

# FERMI BIOS Editor guide.

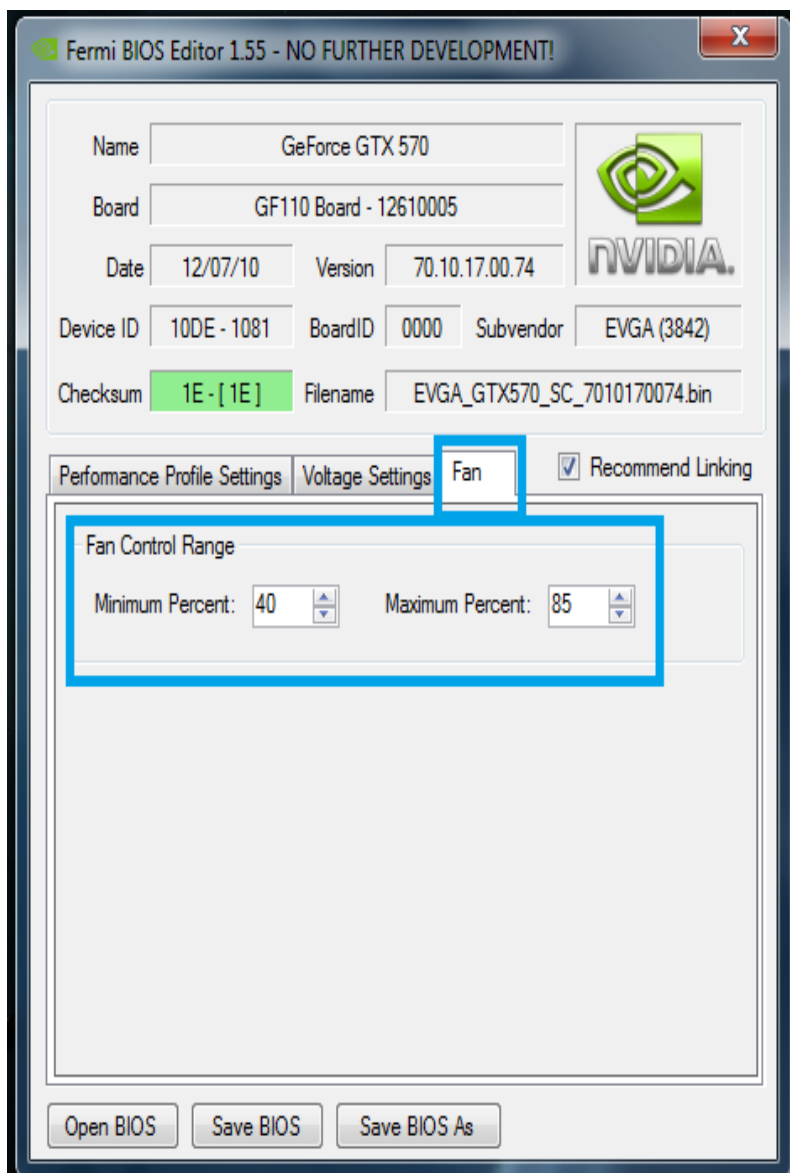
(No future development , newer gpu's then GTX570 and 580 will not be supported)

Open your saved bios with Fermi BIOS Editor , after you are done editing your bios always save it as a .rom file or NVFLASH will not work.

## 1:FANSPEED.

Only possible with GTX460 and GTX5.. serie.

Changing the default fan settings (40%-85%) .You can change the minimum and maximum "fan speed" that can be controlled with software to the desired values. For example that the fan can ramp up to 100%.



**The Fan TAB lets you change the default value for the "Minimum and Maximum FAN %" to the value that you want.**

**If you set the "Maximum fan% to 100% , then you can crank up your fan to 100% and not 85% what the default value is for FERMI.**

**Now you can use any software (MSI Afterburner , EVGA Precision...) that allows you to control the fan speed to let the fan run up to 100%.**

## 2: Voltage settings.

Here you can change the voltage settings of every P-STAGE

**Here you can select which voltage entry is linked with which P-level.**  
**P00 = 3D performance**  
**P3=?used with GTX460,465,470,480.**  
**doesn't exist on the GTX570 , 580.**  
**P08= 3D Lower**  
**P12= 2D Desktop.**

