



ThinkPad X200

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The **ThinkPad X200/X201** Series is a particularly desirable candidate for Coreboot/Libreboot, since they have a 16:10 aspect ratio with an option to install a beautiful 1280x800 IPS screen; just like that of the Flexview T60 systems.

Libreboot Support

There are rumors that the Roka RK9 (which has the exact same chipset as the X200) can have Intel ME disabled. The Libreboot team has used this method to remove the ME firmware on the X200.

If it works out, the ThinkPad R400, which uses the same chipset, could also be compatible.

Installing Libreboot/Coreboot on X200

The ThinkPad X200 works with Libreboot/Coreboot, and requires these proprietary blobs:

- **CPU Microcode** - Intel's proprietary microcode patches for issues with CPUs. Sometimes necessary to prevent CPUs from malfunctioning.
- **VGA Option ROM** (optional) - Only needed for SeaBIOS, after boot most payloads will work without VGABIOS.
- **Intel ME** (Management Engine) - Enterprise laptop management chip. Leave as is.
- **Intel EC** (Embedded Controller) - Leave as is.

Unfortunately, a hardware flasher is required to install Libreboot/Coreboot on the X200 series. (see the [Libreboot website](#))

X200 Hardware Flashing

There are two different flashchips used on the X200: An 8 pin 4MB, and a 16 pin 8MB, located just under the palmrest. Make sure to find out your type before deciding to buy a 8-pin or 16-pin SOIC clip.

You can use either a Bus Pirate or Beagleboard Black (or even Raspberry Pi) to flash.

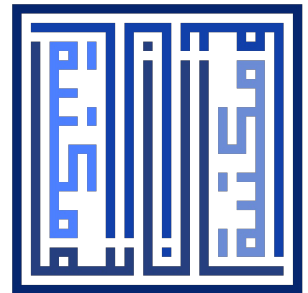
16-pin BIOS Chip

Only the numbers with an asterisk are plugged in to a wire.

```

==== front (display) on your X200 ====
  9  -  -  8*
10* -  -  7*
11  -  -  6
12  -  -  5
13  -  -  4
14  -  -  3
15* -  -  2*
16* -  -  1 - this is pin 1 on the flash chip
==== back (palmrest) on your X200 ====

```



Bibliotheca Anonoma

Coreboot Laptops

Coreboot is an open source, user configurable BIOS. However, it does use a few proprietary blobs here and there.

ThinkPads

These require hardware flashing. Due to Intel Management Firmware, proprietary blobs are required for newer Intel motherboards to even power up.

- **ThinkPad T430/X230**
 - [xx30 BIOS Whitelist Removal](#)
 - [xx30 BIOS Mod with Old Keyboard](#) - Since Libreboot's ROMs each can use a different keyboard layout, would it be possible to modify Coreboot to work with the old xx20 keyboard? Or just mod the official BIOS to do so?
- [ThinkPad X201](#)
- [ThinkPad T60p \(ATI GPU\)](#)
- [ThinkPad T22](#) - Back when Coreboot was known as "LinuxBIOS", they installed it on a ThinkPad T22 for Richard Stallman.

Chromebooks

Most Intel Chromebooks come with Coreboot preinstalled. SeaBIOS can optionally be

Pin #	SPI Pin Name	Bus Pirate (Seed Color)	Beagleboard Black	Raspberry Pi
2	3.3V	red	3.3V PSU RED	17
7	CS	White	Pin 17	24
8	MISO	Black	Pin 21	21
10	GND	Brown	Pin 1	25
15	MOSI	Gray	Pin 18	19
16	CLK	Purple	Pin 22	23

8-pin BIOS Chip

Fun Fact: *This chip pinout is exactly the same as the X60 and T60.*

8-pin X200 POMONA 5250:

```

~~~~~ VGA (left) ~~~~~
 4321
----
 | |
----
 5678
~~~Hard Drive (right)~

```

Pin #	SPI Pin Name	Bus Pirate (Seed Color)	Beagleboard Black	Raspberry Pi
1	CS	White	Pin 17	24
2	MISO	Black	Pin 21	21
3	<i>not used</i>	<i>not used</i>	<i>not used</i>	<i>not used</i>
4	GND	Brown	Pin 1	25
5	MOSI	Gray	Pin 18	19
6	CLK	Purple	Pin 22	23
7	<i>not used</i>	<i>not used</i>	<i>not used</i>	<i>not used</i>
8	3.3V	red	3.3V PSU RED	17

