

How to disable GPU on 2011 MacBook Pro with video issues.

The failure of Discrete GPU results in lines on screen, stripes on screen, sometimes even black screen or blank screen.

This might look like following:-



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There is a widely known defect in the Radeon GPUs on these MacBook Pro models. You are not going to be able to fix the GPU. You can extend its life for a few weeks with a reflow, or attempt to replace the GPU. These days, you may not get a new GPU since the genuine new unused GPU stock may be exhausted and you may get the GPU which is re-balled or re-marked by the seller, which you will regret after installing.

Here we present you 100% working method!! With the removal of an EFI variable and 1 resistor, the GPU will be completely disabled, and you will never have to worry about it again.

A few other fun facts about this modification:

- 1) Cooling- Your MacBook Pro will run cooler. The Radeon normally pumps out a ton of waste heat. Now your Radeon is not powered on. No waste heat. Even better, now you have 2 fans and 2 heat sink pipes dedicated to cooling the Intel GPU/CPU only.
- 2) Less fan noise – Since you now have 2 passive cooling systems working on one chip, your fans will run less, and quieter.
- 3) Battery Life – Now that you don't have several watts of power turning into waste heat, you now have improved battery life.
- 4) No need to modify KEXTs – KEXTs or Kernel Extensions are the Drivers of the OS X world. As far as the OS knows, the AMD chip is not even there. It will not attempt to load the KEXT for it.

OK, let's get into this MacBook Pro GPU Modification. In a nutshell, the summary as follows:-

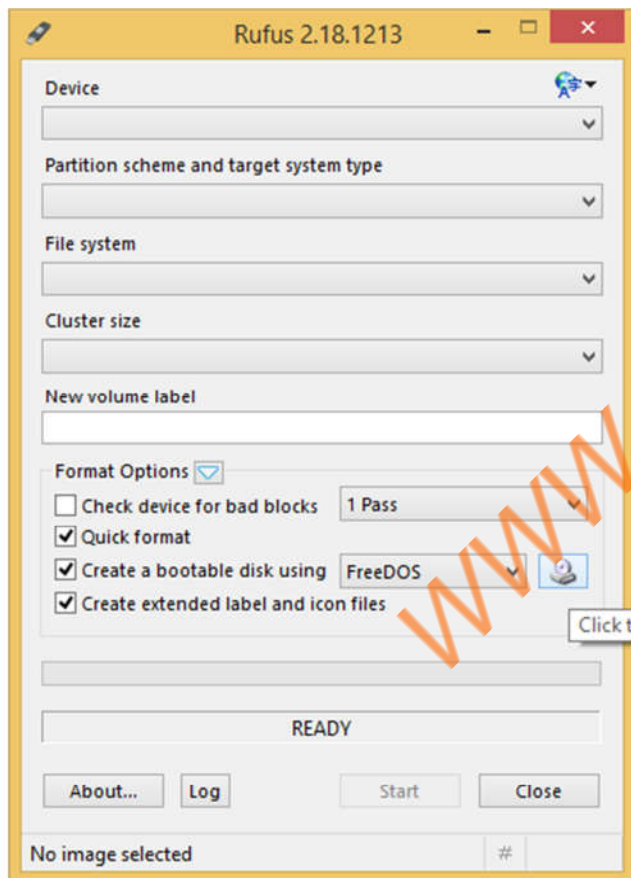
- ⇒ Make a small modification to the EFI using NON GUI version of Arch Linux & a strict Terminal environment.
- ⇒ Reboot in Safe Mode & Shutdown
- ⇒ Remove Battery and motherboard. Remove R8911.
- ⇒ Reassemble, Boot and Enjoy the perfectly working machine, the GPU is disabled and the machine will always use Integrated Graphics.
- ⇒ Do not carry out PRAM / NVRM reset. You can also set EFI password to prevent that from happening. Keep EFI password in safe place.

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Step 1. PREPARE A BOOTABLE USB PENDRIVE WITH A NON GUI LINUX

1.1 Download ArchLinux ISO

You need a working computer for that and a spare CD/DVD/USB drive. Download the latest Arch Linux ISO image from <https://www.archlinux.org/download/> or directly from http://mirrors.acm.wpi.edu/archlinux/iso/2017.10.01/archlinux-2017.10.01-x86_64.iso



Then you could either simply burn this ISO to CD/DVD (which later could be either inserted to MBP's SuperDrive or External DVD Drive connected to MBP by two USB cables) or create a bootable USB.

