# Sun™ Small Programmable Object Technology (Sun SPOT) Kit Installation Instructions *Release 2.0*

*Sun Labs*
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**Sun Microsystems, Inc.**
4150 Network Circle
Santa Clara, CA 95045 U.S.A.
650 960-1300

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# Sun™ Small Programmable Object Technology (Sun SPOT) Kit Installation Instructions

The Sun Small Programmable Object Technology (Sun SPOT) kit supplies you with three Sun SPOTs and a CD-ROM. This document describes how to install the software development toolkit (SDK) on your host workstation.

**Note –** The Sun SPOT SDK software must be installed on the host workstation before attaching any Sun SPOT to the workstation.

In order, the process is:

# Identify the Parts

Your Sun SPOT kit should have come with two free-range Sun SPOTs and one basestation unit. The basestation unit is thinner and does not have a sensor board. It is a Sun SPOT without battery or sensor board, intended to be used for communication between the host workstation and the free-range Sun SPOTs.

The Sun SPOT kit should also include a USB cable with a standard USB-A end for connection to the host workstation and a mini-USB B end for connection to the USB/battery board.

There will also be a Sun SPOT CD-ROM. This CD-ROM contains versions of the Sun SPOT SDK suitable for

- Windows XP
- Macintosh OS X 10.4 (PowerPC and Intel)
- Linux*

# Install the SDK

1. **Insert the Sun SPOT CD-ROM into the host workstation.**

   Your operating system may automatically open a window showing the contents of the Sun SPOT CD-ROM. If it does not, please open a browser window on the top level directory in the CD-ROM.

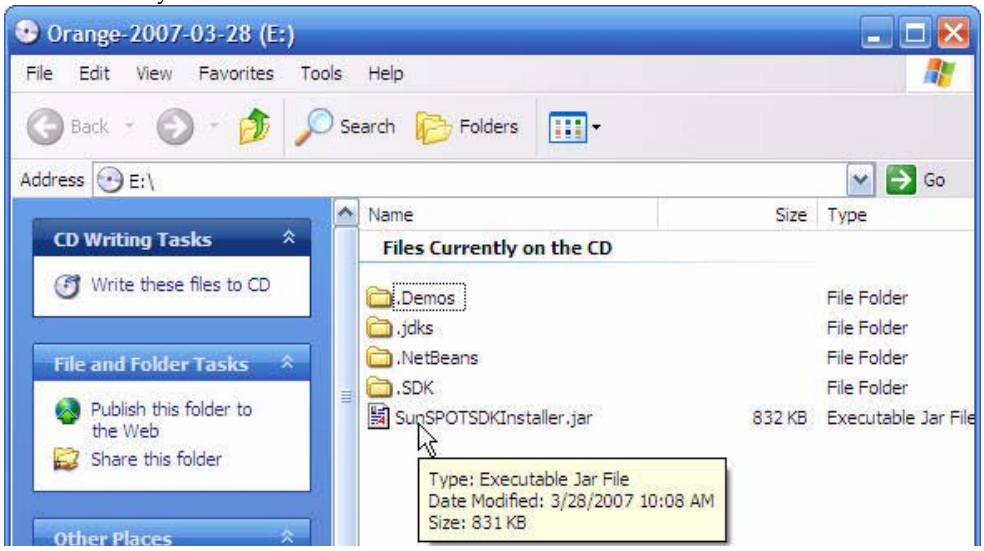



**FIGURE 1** File browser open on the Sun SPOT CD-ROM

*. The SunSPOT SDK has been tested successfully on Fedora Core 5, SuSE 10.1 and Ubuntu 6.06.The SDK is supported on these versions and all versions fully compatible with these versions.

2. **Check what version of Java you have installed on your host workstation, if any.**

   The Sun SPOT SDK requires a Java Development Kit (JDK) from *Sun*. It will work with Sun Java SE 1.5 or later.

   a. **To determine what version of Java you have installed on your host workstation, open a command line window, and type the command "`java -version`".**

      If you do not have any version of Java installed, your system will give an error message complaining about an unknown command.

      If you have a Sun version of Java, it will print something similar to the following:

```
java version "1.5.1_10"
Java(TM) 2 Runtime Environment, Standard Edition (build 1.5.1_10-b03)
Java HotSpot(TM) Client VM (build 1.5.1_10-b03, mixed mode)
```

   b. **If you do not have an appropriate *Sun* version of Java, install one.**

      Windows: The Sun SPOT SDK CDROM has a directory, "`.jdks`". In that directory, there is a file named "`jdk-1_5_0_07-windows-i586-p.exe`" or something similar. Start that executable file to install an appropriate Sun JDK on your host workstation.

      Macintosh: Install the XCode, the Apple Developer Tool Suite. XCode includes an appropriate JDK.

      Linux: The Sun SPOT SDK CDROM has a directory "`.jdks`". In that directory, there is a file named "`jdk-1_5_0_07-linux-i586.bin`" or something similar. Start that executable file to install an appropriate Sun JDK on your host workstation. Non-Sun JDKs (e.g. from GNU) almost certainly will not work correctly.

      If there is a workable Sun JDK on your distribution, please use that. If there isn't, you may be able to find a suitable JDK at `java.sun.com`. Please be sure to use the specific means recommended for your particular Linux distribution to download and install Java SE JDK 1.5 or later from Sun and make it the default Java. To confirm that the Sun Java *is* the default, execute the command "`java -version`" confirm that it shows version 1.5 or later. Other JDKs (e.g. from GNU) may not work correctly.

**c. Check to see if `JAVA_HOME` is set properly.**

`JAVA_HOME` is an environmental variable which should be equal to the directory in which your JDK resides.

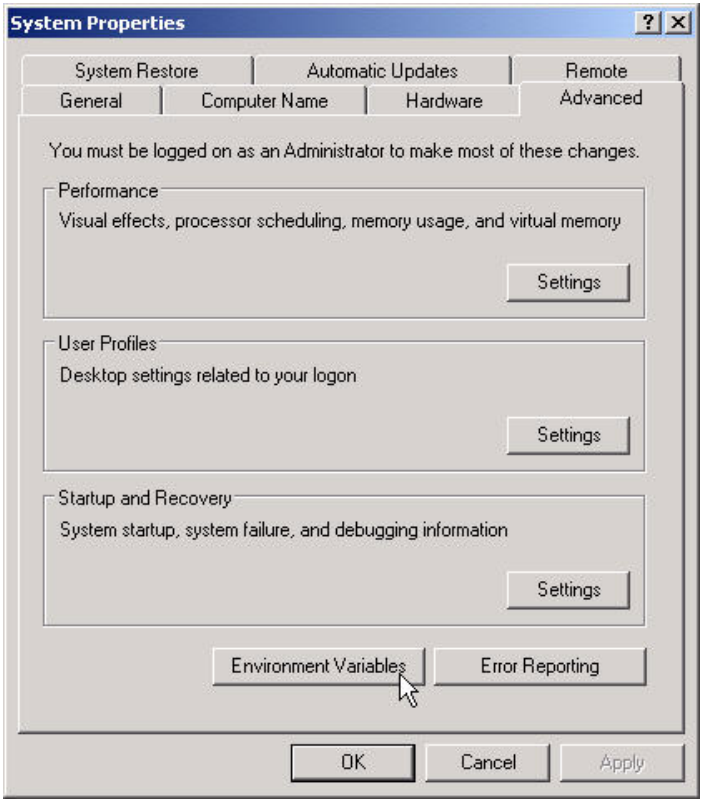
Windows: To check `JAVA_HOME`, open a command line window. Command line windows are available under *Start* > *All Programs* > *Accessories* > *Command Prompt*. In the command line window, enter the command "`set`". A list of environmental variables should display in alphabetical order. If `JAVA_HOME` is among them and is set to the your JDK directory, you can skip Step d, below.

