A. Installing Red Hat Linux

Overview

This installation manual provides instructions on how to properly install and configure Red Hat Linux for the SIGMET (IRIS & RDA) application software (Red Hat Enterprise Linux ES Version 3). We recommend that you read through this manual completely if you are about to install the Linux OS and the SIGMET application software for the first time.

For more information and a more in–depth discussion of the installation process, please refer to the Red Hat Enterprise Linux Installation Guide which can be found on the Documentation CD of your RHEL ES CDs.

During this process it is critical to take notes so that you can properly reuse this information during the post installation modifications.

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A.1 Installation Overview

SIGMET supports two types of installation methods:

- **Automatic**
- **Manual**

The **automatic** installation method uses bootable scripts located on every IRIS/RDA release CD (version 8.06 or later). These scripts contain instructions for the operating system installation (miniroot and operational Linux), SIGMET software installation (IRIS/RDA), and post installation configuration. While some manual steps are still required after this automatic procedure, the time necessary to complete an IRIS/RDA installation on a new computer system is drastically reduced.

The **automatic installation** is the only installation method for RVP8/RCP8/RCW systems.

The **manual** installation method requires the user to follow the 50+ steps found in the following pages of this appendix.

Regardless of which method you choose, we provide the information and tools for you to install two separate Linux operating system environments on your computer. These environments are installed on different partitions so that in the event of a hard disk failure, you will have the ability to boot into a separate space on your disk and recover mission critical data. SIGMET recommends using the SIGBRU utility to perform backups and restore functions. SIGMET identifies the system recovery partition as mini or miniroot and the other environment as operational.

A.1.1 Using this Manual

The instructional sections of this manual use the following format:

Screen "Title"
Action: What to do

The Screen Title indicates what you will see on the installation wizard screen. In most cases we include a screen capture. The action explains what you should do.
Note: Use the Tab key to move between different fields/options on the screen and the space bar to select check boxes.

A.1.2 Types of installation media

Installing Linux requires a Linux installation tree (Linux files) and a boot device. The Linux installation tree can come either from the local CD–ROM/DVD–ROM, a file copied onto your MS windows disk partition (if available), or a file accessible over the network (via NFS or FTP). SIGMET recommends a CD–ROM/DVD–ROM

based installation and this is the only type of installation that will be covered in this manual. For more information refer to the Red Hat Enterprise Linux Installation Guide, Section 2.5–2.7. SIGMET's IRIS/RDA release CD–ROM contains all of the necessary files for an NFS installation, which easily scales when the number of systems increases above two or three.

A.1.3 Installation Preparation

Verify that you can boot from a CD–ROM by powering off your computer system, inserting the RHEL CD–ROM labeled CD 1 or the IRIS/RDA release CD into the CD–ROM drive and then powering on your computer. **If a Linux screen is displayed on your screen continue to Section A.2 for the automatic installation procedure or Section A.3 for the manual procedure.**

If **a Linux screen was not displayed** on your computer then keep continue with this section. When the computer is booting, a message will be displayed to "Press DEL to enter SETUP" (or some other key to enter setup).

Here is what to check: In the BIOS Features Setup, set the boot sequence to be "CD, A, C". For older systems: Try "A, CD, hard disk". In the Standard CMOS Setups, set the Drive A: to "1.44M, 3.5 in." This should be done even if you do not have a drive A, since the operating system will attempt to switch a SCSI CD ROM to drive A. Finally, save your changes by pressing the F10 key. The system will reboot.

Some new computer systems can be configured without floppy drives (drive A). In this situation, you should choose to have your CD boot first.

A.2 Automatic Installation (Operational & Miniroot)

Figure A–1: RedHat Greeting

Action: Type “linux ks=cdrom:/ks/siginstall.cd” (for scsi drives, use siginstall.cd.sda)

This kickstart program will not work on older monitors which cannot be automatically probed by the system. If this applies to you, please temporarily borrow a newer monitor for the installation.

After this command has been entered, the installation process will continue automatically. The CDs should be inserted by an operator (when prompted) in the following order: 1, 2, 3, 4, 1. Once the installation is complete the last CD (CD1) will eject from the system. The system will reboot.

A.2.1 SIGCONFIG & SIGBUILDMINI

Once the operating system installation is complete, SIGMET provides a script that performs all of the necessary post OS installation steps and installs the SIGMET software called sigconfig.

Login as root with a password of “**xxxxxxxx**” (8 x’s). Insert the IRIS/RDA release CD into the CD–ROM. Run the following commands depending on your system configuration:

```
mount /mnt/cdrom
cd /mnt/cdrom/sigmet/

For IRIS only:
./sigconfig -iris

For RVP8:
./sigconfig -rvp8
```

```
For RCP8:
./sigconfig –rcp8

For RCW (RCP8 & IRIS):
./sigconfig –rcw

./sigbuildmini (for scsi drives, use sigbuildmini.sda)
```

SIGCONFIG automatically install IRIS and take care of a large majority of the post installation steps including creating **users, creating IRIS directories, installing IRIS, and turning on/off services**. Sigconfig's other command line options enable it to be used on an **rvp8, rcp8, or rcw** (IRIS & RCP8 on one system).

Sigbuildmini automatically duplicates the /boot and / partitions to other partitions and automatically edits the lilo.conf file.

Run the following commands:

```
# cd /
# eject cdrom <– actually remove the disk from the drive
# reboot
```

When this reboot step is complete you should proceed to Section A.6. Your system is capable of running IRIS without further effort on your part.

A.3 Manual Installation

SIGMET is committed to providing our customers with both an automatic and manual installation procedure. However, in order to provide you with the most efficient support, the disk partitions must be created using a special utility called **fdisk** before the actual installation procedure takes place.

Using fdisk guarantees that when customers choose to perform a manual installation they will still be able to take advantage of our automated post OS installation scripts (specifically **sigconfig** and **sigbuildmini**).

A.3.1 Disk Partitioning

Partitioning the hard drive creates separate areas of the disk for different purposes. For a more in–depth discussion of disk partitioning, see section 4.17 of the Red Hat Installation Guide. SIGMET recommends the following structure (the example is a **40GB** disk):

Device	Size	Type	Purpose	
/dev/hda1	150MB	Linux	/boot	(Operational)
/dev/hda2	5GB	Linux	/	(Miniroot)
/dev/hda3	150MB	Linux	/boot	(Miniroot)
/dev/hda4	34GB	Extended*		
/dev/hda5	7GB	Linux	/	(Operational)
/dev/hda6	27GB	Linux	/usr/iris_data	
/dev/hda7	1GB	swap		

For dual boot systems (windows & linux), please see section A.9 before continuing. If you plan on using RVP8 Time Series Archive (Appendix G, RVP 8 Manual), it is highly recommended that you use a separate large capacity disk.

The only way to access fdisk is to use the linux rescue environment, create the partitions, and then begin the installation process.

If you have not already done so, place the RHEL CD#1 into the CD–ROM drive and power on your computer.

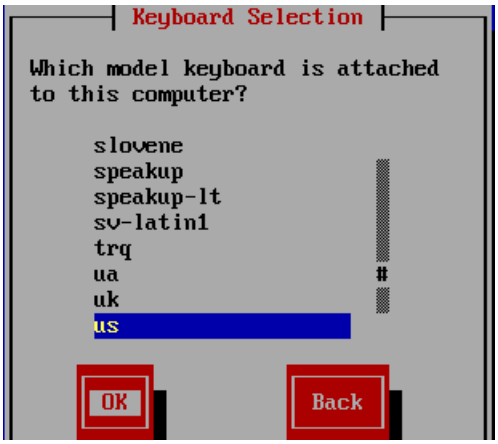
Figure A–2: RedHat Greeting

Action: Type “linux rescue”

Figure A–3: Language Selection

Action: Select “English” ***Sigmet has only tested an English installation**

Figure A–4: Keyboard Selection

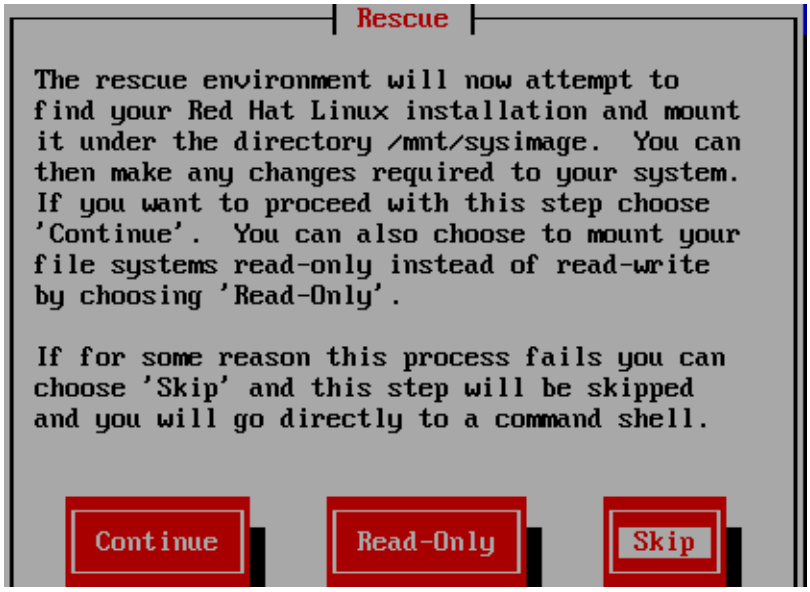


Action: Select “us”. If you have a different keyboard, select the appropriate choice.

Figure A–5: Networking

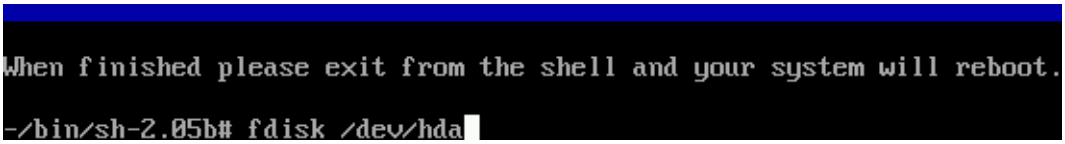
Action: Select “no”

Figure A–6: Rescue



Action: Select “skip”

Figure A–7: Rescue Command Shell



Action: Type “fdisk /dev/hda”

A.3.2 Using fdisk

Fdisk is a command driven program that allows a user to have complete control over the disk partitioning scheme. Each command is a single letter and the following table highlights those used here:

- **p** – print partition table
- **n** – create a new partition
- **d** – delete an existing partition
- **t** – change the partition type identifier
- **w** – write the partition data to disk (finalize the operation)

For the remainder of the fdisk section, all of the user commands will be displayed in an *underlined italicized style*.

When you first enter fdisk, the following output will be displayed:

```
The number of cylinders for this disk is set to 4998.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help):
```

Enter the *p* command.

```
Command (m for help): p

Disk /dev/hda: 255 heads, 63 sectors, 2434 cylinders
Units = cylinders of 16065 * 512 bytes

   Device Boot    Start       End    Blocks   Id  System

Command (m for help):
```

The above is a blank partition table. If your table does not look like this, then you must delete partitions.

Note: Performing fdisk operations will completely delete your hard drive structure and associated data. Only perform these operations if you have a backup of your data or are installing a new system/hard drive.

STEP 1 – Deleting partitions

To delete partitions, do the following:

```
Command (m for help): d
Partition number (1–8): 1
```

Follow each deletion with the *p* command to determine what else needs to be deleted. Once your partition table is blank, continue with the next step.

STEP 2 – Creating partitions

The partitions created in the next procedure will match the table found in Section A.3.1. Each partition created will be identified by its purpose and whether or not it is used for Operational or Miniroot linux.

To create the new partitions you must use the n command, then determine whether it is a primary or extended partition, assign a partition number, and then assign a size. Use the following steps as an example (40GB drive):

STEP 2–1 – Create /boot partition for operational linux (/dev/hda1)

```
Disk /dev/hda: 255 heads, 63 sectors, 2434 cylinders
Units = cylinders of 16065 * 512 bytes

   Device Boot    Start       End    Blocks   Id  System

Command (m for help): n
Command action
   e   extended
   p   primary partition (1–4)
p
Partition number (1–4): 1

First cylinder (1–4998, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1–4998, default
4998): +150M

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
```

STEP 2–2 – Create / partition for miniroot linux (/dev/hda2)

```
Command (m for help): n
Command action
   e   extended
   p   primary partition (1–4)
p
Partition number (1–4): 2
First cylinder (20–4998, default 20):
Using default value 20
Last cylinder or +size or +sizeM or +sizeK (20–4998, default
4998): +5000M

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
```

STEP 2–3 – Create /boot partition for miniroot linux (/dev/hda3)

```
Command (m for help): n
Command action
   e   extended
   p   primary partition (1–4)
p
Partition number (1–4): 3
First cylinder (629–4998, default 629):
Using default value 629
Last cylinder or +size or +sizeM or +sizeK (629–4998, default
4998): +150M

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
```

STEP 2–4 – Create extended partition (/dev/hda4)

Important: For more in–depth information on partitioning, see the RHEL Install manual on your documentation CD

```
Command (m for help): n
Command action
   e   extended
   p   primary partition (1–4)
e
Selected partition 4
First cylinder (648–4998, default 648):
```

```
Using default value 648
Last cylinder or +size or +sizeM or +sizeK (648–4998, default
4998):
Using default value 4998

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
/dev/hda4           648      4998  34949407+   5  Extended
```

STEP 2–5 – Create / partition for operational linux (/dev/hda5)

```
Command (m for help): n
First cylinder (648–4998, default 648):
Using default value 648
Last cylinder or +size or +sizeM or +sizeK (648–4998, default
4998): +7000M

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
/dev/hda4           648      4998  34949407+   5  Extended
/dev/hda5           648      1499   6843658+  83  Linux
```