The bootable USB can be created using utility Rufus.

[Rufus](https://rufus.akeo.ie/downloads/rufus-2.18.exe) is a multi-purpose USB iso writer. Download Rufus from this link <https://rufus.akeo.ie/downloads/rufus-2.18.exe>.

Simply select the Arch Linux ISO, the USB drive you want to create the bootable Arch Linux onto and click start.

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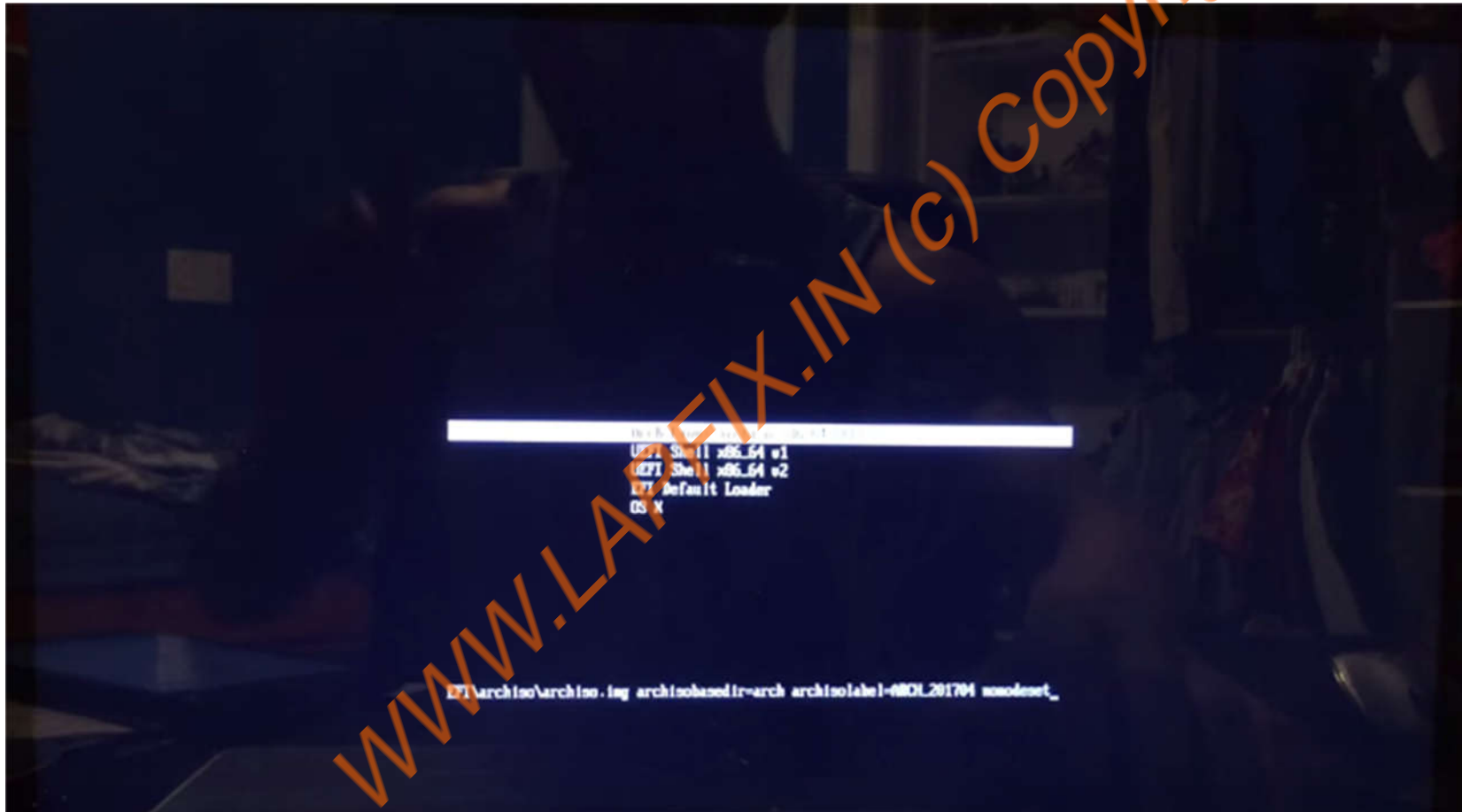
2.1 Boot to it

Insert this CD/DVD/USB to Macbook Pro, hold Option key (alt) while booting. Choose “EFI boot” (that is your bootable installation media).



