



# **Tornado™ 2.02 BSP Rel. 1-4**

## **for PENT/CPCI-731/735/735R2/736/760**

### **Installation Guide**

P/N 217424 Revision AC  
November 2002

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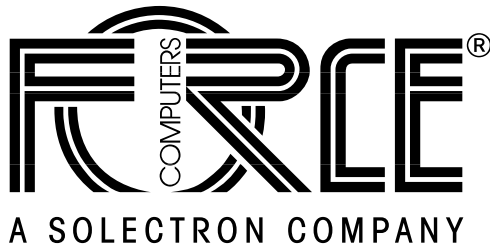
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# Contents

## Using This Manual

## Online Documentation

## Installation

- Introduction** ..... **1-3**
- Supported Devices ..... 1-3
- Delivered BSP Configuration ..... 1-4
  
- Installing the BSP** ..... **1-5**
- Installation Procedure for Solaris ..... 1-5
- Installation Procedure for Windows NT ..... 1-5
  
- Setting up a Project** ..... **1-6**
  
- Booting VxWorks** ..... **1-7**
- Creating a Boot Floppy ..... 1-7
- Loading the VxWorks Image ..... 1-8

## Product Error Report




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## Using This Manual

This Installation Guide is intended for users qualified in software engineering. Users must also have a working understanding of electronics, VxWorks™/Tornado™ and of the board supported by the BSP.

## Style Conventions

Notation	Description
	All numbers are decimal numbers except when used with the following notations:
0000.0000 <sub>16</sub>	Typical notation for hexadecimal numbers (digits are 0 through F), e.g. used for addresses and offsets Note the dot marking the 4th (to its right) and 5th (to its left) digit.
<b>Bold</b>	Character format used to emphasize a word
Courier	Character format used for on-screen output
<b>Courier+Bold</b>	Character format used to characterize user input and to separate it from system output
<Text>	Typical notation for words that represent a part of a command, a programming statement, or the like, and that will be replaced by an applicable value when actually applied.
<i>Italics</i>	Character format for references and for table and figure descriptions.
<hr/> <b>Note:</b> <hr/>	No danger encountered. Pay attention to important information marked using this layout.
<b>Caution</b> 	Possibly dangerous situation: slight injuries to people or damage to objects possible

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## Revision History

SAP No.	Revision	Date	Description
212465	AA	February 2000	Preliminary Release Notes
212465	AB	March 2000	PENT/CPCI-770 relevant information added Changed Template and document type: Release Notes were split into Installation Guide and Release Notes.
212465	AC	May 2000	Product Name changed frDec network driver name changed to dc Section Related Documents removed Chapter Booting VxWorks restructured Chapter Restrictions and Known Problems removed since it is already contained in the online documentation. Editorial changes
216011	AA	October 2001	Information on PENT/CPCI-735 added (release 1.3 of the combined BSP, never officially released)
217424	AA	July 2002	Info for new release 1-4 added Tornado version changed to 2.02 "IPMI controller" added to list of supported devices
217424	AB	September 2002	Added description of WindRiver tool vxsys.com in "Booting VxWorks" Changed file name of boot disk image Removed references to PENT/CPCI-770
217424	AC	November 2002	Added Windriver trademark acknowledgements

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## Online Documentation

Information on booting VxWorks, on BSP configuration, on restrictions and known problems and on other issues is provided by the online documentation delivered with the BSP.

### Updating the Online Documentation

To integrate the BSP online documentation into the Tornado documentation, the HTML reference files `$WIND_BASE/docs/BSP_Reference.html` and `$WIND_BASE/docs/libIndex.html` can be generated or updated if they already exist after BSP installation by calling the WindRiver supplied command `htmlBook`. Refer to Appendix D *Utilities Reference* in the *Tornado 2.0 User's Guide* for more details on the `htmlBook` command.

### Viewing the Online Documentation

The HTML file for the start page from which the rest of the documentation can be accessed is called `<bspname>.html`. It can be found in the directory `$WIND_BASE/docs/vxworks/bsp`.



