

# Linux Laptop — Rover

Howard Gibson

2003 August 31

## Contents

|          |                                      |          |
|----------|--------------------------------------|----------|
| <b>1</b> | <b>Introduction</b>                  | <b>1</b> |
| 1.1      | Objective . . . . .                  | 1        |
| 1.2      | Copyright . . . . .                  | 1        |
| <b>2</b> | <b>Hardware</b>                      | <b>1</b> |
| 2.1      | Laptop . . . . .                     | 1        |
| 2.2      | CPU . . . . .                        | 1        |
| 2.3      | Memory . . . . .                     | 2        |
| 2.4      | Video Card . . . . .                 | 2        |
| 2.5      | Monitor . . . . .                    | 2        |
| 2.6      | Hard Drive . . . . .                 | 2        |
| 2.7      | Floppy Drives . . . . .              | 2        |
| 2.8      | CD-ROM . . . . .                     | 2        |
| 2.9      | Sound Card . . . . .                 | 2        |
| 2.10     | Modem . . . . .                      | 2        |
| 2.11     | Keyboard . . . . .                   | 3        |
| <b>3</b> | <b>Installation</b>                  | <b>3</b> |
| 3.1      | Planning . . . . .                   | 3        |
| 3.2      | Security . . . . .                   | 3        |
| 3.3      | Partitioning . . . . .               | 4        |
| 3.4      | Installation . . . . .               | 4        |
| 3.5      | Booting for the First Time . . . . . | 5        |
| 3.6      | Network Configuration . . . . .      | 5        |
| 3.7      | XFree 86 . . . . .                   | 5        |

|          |  |          |
|----------|--|----------|
| <b>A</b> | <b>Getting into BIOS on a Toshiba Laptop</b> | <b>6</b> |
| <b>B</b> | <b>The Toshiba PC Card</b>                   | <b>6</b> |
| <b>C</b> | <b>Bootng with GRUB</b>                      | <b>6</b> |
| <b>D</b> | <b>Red Hat 7.3</b>                           | <b>7</b> |
| <b>E</b> | <b>Red Hat 7.0</b>                           | <b>7</b> |
| E.1      | Anaconda Problems . . . . .                  | 7        |
| E.2      | Bootng for the first time . . . . .          | 7        |
| E.3      | X11R6 and XFree86 4.0 . . . . .              | 8        |

# 1 Introduction

## 1.1 Objective

- Provide detailed instructions on the current Linux installation on my laptop. This is a rescue procedure, in case I have to re-install Linux.
- Provide new Linux users with a general example of how a Linux machine is installed and configured.

The OS is Red Hat 8.

## 1.2 Copyright

This document is copyright © 2003 by Howard Gibson. You may post this on web pages and bulletin boards free of charge. All other rights are reserved.

# 2 Hardware

The computer is a laptop, purchased at 123 Compute in Toronto. Their web page is [www.123compute.com](http://www.123compute.com). The computer is a Toshiba Satellite Pro 480CDT, and it was reconditioned. There was a KPMG sticker on the bottom when I got it. It came with an OEM copy of Microsoft Windows 95, but no installation CD.

Since I already have a computer, with a CD burner, I purchased a null modem cable. I zipped the `software` directory, and I transferred it over the serial port, all eighty megs of it. The serial setup will be described below.

## 2.1 Laptop

Toshiba Satellite Pro 480CDT. Serial number 28018072. This was reconditioned, rather than new. It came with a KPMG sticker on the bottom with the serial number 203991.

## 2.2 CPU

Intel Pentium, 233, CPU. The boot message says something about 465.31 BogoMIPS, and also something about enabling a F0 0F bug workaround. According to the Toshiba help, it has MMX technology, and a 16KB write-back internal cache.

### **2.3 Memory**

64MB.

### **2.4 Video Card**

Chips and Technologies B65555 SVGA with 2MB RAM. The Red Hat 7.3 and Red Hat 8 installers are agreed that is a CT65555.

### **2.5 Monitor**

12.1 inch TFT colour LCD, 16 million colours at 800x600 resolution. The installation program probed in and described it as a TOS5081, and selected a horizontal frequency of 31.5-48.5MHz, and a vertical frequency of 50-70Hz. There is no other mention of this information, anywhere else.

Red Hat 7.0 selected a horizontal frequency of 31.5MHz, and a vertical frequency of 60Hz.

### **2.6 Hard Drive**

BM-DTCA-24090, 3909MB w/468kB Cache, CHS=993/128/63

### **2.7 Floppy Drives**

Toshiba model PA2611U. Serial number 77068996. This is an external drive “dedicated to use Floppy Drive only”. The floppy drive is removable from the case, and it can be inserted into the computer, in place of the CD-ROM. There is a KPMG sticker on the floppy, with the serial number 202699.

### **2.8 CD-ROM**

Toshiba CD-ROM XM-1502BS, ATAPI CDROM drive. This is removable. It can be replaced with the floppy drive. I haven’t checked it for KPMG stickers. The Toshiba help files describe it as 10X speed.

