVGA8900, TVGA9xxx (no support for TGUI chipsets)
- Tseng ET3000, ET4000AX
- VGA (standard VGA, 4 bit, slow)
- Video 7 / Headland Technologies HT216-32
- Western Digital/Paradise PVGA1, WD90C00/10/11/24/30/31/33

5.3.3 Monochrome

- Hercules mono
- Hyundai HGC-1280
- Sigma LaserView PLUS
- VGA mono

5.3.4 Others

- EGA (ancient, from c. 1992)
  <ftp://ftp.funet.fi/pub/OS/Linux/BETA/Xega/>
- ET4000/W32 and ICS5341 GenDAC
  <ftp://sunsite.unc.edu/pub/Linux/X11/X-servers/>
- Trident TGUI9440
  <ftp://sunsite.unc.edu/pub/Linux/X11/X-servers/>

5.3.5 Works in progress

- Compaq QVision
- Number Nine Imagine 128

No, I do not know when support for these cards will be finished, please don't ask me. If you want support for these cards now get Accelerated-X.

5.4 Commercial X servers

Commercial X servers provide support for cards not supported by XFree86, and might give better performances for cards that are supported by XFree86. In general they support many more cards than XFree86, so I'll onlys list cards that aren't supported by XFree86 here. Contact the vendors directly or check the Commercial HOWTO for more info.

5.4.1 Accelerated-X 1.2

- Chips & Technologies 82C45x, 82C48x, F655xx
- Compaq QVision 2000
- Matrox MGA, Millenium
- Number Nine I-128 / I-128 Pro
- Weitek P9100

$199, X Inside, Inc. <info@xinside.com>

Accel-X supports most cards in 16 and 32 bpp modes and it also supports 24 bit packed pixel modes for cards that have these modes, including ATI Mach32, Mach64 (1280x1024@24bpp), ET4000/W32p, S3-866/868/968, and more. Accel-X also supports other input hardware like graphics tablets and touchscreens.

Accel-X also supports XVideo (Xv) extensions (on Matrox Comet, Marvel-II, and SPEA ShowTime Plus), PEX, and XIE.

5.4.2 Metro-X 2.3

$199, Metro Link <sales@metrolink.com>

Metro-X supports more boards than XFree but less than Accel-X, however I don't have much more information as I can't seem to view the PostScript files they sent me. Mail them directly for more info.

6 Controllers (hard drive)

Linux will work with standard IDE, MFM and RLL controllers. When using MFM/RLL controllers it is important to use ext2fs and the bad block checking options when formatting the disk.

Enhanced IDE (EIDE) interfaces are supported. With up to two IDE interfaces and up to four hard drives and/or CD-ROM drives. Linux will detect these EIDE interfaces.

- CMD-640
- DTC 2278D
- FGI/Holtek HT-6560B
- RZ1000
- Triton (82371FB) IDE (with busmaster DMA)

ESDI controllers that emulate the ST-506 (MFM/RLL/IDE) interface will also work. The bad block checking comment also applies to these controllers.

Generic 8 bit XT controllers also work.

7 Controllers (SCSI)

It is important to pick a SCSI controller carefully. Many cheap ISA SCSI controllers are designed to drive CD-ROM's rather than anything else. Such low end SCSI controllers are no better than IDE. See the SCSI HOWTO and look at performance figures before buying a SCSI card.

7.1 Supported

- AMI Fast Disk VLB/EISA (BusLogic compatible)
- Adaptec AVA-1505/1515 (ISA) (Adaptec 152x compatible)
- Adaptec AHA-1510/152x (ISA) (AIC-6260/6360)
- Adaptec AHA-154x (ISA) (all models)
- Adaptec AHA-174x (EISA) (in enhanced mode)