Macintosh: No need to check. This variable was set when XCode was installed.

Linux: To check `JAVA_HOME`, open a command line window. Enter the command "`env`". A list of environmental variables should display. If `JAVA_HOME` is among them and is set to the appropriate directory, you can skip Step d, below.

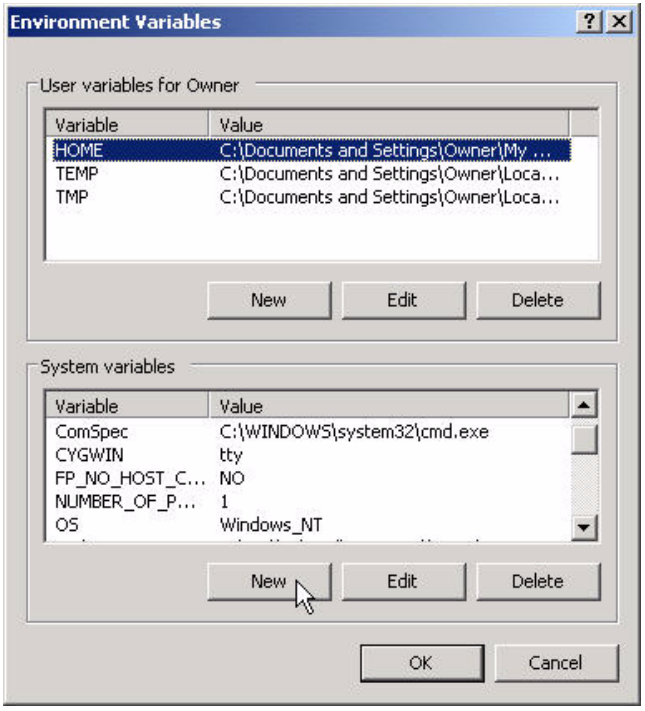
**d. If necessary, set `JAVA_HOME` to the JDK installation directory.**

Windows: Right click on *My Computer* on your desktop or the *My Computer* choice on the *Start* menu. Select *Properties* from the menu that appears. Click on the *Advanced* tab in the dialog box. Click on the *Environmental Variables* button at the bottom.

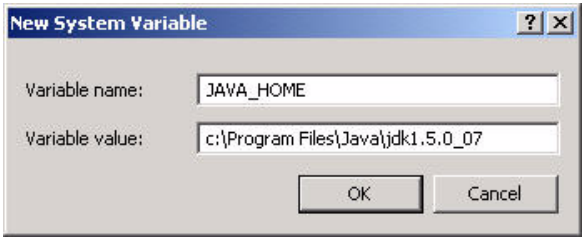



Another dialog box will display. Click *New* in the System Variables section of that

dialog box




Enter the name `JAVA_HOME` and the location of the Java JDK.




Click on the OK buttons in the cascade of dialog boxes to enter the new variable.

Macintosh: `JAVA_HOME` is set when the XCode tools are installed. You don't need to do anything additional.

Linux: Use the method appropriate to your command shell to add `JAVA_HOME` as an environmental variable equal to the JDK directory. For example, for a `csh` equivalent, add something like

```
setenv JAVA_HOME jdk-directory-location
```

to your `.cshrc` file, where "`jdk-directory-location`" is the directory in which you installed the JDK. For a `bash` equivalent, add

```
JAVA_HOME=jdk-directory-location
export JAVA_HOME
```

to the `.bashrc` or `.bash_profile` file, whichever is appropriate for your version of bash.

**e. Check to see if `PATH` is set properly.**

`PATH` is an environmental variable which determines what directories the system uses to search for commands and the order in which the system searches through them. `PATH` needs to have the SUN JDK `bin` directory at the front, so that the right version of Java will execute when a Java command is executed.

`PATH` is capitalized differently on Windows than it is on Macintosh or Linux systems. Under Windows, it is mixed case: `Path`. Under Macintosh and Linux, it is all upper case: `PATH`.

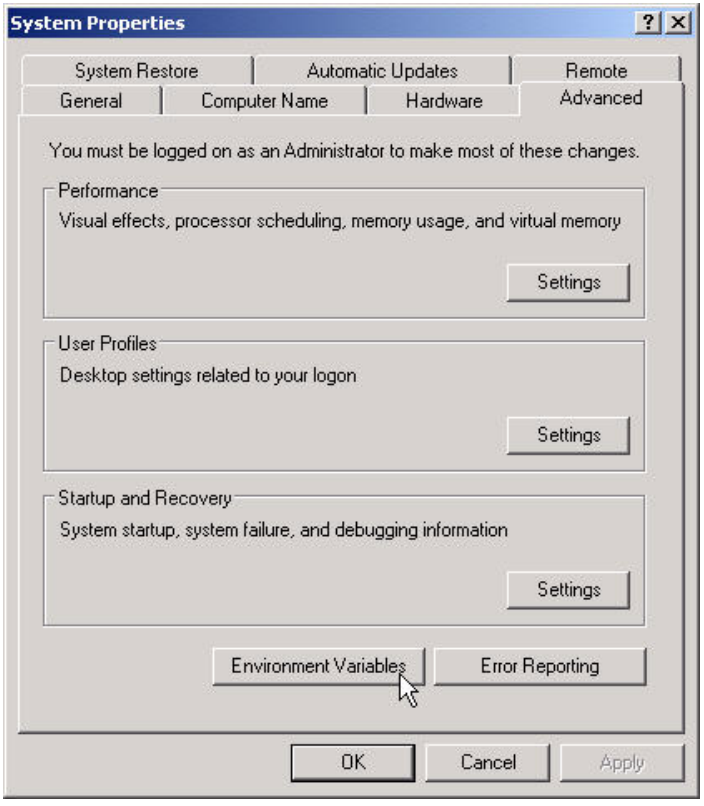
*Windows:* To check `Path` open a command line window. Command line windows are available under *Start* > *All Programs* > *Accessories* > *Command Prompt*. In the command line window, enter the command "`set`". A list of environmental variables should display in alphabetical order. Look at `Path`. If it lists your JDK directory at the *front*, you can skip Step f, below.

*Macintosh:* No need to check. Equivalent modifications were made when XCode was installed.

*Linux:* To check `PATH`, open a command line window. Enter the command "`env`". A list of environmental variables should display. If PATH lists your JDK directory at the *front*, you can skip Step f, below.

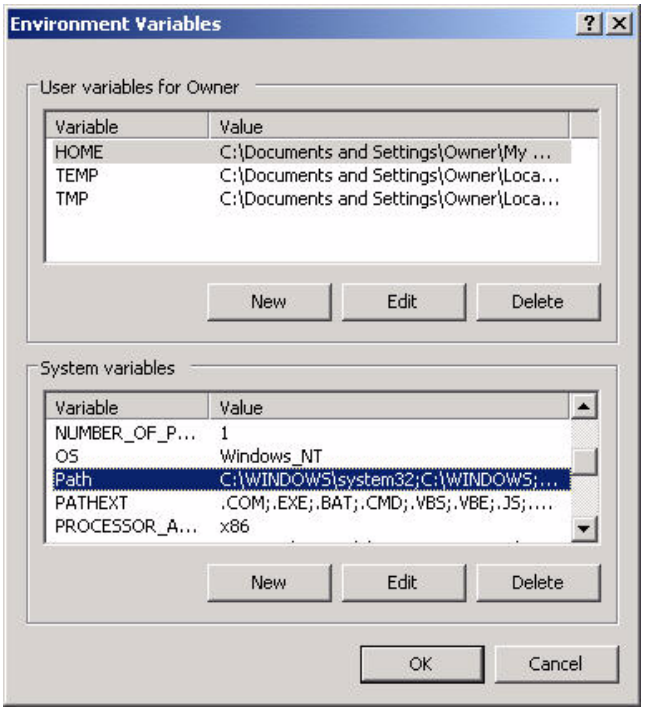
**f. If necessary, change `PATH` to include the JDK installation `bin` directory at the beginning.**

*Windows:* Right click on *My Computer* on your desktop or the *My Computer* choice on the *Start* menu. Select *Properties* from the menu that appears. Click on the *Advanced* tab in the dialog box. Click on the *Environmental Variables* button at the bottom.

