

SENECA COLLEGE OF APPLIED ARTS AND TECHNOLOGY

FACULTY OF TECHNOLOGY

SCHOOL OF ELECTRONICS AND COMPUTER ENGINEERING TECHNOLOGY

SUBJECT: MICROCOMPUTER REPAIR (MIR355)

LAB SECTION: MIR355 _____

STUDENT NAME: _____ , _____ STUDENT NUMBER: _____
(Last Name) (First Name)

Lab 10 - Installing and Managing IDE Hard Drives

When handing in this lab for evaluation, you should hand it in together with your notes for the Lab 10.3 exercises.

Lab 10.1 Remove/Install an IDE hard drive

NOTE: Start a computer with access to my.senecacollege.ca and get the Free FDISK Rev. 1.21 file, Fdisk121.exe, from MIR355 blackboard site under Course Documents -> Useful Tools. Save the file to your bootable floppy disk. You may need Free Fdisk to do this lab module and the lab test if Windows 98 Fdisk or the Windows installation CD can not see/delete certain partitions.

A. Verifying the functionality of your work unit computer

1. Take one work unit computer out from Cabinet 1 and bring it to your work bench.
2. Connect the keyboard, monitor, power cables to your work unit computer, and insert your Windows 98 bootable disk that you created in the previous labs in to the drive A:.
3. Turn on your computer. If it does not boot to A: drive, try to figure out the problem and fix it. If necessary, ask for help from your instructor.
4. Use the **VER** command to find out what OS installed in drive A:.
Ans:
5. Can you access the first logical hard drive C:?
Ans:
6. **If it can not access C:, try to figure out the problem and fix it.** If necessary, ask for help from your instructor.
7. Remove the boot disk from drive A:. Press **<Ctrl + Alt + Del>** key to restart your PC and let the computer boot from C:.. At the C:\> prompt, use the **VER** command to find out what OS installed in drive C:.
Ans:
8. If the OS installed in drive C: is not the same as the one installed in the boot disk. Use the **SYS** or **FORMAT** command to make C: bootable with the same OS.

B. Removing an IDE hard drive

1. Power off your PC and unplug the power cord. (It is not necessary to unplug all other cords.)

2. Remove the case from your PC.
3. Unplug the IDE data ribbon cable and the power cable from the hard drive. Note the position of the power connector and the pin 1 of the data ribbon cable.
4. Which pin of the data ribbon connector is close to the power connector?
Ans:
5. Consult the textbook for reference and then record the jumper setting of the hard drive in your PC.

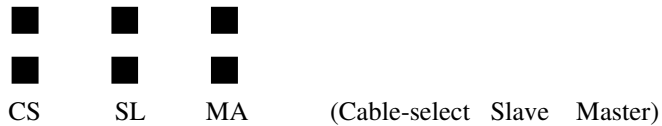


Table 7-7 Jumper settings on an IDE hard drive

Configuration	Description
Single-drive configuration	This is the only hard drive on this IDE channel. (This is the standard setting.)
Master-drive configuration	This is the first of two drives; it most likely is the boot device.
Slave-drive configuration	This is the second drive using this channel or data cable.
Cable-select configuration	The cable-select data cable determines which of the two drives is the master and which is the slave.

JB

5 3 1

6 4 2

5 3 1

6 4 2

5 3 1

6 4 2

Single drive configuration

Master drive configuration (dual drives)

Slave drive configuration (dual drives)

Key:

	Jumper added
	Jumper pins

6. Now, physically remove the hard drive from drive bay of your PC.
7. For safety, stand clear of your PC and plug in the power cord.
8. With the hard drive having been removed, power on the PC and wait for the BIOS error message. Record the error message on the screen below:
9. Enter the CMOS Setup program, if necessary, and follow the menu instruction of your PC BIOS to validate

the removal of the hard drive.

10. When prompted, save the changes and then reboot your PC with your Windows 98 bootable disk.

11. Type **FDISK** command at the A:\> prompt and record any message displayed:

Ans:

C. Installing an IDE hard drive

1. Power off your PC and unplug the power cord.

2. Mount the hard drive that you removed back to its original position.

3. Connect the IDE data cable and the power connector (be sure that the red strip on the data cable is aligned with the pin 1 setting on the hard drive 40 pin connector.)