- Adaptec AHA-274x (EISA) / 284x (VLB) (AIC-7770)
- Adaptec AHA-2940/3940 (PCI) (AIC-7870) (since 1.3.6)
- Always IN2000
- BusLogic (ISA/EISA/VLB/PCI) (all models)
- DPT PM2001, PM2012A (EATA-PIO)
- DPT Smartcache (EATA-DMA) (ISA/EISA/PCI) (all models)
- DTC 329x (EISA) (Adaptec 154x compatible)
- Future Domain TMC-16x0, TMC-3260 (PCI)
- Future Domain TMC-8xx, TMC-950
- Media Vision Pro Audio Spectrum 16 SCSI (ISA)
- NCR 5380 generic cards
- NCR 53c400 (Trantor T130B) (use generic NCR 5380 SCSI support)
- NCR 53c406a (Acculogic ISApport / Media Vision Premium 3D SCSI)
- NCR 53c7x0, 53c8x0 (PCI)
- Qlogic / Control Concepts SCSI/IDE (FAS408) (ISA/VLB)
- Seagate ST-01/ST-02 (ISA)
- SoundBlaster 16 SCSI-2 (Adaptec 152x compatible) (ISA)
- Trantor T128/T128F/T228 (ISA)
- UltraStor 14F (ISA), 24F (EISA), 34F (VLB)
- Western Digital WD7000 SCSI

7.2 Others

- AMD AM53C974, AM79C974 (PCI) (Compaq, HP, Zeos onboard SCSI)
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/scsi/AM53C974-0.3.tgz>`
- Adaptec ACB-40xx SCSI-MFM/RLL bridgeboard
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/scsi/adaptec-40XX.tar.gz>`
- Always Technologies AL-500
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/scsi/al500-0.2.tar.gz>`
- BusLogic (ISA/EISA/VLB/PCI) (new beta driver)
  `<ftp://ftp.dandelion.com/BusLogic-1.0-beta.tar.gz>`

- Iomega PC2/2B
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/scsi/iomega_pc2-1.1.x.tar.gz>
- Qlogic (ISP1020) (PCI)
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/scsi/isp1020-0.5.gz>
- Ricoh GSI-8
  <ftp://tsx-11.mit.edu/pub/linux/ALPHA/scsi/gsi8.tar.gz>

7.3 Unsupported

- Parallel port SCSI adapters
- Non Adaptec compatible DTC boards (327x, 328x)

8 Controllers (I/O)

Any standard serial/parallel/joystick/combo cards. Linux supports 8250, 16450, 16550, and 16550A UART's. Cards that support non-standard IRQ's (IRQ > 9) can be used.

See National Semiconductor's "Application Note AN-493" by Martin S. Michael. Section 5.0 describes in detail the differences between the NS16550 and NS16550A. Briefly, the NS16550 had bugs in the FIFO circuits, but the NS16550A (and later) chips fixed those. However, there were very few NS16550's produced by National, long ago, so these should be very rare. And many of the "16550" parts in actual modern boards are from the many manufacturers of compatible parts, which may not use the National "A" suffix. Also, some multiport boards will use 16552 or 16554 or various other multiport or multifunction chips from National or other suppliers (generally in a dense package soldered to the board, not a 40 pin DIP). Mostly, don't worry about it unless you encounter a very old 40 pin DIP National "NS16550" (no A) chip loose or in an old board, in which case treat it as a 16450 (no FIFO) rather than a 16550A. - Zhahai Stewart <zstewart@hisys.com>

9 Controllers (multiport)

9.1 Non-intelligent cards

9.1.1 Supported

- AST FourPort and clones (4 port)
- Accent Async-4 (4 port)
- Arnet Multiport-8 (8 port)
- Bell Technologies HUB6 (6 port)
- Boca BB-1004, 1008 (4, 8 port) - no DTR, DSR, and CD

- Boca BB-2016 (16 port)
- Boca IO/AT66 (6 port)
- Boca IO 2by4 (4 serial / 2 parallel, uses 5 IRQ's)
- Computone ValuePort (4, 6, 8 port) (AST FourPort compatible)
- DigiBoard PC/X (4, 8, 16 port)
- Comtrol Hostess 550 (4, 8 port)
- PC-COMM 4-port (4 port)
- SIIG I/O Expander 4S (4 port, uses 4 IRQ's)
- STB 4-COM (4 port)
- Twincom ACI/550
- Usenet Serial Board II (4 port)

Non-intelligent cards usually come in two varieties, one using standard com port addresses and use 4 IRQ's, and another that's AST FourPort compatible and uses a selectable block of addresses and a single IRQ. (Addresses and IRQ's are set using `setserial`.) If you're getting one of these cards, be sure to check which standard it conforms to, prices are no indication.

