

Tutorial

How to install Windows 98SE on 86Box for gaming!

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Links for the files

86Box: <https://86box.net/> (Click download stable – At the bottom of the page take the Windows-64 version)

86Box roms: <https://github.com/86Box/roms> (Click code and then Download ZIP)

86Box Manager: <https://github.com/86Box/86BoxManager/releases>

MS-DOS 6.22: <https://winworldpc.com/product/ms-dos/622> (Click on Microsoft MS-DOS 6.22 Plus Enhanced Tools (3.5-1.44mb))

MS CD Extensions (MSCDEX): <https://winworldpc.com/product/ms-cd-extensions-msc/125>

CuteMouse: <https://cutemouse.sourceforge.net/> (Download version 2.1 for the wheel button handled by the BIOS)

Sound Blaster Pro 2: <https://winworldpc.com/product/sound-blaster-drivers/sound-blaster-pro> (Click on Sound Blaster Pro 2 Drivers (8-6-1992) (3.5-1.44mb))

3dfx Voodoo 3000: <https://oemdrivers.com/graphics-3dfx-voodoo-3> (Click on Graphics Driver:>> 3dfx Voodoo3 3000 Install CD<<)

Windows 98SE: <https://winworldpc.com/product/windows-98/98-second-edition> (Click on Windows 98 Second Edition (OEM Full))

Winamp 3.0: <http://www.oldversion.com/windows/winamp-3-0-full> (Click the green Download Now button and wait)

Fractal Fighters: https://archive.org/details/FractalFighters_1020 (Click ZIP)

Installation of 86Box

(and its components)

- 1- Decompress the file 86Box-Windows-64-(version).zip to a new folder named 86Box on a SSD drive (to avoid latency problems later)
- 2- Open the file roms-master.zip and slide the folder roms-master inside the folder you just created for 86Box.
- 3- Rename the folder roms-master to roms. (Which will give you access to all the bios and more)
- 4- Open the file 86BoxManager(version).zip and slide the file 86Manager.exe inside the same folder of 86Box.
- 5- Run the file 86Manager.
- 6- If you don't get any prompt to set the locations of 86Box, go to Settings.
- 7- Set the 86Box path with the folder you just created. And set the VM path by created a VM path inside the 86Box folder. Then click OK.
- 8- Click ADD and set a name (I suggest something like Windows 98SE to make it easy to find).
- 9- Check the box Configure this virtual now. (If you already clicked OK, just select Windows 98SE and click Configure)
- 10- Machine tab
Machine type: Socket 7 (Single Voltage)
Machine: [i430FX] ASUS P/I-P54TP4XE
CPU type: Intel Pentium OverDrive MMX
Speed: 200
Memory: 128 MB
- 11- Display tab
Video: [PCI] 3dfx Voodoo3 3000
- 12- Input devices tab
Mouse: Standard PS/2 Mouse (click configure and set it to Wheel)
Joystick: Microsoft SideWinder Pad (Only set it if you intend to use a non Xbox-One controller as button 11 and 14 are known to cause problems due to their analog nature. In that case I suggest to use JoyToKey; not part of this tutorial due to its numerous intricacies workaround; I personally use a Xbox-One controller so for the tutorial I turned it off.)
- 13- Sound tab
Sound card: [ISA] Sound Blaster Pro v2
- 14- Network tab (Be sure to set one if you play indy games as many use Internet Explorer)
Card 1: Mode: SLiRP Adapter: [PCI] Realtek RTL8029AS
- 15- Storage controllers tab
HD Controller: [PCI] IDE Controller
- 16- Hard disks tab
Click new. Then click specify, name it boot drive and click save. Type: (Set it to 509 MB don't set it higher, for some poorly coded software prior of 2000 it's known to cause problems) Then click Ok.
Click new again. Then click specify, name it Storage and click save. Type: (You can it set it high, but in mind that most games weight less than 50 Mbytes. So I suggest to set it to 518 MB) Channel: 1:0
- 17- Floppy tab
Click on the first 5.25" 360k; Type: 3.5" 1.44M
Click on the second 5.25" 360k; Type: None
In the CD-ROM drives: section click the first Disabled. Bus: ATAPI; Channel; 0:1 ; Speed: 72x.
Click OK.