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When the menu shows, immediately press “e” key to edit the GRUB options of the Arch Linux archiso x86_64 UEFI CD menu entry while it is selected at the main screen, add nomodeset to the end of this line and press Enter.



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If everything is done correctly, you will find yourself at the Linux console! (It takes some time so be patient and wait for the prompt)



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2.2 Clear existing EFI variable.

The efivarfs filesystem is mounted by default! Now you can execute following commands to explore this directory and see if there is a gpu-power-prefs-... variable (where ... is the UUID of this variable). In next steps replace ... with UUID you see.

This UUID will be typically like fa4ce28d-b62f-4c99-9cc3-6815686e30f9

- ⇒ `cd /sys/firmware/efi/efivars` (go to efivars)
- ⇒ `ls` (list the directory efivars)

```
Arch Linux 4.10.6-1-ARCH (tty1)
archiso login: root (automatic login)
root@archiso ~ # cd /sys/firmware/efi/efivars
root@archiso /sys/firmware/efi/efivars # ls
AcpiGlobalVariable-af9ff667-ec10-488a-9dfc-6bf5ee22c2e
BluetoothInternalControllerInfo-7c436110-ab2a-4bab-a000-fef11995c9f02
Boot0000-8be4df61-33ca-1142-aad4-000000000000
BootCurrent-8be4df61-33ca-1142-aad4-000000000000
BootFFFF-8be4df61-33ca-1142-aad4-000000000000
BootOrder-8be4df61-33ca-1142-aad4-000000000000
ConOut-8be4df61-33ca-1142-aad4-000000000000
ConOutDev-8be4df61-33ca-1142-aad4-000000000000
current-network-36c2ba15-6566-4c58-9ab4-c3a520f03043
ep14_provisioned-8be4df61-33ca-1142-aad4-000000000000
ErrOutDev-8be4df61-33ca-1142-aad4-000000000000
FirmwareFeatures-441e0e95-30c7-46fa-3cc6-8bcca0a30c14
FirmwareFeaturesMask-441e0e95-30c7-46fa-3cc6-8bcca0a30c14
FirmwareFeaturesMask-441e0e95-30c7-46fa-3cc6-8bcca0a30c14
gpu-active-fa4ce28d-b62f-4c99-9cc3-6815686e30f9
LangCodes-8be4df61-33ca-1142-aad4-000000000000
last-os-login-ident-046344fe-b43c-4aad-801d-86f4974bc14f
LoaderEntrySelected-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderFirmwareInfo-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderFirmwareType-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderImageIdentifier-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderInfo-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderTimeBase-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderTimeInitted-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderTimeOfLastUpdate-4a67a002-9e4c-41cf-Mc7-440a29a0c4ff
LoaderTimeServicesEnabled-7c436110-ab2a-4bab-a000-fef11995c9f02
MemoryMap-8be4df61-33ca-1142-aad4-000000000000
NVR-ef940111-1402-11d3-8e77-000000000000
PchInit-ef6c2f70a-b694-4877-85ba-40cc09e117eb
PchInit-ef6c2f70a-b694-4877-85ba-40cc09e117eb
Preferred-Boot-36c2ba15-6566-4c58-9ab4-c3a520f03043
Preferred-networks-36c2ba15-6566-4c58-9ab4-c3a520f03043
Setup-MfAaAb-1992-4fda-ab00-0f0000000000
SetupDefaults-6029c20-3953-4c5f-b700-f0c47150a2a
SystemBootInfo-7c436110-ab2a-4bab-a000-fef11995c9f02
SystemBootInfo-7c436110-ab2a-4bab-a000-fef11995c9f02
Timeout-8be4df61-33ca-1142-aad4-000000000000
```

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2.2 Clear existing EFI variable (Continued...)

After executing ls command, if the gpu-power-prefs variable is seen, you will have to remove it with rm.rm gpu-power-prefs...