4. For safety, stand clear of your PC and plug in the power cord.

5. Remove the boot disk from drive A:. Boot up your PC. Can it boot from drive C:?

Ans:

6. If it did not boot to C:, reboot your PC and enter the CMOS setup.

7. Verify that the BIOS automatically detect the hard drive.

8. Save the BIOS changes and exit the Setup program.

9. Reboot your PC and test the installation by booting into the existing OS installed in drive C:. **If it can not boot to drive C:, try to figure out the problem and fix it.**

10. Use **DIR** command to list all files and directories stored in drive C:. What command line did you type?

Ans:

11. Place the boot disk into drive A:. Press **<Ctrl + Alt + Del>** key to restart your PC and let the computer boot from A:.

12. If a directory named WINDOWS is not created under C:\, create one. What command would/did you type to create the WINDOWS directory if it was not created?

Ans:

13. Copy all of the files, **except COMMAND.COM and README.TXT**, from the drive A: to the C:\ directory. Type

```
A:\> COPY *.EXE C:\ <ENTER>
```

```
A:\> COPY *.SYS C:\ <ENTER>
```

```
A:\> COPY *.BAT C:\ <ENTER>
```

14. **Copy all the *.EXE files from the A: drive to the C:\WINDOWS directory.** What command line did you type to copy the files? What is the command line to verify that the files copied to that directory?

Ans:

15. Edit the AUTOEXEC.BAT file in C:\ with the following lines only:

```
@ECHO OFF
CLS
C:\WINDOWS\MSCDEX /D:MSCD001
PROMPT=$p$g
PATH=C:\WINDOWS;C:\
LOADHIGH= C:\WINDOWS\DOSKEY.COM
```

16. Edit the CONFIG.SYS file in C:\ with the following lines only:

```
DEVICE=C:\HIMEM.SYS
DEVICE=C:\OAKCDROM.SYS /D:MSCD001
DOS=HIGH,UMB
BUFFERS=50
FILES=40
DEVICEHIGH=C:\RAMDRIVE.SYS /E 2048
```

17. Remove the boot disk from drive A:. Press <Ctrl + Alt + Del> key to restart your PC and let the computer boot from C:. At the C:\> prompt, use the **DIR** command to access the RAM Drive and the CD-ROM drive.

18. Press <Ctrl + Alt + Del> key to restart your PC. While the computer is booting and just before displaying the message of “Starting Windows 98 ...”, press **F8** key to enter the startup menu of Windows 9x. Select Option 4 or 5 Step-by-step confirmation and press **Enter** key. Follow the prompt to let the computer run through all the commands in CONFIG.SYS and AUTOEXEC.BAT. If you encounter a problem when running through the commands in CONFIG.SYS and AUTOEXEC.BAT, **try to figure it out and fix it.**

19. At the C:\> prompt, use the **VER** command to find out what OS installed in drive C:.

20. Now, in the root directory C:\, uniquely identify your drive by creating a TXT file in the root directory called **MIRnn.TXT**, where 'nn' is your PC's number, e.g. PC **8** would have **MIR08.TXT**. For the next section of this lab, label your actual HDD using masking tape with the same code **MIR08**.

21. Shut down your PC and power off.

22. Unplug the power cable.

Lab 10.2 Install a second IDE hard drive

NOTE: You need to work in a group of two (or more if applicable) students so that you can remove one hard drive from one work unit PC and install it into another work unit PC.

A. Installing a slave drive using the Master/Slave configuration

We suppose that two students work together in a group.

Student 1

1. Power off your PC and unplug the power cord (it is not necessary to unplug all other cords).
2. Remove the case from your PC. (If the case has not been removed yet.)
3. Locate the hard drive.
4. Unplug the IDE data ribbon cable and power connector from the hard drive.

CD-ROM/DVD drive, try to figure out the problem and fix it. What is the drive letter assigned to the CD-ROM/DVD drive connected to the secondary IDE channel?