### **2.9 Sound Card**

Yamaha OPL3-SA3 sound chip, compatible with SoundBlaster Pro V3.01.

### **2.10 Modem**

Some kind of 33K modem. This is a “real” modem, not a winmodem, so I have had no problems using it, other than the fact that it runs at only 33K.

## 2.11 Keyboard

84 key keyboard which emulates the IBM PS/2 keyboard. It comes with the “AccuPoint” pointing device. I could learn to like this. You can type and point without moving your hands off the home row.

The tilde character and the reverse quote are located down just to the right of the space bar where I am not used to it. These are important in a UNIX/L<sup>A</sup>T<sub>E</sub>X environment.

## 3 Installation

### 3.1 Planning

This machine was purchased as a portable workstation, to be used when I am away from my main computer. In many ways, this is not a demanding requirement. I need adequate capability in terms of graphics, disk space and processing power. I wanted it to be cheap, and I wanted some way to exchange information with my main computer.

I will be exchanging data through the serial port. I have purchased a DE9 null modem cable, and I have configured my main computer to accept logins through the serial port `/dev/ttyS0`.

Since I don't plan to keep data on this thing, there is no need for backups. All backups are done on my main computer.

### 3.2 Security

Laptops get stolen. Mine may be somewhat safer, since it is old, but it is an adequate games platform, and it wasn't really all that cheap. If it does wander off, I don't want anyone to get at my personal information, like credit cards, Internet passwords and such.

No critical personal stuff will be left on the laptop. Probably, I won't use this to connect to the Internet at all. If I do, I will type in the password. Files will be stored on the laptop as needed. When I am done, I will transfer them back to the main computer, and delete them here.

This internet paranoia is somewhat less critical now that Red Hat installs a firewall. I have left mine at the highest security setting. I don't need RealAudio streaming.

As I was planning my purchase, I was figuring that if I had only one system partition, there would be no way to get at it without removing it from the computer and installing it in something else. You need passwords to get at Linux. In the end, I created a `/usr/local` partition, making upgrades easiers, and making my data less secure.

On earlier installs, I left the Windows 95 partition in place. My machine is set at Greenwich Mean Time. During the summer, Windows 95 sets this to Greenwich Mean Daylight Savings time, whatever that is. I do not use Windows 95, so it has to go.

### 3.3 Partitioning

Here is my partitioning scheme.

```
[root@localhost RoverLinux]# /sbin/fdisk /dev/hda
```

```
Command (m for help): p
```

```
Disk /dev/hda: 128 heads, 63 sectors, 993 cylinders
Units = cylinders of 8064 * 512 bytes
```

| Device    | Boot | Start | End | Blocks  | Id | System     |
|-----------|------|-------|-----|---------|----|------------|
| /dev/hda1 | *    | 1     | 813 | 3277994 | 83 | Linux      |
| /dev/hda3 |      | 814   | 846 | 133056  | 82 | Linux swap |
| /dev/hda4 |      | 847   | 993 | 592704  | 83 | Linux      |

```
Command (m for help):
```

```
[howard@rover howard]$ df
File system          1k-blocks      Used Available Use% Mounted on
/dev/hda2             2218416    1260516   845208   60% /
/dev/hda4              583360         96   553632    1% /usr/local
/dev/hda1             1016280    310368   705912   31% /Win95
[howard@rover howard]$
```

The BIOS is recent enough that I don't need the separate `/boot` partition. If I had an older computer, I would have needed to keep `/boot` entirely within the first 512MB of the hard drive.

### 3.4 Installation

My original Red Hat 7.0 installation program worked nicely the first time I installed Linux. I just followed the instructions. On a subsequent install, I had problems with Anaconda crashing, which are described later.

When I installed Red Hat 8.0 on top of Red Hat 7.3, I had problems booting from GRUB because I could not get into the BIOS. GRUB sees the floppy disk, but not the CD-ROM at boot time.

I have left BIOS instructions in the appendix of this document.

I did not have problems with the PC card on any of the Red Hat 7s, but I am having them with Red Hat 8. The solution for this problem is described in the appendix.

If you have an older machine that requires a boot partition within the first 512MB of the hard drive, you must *not* use Disk Druid. You must use fdisk, which lets you create primary partitions. I have used fdisk anyway in the past, because I like it. Disk Druid works fine.

When prompted, I enabled MD5 passwords and shadow passwords. I didn't bother with NIS, LDAP and Kerberos.

I selected the two button mouse with three button emulation.

I installed most of the software. I did not bother with all the language support, just English and French.

### 3.5 Booting for the First Time

There were no problems booting this time. The BIOS hacks must have fixed the PCMCIA.

### 3.6 Network Configuration

I did enough network configuration on Rover to make the command line prompt not look ugly, and to make Pine stop squawking about invalid domains.

I went into  
`/etc/sysconfig/network`, and I set it up as follows...

```
NETWORKING=yes  
HOSTNAME=rover.eol.ca
```

The boot scripts in `/etc/rc.d` read this file and use the information to set the hostname at booting.

