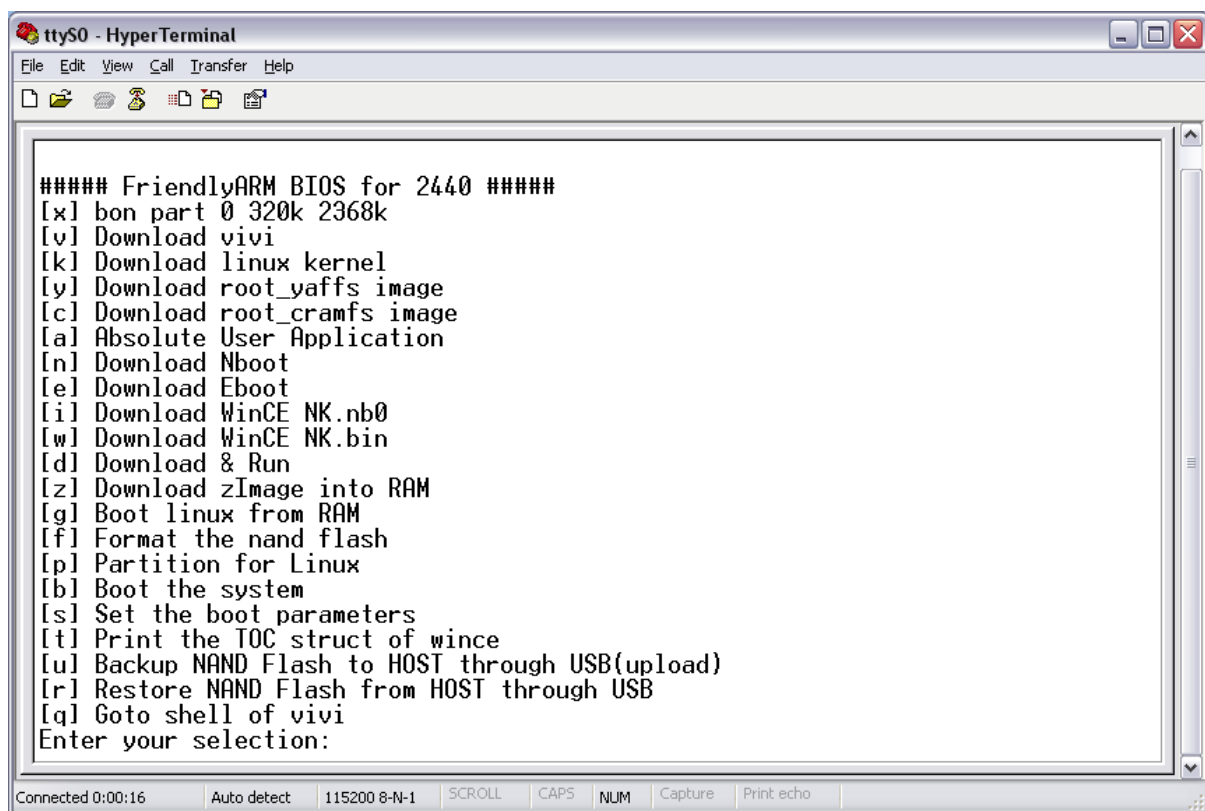


2.2 The Development Board Features and the Use of BIOS

2.2.1 Boot into the BIOS Mode

Supervivi time at the factory has been pre-installed into the board of the NOR flash, set the DIP switch S2 for the NOR flash started to enter BIOS mode, when the development board will show the green LED1 blinking state, and its interface to start the following map.



```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help

##### FriendlyARM BIOS for 2440 #####
[x] bon part 0 320k 2368k
[v] Download vivi
[k] Download linux kernel
[y] Download root_yaffs image
[c] Download root_cramfs image
[a] Absolute User Application
[n] Download Nboot
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection:
    
```

Connected 0:00:16 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

Supervivi Introduction:

Development board is based on the BIOS used in the original Samsung vivi improvement from the bootloader, called Supervivi, it functions the way the menu and can order the original interactive mode switch with each other.

JTAG board Supervivi can use direct fire into the use of NOR flash can also be burned directly into the NAND flash run. When burned into the NOR flash and benefit when there will be a menu mode; when firing into the NAND flash and from run-time, interactive mode is the

command (hint: the need to hold down the HyperTerminal interface to enter the space bar, otherwise the direct start system).

Menu mode Supervivi main programmer and systems and debugging, and also can set the parameters and zoning and so on, it the use of USB download, the programmer to build a very simple environment, and download speed, is very convenient to use.

If Supervivi burned into the NOR flash (default), you can not only convenient to use it to download the update Linux and WinCE system can also support the programmer in any other operating system to start NAND flash and non-operating system to NAND flash, such as uCos2, U-boot, Nboot, 2440test and so on, and then select start from the NAND flash, so that you can use a variety of systems, we will gradually increase the demo file, please refer to our website for more information.