STEP 2–6 – Create /usr/iris_data for operational linux (/dev/hda6)

```
Command (m for help): n
First cylinder (1500–4998, default 1500):

Using default value 1500
Last cylinder or +size or +sizeM or +sizeK (1500–4998, default
4998): +27500M

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
/dev/hda4           648      4998  34949407+   5  Extended
/dev/hda5           648      1499   6843658+  83  Linux
/dev/hda6          1500      4875  26860648+  83  Linux
```

STEP 2–7 – Create swap partition for both operational and miniroot (/dev/hda7)

```
Command (m for help): n
First cylinder (4844-4998, default 4844):
Using default value 4844
Last cylinder or +size or +sizeM or +sizeK (4844-4998, default
4998): +1000M

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
/dev/hda4           648      4998  34949407+   5  Extended
/dev/hda5           648      1499   6843658+  83  Linux
/dev/hda6          1500      4875  26860648+  83  Linux
/dev/hda7          4876      4998    987966   83  Linux
```

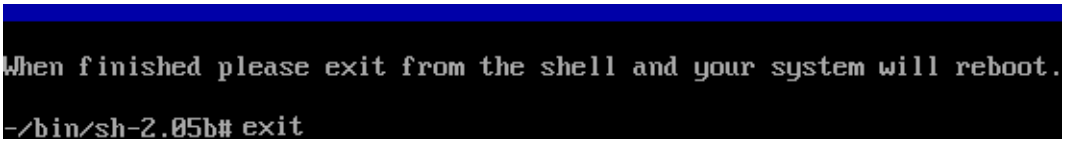
STEP 2–8 – Set partition ID on swap to be swap

```
Command (m for help): t
Partition number (1-8): 7
Hex code (type L to list codes): 82
Changed system type of partition 7 to 82 (Linux swap)

Command (m for help): p

Disk /dev/hda: 41.1 GB, 41110142976 bytes
255 heads, 63 sectors/track, 4998 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        19    152586   83  Linux
/dev/hda2            20       628   4891792+  83  Linux
/dev/hda3           629       647    152617+  83  Linux
/dev/hda4           648      4998  34949407+   5  Extended
/dev/hda5           648      1499   6843658+  83  Linux
/dev/hda6          1500      4843  26860648+  83  Linux
/dev/hda7          4876      4998    987966   82  Linux
```

STEP 2–9 – Write partition table to disk

```
Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks
```

Figure A–8: Rescue Command Shell

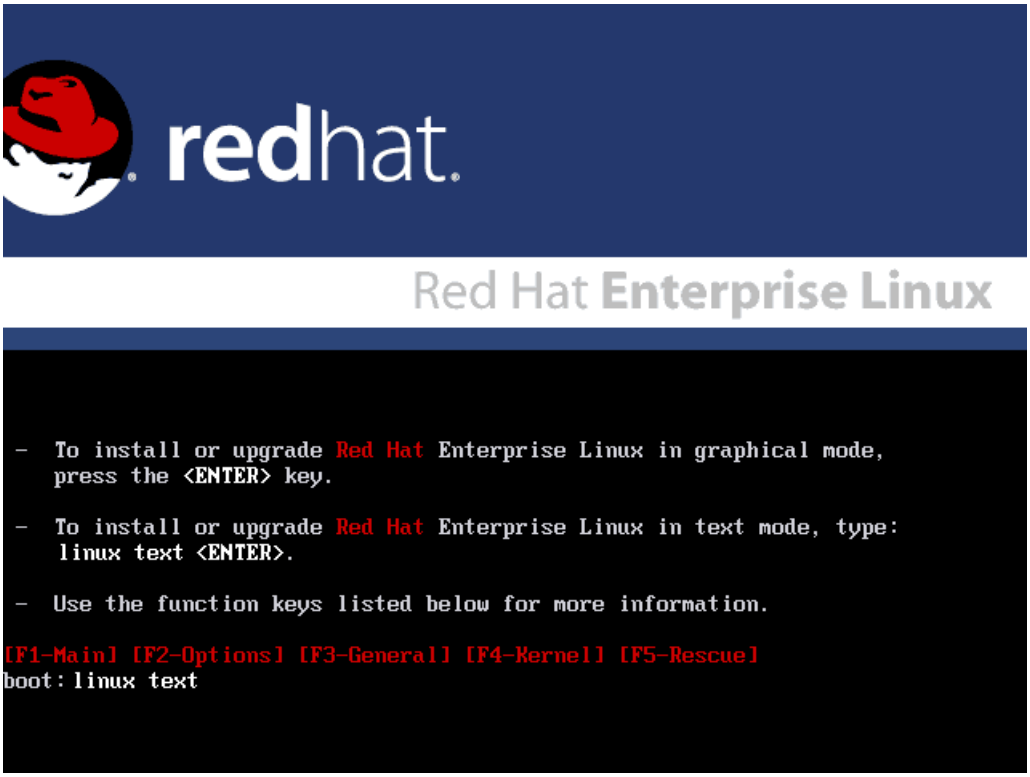


Action: Type “exit”, your system will reboot. Continue with the procedure.

A.3.3 Operational Linux Install

If you have not already done so, place the RHEL CD–ROM #1 into the drive and reboot your computer.

Figure A–9: RedHat Greeting

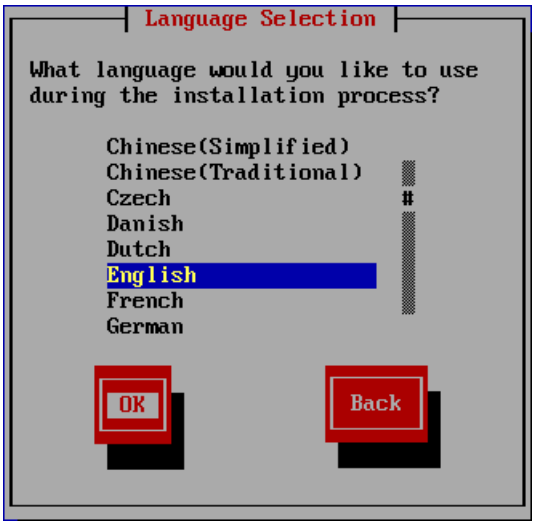


Action: Type “linux text”

Figure A–10: Red Hat Enterprise Linux ES

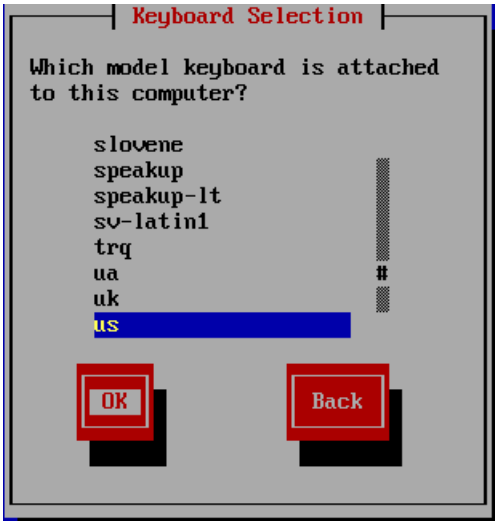
Action: Select “OK”

Figure A–11: Language Selection



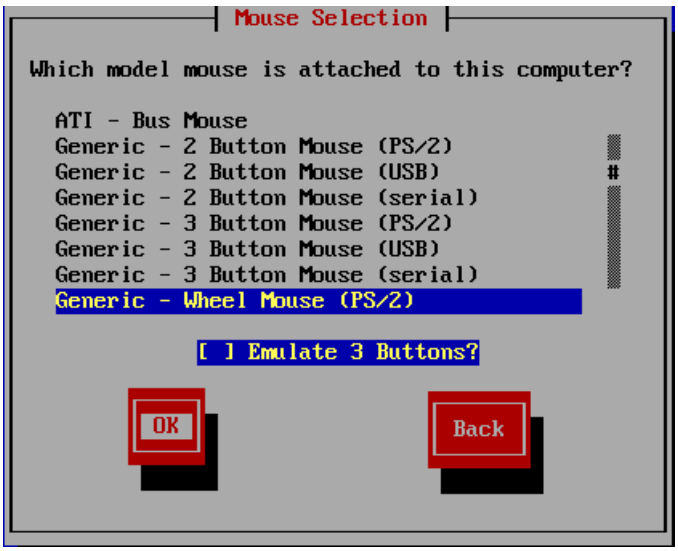
Action: Select “English” ***Sigmet has only tested an English installation

Figure A–12: Keyboard Selection



Action: Select “us”. If you have a different keyboard, select the appropriate choice.

Figure A–13: Mouse Selection



Action: Select the type of generic mouse for your configuration.

*Red Hat 8: If you are installing Red Hat 8, you will be prompted with another dialog box, you should choose a "Custom" install.

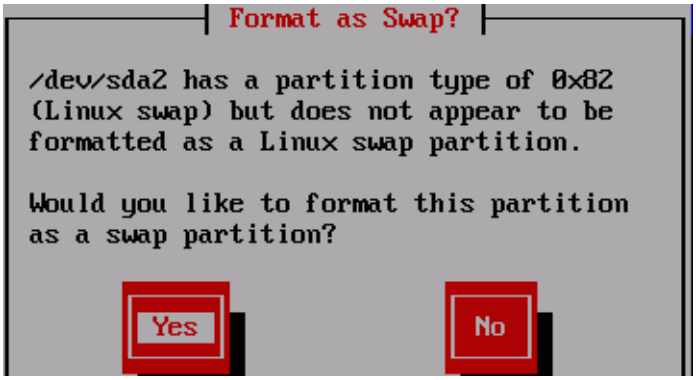
A.3.4 Formatting and assigning mount points to partitions

After following the initial steps of the installation process, you must use Disk Druid to format and assign mount points to the partitions that were created in Section A.3.1 of this manual.

Figure A–14: Disk Partitioning Setup

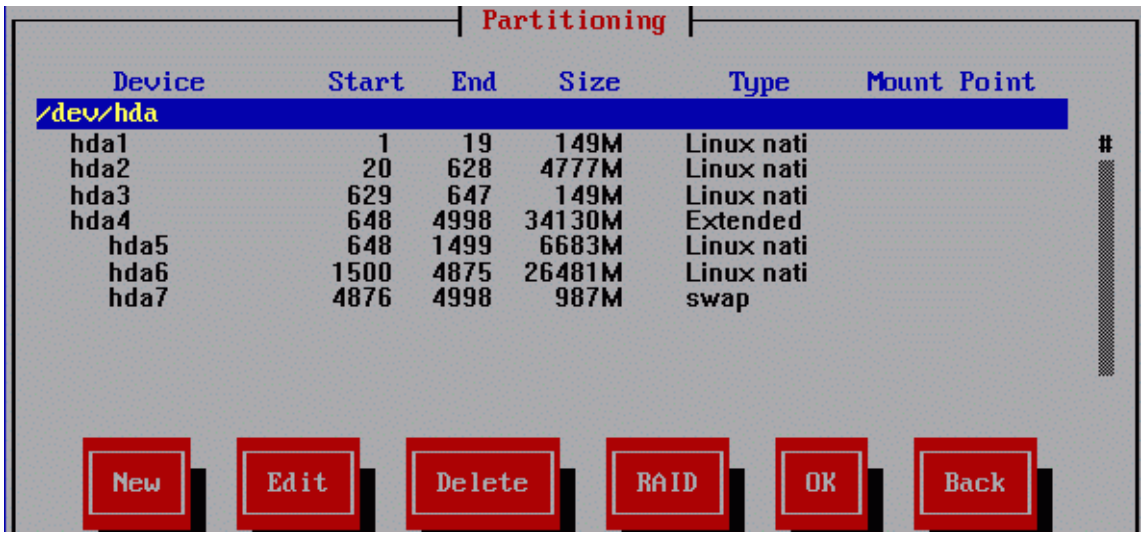
Action: Select "Disk Druid"

Figure A–15: Format as Swap?



Action: Select “Yes”

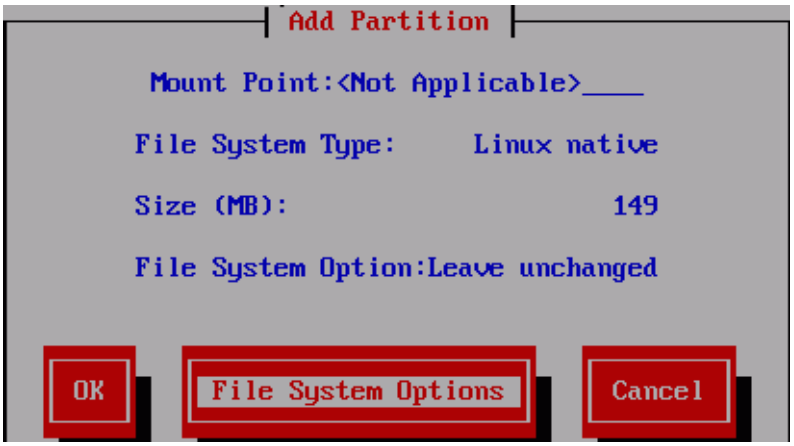
Figure A–16: Partitioning (we are really editing)



Action: Step 1 – Select “hda1”, then select “edit”, proceed to next figure
Step 2 – Select “hda5”, then select “edit”, proceed to next figure
Step 3 – Select “hda6”. then select “edit”, proceed to next figure

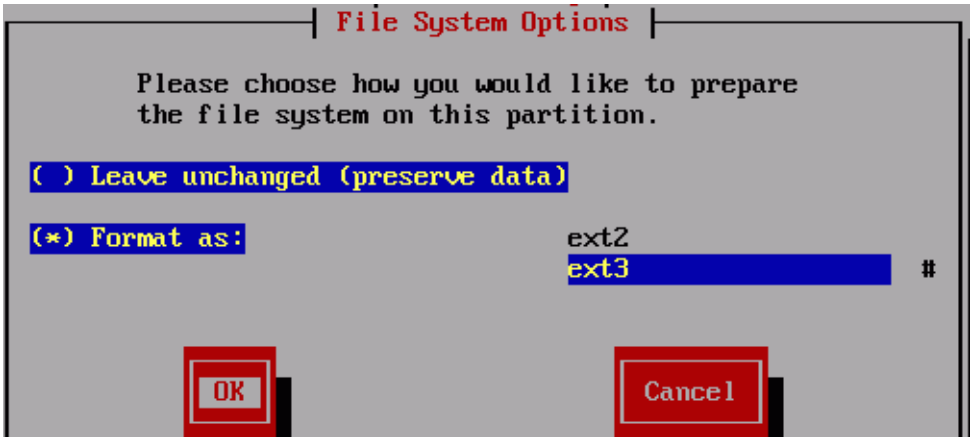
Note that the actions represented in Figure A–17 through Figure A–20 need to be completed 3 times for the proper result. Follow each step all the way through to figure A–20.

