nucore

USER MANUAL

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Installation Instructions

The following section will walk you through step by step instructions on how to install Ubuntu Linux and Nucore. Before you proceed make sure you have the latest installation instructions and Nucore deploy by checking the Support forum at:

http://www.bigguyspinball.com/community/

Section One - Requirements

Nucore runs on Ubuntu Linux version 8.04 LTS. It is possible that Nucore will run on other Linux distros but Ubuntu is the only fully-tested and supported version of Linux. You must install Linux before proceeding (see Section Two.)

A. Machine Specifications (Minimum)

- Intel (E-6600) or AMD X2 5000 dual-core processor (or greater)
- 2GB of system ram
- 8GB of mass storage (for os and application)
- Compatible video - integrated or card (for use with original Pin2000 monitors an Ultimarc Arcade VGA PCI adapter or another video card with a scan line converter. Not required for use with a LCD monitor)
- Compatible sound - integrated or card (check Ubuntu site for suggestions)
- CDROM drive for initial software load

B. Software requirements

Ubuntu 8.04 LTS
(The installation CD was supplied with your package)

C. Other Requirements

Internet access (installation only)

Newer hi-res monitor (installation only)

USB thumb drive (FAT32 format) for upgrades and loading music.

Section Two – Computer BIOS Settings

Bios settings are very important for game speed and sooth graphics. We need to maximize speed and turn off all power saving features that will cause delays. The items below are common settings. The names may vary from bios to bios and some may not be available. Some bios' are organized as basic/advanced, some have separate menus for power management. Be aware that some menus have scroll bars with hidden items on the menu that are off the bottom of the screen.

Speed:
1) System Bios Cacheable - Enabled.
2) CPU internal Cache - Enabled.
3) External Cache - Enabled.
4) Video Bios Cacheable - Enabled

Power Management
1) CPU throttling

On AMD based systems this is called "Cool and Quiet". Make sure this is disabled

On Intel Core2 based systems there are three settings you'll need to disable:
Limit CPUID MaxVal – Disable
C1E Function – Disable
EIST Function – Disable

2) ACPI Suspend type – S1
3) HPET Support - Enabled.

USB Devices
1) USB Keyboard function – Enable
2) USB Mouse function - Enable

Special Features:
1) Parallel Port: SPP recommended. (All modes will work EPP, ECP)
2) Power On After Power Failure - ON, This eliminates pressing power button on every power up.

Section Three – Installation Ubuntu Linux

Please follow the installation instructions closely. Failure to do so may result in a failed install. When installing Ubuntu make sure you have a newer monitor that can run 1024x768 resolution at a minimum. Failure to connect to a monitor like this will cause Ubuntu to run in 800x600 mode and you will not be able to step through all of the confirmation screens.

Step 1 – Connect to the internet

Connect your computer to a network or directly to a modem that has active access to the internet.

Step 2 – Insert installation CD

Power-on the computer and insert the Ubuntu 8.04 LTS installation CD in the CD Drive. Make sure the computer boots from the CD. If it doesn't boot from the CD check your bios settings (see Section Two.)

Step 3 – Start Ubuntu

Once the CD boots you will see this screen (fig 1)

(Figure 1. Ubuntu boot screen – language select)

Press (ENTER) to select English. Next you will need to press the (F4) key and select "Safe graphics mode" (Fig2)

(FIGURE 2. UBUNTU BOOT SCREEN – MODES)

Press (ENTER). Using the up and down arrow keys select “Try Ubuntu without any change to your computer” and Press (ENTER). (fig3)

(FIGURE 3. UBUNTU BOOT SCREEN – TRY UBUNTU)

After the system finishes the initial load you will see a screen with two icons: Example and install. Click on the install icon and this screen will appear (fig 4)

(FIGURE 4. UBUNTU INSTALL SCREEN – LANGUAGE SELECT)

Click the forward button to select English as your language.

