

# HS-4000

## Half 486 Little Board

PCI Slot, PC/104 Bus, Flat Panel Connector,  
100-Base Network, RS-232/422/485.

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# CONTENTS

<b>GENERAL INFORMATION</b> .....	<b>3</b>
1.1 MAJOR FEATURES .....	4
1.2 SPECIFICATIONS .....	5
1.3 DELIVERY PACKAGE .....	6
<b>HARDWARE INSTALLATION</b> .....	<b>7</b>
2.1 CAUTION OF STATIC ELECTRICITY.....	7
2.2 CAUTION ON UNPACKING AND BEFORE INSTALLATION.....	8
2.3 HS-4000'S LAYOUT .....	9
2.4 QUICK LISTING OF JUMPERS.....	10
2.5 QUICK LISTING OF CONNECTORS.....	10
2.6 JUMPER SETTING DESCRIPTION.....	12
2.7 SETTING THE CPU OF HS-4000.....	13
2.8 CMOS DATA CLEAR .....	14
2.9 CACHE SIZE SELECT .....	14
2.10 SYSTEM MEMORY DRAM .....	15
2.11 WATCH-DOG TIMER .....	15
2.12 VGA CONTROLLER.....	17
2.13 DISKONCHIP? ADDRESS SETTING.....	18
<b>CONNECTION</b> .....	<b>19</b>
3.1 THE FLOPPY DISK DRIVE CONNECTOR .....	19
3.2 PCI E-IDE DRIVE CONNECTOR .....	20
3.3 PARALLEL PORT CONNECTOR .....	21
3.4 SERIAL PORTS CONNECTORS.....	22
3.5 KEYBOARD & MOUSE CONNECTOR .....	24
3.6 POWER'S LED, FAN AND KEY-LOCK CONNECTORS .....	24
3.7 DC MAIN AND AUX. POWER CONNECTORS .....	25
3.8 EXTERNAL FRONT PANEL CONNECTOR .....	25
3.9 PS/2 MOUSE IRQ12 SELECTION CONNECTOR .....	26
3.10 VGA CONNECTOR.....	26
3.11 FAST ETHERNET CONNECTOR .....	27
3.12 PC/104 BUS CONNECTION .....	27
3.13 FLAT-PANEL CONNECTOR.....	29
<u>Connections for four standard LCDs</u> .....	30

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<b>AMI BIOS SETUP .....</b>	<b>35</b>
4.1 MAIN MENU .....	36
4.2 STANDARD CMOS SETUP .....	37
4.3 ADVANCED CMOS SETUP .....	38
4.4 ADVANCED CHIPSET SETUP .....	40
4.5 POWER MANAGEMENT SETUP .....	41
4.6 PERIPHERAL SETUP .....	42
<b>A BRIEF BROWSE OF 100 BASE-T LAN RTL-8139'S   INSTALLATION SOFTWARE.....</b>	<b>43</b>
5.1 TEXT FILES LIST OF HELP DOCUMENTS.....	44
5.2 DISKETTE CONTENTS.....	44
5.3 FILES ON CONFIGURATION DISK.....	45
5.4 INSTALLING NOVELL NETWORK DRIVERS TO WORKSTATION FOR DOS ODI CLIENT .....	48
5.5 SERVER DRIVER FOR NET WARE 3.12.....	50
5.6 SERVER DRIVER FOR NET WARE 4.1.....	51
5.7 SERVER DRIVER FOR NET WARE 4.11 .....	53
5.8 CLIENT 32 FOR WINDOWS 95.....	54
5.9 INSTALLING IBM NETWORK DRIVERS TO LAN SERVER FOR OS/2 2.3.....	56
5.10 LAN SERVER FOR OS/2 4.0.....	59
5.11 INSTALLING MICROSOFT NETWORK DRIVERS TO MICROSOFT NETWORK CLIENT FOR DOS .....	60
5.12 LAN MANAGER WORKSTATION / SERVER.....	63
5.13 WINDOWS FOR WORKGROUPS v3.0.....	64
5.14 WINDOWS NT 3.5, 3.51, & 4.0 .....	67
5.15 WINDOWS 95 & OSR2.....	68
5.16 INSTALLING UNIX NETWORK DRIVERS TO SCO UNIX 4.x.....	68
5.17 SCO UNIX 5.x .....	70
5.18 OTHER NTEWORK OF OPERATING SYSTEM INFORMATION OF PACKET DRIVER.....	72
5.19 LANTASTIC 6.0 WITH NDIS DRIVER.....	73