If you are getting the “operation not permitted” message while attempting to rm, it means that efivars has been mounted as read-only and you need to remount it with read-write permissions and try again:

- | | |
|---|--|
| ⇒ cd / | (go to root) |
| ⇒ umount /sys/firmware/efi/efivars/ | (unmount efivars) |
| ⇒ mount -t efivarfs rw /sys/firmware/efi/efivars/ | (remount with read-write permissions) |
| ⇒ cd /sys/firmware/efi/efivars/ | (again go to efivars) |
| ⇒ rm gpu-power-prefs... | (remove gpu-power-prefs) |

If this also fails (you still can't erase the file), use chattr command to disable file immutability and then erase the file:

- | | |
|----------------------------------|--|
| ⇒ chattr -i "gpu-power-prefs..." | (disable immutability of gpu-power-prefs) |
| ⇒ rm gpu-power-prefs... | (remove gpu-power-prefs) |

This step ensures that the existing EFI variables are cleared.

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2.3 Create a new gpu-power-prefs-... file

⇒ `printf "\x07\x00\x00\x00\x01\x00\x00\x00" > /sys/firmware/efi/efivars/gpu-power-prefs-fa4ce28d-b62f-4c99-9cc3-6815686e30f9`



```
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AcpiGlobalVariable-f9ff67-ec10-488a-94fc-6cbf5ee22c2e
bluetoothInternalControllerInfo-7c436110-ab2a-4bbb-a800-fe41995c9f82
Boot0000-8be4df61-33ca-1142-a94d-00e990832bdc
BootCurrent-8be4df61-33ca-1142-a94d-00e990832bdc
BootFFFF-8be4df61-33ca-1142-a94d-00e990832bdc
BootOrder-8be4df61-33ca-1142-a94d-00e990832bdc
ConOut-8be4df61-33ca-1142-a94d-00e990832bdc
ConOutDev-8be4df61-33ca-1142-a94d-00e990832bdc
current-network-36c28a35-6566-4c59-9eb4-cba528f83043
epid_provisioned-8be4df61-33ca-1142-a94d-00e990832bdc
ErrOutDev-8be4df61-33ca-1142-a94d-00e990832bdc
FirmwareFeatures-441de95-3bc7-4afa-9cc5-4bcca8a30c14
FirmwareFeaturesMask-441de95-3bc7-4afa-9cc5-4bcca8a30c14
fw-computer-name-7c436110-ab2a-4bbb-a800-fe41995c9f82
gpu-active-fa4ce28d-b62f-4c99-9cc3-6815686e30f9
Lang-8be4df61-33ca-1142-a94d-00e990832bdc
LangCodes-8be4df61-33ca-1142-a94d-00e990832bdc
last-oslogin-ident-8b6344fc-bd3c-4a4d-8014-86fd974bc14f
LoaderEntrySelected-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderFirmwareInfo-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderFirmwareType-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderImageIdentifier-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderInfo-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderTimeExecUSec-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderTimeInitUSec-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LoaderTimePostUSec-4a67b082-0a4c-41cf-b6c7-440a29b8dc4f
LocationServicesEnabled-7c436110-ab2a-4bbb-a800-fe41995c9f82
MemoryConfig-8be4df61-33ca-1142-a94d-00e990832bdc
RTC-eb704011-1402-11a3-8c77-00a0c969723b
TchInit-etc4779a-b394-8077-85ba-4ee09e117eb
TchOSReis-etc2f79a-b394-8077-85ba-4ee09e117eb
preferred-boot-36c28a35-6566-4c59-9eb4-cba528f83043
preferred-os-b362a-36c28a35-6566-4c59-9eb4-cba528f83043
Setup-4fbbab-1392-4fde-abbb-cf1cc5ad7454
SetupFails-95293c20-3953-4a5f-b7d8-f1c6a7150b2a
SystemAudioVolume-7c436110-ab2a-4bbb-a800-fe41995c9f82
SystemAudioVolumeDB-7c436110-ab2a-4bbb-a800-fe41995c9f82
TimeOut-8be4df61-33ca-1142-a94d-00e990832bdc
root@archiso /sys/firmware/efi/efivars # printf "\x07\x00\x00\x00\x01\x00\x00\x00" > /sys/firmware/efi/efivars/gpu-power-prefs-fa4ce28d-b62f-4c99-9cc3-6815686e30f9
```

Explanation - The G-mux chip Lattice XP2 does the job of switching between GPU & Integrated Graphics.