Performance Profile Settings Voltage Settings Fan ☒ Recommend Linking

P00 - Profile:	1464	1464	540	1464	1539	1900	540
Voltage Entry #2	540	0	0	231	1539		
P03 - Profile:	0	0	0	0	0	0	0
Voltage Entry #0	0	0	0	0	0		
P08 - Profile:	810	810	405	810	810	324	405
Voltage Entry #1	405	0	0	231	810		
P12 - Profile:	270	540	135	101	270	135	135
Voltage Entry #0	270	0	0	231	270		

Open BIOS Save BIOS Save BIOS As

Fermi BIOS Editor 1.55 - NO FURTHER DEVELOPMENT!

Name GeForce GTX 570 Board GF110 Board - 12610005 Date 11/11/10 Version 70.10.17.00.03 NVIDIA

**Here you change the maximum controlled voltage.**

Performance Profile Settings Voltage Settings Fan ☒ Recommend Linking

Voltage Table

Max Table Voltage 1112 mV

Voltage Pattern

Voltage Entry #0	912 mV
Voltage Entry #1	912 mV
Voltage Entry #2	GPU Default
Voltage Entry #3	Keep (Ukn.)

Open BIOS Save BIOS Save BIOS As

**Voltage Entry 2 : Default P00 (3D perf.) voltage of GPU , can not be changed.**  
**If you want to change the 3D perf. voltage you need to point voltage "Entry 3" to the P00 profile and changes this voltage entry to the desired value.**