I set up `/etc/hosts` as follows...

```
127.0.0.1 localhost.localdomain localhost  
127.0.0.1 rover.eol.ca
```

The domain `rover.eol.ca` is a figment of my imagination. I connect to the Internet using my main computer and its 56K modem.

### 3.7 XFree 86

I was happy with XFree86 was set up by the installer.

## A Getting into BIOS on a Toshiba Laptop

1. Shut off the laptop
2. Turn on the computer and immediately hold down ESC.
3. When prompted to hit F1, hit F1.

## B The Toshiba PC Card

This causes all sort of problems, and there are websites that advocate not buying Toshiba laptops as a result of this.

On Red Hat 8, the install boot hung when it probed for PC cards. I went into the BIOS and looked at the PC Card Controller Mode. The default is “Auto-Selected”. As per advice from some websites, I changed this to “PCIC Compatible”.

## C Booting with GRUB

I had to boot Linux into Single user mode. It is not obvious how to do this. This information comes from the Red Hat Linux 7.2 Bible, by Christopher Negus. The publisher is Hungry Minds.

When you turn the machine on, you can either select the system you want to boot, or you can wait for the default. This gives you the standard boot. If you want to do a non-standard boot, you must edit the boot process.

Select the kernel image you want booted, and hit the letter **e**. You will see something like the following on your screen. . .

```
GRUB version 0.90 (639K lower / 65530K upper memory)

root (hd0,1)
kernel /boot/vmlinuz-2.43.7-10 ro root=/dev/hda3 hdc=ide-scsi
initrd /boot/initrd-2.4.7-10.img
```

There are some help notes immediately after this that I don't feel like typing in. The above notes from from the Linux Bible, not from my Red Hat 7.3 laptop. I also cannot remember the value for upper memory.

The only line you should modify is the kernel one, which selects the boot image. Position the cursor on the kernel line and press **e**.

To boot in single user mode, add the text `linux 1`.

Hit the letter **b** to boot the machine.

## D Red Hat 7.3

When I installed Red Hat 7.3, the system crapped out when it tried to initialize PCMCIA. This failure is similar to that of Red Hat 7.0, except that it said something about `pci=biosirq`. I could not get into the interactive install.

I had to boot in single user mode. I disabled PCMCIA the same way I disabled it on Red Hat 7.0, by loading `/etc/sysconfig/pcmcia` into a text editor and changing `PCMCIA=yes` to `PCMCIA=no`. I don't have any PCMCIA stuff.

Red Hat 7.3 could not find a mount point for my Windows 95 partition. I was prompted for a Windows mount point when I did the install, and I provided it, but it didn't work. Check my Red Hat 7.0 notes below, for the most likely explanation. All I had to do was to create the mount point.

## E Red Hat 7.0

This machine was originally set up as a Red Hat 7.0 box. The following notes were written for Red Hat 7.0. They are probably no longer relevant.

### E.1 Anaconda Problems

On my first install, I used Disk Druid to assign the mount points, and everything worked fine.

When I re-installed the system to get things exactly the way I wanted them, the install program, `anaconda`, crashed. It let me define the partitions, select software and do the video configuration. It formatted the hard drive partitions, then it exited with a bunch of error messages.

I searched Red Hat's web page for information, and I found it. The relevant documents are Red Hat Bug Advisory RHBA-2000-084, and Bug Report 18032.

The practical solution is not to assign a mount point for the Windows partition. I wanted Windows 95 mounted at `Win95`, and I had to set this up later.

Problem solved.

### E.2 Booting for the first time

Rover for Red Hat 7.0 did not boot the first time. It announced an interrupt conflict, and it locked up. With Red Hat at least, you are prompted during the boot to hit "I" for an interactive boot. I did so, and I found out that the PCMCIA script was crashing it.

I disabled this by loading `/etc/sysconfig/pcmcia` into a text editor and changing `PCMCIA=yes` to `PCMCIA=no`. I don't have any PCMCIA stuff.

### E.3 X11R6 and XFree86 4.0

For XFree86 4.0 on Red Hat 7.0, the configuration files are stored in `/etc/X11`. I used `Xconfigurator` to set it up.

It was possible to bring up X in 640x480 mode, but the fonts looked awful.

`Xconfigurator` automatically identified my video card, but I could not find anything on my monitor/display. I was unable to find anything I could type in that would make the X test work. Eventually, I set the 24 bit 800x600 display, and told it not to test X. Then, I edited `XF86Config` manually.

I found some timing values on a website. After a little hacking around, I found values that worked.

```
HorizSync 31.5-48.5
VertRefresh 50-70
Mode "800x600"
    DotClock 34
    HTimings 800 840 968 1056
    VTimings 600 601 605 628
    Flags "+hsync" "+vsync"
EndMod
```

I didn't bother with the fonts. Notes in `XF86Config` state that the font lines are no longer used. There is a separate font server.