9.2 Intelligent cards

9.2.1 Supported

- Cyclades Cyclom-8Y/16Y (8, 16 port) (ISA/PCI)
- Stallion EasyIO (ISA) / EasyConnection 8/32 (ISA/MCA)
- Stallion EasyConnection 8/64 / ONboard (ISA/EISA/MCA) / Brumby / Stallion (ISA)

9.2.2 Others

- Comtrol RocketPort (8/16/32 port)
  `<ftp://tsx-11.mit.edu/pub/linux/packages/comtrol/>`
- Computone IntelliPort II (4/8/16 port)
  contact Michael H. Warfield <`mhw@wittsend.atl.ga.us`>
- DigiBoard COM/Xi
  contact Simon Park <`si@wimpol.demon.co.uk`>
- DigiBoard PC/Xe (ISA) and PC/Xi (EISA)
  `<ftp://ftp.digibd.com/drivers/linux/>`

- Hayes ESP8
  contact Dennis Boylan <dennis@lan.com>
- Moxa C218 (8 port) / C320 (8/16/24/32 expandable)
  <ftp://ftp.moxa.com.tw/drivers/c-218-320/linux/>
- Specialix SIO/XIO (modular, 4 to 32 ports)
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/serial/sidrv0_5.taz>

10 Network adapters

Ethernet adapters vary greatly in performance. In general the newer the design the better. Some very old cards like the 3Com 3C501 are only useful because they can be found in junk heaps for $5 a time. Be careful with clones, not all are good clones and bad clones often cause erratic lockups under Linux. Read the Ethernet HOWTO for detailed descriptions of various cards.

10.1 Supported

10.1.1 Ethernet

- 3Com 3C501 - “avoid like the plague”
- 3Com 3C503, 3C505, 3C507, 3C509/3C509B (ISA) / 3C579 (EISA)
- AMD LANCE (79C960) / PCnet-ISA/PCI (AT1500, HP J2405A, NE1500/NE2100)
- AT&T GIS WaveLAN
- Allied Telesis AT1700
- Ansel Communications AC3200 EISA
- Apricot Xen-II
- Cabletron E21xx
- DEC DE425 (EISA) / DE434/DE435 (PCI)
- DEC DEPCA and EtherWORKS
- HP PCLAN (27245 and 27xxx series)
- HP PCLAN PLUS (27247B and 27252A)
- HP 10/100VG PCLAN (ISA/EISA/PCI)
- Intel EtherExpress
- Intel EtherExpress Pro

- NE2000/NE1000 (be careful with clones)
- New Media Ethernet
- Racal-Interlan NI5210 (i82586 Ethernet chip)
- Racal-Interlan NI6510 (am7990 lance chip) - doesn't work with more than 16 megs RAM
- PureData PDUC8028, PDI8023
- SEEQ 8005
- SMC Ultra
- Schneider & Koch G16
- Western Digital WD80x3
- Zenith Z-Note / IBM ThinkPad 300 built-in adapter

10.1.2 Pocket and portable adapters

- AT-Lan-Tec/RealTek parallel port adapter
- D-Link DE600/DE620 parallel port adapter

10.1.3 Slotless

- SLIP/CSLIP/PPP (serial port)
- EQL (serial IP load balancing)
- PLIP (parallel port) - using "LapLink cable" or bi-directional cable

10.1.4 ARCnet

- works with all ARCnet cards

10.1.5 Token Ring

- IBM Tropic chipset cards

10.1.6 Amateur radio (AX.25)

- Ottawa PI/PI2
- Most generic 8530 based HDLC boards

10.2 Others

10.2.1 Ethernet

- 3Com Demon Ethercards (3C592, 3C597 (100 mbps)) (EISA)
  <http://cesdis.gsfc.nasa.gov/linux/drivers/vortex.html>
- 3Com Vortex Ethercards (3C590, 3C595 (100 mbps)) (PCI)
  <http://cesdis.gsfc.nasa.gov/linux/drivers/vortex.html>
- DEC 21040/21140 "Tulip" / SMC PCI EtherPower 10/100
  <http://cesdis.gsfc.nasa.gov/linux/drivers/tulip.html>
- HP J2585 (PCI) / HP J2573 (ISA) (ATT2MDx1 / 100VG)
  <http://cesdis1.gsfc.nasa.gov:80/linux/drivers/100vg.html>