If Supervivi burned into the NAND flash, it can automatically identify your programmer of the Linux or WinCE system, or other systems, and automatically turn them on. In this manual, "The Installation and Update System", we directly use it as a bootloader.

In addition, the use of Download & Run feature, you can also download the program into memory to run at once, which is the development of debugging is very helpful, so you do not even have to use the simulator, we 2440test CD-ROM in the procedure is a case in point.

Supervivi use Linux kernel can also be used to download the zImage file into memory to run, if you have good network, start supervivi to set parameters, you can also restart the entire system through the network. The same, supervivi can be WinCE in the run-time image file downloads NK.nb0 running in memory.

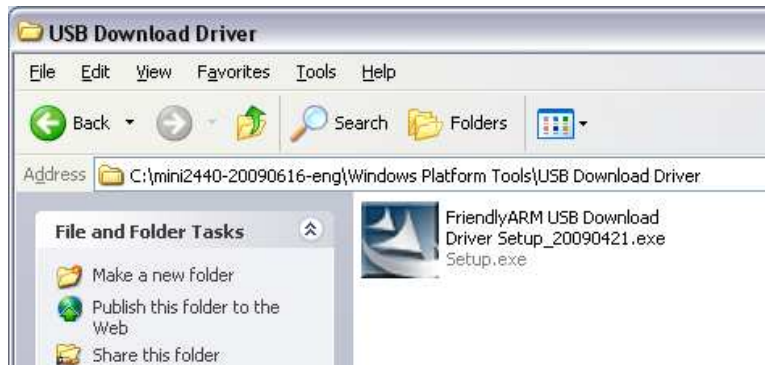
2.2.2 Install USB Download Driver

Note: here to install the USB driver is only useful in the BIOS mode. It needs use with dnw.exe software, access to Linux or WinCE systems are not use the driver.

Description: installation the download driver does not need to connect USB with development board, which is independent of the installation.

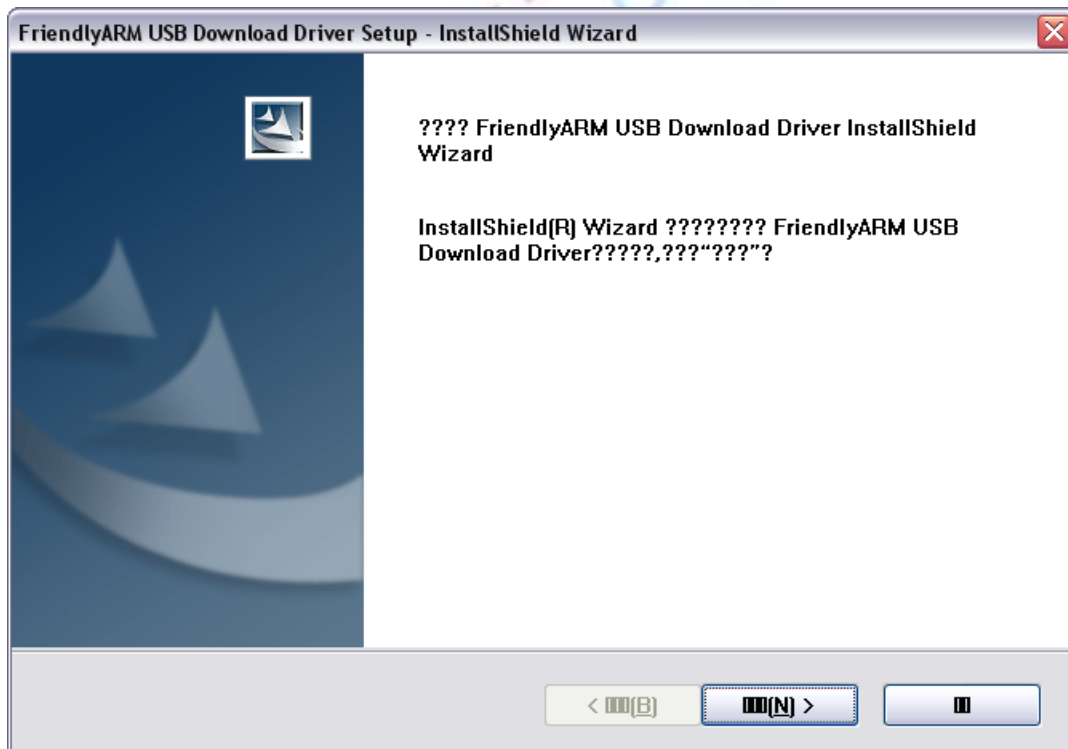


Double-click the CD-ROM to run the "Windows Platform Tools\USB Download Driver\FriendlyARM USB Download Driver Setup_20090421.exe" setup to start the installation.

