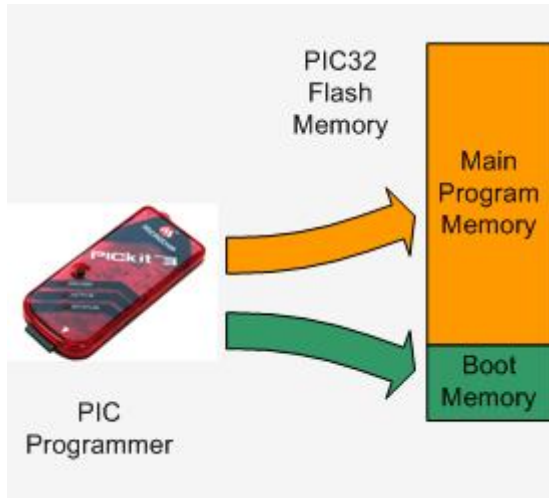


Loading New Firmware

Loading a new version of MMBasic into the Maximite is controlled by a boot loader. This is a small program which has the ability to reprogram the PIC32 program memory using data sent to it over the USB interface. It is located in a reserved section of the PIC32's program memory and is always there regardless of what program is loaded into the main memory.



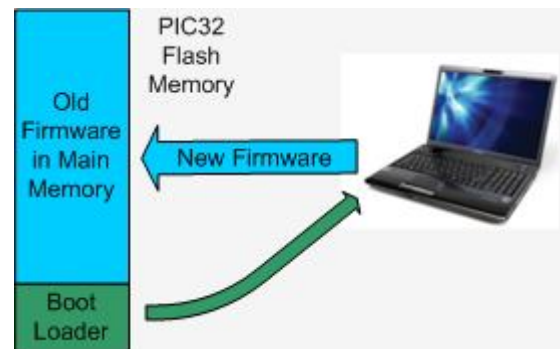
The boot loader was automatically installed when the PIC32 was programmed with the original version of MMBasic for the Maximite (version 2.1). This must be loaded by a PIC programmer such as the PICKit 3 and this will have been done by the kit supplier or yourself if you built the Maximite using a virgin PIC32 chip (this is illustrated in the diagram on the left).

Once the boot loader is installed all future upgrades are done over the USB interface under control of the boot loader (see the diagram below). No programmer is required.

Because the boot loader

is located in a protected area of memory it is completely unaffected by failures when programming the main memory. For example, if you loose power or accidentally unplug the USB cable while programming you can just go back to the beginning and restart the boot load process – the boot loader will never be corrupted or lost.

You can load whatever version of MMBasic that you want (ie, you can go back to an old version as well as load a recent version). There will also be special versions of the Maximite firmware and you can also try them out (for example RetroBSD).



Windows 7

To load the new version of MMBasic you need to run the program BootLoader.exe on your Windows computer (this will be supplied with the upgrade). This program is used to send the data over USB to the boot loader running on the Maximite.

On Windows 7 this program can be run directly (installation is not required). It will also run on earlier versions if you install Microsoft's .NET V2.0 or later runtime. However, in that case, it is probably easier to use MPHidFlash (described in the next section)

For Macintosh, Linux and Windows XP or Vista

You should download MPHidFlash from: <http://code.google.com/p/mphidflash/>

There are versions for Windows, Macintosh or Linux (called binaries) and the program is run from the command line (DOS Box in Windows).

The command that you should run is:

```
mphidflash -v 04D8 -p FA8D -n -w <filename>
```

Where <filename> is the name of the MMBasic upgrade file (it will have a .hex extension). Be careful to use the correct file as mphidflash will overwrite the boot loader if given the wrong file. The correct file should have a name like Maximite_MMBasic_Vx.xx.hex where x.xx represents the version number.

The `-n` option (skip verify) is required because, for some reason, the verify function in MPHidFlash does not work with MMBasic upgrades. The file will still be written correctly and you can test it by cycling the power and checking that MMBasic runs OK.