10.2.2 ISDN

- Linux ISDN WWW page
  <http://www.ix.de/ix/linux/linux-isdn.html>
- 3Com Sonix Arpeggio
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/network/sonix.tgz>
- Combinet EVERYWARE 1000 ISDN
  <ftp://sunsite.unc.edu/pub/Linux/patches/network/combinet1000isdn-1.02.tar.gz>
- Diehl SCOM card
  <ftp://sunsite.unc.edu/pub/Linux/kernel/patches/network/isdndrv-0.1.1.tar.gz>
- ICN ISDN / Teles ISDN / Creatix AVM ISDN cards
  <ftp://ftp.franken.de/pub/isdn4linux/>

ISDN cards that emulate standard modems or common Ethernet adapters don't need any special drivers to work.

10.2.3 PCMCIA cards

- See Appendix B for complete list

10.2.4 ATM

- Efficient Networks ENI155P-MF 155 Mbps ATM adapter (PCI)
  <http://lrcwww.epfl.ch/linux-atm/>

10.2.5 Frame Relay

- Sangoma S502 56K Frame Relay card
  `<ftp://ftp.sovereign.org/pub/wan/fr/>`

10.3 Unsupported

- Xircom adapters (PCMCIA and parallel port) are not supported.

11 Sound cards

11.1 Supported

- 6850 UART MIDI
- Adlib (OPL2)
- Audio Excell DSP16
- Aztech Sound Galaxy NX Pro
- Crystal CS4232 (PnP) based cards
- ECHO-PSS cards (Orchid SoundWave32, Cardinal DSP16)
- Ensoniq SoundScape
- Gravis Ultrasound
- Gravis Ultrasound 16-bit sampling daughterboard
- Gravis Ultrasound MAX
- Logitech SoundMan Games (SBPro, 44kHz stereo support)
- Logitech SoundMan Wave (Jazz16/OPL4)
- Logitech SoundMan 16 (PAS-16 compatible)
- MPU-401 MIDI
- MediaTriX AudioTriX Pro
- Media Vision Premium 3D (Jazz16)
- Media Vision Pro Sonic 16 (Jazz)
- Media Vision Pro Audio Spectrum 16
- Microsoft Sound System (AD1848)

- OAK OTI-601D cards (Mozart)
- OPTi 82C928/82C929 cards (MAD16/MAD16 Pro)
- Sound Blaster
- Sound Blaster Pro
- Sound Blaster 16
- Turtle Beach Wavefront cards (Maui, Tropez)
- Wave Blaster (and other daughterboards)

11.2 Others

- MPU-401 MIDI (intelligent mode)
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/sound/mpu401-0.2.tar.gz>`
- PC speaker / Parallel port DAC
  `<ftp://ftp.informatik.hu-berlin.de/pub/os/linux/hu-sound/>`
- Turtle Beach MultiSound/Tahiti/Monterey
  `<ftp://ftp.cs.colorado.edu/users/mccreary/archive/tbeach/multisound/>`

11.3 Unsupported

The ASP chip on Sound Blaster 16 series and AWE32 is not supported. AWE32's onboard E-mu MIDI synthesizer is not supported.

Nathan Laredo <laredo@gnu.ai.mit.edu> is willing to write AWE32 drivers if you send him a complimentary card. He is also willing to write drivers for almost any hardware if you send him free samples of your hardware.

Sound Blaster 16's with DSP 4.11 and 4.12 have a hardware bug that causes hung/stuck notes when playing MIDI and digital audio at the same time. The problem can happen with either Wave Blaster daughterboards or MIDI devices attached to the MIDI port. There is no known fix.

12 Hard drives

All hard drives should work if the controller is supported.

(From the SCSI HOWTO) All direct access SCSI devices with a block size of 256, 512, or 1024 bytes should work. Other block sizes will not work (Note that this can often be fixed by changing the block and/or sector sizes using the MODE SELECT SCSI command).

Large IDE (EIDE) drives work fine with newer kernels. The boot partition must lie in the first 1024 cylinders due to PC BIOS limitations.

Some Conner CFP1060S drives may have problems with Linux and ext2fs. The symptoms are inode errors during `e2fsck` and corrupt file systems. Conner has released a firmware upgrade to fix this problem, contact Conner at 1-800-4CONNER (US) or +44-1294-315333 (Europe). Have the microcode version (found on the drive label, 9WA1.6x) handy when you call.