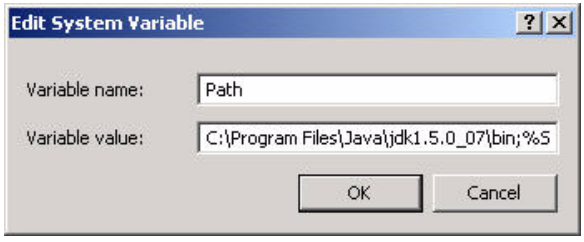



Another dialog box will display. Select `Path` in the list of System Variables and

click on the *Edit* button.




Edit the *Variable value* field to add the location of the Java JDK followed by the characters "\bin;" to the front to the value. For example, if the JDK was installed




in

```
C:\Program Files\Java\jdk1.5.0_07
```

then you should add

```
C:\Program Files\Java\jdk1.5.0_07\bin;
```

to the front of the existing `Path` variable.

Click on the OK buttons in the cascade of dialog boxes to enter the new variable.

*Macintosh:* You don't need to do anything additional. Equivalent modifications were made when XCode was installed.

*Linux:* Use the method appropriate to your command shell to modify `PATH` include the `bin` subdirectory of the JDK directory. For example, for a `csh` equivalent, add something like

```
set PATH $JAVA_HOME/bin:$PATH
```

to your `.cshrc` file. For a `bash` equivalent, add

```
export PATH=$JAVA_HOME/bin:$PATH
```

to the `.profile` or `.bash_profile` file, whichever is appropriate for your version of `bash`.

3. **Use Java to open and run the `SunSPOTSDKInstaller.jar`.**

   a. **If you have Java installed and selected to open jar files, opening the jar file in the CDROM browser window will start the installer.**


**FIGURE 2** Installer welcome screen.

If the Installer window opens, you can skip Step b, below, and go directly to Step 4, on page 11.

   b. **If your computer has Java installed, but does not have Java as the default way to open jar files, you will need to invoke Java on the file explicitly.**

      i. **Open a command window.**

      Under Windows, this is usually available from Start > All Programs > Accessories > Command Prompt.

Under Linux, any command shell will work.

**ii. Set your current directory to the root directory of the CDROM.**

Under Windows: If the CDROM is the "D" drive, then

```
D:
cd /
```

Under Linux, the location of the CDROM will depend on the version of Linux that you have. Possibilities include /media, /media/cdrom, `/dev/cdrom`, and others. Consult your Linux documentation to determine the directory name used on your distribution. If the CDROM is `/media`, then

```
cd /media
```

**iii. Invoke Java on the file `SunSPOTSDKInstaller.jar`:**

```
java -jar SunSPOTSDKInstaller.jar
```

Java will load and the Installer welcome screen, shown in FIGURE 2, will display.

Linux note: Some Linux distributions convert all filenames to lowercase.

**4. Click on "Continue" to continue with the SDK installation.**

The installer will then display the Sun SPOT SDK license agreement and the software licenses for several public software packages.


**FIGURE 3** Software license agreement

5. **Click on the "Accept" button to accept the license agreements.**

   You will need to scroll to the bottom of the license agreement before you will be able to click on the "Accept" button.

   The installer will then inspect the software installed on your system and select the additional software needed for the SDK. It will display a list of software which it plans to install.

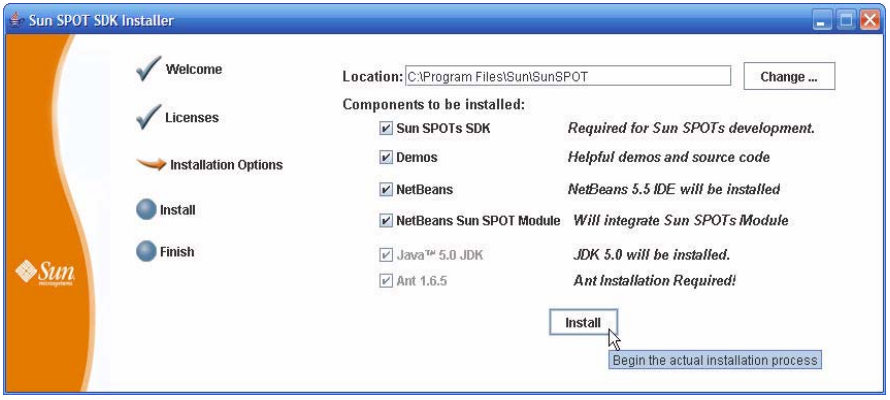



**FIGURE 4** Software scheduled for installation.

You may select and deselect software packages as you see fit. Ordinarily, it is best to accept the installer's choices.

6. **When you have selected the software for installation, click on the “Install” button.**

The installer will then begin installing software, displaying progress on the screen.

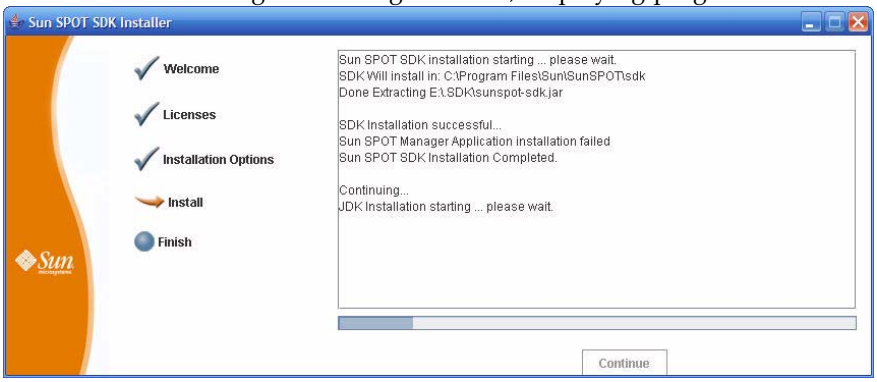
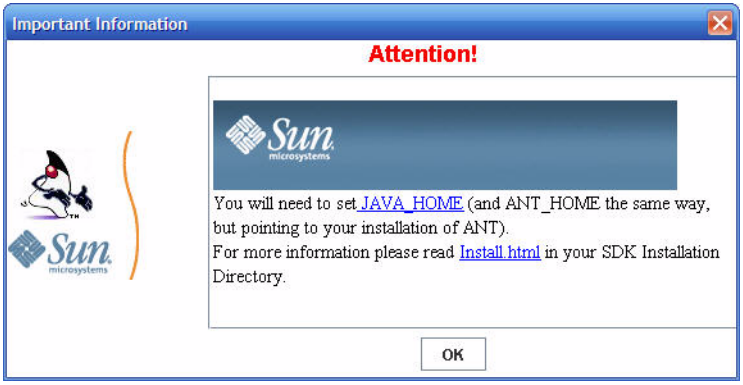



**FIGURE 5** The installer displays the installation progress.

If Ant has not been previously installed on this machine, a dialog box will appear at this point:




You will set `Ant_Home` later in the installation, during Step 15.