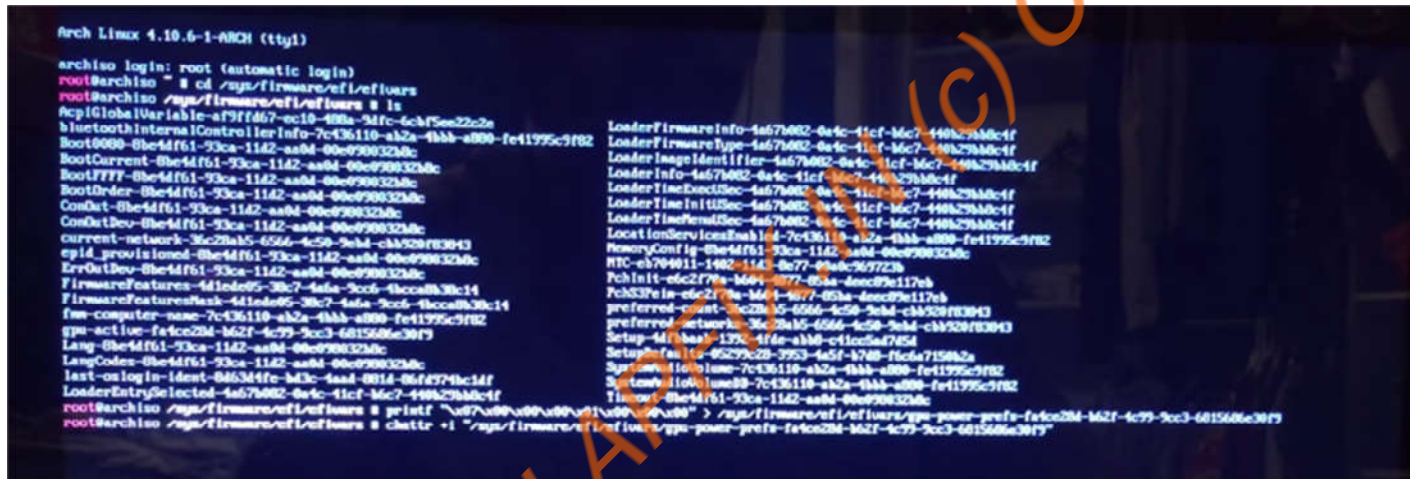
G-mux initial switch state on boot-up is user configurable via the EFI variable `gpu-power-prefs-fa4ce28d-b62f-4c99-9cc3-6815686e30f9` (5th byte, + * 1 = IGD, 0 = DIS). Based on this setting, the EFI firmware tells G-mux to switch the panel and the external DP connector and allocates a frame-buffer for the selected GPU.

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2.4 Add immutability to the gpu-power-prefs-... file

This chattr command is supposed to lock a file to make it accessible only by “superuser” – and so that, while booting, your EFI will have no chance to change your gpu-power-prefs-... variable under any circumstances

⇒ `chattr +i "/sys/firmware/efi/efivars/gpu-power-prefs-fa4ce28d-b62f-4c99-9cc3-6815686e30f9"`