Ans:

31. Ask your instructor to verify the steps 29 and 30. Get his/her initial: _____

32. Turn off the power and unplug the power cord.

Lab 10.3 Troubleshoot hard drives

This section of Lab 10 is to help you simulate and troubleshoot common hard drive problems. After completing this lab, hopefully, you will be more competent to diagnose and repair hard drive problems. Two students (one student if odd number or if applicable) work as a team to help each other to practice diagnosing and remedying common hard drive problems. **You are expected to document the process for your review or reference.**

1. Verify that your hard drive is working by using a command prompt to display files on the drive.
2. Switch computers with another team.
3. Sabotage the other team's computer by doing one of the following:
 - Remove or incorrectly configure the drive jumpers
 - Remove the power connector from the drive
 - Switch data cables to place devices on incorrect IDE channels (*Some BIOSs can adjust itself to access the single HDD automatically regardless which IDE channel that the HDD is connected to.)
 - Connect DVD/CD-ROM drive to the same IDE channel as the HDD and set the jumper of DVD/CD-ROM as master-drive or cable-select while the HDD is set to master-drive
 - Disable IDE controllers in CMOS setup
 - Delete or rename one of the system files on the hard drive to make it unbootable or corrupted (refer to Lab 8.3)
4. Return to your team's computer and examine it for any symptoms of a problem.
5. **On a separate piece of paper or your lab notebook**, answer the following questions relating to the problem's symptoms:
 - What symptoms would a user notice?** (Describe the symptoms as the user might describe them.)
 - Does the system boot from the hard drive?**
 - Does POST display the hard drive?**
 - Can you boot from a floppy disk and change to the drive in question?**
 - Does the CMOS HDD Autodetect option detect the hard drive?**
6. **On a separate piece of paper**, before you actually begin your investigation, **state your initial diagnosis.**
7. Diagnose and repair the problem.

8. **On a separate piece of paper, list the steps required to confirm your diagnosis and solve the problem.**
9. **On a separate piece of paper, answer the following questions relating to your final conclusions:**
 - What was the problem?**
 - What did you do to correct the problem?**
 - Was your preliminary diagnosis correct?**
10. Repeat Steps 1-9, choosing actions at random from the list in Step 3, until your team has performed all the items listed in Step 3. Be sure to write down the relevant information (as instructed in the steps) for each problem. **Also, make sure that each member in the team understands exactly what you are doing.**
11. **When handing in this lab, you should hand it in together with your notes on the separate piece of paper or your lab notebook for the above lab exercises.**

Turn off the PC. Disconnect the keyboard, mouse, monitor, and power cables. Return the PC unit back to Cabinet 1 at least five minutes before the end of your lab session.

Lab 10.4 Review questions

1. It is good practice to write down the jumper configuration of a hard drive before removing it from a computer.
True / False
2. If an IDE data ribbon cable has a notch or a hole on it, then you have to set the jumper setting on the hard drive to the CS (Cable Select) connection.
True / False
3. If an IDE data ribbon cable has a notch or a hole on it. The master hard drive has to be connected to the connector that is closest to the controller card or the connector on the motherboard.
True / False
4. How many pins are there on the IDE data ribbon cable?
Ans:
5. How many IDE hard drives can be connected to a single data ribbon cable?
Ans:
6. Are all IDE hard drive controllers integrated on a system board? Explain your answer.
Ans:
7. If you have two IDE hard drive that are connected to the same data ribbon cable without a notch or the hole on it. The Master hard drive jumper setting is:

• • •
CS SL MA

And the Slave hard drive jumper setting is:

• • •
CS SL MA

8. How can you easily identify a Cable Select data cable?

Ans:

9. Name all of the possible IDE devices that can be connected to a single IDE cable.

Ans:

10. If you have 4 EIDE devices such as three hard drives and one CD-ROM, how would you connect them to an EIDE controller card with two IDE channels?

Ans:

Reminder: Bring a Phillip's head screw driver, Windows 98 boot diskette (Lab 8.1), a duplicate copy of the Windows 98 boot, Windows 98 Tool Disk or CD if you have created one (available on MIR355 blackboard site under Course Documents -> Useful Tools), and a CD with any data files for the MIR355 lab test. Lab notes and lab module instructions are NOT allowed in the lab test except a double-sided hand-written paper of letter size!