



JUMPtec[®]

Windows NTE

Solution Pack

Technical Manual

Rev. 1.1

JUMPtec[®]

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PN of Manual:	JWinNTE.doc
Manual Rev.:	1.1
File:	JWinNTE.doc

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User Information

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General

For the circuits, descriptions and tables indicated no responsibility is assumed as far as patents or other rights of third parties are concerned.

The information in the Technical Descriptions describes the type of the boards and shall not be considered as assured characteristics.

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Warranty

Each board is tested carefully and thoroughly before being shipped. If, however, problems should occur during the operation, please check your user specific settings of all boards included in your system. This is often the source of the fault. If a board is defective, it can be sent to your supplier for repair. Please take care of the following steps:

1. The board returned should have the factory default settings since a test is only possible with these settings.
2. In order to repair your board as fast as possible we require some additional information from you. Please fill out the attached Repair Form and include it with the defective board.
3. If possible the board will be upgraded to the latest version without additional cost.
4. Upon receipt of the board please be aware that your user specific settings were changed during the test.

Within the warranty period the repair is free of charge as long as the warranty conditions are observed. Because of the high test expenditure you will be charged with the test cost if no fault is found. Repair after the warranty period will be charged.

This **JUMPtec[®]** product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period **JUMPtec[®]** will at its option either repair or replace defective products.

For warranty service or repair the product must be returned to a service facility designated by **JUMPtec[®]**.

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance or handling by buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.

JUMPtec[®] will not be responsible for any defects or damages to other products not supplied by **JUMPtec[®]** that are caused by a faulty **JUMPtec[®]** product.

Introduction

The **JUMPtec[®]** Windows NTE Solution Pack is an add-on to Microsoft Windows NT Embedded and its primary tool Target Designer. It contains everything to easily and efficiently use the Windows NT Embedded operating system on **JUMPtec[®]** boards.

This solution pack supports for the NTE Target Designer's visual configuration and build environment.

It contains Component Definition Files (KDF) for all necessary drivers required for **JUMPtec[®]** like video and network adapters.

It also includes pre-configured configurations for **JUMPtec[®]** boards so you have a solid and tested base from where to start your one NTE projects.

Support is provided for the **JIDA32 Library API** for NTE to access the **JUMPtec[®]** specific onboard hardware features like watchdog, LCD backlight, EEPROM, and the I2C bus.

A compact **Webserver** aids you in the development of embedded systems that can be controlled from any other internet/intranet workstation with just a web browser.

As a courtesy the Solution Pack also includes KDFs for additional fonts and the MS PowerPoint Viewer.

The **JUMPtec[®]** Windows NTE Solution Pack is free and updates can be downloaded from our Website.

The current version of the Solution Pack includes:

- Video Drivers
- Ethernet Drivers
- DIMM COM3 and COM4 Support
- Additional Headless Support
- JIDA32 Library API
- WebServer
- Fonts
- Microsoft PowerPoint Viewer (available as a separate ZIP file)

The following boards are supported:

- ETX-P1
- ETX-P3
- ETX-MGX
- littleMONSTER/586
- littleMONSTER/Pentium
- littleMONSTER2
- coolMONSTER
- coolMONSTER/Sound
- coolMONSTER/P3
- MOPSIcd4
- MOPSIcd6
- MOPS/586
- MOPS/686+
- DIMM-PC/486
- DIMM-PC/520
- VNS-786
- PC/104-VGACRT-4
- PC/104-VGALCD-4
- AGP-SPRINT-7
- PCI-SPRINT-6B
- PCI-SPRINT-6A
- ISA-VGALCD-4A

What's new

Version 1.1

Support for these boards:

- ETX-P3
- ETX-MGX
- DIMM-PC/486
- DIMM-PC/520
- VNS-786

New features:

- DIMM COM3 and COM4 Support
- Additional Headless Support
- Updated JIDA32 Library API

Requirements

To run the **JUMPtec[®]** Windows NTE Solution Pack must install the following products:

- Windows NT Embedded 4.0

Installation

Please make sure the Windows NT Embedded 4.0 or Target Designer has been installed properly.