# Chapter-1

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## General Information

The HS-4000 is an all-in-one half size industrial single board with design in Novell NE2000 compatible 32-bit PCI bus Ethernet, provides 100 BASE-T or 10 BASE-T for directly network automation demand.

Supports for various 40-133 MHz 80486SX/DX/DX2/DX4, 5x86 CPUs with 32-bit data bus and processing ability. Up to 64MB RAM by 72-pin SIMM supported. Provides "DiskOnChip? " socket supported memory size up to 24 MB.

Design in with on board 1MB memory VGA architecture, supports direct interface to color and monochrome Single Drive (SD) and Dual Drive (DD) STN, TFT & EL panels and resolutions up to 1024x768 256 colors to CRT monitor.

The HS-4000 support completed with all necessary I/O for industrial application. A PCI enhanced IDE for two ATA-2 IDE drivers; supports up to two floppy disk drivers; provide three high speed serial RS-232 ports and one RS232/422/485 port with compatible to 16C550 UART with 16-byte FIFO; one enhanced bi-directional parallel port which support SPP/EPP/ECP. The board also provides keyboard and PS/2 mouse connector, PC/104 connector and one standard PCI slot etc.

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## 1.1 Major Features

- ✂✂ 80486SX/DX/DX2/DX4, 5x86 CPU supported.
- ✂✂ ALi 1487/1489 chipset.
- ✂✂ Supports DRAM up to 64 MB.
- ✂✂ Fast PCI enhanced IDE controller supports two IDE drives.
- ✂✂ Three high-speed serial RS-232 ports and one RS232/422/485 selectable port (supports 16C550 UART with 16-byte FIFO).
- ✂✂ One enhanced bi-directional parallel port supports SPP/EPP/ECP.
- ✂✂ Keyboard and PS/2 Mouse connector.
- ✂✂ On-board ALi M5113 Super I/O.
- ✂✂ On-board 32 bit PCI-BUS VGA/ Panel controller.
- ✂✂ "DiskOnChip™ " Socket Supported Memory Size up to 24 MB.
- ✂✂ On-board 32 bit PCI bus Ethernet, Novell NE2000 compatible.
- ✂✂ Supports PC/104 connector.
- ✂✂ One standard PCI slot.

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## 1.2 Specifications

- ✂✂ **CPU:** 80486SX/DX/DX2/DX4/5X86.
- ✂✂ **Bus interface:** PCI bus
- ✂✂ **Chipset:** ALi 1487/1489
- ✂✂ **Data bus:** 32-bit
- ✂✂ **Processing ability:** 32-bit
- ✂✂ **PCI Flat Panel / VGA Controller:** VGA Chipset with 1 MB memory interface to color and monochrome Single Drive (SS) and Dual Drive (DD) STN, TFT & EL panels. Support CRT resolutions up to 1024x768 256 colors.
- ✂✂ **PCI Enhanced IDE interfaces:** Supports up to two enhanced IDE ATA-2).
- ✂✂ **RAM memory:** Up to 64MB, uses two 72-pin SIMM sockets.
- ✂✂ **Cache memory:** On board 128KB 2nd level cache.
- ✂✂ **Floppy disk drive interface:** Supports up to two floppy disk drives.
- ✂✂ **Parallel port:** One parallel port supports SPP/ECP/EPP.
- ✂✂ **Serial port:** Three RS-232 ports one RS232/422/485 port supports 16C550 UART with 16-byte FIFO.
- ✂✂ **BIOS:** AWARD flash BIOS.
- ✂✂ **Watchdog timer:** Hardware circuit can be set by 1, 2, 10, 20, 110, or 220 seconds period Reset or NMI was generated when CPU did not periodically trigger the timer.
- ✂✂ **Ethernet:** Realtek RTL 8139, 32 bit PCI bus Ethernet, Novell NE2000 compatible.
- ✂✂ **Keyboard / Mouse connector:** 8-pin connector supports standard PC/AT keyboard and a PS/2 mouse.
- ✂✂ **PC/104:** 104-pin connector support 16 bit ISA Bus.
- ✂✂ **PCI slot:** Standard PCI bus expansion slot.
- ✂✂ **Flash memory Disk:** Reserved socket for "DiskOnChip™ ", support up to 24MB Flash memory disk.