**Note: the minimum you can go with FERMI is 0.825V.**

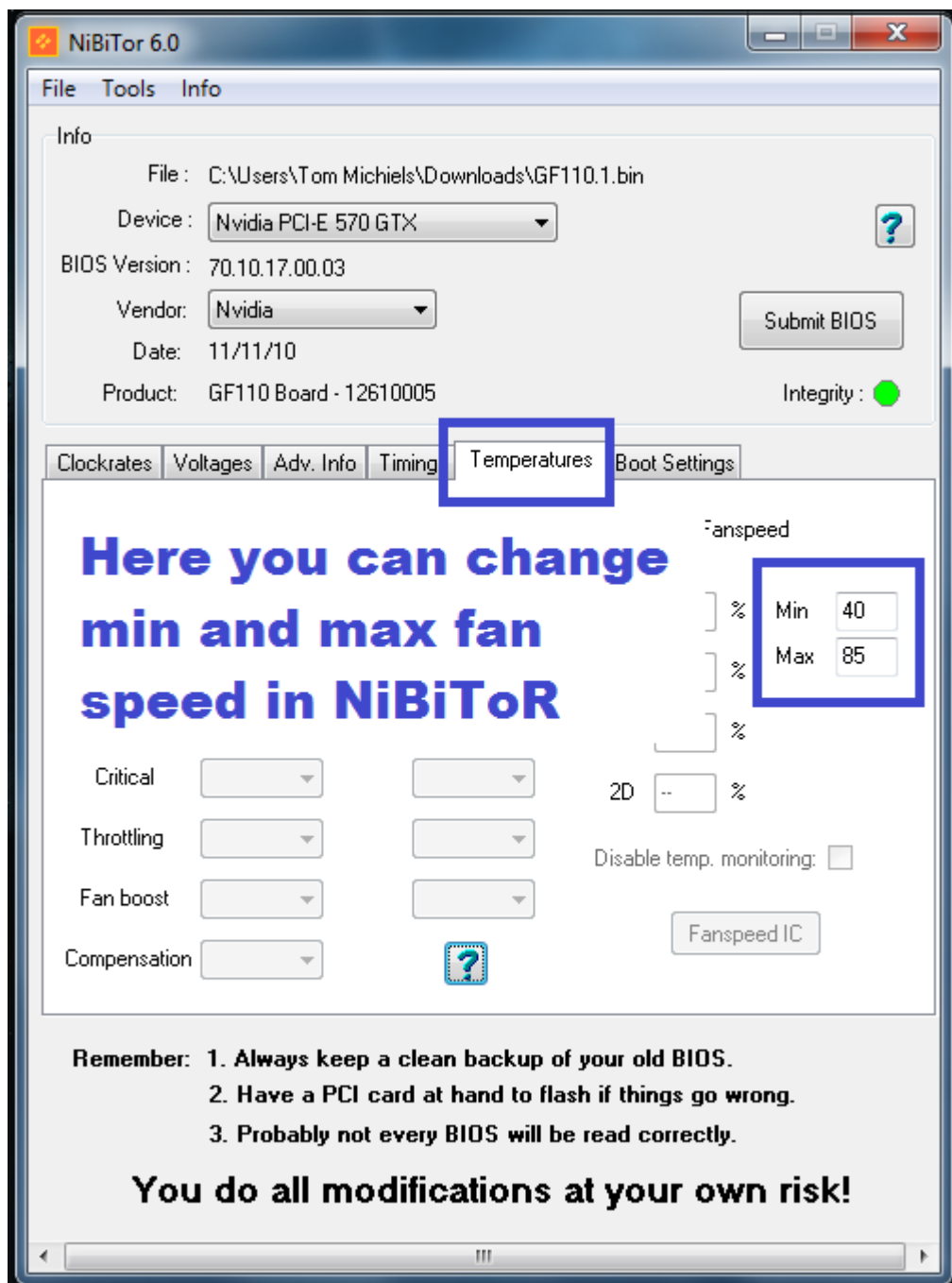
Open BIOS   Save BIOS   Save BIOS As

# "NiBiToR" Fermi BIOS editing guide.

Open your saved bios with NiBiToR , after you are done editing your bios always save it as a .rom file or NVFLASH will not work.

## 1:FANSPEED. Only possible with GTX460 and GTX5.. serie.

Changing the default fan settings (40%-85%) .You can change the minimum and maximum "fan speed" that can be controlled with software to the desired values. For example that the fan can ramp up to 100%.



## 2: Voltage settings.

Here you can change the voltage settings of every P-STAGE

**Change the Maximum controlled voltage.**  
The Maximum in this case is 1.213V and voltage changing goes in steps of 0.0125V.

**2D Voltage**, you can lower this so your GPU uses less energy when in desktop mode and lower idle temps. (I set mine at 0.863V) Don't put it to low or your system becomes unstable.

**3D LOWER clock Voltage.** (I don't change this).

**3D Performance clock Voltage.**  
When you overclock and you want to change the voltage you change the first tab to the desired value, make sure that the second tab value always bigger or equal is to the first tab value. (0.9505 is the default value, some chips have enough with this others will use 0.9755 or even more, that is why the second tab shows 1.105V) So you need to check your default VID value with **"MSI Afterburner"** or **NVIDIA Inspector** Ex: in the software it shows 0.988V, your chip needs this to run at *stock* even when you bios says 0.9505V in the First tab.  
(My First Tab is set to 1.038V second I left at 1.105V now I run at 855/1710/2050MHz and it shows 1.038V in **"MSI Afterburner and in NVIDIA Inspector"**)

**P3= 2D Clocks**  
**P7= 3D Lower Clocks**  
**P15= 3D Performance Clocks**

With some fermi's (GTX480) P7 uses the same as P3 and you can not change "setting1" P12 is only used by GTX 4..and not 5.., No need to change this value

**NOT USED**

Perfmode / Voltage: P3 Setting 0 P7 Setting 1 P12 Setting 0 P15 Setting 2

**Note: the minimum you can go with FERMI is 0.825V , NiBiToR lets you go lower but it will not work !!!!!!!!!!!!!!!!!!!!!!!**



### 3: Clock & Memory settings.

**CHANGING CLOCKS:** (Core and shader are linked with FERMI) For the clock/shader speed and memory speed we made a real easy to use tool , "FermibiosCalculator" , this tool does all the calculations for you and shows you where to put the values in NiBiToR. We made this tool because NiBiToR doesn't do the calculations for you. Here it is :