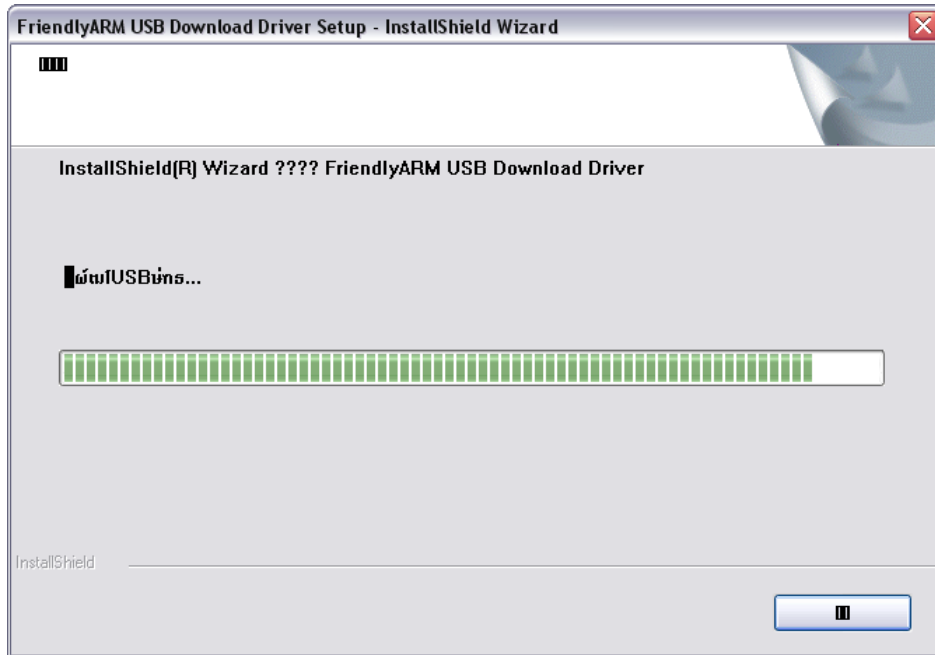


Installation interface appears in Figure:

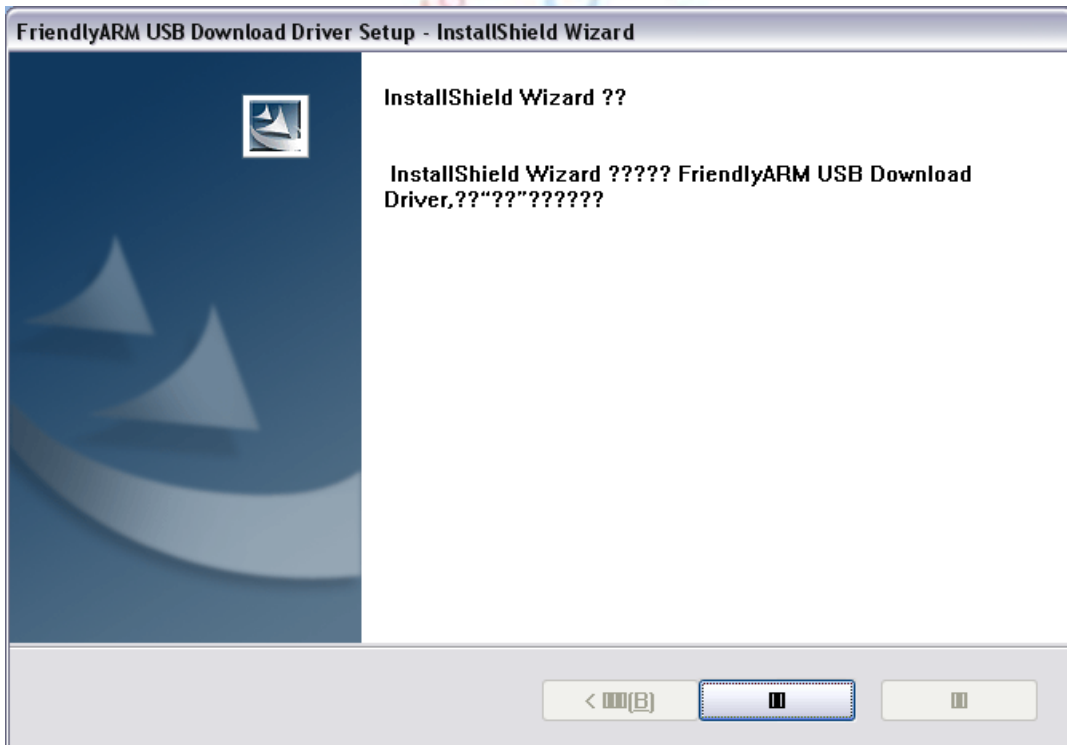
Click "Next (N)" to continue:



At this point warning messages maybe pop up click "Continue Anyway(C)":



Click "Continue", USB download driver will soon be installed, in Figure:



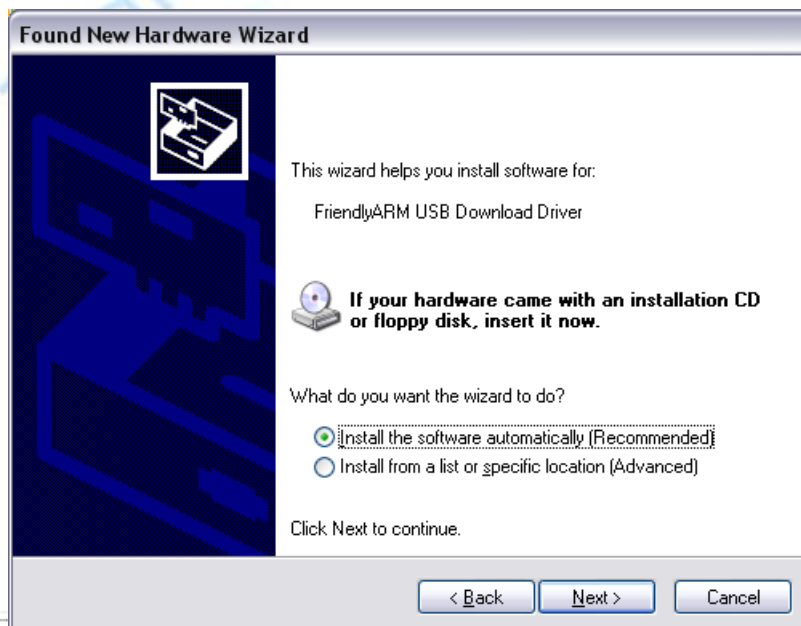
We've detected USB driver below.

First of all, set up development board S2 DIP-switch for the NOR flash start, a good side to connect the USB and power lines (which can be do not have to connect to the serial line).

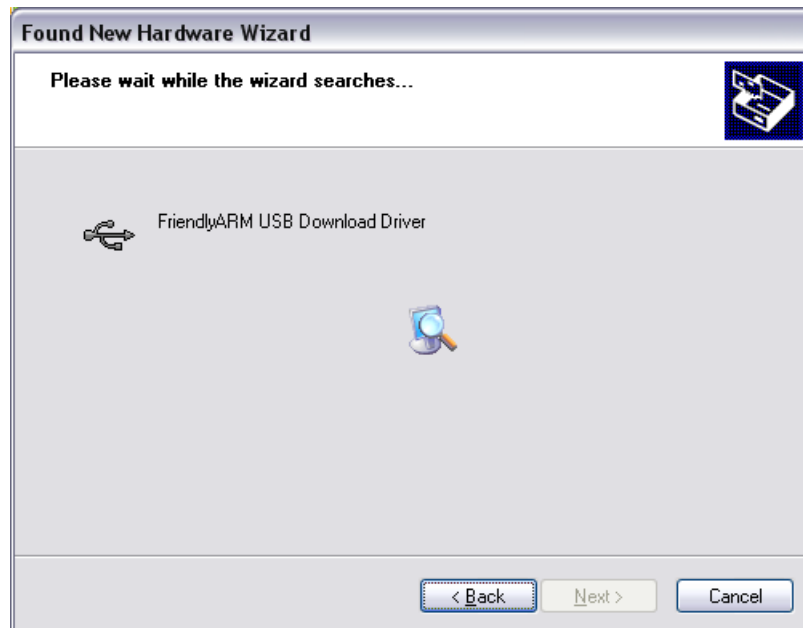
Open the power switch S1, is the first time if you use, Windows XP system, you will be prompted to find new USB equipment, and a figure interface, in this select "No, not this time", and click "Next" to continue.



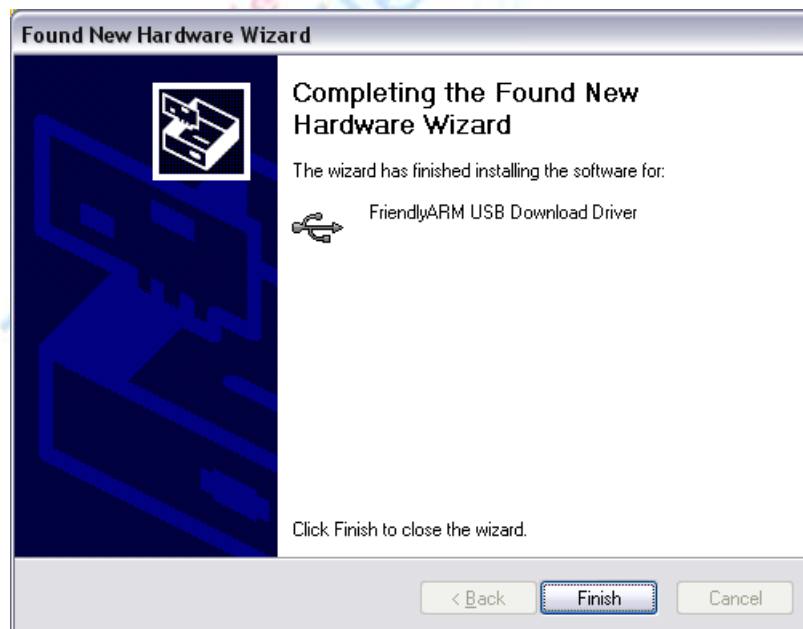
Figure prompt appears, select "Install the software automatically" and click "Next" to continue.