Step 4 – Install Ubuntu

Next you will see the following screen (fig 5)

(FIGURE 5. UBUNTU INSTALL SCREEN – TIMEZONE)

Use your mouse to select your region and city. Once you have done this click the Forward button. Next you will see the following screen (fig 6)

(FIGURE 6. UBUNTU INSTALL SCREEN – KEYBOARD SELECT)

This selects the type of keyboard you will use. Use the default selection and click Forward. Next you will see the following screen (fig 7)

(FIGURE 7. UBUNTU INSTALL SCREEN – PARTITION MANAGER)

If your hard drive is blank it will default to Guided. If your hard drive is not blank you will see a different screen on which guided is an option. Choose Guided – use entire disk and click Forward. Next you will see the following screen (fig 8)

(FIGURE 8. UBUNTU INSTALL SCREEN – USER SETUP)

Fill in the 'What is your name field?' with 'nucore' (lower case.) The login name will change to nucore and the name of the computer will say 'nucore-desktop'. Enter your password as 'nucore' (no quotes – lower case.) Click the Forward button. Next you will see the following screen (fig 9)

(FIGURE 9. UBUNTU INSTALL SCREEN – INSTALL REVIEW)

On this screen click Install. During the installation process you will see a progress bar (fig 10)

(FIGURE 10. UBUNTU INSTALL SCREEN – INSTALL PROGRESS)

The installation will take approximately 10 minutes depending on the speed on your machine. You may get an error during the installation process that the Ubuntu installation CD is bad. If this happens remove the CD, clean it gently with a soft cloth and restart the installation process. Linux

is very finicky about CDROM drives and disks. If cleaning the disc doesn't solve the problem you may want to try another CDROM drive or download a burn a new installation disc. Please report the issue on the support forums (http://www.bigguyspinball.com/community/viewforum.php?f=18)

Once the installation is complete you will see this screen (fig 11)

(FIGURE 4. UBUNTU INSTALL SCREEN – INSTALLATION COMPLETE)

Click the Restart now button and remove the Ubuntu Installation CD when prompted. The Linux installation is now complete.

Section Four – Installation Nucore

Step 1 - Login

Once the computer reboots you will see the login screen (fig 12)

(FIGURE 12. UBUNTU FIRST BOOT SCREEN – LOGIN - USERNAME)

Enter 'nucore' in the Username box and press (Enter). You will then be prompted for a password (fig 13)

(FIGURE 13. UBUNTU FIRST BOOT SCREEN – LOGIN - PASSWORD)

Enter 'nucore' in the Password box and press (Enter). Next you will see the Ubuntu Desktop (fig 14)

(FIGURE 14. UBUNTU FIRST BOOT SCREEN – DESKTOP)

Step 2 – Assign a password to the root user

The Linux administrative user is 'root'. Now you will need to create a password for the root user. Click the System option on the top menu bar. Next move your mouse down to Administration which will bring up another menu. Click Users and Groups from this menu (fig 15)

(FIGURE 15. UBUNTU SETUP – MENU)

Next you will see the following screen (fig 16)

(FIGURE 16. UBUNTU SETUP – USERS AND GROUPS)

Select the root user and then click the unlock button. At this point you will be asked to authenticate (fig 17)

(FIGURE 17. UBUNTU SETUP – AUTHORIZATION)

Enter 'nucore' in the Password for nucore box and click Authenticate. Now select the root user again and click the Properties button and you will see the following screen (fig 18)

(FIGURE 18. UBUNTU SETUP – ROOT PASSWORD)

Click in the 'Set password by hand' circle and enter 'nucore' in both boxes. Click OK. You have now assigned the password 'nucore' to the 'root' (or admin) user.