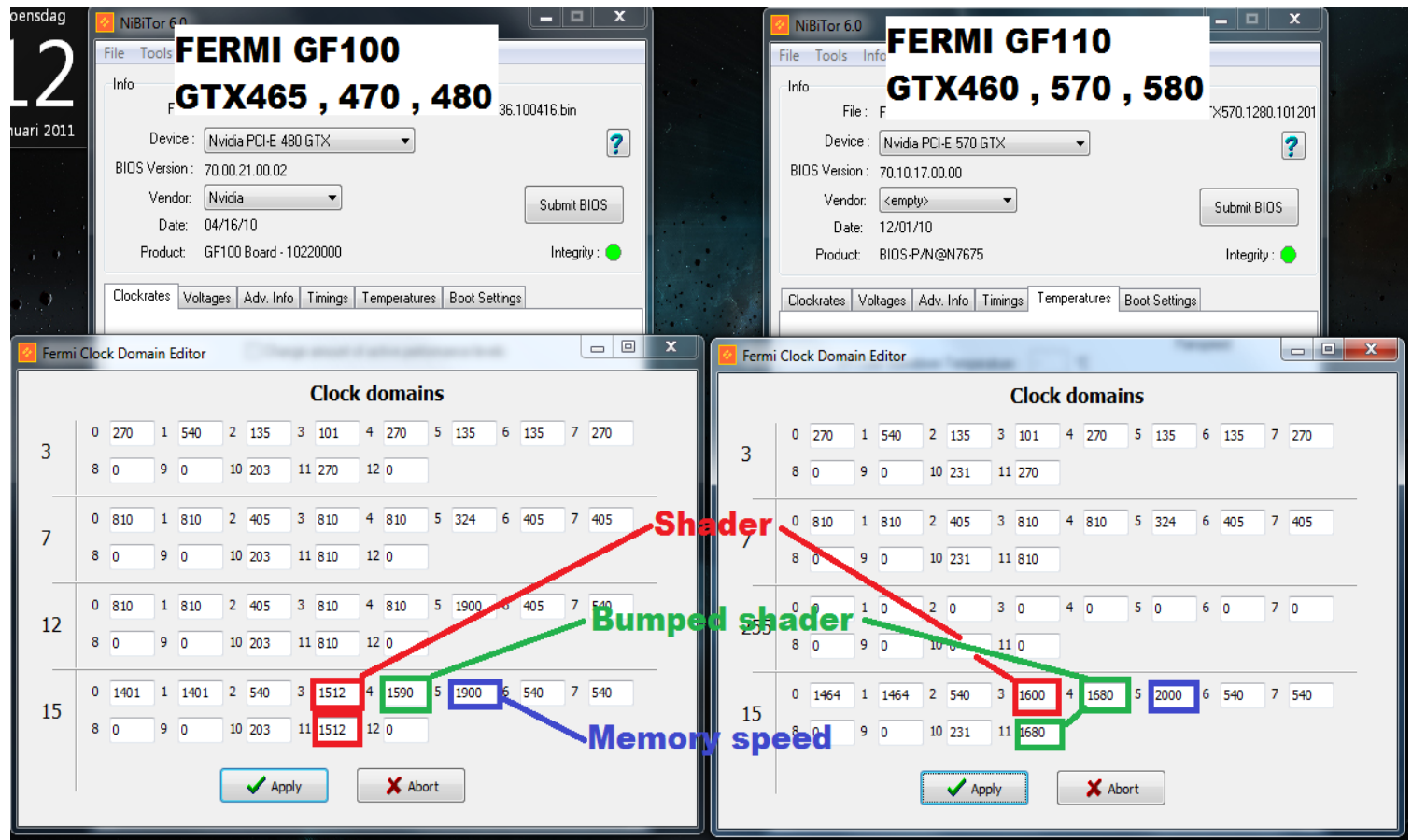
## FermibiosCalculator:



Just type in your new shader speed and memory(not needed if you don't change it) and select your GPU , this app will calculate the values (bumped shader )and show you where to put them in NiBiToR in the P12 level and or P15 level depending on what GPU. **The tabs that stay blank you DON'T change !!**

Supported cards are: GTS450, GTX460SE, GTX460, GTX460 ASUS TOP, GTX470, GTX480, GT520, GTX560, GTX560ti, GTX570, GTX580, GTX590.(can change)(If you use this please read the "read me" file !!)