Certain Micropolis drives have problems with Adaptec and BusLogic cards, contact the drive manufacturers for firmware upgrades if you suspect problems.

- Multiple device driver (RAID-0, RAID-1)
  <ftp://sweet-smoke.ufr-info-p7.ibp.fr/public/Linux/>

13 Tape drives

13.1 Supported

- SCSI tape drives
  (From the SCSI HOWTO) Drives using both fixed and variable length blocks smaller than the driver buffer length (set to 32k in the distribution sources) are supported. Virtually all drives should work. (Send mail if you know of any incompatible drives.)
- QIC-02 drives

13.2 Others

- QIC-117, QIC-40/80, QIC-3010/3020 (QIC-WIDE) drives
  Most tape drives using the floppy controller should work. Various dedicated controllers (Colorado FC-10/FC-20, Mountain Mach-2, Iomega Tape Controller II) are also supported
  <ftp://sunsite.unc.edu/pub/Linux/kernel/tapes>

13.3 Unsupported

- Emerald and Tecmar QIC-02 tape controller cards - Chris Ulrich <insom@math.ucr.edu>
- Drives that connect to the parallel port (eg: Colorado Trakker)
- Some high speed tape controllers (Colorado TC-15)
- Irwin AX250L/Accutrak 250 (not QIC-80)
- IBM Internal Tape Backup Unit (not QIC-80)
- COREtape Light

14 CD-ROM drives

14.1 Supported

- SCSI CD-ROM drives
  (From the CD-ROM HOWTO) Any SCSI CD-ROM drive with a block size of 512 or 2048 bytes should work under Linux; this includes the vast majority of CD-ROM drives on the market.
- EIDE (ATAPI) CD-ROM drives
- Aztech CDA268, Orchid CDS-3110, Okano/Wearnes CDD-110, Conrad TXC
- GoldStar R420
- LMS Philips CM 206
- Matsushita/Panasonic, Creative Labs, Longshine, Kotobuki (SBPCD)
- Mitsumi
- Optics Storage Dolphin 8000AT
- Sanyo H94A
- Sony CDU31A/CDU33A
- Sony CDU-535/CDU-531
- Teac CD-55A SuperQuad

14.2 Others

- LMS/Philips CM 205/225/202
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/cdrom/lmscd0.3d.tar.gz>`
- Mitsumi FX001D/F (alternate drivers)
  `<ftp://ftp.gwdg.de//pub/linux/cdrom/drivers/mitsumi/mcdx-1.0a.tar.gz>`
- NEC CDR-35D (old)
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/cdrom/linux-neccdr35d.patch>`
- Sony SCSI multisession CD-XA
  `<ftp://tsx-11.mit.edu/pub/linux/patches/sony-multi-0.00.tar.gz>`

14.3 Notes

PhotoCD (XA) is supported.

All CD-ROM drives should work similarly for reading data. There are various compatibility problems with audio CD playing utilities. (Especially with newer low-end NEC drives.) Some alpha drivers may not have audio support yet.

Early (single speed) NEC CD-ROM drives may have trouble with currently available SCSI controllers.

15 Removable drives

All SCSI drives should work if the controller is supported, including optical (MO), WORM, floptical, Bernoulli, Zip, SyQuest, PD, and others.

- Parallel port Zip drives
  `<ftp://gear.torque.net/pub/>`

Removable drives work like floppies, just `fdisk`/`mkfs` and mount the disks. Linux provides drive locking if your drives support it. `mtools` can also be used if the disks are in MS-DOS format.

CD-R drives require special software to work. Read the CD-R Mini-HOWTO.

Linux supports both 512 and 1024 bytes/sector disks.

16 Mice

16.1 Supported

- Microsoft serial mouse
- Mouse Systems serial mouse
- Logitech Mouseman serial mouse
- Logitech serial mouse
- ATI XL Inport busmouse
- C&T 82C710 (QuickPort) (Toshiba, TI Travelmate)
- Microsoft busmouse
- Logitech busmouse
- PS/2 (auxiliary device) mouse

16.2 Others

- Sejin J-mouse
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/console/jmouse.1.1.70-jmouse.tar.gz>`
- MultiMouse - use multiple mouse devices as single mouse
  `<ftp://sunsite.unc.edu/pub/Linux/system/Misc/MultiMouse-1.0.tgz>`

16.3 Notes

Touchpad devices like Alps Glidepoint also work, so long they're compatible with another mouse protocol.