- 
- ✂✂ **Power connector:** Support 4-PIN power connector input (+5V, +12V).
  - ✂✂ **CMOS:** Real-time clock/calendar and battery backup by DS12B887 or equivalent device.
  - ✂✂ **Power supply voltage:** +5V  $\pm 5\%$ , +12V  $\pm 5\%$ .
  - ✂✂ **Max. Power requirement:** +5V @2.2A.
  - ✂✂ **Operating temperature:** 0-55°C (CPU need cooler).
  - ✂✂ **Board size:** 8" (L) x 5.75" (W) (203mm x 146mm).

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## 1.3 Delivery Package

The delivery package of HS-4000 includes all following items:

- ## HS-4000 Industrial Single Board
- ## Printer port Flat Cable
- ## IDE port Flat Cable
- ## FDD port Flat Cable
- ## 40-pin COM ports Cable
- ## Flat Panel Cable
- ## Front Panel Cable
- ## Ethernet Cable
- ## PS/2 Mouse and Keyboard Transfer Cable
- ## Utility Diskette
- ## User's Manual

Please contact with your dealer if any of these items are missing or damaged when purchasing. And please keep all parts of the delivery package with packing materials in case of you want to ship or store the product in future.



# Chapter-2

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## Hardware Installation

This chapter provides the information on how to install the hardware of HS-4000. At first, please follow up sections 1.3, 2.1 and 2.2 in check the delivery package and carefully unpacking. Following after, the jumpers setting of switch, watchdog timer, and the DiskOnChip? address selection.

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### 2.1 Caution of Static Electricity

The HS-4000 has been well package with a anti-static bag in protect its sensitive computer components and circuitry from the damage of static electric discharge.

**Note:** DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.

You should follow the steps as following to protect the board in against the static electric discharge whenever you handle the board:

1. Please use a grounding wrist strap on whoever needs to handle the HS-4000. Well clip the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handle the HS-4000 for harmlessly discharge any static electricity through the strap.
2. Please use anti-static pad for put any components or parts or tools on the pad whenever you work on them outside the computer. You may also in use the anti-static bag instead the pad. Please ask from your local supplier in help up your necessary parts on anti-static requirement.