Step 3 – Allow root user login

Now that you have setup the root user you need to enable root user login. Click the System option on the top menu bar. Next move your mouse down to Administration which will bring up another menu. Click Login Window from this menu (fig 19)

(FIGURE 19. UBUNTU SETUP – MENU)

Once you click this you will be prompted for your password (fig 20)

(FIGURE 20. UBUNTU SETUP – PASSWORD)

Enter 'nucore' in the password box and click OK. The Login Window Preferences screen will appear. Click the Security tab to show the following screen (fig 21)

(FIGURE 21. UBUNTU SETUP – LOGIN WINDOW PREFERENCES)

Move your mouse to the Allow local system administrator login box and click it (fig 22)

(FIGURE 22. UBUNTU SETUP – LOGIN WINDOW PREFERENCES)

Then click Close. You can now login as the 'root' user. At this point click the red power button on the top right corner of the screen. You will see the following screen (fig 23)

(FIGURE 23. UBUNTU SETUP – LOG OUT)

Click the Restart button.

Step 4 – Final Installation

You will now need to login as the 'root' user. Enter 'root' as the Username on the login page and press (ENTER) (fig 24)

(FIGURE 24. UBUNTU SETUP – ROOT LOGIN)

Next enter 'nucore' as the password in the Password box and press (ENTER). Next insert the Nucore Install disc in the CDROM drive. When the system has recognized the disc you will see a popup window (fig 25)

(FIGURE 25. NUCORE INSTALL – CONFIRM INSTALL)

Now click the Run button this will start the installation (FIG 26)

(FIGURE 26. NUCORE INSTALL – INSTALL RUNNING)

The installation will take approximately 30 minutes (depending on your internet connection.) Do not close the install window or attempt to do anything else on the machine while the install is running. The screen may go black. You can press the space bar to bring the screen back up. You will also notice a new file on the desktop (nucore_install.log.) This is a log file that will show you the details of the installation. Once the installation window closes open the log file by clicking on it. This is an example of a successful install (fig 27.)

(FIGURE 27. NUCORE INSTALL – LOG FILE)

The second line from the bottom will say, "Nucore install was a success." If you see this message you are finished with the install and may proceed to Section Five. If you receive a message that says errors have occurred make sure you are connected to the internet and you can go to a web site. If you are connected run the installation again by removing and re-inserting the install CD. Errors can also occur if Ubuntu's repositories are temporarily offline. If this happens the apt-get commands will show failure. In this case wait a few minutes and run the installation again. If you still haven't successfully completed the installation go to the Big Guys Support page and upload your log file.

Section Five – Installing Nucore ROM Files

Open your Home folder by clicking Places on the top menu and selecting Home Folder (fig 29)

(FIGURE 29. ROM INSTALL – HOME FOLDER)

Next click on the nucore folder (fig 30)

(FIGURE 30. ROM INSTALL – HOME FOLDER)

You will now see the contents of the nucore folder (fig 31)

(FIGURE 31. ROM INSTALL – NUCORE FOLDER)

You now need to download the Nucore ROM package from www.pinball.com. Run the Firefox browser (click on the globe with fire next to the System option on the top bar.) Enter the following address into the browser http://www.pinball.com/Williams/transfer/nucore.tar.tar and press ENTER. When the save dialog box pops up click Save File and the click the OK button (fig 32.)

(FIGURE 32. ROM INSTALL – DOWNLOAD ROMS)

Once the download is finished close the browser. Now you will need to copy the Nucore rom file to your Nucore directory. Click on nucore.tar.tar on your desktop (fig 33)

(FIGURE 33. ROM INSTALL – COPY ROMS)

Drag and drop the file in the Nucore directory. Next right-click on the nucore.tar.tar file and choose Open with "Archive Manager" (fig 34)

(FIGURE 34. ROM INSTALL – EXTRACT ROMS)

Once Archive Manager starts hold the CONTROL key and click the ROMs and update folders. Then click Extract (fig 35)

(FIGURE 35. ROM INSTALL – EXTRACT ROMS)

The Archive Manager will show the current directory which should be /root/nucore. Now click the Extract button (fig 36)

(FIGURE 36. ROM INSTALL – EXTRACT ROMS)

The two folders will extract in the Nucore directory and the archive manager will close (fig 37)

(FIGURE 37. ROM INSTALL – FINAL ROMS)

Section Six – Master Volume

Now is a good time to set your master volume since it's very easy to do in the windows manager. Click on the speaker icon in the upper right side of the top menu bar. Adjust the slider to 87%. This is a good starting value and you can always change this setting later (fig 37a)

(FIGURE 37A.- SETTING MASTER VOLUME)

At this point the installation procedure is complete and you can shut the system down and connect it to your game. When you connect your Nucore machine to your game make sure the USB interface board is also connected. Nucore will not run without the USB board.