Newer Logitech mice (except the Mouseman) use the Microsoft protocol and all three buttons do work. Eventhough Microsoft's mice have only two buttons, the protocol allows three buttons.

The mouse port on the ATI Graphics Ultra and Ultra Pro use the Logitech busmouse protocol. (See the Busmouse HOWTO for details.)

17 Modems

All internal modems or external modems connected to the serial port.

A small number of modems come with DOS software that downloads the control program at runtime. These can normally be used by loading the program under DOS and doing a warm boot. Such modems are probably best avoided as you won't be able to use them with non PC hardware in the future.

All PCMCIA modems should work with the PCMCIA drivers.

Fax modems need appropriated fax software to operate.

- Digicom Connection 96+/14.4+ - DSP code downloading program
  `<ftp://sunsite.unc.edu/pub/Linux/system/Serial/smdl-linux.1.02.tar.gz>`
- ZyXEL U-1496 series - ZyXEL 1.4, modem/fax/voice control program
  `<ftp://sunsite.unc.edu/pub/Linux/system/Serial/ZyXEL-1.4.tar.gz>`

18 Printers/Plotters

All printers and plotters connected to the parallel or serial port should work.

- HP LaserJet 4 series - free-lj4, printing modes control program
  `<ftp://sunsite.unc.edu/pub/Linux/system/Printing/free-lj4-1.1p1.tar.gz>`
- BiTronics parallel port interface
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/misc/bt-ALPHA-0.0.1.tar.gz>`

18.1 Ghostscript

Many Linux programs output PostScript files. Non-PostScript printers can emulate PostScript Level 2 using Ghostscript.

- Ghostscript
  `<ftp://ftp.cs.wisc.edu/pub/ghost/aladdin/>`

18.1.1 Ghostscript supported printers

- Apple Imagewriter
- C. Itoh M8510
- Canon BubbleJet BJ10e, BJ200
- Canon LBP-8II, LIPS III
- DEC LA50/70/75/75plus
- DEC LN03, LJ250
- Epson 9 pin, 24 pin, LQ series, Stylus, AP3250
- HP 2563B
- HP DesignJet 650C
- HP DeskJet/Plus/500
- HP DeskJet 500C/520C/550C/1200C color
- HP LaserJet/Plus/II/III/4
- HP PaintJet/XL/XL300 color
- IBM Jetprinter color
- IBM Proprinter
- Imagen ImPress
- Mitsubishi CP50 color
- NEC P6/P6+/P60
- Okidata MicroLine 182
- Ricoh 4081
- SPARCprinter
- StarJet 48 inkjet printer
- Tektronix 4693d color 2/4/8 bit
- Tektronix 4695/4696 inkjet plotter
- Xerox XES printers (2700, 3700, 4045, etc.)

18.1.2 Others

- Canon BJC600 and Epson ESC/P color printers
  `<ftp://petole.imag.fr/pub/postscript/>`

19 Scanners

- A4 Tech AC 4096
  <ftp://ftp.informatik.hu-berlin.de/pub/local/linux/ac4096.tgz>
- Epson GT6000
  <ftp://sunsite.unc.edu/pub/Linux/apps/graphics/scanners/ppic0.5.tar.gz>
- Fujitsu SCSI-2 scanners
  contact Dr. G.W. Wettstein <greg%wind.UUCP@plains.nodak.edu>
- Genius GS-B105G
  <ftp://tsx-11.mit.edu/pub/linux/ALPHA/scanner/gs105-0.0.1.tar.gz>
- Genius GeniScan GS4500 handheld scanner
  <ftp://tsx-11.mit.edu/pub/linux/ALPHA/scanner/gs4500-1.3.tar.gz>
- HP ScanJet, ScanJet Plus
  <ftp://ftp.ctrl-c.liu.se/unix/linux/wingel/>
- HP ScanJet II series SCSI
  <ftp://sunsite.unc.edu/pub/Linux/apps/graphics/scanners/hpscanpbm-0.3a.tar.gz>
- HP ScanJet family (including ScanJet 3c)
  <http://www.tummy.com/xvscan/>
- Logitech Scanman 32 / 256
  <ftp://tsx-11.mit.edu/pub/linux/ALPHA/scanner/logiscan-0.0.2.tar.gz>
- Mustek M105 handheld scanner with GI1904 interface
  <ftp://tsx-11.mit.edu/pub/linux/ALPHA/scanner/scan-driver-0.1.8.tar.gz>
- Mustek Paragon 6000CX
  <ftp://sunsite.unc.edu/pub/Linux/apps/graphics/scanners/muscan-1.1.5.taz>
- Nikon Coolscan SCSI 35mm film scanner
  <ftp://sunsite.unc.edu/pub/Linux/apps/graphics/scanners/>
- UMAX SCSI scanners
  contact Craig Johnston <mkshenk@u.washington.edu>