Warning interfaces maybe appears interface click "continue".



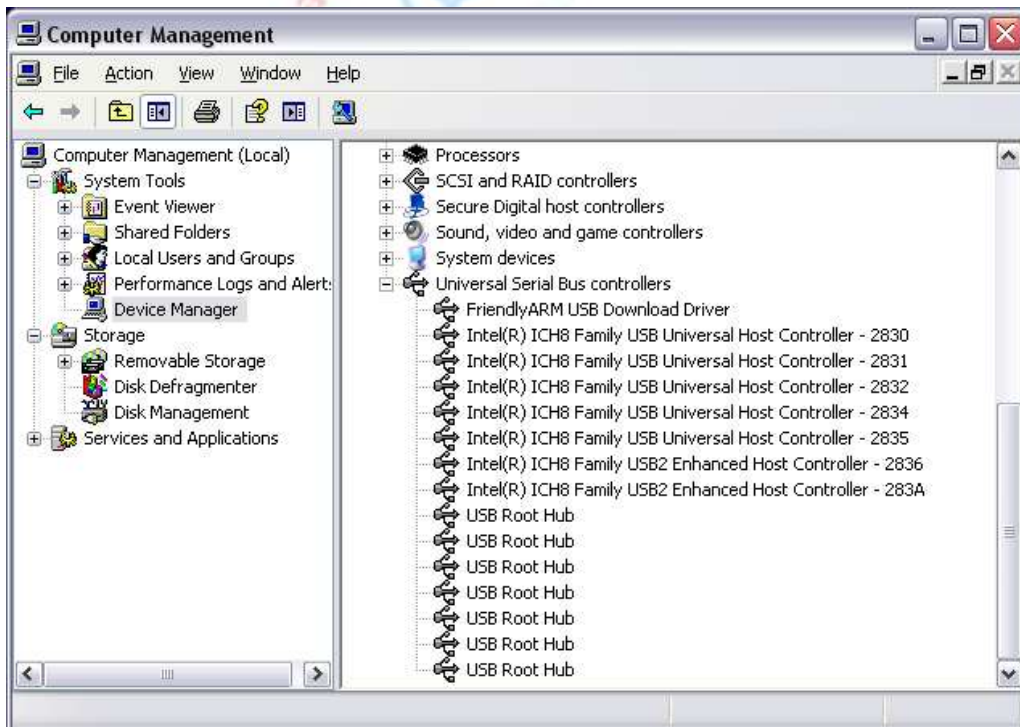
At this point, the USB Download Driver installation steps finished.



Open the CD-ROM at this time of dnw.exe download software, you can see USB connections OK, figure.