During the installation, depending on your earlier choices and your operating

platform, the installer may install the NetBeans IDE:


**FIGURE 6** Welcome screen for the NetBeans installation

7. **Click on the "Next" button to begin NetBeans installation.**

   The installation software will then display the NetBeans license agreement:

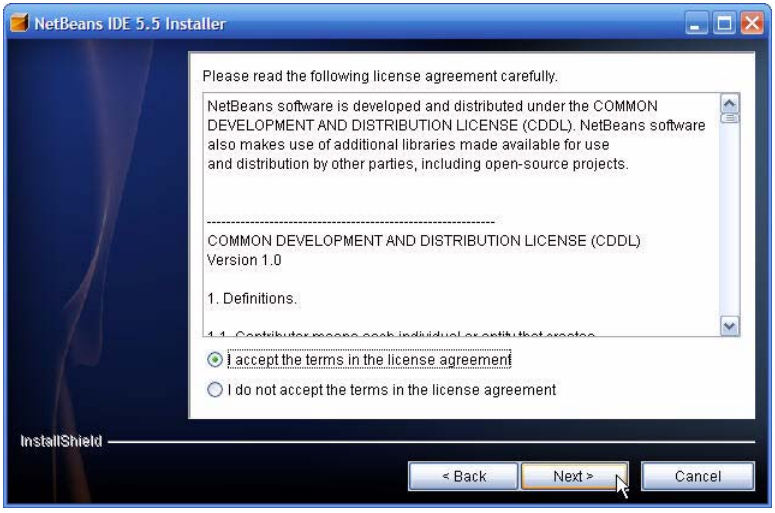



**FIGURE 7** NetBeans license agreement

8. **Select the “I accept” radio button to accept the license agreement, then click on the “Next” button to proceed.**

   The NetBeans installer will ask in which directory to NetBeans software should be installed. The default varies with the underlying operating system type. We recommend that you install NetBeans in the default location.

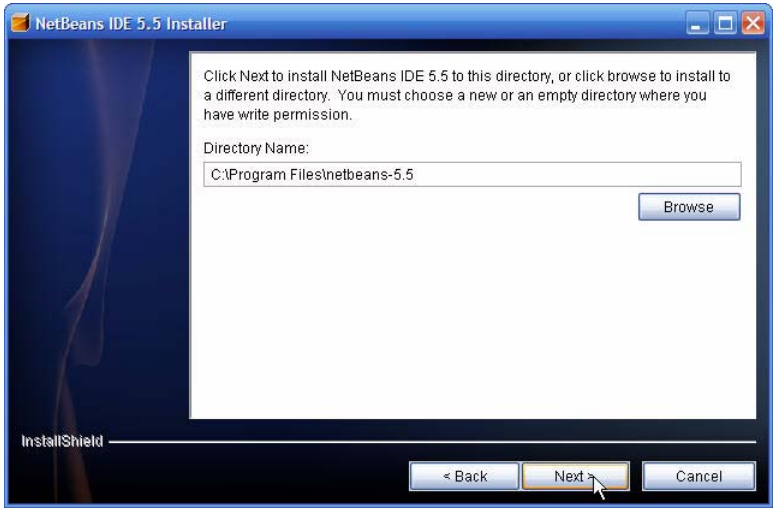



**FIGURE 8** NetBeans install directory choice

9. **Specify a NetBeans directory or accept the default directory choice. Click on the "Next" button to proceed.**

   The NetBeans installer will inspect the version of Java that is installed on the host workstation and determine if NetBeans can be installed on top of that version. If more than one Java is available, NetBeans will ask you to choose between the Java versions.

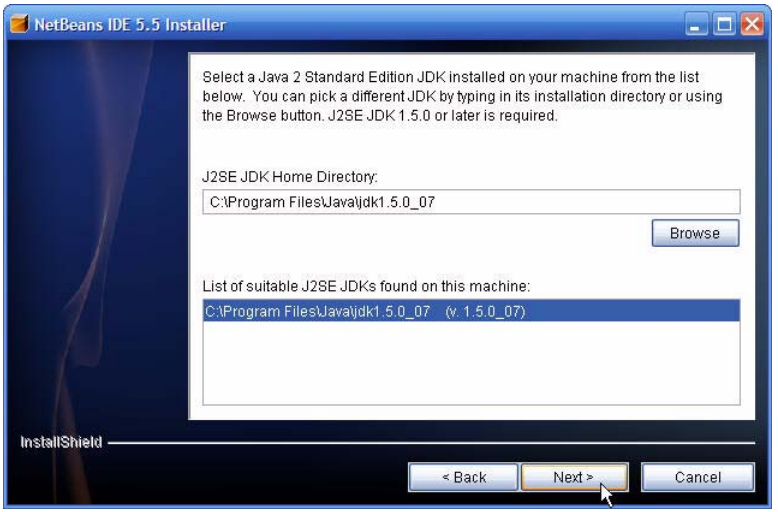



**FIGURE 9** Choosing a version of Java for NetBeans.

10. **If more than one version of Java is available, choose the one in which you prefer to work. The version must be a Sun Java 1.5.0 or later. Click on the "Next" button to continue.**

11. **The NetBeans Installer will show you how much room it will require to complete the installation. Click on the "Next" button to continue with the installation.**

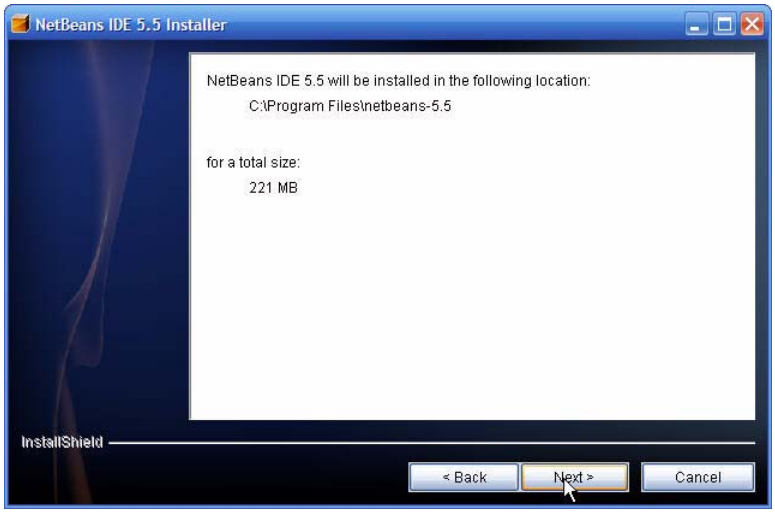



**FIGURE 10** NetBeans installation shows the disk space required.

As the software is installed, a progress bar will show the percentage of completion.

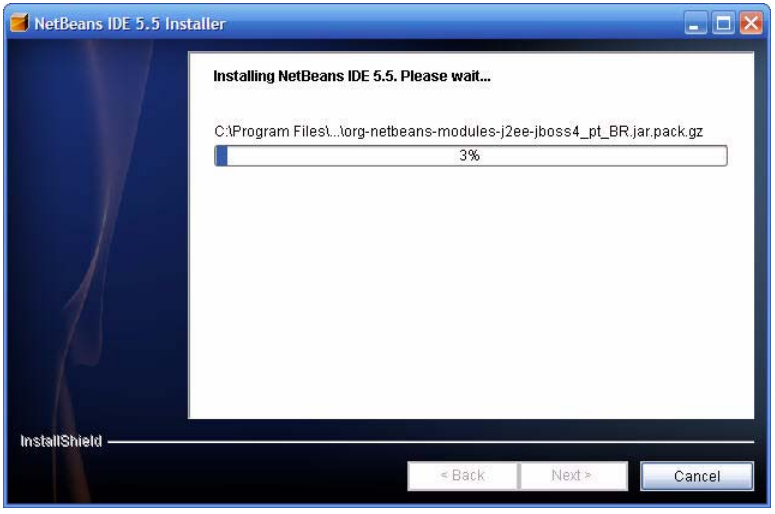



**FIGURE 11** NetBeans software installation in progress

12. **When the NetBeans software has been installed, click on the “Finish” button.**