20 Other hardware

20.1 VESA Power Savings Protocol (DPMS) monitors

Support for power savings is included in the Linux kernel. Just use `setterm` to enable support.

20.2 Joysticks

- Joystick driver
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/console/joystick-0.7.3.tgz>`
- Joystick driver (module)
  `<ftp://sunsite.unc.edu/pub/Linux/kernel/patches/console/joyfixed.tgz>`

20.3 Video capture boards

- FAST Screen Machine II
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/ScreenMachineII.1.2.tgz>
- ImageNation Cortex I
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/cortex.drv.0.1.tgz>
- ImageNation CX100
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/cxdrv-0.1beta.tar.gz>
- Pro Movie Studio
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/PMS-grabber.2.0.tgz>
- Quanta WinVision video capture card
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/fgrabber-1.0.tgz>
- Video Blaster, Rombo Media Pro+
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/vid_src.gz>
- VT1500 TV cards
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/vt1500-1.0.5.tar.gz>

20.4 UPS

- APC SmartUPS
  <ftp://sunsite.unc.edu/pub/Linux/system/UPS/apcd-0.1.tar.gz>
- UPS's with RS-232 monitoring port (unipower package)
  <ftp://sunsite.unc.edu/pub/Linux/system/UPS/unipower-1.0.0.tgz>
- various other UPS's are supported, read the UPS HOWTO

20.5 Data acquisition

The Linux Lab Project site collects drivers for hardware dealing with data acquisition, they also maintain some mailing lists dealing with the subject. I have no experience with data acquisition so please check the site for more details.

- Linux Lab Project
  <ftp://koala.chemie.fu-berlin.de/pub/linux/LINUX-LAB/>
- CED 1401
- DBCC CAMAC
- IEEE-488 (GPIB, HPIB) boards
- Keithley DAS-1200
- National Instruments AT-MIO-16F / Lab-PC+
- Analog Devices RTI-800/815 ADC/DAC board
  contact Paul Gortmaker <gpg109@anu.edu.au>

20.6 Miscellaneous

- Maralu chip-card reader/writer
  <ftp://ftp.thp.uni-koeln.de/pub/linux/chip/>
- Mattel Powerglove
  <ftp://sunsite.unc.edu/pub/Linux/apps/linux-powerglove.tgz>
- AIMS Labs RadioTrack FM radio card
  <ftp://sunsite.unc.edu/pub/Linux/apps/sound/radiotrack-1.1.tgz>
- Reveal FM Radio card
  <ftp://magoo.uwsuper.edu/pub/fm-radio/>
- Videotext cards
  <ftp://sunsite.unc.edu/pub/Linux/apps/video/videoteXt-0.5.tar.gz>

21 Related sources of information

- Cameron Spitzer's hardware FAQ archive
  <ftp://rahul.net/pub/cameron/PC-info/>
- Computer Hardware and Software Vendor Phone Numbers
  <http://mtmis1.mis.semi.harris.com/comp_ph1.html>
- Guide to Computer Vendors
  <http://www.ronin.com/SBA/>
- System Optimization Information
  <http://www.dfw.net/~sdw/>

22 Acknowledgments

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23 Appendix A. S3 cards supported by XFree86 3.1.2.