- [Coreboot Wiki - ThinkPad X200](#)
- [Phoronix - The Lenovo X200 Now Works With Coreboot](#)
- [Anzwx - New Coreboot Mainboard - Lenovo X200](#)

Supported Variants

- [ThinkPad X200](#)
 - ThinkPad X200s
 - ThinkPad X200 Tablet - Currently the digitizer doesn't work... should probably check the X60 Tablet for compatible code?

Possible Supported Variants

- [ThinkPad R400](#) - Uses DDR2 RAM, which is problematic. Maybe devs have fixed it.
- ThinkPad T400
 - ThinkPad T400s

Installing Coreboot on X201

- Source: [Coreboot Wiki - ThinkPad X201](#)

installed to add Windows support.

Just use [John Lewis's Installation Script for All Models](#) to autoinstall.

- [Chromebook Coreboot Installation](#) - Install Coreboot + SeaBIOS for 2nd gen laptops. Not necessary for 3rd gen.
 - Acer C7 Chromebook
 - [Toshiba Chromebook 2](#) - The only 13-inch model around with an FHD 1920x1080 IPS screen.
 - [Samsung Series 5 550](#)
 - [Acer C720 Chromebook](#)
 - [ThinkPad X131e Chromebook](#)
 - [Install Typical BIOS](#)
- [Chromebook Pixel](#)

Build Notes

- [Compiling GRUB2 for Coreboot](#)
- [Future Website Design](#)
- [Other Custom BIOSes](#)
 - [Dual IDA C2D](#)

Libreboot Laptops

NOTE: *The Libreboot components of this wiki was divested into the [Official Libreboot Documentation](#) here. Please use that from now on.*

Libreboot laptops are certified by the FSF to protect your freedom.

They contain no proprietary blobs of any kind, and have the best support for FSF certified GNU/Linux.

ThinkPads

- [ThinkPad X60, X60 Tablet](#)
- [ThinkPad T60 \(Intel GPU\)](#)
 - [Flexview Screens](#)
 - [CPU Buying Guide](#)

Macbooks

- [Macbook 2,1](#)

Other Tutorials

- [Customizing Libreboot](#)
- [X60 T60 Hardware Flashing](#)
 - [Hardware Flashing with Raspberry Pi](#)
- [X200 X201 Hardware Flashing](#)
 - [Hardware Flashing with Raspberry Pi](#)
- [Installing Trisquel with Full Disk Encryption](#)
- [BIOS Flashchip Identification](#)

Supported Variants

- [ThinkPad X201](#)
 - ThinkPad X201s
 - ThinkPad X201 Tablet

Possible support:

- ThinkPad T410
 - [ThinkPad T410s](#)

AFFS (IPS) Screen Mod for X200/X201 (non-tablet)

Notice: We have clarified the replacement process to the best of our ability. However, you, the modifier, bear full responsibility for following the process correctly.

The ThinkPad X200/X201 laptops are capable of using a very high quality AFFS/IPS BOE-Hydis screen (with CCFL backlight), which has a resolution of 16:10 1280x800. This screen is much brighter, has better viewing angles, and better color reproduction than the typical TN panel.

Many users prefer the normal X200/X201 to the tablet version, since it is lighter, cheaper to get, and uses full voltage CPU, unlike the low-voltage CPUs on the tablets.

Purchase an AFFS Screen

Try to find a screen *without a glass touchscreen*; the seller will say that in their listing. Otherwise, you'll just have to [carefully slice off the glass with a craft knife](#) (Be careful, it uses very strong 3M VHB tape).

There are two types of screens: Matte and Glossy. The matte screens have an anti-glare layer, just like the current one on your laptop. The glossy screens don't have that layer and reflect light a little more, just like your smartphone or consumer laptop.

