PCx

COLLABORATORS

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PCx

1.1 PCx Guide

PCx Guide

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1.2 Legalities & Warranty Information

Legalities & Warranty Information

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1.3 Introduction

Introduction

Please read this manual in its entirety before attempting to install or use the PCx emulation module.

This guide contains the latest information concerning the PCx Emulation Module. Always be sure to check the file called "Changes.txt" in any future upgrades for more information.

Software Backup

Emulation Requirements

Software Installation

Discussion

This emulation module concerns itself with the PC emulation support. Where differences exist between a real 100% Compatible AT Clone and the PCx emulation, they will be noted. It is assumed that the user is familiar with the AT Clone systems, and any PC applications the user wishes to use. If the user is not familiar with the operating system they plan on installing, they should consider purchasing any one of several "how to"

books available.

The 100% Compatible AT Clone is undoubtedly the most popular personal computer on the market today. While the price of these computers is continually on the decrease, the investment you have already made with your system makes the PCx Emulation Module, the most inexpensive way to gain access to all those "popular" software titles.

This emulation module emulates in its entirety all of the components that physically make up a real 100% compatible AT Clone. The following is a list of all the components that are supported:

- 80x86 brand CPU (with built-in FPU)
- Video VGA/SVGA
- Mouse
- Floppy disk
- Hard drive
- Serial port(s)
- Parallel port(s)
- Sound
- Miscellaneous hardware

With that in mind, we proudly present the world's fastest PC emulation, courtesy of the Amiga!

1.4 Software Backup

Making Backups

Before using the PCx Emulation Disk, please make a backup and place the original in a safe place. To make a backup copy, consult the user's guide that came with your Amiga, or use your favorite backup utility.

Note: You are authorized to make backups for your own use. The disk is unprotected and may be copied using any Amiga backup utility. However, all software associated with the emulation is copyrighted and may not be distributed in any form, electronic or otherwise.

1.5 Emulation Requirements

Emulation Requirements

To use the PCx Emulation Module, you must have the following hardware and software:

1) An Amiga with a 68020 or newer CPU. This emulation module does not allow the use of a 68000/68010 CPU which is what the A500/A2000's shipped with from the factory.

2) Amiga's 2.04 or newer OS (operating system).

3) At least 3 megabytes of available fast memory. This minimum will allow you to have essentially a 640K PC. At least 6 megabytes of available fast memory is needed if you intend to run Microsoft Windows. This memory should be 32 bits wide for the best speed possible.

4) An Amiga hard drive partition that has about 3 megabytes of available space for the PCx module to be installed into. In addition, you will probably want to have an Amiga hard drive partition that can be formatted as an IBM hard drive partition. The emulation module can work from floppies, however, most PC application software requires hard drive space for its installation.

5) An operating system designed to work with 80x86 brand CPUs stored on floppy disk. Most commonly, this is Microsoft DOS, although OS/2, Windows NT, or Novell could also be used. For this manual it is assumed that Microsoft DOS will be installed, where installation instructions are concerned.

1.6 Software Installation

Software Installation

Each release disk, and any future upgrade disk, will contain an installer script that uses the installer program (which is also included).

To install or update your software, insert the PCx Emulation Disk into any Amiga floppy device such as DF0:. When the disk icon appears on Workbench, double-click on its icon, and when the disk is opened, you will see an icon titled, "HardDisk_Installer."

Double-click on this file, and follow the on-screen instructions. You may wish to select the "Pretend" option when first doing the installation so that you may gather any information that may be required during an actual installation.

1.7 overview

Overview

The following articles explain, in general, aspects of the emulation. They also mention a few things you may need to know about the PC...

Multitasking

Mouse and Keyboard

Floppy Disks

Hard Drives

1.8 Multitasking

Multitasking

The PCx emulation module does not take complete control of the Amiga's operating system while running, but instead, allocates the memory that the user defines and launches an Amiga task that runs concurrently with any other task.

The only task that cannot run while the PCx emulation is running, is another instance of the PCx module. This means that you will not be able to have two PC emulations running at the same time.

1.9 Mouse and Keyboard

Mouse and Keyboard

The mouse and keyboard are emulated as real PC devices. The mouse is treated as a PC Bus mouse or a PS/2 style mouse.

The keyboard is treated as a 101/102-Key PS/2 style keyboard.