## "NiBiToR" (Tools - FERMI Clocks)



**When you change the "Shader" speed then the "Bumped shader" speed must be adjusted!!!!!!**

***There are differences between the Fermi GF100 and GF110 like the pictures shows.***

***-For the (GF100) GTX465 , 470 , 480 the rule is to put in TAB4 the new calculated "bumped shader" value and in TAB11 the same value as your new SHADER speed!!!!!!!!!!!!!!(Also the ASUS GTX460 DirectCU TOP)***

***-For the (GF110, GF104 , GF114) GTX460 , 570 , 580 , 590 and GTX560ti you put in TAB4 and TAB11 the new calculated "bumped shader" value!!!!!!!!!!!!!!(except the ASUS GTX460DirectCU TOP)***

## ASUS GTX460 DirectCU top is exception on this rule.

Here you see the ASUS GTX460 DirectCU top compared with the MSI Factory overclocked card and a ASUS card at NVIDIA reference speed.

In the Asus GTX460 DirectCU TOP bios the overclocked Shader speed is in Tab 0 , 1 , 3 and 11

Only in tab 4 they put the Bumped shader speed.

(center BIOS = ASUS DirectCU TOP , all bioses are version 70.04.13.00.01 , so it is something ASUS does to this bios with this card)

The image displays three side-by-side screenshots of BIOS and Fermi Clock Domain Editor windows, comparing the settings of three different ASUS GTX460 DirectCU TOP cards. The BIOS windows show the 'Info' tab with the following details:

- File: C:\Users\Tom Michiel\Downloads\MSI GTX460 1024 102807\_2.bios
- Device: Nvidia PCI-E 460 GTX
- BIOS Version: 70.04.13.00.01
- Vendor: MSI
- Date: 09/07/10
- Product: GF104 Board - 10410001

The Fermi Clock Domain Editor windows show the 'Clock domains' tab with the following settings:

- MSI Factory overclocked GTX460 1024MB, Like the guide explains. Tab4 and 11 Bumped shader speed
- ASUS DirectCU TOP, 1024MB. ASUS put the Factory overclocked shader speed in TAB 0, 1 and 11. Where with all other vendors (See MSI bios) tab 0 and 1 stay the same as the NVIDIA reference shader speed. So ASUS did this for some reason on there DirectCU TOP model (better support for Smartdoctor?)
- ASUS reference NVIDIA reference speeds 1024MB, Like the guide explains. Tab4 and 11 Bumped shader speed.

All 3 Bios versions are the same , MSI is factory overclocked like the ASUS DirectCU TOP but MSI does it like all other vendors Tab 11 and 4 = Bumped shader.

If you edit the ASUS GTX460 DirectCU TOP bios with "FERMI BIOS EDITOR 1.55" things are adjusted automatic in the way ASUS does in the DirectCU TOP card or use the "FermibiosCalculator" and select the GTX460Asus TOP card.



## How to calculate the "bumped shader". Or use the FermibiosCalculator

I calculated the value that you need to multiply with your new "shader speed" to get the new "bumped shader" value.

Here are the values for each card .

$$\text{GTX460} = 675/1350/1800\text{MHz} = 1431:1350 = 1.06$$

$$\text{GTX 465} = 607/1215/1603\text{MHz} = 1272:1215 = 1.04691$$

$$\text{GTX470} = 607/1215/1674\text{MHz} = 1272:1215 = 1.04691$$

$$\text{GTX480} = 700/1401/1848\text{MHz} = 1472:1401 = 1.05067$$

$$\text{GTX570} = 732/1464/1900\text{MHz} = 1539:1464 = 1.05122$$

$$\text{GTX580} = 772/1544/2004\text{MHz} = 1620:1544 = 1.04922$$

$$\text{GTX590} = 607/1215/1707\text{MHz} = 1272:1215 = 1.04691$$

$$\text{GTX560ti} = 822/1645/2004\text{MHz} = 1744:1645 = 1.06018$$

*(NOTE: the calculation of these values are based on the stock bios settings of every card)*

**The rule : divide stock "bumped shader (tab4)" with stock "shader (tab3)" , the result of this you multiply with your new "shader speed (tab3)" and the result of that is the new "bumped shader speed".**

### Examples:

#### 1:Changing the clocks on the GTX480 (GF100)

Stock settings on this "factory-occard: "Shader":1512 (tab3 & 11) , "Bumped shader":1590 (tab4) , Memory 1900(tab5)

This card runs at stock "factory-overclock" 756/1512/1900MHz

We are going to change this to 800/1600/2000MHz.