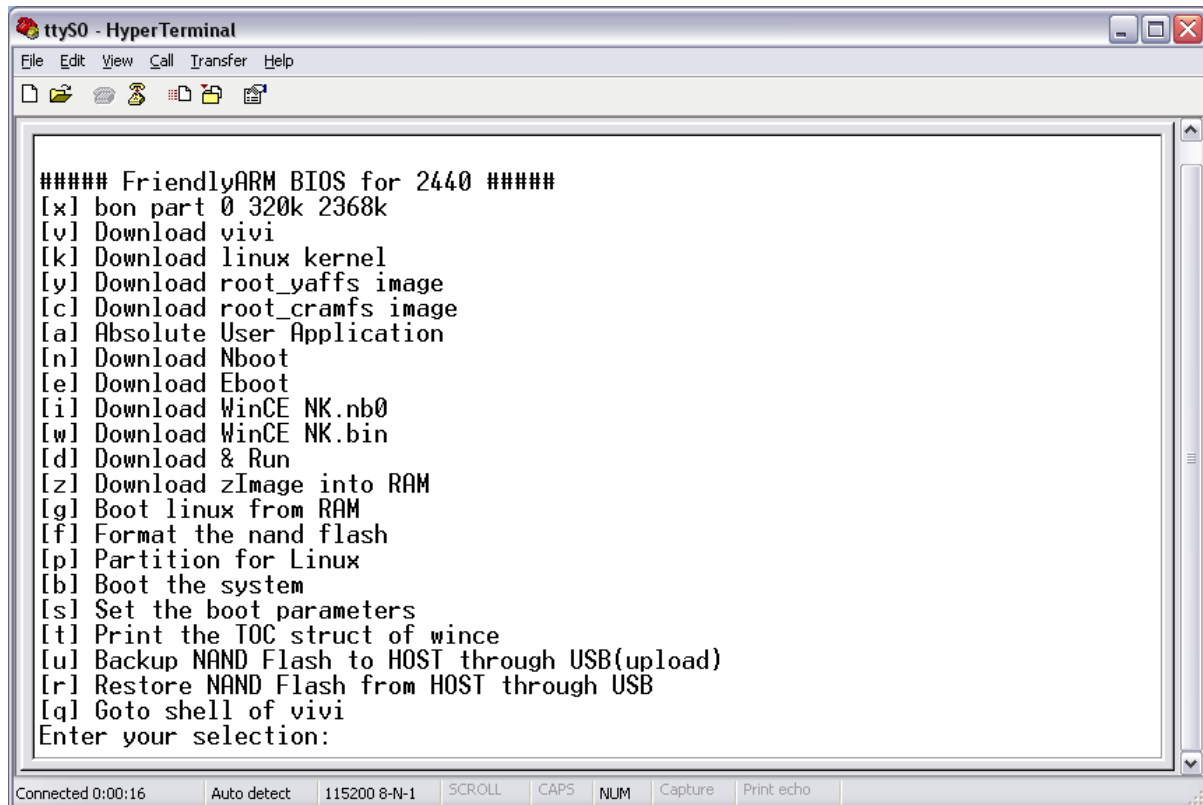


Device Manager on your computer, you can also see the USB download driver-related information, in Figure:



2.2.3 Main Menu Function Description

Note: The following functions through the USB to download both the use of this procedure with the DNW.



```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
##### FriendlyARM BIOS for 2440 #####
[x] bon part 0 320k 2368k
[v] Download vivi
[k] Download linux kernel
[y] Download root_yaffs image
[c] Download root_cramfs image
[a] Absolute User Application
[n] Download Nboot
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection:
    
```

[x]: Partition NAND flash for default, this is equivalent to the implementation of the command-line `bon part 0 320k 2368k`

[v]: Download the vivi Linux bootloader to NAND flash through the USB

[k]: Download Linux kernel to the kernel partition NAND flash through the USB

[y]: Download yaffs file system image to the root partition NAND flash through the USB

[c]: Download cramfs file system image to the root partition NAND flash through the USB

[a]: Download user program to NAND flash through the USB, the general user program for this bin can they line documents, such as 2440test (need to support more than 4K limit), uCos2 (development board in support uCos2 with the NAND flash boot), U-Boot, etc; of course, can be any size bin of other procedures.

[n]: Download WinCE procedures Nboot the start of the Block 0 the NAND flash through the USB

[e]: Download the WinCE Bootloader the Eboot to Eboot Zoning NAND flash through the USB

[i]: Download WinCE image running NK.nb0 to NAND flash through the USB

[w]: Download WinCE issued image NK.bin to NAND flash through the USB

[d]: Download through the USB to a specific memory address (DNW through the Configuration>Option election address specified to run), and run. For the development board, SDRAM physical start address is 0x30000000, the end is 0x34000000, the size of 64Mbytes, another BIOS itself 0x33DE8000 take up more space, so BIOS using the USB download function should be designated address between 0x30000000 - 0x33DE8000.

[z]: Download Linux kernel image file into memory zImage, download address 0x30008000 through the USB.

[g]: Running the Linux kernel memory image, the function of general combining [z] together.

[f]: Erase NAND flash, the implementation of this function will erase the specified integer NAND flash address space. Of the development board, NAND flash size 64Mbytes, its space address range is 0 - 0x4000000, commonly used erase operation is Linux partition data, and erases the entire NAND flash, the scope of its address space as follows:

Erase address the scope of common table

Enter the "f", BIOS will be prompted to enter your start address and end address, the address range table for the commonly used		
	Start Address	End address
Vivi erase data partition (block0-13)	0x0	0x50000
Linux kernel partition data erasure (block14-93)	0x50000	0x250000
Erase the file system partition data (block94-4095)	0x250000	0x4000000
Erase whole NAND flash (block0-4095)	0x0	0x4000000

Tip: The development board NAND flash used a total of 4096 blocks, in each block are 32 pages, each page there is 512 bytes, so a total of $4096 \times 32 \times 512 = 64\text{M}$ bytes.

[p]: Partition the NAND flash, mainly for Linux, a detailed description see sub-menu

[b]: Boot the system, if it burn into the Linux or Windows CE, the implementation of identification from the command will automatically identify the start system.

[s]: Set Linux boot parameters, a detailed description see sub-menu

[t]: Print the Table of Content of WinCE Kernel Image (rarely used)

[u]: Backup the entire NAND flash content uploaded to the PC through the USB storage for a file, the PC system features similar to those frequently used tools of the Ghost.

[r]: Restore backup files back to the NAND flash.