The following are differences between the two keyboards:

- The Help/Ctrl-Help keys produce Pause/Break
- keypad "(" and ")" produce "Num Lock" and "Scroll Lock"
- Left-Amiga-F1 and -F2 produce function keys F11 and F12
- Left-Amiga-Ctrl produces Right-Ctrl
- Left-Amiga with keypad key produces non-numeric keys (e.g., Left-Amiga-keypad "7" produces "Home" key)
- Left-Amiga-keypad "*" produces "Print Scrn" key
- Right-Amiga-R or Right-Amiga-Right-Alt-Del resets the PC
- Right-Amiga-Q or Left-Amiga-Right-Amiga-Right-Alt quits the PC

1.10 Floppy Disks

Floppy Disks

Two of the Amiga's floppy drives may be treated as PC floppy drives. During the setup of the software, the user can select which DFx: drive will be used for the PC's A: drive, and which will be used for the B: drive.

See
Floppy Configuration
for more information.

1.11 Hard Drives

Hard Drives

The PCx emulation supports hard drives in three ways: AmigaDOS devices, virtual hard drives (hard files), and physical SCSI hard drives.

AmigaDOS Partitions

AmigaDOS partitions are those partitions, or areas, on a device that the Amiga normally uses for data storage. These partitions can be on hard drives, SyQuest cartridges, or any other format of fixed or removable data that has been set up for use with the Amiga's operating system.

If you are unfamiliar with the creation of an AmigaDOS partition please consult the reference manual for your hard drive controller or seek someone who is familiar with hard drive setups for help. It takes only a few seconds to destroy all the data on your hard drive if you make a mistake. Please take care before attempting to create/modify these partitions.

An AmigaDOS partition that is intended for use with PCx emulation has restrictions. First of all, it cannot be any larger than 528 megabytes in size. Secondly new partitions must be formatted by AmigaDOS before the PCx emulation can use them. If the partition is not formatted with an AmigaDOS format, PCx's format routine will fail. Lastly, the partition must be mounted and available to the Amiga!

Hard files (Virtual Hard Drives)

A hard file, in reality, is nothing more than one big data file that resides wherever you save it. The difference between this and any other file is that the information in the file is treated just like a hard drive. When the PCx emulation tries to save data to what it thinks is a hard drive, it really just gets stored in this data file (in the correct format and position).

The advantage of using a hard file over an actual AmigaDOS partition is that no re-partitioning of an existing hard drive is necessary. The disadvantage is that access to these virtual hard drives must now go through another level of indirection resulting in slower performance.

Note: To get the best speeds out of a hard file, it is recommended that you use a hard drive optimization application that de-fragments, or re-orders, the hard drive partition that contains the hard file, not the hard file itself. You can also use the DOS command "AddBuffers" to increase hardfile performance (see your AmigaDOS reference for details on AddBuffers).

SCSI Devices

Real PC machines do not typically come with SCSI controllers and/or SCSI

hard drives. If you plan on using SCSI hard drives with your PCx, you must setup the PCxASPI device driver on the PC side. Please refer to the PCx driver readme for details on this subject.

1.12 Sound

Sound

Audio support is provided through the Amiga's own sound hardware. The PCx emulation will emulate the PC speaker in addition to Sound Blaster digital audio compatibility. (See
Sound Support
.)

1.13 Video

Video

Video is accomplished by use of device drives that utilize the video hardware that the Amiga normally uses. The user selects a video driver based on the type of emulation desired. Drivers are supplied for VGA, and SVGA type adapters. (See
Video Display
.)

The low-res 256 color mode of the VGA adapter will be approximated with older custom chipset (the Agnus chip) that comes with older Amigas. For AGA type machines, all the VGA and some of the SVGA modes are available. To use the other emulated display adapters, third party video cards for the Amiga must be installed. Examples of these cards include Picasso II, Piccolo, Piccolo SD64, Merlin, Retina, Retina Z3, CyberVision 64, and the EGS Spectrum. It's through the hardware available on these cards that the higher resolution/ color modes of the SVGA can be emulated.

1.14 Real-Time Clock/CMOS RAM

Real-Time Clock/CMOS RAM

The PCx real-time clock is emulated through software and hardware. The time is initially taken from the Amiga's system clock. Make sure that the Amiga's date and time are correctly set (through Preferences) before running the PCx emulation.