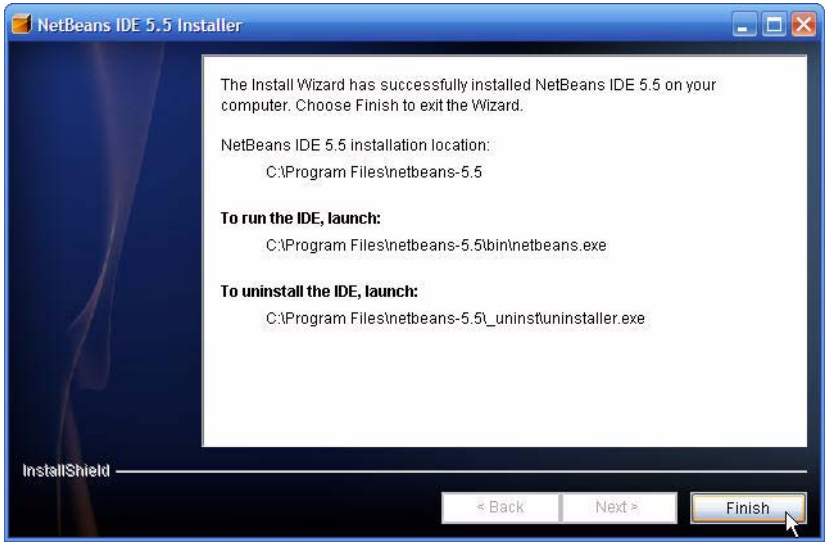



**FIGURE 12** NetBeans installer is done.

After NetBeans has been installed and you have clicked on the “Finish” button, focus will return to the Sun SPOT SDK installation window.

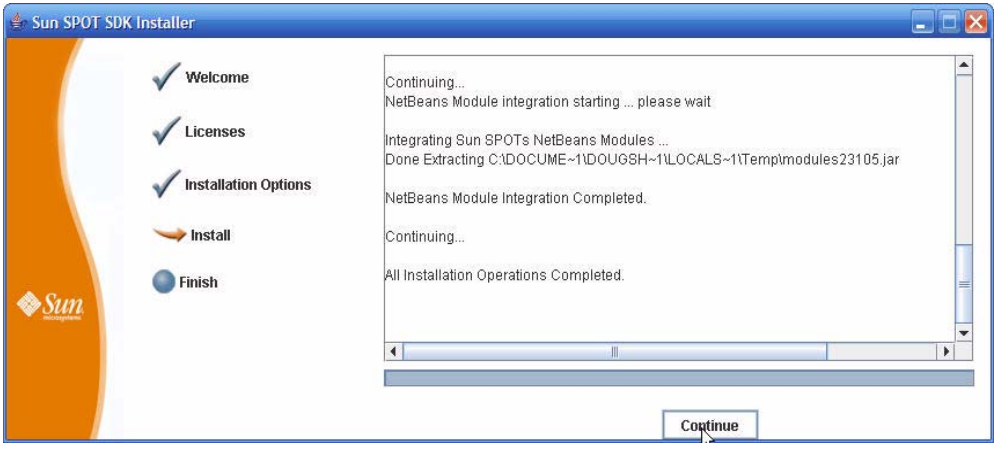



**FIGURE 13** Sun SPOT SDK software installer is finished with installation tasks.

13. **Click on the “Continue” button.**

    The Sun SPOT SDK will display its completion screen.

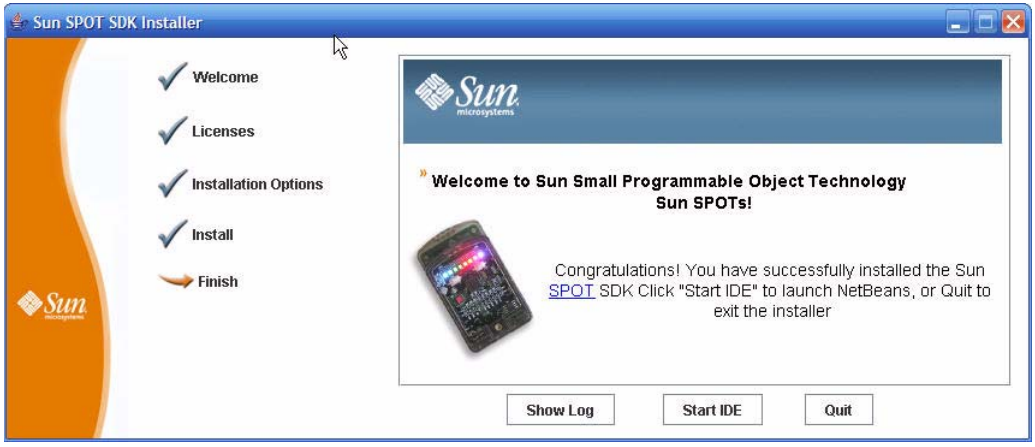



**FIGURE 14** Sun SPOT SDK installation is complete.

At this point, the Sun SPOT SDK has been installed. If you wish to find out exactly what changes have been made, click on the “Show Log” button. If you have installed NetBeans and wish to launch it, clicking on the “Start IDE” button will start NetBeans.

Launching the IDE will also launch a browser window that includes pointers to the Sun SPOT tutorial and most of the important Sun SPOT documentation and tutorials. The fastest way of getting started with Sun SPOTs is to go through the tutorial.

14. **Click on the “Quit” button to finish the SDK installation.**

    The Sun SPOT SDK is now installed.

15. **If necessary, set ANT_HOME.**

    a. **Check to see if `ANT_HOME` is set properly.**

    `ANT_HOME` is an environmental variable which should be equal to the directory in which `Ant` was installed. `Ant` commands are used extensively in Sun SPOT development.

    If `Ant` was installed as part of the Sun SPOT SDK, it will have been installed in the user’s home directory. Under windows, this will probably be

    ```
    c:\Documents and Settings\Owner\apache-ant-1.6.5
    ```

    Under Linux, this will probably be:

```
/home/owner/apache-ant-1.6.5
```

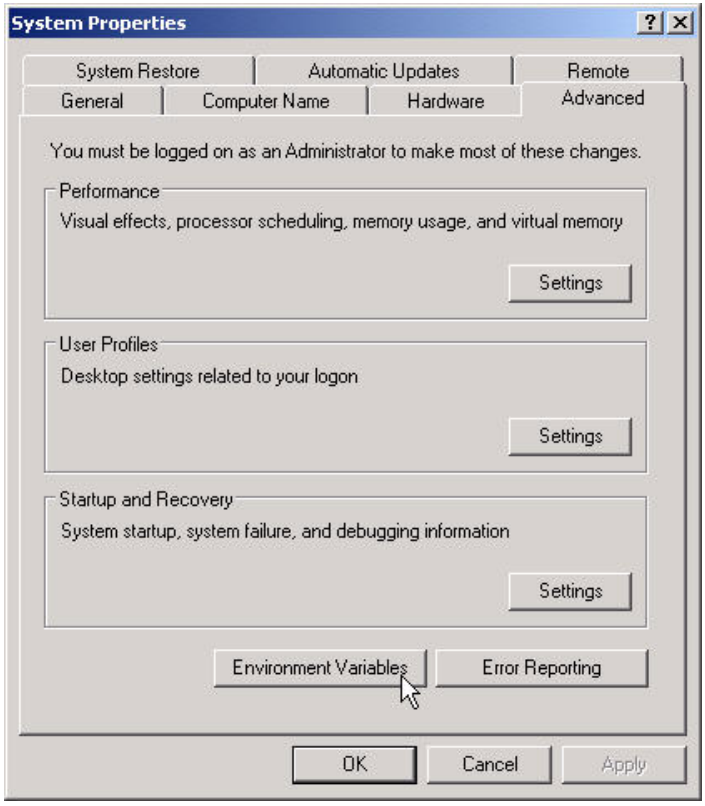
Windows: To check `ANT_HOME`, open a command line window. Command line windows are available under *Start* > *All Programs* > *Accessories* > *Command Prompt*. In the command line window, enter the command "`set`". A list of environmental variables should display in alphabetical order. If `ANT_HOME` is among them and is set to the appropriate directory, you can skip Step d, below.