# 1

## Installation



## Introduction

This manual describes the installation of the Tornado 2.02 BSP for the Force Computers PENT/CPCI-731/735/735R2/736/760. Additionally, it summarizes the steps for setting up a project.

This BSP is a combined BSP that supports the following CPU boards:

- PENT/CPCI-731
- PENT/CPCI-735
- PENT/CPCI-735R2
- PENT/CPCI-736
- PENT/CPCI-760

The board support package can be configured for a specific board by selecting the appropriate define in `config.h` (see section “Configuration Options” in the online documentation). The directory for the combined BSP for the Intel boards is called `frc7xx_cpci`.

The descriptions in this document apply to all boards, except where stated.

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**Note:**

- **This BSP (`frc7xxx_cpci`) is not supported by Wind River Systems. Any problem should be reported directly to Force Computers technical support.**
  - **This BSP for the PENT/CPCI-731/735/735R2/736/760 should only be used with Tornado 2.02. Force Computers does not guarantee the compatibility of this BSP with earlier Tornado versions.**
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## Supported Devices

The frc7xxx BSP supports the following devices of the PENT/CPCI-731/735/735R2/736/760:

- **PENT/CPCI-731:** 21143 Ethernet controller, 21154 non-transparent PCI-to-PCI bridge, I<sup>2</sup>C bus, FLASH devices, watchdog
- **PENT/CPCI-735/735R2/736:** 82559 Ethernet controller, Sentinel universal PCI-to-PCI bridge, I<sup>2</sup>C bus, FLASH devices, watchdog, IPMI controller (not PENT/CPCI-735!)
- **PENT/CPCI-760:** 21143 Ethernet Controller, I<sup>2</sup>C bus, FLASH devices, watchdog

## Delivered BSP Configuration

The default BSP configuration is as stated below:

- Ethernet driver in END configuration
- No SCSI support included
- No flash utility library included
- No show routines included
- No watchdog enabled
- Serial consode enabled

It is possible to adapt most of these configuration items by changing the respective defines in the file config.h in the BSP directory. For information on how to adapt the configuration, refer to the online documentation. For information on how to display the online documentation, see the "Online Documentation" section on page ix.

## Installing the BSP

The default packaging of the BSP is a compressed tar or zip file which can be downloaded from the Force Computers SMART page.

### Installation Procedure for Solaris

To install the BSP on Sun-Solaris hosts, use the tar file.

The following procedure explains how to install a BSP contained in a file named, for example, `bspFile.tar.Z`:

1. Enter `cd $WIND_BASE`  
to go to the Tornado 2.0 installation directory.
2. Enter `uncompress <bspFile>.tar.Z`  
to uncompress the BSP file.
3. Enter `tar xof <bspFile>.tar`  
to install the BSP.

### Installation Procedure for Windows NT

For installing the BSP on Windows NT hosts, use the provided zip file. To unzip the file, extract it in the top-directory of your Tornado installation (e.g. `C:\Tornado`).

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## Setting up a Project

If required, a project for the BSP can be created after BSP installation using the Tornado 2.0 project tool. For further information, refer to the *Tornado 2.0 User's Guide*.

When asked during the procedure, select:

- Create a bootable VxWorks image (custom configure)
- Would you like to base your project on: A BSP

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**Note:** There are cases in which the Wind River Project Tool cannot set up the project. Then the Project Tool aborts with the following error message: `list must have an even number of elements`. This error comes from the parser of the project tool. It is caused by an offending `#define` in `config.h`. In most cases the reason is the `#define INCLUDE_FLASH`. Ensure that this macro is undefined. If another `#define` is causing the problem, the offending `#define` must be isolated and changed to `#undef`. After successful setup of the project the `#define` can be enabled again.

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## Booting VxWorks

The normal way to boot the BSP is via floppy disk. To create a bootable disk, use a DOS formatted 3.5" 1.44 MByte disk and refer to the *VxWorks Programmer's Guide 5.4*.