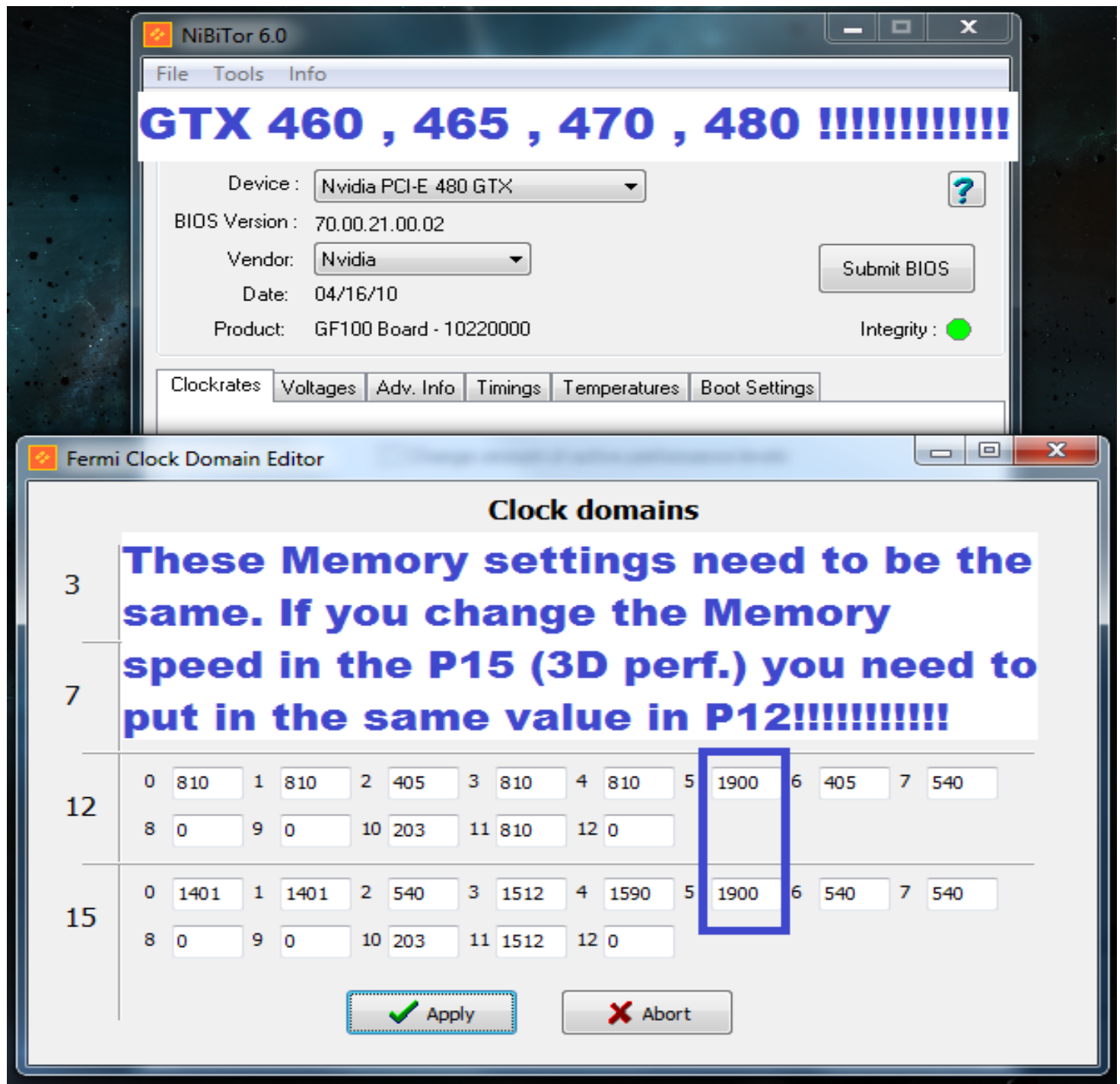
**Memory** : change the value in tab5 to **2000**.