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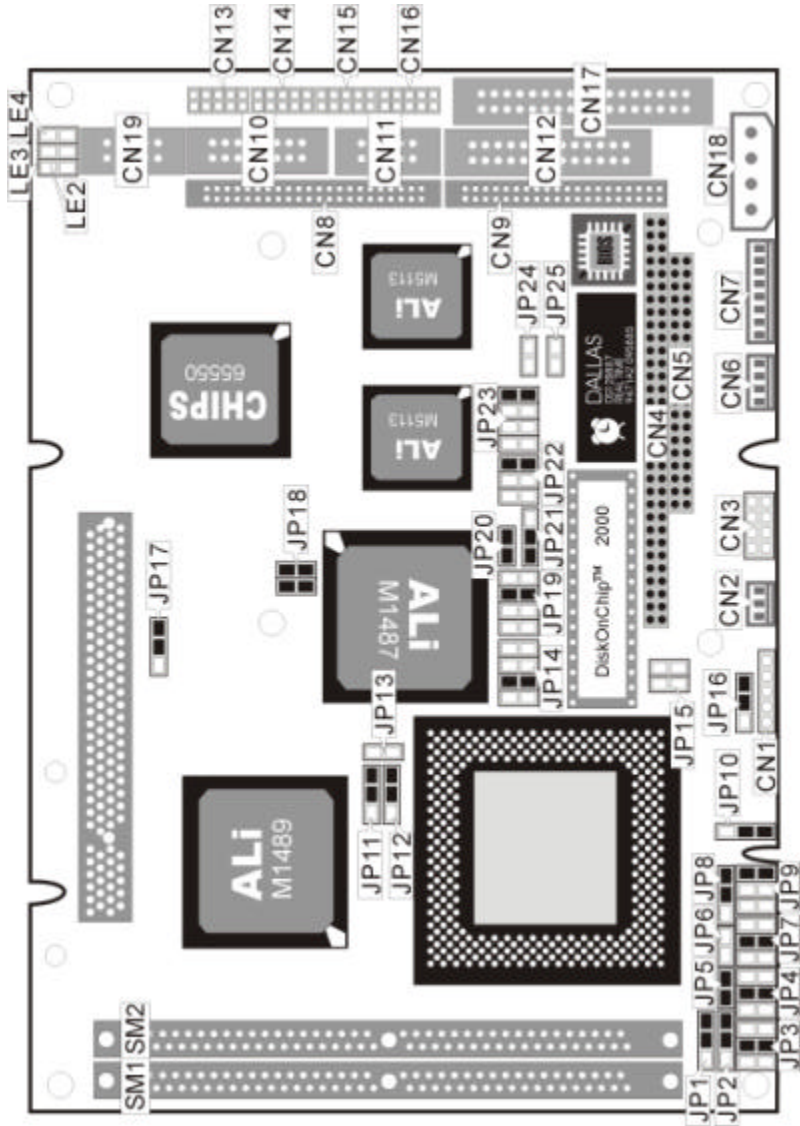
## 2.2 Caution on Unpacking and Before Installation

First of all, please follow with all necessary steps of section 2.1 in protection the HS-4000 from electricity discharge. With refer to section 1.3, please check the delivery package again with following steps:

1. Unpacking the HS-4000, keep well storage of all packing material, manual and diskette etc. if has.
2. Is there any components lose or drop from the board? DO NOT INSTALL IF HAPPENED.
3. Is there any visual damaged of the board? DO NOT INSTALL IF HAPPENED.
4. Well check from your optional parts (i.e. CPU, SRAM, DRAM, ROM-Disk etc.) for completed setting all necessary jumpers setting to jumper pin-set and CMOS setup correctly. Please also reference to all information of jumpers setting in this manual.
5. Well check from your external devices (i.e. Add-On-Card, Driver Type etc.) for completed add-in or connection and CMOS setup correctly. Please also reference to all information of connector connection in this manual.
6. Please keep all necessary manual and diskette in a good condition for your necessary re-installation if you change your Operating System or whatever needs.

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## 2.3 HS-4000' s Layout



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## 2.4 Quick Listing of Jumpers

JP1, 2, 3, 4, 5, 7, 8, 9, 10	—	for CPU type setting
JP6	—	for AMD CPU type selection
JP11, 12	—	for Cache size setting
JP13	—	CPU clock selection
JP14	—	for DiskOnChip™ address setting
JP15	—	CPU's Vcore voltage level selection setting
JP16	—	CPU's operating voltage selection setting
JP17	—	PCI clock setting
JP18	—	CPU Clock-in selection
JP19	—	WATCH-DOG Time-out period selection
JP20	—	PS/2 Mouse IRQ selection
JP21	—	WATCH-DOG Active selection
JP22	—	RS422/485 Receiver Enable Control
JP23	—	RS422/485 Transceiver Enable Control
JP24	—	COM4 Enable/Disable setting

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## 2.5 Quick Listing of Connectors

CN1:	POWER LED/KEYLOCK
CN2:	FAN CON
CN3:	FRONT PANEL
CN4:	PC104-64
CN5:	PC104-40
CN6:	POWER CONNECTOR (-12V, -5V)
CN7:	KEYBOARD + MOUSE CONNECTOR
CN8:	FLAT PANEL PORT
CN9:	HDD (IDE) CONNECTOR
CN10:	VGA CONNECTOR
CN11:	RS422/RS485
CN12:	PARALLEL PORT

CN13: COM1  
CN14: COM2  
CN15: COM3  
CN16: COM4  
CN17: FDD CONNECTOR  
CN18: POWER CONNECTOR  
CN19: ETHERNET CONNECTOR

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## 2.6 Jumper Setting Description

A jumper pin-set is **ON** as a shorted circuit with a plastic cap inserted over two pins. A jumper pin-set is **OFF** as an open circuit with a plastic cap inserted over one or no pin(s) between pins. The below figure 2.2 shows the examples of different jumper pin-set setting as **ON** or **OFF** in this manual.