The CMOS RAM that contains drive, memory, and hardware settings is normally located on battery backed up memory in a real PC. This information is stored in a file on the Amiga called "RTC.config", and is loaded every time the emulation starts. If this file cannot be found, the file will be created with default values.

Note: This file contains important information and should never need
to be modified. Please do not attempt to modify this file.

1.15 Restarting and Quitting

Restarting and Quitting

Warm-Boot

The PCx emulation may be restarted by holding down the CTRL, ALT, and
DEL keys simultaneously (the DEL key can be either the DEL key next to the
HELP key or the one located on the keypad).

Cold-Boot

The PCx emulation can simulate the PC's ability to perform a hard reset by holding
down the Right-Amiga, Right-Alt, and the DEL key on the keypad simultaneously.
Right-Amiga R performs the same function.
Shutdown

To stop the emulation completely, hold down the Left-Amiga, Right-Amiga, and
Right-Alt keys simultaneously. Right-Amiga Q performs the same function.

Note: Shutting down causes the emulator to save the CMOS RAM to the
save file.

1.16 Getting Started

Getting Started

Once you have installed the software, you are now ready to configure the
emulation options.

Launching the Emulation

To start the emulation setup, locate the PCx drawer and double-click the
icon. Double-click this icon to bring you to the contents of the PCx
Emulation.

During the installation, the installer script asked several questions and,
based on the answers you provided, or that were detected, an icon was
created that starts the emulation.

PCx

This icon brings up the full version of the emulation, including the FPU.
To use this version, you must have a CPU equipped with an FPU (or a
floating point co-processor--68881 or 68882)

PCsx

This icon brings up the version of the emulation which does not support hardware-level floating point. Use this version if your Amiga system is not equipped with an FPU.

1.17 Emulation Setup

Emulation Setup

Once the Emulation Setup screen is displayed, you will see a cycle gadget and a button gadget.
"Start Emulator".

There is also the standard system gadgets in both upper right & left corners (close window, which exits the program, located in the upper left corner, and Screen-to-back, which toggles to the next Amiga screen, located in the upper right corner).

The cycle gadget brings up controls for:

Memory

Video

Floppy

Devices

Ports

BIOS

Sound

Peripherals

Advanced

Configuration
This button gadget starts the emulator:

Start Emulator
There is no order in which you must configure the various settings ↩
, however,
it is recommended that the Memory is the last one configured.

1.18 Memory

Memory

When the cycle gadget shows Memory the Main Setup Window will show

the memory setup controls (see Figure 1).

Since the PCx emulation multitasks with the Amiga's OS, it is necessary to set aside a certain amount of memory for the emulation (so the Amiga and any other tasks don't steal it!). This is accomplished by allocating memory when the emulation is first started. This memory will not be available to the Amiga or any other Amiga tasks until the emulation has been shutdown.

Displayed in the window is a ListView that will contain a breakdown of the nodes of memory detected in your machine. For every contiguous region of memory found, an entry will be made in the list. This memory list is prioritized based on its configuration priority.

Inside this ListView, one of the entries will have its text highlighted, indicating that this particular region will be used for the memory allocation. To change which region is used (for instance, you may want the faster 32 bit memory, or you may want a region that offers a greater amount of memory in which to allocate from), simply click on the entry within the ListView. The highlighted text will be changed to reflect your choice.

The Slider control allows you to increase or decrease the amount of PC extended memory. The base memory is 1 megabyte, and is a requirement for the emulation. Memory above this amount will be treated as PC extended memory.

As you begin to increase the amount of extended memory, the Total Memory indicator will increase, and the memory available from within the currently highlighted entry will decrease.

If you want more memory than can be obtained from the current highlighted entry, then you need to select a larger entry and select the amount you want.

Note: If you later decide to physically add or remove memory to your
machine, you must re-configure this memory configuration before
attempting to run the emulation.

1.19 Video Display

Video Display

When the cycle gadget shows Video the Main Setup Window will show the video setup controls (see Figure 2a).

Click on the GetFile gadget to select a video driver.

The Driver Information gadget will display a ListView containing information on the modes supported by the selected video driver. Figure 2b

The Configure Modes gadget will display a ListView of modes supported by this driver, a Set Video Mode button, a current ModeID Sting gadget, and a Done button. Figure 2c
Click on an entry in the ListView. The current Amiga Video ModeID will be shown in the string gadget. If the mode may be changed (some drivers only allow certain PC modes to be changed), you may click on

Set Video Mode for an Amiga Display Mode Requester, or type the ModeID directly into the ModeID string field. After setting the PC modes to the desired Amiga Display Modes, click on Done.