### Creating a Boot Floppy

To create a boot disk from the supplied boot images on a Solaris workstation, for example for a PENT/CPCI-760, do the following:

1. Insert a formatted 1.44 MByte 3.5" disk into disk drive 0.
2. Open disk in Solaris file manager to view its name.
3. To write the boot image to the 3.5" disk on Solaris, enter the following:

```
dd if=760.bootrom.sys of=/vol/dev/rdiskette0/FLOPPY_NAME
where 'FLOPPY_NAME' is the name of the disk as displayed by the
Solaris file manager.
```

On a Windows NT machine use the public domain program rawrite.exe to copy the boot image onto a 3.5" disk.

You may also format a 3.5" disk, use the WindRiver DOS tool vxsys.com to make the disk bootable and then copy the boot image on it.

In the distribution of the BSP, pregenerated versions of all relevant compiled modules plus images of the 3.5" 1.44 MByte disks are provided. The image file names for the specific board can be seen in the table below.

**Table 1:** *Delivered Images*

Board	File	Description
PENT/CPCI-731	731.bootrom.sys	Boot image for 3.5" boot disk
	731.bootrom_uncmp	Bootrom image for the PENT/CPCI-731
	731.vxWorks	VxWorks for the PENT/CPCI-731
	731.vxWorks.sym	Symbol table of the VxWorks for the PENT/CPCI-731
	731.vxWorks.st	Stand-alone VxWorks for the PENT/CPCI-731

**Table 1:** *Delivered Images (cont.)*

Board	File	Description
<b>PENT/CPCI-735/735R2/736</b>	735.bootrom.sys	Boot image for 3.5" boot disk
	735.bootrom_uncmp	Bootrom image for the PENT/CPCI-735/735R2/736
	735.vxWorks	VxWorks for the PENT/CPCI-735/735R2/736
	735.vxWorks.sym	Symbol table of the VxWorks for the PENT/CPCI-735/735R2/736
<b>PENT/CPCI-760</b>	735.vxWorks.st	Stand-alone VxWorks for the PENT/CPCI-735/735R2/736
	760.bootrom.sys	Boot image for 3.5" boot disk
	760.bootrom_uncmp	Bootrom image for the PENT/CPCI-760
	760.vxWorks.sym	Symbol table of the VxWorks for the PENT/CPCI-760
	760.vxWorks.st	Stand-alone VxWorks for the PENT/CPCI-760

If another, customized bootable VxWorks image was generated, execute the following command to transform the bootrom\_uncmp file into a bootrom.sys file:

```
dd if=bootrom_uncmp of=bootrom.sys bs=32 skip=1
```

This command also deletes the 32 Byte a.out header of the bootrom image.

Bootrom.sys can then be copied onto the previously created diskette.

## Loading the VxWorks Image

The VxWorks image can be loaded either from floppy disk, hard disk or network using the END configuration of the driver for the 82559 or 21143 Ethernet chips.

The name of the boot device to specify is frcFei or dc, depending on the hardware. The network driver is supplied in END style only.

# Product Error Report

Product:	Serial No.:
Date Of Purchase:	Originator:
Company:	Point Of Contact:
Tel.:	Ext.:
Address: _____ _____ _____	
Present Date:	
Affected Product: <input type="checkbox"/> Hardware <input type="checkbox"/> Software <input type="checkbox"/> Systems	Affected Documentation: <input type="checkbox"/> Hardware <input type="checkbox"/> Software <input type="checkbox"/> Systems
Error Description: _____ _____ _____ _____ _____ _____ _____ _____ _____	
<p><b>This Area to Be Completed by Force Computers:</b></p> <p>Date:</p> <p>PR#:</p> <p>Responsible Dept.:      <input type="checkbox"/> Marketing <input type="checkbox"/> Production             <input type="checkbox"/> Engineering <input type="checkbox"/> Board <input type="checkbox"/> Systems</p>	

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