Figure A–17: Add Partition (we are really editing)



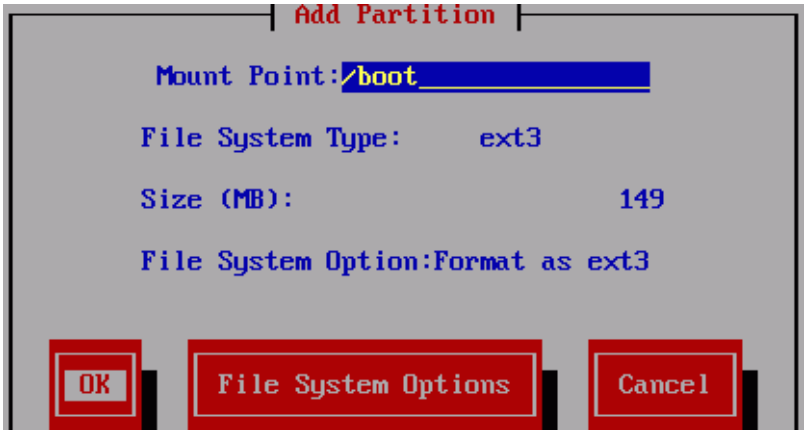
Action: Select "File System Options"

Figure A–18: Add Partition Step 2



Action: Select "Format as: (ext3 will be selected by default)"

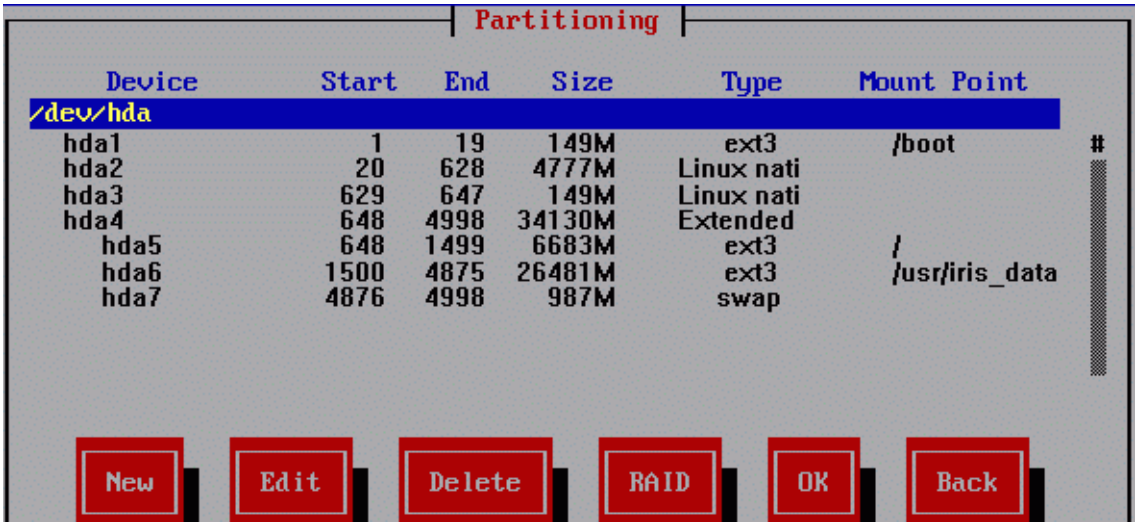
Figure A–19: Add Partition Step 3



Action: Step 1 – Type "/boot" in the Mount Point field
Step 2 – Type "/" in the Mount Point field
Step 3 – Type "/usr/iris_data" in the Mount point filed

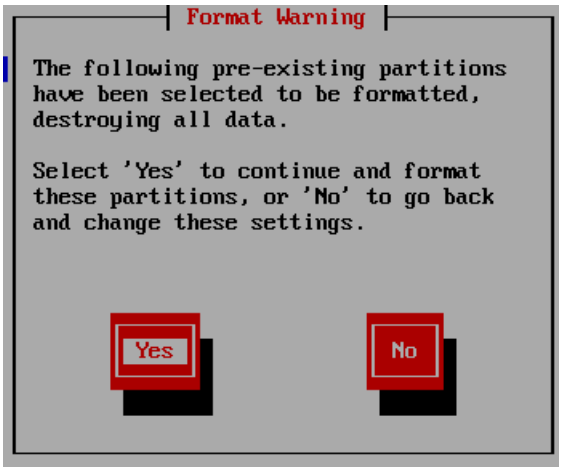
You have just formatted and assigned mount points for the / and /boot of the operational linux. The partitioning screen should look like the following figure. Write down a copy of this info in your notes.

Figure A–20: Operational LInux Partitioning



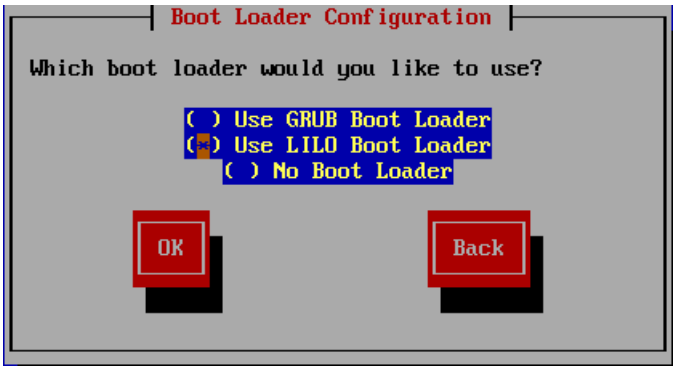
Action: Select "OK"

Figure A–21: Format Warning



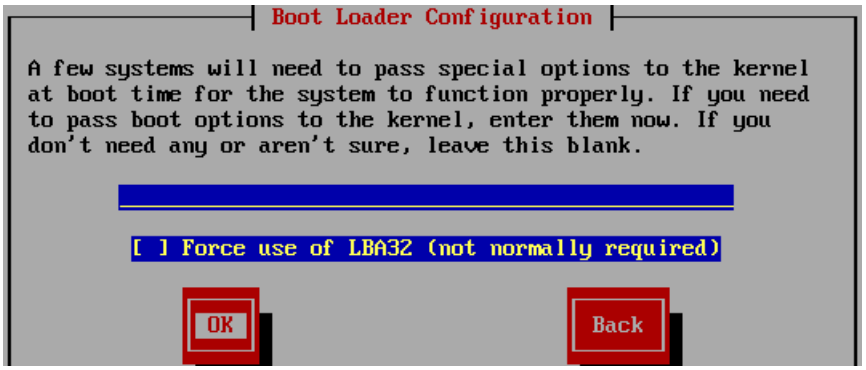
Action: Select Yes

Figure A–22: Boot Loader Configuration



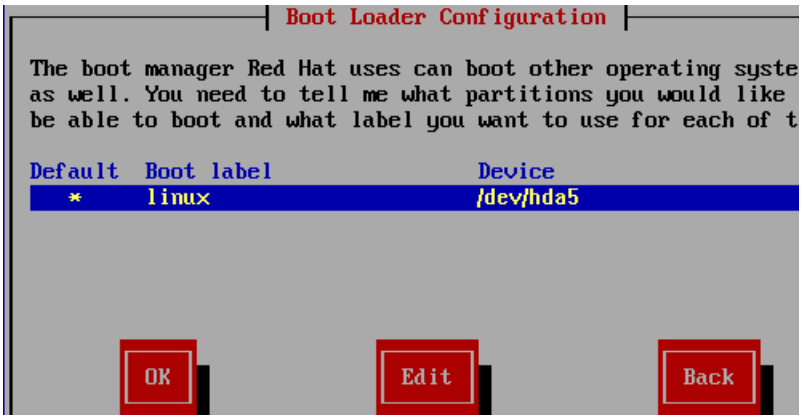
Action: Select “Use LILO Boot Loader”.

Figure A–23: Boot Loader Configuration (Step 2)



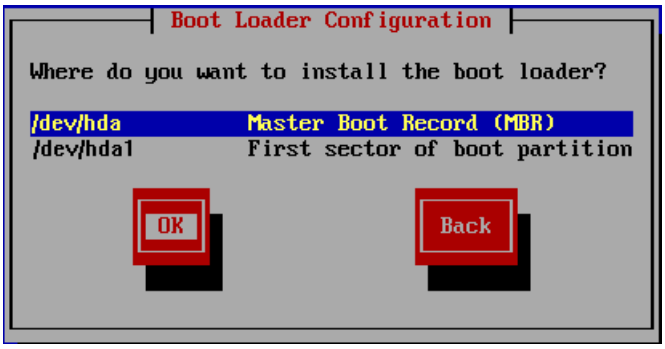
Action: Select “Ok”. If their are options in the top field, do not delete them.

Figure A–24: Boot Loader Configuration (Step 3)



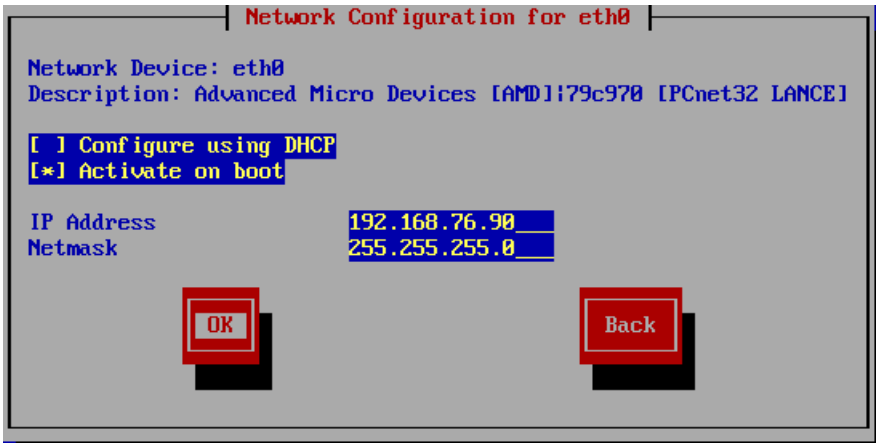
Action: Select OK

Figure A–25: Boot Loader Configuration (Step 4)



Action: Select Master Boot Record (MBR)

Figure A–26: Network Configuration for eth0

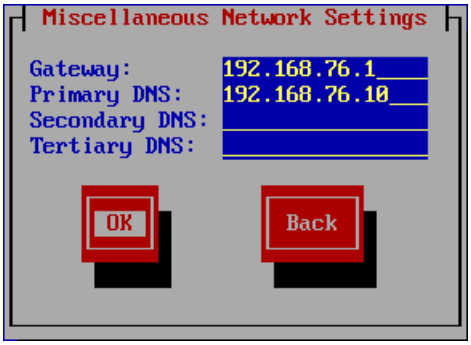


Action: Select "Configure using DHCP" (**select only if this is used at your site**)
Action: Select "Activate on boot"

Action: Enter the system IP Address
Enter the Netmask

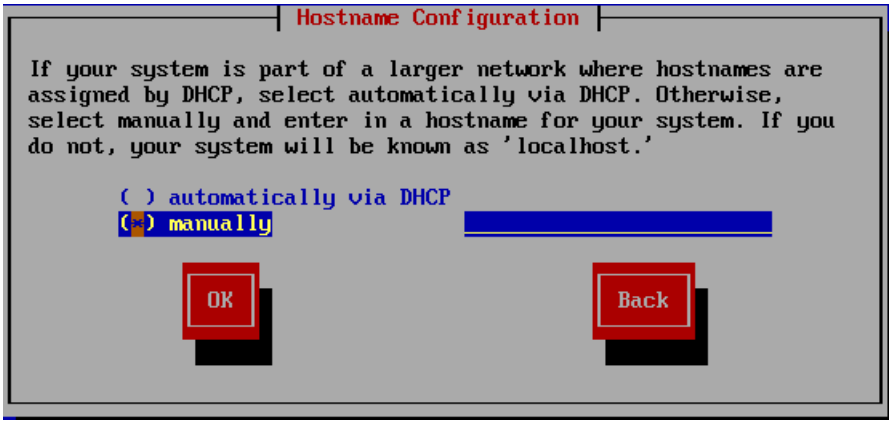
If there is a second network card, it will be configured in a similar manner.

Figure A–27: Miscellaneous Network Settings



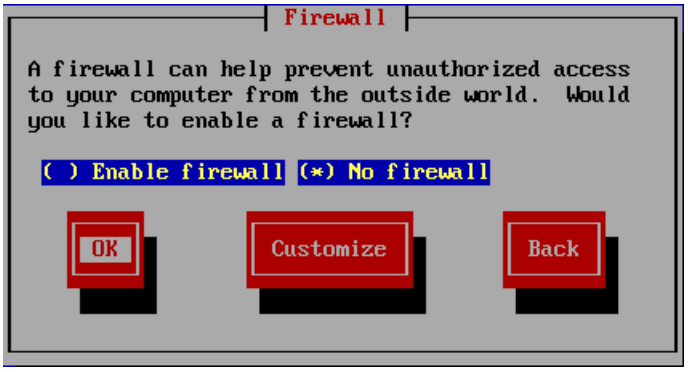
Action: Enter the Default gateway (IP).
Enter the primary name server.

