

# How to create and use a boot disk to load your MaRTE OS program 2013

## 1 Introduction

When you compile and link using the MaRTE OS cross-compiler (eg `mgnatmake my_prog.adb`) the `mgnatmake` command creates an executable in the form of a file named `mprogram` in the current directory. To run it you must copy it to a special boot floppy disk and then boot the train 486 in ATC620 using it. `Mprogram` automatically starts running and at the end all you can do is reboot. No operating system is loaded.

The boot disk is a GRUB disk originally set up to boot a PC from a network. We are not doing that: the system goes through the motions but does not actually use the network – it loads and then calls `mprogram` instead. Hence we call this a “fake netboot”. (The technique is called “stand-alone target” in the MaRTE User’s Guide, `marte_ug.htm` . )

## 2 Formatting the boot disk

There are some spare floppies in the lab possibly labelled “fake netboot”; others may have very old files on them. To create a boot disk:

### 2.1 On a Windows PC with a floppy drive

- Download file **fakenetboot.zip** from Blackboard and unzip.
- Double-click `rawwritewin.exe`
- Select your floppy drive
- Select the boot image file “`grubfloppy.img`”
- Choose the number of copies (spares are good)
- Put a formatted 1.44 Meg floppy disk in the floppy disk drive
- Click “Write” and follow instructions.

(Acknowledgment: `rawwritewin` was supplied by John Newbigin <http://uranus.it.swin.edu.au/~jn/linux/rawwritewin-0.7.zip> under GNU licence.)

### 2.2 On a Linux PC

(FICT no longer runs a Linux lab but you might run Linux yourself **and have a floppy drive** ☺?) The file `grubfloppy.img` and a script to copy it are stored in the mercury `$GIVEN` directory. (If you are set up for MaRTE then symbol `$GIVEN` should be defined.) However the configuration of your Linux PC probably won’t have mercury’s MaRTE on the path. Hence (once only) get these files:

- Start a terminal window (the icon of a monitor screen under System Tools) and **ssh** to mercury and log in.
- copy the files into your home (if you didn’t get them already from `$GIVEN`):  

```
cp -p $GIVEN/cpbootfloppy .
cp -p $GIVEN/grubfloppy.img .
```

 (don’t omit the dots!)

Later as required:

- Put a formatted 1.44 Meg floppy disk in the Linux PC’s floppy disk drive
- in a terminal window talking to the local Linux PC type:  

```
cpbootfloppy
```

- Repeat so you have a stock of spares.

### 3 Copying your mprogram onto the boot disk

#### 3.1 On a Windows PC

- (a) by dragging
  - Assuming you have a `\\mercury.it.swin.edu.au` window open and another window showing the contents of `A:\` you can simply drag the file `mprogram` onto the floppy disk (replacing the existing `mprogram`).
- (b) using WinSCP
  - Use WinSCP to copy the file `mprogram` to a temp directory on the PC. The transfer will be automatically in binary. It is a good idea to preserve timestamp.
  - In an MSDOS window attached to the temp directory, type
 

```
copy/y mprogram a:
```

    - (If you are using an older floppy disk it may expect to find a file named `netboot`, not `mprogram`, hence
 

```
copy/y mprogram a:\netboot
```

)

#### 3.2 On a Linux PC

We assume your files are stored locally. It uses a program named `mcopy`.

- Open a terminal window (maybe with the icon of a monitor screen under System Tools).
- `cd` to your working directory.
- Place your boot floppy in the drive. (Note you do NOT **mount** the floppy.)
- Type
 

```
mcopy -o mprogram a:
```
- If you leave out the `-o`, type **o** in response to the query (small o for overwrite).

### 4 Finally ... booting

- Insert your disk into the A drive of the train 486/Pentium PC in ATC620 and reboot (by turning the power off and back on, or by pressing the Reset button in the middle of the front panel).
- After a few seconds you will get the GRUB menu with the only entry highlighted. You can press `<Enter>` to save a second or two.
- Wait for your program to load from the floppy disk.
- Finally MarteOS will introduce itself and list the installed I/O channels. If you have used `exec_load` then you should see `exec_load` calibrate itself.
- Then you should see the Swindows display defined by your program.
- Switch on the electronics power supply (big switch).
- Use your `Init` or `Reset` command to initialize the I/O cards.
- If your program ever exits there will be a message to reboot.
- Avoid rebooting with a train over a turnout – the turnout may be damaged.