To install the **JUMPtec[®]** Windows NTE Solution Pack you must perform the following steps manually:

- Extract the **JUMPtec[®]** Win NTE Solution Pack to any new empty directory.
- Make sure that the subdirectory structure remains intact.
- Open "Windows NT Embedded Target Designer".
- From the "Tools" menu select "Component Management...".
- Press the "Add" button.
- Navigate to the **JUMPtec[®]** Solution Pack's directory and select any KDF file.
- Press "Open", wait until processed, then press "OK". (Warnings about NetAdapter.tdx are OK).
- Repeat the last three steps until all KDFs have been imported in any order.

Required KDFs:

- e100ent.kdf
- ends3isa.kdf
- pcnet.kdf
- gx.kdf
- dm9pci.kdf
- JDimmSer.kdfJida.kdf
- ChipsCRTOnly.kdf

Optional KDFs:

- Tahoma.kdf
- Verdana.kdf
- Webserver.kdf
- ppview.kdf (available in a separate ZIP file)
- Click "OK" to close the Component Management Window
- From the "Configuration" menu select "Import..."
- Navigate to the **JUMPtec[®]** Solution Pack's directory and select any required CFG file
- Press the "Import" button, wait until processed, then press "OK".
- Repeat the last three steps until all required CFG files have been imported in any order

This table lists which CFG file is required for which boards.

Board	Configuration File
ETX-P1	ETX P1.cfg
ETX-P3	ETX P3.cfg
ETX-MGX	ETX MGX.cfg
littleMONSTER/586 littleMONSTER/Pentium	littleMONSTER.cfg
littleMONSTER2 coolMONSTER coolMONSTER/Sound	coolMONSTER (CMP, CMPS, LM2).cfg
coolMONSTER/P3	coolMONSTER P3.cfg
MOPSIcd4	MOPSIcd4.cfg
MOPSIcd6	MOPSIcd6.cfg
MOPS/586	MOPS586.cfg
MOPS/686+	MOPS686.cfg
DIMM-PC/486 DIMM-PC/520	DIMM486.cfg or DIMM486COM3.cfg
VNS-786	VNS786.cfg
AGP-SPRINT-7 PCI-SPRINT-6B PCI-SPRINT-6A PC/104-VGACRT-4 PC/104-VGALCD-4 ISA-VGALCD-4A	<i>Add-in boards. You need to add the components to your main board's configuration.</i>

Image Build

You are now ready to create a Windows NT Embedded image for your target system. It is recommended to copy the original **JUMPtec[®]** board configurations and then modify the copy.

- Select the **JUMPtec[®]** configuration in Target Designer.
- Choose "Copy" from the context menu (right click).
- Select the Collection where you want to place the copy (for example "User Configurations")
- Choose "Paste" from the context menu.
- Wait until the copy process has been completed.
- Rename the copied configuration.
- Make any desired changes.
- Choose "Build and Install..." from the "Image" menu.

After the build process the finished product will be in the "C:\EmbeddedOS" subdirectory. This contains everything that needs to be placed on the target systems boot drive.

Configurations and Components

This table lists the components contained in each component description file KDF:

Component	KDF
Intel(R) GD82559ER Ethernet Controller Driver	e100ent.kdf
Crystal LAN Family Adapter Driver	ends3isa.kdf
Davicom Ethernet Driver	dm9pci.kdf
Geode GX Display Driver	gx.kdf
AMD PCNET PCI Ethernet Adapter Driver	pcnet.kdf
JIDA32 Library Interface for JUMPtec [®] boards (Watchdog, EEPROM...)	Jida.kdf
JUMPtec [®] DIMM Serial Card Add-On Driver	JDimmSer.kdf
JUMPtec [®] CRT Only Add-on Driver for Chips & Technology Graphics Chips	ChipsCRTOnly.kdf
Tahoma TrueType Font	Tahoma.kdf
Verdana TrueType Font	Verdana.kdf
GoAhead Embedded Webserver	Webserver.kdf
Microsoft PowerPoint Viewer (available in a separate ZIP file)	ppview.kdf

Configuration Defaults

All JUMPtec[®] board configurations are based on the "Minimal With Network" configuration (NT Workstation with Graphics) and require about 13 MB on the target's hard or flash disk.