Figure A–28: Hostname



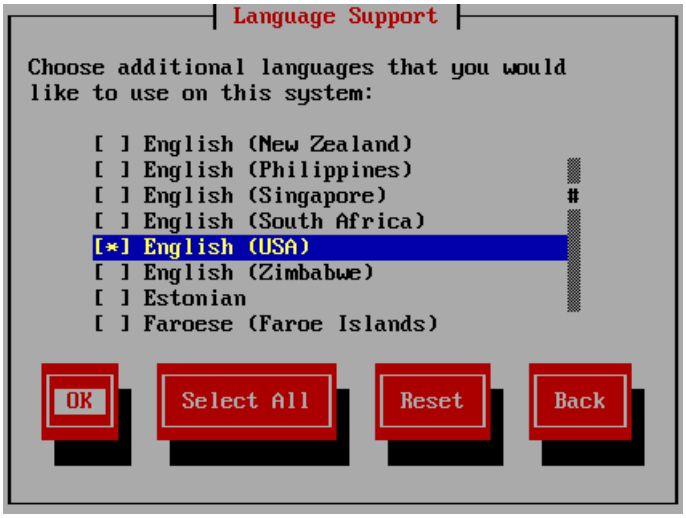
Action: Select "automatically via DHCP" if your network handles host name assignment, otherwise select "manually" and enter the hostname of the system.

Figure A–29: Firewall Configuration



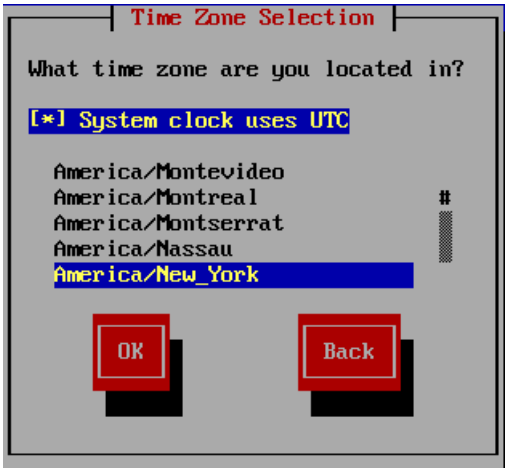
Action: Select "No Firewall"

Figure A–30: Language Support



Action: Select “English” plus any other languages you would like to use.

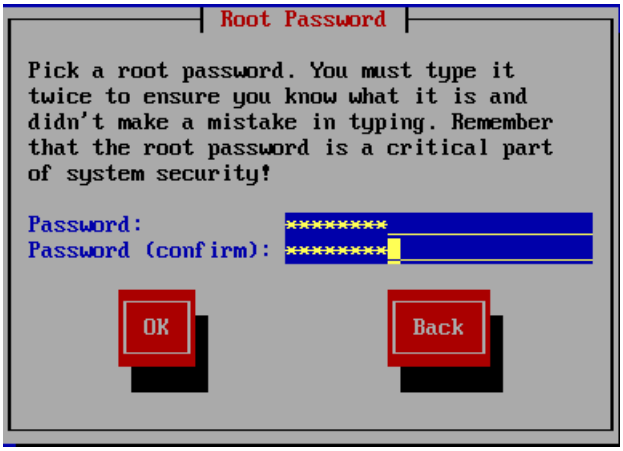
Figure A–31: Time Zone Selection



Action: Select “Hardware clock uses UTC”
Select your current time zone.

On shipboard systems it makes most sense to use the UTC time zone. On all other systems SIGMET recommends that you set to the local time zone. The RVP8 will always display times in UTC. In IRIS you can select to record using local or UTC.

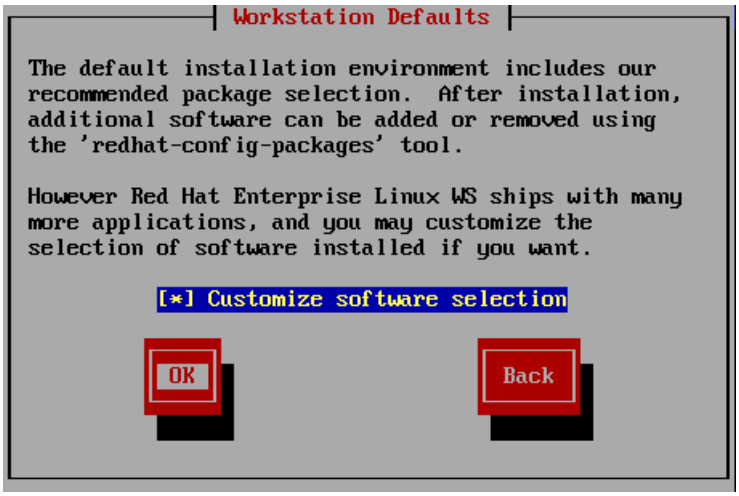
Figure A–32: Root Password



Action: Enter your desired password.

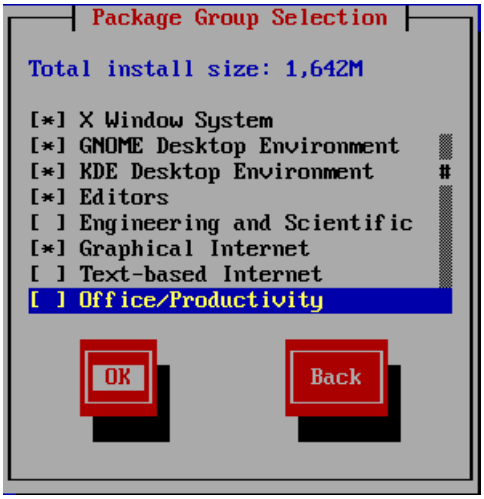
Note: Default SIGMET factory password is "xxxxxxxx" (8 lower case x's).

Figure A–33: Workstation Defaults



Action: Select "Customize software selection"

Figure A–34: Package Group Selection



Action: Select the packages as listed below.

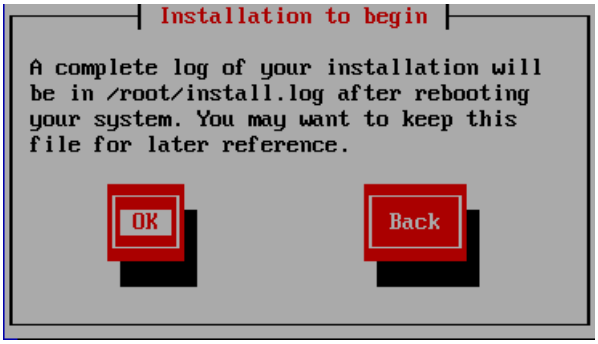
A.3.5 Operational Package Selection

The operational linux requires a greater number of packages to support IRIS/RDA and the following list identifies all packages that must be installed.

RHEL ES 3 systems:

X Window System
Gnome Desktop Environment
KDE Desktop Environment
Editors
Graphical Internet
Sound and Video
Server Configuration Tools
System Tools
Web Server (only for IRIS/Web)
Windows File Server (only if required)
FTP Server
Development Tools
Kernel Development
X Software Development
Legacy Software Development
Administration Tools
Printing Support

Figure A–35: Installation to begin

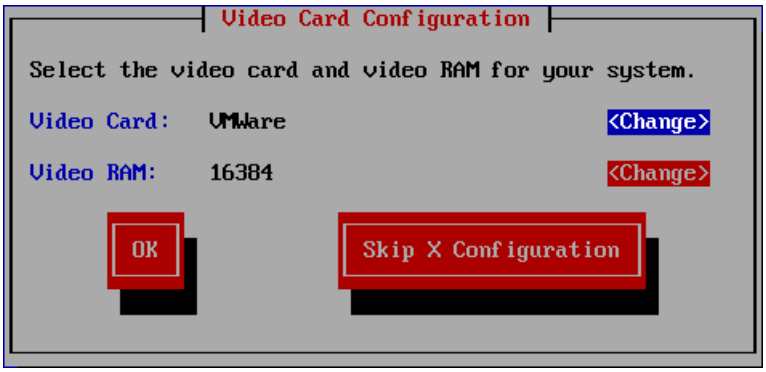


Action: Select OK

At this point the packages are actually installed on your new Linux partition which takes approximately 20 minutes. A progress bar is displayed on the screen during this process. Someone will need to be present to insert the required CDROMs when the installation program requires them.

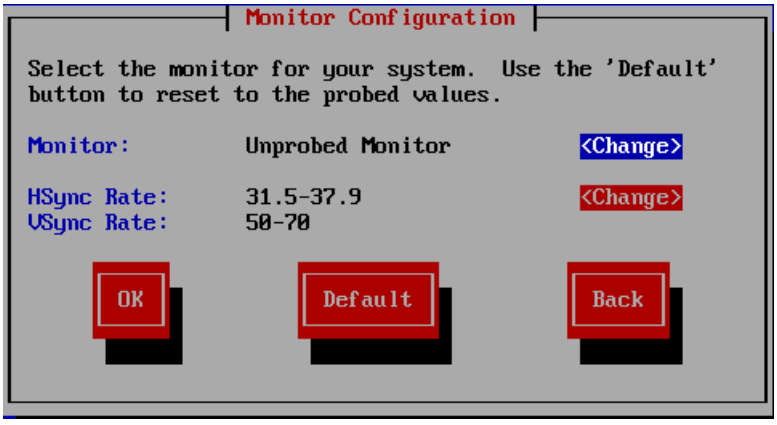
The last step in the operational linux installation is to configure your video card, monitor, and X windows. This did not occur during the miniroot installation process because the X windows package was not installed.

Figure A–36: Video Card Configuration



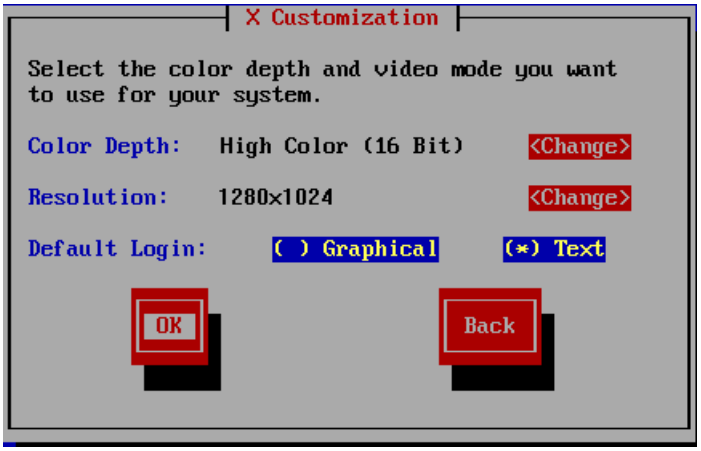
Action: –Linux will most likely detect your video card. If not then select change and choose the correct card.
–Linux will most likely detect the amount of Video RAM (memory) on the video card. 8MB can be used a default.

Figure A–37: Monitor Configuration



Action: Linux will detect your monitor. Make sure the "Monitor" field contains the model and make of your monitor. If not, select "Change" and use a generic monitor that best fits your hardware, e.g. "Monitor 1280x1024".

Figure A–38: Screen "X Customization"



Action: Select at least 16 bit color depth and a resolution of 1280x1024 (1024x768 is also acceptable). Finally, make sure that "Text" is set as the default login.

A.3.6 Final Steps of Operational Linux Installation

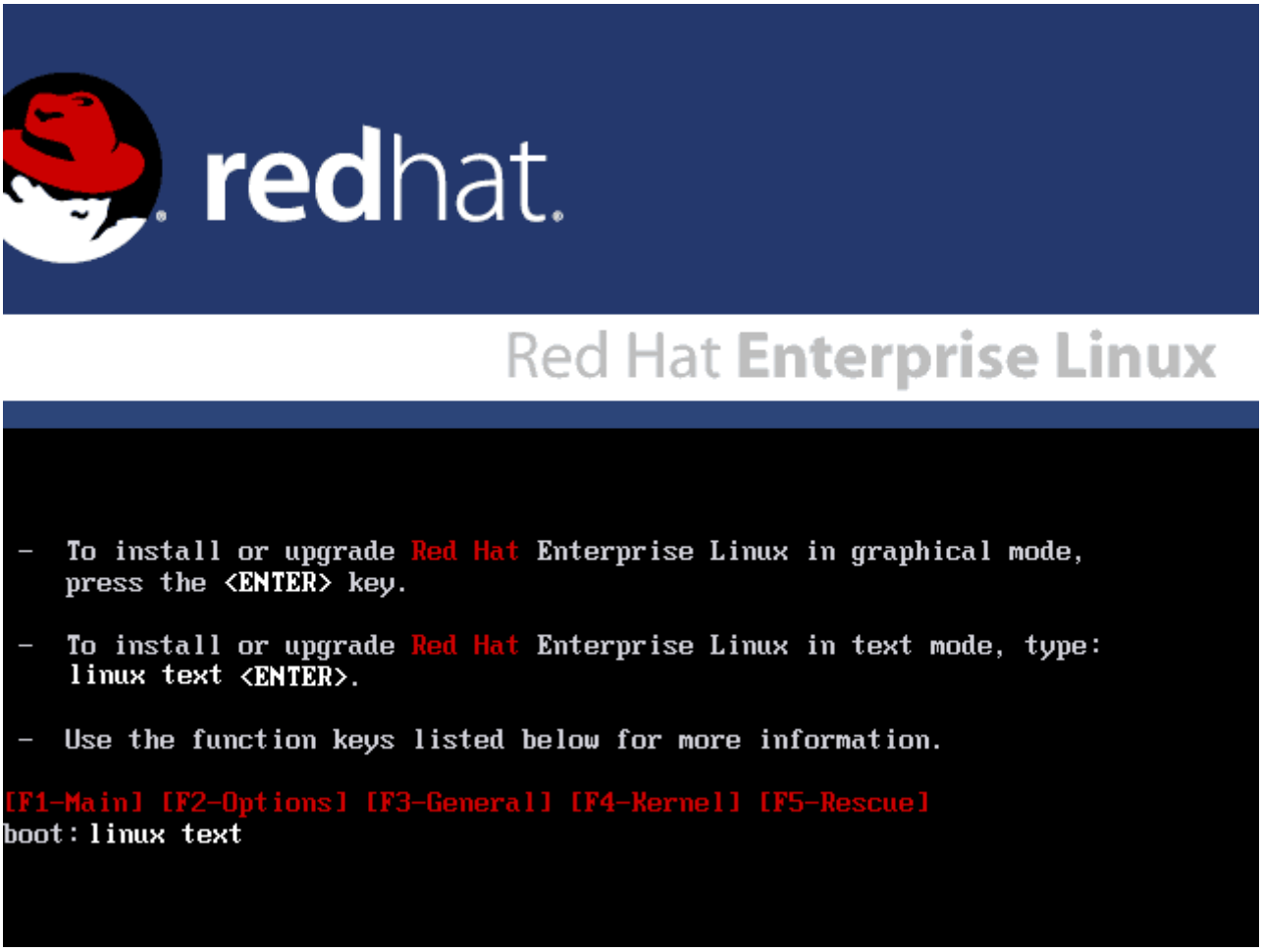
When the computer reboots, the LILO bootloader screen is displayed with linux as a an option – just hit enter. Status messages and boot information will scroll by and these means that you have successfully installed the miniroot and it is booting. Login as the "root" user and enter the password that you provided during the installation process.