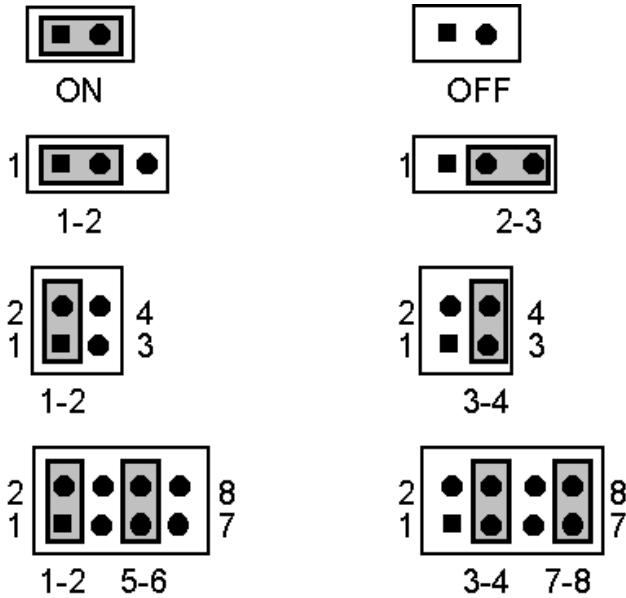


Figure 2.2

All jumper pin-set already has its default setting with the plastic cap inserted as ON, or without the plastic cap inserted as OFF. The default setting may reference in this manual with a "\*" symbol in front of the selected item.

## 2.7 Setting the CPU of HS-4000

The HS-4000 provides all possibility in jumper setting for wide using all types of 486 series CPU with JP1, JP2, JP3, JP4, JP5, JP7, JP8, JP9 and JP10 setting as following:

### *☞* CPU Clock Setting

CPU	JP1	JP2	JP3	JP4	JP5	JP7	JP8	JP9	JP10
1.IntelDX4™	OFF	1-2	3-4	3-4	ON	3-4	2-3	OFF	2-3
<b>*2.Cyrix 5x86</b>	<b>2-3</b>	<b>2-3</b>	<b>3-4</b>	<b>3-4</b>	<b>ON</b>	<b>3-4</b>	<b>2-3</b>	<b>5-6</b>	<b>2-3</b>
3.AMD DX4 + (SV8B)	2-3	2-3	3-4	3-4	ON	3-4	2-3	5-6	2-3
4.Cyrix/TI/SGS DX2/DX4	1-2	1-2	5-6	5-6	ON	5-6	2-3	1-2	2-3
5.AMD DX/DX4 (NV8T)	OFF	1-2	1-2	OFF	OFF	OFF	2-3	OFF	2-3
6.AMD DX2+ (SV8B)	2-3	2-3	3-4	3-4	ON	3-4	2-3	1-3,5-6	2-3
7.AM5x86 P75 (133MHz)	2-3	2-3	3-4	3-4	ON	3-4	2-3	1-3,5-6	2-3

Correspond to different type CPU, it is request to set JP15 and JP16 for match the CPU operating voltage. Here shows at below of the proper jumper settings for their respective Vcc.

### *☞* CPU power supply select

JP15	DESCRIPTION
1-2, 3-4	5V
<b>*ALL OFF</b>	<b>3V</b>

JP16	DESCRIPTION
1-2	3.45V
<b>*2-3</b>	<b>3.3V</b>

For AMD type CPU, please set correctly of JP6 as following. For others, please keep JP6 at **OFF** setting.