1.20 Floppy Drives

Floppy Drives

When the cycle gadget shows Floppy the Main Setup Window will show the floppy setup controls (see Figure 3).

This allows you to select which Amiga disk drives will be used as equivalent PC floppy drives. Standard PCs have a maximum of two floppy drives (custom BIOSs and/or drivers allow for more floppies), and so a maximum of two floppies is supported. These disk drives are referred to as A: and B: drives. The A: drive is the first disk drive, and is the drive used if you wish to boot the system off of a floppy disk (this is analogous to the Amiga's DF0:).

Selecting Exclusive makes the drive not available on the Amiga Side.

Multi-os.device

A custom device driver "multi-os.device" was written to handle the floppy disk access. This device driver has the ability to read and write IBM 720K, IBM 1.44M, and Macintosh high density disks.

You must have a high density disk drive to be able to read and write high density disks (Macintosh or IBM). You can use Commodore's own high density drive (Chinon 357-A) or one of the 3rd party high density disk drives available. (Note: AE high density is a non-standard format.)

The emulation uses multi-os.device automatically without any type of user setup required.

Note: During the emulation, you may insert a disk into the drive in response to some PC application's prompt. Due to how the Amiga's disk insertion detection scheme works, there will be a few seconds of delay before the emulation recognizes a disk has been inserted, so don't be alarmed if the application asks you to re-insert the diskette.

1.21 Devices

Devices

When the cycle gadget shows Devices the Main Setup Window will show the device setup controls (see Figure 4a).

This emulation setup window allows the user to select what Amiga Devices (other than floppy drives) are going to be used as hard drive devices. Standard PCs have a maximum of two physical hard drives that can be connected to the controller. On a real PC, additional controllers could be

added to allow more hard drives, however, under the PCx emulation, only two drives will initially be supported.

These drives are typically referred to as the C: and D: drives. The C: drive is the first hard disk drive and is the drive used if you wish to boot the system off of a hard disk.

The Left ListView shows a list of selectable hardfiles (designated by the * preceding the name) and partitions. Click on a hardfile or partition to add it to the Right ListView.

NOTE: Selected partitions will be overwritten by the emulation, effectively destroying any Amiga information on it. DO NOT select any partition that you are using for Amiga storage (e.g., your Workbench partition), or you will lose all files on it.

Click on Clear Selected to clear the Right ListView. Clicking on an entry in the Right ListView will display information on that entry (see Figure 4b) ↩ .

Click on Hardfile Setup to switch to the Hardfile Setup controls (see Figure 4c). Create makes a hardfile of the size shown in the string gadget in MSHF: (MSHF: is set to "PCx:Hardfiles/" by the installer, but may be changed by the user by changing the Assign command in S:User-Startup).
Remove allows you to delete a hardfile.

1.22 Ports

Port Setup

When the cycle gadget shows Ports the Main Setup Window will show the Ports selection controls (see Figure 5).

PCx emulation supports two serial ports (COM1: and COM2:), and two parallel ports (LPT1: and LPT2:). Clicking on the CheckBox next to the port name makes that port available inside the emulation. The GetFile gadget may then be used to select a device, or the device name may be entered by hand. The unit number must be entered by hand.

This setup screen allows you to select which Amiga device will be used for the COM1: and COM2: ports. The check box gadgets below the "COM1" and "COM2" texts allow you to select which (if any) of the two serial ports you wish to use.

You are not limited to the Amiga's "serial.device" (default setting). You can use any serial type of device such as Supra's Modem0.device or other 3rd parties' serial device drivers. This also applies to the "parallel.device".

NOTE: You must be sure that you only select a serial type of device for COM1: or COM2:, and only a parallel type of device for LPT1 or LPT2:. Any other type of device may crash your Amiga.

1.23 BIOS Image

BIOS Image

When the cycle gadget shows BIOS the Main Setup Window will show
the BIOS selection controls (see Figure 6).