Setting up MS-DOS 6.22

(and its drivers)

- 1- Click on Windows 98SE and click Start
- 2- Press DEL to enter the BIOS
- 3- Go to BIOS Features Setup
- 4- Go to Boot Sequence and press “-” on the numpad (that will make A drive having the priority during when rebooting)
- 5- Press ESC and go to SAVE & EXIT SETUP. And type Y and press ENTER.
- 6- Open your folder where you downloaded all the files and extract the files Microsoft MS-DOS 6.22, cutemouse21b4, Microsoft MS-DOS CD-ROM and Sound Blaster Pro 2 Drivers in different folders.
- 7- Inside 86Box windows click on the little diskette on the bottom left and select existing image and then DISK1.img inside the MS-DOS 6.22 folder and then press enter.
- 8- Press ENTER three times (it will then reboot)
- 9- Set the country and keyboard layout to your preference. Keep in mind the Keyboard layout standards changed a lot depending the area you live in since the release of MS-DOS 6.22, which is why in this tutorial I’ll keep United States; making it easier to find the keys.
- 10- Press enter until it start to install the MS-DOS.
- 11- When prompted for the next diskette click on the diskette icon on the bottom left, eject and then choose DISK2.img same principle for the third diskettes.
- 12- Once installation completed, eject the diskette and then press ENTER twice. (It’ll then reboot)
- 13- Click the diskette icon on the bottom left, go to the MS-DOS CD-ROM folder and then click on disk1.img. Click OK
- 14- Type A: then press enter! And then type Install. Press Enter!
- 15- When a windows with a path for the CDROM appear just press enter and wait the end of the installation. And press enter again!
- 16- Eject the diskette and then insert the one inside the Sound Blaster Pro 2 drivers.
- 17- Type inst-hd c: Press enter!
- 18- Press enter twice! (Let it install)
- 19- After the installation press Enter on each prompt until it ask if you want to reboot!
- 20- Eject the diskette and then press Y and press enter again! (It’ll reboot while loading your CD-ROM and sound card drivers. Which will ease a lot the installation of Windows 98SE especially for the sound fonts important for many Indy games that use old school midi files.)
- 21- Click on the CD on the bottom left of the windows and then click folder. Then select the folder bin inside the cutemouse folder.
- 22- Type md ctmouse. Then type xcopy e: [c:\ctmouse](#) and then press enter.
- 23- Type edit autoexec.bat and then press enter.
- 24- Go to the bottom of the document (last line) and type cd ctmouse and then press enter. type ctmouse and then press enter. Type cd.. then press enter.
- 25- Press ALT and F simultaneously and save.
- 26- Press ALT and F simultaneously again and go to exit.
- 27- Eject the CD by pressing the CD icon on the bottom left and press eject.
- 28- Click on the blue button on the right of the pause button. (It’ll do a hard reset; only use it if you’re in DOS never in Windows; if for whatever reason it freeze in Windows simply close the emulator.)

Installation of Windows 98SE

(and its drivers)