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Boot0000-0be4df61-33ca-1142-aad4-00099003234c
BootCurrent-0be4df61-33ca-1142-aad4-00099003234c
BootFFFF-0be4df61-33ca-1142-aad4-00099003234c
BootOrder-0be4df61-33ca-1142-aad4-00099003234c
ConOut-0be4df61-33ca-1142-aad4-00099003234c
ConOutDev-0be4df61-33ca-1142-aad4-00099003234c
current-network-36c2ba35-6566-4c58-9dd4-ch3529f83043
epid_provisioned-0be4df61-33ca-1142-aad4-00099003234c
ErrOutDev-0be4df61-33ca-1142-aad4-00099003234c
FirmwareFeatures-441de05-3bc7-4ada-9c6b-00ca083bc14
FirmwareFeaturesExt-441de05-3bc7-4ada-9c6b-00ca083bc14
fw-computer-name-7c436119-a32a-4bb8-a809-fe11995c9f82
gpu-active-fafce28d-b62f-4c99-9cc3-6815686e30f9
Lang-0be4df61-33ca-1142-aad4-00099003234c
LangCodes-0be4df61-33ca-1142-aad4-00099003234c
Last-LoggedIn-00000000-0000-0000-0000-000000000000
LoaderEntrySelected-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderFirmwareInfo-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderFirmwareType-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderImageIdentifier-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderInfo-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderTimeEndOfSec-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderTimeInitOfSec-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderTimeInitOfSec-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LoaderTimeInitOfSec-fa67b002-64fc-41cf-b6c7-440a29a8c4f
LocationServicesEnabled-7c436119-a32a-4bb8-a809-fe11995c9f82
MemoryConfig-0be4df61-33ca-1142-aad4-00099003234c
RTC-0b794011-1902-1142-8e77-000000000000
PchInit-c6c2f79a-b604-4077-93ba-40cc99e117eb
PchS3Pch-c6c2f79a-b604-4077-93ba-40cc99e117eb
preferred-contrast-36c2ba35-6566-4c58-9dd4-ch3529f83043
preferred-contrast-36c2ba35-6566-4c58-9dd4-ch3529f83043
Setup-44ba0-1192-4f4e-abb8-cf10c0a72054
Setup-44ba0-1192-4f4e-abb8-cf10c0a72054
SystemVolume-7c436119-a32a-4bb8-a809-fe11995c9f82
SystemVolume-7c436119-a32a-4bb8-a809-fe11995c9f82
SystemVolume-7c436119-a32a-4bb8-a809-fe11995c9f82
Time-0be4df61-33ca-1142-aad4-00099003234c
root@archiso /sys/firmware/efi/efivars # printf "\n0x0000000000000000" > /sys/firmware/efi/efivars/gpu-power-prefs-fafce28d-b62f-4c99-9cc3-6815686e30f9
root@archiso /sys/firmware/efi/efivars # chattr -i "/sys/firmware/efi/efivars/gpu-power-prefs-fafce28d-b62f-4c99-9cc3-6815686e30f9"
```

2.5 Unmount efivars and reboot

Change to the root directory to unmount efivars:

- ⇒ `cd /`
- ⇒ `umount /sys/firmware/efi/efivars/`

Guarantees that your EFI variables are flushed to efivarfs filesystem. Please unmount it safely before rebooting.

- ⇒ `reboot`

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BootFFFF-8be4df61-93ca-1142-aa04-000000000000
BootDriver-8be4df61-93ca-1142-aa04-000000000000
ConOut-8be4df61-93ca-1142-aa04-000000000000
ConOutDev-8be4df61-93ca-1142-aa04-000000000000
current-network-36c28a15-6566-4c50-9a04-cba920f03043
epid_provisioned-8be4df61-93ca-1142-aa04-000000000000
ErrOutDev-8be4df61-93ca-1142-aa04-000000000000
FirmwareFeatures-4d1ede05-30c7-4afa-9cc6-4bcca8b30c14
FirmwareFeaturesMask-4d1ede05-30c7-4afa-9cc6-4bcca8b30c14
fw-computer-name-7c436110-ab2a-4000-fe11995c9f02
gpu-active-fefce204-b62f-4c79-9cc3-6015606c30f9
Lang-8be4df61-93ca-1142-aa04-000000000000
LangCodes-8be4df61-93ca-1142-aa04-000000000000
last-on-login-ident-046344fe-b43c-4aa1-0014-06f4774bc1df
LoaderEntrySelected-4a67b002-0a4c-41cf-bc7-440b29a00c4f
root@archiso /sys/firmware/efi/efivars # printf '\x07\x00\x00\x00\x01\x00\x00\x00' > /sys/firmware/efi/efivars/gpu-power-preff-fefce204-b62f-4c79-9cc3-6015606c30f9
root@archiso /sys/firmware/efi/efivars # chattr +l "/sys/firmware/efi/efivars/gpu-power-preff-fefce204-b62f-4c79-9cc3-6015606c30f9"
root@archiso /sys/firmware/efi/efivars # cd /
root@archiso ~ # umount /sys/firmware/efi/efivars/
root@archiso ~ # reboot_
```

On this reboot it is essential that you boot once into safe mode (hold Shift throughout boot), and then choose shutdown (not restart) from the menu. The safe boot clears OS level GPU preferences that may interfere with the following process.

Do this safe boot with the R8911 resistor in place. Without this SAFE BOOT, the next steps may not work. Do no more boots until you complete the next steps.

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Now remove the battery and motherboard. Remove R8911. Reassemble everything back and enjoy the perfectly working MacBook again. Removing the R8911 disables the ISL6263 converter and the disabled GPU cannot waste the power anymore.

That is basically it. Next time you boot up you will notice your GPU defect is gone, and you will no longer see the AMD GPU as installed hardware. You must now install an EFI password so that the NVRAM is prevented from reset and this mod continues to work.