BIOS stands for Basic Input Output System. All PCs have a BIOS included on the motherboard. Each of these BIOSs are tailored to a particular manufacturer's motherboard. Since the emulation is a virtual PC, it too has its own BIOS associated with it. The default selection is a file stub that selects the Native 68K BIOS emulation. Clicking on the GetFile gadget allows you to select an actual PC BIOS (if you have one and have placed it in "PCx:BIOS/").

1.24 Sound

Sound Support

When the cycle gadget shows Sound the Main Setup Window will show
the Sound controls (see Figure 7).

PC Speaker Volume
This slider controls the volume of the PC's Internal Speaker. A volume of zero disables the PC Speaker output.

DAC Volume
This slider controls the volume of the SoundBlaster compatible Digital Audio Channel. A volume of zero disables the Digital Audio.

Synthesizer Volume
This slider controls the volume of the SoundBlaster compatible Synthesized Audio. A volume of zero disables the sythesized audio.

1.25 Peripherals

Peripheral Control

When the cycle gadget shows Peripherals the Main Setup Window will show
the mouse/joystick controls (see Figure 8).

Mouse Emulation allows you to select between a BUS style mouse, or a PS/2 style mouse. The BUS mouse setting is faster and preferred, but requires a newer mouse driver (e.g., MSMouse v9.1). The PS/2 mouse setting is slower, but supported by more mouse drivers.

Joystick Emulation allows you to select between an analog joystick emulated by the mouse, or a digital joystick emulated using an Amiga joystick. CD-32 joypads are supported.

1.26 Advanced Options

Advanced Options

When the cycle gadget shows Advanced the Main Setup Window will show
the Advanced CPU controls (see Figure 9).

CPU Turbo Mode cycles between None, Level 1, and Level 2. Level 1 and 2
may increase the speed of protected mode software (Window and DOS/4GW programs).
They generally don't affect DOS REAL Mode programs.

Transcription enables/disables the transcription of x86 code into 68K
code. This can speed up some operations tremendously. While enable, Cache Size
sets the amount of memory to allocate for code buffers.

1.27 Configuration

Configuration

When the cycle gadget shows Configuration the Main Setup Window will show
the Load/Save Configuration controls (see Figure 10).

This allows you to load or save all of the setup information that is currently
set. A configuration file consists of all the settings for each configuration ↩
menu
(all the items listed under Emulation Setup in the Section
Emulation Setup
).

You may have more than one configuration saved so that you can start the
emulation with different settings.

The filename "PCx.config" will always be the default filename that the
emulation software will attempt to load. If you want to use a different
configuration file, you will have to load it yourself before starting the
emulation.

To save the current setup configuration, click on the Save gadget. An Amiga
file requester will then be displayed.

You can save the config file by either highlighting the config name (default
being "PCx.config") and clicking on Save, by double-clicking on the
config file name itself, or by entering the filename manually and pressing
the RETURN key.

1.28 Starting up the Emulation

Starting up the Emulation

Clicking on the Start Emulator button will start the emulation.
Once started, the Emulation Setup window will disappear.

At this point, you may need to boot a DOS setup disk to setup the selected hardfile/partition. MS-DOS setup disks will automatically setup drive C: and install MS-DOS. If your boot disk boots up to A:> without setting up the harddrive, you will have to run FDISK and then format C: yourself. If you don't know how to do this, consult the numerous books or someone who does know how to do this.

1.29 MS-DOS Drivers and Utilities

MS-DOS Drivers and Utilities

Included with the PCx Emulation software are some useful MS-DOS device drivers and utility programs.

Consult the include readme file on installing and using these files.

Note: Usage of the device drivers will require modification of your boot-up disk's CONFIG.SYS and/or AUTOEXEC.BAT file(s). Refer to the documentation that came with your copy of MS-DOS for a complete explanation of these two files.

1.30 Limitations/Bugs

Limitations/Bugs

Limitations in PCx v1.0:

- no synthesized sound yet
- no joystick support yet
- PCxAFS read/write disabled until reliable

Limitations in the Demo Version (in addition to above):

- limit of 4MBytes of total memory selectable
- video modes cannot be altered
- partitions cannot be selected
- hardfiles limited to 16MBytes
- only one device selectable
- no serial or parallel support
- digital audio channel not supported
- no transcription support
- no turbo support

- configuration cannot be saved

- pcxaspi.sys and pcxcd.sys are *NOT* included with DEMO!

1.31 Illustrations

Illustrations

1.32 Copyright and Trademark Acknowledgements

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