- 1- Open the folder where you downloaded all the files. Then extract in separate folder 3DFX-Voodoo3-3000 and Microsoft Windows 98 Second Edition.
- 2- Click on the CD icon in the bottom left of the windows and click image and then select the iso inside the windows 98 folder.
- 3- Because we have installed a proper CD-ROM drivers, we don't need to xcopy a folder of windows 98, we can start right now the installation!
- 4- Type E: and then press enter. And the type setup and press enter twice! Let the scan doing its jobs. And then go to exit.
- 5- Click continue and then let Windows prepare its files.
- 6- Click next and wait again!
- 7- Click Custom and then click next.
- 8- Be sure to select all the Accessibility, especially the magnifier that is very useful in educative games. While in accessory you might be wanted to turn on the Games section. You might be willing to turn on the Desktop themes (which was a big thing at the time, more than our days). You should however turn off the personal server in Internet Tools. You might be willing to turn on the multi-language support; especially useful for web browser base indy games. You might be willing to turn on the Multimedia Sound Schemes and Sample Sounds; especially useful if you want to make some test with the audio to avoid the classic ZZZZZZ. You might be willing to turn off the 4 online service as they are not working anymore. You might be willing to turn off Outlook Express for safety reasons.
- 9- Click Next and then name your computer and then click Next again!
- 10- You can choose your Keyboard Layout and Regional Settings which are more up to date than 6.22, but keep in mind we are talking 1998 standards, which means that some little things might still have changed none the less.
- 11- Click Next until it pop-up a windows Insert Disk to create a Startup Disk. Don't waste your time with that, just click cancel to skip creating a startup disk!
- 12- Click Next and it will then enter in the "long run" of installing Windows! (Which won't be that long because we have previously installed and preloaded a functional MS-DOS 6.22)
- 13- It will the ask to wait 15 second or press restart to reboot the computer. Let's do this!
- 14- After the reboot, it'll ask you to write a name and a company names. Then click next!
- 15- Then read the very very serious licence agreement, click accept and then click next!
- 16- Enter a product key. (You might find it where you downloaded the Windows; for legal reason I won't add it here as despite in some country there is a gray zone in the laws authorizing it, it's not the same for every country.) Then click next!
- 17- Then click Finish! (It'll then do the process of Setting up hardware, as we installed basic drivers manually in the MS-DOS before, it make this process much faster and smoother)
- 18- It will ask again for 15 seconds or reboot, let's do this again!
- 19- Wait until it ask for the Date/Time Properties; set your timezone! And then click ok!
- 20- It will ask once again for 15 seconds or reboot, let's once again do this!
- 21- After the reboot, press OK!

- 22- It will then detect the emulator monitor! Let's click next until you have to option to choose CD-ROM. Tick its case and then click next and finish!
- 23- Now that Windows is installed, close the musical Window and let's install the drivers of Voodoo3 3000 Graphic card!
- 24- Click the CD icon on the bottom left and eject. Then click again on the CD icon and click folder. Then choose the 3DFX-Voodoo3-3000 folder you created earlier while unpacking.
- 25- It should popup the installation of the drivers software. So click yes to accept the license agreement!
- 26- It will then install and reboot your computer! After the reboot DirectX 7 will install itself, let it do it job. And when it ask to restart just click OK for another reboot!
- 27- After the reboot press OK!
- 28- Now, let's turn on the internet for the indy games that need it. (Yes, even when the pointer website is dead, some indy games still need internet as they need to use Internet Explorer; IE refusing to run any script if you don't set internet.)
- 29- Click Start/Settings/Control Panel
- 30- Double click on Internet Options
- 31- Click on the tab Connections and then click on Setup
- 32- Choose the third option and then click next!
- 33- Choose the second option and then click next!
- 34- Tick the Automatically discovery of proxy server and then click next!
- 35- Select no and click next!
- 36- Click Finish!
- 37- Type google.ca (or .com or whatever which one is your google) to be sure it's working!

Let's test some software

(to be sure everything is ok!)

- 1- Open the folder where you downloaded all the files. Then extract in a folder FFIGHT11!
- 2- Slide Winamp file in the same folder!
- 3- Click the CD on the bottom left, eject any CD and then click again the CD on the bottom left and click folder. Choose the FFIGHT11.
- 4- Then on your keyboard press Windows sign and E simultaneously to open file explorer.
- 5- Click on the E: drive on the left!
- 6- Double click on winamp and agree with the licence.
- 7- Click next two times! (it will then install the software)
- 8- Click next, then later and then Run Winamp!
- 9- Now slide the file Wildcat in the playlist! And double click on it inside the playlist to test if the midi is playing properly!
- 10- If the cymbal is discreet, it means it works perfectly. If the cymbal is exaggerated like it would in Sound Blaster 16 sound font something gone wrong during the installation. But normally if you followed it should be normal!
- 11- Now let's try the freeware game associated to this very awesome and rocky midi files!
- 12- Close winamp! Click on the background and click properties.
- 13- Then go to settings tab and then slide the slider under screen are to 800x600. And click ok! (And ok for the rest of the prompt)
- 14- Then go back to file explorer and click on D:.
- 15- Then right click on the right window, choose new and create a folder. Call it the name you want.
- 16- Then click on the "+" just on the left of D: and then go back to the CD and slide every files except Winamp in the folder you just created!
- 17- Go the folder in the drive D and then double click on the ffight11 to start the game!
- 18- If the game don't stutter, it means everything is fine because with the game when the emulator goes below 95 it stutter, but if you're 99/101% it means it works perfectly! So congratulation you've just installed a Windows 98SE ready for gaming!