If you have enjoyed this process, but want to get started with IRIS, go to Section A.2.1. Otherwise, proceed with the next section.

A.3.7 Miniroot (System Recovery) Install

Place the RHEL CD#1 into the appropriate drive and power on your computer.

Figure A–39: RedHat Greeting



Action: Type “linux text”

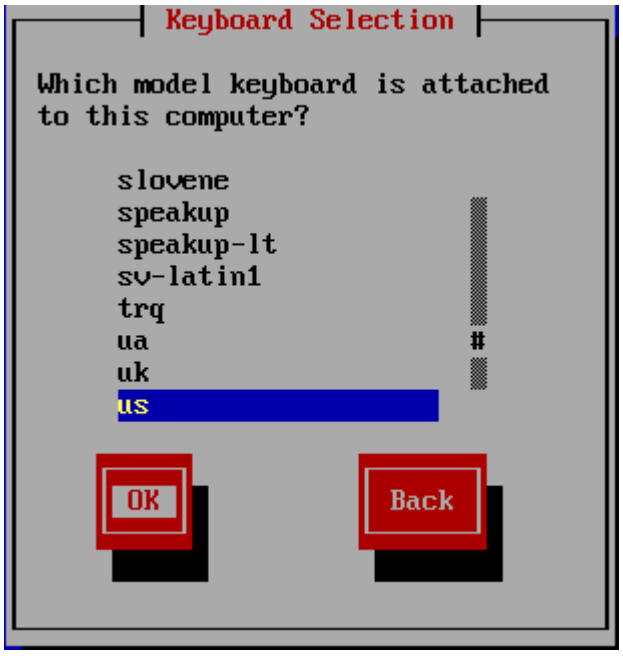
Figure A–40: Red Hat Enterprise Linux ES

Action: Select “OK”

Figure A–41: Language Selection

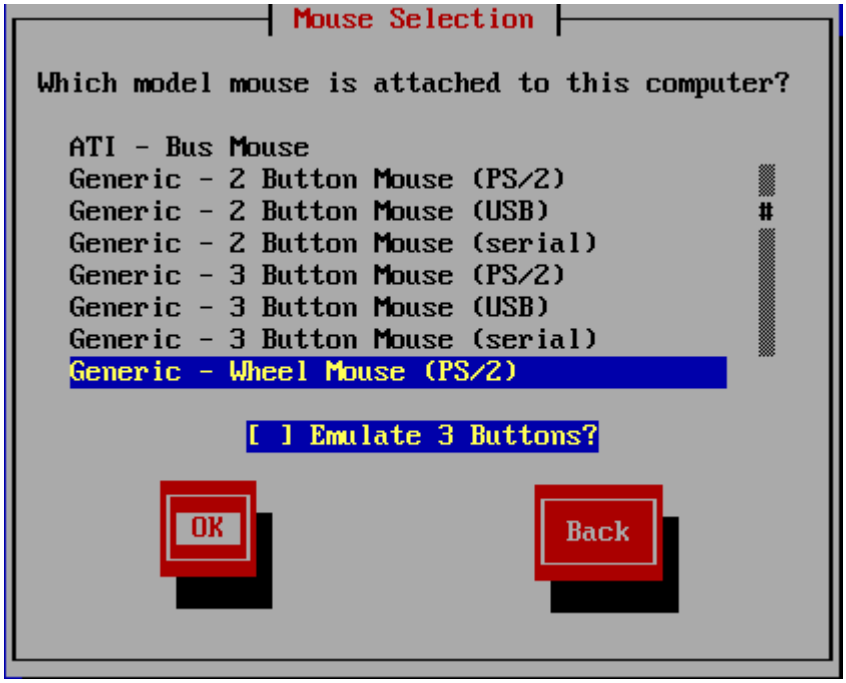
Action: Select “English” ***Sigmet has only tested an English installation

Figure A–42: Keyboard Selection



Action: Select “us”. If you have a different keyboard, select the appropriate choice.

Figure A–43: Mouse Selection

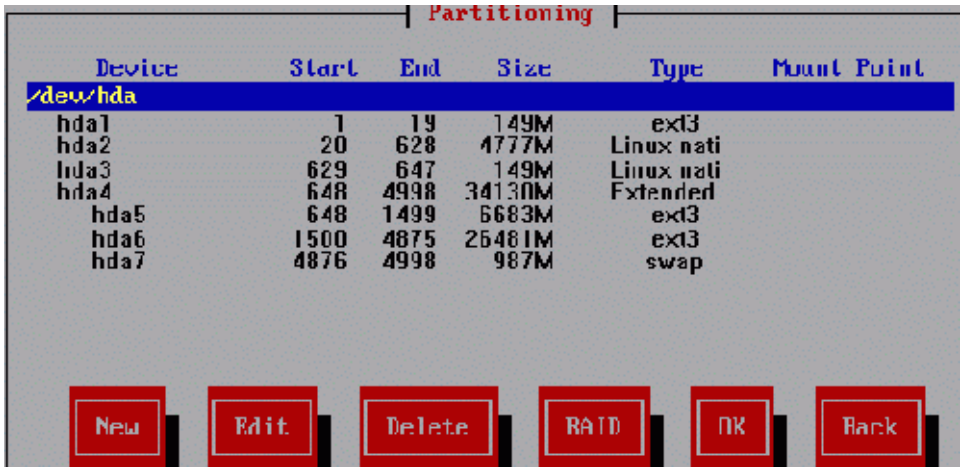


Action: Select the type of generic mouse for your configuration.

Figure A–44: Disk Partitioning Setup

Action: Select “Disk Druid”

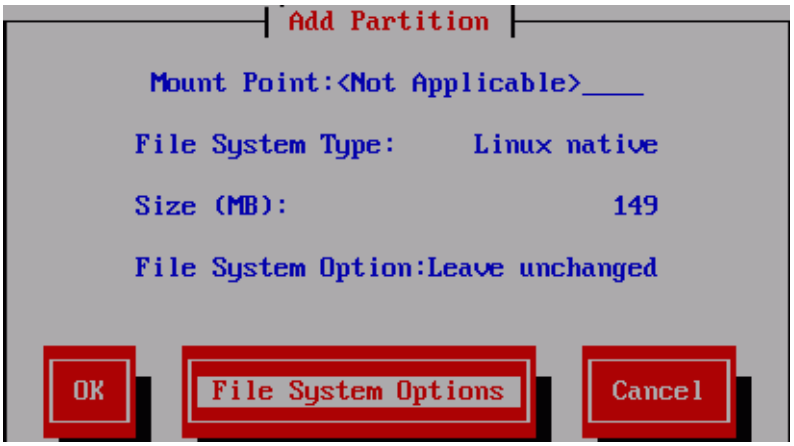
Figure A–45: Partitioning (we are really editing)



Action: Step 1 – Select “hda2”, then select “edit”, proceed to next figure
Step 2 – Select “hda3”, then select “edit”, proceed to next figure

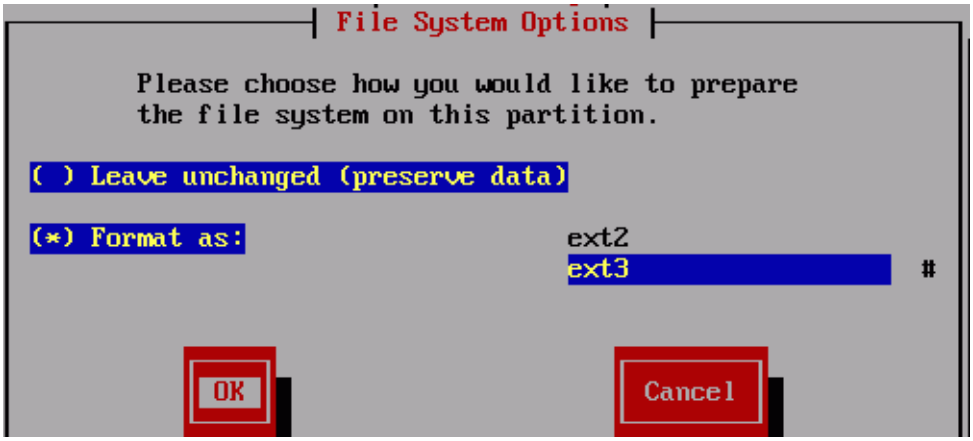
Note that the actions represented in Figure A–45 through Figure A–48 need to completely 3 times for the proper result. Follow each step all the way through to figure A–48.

Figure A–46: Add Partition (we are really editing)



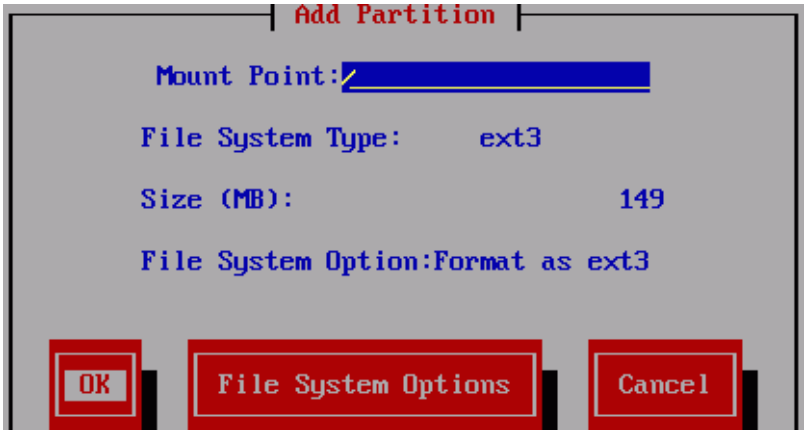
Action: Select "File System Options"

Figure A–47: Add Partition Step 2



Action: Select "Format as: (ext3 will be selected by default)"

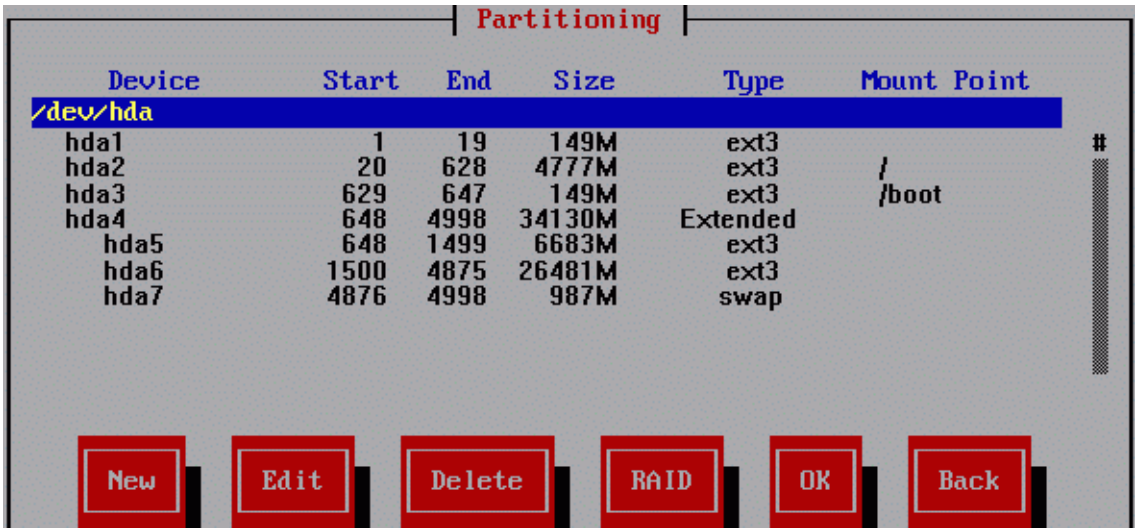
Figure A–48: Add Partition Step 3



Action: Step 1 – Type "/" in the Mount Point field
Step 2 – Type "/boot" in the Mount Point field

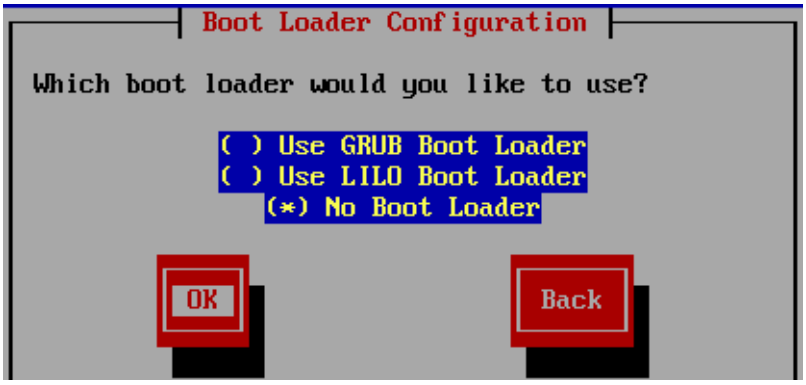
You have just formatted and assigned mount points for the / and /boot of the miniroot. The partitioning screen should look like the following figure. Write down a copy of this info in your notes.

