Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.111 – Introductory Digital Systems Laboratory

PAL Programming

Last revised January 23, 2004

Introduction

We will not deal here with the details of the HDL (Verilog or VHDL) coding used to generate the logic embedded in the PAL, but assume that you have properly coded what you want the PAL to do. Compile the code using GALAXY.

GALAXY is also available on the lab computers.

It is necessary to open a project (either 'open' or 'new' and select the HDL files you will be incorporating into your design. Use "smart" compile. When your file compiles with no errors, select the appropriate part ('device'), set the appropriate top file and then compile again. You should have two files that are pertinent here: one is the '.rpt' file which will disclose pin numbers on your PAL. The other is the '.jed' of JEDEC file which you will use to program your PAL.

Use the commands

```
add mcopy
mcopy -t a: <filename>.jed
```

to copy a jedec file to a floppy disk.

The `-t` does the translation between DOS and UNIX line-endings.

The PAL programmer is a 'universal programmer' made by Hi-Lo Systems and it is located on the 'dome side' of the lab, near the window. The program you will use to 'burn' the jedec file into your part is called `WACCESS`. Unfortunately, this program only runs under Windows 95. There is an icon for it on the screen of the computer.

Make sure the programmer is turned on.

1. Start `WACCESS` by double clicking the icon.
2. Select the device you are using, first by manufacturer and then by part number. Note that there are many devices and many manufacturers. Note also that this thing can program many different *types* of devices: make sure that it is displaying lists of PLD's (programmable logic devices).

3. Load your jedec file from the floppy.

4. Program: you will get a pulldown box that, by default, both programs and verifies. Leave both options on.

If all is well the programmer will tell you that it was successful.

The program can do other things: it can verify that what is in a device is what is intended by a jedec file. It can erase a part. It can verify that a part is erased.

If you have selected the wrong part number, the program will complain. If you have failed to turn on the power to the programmer, the program will complain with a strange error message. If you have failed to insert a part to be programmed, the program will also complain.