Macintosh: No need to check. This variable was set when XCode was installed.

Linux: To check `ANT_HOME`, open a command line window. Enter the command "`env`". A list of environmental variables should display. If `ANT_HOME` is among them and is set to the appropriate directory, you can skip Step d, below.

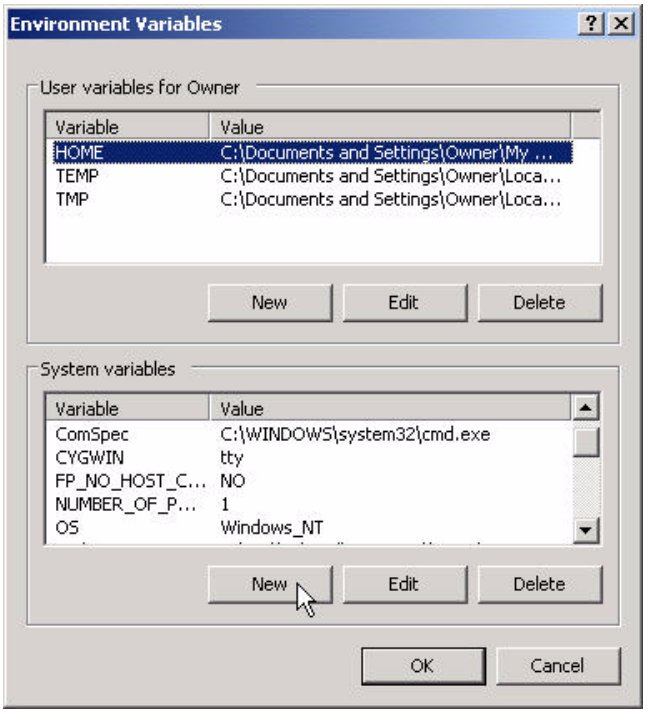
**b. If necessary, set `ANT_HOME` to the ANT installation directory.**

Windows: Right click on *My Computer* on your desktop or the *My Computer* choice on the *Start* menu. Select *Properties* from the menu that appears. Click on the *Advanced* tab in the dialog box. Click on the *Environmental Variables* button at the bottom.

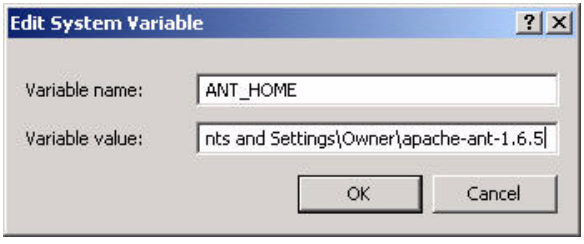



Another dialog box will display. Click *New* in the System Variables section of that

dialog box




Enter the name ANT_HOME and the location of the `Ant` directory. By default,




Ant is installed in a sub-directory, named `apache-ant-1.6.5` within the user's home directory. Under Windows, this is `C:\Documents and Settings\Owner\apache-ant-1.6.5`.

Click on the OK buttons in the cascade of dialog boxes to enter the new variable.

*Macintosh*:ANT_HOME is set when the XCode tools are installed. You don't need to do anything additional.

*Linux*: By default, `Ant` will be installed in a subdirectory, named `apache-ant-1.6.5`, within the installing user's home directory. Use the method appropriate to your command shell to set ANT_HOME to the `Ant` installation directory. For example, for a `csh` equivalent, add something like

```
setenv ANT_HOME ant-directory-location
```

to your `.cshrc` file, where "`ant-directory-location`" is the directory in which `Ant` was installed. For a `bash` equivalent, add

```
ANT_HOME=ant-directory-location
export ANT_HOME
```

to the `.profile` or `.bash_profile` file, whichever is appropriate for your version of bash.

**c. Check to see if `PATH` is set properly.**

`PATH` is an environmental variable which determines what directories the system uses to search for commands and the order in which the system searches through them. `PATH` needs to include the `Ant bin` directory, so that `Ant` can be run at the command line.

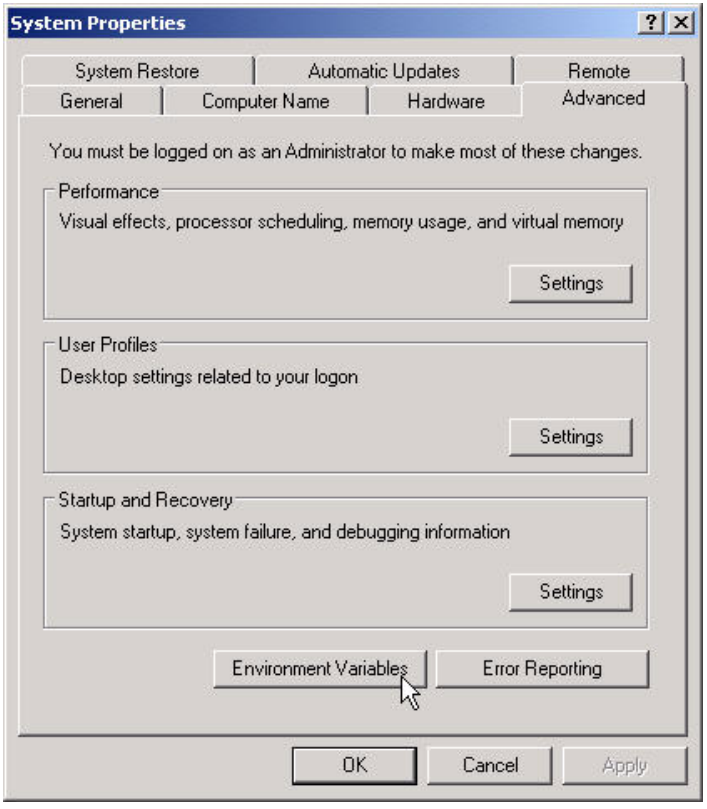
*Windows:* To check `PATH`, open a command line window. Command line windows are available under *Start* > *All Programs* > *Accessories* > *Command Prompt*. In the command line window, enter the command "`set`". A list of environmental variables should display in alphabetical order. Look at `PATH`. If it lists your `Ant/bin` directory anywhere, you can skip Step f, below.

*Macintosh:* No need to check. Equivalent modifications were made when XCode was installed.

*Linux:* To check `PATH`, open a command line window. Enter the command "`env`". A list of environmental variables should display. If PATH lists your `Ant/bin` directory anywhere, you can skip Step f, below.

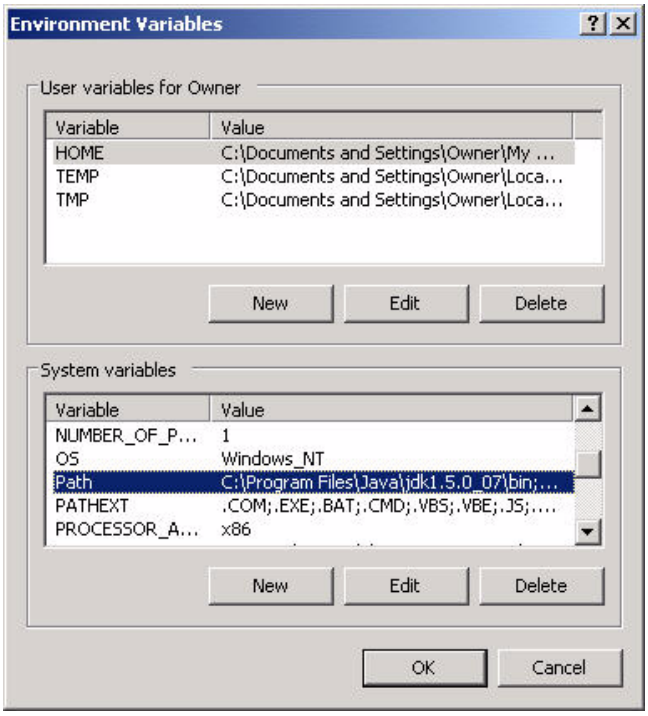
**d. If necessary, change `PATH` to include the Ant installation `bin` directory at the beginning.**

*Windows:* Right click on *My Computer* on your desktop or the *My Computer* choice on the *Start* menu. Select *Properties* from the menu that appears. Click on the *Advanced* tab in the dialog box. Click on the *Environmental Variables* button at the bottom.