F.A.Q.

(Or might potentially be asked!)

Question: Why did you made this tutorial?

Answer: For two reasons! First, because most tutorial I'm currently seeing on YouTube are made by people who put more focus on telling their own life instead on focusing on why we are there! So we end up wasting 5 hours of our life in a job that what would normally be 40/60 minutes just we are forced to hear trash about things we don't care. And the second reason is because most tutorial I'm seeing lead people to do major mistake such having the mouse not properly configured with proper drivers or video card doing artifacts because a Voodoo accelerator have been added alongside the wrong card. Pushing wrong audio drivers causing major problems with the midi sound fonts. And not to say these problems are all prone to provoke more crashes.

Question: Why you don't speak during the video going alongside this tutorial?

Answer: Because of the thematic of the channel. The idea is to show the product as they are. Giving an authentic experience to those who watch the videos! Which is also why, I try to minimize the director cut. And also, many people understand more easily while watching than hearing a voice over. I personally often cut the audio when somebody's voice annoy me. So the visual must speak for itself.

Question: Why did you use Sound Blaster Pro 2 instead of the classic Sound Blaster 16 or a more modern Sound Blaster?

Answer: Because I prefer the midi sound font of the Sound Blaster Pro 2. Sound Blaster 16 and more modern card tend to have exaggerated sound. By example, if you listen a midi music with some cymbal like shown in the video alongside this tutorial, in Sound Blaster 16 you will almost only hear the cymbal the rest gonna be buried, while in Sound Blaster Pro 2 it's more equilibrated. It doesn't sound like the real instrument, but globally and musically it still give a better result in most of the case. Except, of course, if a midi files was made having the Sound Blaster 16 in mind. But, that's rarely the case as the Sound Blaster 16 (and more recent) are more WAV and MP3. So less, focused on the midi than the Sound Blaster Pro 2 era.

Question: Why did you use the MMX 200 instead of a more modern CPU in emulation?

Answer: Because, I wanted to present a gaming PC that is more adequate for gaming prior 2002. Which is the thematic of my channel.

Question: What resolution do you suggest us to play?

Answer: In main stream games I suggest 640x480 16 bits in most of the case to avoid latency problems as main stream games tend to stack everything and never closing things. But with indy games, 1024x768 16 bits, 800x600 24 bits or 640x480 32 bits should be the ideal pin point. Please take note that some games especially those prior than 1997 often want you to play in 256 colors.

Question: I don't have any keypad, so I can't press "-" like you do in the bios like you did in the tutorial! Do you have any advice on how to press it?

Answer: The first method is to temporary software rebind one of key on keyboard. Or the second method is using a virtual keyboard software that have a keypad on it, like the On-Screen Keyboard that comes with Windows 10 and 11. Here's how to use it: <https://www.makeuseof.com/tag/get-numeric-keypad-windows/>

Question: HELP! My cursor is stuck on the screen I can't read the rest of your tutorial!

Answer: Don't panic, just press F8 and F12 simultaneously and your cursor gonna be unstuck from 86Box window!

Question: How to Fullscreen?

Answer: Press simultaneously CTRL ALT and PAGE UP. To return in window mode, CTRL ALT and PAGE simultaneously!