Section Six – Troubleshooting

If nucore fails to start on reboot please repeat the final installation instructions in Section Four – Step Four. If nucore fails to start again you'll need to check and make sure you copied the proper files into the correct locations (Section Five.) The GDM (windows manager) will no longer auto start. If nucore fails to load you will come to a text only login prompt. Enter your username and password (root/nucore) this will leave you at a terminal prompt. To start the GDM type the following:

/etc/init.d/gdm start

This will start the GDM and allow you to check your files graphically. If you know Linux commands you can skip this step and use the terminal window.

Nucore Software Users Guide

This section will instruct you how to use Nucore and all of the modes and menus.

Nucore – Boot-up

During boot-up Nucore defaults to auto playfield selection. The software attempts to automatically determine which playfield is installed. If it's able to detect which playfield is installed the game will automatically start. If for some reason the playfield is not detected you will see the following screen (fig 38)

(FIGURE 38. NUCORE – GAME CHOOSER)

This screen will allow you to choose which playfield you have installed. Once Nucore is loaded you can also hard-select which game is installed (see Configuration Menu.) If for some reason you need to exit from this screen press the F1 key on your keyboard. This will exit Nucore and take you back to a terminal prompt.

Nucore – Attract Mode

When you first boot Nucore and your game goes into attract mode you will notice something new, the Nucore logo in the upper right hand corner of the screen (fig 39)

(FIGURE 39. NUCORE – ATTRACT MODE)

This logo signifies that Nucore is in attract mode which is very important. Most of the Nucore features will not start unless the game is in attract mode, the Jukebox being the prime example. If you have a problem starting the Jukebox make sure you see this logo in the upper right corner. The logo is not visible during game modes or diagnostic/configuration screens.

Controlling Nucore – Flipper and Action Buttons

Pinball 2000 machines have 2 flipper buttons and two action buttons (unique to pinball 2000) (fig 40)

(FIGURE 40. PINBALL 2000 BUTTONS)

Most functions in Nucore are controlled by these buttons eliminating the need for a keyboard. In most cases starting and exiting modes relies on simultaneously pressing both action buttons. Example: While in attract mode simultaneously holding both left and right action buttons down starts the Jukebox mode. Simultaneously pressing these same buttons will also exit the Jukebox mode. If one or both of your actions buttons don't work you will not be able to fully utilize Nucore. Replacement button assemblies are available at most pinball suppliers.

Nucore Jukebox

Nucore has a built-in jukebox that can be activated while in attract mode (fig 41)

(FIGURE 41. NUCORE JUKEBOX)

While in attract mode you can simultaneously press the left and right action button (fig 40) to start the Jukebox. The jukebox will play songs in order of the automatically generated playlist (see config menu) or in a random order. While in jukebox mode pressing the left or right flipper button will change songs. While in random mode either flipper button will randomly choose a song. While playing songs in list order the left flipper moves back a song in the list while the right flipper button plays the next song in the list.

To control the music volume you will use the left and right action buttons. The left action button lowers the volume while the right action button increases volume. The current volume level will show on the bottom of the jukebox screen (fig 42)

(FIGURE 42. NUCORE JUKEBOX VOLUME DISPLAY)

Pressing the left action button while the volume is all the way off will display “MUTED”. Pressing the right action button while the volume is at 100% will display “MAXIMUM”.

To exit the jukebox mode simultaneously press both action buttons and you will be taken back to the attract mode screen. If you press the game start button while in jukebox mode the jukebox will stop automatically and the game will begin. The jukebox will automatically restart after a specified amount of time (see jukebox delay – config menu.)