Figure A–49: Partitioning



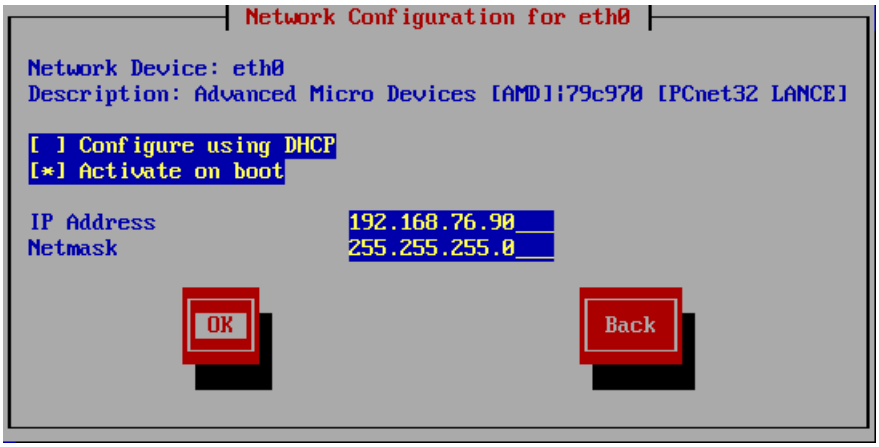
Action: Select "OK"
Verify sure that /boot is hda3

Figure A–50: Boot Loader Configuration



Action: Select "No Boot Loader"

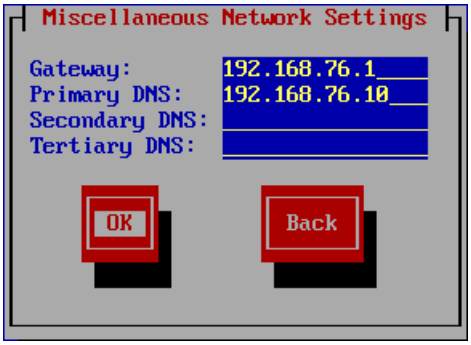
Figure A–51: Network Configuration for eth0 (and eth1 if available)



Action: Select "Configure using DHCP" (**select only if this is used at your site**)
Action: Select "Activate on boot"

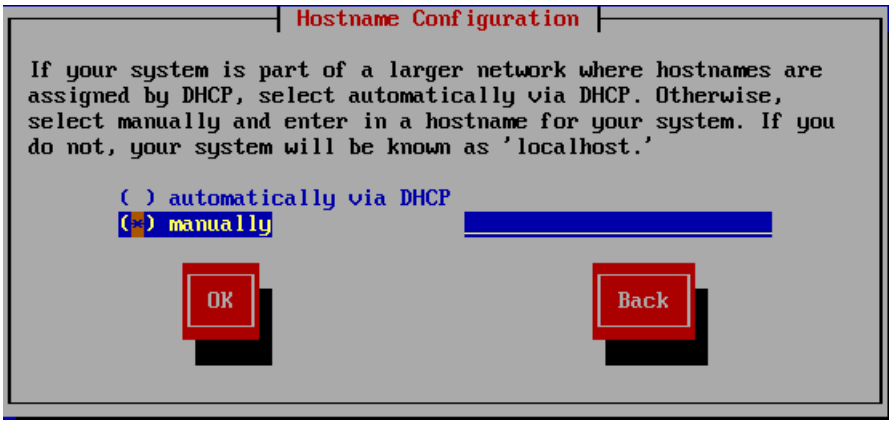
Action: Enter the system IP Address, Enter the Netmask

Figure A–52: Miscellaneous Network Settings



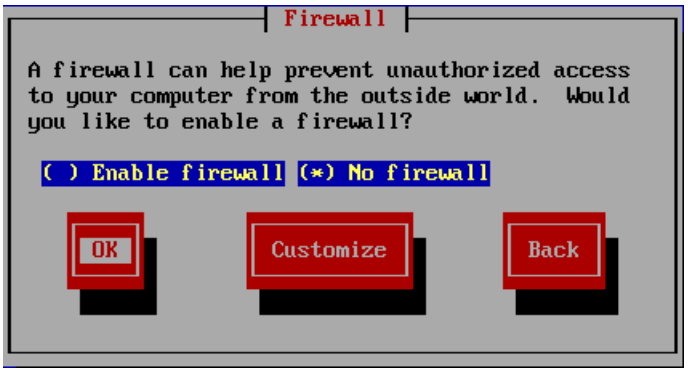
Action: Enter the Default gateway (IP) and the primary name server.

Figure A–53: Hostname



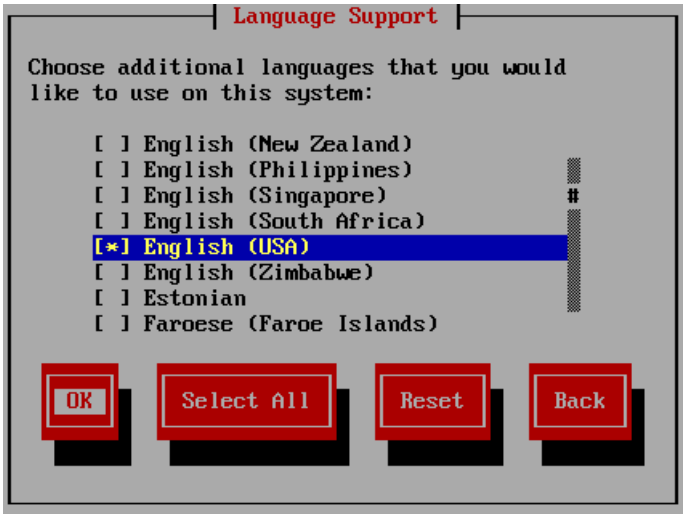
Action: Select “automatically via DHCP” if your network handles host name assignment, otherwise select “manually” and enter the hostname of the system.

Figure A–54: Firewall Configuration



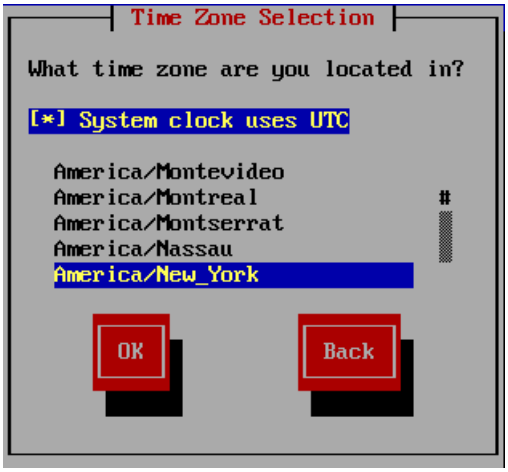
Action: Select “No Firewall”

Figure A–55: Language Support



Action: Select “English” plus any other languages you would like to use.

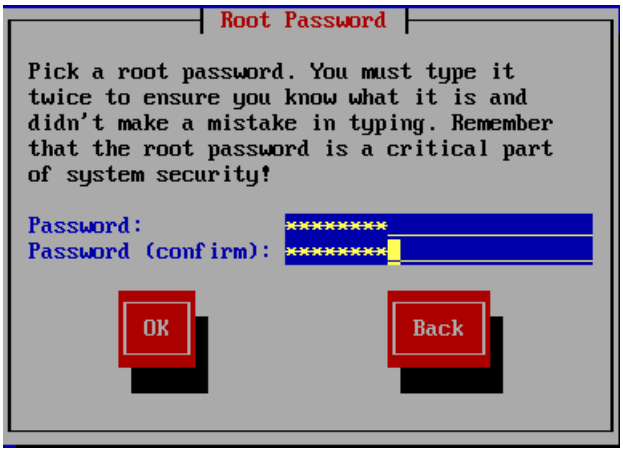
Figure A–56: Time Zone Selection



Action: Select “Hardware clock uses UTC”
Select your current time zone.

On shipboard systems it makes most sense to use the UTC time zone. On all other systems SIGMET recommends that you set to the local time zone. The RVP8 will always display times in UTC. In IRIS you can select to record using local or UTC.

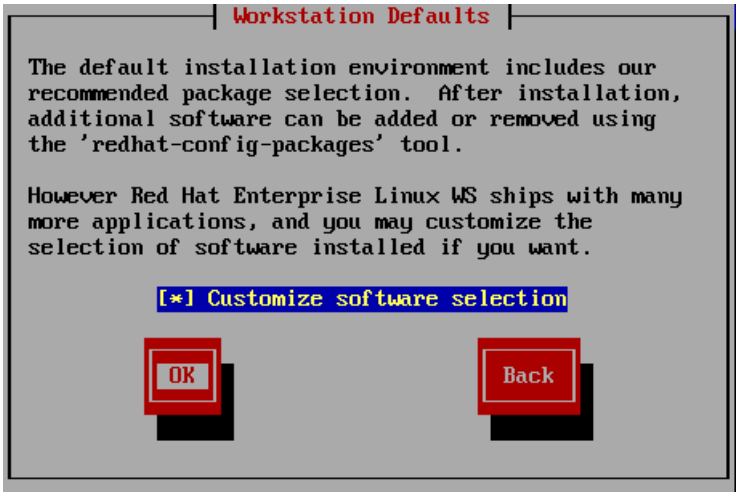
Figure A–57: Root Password



Action: Enter your desired password.

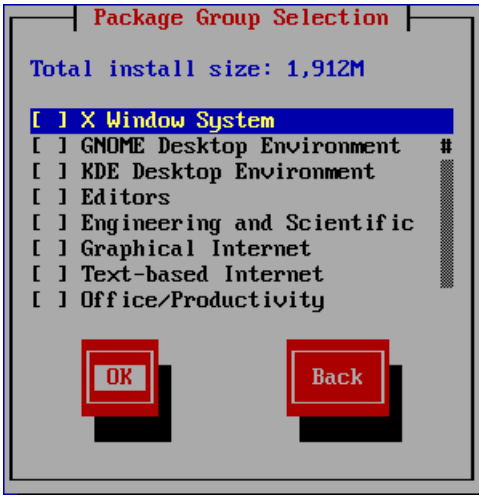
Note: Default SIGMET factory password is “xxxxxxxx” (8 lower case x’s).

Figure A–58: Workstation Defaults



Action: Select "Customize software selection"

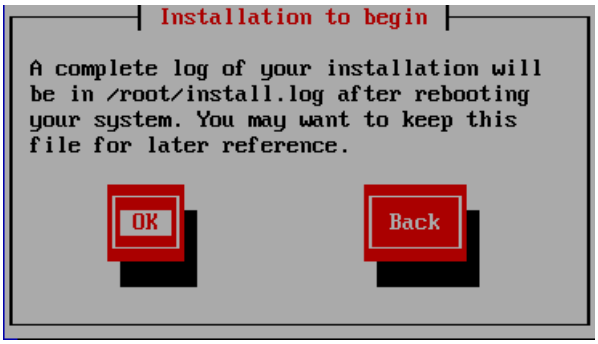
Figure A–59: Package Group Selection



Action: For this miniroot install, unselect **ALL** packages. A base installation will occur even if no packages are selected.

A.3.8 Final Steps of Miniroot Installation

Figure A–60: Installation to begin



Action: Select OK

Finally, the system will begin formatting the partitions and copying the files.

At this point the packages are actually installed to your new Linux partition. For miniroot, this should take about 5 minutes. A progress bar is displayed on the screen during this process. Someone will need to be present to insert the required disks when the installation program requires them.

After these final tasks have been completed, an Install Complete window will be displayed, you should remove all CDROMs from the computer. When the computer reboots, the LILO bootloader screen is displayed – just hit enter.

A.4 Configuring LILO

LILO is the linux boot loader software that provides the Linux boot screen and OS selection options. The goal of this next section is to change the LILO configuration so that it provides you with the option to boot into either the miniroot or operational linux.

If you haven't already done so, login as root. Now check from your notes, which partition was allocated to the /boot area of the miniroot. In our example, the / was /dev/hda3. So now enter commands

```
# mkdir /mnt/hda3
# mount /dev/hda3 /mnt/hda3
```

If you get an error after issuing the mount command above, try the following:

```
# mount –t ext3 /dev/hda3 /mnt/hda3
```

Before editing the lilo.conf file, make a backup copy.

```
# cp /etc/lilo.conf /etc/lilo.old
```

Edit the lilo.conf using vi or other similar editing program.

```
# vi /etc/lilo.conf
```

In that file, you see seven lines in a section starting with the word Image. Make a second copy of that section and edit the underlined parts like below. Make sure to double check the underlined portions to make sure they agree with the /boot and / partitions define for your miniroot. Failure to do this correctly may result in loss of ability to boot your system.

If your system has two processors or a new hyper–threading enabled processor there will be 2 differences in your lilo.conf – 1) "smp" will be at the end of you the kernel version, e.g. vmlinuz–2.4.21–4.EL.smp 2) there will be an additional section called oplinux–up (uni–processor) which should not be duplicated or deleted – it is for troubleshooting.

```
image=/boot/vmlinuz–2.4.21–4.EL
      label=linux
      initrd=/boot/initrd–2.4.21–4.EL.img
      read–only
      vga=773
      root=/dev/hda5

image=/mnt/hda3/vmlinuz–2.4.21–4.EL
      label=miniroot
      initrd=/mnt/hda3/initrd–2.4.21–4.EL.img
      read–only
      vga=773
      root=/dev/hda2
```

Save and exit the file.