**Shader**: change value in tab3 & 11 to **1600**.

**Bumped shader**:  $1590/1512 = 1.0515873 \times 1600 = 1682.53968 = 1682$  in tab4

**Warning for GTX 460 , 465 , 470 , 480!!!! Not for GTX 570 , 580 , 590 and GTX560ti.**

"FermibiosCalculator" shows you this , just select your GPU!!!



## 2:Changing the clocks on the GTX570 (GF110)

Stock settings on this "factory-oc card: "Shader":1600 (tab3) , "Bumped shader":1680 (tab4 &11) , Memory 2000(tab5)

This card runs at stock "factory-overclock" 800/1600/2000MHz

We are going to change this to 850/1700/2200MHz.

**Memory** : change the value in tab5 to **2200**.

**Shader**: change value in tab3 to **1700**.

**Bumped shader**:  $1680/1600 = 1.05 \times 1700 = 1785$  in tab4 & 11

**Finish every editing with "APPLY" and save your edited bios as a (.rom) file.**

## Some INFO on the GTX590

The GTX590 got a P14 level , this level is the downclock level , when the card got to much powerdraw the card will trotlle down to these clocks.

**Core=553MHz / Shader =1107MHz and Memory=1603/3206MHz Effective datarate.**

**It will use the voltage setting 1 .**

You can not see these clocks trottlng down , your software will show the default docks 607/1215/1707MHz. The only thing where you will notice is that your FPS will drop down.

So overclocking this card its hard , you need to find the max voltage before you notice that your FPS in games are dropping down. Better to just try raising the Clock speeds and NO Voltage tweak.

**The latest NVIDIA driver won't even allow voltage Tweaking with software.**

I think the highest stable clock that you can get without voltage tweak is 680/1360/1850MHz(3400MHz)

This p14 level will be activated by the driver. (Ex: Running Furmark will activate this and some other stress programs)

The GTX590 is a bad overclocker if you want to tweak voltage , **If you put the voltage to high the powerdraw limiter will kick in faster.**

**My advice on the GTX590 is NO OVERVOLTING!!!!!!!**

## GTX590BIOS screen

**GTX590**

The rules to edit the bios are the same as with the GF110 (580,570).

The only thing you need to change is the P15 level.

Tab3= Shaderspeed  
Tab4 and 11 are the bumped shader.  
Tab5 is the memory speed.

P14 level is the downclock level, when the cards draws to much power these are the clocks that it will go to = Shader 1107MHz / core 553MHz, Memory 1603 effective 3206 MHz.  
It will use values of Voltage setting 1 ( 0.875 - 0.925).

2D and 3Dlower (P3 and P7) use voltage setting 0.

I would not change a thing in the GTX590 BIOS !!!  
The GTX590 is fragile on OVER-VOLTING!!!!  
Undervolting and fan settings are no problem.  
It is possible that you change settings in the bios but that the driver of NVIDIA will over rule these settings.  
With the latest drivers it is not possible to do voltage tweaking with software.

**Annotations in the image:**

- Max Software voltage:** 1,213 V
- FANSPEED in %:** 40 (Min) to 95 (Max)
- Voltage Settings:** Setting 0: 0.8755 V, Setting 1: 0.8755 V, Setting 2: 0.8755 V, Setting 3: 0.8755 V
- Clock domains:**
  - 3: 0 270 1 540 2 135 3 101 4 270 5 135 6 135 7 270
  - 7: 0 810 1 810 2 405 3 810 4 810 5 324 6 405 7 405
  - 14: 0 1107 1 1107 2 540 3 1107 4 1161 5 1603 6 540 7 540
  - 15: 0 1107 1 1107 2 540 3 1215 4 1272 5 1707 6 540 7 540

**Changing the original BIOS and flashing your GPU will void your warranty. ALWAYS MAKE BACKUP OF ORIGINAL BIOS with NVFLASH or GPU-Z.**

How you backup your original BIOS and how you flash your NVIDIA gpu is explained here <http://forums.guru3d.com/showthread.php?t=313989>

**Civato 2011. (THX to BetA13 for extra INFO)**

**Thanks to Crispyi for all the help on the FermibiosCalculator !!!**