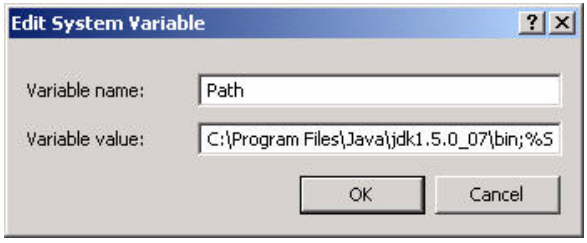



Another dialog box will display. Select `Path` in the list of System Variables and

click on the *Edit* button.




Edit the *Variable value* field, adding the character ";" followed by the `Ant` installation path name, followed by the characters "\bin" to the *back* of the existing value. For example, if `Ant` was installed in




```
C:\Documents and Settings\Owner\apache-ant-1.6.5
```

then you should add

```
;C:\Documents and Settings\Owner\apache-ant-1.6.5\bin
```

to the back of the existing `Path` variable.

Click on the OK buttons in the cascade of dialog boxes to enter the new variable.

*Macintosh:* You don't need to do anything additional. Equivalent modifications were made when XCode was installed.

*Linux:* Use the method appropriate to your command shell to modify `PATH` include the `bin` subdirectory of the ANT directory. For example, for a `csh` equivalent, add

```
set PATH $PATH:$ANT_HOME/bin
```

to your `.cshrc` file. For a `bash` equivalent, add

```
export PATH=$PATH:$ANT_HOME/bin
```

to the `.profile` or `.bash_profile` file, whichever is appropriate for your version of `bash`.

# Install the Sun SPOT USB Driver (Windows)

If you have a Windows host workstation, you must install the Sun SPOT USB driver. This will happen semi-automatically when you connect any Sun SPOT to the host workstation. One of your three Sun SPOTs is intended as a basestation unit. It is the thinner Sun SPOT. We suggest you connect this unit to your host workstation before the other Sun SPOTs.

1. **Connect the USB cable to the host workstation and to the Sun SPOT.**

   The Windows “Found New Hardware” wizard will display.


**FIGURE 15** The Windows “Found New Hardware Wizard”

2. **Select the option “Install the software automatically” and click the “Next” button.**

Windows will search for the Sun SPOT driver and install it.

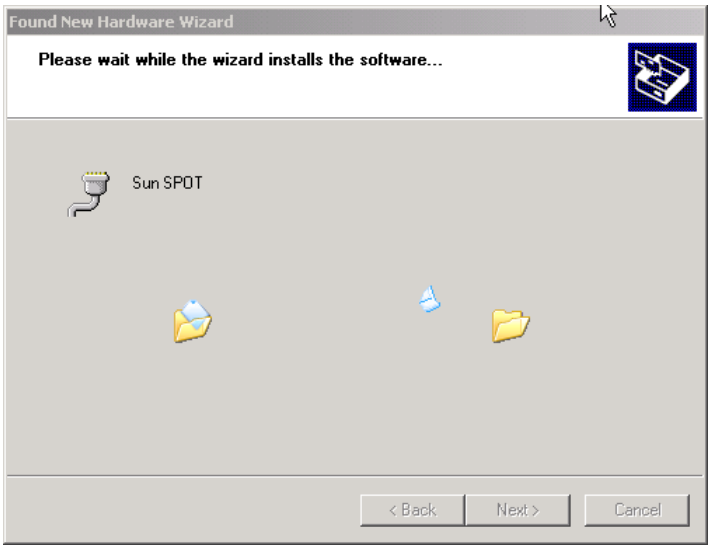



**FIGURE 16** Windows installs the Sun SPOT driver.

The driver has not been certified by Microsoft, so the Windows installer may warn you of the lack of vertification.

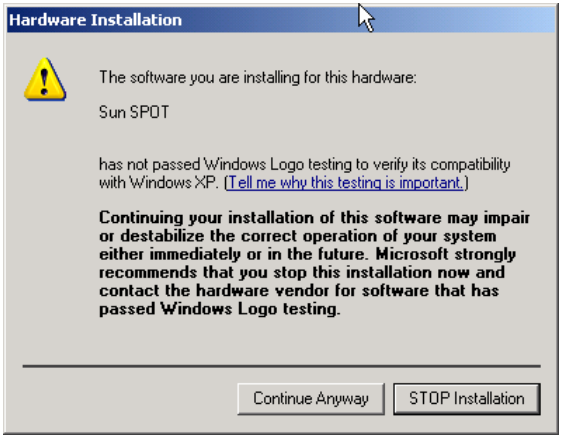



**FIGURE 17** Windows asks permission to install the driver

3. **Click on the “Continue Anyway” button.**

   When the USB driver installation is complete, Windows will display a completion notice.

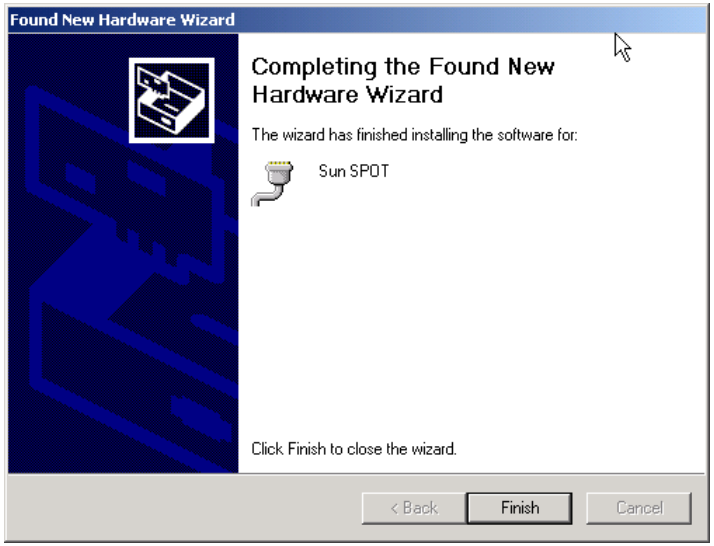



**FIGURE 18** Windows has finished installing the Sun SPOT driver

4. **Click on the “Finish” button to exit the USB driver installation.**

   Your Sun SPOT should now be installed properly on your Windows host workstation.

5. **Repeat this procedure for the other Sun SPOTs in your kit.**

   Windows can distinguish between individual Sun SPOTs and will assign a different COM port to each SPOT. Each time a new Sun SPOT is plugged into a given Windows host workstation, Windows will initiate another USB driver installation. Selecting the “Install Automatically” option is the quickest and easiest way of completing the necessary installation. Attach the other Sun SPOTs, one by one, to the USB cable now and allow Windows to install the driver and create the COM port for that SPOT.

# Adjust Permissions (Linux)

The Sun SPOT SDK uses the RXTX library to access devices, including the Sun SPOTS, over the USB serial port. Therefore the SDK user must have read and write permission to both the serial device and the lock files. On some Linux distributions, e.g. Ubuntu 6.06, the access rights are set appropriately. For most Linux

distributions, the user has to be explicitly given access permission by manually adding read and write permission to the groups owning the serial devices and lock files.

On the tested distributions, Suse 10.1 and Fedora Core 5, the required groups are "`uucp`" and "`lock`". This may be different in your installation, so check to see which group owns the serial device and "`/var/lock`". The actual command to add a user to a group, differs for various distributions. Consult the distribution's documentation for the exact command.