To add songs to the jukebox you can use the USB Update function in the config menu (see config menu.) The amount of songs you can add to the jukebox is only limited by your physical storage on the Nucore machine. Advanced Linux users can also specify network shares that contain music. See the support forums for more details.

Nucore Configuration Menu

We have created a custom Nucore setting menu that you can access while the coin door is open. While the machine is running open the coin door. You will see this screen (fig 43)

(FIGURE 43. NUCORE COIN DOOR OPEN)

While the coin door in open you simultaneously press the plus and minus buttons on the coin door to start the configuration menu (fig 44)

(FIGURE 44. NUCORE CONFIGURATION MENU - HOME)

This configuration home screen contains a menu of options. It will also show you the version of Nucore you are running, the build date, and how many frames per second your system is generation (maximum rate ~60fps.) You can select which menu item you want to change by pressing the + and - buttons on the coin door. To choose a menu options press the ENTER button on the coin door. To back out of a menu item or exit the menu press the ESCAPE button.

Configuration Menu – Game Options

Game options has one item – Game selection (fg 45)

(FIGURE 45. NUCORE GAME SELECTION)

Game selection has 3 options:

- AUTO (default)
- RFM - Revenge From Mars
- SWE1 - Star Wars Episode One

When you first see this screen the GAME* option will be highlighted. To change the game selection press the ENTER button on the coin door. Now the game options will become highlighted (fig 46)

(FIGURE 46. NUCORE GAME OPTION)

Pressing the + and – buttons on the coin door will change the game. Choosing AUTO will let Nucore automatically determine which playfield is installed. If there are serious issues with the playfield the auto detection may fail. Also, if you only have one playfield choose that specific game. Once you have made your selection press the ENTER button then press ESCAPE to return to the main menu. All of the menus function this way so please keep this in mind. When a screen displays *REQUIRES REBOOT and the option you change has an * next to it the game will automatically reboot once you leave the config menu.

Configuration Menu – Jukebox Options

There are four options on the jukebox menu (fig 47)

(FIGURE 47. NUCORE JUKEBOX OPTIONS)

- CREATE NEW PLAYLIST
  This option will automatically re-generate the jukebox playlist. You will only need to run this option if you manually add music or network shares. Adding new music using the USB Update automatically runs this option.
- JUKE BOX ENABLED
  This option will allow you to disable/enable the jukebox functionality.
- JUKE BOX STARTUP DELAY
  This is the time (in seconds) that Nucore waits to restart the jukebox after a game is finished. Note: the jukebox will only automatically start if it was previously running while a game was started.
- JUKE BOX RANDOM
  This option enables/disables random song selection.

Configuration Menu – System Options

There are two options on the system menu (fig 48)

(FIGURE 48. NUCORE SYSTEM OPTIONS)

- INVERT SCREEN
  This option will allow you to invert the screen (Default NO.)
- BPP MODE
  This option allows you to select the bit depth of Nucore. The default is 16 and should not be changed unless you decide to run Nucore under a X11 environment such as Gnome or KDE. If you choose to run it in a windows manager select 32. There will be a slight performance hit when you select this option.

Configuration Menu – USB Update

The USB Update procedure is fully automatic and very easy to use. In order to use the USB Update you'll need a formatted USB drive such as a memory stick or external hard drive. NOTE: The drive MUST be formatted as Fat32 or it will not work. The update procedure will allow you to add music to the jukebox library and update game code. To load music copy any MP3 files (no other file formats are supported) to the USB device. Do not put the music in a folder as the update will only copy .mp3 files that are in the base directory of the device. When you are ready to add or update files have your USB drive ready and enter the USB UPDATE menu (fig 49)

(FIGURE 49. NUCORE USB UPDATE - HOME)

1. Press the ENTER button on the coin door and you will see the word GO highlighted.
2. Press the ENTER button again to begin the procedure. You will see this screen (fig 50)

(FIGURE 50. NUCORE USB UPDATE - HOME)

3. Now insert you USB drive in the Nucore computer. TIP: You can purchase a 6' USB extension cable and run the cable from your Nucore computer to the coin door area. This will make connecting a USB device much easier.
4. Once the drive is recognized Nucore will copy the files from the USB drive.
5. When the file copy procedure is complete you will be prompted to remove the drive (fig 51)

(FIGURE 51. NUCORE USB UPDATE – REMOVE DRIVE)

6. You may now remove the drive from the computer. Press the ESCAPE button on the coin door twice and Nucore will restart.