The following components have been added to all JUMPtec[®] board configurations:

- "Write Filter" (on the first partition of the first hard/flash disk)
- "Serial Ports Common"
- "COM1"
- "COM2"
- "Parallel Ports Common"
- "LPT1"
- "Standard Floppy Disk" (except ETX boards)
- "Net Command (NET.EXE)"
- "TCP/IP Utilities"

The appropriate video drivers and Ethernet drivers have been selected for each board. Please note that even boards without an onboard graphics controller contain a "Standard VGA" driver for development. See Video Driver for details.

Write Filter

All JUMPtec[®] supplied board configuration have a write filter set on the first partition of the first hard/flash disk (\Device\Harddisk0\Partition1). The write filter protects the physical hard or flash disk from modifications. NT and applications can still write to the drive but all changes are cached in memory (as available) and not written to the physical drive. This makes the system very reliable since it can be turned off at any time without data loss. On the next reboot everything will be as originally designed.

HINT: Use a second partition to save your data if required and flush files often.

To turn off the write filter you need to remove the check mark from the "Write Filter" component in Target Designer under "System\Devices\Storage\Storage Filter Drivers\".

To just temporarily allow write access you can boot the target system under DOS and then rename the file "c:\winnt\system32\drivers\wrfilter.sys". After all your modifications on the disk are made just rename the driver back to its original name and reboot. Note that the missing driver will not produce any error messages during startup.

Video Drivers

The appropriate video drivers have been selected for each board.

Please note that even boards without an onboard graphics controller contain a "Standard VGA" driver for development.

To create a truly headless system the "VGA" driver can be removed and replaced by the "NullVGA" driver component in Target Designer under "System\Devices\Display\Display Drivers". In that case consider adding the "Serial Console Administration" component as well.

The default resolution is 640*480. You can select any other available resolution from the "Properties" menu item by right clicking on the chosen display driver.

If you have a board equipped with a Chips and Technology graphics chip and have NO flat panel connected and want to use a resolution other than 640*480 then you need to include the "ChipsCRTOnly" component in Target Designer under "System\Devices\Display\Display Driver Options". Otherwise the monitor cannot synch on the generated video signal.

For the JUMPtec[®] add-in graphics cards you need to select the correct configuration for the motherboard and then add the following graphics driver component in Target Designer under "System\Devices\Display\Display Drivers".

Board	Display Driver Component
AGP-SPRINT-7	ATI
PCI-SPRINT-6B	Chips
PCI-SPRINT-6A	Chips
PC/104-VGACRT-4	VGA
PC/104-VGALCD-4	VGA
ISA-VGALCD-4A	VGA

Ethernet Driver

The appropriate Ethernet drivers have been selected for each board.

To change the base address and IRQ boot DOS and use the DOS based SETUP or DIAG programs for each controller. (Available at the **JUMPtec[®]** website).

For PCI based controllers the correct PCI slot number must be selected for each board. This has already been done for the **JUMPtec[®]** supplied configurations.

TCP/IP is configured to use DHCP. To assign a fixed address go to the Properties dialog of "System\Network\Network Protocols\TCP/IP" under Target Designer.

Floppy Disk Driver

A floppy driver is added for all configurations except for the ETX.boards.

Serial Driver

The **JUMPtec[®]** board configuration include the serial ports for COM1: and COM2: To avoid interrupt conflicts the ports COM3: and COM4: are not included even if they are available on-board.

To enable the additional COM3: and COM4: ports just the COM3 and COM4 component in Target Designer under "System\Devices\Serial Ports". For each port choose "Properties" from the context menu. Press the "Advanced..." button on the dialog that appears and choose the following "Base I/O Port Address" and "Interrupt Request Line (IRQ)":

Port	I/O	IRQ
COM3:	3E8	10
COM4:	2E8	11

DIMM Serial Card Add-On Driver

This driver enables the COM3 and COM4 on the DIMM/COM and DIMM/COMBO module.