Question: In some of your videos in the past you seems to have problems with the mouse. Will I have the same problems after using the tutorial?

Answer: No! I had the mouse problems because I made the mistake to follow other people tutorials. I then got enough and pissed off, so I made my own way with trial and error, like I was doing in the 90's. Which is how I landed with the approach I used! So, normally you should not have a problem with the mouse by following the step of this tutorial. Unless your emulation goes under 90%, but if it goes under 90% you should normally see or hear things stuttering too. Which, obviously the mouse system is not really problem there!

Question: My emulation is never at 100% why?

Answer: I would tend to believe that your specs are maybe a bit too low for this config approach. Understand that this emulator works mono core as much for the video and process simultaneously! So even if you have a modern CPU, if your CPU is slow per core, it might impact its performance as only one of these is used.

Question: Is the emulation perfect?

Answer: Sadly no! But, the experience with 86Box is presently the best one I got for a Windows 98SE while using a Ryzen CPU. Which is a great news as Ryzen is not well known to wrote well with VM. And there, based on my own experience, most of the games should be not only running fine, but running very great.

Question: What to do an error pop-up continuously preventing me click the start button to reboot?

Answer: First try pressing CTRL-F12 to shut down windows. If it doesn't work, just close the 86Box windows and reopen it. Then normally Windows will do a Scandisk and everything will be fine. Unless Windows was updating it's drivers.

Question: Windows update don't work anymore is it a way to get all the update?

Answer: Yes, but I don't recommend it. Unless you have a functionality problem. Why? First many games, were made without these update in made and many will just continually crash especially the older ones. But also, because many of these update actually reduce the performance to add some security feature that are from our days standards totally outdated.

Question: If I install Windows in another language, will your tutorial still be valid?

Answer: Absolutely! My first language is French Quebecer, so I grown up using a French Windows 98SE & a french MS-DOS 6.22 all the steps are the exact sames. That being said, if you have Japanese Windows be sure to also install the roman IME to be able to install game from the Occident (WEST) as Japanese windows don't use backslash. However Arab, Chinese and others normally does.

Question: Does it means that I can play Japanese games in this Windows installation?

Answer: No, but I remember I think the time, that I was able to play Japanese game with Locale thingy.

The reason why I remember it, it's because I was playing... Hum! Hum! Adult games to say the least! However, I'm currently having hard to find it again. And, I know, it's not the JAMONDO thingy! Many say it's impossible, but I know for a fact, that I was able to. So it exists, but I don't remember what software it is that made able to JapLocale! That being said, it's maybe somewhere in my backups! So if one day I find it, I might first test it and then make it public if, of course, it's freeware.

Question: Can I use your installation to try to use, midi session or an old version of Paint Shop Pro?

Answer: On the software side no problems, however, you might have problems to plug anything and make work. So if you use midi session you'll have to use your mouse to make the music instead of a Roland keyboard. And, if you want to use a drawing board, well in won't work as well, you'll be forced to use the mouse. Same thing about scanner, as at the time, JASC Paint Shop Pro forced only had a pre-selected of compatible scanner for the software. So, as these scanners are prior than the epoch of USB, well you won't be able to find one who can make even make a passthrough to simulate one of the epoch.

Question: Why did you use Winamp 3 instead of a Winamp more classic like the version 2?

Answer: Winamp 2 was using the media play output to make play the midi files. While Winamp 3 have its own inner player that use sound font different, which is more like in games. You know the thematic of my channel, Nap'n'Retrogaming!

Question: If I have some more question not answered here, where I could ask it to you?

Answer: On the video associated to this tutorial there's a comment section! Ask it there, I'm on YouTube every day. And don't worry, I might look rude due to what I said about other tutorial. But I'm not a rude person, far from that. I'm just pissed off, because I'm starting to think they are doing it on purpose to make it look harder than it is really so they look more techy than they really are, when in fact obviously they barely can turn on a computer to say the least... Which have the results of people massively giving up on the project, so many potential good talents who could spray the interest of many unique forgotten things are sadly lost.