[q]: Return to interactive mode vivi, figure

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
##### FriendlyARM BIOS for 2440 #####
[x] bon part 0 320k 2368k
[v] Download vivi
[k] Download linux kernel
[y] Download root_yaffs image
[c] Download root_cramfs image
[a] Absolute User Application
[n] Download Nboot
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: q
Supervivi> _
    
```

Connected 0:13:39 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

In interactive mode, enter the menu command, you can return to the menu mode.

2.2.4 Description Function of the Partition Sub-Menu

Function [p], into its sub-menu, shown in Figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: p

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: _

Connected 0:06:04 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo
  
```

(1) Browse Partition [v]

Enter the "v" to view the current partition table, the table exists in the NAND flash, if NAND flash is empty or new, will display the default BIOS partition table itself, figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
[ ] [ ] [ ] [ ] [ ] [ ]
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: v
Number of partitions: 5
name      :      offset      size      flag
-----
vivi      :      0x00000000    0x00028000    0
eboot     :      0x00028000    0x00018000    0
param     :      0x00040000    0x00010000    0
kernel    :      0x00050000    0x00200000    0
root      :      0x00250000    0x03dac000    0

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: _
    
```

Connected 0:08:48 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

(2) Delete Partition [d]

Input "d", you will be prompted to enter the partition name you want to delete, for example, to delete division vivi, enter "vivi" (cited no. do not need to enter), Figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
eboot      :      0x00028000      0x00018000      0
param      :      0x00040000      0x00010000      0
kernel     :      0x00050000      0x00200000      0
root       :      0x00250000      0x03dac000      0

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: d
Enter partition name : vivi
deleted 'vivi' partition

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: _
    
```

Connected 0:10:12 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

(3) Save the Operation [w]

Enter the "w", can save the settings, such as vivi just delete the partition, if you had not saved, the next browse your system partition times, you found that the district will still have to implement the user interface preserve the figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
Enter partition name : vivi
deleted 'vivi' partition

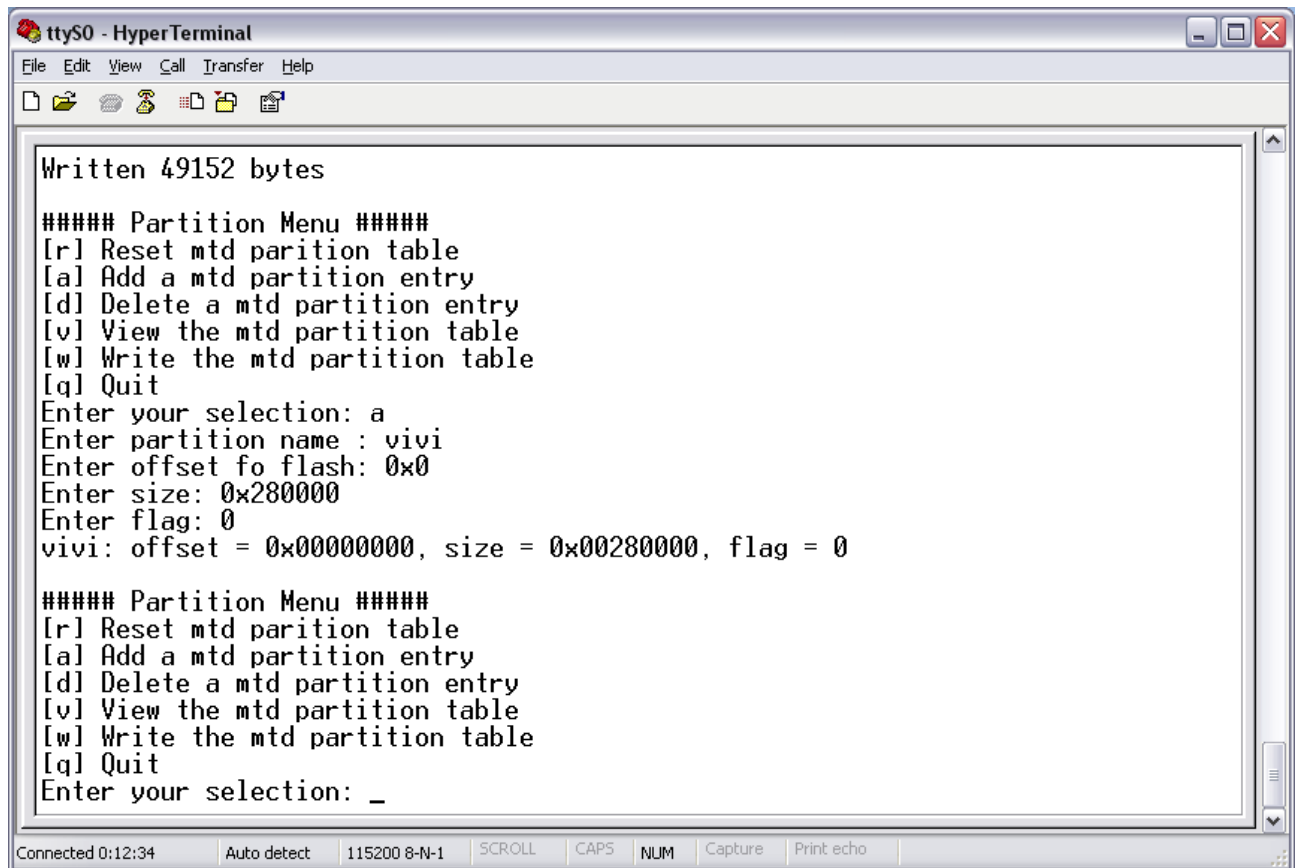
##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: w
Found block size = 0x0000c000
Erasing...     ... done
Writing...     ... done
Written 49152 bytes