CHIPSET	RAMDAC	CLOCKCHIP	BPP	CARD
801/805	AT&T 20C490		16	Actix GE 32
				Orchid Fahrenheit 1280+
801/805	AT&T 20C490	ICD2061A	16	STB PowerGraph X.24
805	S3 GENDAC		16	Miro 10SD VLB/PCI
				SPEA Mirage VLB
805	SS2410	ICD2061A	8	Diamond Stealth 24 VLB
801/805	AT&T 20C490	Ch8391	16	JAX 8231, SPEA Mirage
928	AT&T 20C490		16	Actix Ultra
928	Sierra SC15025	ICD2061A	32	ELSA Winner 1000 ISA/VLB/EISA
928	Bt485	ICD2061A	32	STB Pegasus VL
928	Bt485	SC11412	16	SPEA Mercury VLB
928	Bt485	ICD2061A	32	#9 GXE Level 10/11/12
928	Ti3020	ICD2061A	32	#9 GXE Level 14/16
864	AT&T 20C498	ICS2494	32	Miro 20SD (BIOS 1.x)
864	AT&T 20C498/	ICD2061A/	32	ELSA Winner 1000 PRO VLB/PCI
	STG1700	ICS9161		MIRO 20SD (BIOS 2.x)
864	STG1700	ICD2061A	32	Actix GE 64 VLB
864	AT&T 20C498/	ICS2595	16	SPEA Mirage P64 DRAM (BIOS 3.x)
	AT&T 21C498			
864	S3 86C716 SDAC		32	ELSA Winner 1000 PRO
				Miro 20SD (BIOS 3.x)
				SPEA Mirage P64 DRAM (BIOS 4.x)
				Diamond Stealth 64 DRAM
864	ICS5342	ICS5342	32	Diamond Stealth 64 DRAM (some)
864	AT&T 20C498-13	ICD2061A	32	#9 GXE64 PCI
964	AT&T 20C505	ICD2061A	32	Miro Crystal 20SV PCI
964	Bt485	ICD2061A	32	Diamond Stealth 64
964	Bt9485	ICS9161A	32	SPEA Mercury 64
964	Ti3020	ICD2061A	8	ELSA Winner 2000 PRO PCI
964	Ti3025	Ti3025	32	#9 GXE64 Pro VLB/PCI
				Miro Crystal 40SV
964	IBM RGB		32	Hercules Terminator 64
868	S3 86C716 SDAC		32	ELSA Winner 1000AVI
968	TVP3026		32	ELSA Winner 2000PRO/X
				Diamond Stealth 64 Video VRAM
968	IBM RGB		32	Genoa VideoBlitz III AVI
				Hercules Terminator Pro 64
				STB Velocity 64V
				#9 FX Motion 771
732	(Trio32)		32	Diamond Stealth 64 DRAM SE
				(all Trio32 based cards)
764	(Trio64)		32	SPEA Mirage P64 (BIOS 5.x)
				Diamond Stealth 64 DRAM
				#9 FX Vision 330
				STB PowerGraph 64
				(all Trio64 based cards)

24 Appendix B. Supported PCMCIA cards

These cards are supported by David Hinds' PCMCIA package and this list is taken from his web page.

24.1 Ethernet cards

- 3Com 3c589, 3c589B
- Accton EN2212 EtherCard
- CNet CN30BC Ethernet
- D-Link DE-650
- EFA InfoExpress SPT EFA 205 10baseT
- EP-210 Ethernet
- Farallon Etherwave
- GVC NIC-2000P Ethernet Combo
- HYPERTEC HyperEnet
- IBM CreditCard Ethernet Adapter
- IC-Card Ethernet
- Katron PE-520 Ethernet
- Kingston KNE-PCM/M
- LANEED Ethernet
- Linksys EtherCard
- Maxtech PCN2000 Ethernet
- Network General "Sniffer"
- New Media Ethernet
- Novell/National NE4100 InfoMover
- Proteon Ethernet
- PreMax PE-200 Ethernet
- RPTI EP400 Ethernet
- Socket Communications Socket EA LAN Adapter
- Thomas-Conrad Ethernet
- Volktek Ethernet

24.2 Modem cards

- All modem cards should work

24.3 Memory cards

- New Media SRAM
- Epson 2MB SRAM
- Intel Series 2 and Series 2+ Flash

24.4 SCSI adapters

- Qlogic FastSCSI PCMCIA
- New Media Bus Toaster SCSI
- Adaptec APA-1460 SlimSCSI

24.5 Unsupported

- Xircom ethernet and ethernet/modem cards
- Canon/Compaq PCMCIA floppy drive