Upgrading MMBasic

To start the upgrade you should hold down the boot load button on the Maximite while you apply power. The power LED will rapidly flash to indicate that the boot loader is in control.

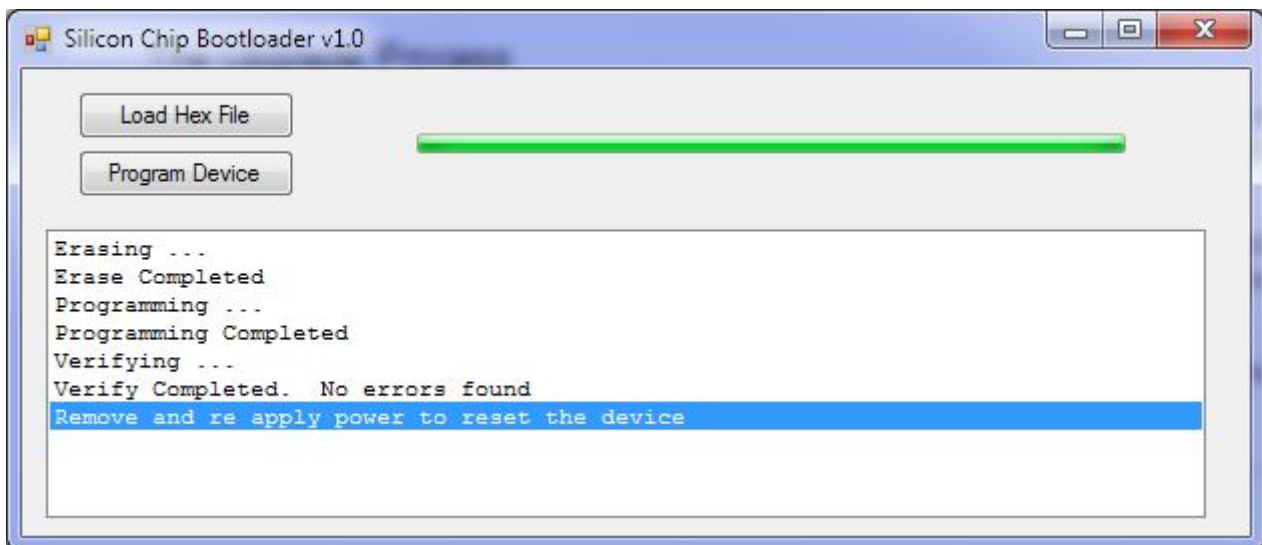
Plug the USB cable from the Maximite into your computer and it should automatically recognise the Maximite and load the appropriate driver (called a HID driver). In Windows the Maximite (in boot load mode) will show up in Device Manager as a "Human Interface Device", "USB Input Device". On the Macintosh it will show up as: Hardware » USB » USB Bus » Silicon Chip Bootloader.

If you are using BootLoader.exe it will automatically detect the Maximite and show the message "Device attached". Click on the "Load Hex File" button and load the firmware upgrade file (it will have a .hex extension). Click on the "Program Device" button and the program will show the status as it progresses. It should finish with the screen shot shown below.

If you are using MPHidFlash enter the command line as shown in the previous section. As it runs it will first show "Erasing" then "Writing" followed by many dots as it writes each block of data to the Maximite.

At the completion of the process the power LED on the Maximite will flash slowly to indicate that the new firmware is programmed and ready to run. The complete operation should take less than 60 seconds.

Remove and re apply power (without holding down the boot load button) and the Maximite will start up running the new firmware.



Possible Problems

If the "Load Hex File" button in BootLoader.exe is greyed out or MPHidFlash reports "Device not found" it means that the Maximite is not connected or not in boot load mode. Check the USB cable and that the power light on the Maximite is flashing.

In some cases BootLoader.exe will not show "Verify Completed" after verifying the programming, instead it will simply print a second "Verifying ..." message and appear to hang. Despite this the programming has verified correctly and you can then recycle the power on the Maximite to start running the new firmware.

For new firmware and other updates go to <http://geoffg.net/maximite.html>