If there is a problem with reading the USB drive Nucore will stop after 20 seconds and display the following error (fig 52)

(FIGURE 52. NUCORE USB UPDATE – DRIVE NOT FOUND)

If you get this error check the following:

- Make sure the USB drive is formatted.
- If using a USB extension cable make sure it's connected properly to the computer. You may also want to try connecting the drive directly to the computer in case of a faulty cable
- Check BIOS settings

Log Files

Whenever you execute the USB update Nucore will copy the log files from your computer to the USB device. These files can be very useful for troubleshooting any issues you may be having.

Nucore Command Line Options

Nucore has a number of command line options you can choose. Most people will never have any reason to manually run Nucore unless there are technical issues such as failed playfield detection. The Nucore executable is in the /root/nucore/bin/ directory. To run Nucore from a terminal session type:

./run nucore (options)

To see the list of options type
./run Nucore ?

```
*****************************************************************************
usage: nucore [game(rfm_15,swe1_14,auto)] [options]

General Options:
-nojukeplay       disable playback of jukebox songs
-genplaylist      create a new jukebox playlist

Video Options:
-flipscreen       display video flipped upside down
-fullscreen        display in full screen
-window           runs the emulator in windowed mode
-bpp (16 or 32)   selects bit-depth for renderer

Port options:
-parallel pnum   redirect the parallel port to host port# (hex or dec)

*****************************************************************************
```

1. Disable Jukebox (-nojukeplay)
   This will turn off jukebox functionality. This can also be changed from the config menu.

2. Generate Playlist (-genplaylist)
   Nucore will search the music directories for .mp3 sound files and automatically add them to the master playlist.

3. Flipscreen (-flipscreen)
   This will allow you to invert the screen. This can also be changed from the config menu.

4. Fullscreen Mode (-fullscreen)
   This will run the emulator in fullscreen mode. This can also be changed from the config menu.

5. Window Mode (-window)
   This will run the emulator in windowed mode. This can also be changed from the config menu.

6. No Watermark (-nowatermark)
   This will disable the watermark. This setting will be removed for production.

7. Bits Per Pixel (-bpp)
   This specifies which bit depth Nucore will use. When running the emulator in xwindows ALWAYS specify -bpp 32. Otherwise you may experience slowdown. When running Nucore from the console specify -bpp 16. This can also be changed from the config menu.

8. Parallel Port Address (-parallel [hex address ex. 0x378])
   This allows you to specify which address your parallel port is set to.

Nucore Keyboard Commands

KEY	Function
F1	This will exit the emulator.
F3	This will toggle screen flipping (useful for repairs)
F3	(-) Fine adjust – light timing*
F4	(+) Fine adjust – light timing*
F5	(-) Coarse adjust – light timing*
F6	(+)Coarse adjust – light timing*

*Due to differences in computer architecture you may notice GI light flickering. The timing adjust will allow you to fine tune the GI timing for your specific computer. While making these adjustments you may notice the relay clicking on and off, this is expected. These settings are saved.

Nucore Support and Tips

If you need additional support or encounter any possible bugs please go to the Nucore Support Forum on the Big Guys Pinball site:

http://www.bigguyspinball.com/community/viewforum.php?f=18

You will be able to search this forum for solutions to your issue and possibly help other people with the issues. This forum will also contain the latest Nucore software and manuals. Also, if you have any ideas for improvements or additions to Nucore please post them on the site. We are very interested in your input.