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: _
    
```

Connected 0:11:14 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

(4) Add a Partition [a]

Input "a", the system will prompt you to add a number of geographical information, name, offset address, size, flag, etc. general information can be a default value, add the district to implement the user interface in figure:



```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
Written 49152 bytes
##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: a
Enter partition name : vivi
Enter offset fo flash: 0x0
Enter size: 0x280000
Enter flag: 0
vivi: offset = 0x00000000, size = 0x00280000, flag = 0

##### Partition Menu #####
[r] Reset mtd partition table
[a] Add a mtd partition entry
[d] Delete a mtd partition entry
[v] View the mtd partition table
[w] Write the mtd partition table
[q] Quit
Enter your selection: _
    
```

(5) Reset the Partition Table [r]

The implementation of "r", can use their own BIOS's partition table information, to replace all the current partition table, when you are not small the heart is not clear to delete the Linux partition, you can perform this function to restore Linux system partition table, of course, after the restoration enter "w" to preserve to be valid.

(6) Return to Main Menu [q]

The implementation of "q", will return to the main menu level.

2.2.5 Set Linux Boot Parameter Function Sub-Menu

Through the Linux Boot Parameter Sub-Menu function, you can start more flexible Linux systems, the main menu in the BIOS its executive function [s], Set linux boot parameters into the sub-menu, shown in Figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
[n] Download Nboot
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: s

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeory
[q] Quit
Enter your selection:
    
```

Connected 0:14:32 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

normal, according to the parameters you are prompted to enter the name of "mach_type", Then the input parameter value "867" (quotation marks do not enter), remember to change the input after the "w" to save the setting, Figure:

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
Writing... .. done
Written 49152 bytes
Saved vivi private data

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeory
[q] Quit
Enter your selection: s
Enter the parameter's name(mach_type, media_type, linux_cmd_line, etc): mach_typ
e
Enter the parameter's value(if the value contains space, enclose it with "): 782

Change 'mach_type' value. 0x0000030e(782) to 0x0000030e(782)

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeory
[q] Quit
Enter your selection: _
    
```

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
Enter the parameter's value(if the value contains space, enclose it with "): 782

Change 'mach_type' value. 0x0000030e(782) to 0x0000030e(782)

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeory
[q] Quit
Enter your selection: w
Found block size = 0x0000c000
Erasing... .. done
Writing... .. done
Written 49152 bytes
Saved vivi private data

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeory
[q] Quit
Enter your selection:
    
```

linux_cmd_line is frequently used as a kernel boot parameters, such as the kernel to log the start and end information replaced by serial-side 1 (the default is the serial port 0), such modifications:

Parameters through the browser, we can see the original parameters:

linux_cmd_line: noinitrd root=/dev/mtdblock2 init=/linux console=ttySAC0

Enter the "s" after the prompt you want to modify in accordance with the parameters "linux_cmd_line", enter, and then the input parameter value (because the parameter space in the string, so need to enter enclosed in double quotes):

"noinitrd root=/dev/mtdblock2 init=/linux console=ttySAC1, 115200"

As shown:

```

Written 49152 bytes
Saved vivi private data

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memory
[q] Quit
Enter your selection: s
Enter the parameter's name(mach_type, media_type, linux_cmd_line, etc): linux_cm
d_line
Enter the parameter's value(if the value contains space, enclose it with "): "no
initrd root=/dev/mtdblock2 init=/linux console=ttySAC1,115200"
Change linux command line to "noinitrd root=/dev/mtdblock2 init=/linux console=t
tySAC1,115200"

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memory
[q] Quit
Enter your selection: _
    
```

```

ttyS0 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
initrd root=/dev/mtdblock2 init=/linux console=ttySAC1,115200"
Change linux command line to "noinitrd root=/dev/mtdblock2 init=/linux console=t
tySAC1,115200"

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeoery
[q] Quit
Enter your selection: w
Found block size = 0x0000c000
Erasing...     ... done
Writing...     ... done
Written 49152 bytes
Saved vivi private data

##### Parameter Menu #####
[r] Reset parameter table to default table
[s] Set parameter
[v] View the parameter table
[w] Write the parameter table to flash memeoery
[q] Quit
Enter your selection: _
    
```

Connected 1:16:19 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

This system, when activated, the kernel start-up information and login information will appear in the serial port 1, while the output of vivi information will not change, or out from the serial port 0.

(3) Save Configuration [w]

When set to change, you can enter the "w" save changes.

(4) Restore the Default Value [r]

Enter the "r" to restore the factory parameters to start the kernel.

(5) Return to Main Menu [q]

Enter "q" to return to the main menu BIOS functions.