Now run LILO with command

```
# lilo –v
```

lilo will print out a listing of the various actions that follow. At the end you should see “Writing boot sector” if the lilo.conf is correct. If not, then “Fatal...” will be displayed followed by a reason. You should then check your lilo.conf file for errors. If you are unable to get lilo to work you can temporarily save your work and reset the lilo.conf file to the backup version.

```
# cp /etc/lilo.conf /etc/lilo.new
# cp /etc/lilo.old /etc/lilo.conf
```

You should now run lilo –v and make sure no errors are listed (the system is just as it was before any of the changes to the lilo.conf). In order to take advantage of the disaster recovery capabilities of miniroot, it is imperative that lilo.conf is eventually edited so that both linux installations are displayed at the startup prompt.

Finally, you can “reboot” your computer. During the reboot oplinux and miniroot will be displayed as valid boot choices (for dual processor systems, oplinux–up will also be displayed).

A.5 Manual Installation Configuration

A.5.1 RHEL ES 3

The next step in customizing the machine for IRIS operation is to install some additional Linux packages. To do this, you must insert the appropriate RedHat Installation CD into the CDROM drive and mount the CDROM.

```
# mount /mnt/cdrom
# cd /mnt/cdrom/RedHat/RPMS
```

Hint: Once the beginning of a unique command has been type, press "Tab" for auto-completion.

Install "festival" from CD #2 as follows:

```
# rpm –Uvh festival–1.4.2–18.i386.rpm
```

Install "openmotif21" and "telnet–server" from CD #3 as follows:

```
# rpm –Uvh openmotif21–2.1.30–8.i386.rpm
# rpm –Uvh telnet–server–0.17–26.i386.rpm
# rpm –Uvh rsh–server–0.17–10.i386.rpm
```

When you are finished with a CDROM you should type the following:

```
# cd /
# eject cdrom
```

Check that your language is set correctly. Do this with the "locale" command which will output something like to the following to your screen:

```
LANG=en_US.UTF–8
```

The above is **incorrect**, and will cause display problems in IRIS. To fix this, edit the file /etc/sysconfig/i18n. Change the appropriate line in the file to read:

```
LANG=en_US
```

A.5.2 User Account Configuration

Type in the following commands to create accounts for the operator & observer user:

```
# /usr/sbin/userdel operator
# /usr/sbin/useradd –g users –m –n operator –u 1000 –s /bin/ksh
# /usr/sbin/useradd –g users –m –n observer –u 1001 –s /bin/ksh
# echo 'xxxxxx' | passwd ––stdin operator
# echo 'xxxxxx' | passwd ––stdin observer
```

By default, the Linux OS forces the use of "strong passwords". If you wish to be able to use simpler passwords, you should now edit the file "/etc/pam.d/passwd". The file should then be made to consist of only a single line reading:

```
password required /lib/security/pam_unix.so
```

Save the file and exit. Now each user can change their password to be anything.

A.5.3 Configuration for Automatic Startup

The RVP8/RCP8/IRIS application software can be configured to startup automatically following a boot of the system. In the Automatic Software Installation, this happens by default. However, in the Manual Software Installation, this is an optional configuration that may be performed. The procedure to configure this is documented here.

The procedure to configure the automatic software startup contains two stages. First is to copy the appropriate startup program to the startup directory, and second is to enable that startup program to run following a boot.

A.5.3.1 Copying of Automatic Startup Programs

Below are the commands required to copy the startup programs. Note that if a single system is support multiple application (ie, RCP8 and IRIS), then you must perform the copies described for both:

```
RVP8:
# cp ${IRIS_ROOT}/bin/rda/rdasys /etc/rc.d/init.d
# cp ${IRIS_ROOT}/config_template/init/rvp8 /etc/rc.d/init.d
# cp ${IRIS_ROOT}/config_template/init/dspexport /etc/rc.d/init.d
# chmod 755 /etc/rc.d/init.d/rdasys
# chmod 755 /etc/rc.d/init.d/rvp8
# chmod 755 /etc/rc.d/init.d/dspexport

RCP8:
# cp ${IRIS_ROOT}/bin/rda/rdasys /etc/rc.d/init.d
# cp ${IRIS_ROOT}/config_template/init/rcp8 /etc/rc.d/init.d
# chmod 755 /etc/rc.d/init.d/rdasys
# chmod 755 /etc/rc.d/init.d/rcp8

IRIS:
# cp ${IRIS_ROOT}/config_template/init/iris_init_linux
          /etc/rc.d/init.d/iris
# chmod 755 /etc/rc.d/init.d/iris
```

A.5.3.2 Enabling Startup Programs

Below are the commands required to enable the startup programs:

```
RVP8:
# chkconfig --add rdasys
# chkconfig --add rvp8
# chkconfig --add dspexport

RCP8:
# chkconfig --add rdasys
# chkconfig --add rcp8

IRIS:
# chkconfig --add iris
```

A.6 Automatic Installation Configuration

A.6.1 Configuring X Windows

X–windows is the unix/linux software that provides the underlying software to support graphical user interfaces (GUI). To test if the X–windows configuration completed at the end of the installation process was successful, login as root and type the following:

```
# xinit
```

The screen should go blank for a second and then the screen should have a white box in the upper left hand corner with a command prompt and cursor. If this does not happen and an error message is displayed, try running:

```
# redhat–config–xfree86
# redhat–config–xfree86 ––reconfig
```

Hopefully, you can use this utility to modify your X–Windows settings so that the "xinit" command will execute error free and optimize it for your display. Select at least 16 bit color depth and a resolution of 1280x1024 (1024x768 is also acceptable). If modifying your settings does not fix the problem, SIGMET recommends that you proceed to the optional section X–Windows Troubleshooting, Section A.10.

A.6.2 Configuring your time zone

If you used the automatic installation procedure or need to your time/date settings for another reason, as root, run:

```
# redhat–config–date
```

A.7 Network Configuration

A.7.1 Basic Network Configuration

If you used the automatic installation procedure or need to change your network settings for another reason, as root, run:

```
# redhat–config–network
```

After you have made your desired changes, run:

```
# service network restart
```

A.7.2 TCP/IP Service Configuration

RedHat Linux comes by default with most of the TCP/IP services disabled. For operation of IRIS, some of these services must be enabled. To see which services are currently on, type:

```
$ chkconfig ––list
```

To enable the desired services, as root type a command such as:

```
# chkconfig rsh on
```

If you are logged into a window environment, as root type the following command:

```
# redhat–config–services
```

You may wish to enable the **rlogin, rsh, telnet, sshd** and **ftpd** services. Note that ftp is called either “vsftpd” or “wu–ftpd”.

A.7.3 FTP for Red Hat Enterprise Linux and Red Hat 8.0 (vsftpd)

By default, ftp access to your computer may be blocked. If you wish to allow ftp access, check the following:

The /etc/vsftpd.users file contains a list of user names which are not allowed to ftp. Check this to make sure your desired ftp user name is not listed (i.e. operator).

There is an additional file in /etc/ called vsftpd.user_list which can be used for advanced security configuration. Check this to make sure your desired ftp user name is not listed (i.e. operator).

The /etc/vsftpd/vsftpd.conf should be reviewed depending on the security requirements of your network. SIGMET recommends at least the following change which will disable anonymous FTP:

```
anonymous_enable=NO
```

A.7.4 Rcp

Authorization to use **rcp** is controlled both by the file /etc/hosts.equiv discussed in section 1.4.1, and by the pam.d software. Take a look in the /etc/pam.d directory. There is a separate file controlling many different services. The “rsh” file controls

rsh and rcp. Login as operator and then conduct a simple test to see if you are authorized is to type “rsh host date”, where “host” is your hostname. The rsh file should contain the following:

```
#%PAM-1.0
# For root login to succeed here with pam_securetty, ”rsh” must be
# listed in /etc/securetty.
auth       required     /lib/security/pam_nologin.so
auth       required     /lib/security/pam_securetty.so
auth       required     /lib/security/pam_env.so
auth       required     /lib/security/pam_rhosts_auth.so
account    required     /lib/security/pam_stack.so service=system-auth
session    required     /lib/security/pam_stack.so service=system-auth
```

The documentation for this package is available online on your system. Point your browser to the file: /usr/share/doc/pam–0.74/html/pam.html.

Here is a summary: The word ”required” means that the operation must pass all 6 of these security tests before it is permitted. The “pam_nologin.so” command means that if the file /etc/nologin exists you are stopped. The ”pam_securetty.so” means that if you are root, and the terminal is not listed in the /etc/securetty file then you are blocked. The ”pam_rhosts_auth.so” means that ruserok function must pass, which basically means that the /etc/hosts.equiv file is checked, or the $HOME/.rhosts file is checked. I have not figured out what the other lines mean. When it fails,a single line is added to the /var/log/messages file mentioning the failure, but not the reason.

If you cannot get it to work, then try changing one of the lines form “required” to “sufficient”. This should make it go without checking the rest. Changing this file takes effect right away, you do not need to reboot.

The RHEL Linux has a problem with kerberos **rsh** and **rcp** as follows:

1) **rsh** does not work at all to hp 10.20 systems
2) **rcp** gets a warning message to all platforms

As it turns out, there are 2 sets of r* commands installed on those systems. The commands in /usr/bin work fine the old way. We recommend for SIGMET systems that you remove the kerberos path from your PATH as follows:

```
# chmod 111 /etc/profile.d/krb5.sh
```

Then log out and in.

A.7.5 Routing

By default, a Linux system will not route network data. To enable routing, type the following command:

```
# echo 1 > /proc/sys/net/ipv4/ip_forward
```

Once you get this working, put the same line in your /etc/rc.d/rc.local file so it takes effect each time you boot.

A.8 Region Specific Settings

The N2 python code uses the tk library. You need to make a link for this to work:

```
# cd /usr/lib
# ln –s libtk8.3.so libtk.so
```

A.9 Earlier Versions of the RDA Installation CD

SIGMET strongly recommends that customers use the new Red Hat Enterprise Linux procedure described in the above sections of this manual. However, it might be required due to operational commitments that an older CD–ROM be used. Please use the following instructions depending on your version of RDA CD.

Booting from the RDA 8.04 Installation CDROM (RedHat 8.0)

- When the **BOOT:** prompt is presented, type the following command, depending on your system type:

  RVP8:

  ```
  linux ks=cdrom:/ks/rvp8
  ```

  If you have a completely new hard drive, then use the following command: (WARNING: THIS WILL DELETE ALL PARTITION INFORMATION)

  ```
  linux ks=cdrom:/ks/rvp8.newdisk
  ```

  RCP8:

  ```
  linux ks=cdrom:/ks/rcp8
  ```

  If you have a completely new hard drive, then use the following command: (WARNING: THIS WILL DELETE ALL PARTITION INFORMATION)

  ```
  linux ks=cdrom:/ks/rcp8.newdisk
  ```

  After typing the appropriate command press **ENTER.**

- The operating system and RDA software is installed automatically at this point.

Steps to enable the automatic startup of the Comtrol RocketPort serial card:

- At login prompt, login as: "**root**" and password "**xxxxxxxx**" (8 x's)
- Type the following commands:

  ```
  chkconfig --add rocket
  chkconfig --level 2345 rocket on
  ```

- Logout of root by typing "**exit".**

Booting from the RDA 8.01 or earlier Installation CDROM (RedHat 7.3)

- When the **BOOT:** prompt is presented, type the following command, depending on the version of CPU that is in your system:

  For Supermicro –G2 board type:

  `linux ks=cdrom:/ks/ks–gb–hda.cfg`

  For Supermicro –Q board type:

  `linux ks=cdrom:/ks/ks–100.hda.cfg`

  After typing the appropriate command press **ENTER.**

- The software is installed automatically at this point. If prompted with:

  "Would you like to initialize this drive?",

  select **YES** (using the TAB key) and then select **ENTER**.

- After about 10 minutes, the CDROM ejects. Remove it. The PC reboots automatically. Continue to next section.

Installation steps to enable automatic startup of the RDA software

- At login prompt, login as: "**root**" and password "**xxxxxxxx**" (8 x's)
- If you are installing an RVP8, type:

  `chkconfig ––level 2345 dspexport_init on`
  `chkconfig ––level 016 dspexport_init off`
  `chkconfig ––level 2345 rvp8_init on`

- If you are installing an RCP8, type:

  `chkconfig ––level 2345 rcp8_init on`

- Logout of root by typing "**exit".**

A.10 X-Windows Troubleshooting: Framebuffer Method

Sometimes the standard X server for your video card just does not seem to work, or works very poorly. In cases like this, you can often achieve success by configuring the card as a frame buffer device, rather than using one of the specific X servers. We have used this method several times for video cards that were not fully supported by Linux, and it works quite well. Frame buffer support is directly built into the 2.2.x kernels, so the procedure is pretty easy.

Here are instructions that should get tough-dog video cards up and running:

- Don't worry too much about setting up X during the install. You're going to change the /etc/X11/XF86Config file later anyway. Just fiddle through the X setup, choose VGA16 or some other generic server like SVGA, pick a monitor, etc. It will probably fail, which is no problem — just quit the X setup stuff when you get the chance, and complete the RedHat install.
- When you first boot, login as root and edit your /etc/lilo.conf file, adding the line VGA=791 under the read–only line in the Linux section. This is the decimal code for 16bpp and 1024x768 resolution. To get a different resolution and color depth, see the valid decimal code table below (from the Vesafb Mini-HOWTO).

```
Colors   640x480 800x600 1024x768 1280x1024 1600x1200
--------+-----------------------------------------
256     |   769     771      773      775       796
32,768  |   784     787      790      793       797
65,536  |   785     788      791      794       798
16.8M   |   786     789      792      795       799
```

- Exit the editor saving your changes, and type:

```
lilo –v
```

  Then reboot. When you reboot, you should now have a cute penguin in the top left hand corner of your screen and your resolution should be 1024x768.