### *☞* AMD CPU type select

JP6	DESCRIPTION
ON	AMD DX2
<b>*OFF</b>	<b>AMD DX4</b>

---

JP18 used to synchronize the CPU clock with the CPU type. Please set the CPU clock with JP18, JP13 and JP17 jumpers according to the base CPU speed.

☞ **CPU clock select**

<b>JP18</b>	<b>JP13</b>	<b>JP17</b>	<b>DESCRIPTION</b>
OFF, OFF	OFF	1-2	25 MHz
<b>*1-2, 3-4</b>	<b>OFF</b>	<b>1-2</b>	<b>33 MHz</b>
OFF, 3-4	ON	2-3	40 MHz
1-2, OFF	ON	2-3	50 MHz

---

## 2.8 CMOS Data Clear

The JP25 provides a hardware CMOS data clear function with an **ON** to it. *Never clear CMOS data during power on in case of damage the sensitive electronic components or the board.*

☞ **CMOS Data Clear**

<b>JP25</b>	<b>DESCRIPTION</b>
ON	Clear Data
<b>*OFF</b>	<b>Normal</b>

---

## 2.9 Cache Size Select

The HS-4000 design in with a wide ranges Cache Size architectures to meet all different costs request. The standard specification is 32K x 8.

☞ **Cache Size select**

<b>JP11</b>	<b>JP12</b>	<b>DESCRIPTION</b>
<b>* 2-3</b>	<b>* 2-3</b>	<b>* 32K x 8</b>
1-2	2-3	64K x 8
1-2	1-2	128K x 8



---

## 2.10 System Memory DRAM

The HS-4000 provides a wide range of on-board DRAM memory sizes from 1 MB to 16 MB by using 1, 2, 4, 8 or 16MB 72-pin SIMMs (Single In-Line Memory Modules) with access time should be 70 n-second or faster.

The HS-4000 provides two banks for memory installation by SIMM RAM module on card. The banks are designated as Bank0 and Bank1. See the figure on section 2.3 for get the identifying the banks. You must use from Bank0 first if install one SIMM only. If you are using both banks, the memory capacity of both SIMMs should be the same.

---

## 2.11 Watch-Dog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable. The Enable cycle should proceed by READ PORT 443H. The Disable cycle should proceed by READ PORT 043H. A continue Enable cycle after a first Enable cycle means Refresh.

Once if the Enable cycle activity, a Refresh cycle is request before the time-out period for restart counting the WDT Timer's period. Otherwise, it will assume that the program operation is abnormal when the time counting over the period preset of WDT Timer. A System Reset signal to start again or a NMI cycle to the CPU comes if over.

The JP21 is using for select the active function of watch -dog timer in disable the watch -dog timer, or presetting the watch -dog timer activity at the reset trigger, or presetting the watch -dog timer activity at the NMI trigger.

### JP21 : Watch-Dog Active Type Setting

JP21	DESCRIPTION
*1-2	System Reset
2-3	Active NMI
OFF	disable Watch-dog timer

### JP19: WDT Time - Out Period

PERIOD	1-2	3-4	5-6	7-8
*1 sec	OFF	OFF	ON	OFF
2 sec	OFF	OFF	ON	ON
10 sec	OFF	ON	OFF	OFF
20 sec	OFF	ON	OFF	ON
110 sec	ON	OFF	OFF	OFF
220 sec	ON	OFF	OFF	ON

The Watch-dog timer is disabled after the system Power-On. The watch-dog timer can be enabled by a Enable cycle with reading the control port (443H), a Refresh cycle with reading the control port (443H) and a Disable cycle by reading the Watch-dog timer disable control port (043H). After a Enable cycle of WDT, user must constantly proceed a Refresh cycle to WDT before its period setting comes ending of every 1, 2, 10, 20, 110 or 120 seconds. If the Refresh cycle does not active before WDT period cycle, the on board WDT architecture will issue a Reset or NMI cycle to the system.

The Watch-Dog Timer is controlled by two I/O ports.

443H	I/O Read	The Enable cycle.
443H	I/O Read	The Refresh cycle.
043H	I/O Read	The Disable cycle.