After adding the user to the group, you should logout and login again to allow the changes to take effect.

# Create a Utility Directory (Macintosh)

This SDK uses RXTX, an open source serial communication library. This library attempts to respect as many standards as possible when using serial devices, which includes the location and use of lock files. Therefore, the user account that you will use to deploy Sun SPOT applications must have write permissions on the following directories:

- `/var/spool/lock`
- `/var/lock`

Login as the `admin` user and set up the `/var/lock` directory:

```
sudo mkdir /var/lock
sudo chgrp uucp /var/lock
sudo chmod 775 /var/lock
```

You should also add yourself to the `uucp` group, using the command:

```
sudo niutil -appendprop / /groups/uucp users <your login>
```

If you have used a previous version of RXTX, it may have used the `/var/spool/uucp` directory for its locking files and it will be necessary to delete any left-over files that may be in `/var/spool/uucp`.

Logout and login back in for these changes to take effect. On some machines, you may need to shutdown and reboot for the changes to take effect.

# Ant Upgrade

Occasionally, the installation software will advise you to do an “ant upgrade” after the installation is complete. This means that the SDK has a more recent version of the SPOT firmware or operating software than is installed on the SPOT. The “ant upgrade” procedure installs the newer version from the SDK onto the SPOT.

The procedure has two parts. First you install the new version of the SPOT software, then, if necessary, restore the application software resident on the SPOT.

## Install New SPOT System Software

To install the newest SPOT system software:

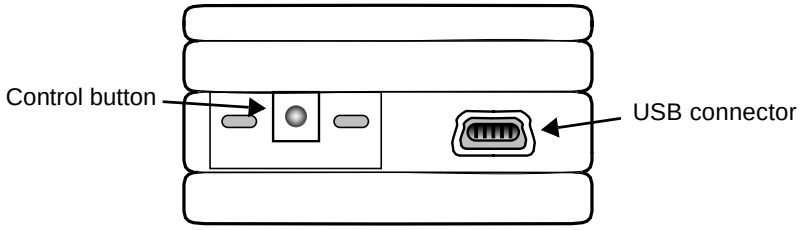
1. **Open a command line window.**
2. **Navigate to a Sun SPOT project directory.**

   SPOT-related ant commands need to be executed from within a SPOT-related project directory. If you will be running the tutorial, a convenient location would be `[SunSPOTdirectory]/Demos/BounceDemo/BounceDemo-onSPOT`.
3. **Connect the SPOT to be upgraded to the USB cable.**
4. **Execute the command “`ant upgrade`”.**

   The upgrade procedure will take about two or three minutes. The upgrade procedure may stall, displaying a message:

```
[java] Waiting for target to synchronise...
[java] (please reset SPOT if you don't get a prompt)
```

If this happens, please press and release the control button on the Sun SPOT. The




software install process should continue after the SPOT synchronizes with the host workstation.

When the upgrade procedure is done, the control window should display something like

```
[echo] Upgrade complete
[echo]
[echo] IMPORTANT
[echo]
[echo] If the device upgraded is to be a basestation then you must
now execute:
[echo]
[echo] ant selectbasestation
[echo]
[echo] and then press the control button.
[echo]

upgrade:

BUILD SUCCESSFUL
Total time: 2 minutes 2 seconds
```

5. **Repeat this procedure on all the Sun SPOTs in the kit.**

## Restore the Application Software on the SPOTs

The upgrade procedure will remove the application software from the Sun SPOTs. It will also disable the basestation software on the basestation SPOT. If the basestation is going to be used as a basestation, that software must be re-enabled and started. In

addition, if any of the free-range SPOTs had useful application software on them, that software must be redeployed to the SPOTs. If you are planning on doing the tutorial, the Bounce Demo must be redeployed to both free-range SPOTs.

### *To Restore the Bounce Demo to the Free-Range SPOTs*

1. **Open a command window.**
2. **Navigate to the Bounce Demo project directory.**

   The Bounce Demo directory is `[SunSPOTdirectory]/Demos/BounceDemo/BounceDemo-onSPOT`.
3. **Connect the free-range SPOT to the USB cable.**
4. **Execute the command "`ant deploy`".**

   You may need to again press and release the control button to synchronize the SPOT and the host workstation and allow the software download to proceed.

   Repeat this procedure with all of the free-range Sun SPOTs.

### *To Restore the Basestation Software to the Basestation SPOT*

1. **Open a command window.**
2. **Navigate to a Sun SPOT project directory.**
3. **Connect the basestation SPOT to the USB cable.**
4. **Execute the command "`ant selectbasestation`".**

   You may need to again press and release the control button to synchronize the SPOT and the host workstation and allow the software download to proceed.
5. **After the download has completed, press and release the control button on the basestation SPOT to start it operating as a basestation.**

## What to Do Next (All Platforms)

If you installed the NetBeans development tool, please start NetBeans now. It will launch a browser window displaying a series of links, including one for the Sun SPOT tutorial. This tutorial can also be started by loading `[SunSPOTdirectory]/sdk/doc/tutorial/Tutorial.html` into a web browser.

This tutorial will guide you through a series of demos, through the process of making changes to a Sun SPOT Java program, downloading it to a SPOT and running it. We heartily suggest that your next task, after installing the Sun SPOT

SDK, should be to run through the Sun SPOT tutorial once. After that, you should look through the demos in the `[SunSPOTdirectory]/Demos` directory, particularly, the small applications in the `[SunSPOTdirectory]/Demos/CodeSamples`. You will also find PDFs of the *Sun SPOT Owner's Manual* and the *Sun SPOT Developer's Guide* to be very useful. You can find these in the directory `[SunSPOTdirectory]/sdk/doc`.

# Upgrading from Release 1.0 to Release 2.0

If you already have Sun SPOTs and want to upgrade from Release 1.0 to Release 2.0, the steps, briefly, are:

1. **Make sure you have Java 1.5.0 or better.**

   Release 1.0 worked with Java 1.4.2 or better. Release 2.0 requires Sun Java 1.5.0 or better.

2. **Install the new SDK**

   You can do this either by following the installation instructions above or you can use the Sun SPOT SDK Manager to download the new SDK software over the Internet.

   The Sun SPOT SDK Manager is on the distribution CDROM as a `jar` file. To start the tool, copy it to any location on your host workstation and start it. On host stations with Java installed, clicking on the jar file is usually enough. The application in the jar file can also be explicitly launched with

   ```
   java -jar SPOTManager.jar
   ```

   Once the SPOT SDK Manager application is launched, SPOT SDK Manager tool will contact the Sun SPOT website and display the available versions of the Sun SPOT SDK. Selecting the SDK tab will allow you to see the choices. Select an SDK version from the right hand panel and then install it using the Install button beneath the list of choices.

3. **Upgrade the software on the individual Sun SPOTs.**

   The software on the Sun SPOTs needs to be consistent with the SDK being used. The SPOT-resident software can be installed by attaching the SPOTs to a USB port and executing the command "`ant upgrade`". After upgrading, basestations should also be returned to basestation status by executing the "`ant selectbasestation`" command.

   The SPOT-resident software can also be installed from within the SPOT SDK Manager. Select the Sun SPOTs tab. It will show all Sun SPOTs currently attached to the host workstation. Select the individual SPOTs to be upgraded, then click on the Upgrade button.

4. **Adjust your application programs to use the new `IAccelerometer3D` and `RadiostreamConnection` APIs.**

   There is a AppNote on the new accelerometer interface. It is in the `[SDKdirectory]/doc/AppNotes/AccelerometerAppNote.pdf`

   The previous radio API, `RadioConnection`, continues to work, but is now deprecated. See the Javadoc for details on `RadioConnection` and related classes.

5. **Reload the reworked application programs on the SPOTs**