- Now, login as root and do the following (assuming you still have your RedHat install CD in the drive):

```
# mount /dev/cdrom /mnt/cdrom
# cd /mnt/cdrom/RedHat/RPMS
# rpm –Uvh XFree86–FBDev–3.3.6–35.i386.rpm
# cd /etc/X11
# rm X
# ln –s /usr/X11R6/bin/XF86_FBDev /etc/X11/X
```

- Now you need to edit your /etc/X11/XF86Config (for older systems you should modify the XF86Config–4 file as well) file so it will work with the FBDev server. First, delete all the mode lines. You don't need them. Next, add this to the area that has all the different screen and server information:

```
Section "Screen"
   Driver          "FBDev"
   Device          "My Video Card"
```

```
    Monitor          ”My Monitor”
    DefaultDepth      16
       SubSection    ”Display”
       Depth          16
       Modes         ”1024x768”
    EndSubSection
EndSection
```

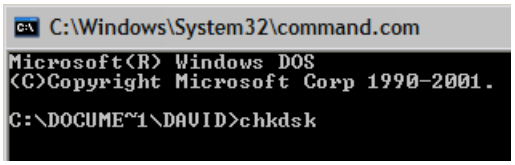
- Run “**xinit**”. That’s it! Naturally, you will have to change the Depth and Modes lines to reflect the decimal code you chose for your depth and resolution in your lilo.conf file.

A.11 Installing Linux on Windows System (Dual Booting)

Installing Linux on a windows system provides the end user with a little more flexibility, but requires a modified installation process. The following instructions are focused on computer systems that have a single hard drive with Microsoft Windows and Partition Magic 8 already installed. Here is a quick overview of the process:

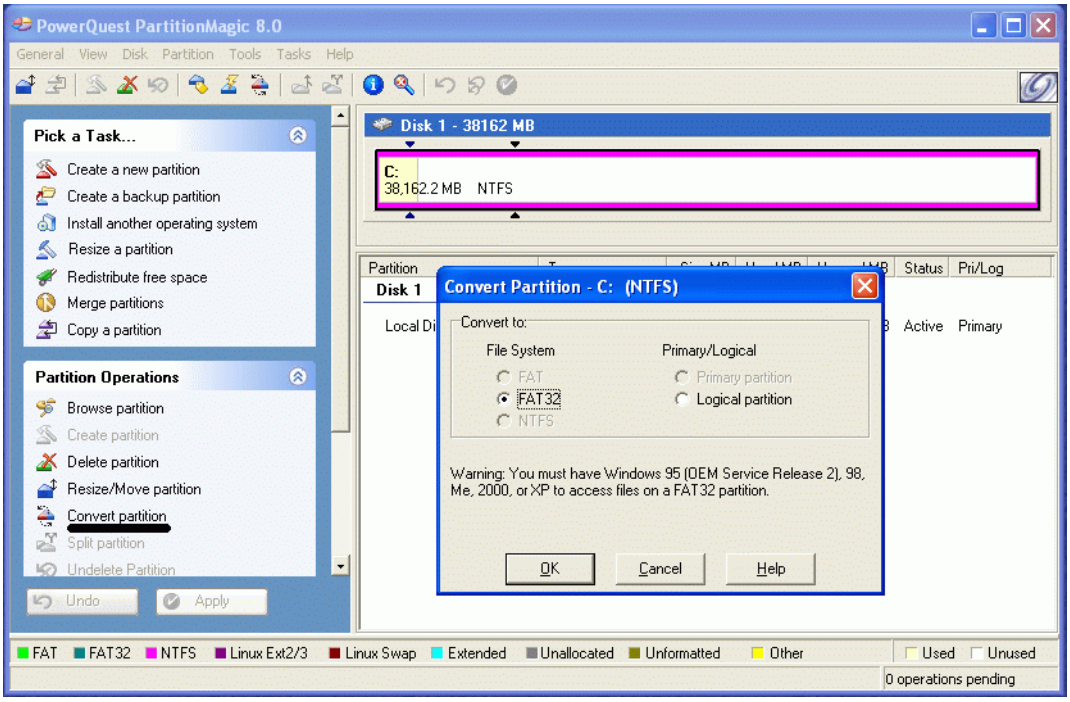
- Convert NTFS partition to FAT32 (enabling linux to access windows' data)
- Create free space for linux by shrinking the windows partition
- Adjust the formatting plan and lilo.conf as discussed in Section A.9.1

Figure A–61: chkdsk



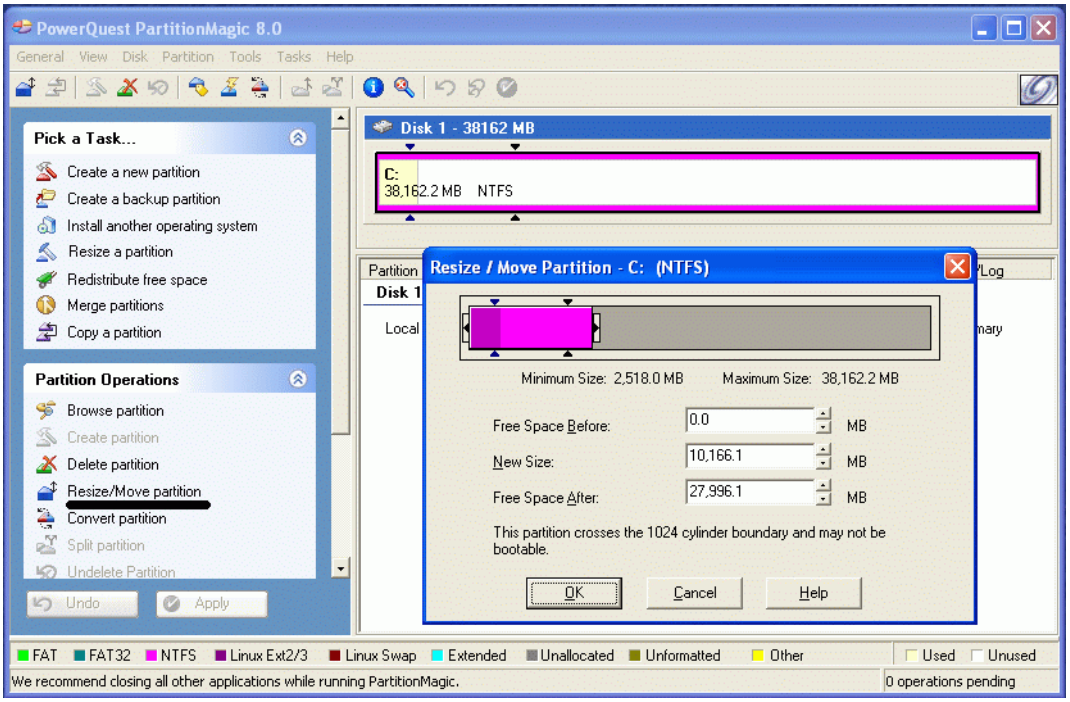
Action: Run chkdsk from a command prompt

Figure A–62: Convert NTFS partition (c:) to FAT32



Action: Convert partition to FAT 32

Figure A–63: Resize Partition



Note: For older computer systems (prior to 2002) and those not using Red Hat Enterprise Linux, you must also create 150 MBs before the Windows partition to create /boot partitions.

Action: Resize the partition by entering the number of desired MBs for your complete (all linux partitions) linux installation in the “Free Space After” field. After clicking OK, click the Apply button in the left hand corner. You MUST reboot your computer for these changes to occur. Make sure that your CD and disk drives are empty.

A.11.1 Dual Boot (Windows & Linux) Tips

Partitioning – The addition of a Windows partition increases the partition numbers by one.

Device	Size	Purpose
/dev/hda1	5GB	windows
/dev/hda2	1GB	/ miniroot
/dev/hda3	7GB	/ oplinux
/dev/hda4		Extended Partition*
/dev/hda5	1GB	Linux Swap Space
/dev/hda6	27GB	/usr/iris_data (for oplinux)
		*Automatically created when needed during partitioning process.

lilo.conf – Accurate recording of the partition information is critical to the successful creation of a lilo.conf file which properly supports three OS's (miniroot, oplinux, and windows).

In the example above, the / for miniroot was /dev/hda2. So now enter commands

```
# mkdir /mnt/hda2
# mount /dev/hda2 /mnt/hda2
```

If you get an error after issuing the mount command above, try the following:

```
# mount –t ext3 /dev/hda2/ /mnt/hda2
```

Next you edit the lilo.conf file, that can be done with the vi editor.

```
# vi /etc/lilo.conf
```

In that file, you see seven lines in a section starting with the word Image. Make a second copy of that section and edit the underlined parts like below. Make sure to double check the underlined portions to make sure they agree with the /boot and / partitions define for your miniroot. Failure to do this correctly may result in loss of ability to boot your system.

```
image=/boot/vmlinuz–2.4.21–4.EL
      label=oplinux
      initrd=/boot/initrd–2.4.21–4.EL.img
      read–only
      root=/dev/hda3

image=/mnt/hda2/boot/vmlinuz–2.4.21–4.EL
      label=miniroot
      initrd=/mnt/hda2/boot/initrd–2.4.21–4.EL.img
      read–only
      root=/dev/hda2

other=/dev/hda1
      optional
      label=windows
```

Save and exit the file.

Now run LILO with command

```
# lilo -v
```

and reboot your computer. During the reboot, you can see the option for the three operational systems you are able to boot to.

A.12 Special notes for notebook installations

Most notebook computers have only a single bay for the cdrom or floppy, and some have unusual interfaces to these devices. Often there is a magic code required to allow booting from the cdrom, or to enable the graphics. Fortunately each model laptop is well documented on the web page:

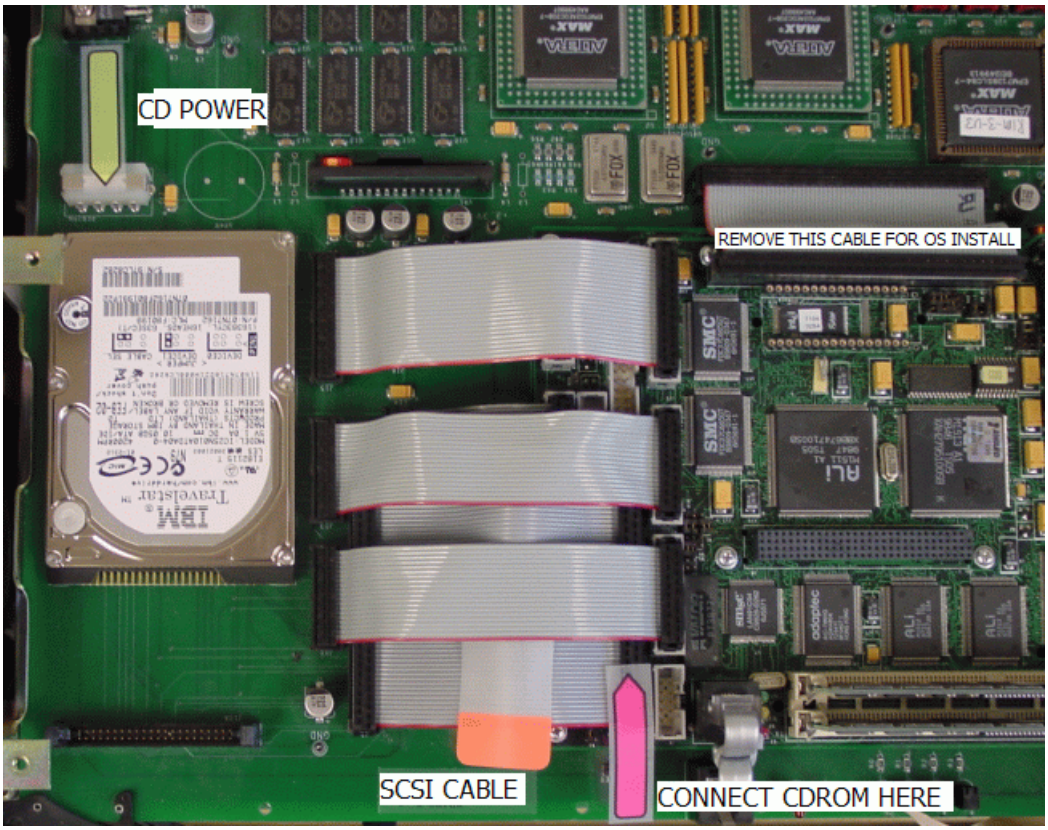
http://Linux-on-laptops.com/

A.13 RxNet7

A.13.1 OS Installation

SIGMET only recommends Red Hat 7.3 for the RxNet7 system. Additionally, a SCSI CDROM is the preferable boot media.

Hardware Preparation:



***Make sure that the proper hardware is plugged in (hard drive not connected here, but should be plugged in the slot underlined in white).**

Booting from CD–ROM:

Press the delete key to enter the BIOS settings. Choose the "BIOS Features Set–up" menu and then make sure that the "Boot Sequence" is set to "CD, A, C". The following picture describes how to connect the SCSI CD–ROM to the RxNet7.

A.13.2 Network Driver

The driver for the RxNet7 network card is not shipped on the standard RedHat 7.2 release CDROM. However, this driver module is shipped on the IRIS Release CDROM. To install the driver, follow the below instructions:

```
# mount /dev/cdrom /mnt/cdrom
# cd /mnt/cdrom/Linux
# cp smc9194.o /lib/modules/2.4.7-10/kernel/drivers/net
```

You are now done with the CDROM and may type:

```
# cd /
# umount /mnt/cdrom
# eject /dev/cdrom
```

This driver can also be obtained from SIGMET's ftp site found below:

ftp.sigmet.com/outgoing/os_patches/Linux/RH7.2/smc9194.o

The networking options for the RxNet7 can now be setup in the **netconf** utility. For kernel driver, specify **smc9194**.