Finally, if the panel was heavily used in the past, the CCFL bulb has probably dimmed considerably. Buy a brand new panel if you want a fresh bulb.

Search for these part numbers on eBay:

- [HV121WX4-120](#) - BOE-Hydis: Matte, AFFS, CCFL, 1280x800
 - \$75+15 (New) - [findusall](#) - This is probably the best deal around, since it is completely new, and has no digitizer/glass touch panel.
 - \$60 (New) - [BrandNewLCDs](#) - Would be the best deal, but I'm not sure if this one has no digitizer/glass touch panel (asking the seller).
- [HV121WX4-110](#) - BOE-Hydis: Glossy, AFFS, CCFL, 1280x800
- [HV121WX4-100](#) - BOE-Hydis: Glossy, AFFS, CCFL, 1280x800
- [LTN121AP02-001](#) - Samsung: Matte, PVA, CCFL, 1280x800
 - PVA Screens have [far higher contrast than AFFS and same great colors](#), but the viewing angles are a little worse (still way better than the default TN panel). Also, this screen is cheaper and more common. It just depends on what you prefer.

Check Model Type

Unfortunately, any X200/X201 that comes with an LED screen must replace their cable and inverter with a CCFL-compatible version to work with AFFS screens (since the X200 Tablet LED screens are not compatible).

In general, most X200 systems have CCFL (though there are exceptions), and all X201 systems have LED.

To see which version you have, check the bottom of the ThinkPad.

[Method](#)

- [Phoenix BIOS Crisis Recovery](#) - (under research) Software method for recovering the factory BIOS, even if you lost the original dump.

Clone this wiki locally

<https://github.com/bibanon/C>



- If your ThinkPad has a warning label that states [and a lamp that contains mercury](#), you have a CCFL version. Just plug the new screen in and go.
- If your ThinkPad does not have such a warning label, you have an LED version. Make sure to buy a CCFL cable and inverter to replace your current LED cable and inverter.

Replacing the Cable and Inverter (LED versions only)

Note: If your X200/X201 came with a CCFL screen, skip this step.

Find these part numbers on eBay, and purchase them:

- [44C9909](#) - CCFL LVDS cable with bluetooth and camera connections
- [42W8009](#) or [42W8010](#) - Inverter

(see HMM for instructions on replacing inverter and cable...)

Replacing the screen

(check HMM)

Gallery

- [yak's X200 AFFS -120 Mod](#)

Sources

- [ThinkPad Forums - Matte AFFS Panel on X200](#)
- [ThinkPad Forums - Parts for X200 AFFS Mod](#)
- [ThinkWiki.de - X200 Displayumbau](#)

X200s AFFS Mod

The X200s/X201s models with 1440x900 WXGA+ screens are [too thin to use the thicker AFFS screen](#). You will have to replace the entire lid with one from a regular X200/X201 to use this screen.

X200/X201 Tablet AFFS/IPS Screens

All X200/X201 Tablet laptops come with an AFFS/IPS screen by default. However, the X200/X201 Tablet is capable of using LED backlit AFFS screens, which are superior since the CCFL bulbs will go dim with time.

AFFS LED Screen Upgrade

First, buy one of the LED screens below from eBay (make sure the digitizer/touch panel is attached):

- [TabletPCReview - The Definitive X200 Tablet LCD Panel Resource](#)

Then, replace the CCFL cable and inverter with the LED versions:

- need parts number

X200 Series Motherboard Upgrade to X201 Series

The ThinkPad X201 motherboard is a drop in replacement for the X200 motherboard; even if you did the AFFS mod. The X201 board offers these improvements:

- **Core i3/i5/i7** - 1st generation - Far more powerful, and more power efficient than Core 2 Duo.
 - **Touchpad Support** - The X201 palmrest contains a multitouch touchpad.
-

You will need to replace the X200 palmrest with an X201 palmrest; which includes a touchpad.

[Lenovo Hardware Maintenance Manual - X200/X200s and X201/X201s](#)

- Source: [ThinkPad Forums - Another successful X200->X201 Transformation](#)