Notes on DIMM486COM3.cfg:

DIMM-PC/486 NTE Configuration with COM3 on IRQ10 enabled. By default the Ethernet chip uses that IRQ. So you need to use the DOS Crystal Setup program to change the IRQ of the Ethernet chip to IRQ12 for example. Note that for COM4 to work you must reroute the IRQ11 line on the DIMM/COM/COMBO to another free IRQ on the DIMM-PC/486. COM4 of the DEMO Board cannot work without this hardware change.

NT Embedded Headless Support

To use NT Embedded without a physical Video chip that have a Phoenix BIOS (like the MOPS/686) you need to replace these files on the target systems root.

- ntldr
- ntdetect.com

This is need in addition to using the headless video driver.

JIDA32 Library API

Most **JUMPtec**[®] PC boards are equipped with unique hardware features that cannot be accessed with standard API. The JIDA interface allows you to access these features in a hardware independent manner under any Win32 based operating system.

The interface DLL works under any flavor of Win32. The DLL communicates with a platform dependent driver. At the present time drivers are available for Windows 9x, Windows NT and Windows NTE.

The Windows NTE drivers have been included in the Windows NTE Solution Pack for your convenience. To use JIDA Win32 in your application you must download the JIDA Win32 driver and development pack available as a separate archive. Please refer to the JIDA32.DOC manual for further information.

To include the JIDA32 Library Interface you need to add the "JIDA32" component in Target Designer under "System\Devices\JUMPtec\".

WebServer

The **JUMPtec**[®] Solution Pack contains the GoAhead WebServer compiled for Windows NTE on the X86 platform solely for our customers' convenience. The server can be redistributed royalty free as long as improvements to the source code are made available to GoAhead Software, Inc. and proper copyright notices are presented. For the complete source code as well as the full license agreement please visit the GoAhead website at <http://www.goahead.com/webserver>. **JUMPtec**[®] does not provide support or warranty for this component. Copyright (c) 2000 GoAhead Software, Inc. All Rights Reserved.

To include the web server you need to add the "WebServer" component in Target Designer under "System\Network\Network Services\".

If you only add that component place your web pages under "Web" on you target system. The default page is called "home.asp". To activate the web server run webs.exe.

To run the web server automatically you need to add the "WebServer AutoStart" component in Target Designer under "System\Network\Network Services\".

To include the a sample web page you need to add the "WebServer Sample" component in Target Designer under "System\Network\Network Services\".

Bootable Windows NTE Configuration

If you have the **JUMPtec[®]** Remote Target Setup (JERTS) tool (available separately) then you can set up your target conveniently thru Ethernet from your development workstation. (See JERTS documentation for details)

If you don't have JERTS then here is how to manually create a bootable Windows NTE on your target system. Just follow these steps after building and NTE configuration:

- Connect a **JUMPtec[®]** chipDISK or second hard disk to any PC where Windows NT 4.0 is installed.
- Boot up the Windows NT 4.0 machine.
- Open the disk administrator and format the chipDISK with a FAT file system.
- Copy all files from C:\EmbeddedOS that belong into the root to that drive first (boot.ini, ntldr, nt detect.com)
- Then copy the WINNT and TEMP (last one is empty)
- Shutdown the machine and connect the chipDISK to the **JUMPtec[®]** board
- Turn it on.
- The NTE command prompt should come up.
- If the network is not connected or if there is no DHCP server then you will get an error message after a minute.
- If you have the network setup properly you can do a "ipconfig /all" to verify the IP addresses.
- TCP/IP tools and NET.EXE are included by default so you can do a "net use X: \\server\share" to connect to a file server.

Hints

Attending one of our Windows NTE Seminars helps you avoid many of the pitfalls of getting started with Windows NTE.

Document Revision History

Filename	Date	Edited by	Revision	Alteration to preceding revision
JWINNTE.DOC	2000.07.19	DP	1.0	Initial version for NTE 4.0
JWINNTE.DOC	2001.11.26	DP	1.1	Added boards DIMM-PC/486/520, ETX-P3, ETX-MGX, VNS-786