The following sample programs showing how to Enable, Disable and Refresh the Watch-dog timer:

```

WDT_EN_RF      EQU    0443H
WDT_DIS        EQU    0043H

WT_Enable      PUSH   AX                ; keep AX DX
                PUSH   DX
                MOV    DX,WDT_EN_RF    ; enable the watch-dog timer
                IN     AL,DX
                POP    DX                ; get back AX, DX
                POP    AX
                RET

WT_Rresh       PUSH   AX                ; keep AX, DX

```

---

	PUSH	DX	
	MOV	DX,WDT_ET_RF	; refresh the watch-dog timer
	IN	AL,DX	
	POP	DX	; get back AX, DX
	POP	AX	
	RET		
WT_DISABLE	PUSH	AX	
	PUSH	DX	
	MOV	DX,WDT_DIS	; disable the watch-dog timer
	IN	AL,DX	
	POP	DX	; get back AX, DX
	POP	AX	
	RET		

---

## 2.12 VGA Controller

The C&T 655xx family supports a wide variety of monochrome and color Single-Panel, Single-Drive (SS) and Dual-Panel, Dual Drive (DD) standard and high-res passive STN and active matrix TFT/MIN LCD, and EL panels. For monochrome panels, up to 64 gray scales are supported. Up to 4096 different colors can be displayed on passive STN LCDs and up to 16 M colors on 24-bit active matrix LCDs.

The HS-4000 uses C&T 65550 chipset. Provides 2.0 mm pitch 44-pin on-board internal connector for flat panel connection; and a external DB15 analogy R.G.B. output connector for CRT monitor. By BIOS setup, user may use one of the display devices or both. Please use at the same resolution when both display. Please contact with your dealer if connection to a new specification flat panel.

The HS-4000 offers a variety of programmable features to optimize display quality. Vertical centering and stretching are provided for handling modes with less than 480 lines on 480 - line panels. Horizontal and vertical stretching capabilities are also available for both text and graphics modes for optimal display of VGA text and graphics modes on 800x600 and 1024x768 panels.

---

## 2.13 DiskOnChip? Address Setting

The HS-4000 provides a U8 socket for install the DiskOnChip? module.

A JP14 may select the starting memory address of the DiskOnChip? (D.O.C.) for avoid the mapping area with any other memory devices. If you have another extra memory devices in the system with the same memory, neither the HS-4000 nor the extra memory devices will function normally. Please setting both at different memory address mapping.

### ≡≡ **JP14 : DiskOnChip? Address**

PIN NO.	Address
<b>*1-2</b>	<b>D000</b>
3-4	D800
5-6	E000
7-8	E800

\*) : default setting

The D.O.C. function allows the system in using without FDD nor HDD. The D.O.C. may formatting as driver C: or driver A:. User may also easily uses the DOS's commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc. This is means that the D.O.C. may uses as driver-A if the system without FDD-A for ambient application. Please contact with your supplier for different size D.O.C. module.

# Chapter-3

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## Connection

This chapter gives all necessary information of the peripheral's connections, switches and indicators.

---

### 3.1 The Floppy Disk Drive Connector

A standard 34-pin header daisy-chain driver connector provides as CN17 with following pin assignment. Total two FDD drivers may connect.

#### ☞ **CN17: FDD CONNECTOR**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT
33	GROUND	34	DISK CHANGE#

---

## 3.2 PCI E-IDE Drive Connector

A standard 40-pin header daisy-chain driver connector provides as CN9 with following pin assignment. Total two IDE (Integrated Device Electronics) drivers may connect.

### *##* **CN9(IDE 1) : Primary IDE Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND# -DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0	38	HDC CS1#
39	HDD ACTIVE	40	GROUND

---

### 3.3 Parallel Port Connector

A standard 26-pin flat cable driver connector provides as CN12 with following pin assignment for connection to parallel printer.

*☞* **CN12 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	GROUND

---

## 3.4 Serial Ports Connectors

The HS-4000's CN13, 14, 15 and 16 headers provides four high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. Please see the following pin assignment. With the delivery package, user may uses the 40-pin COM cable for plug into CN13, 14, 15 and 16 for get COM1 to COM4 connection. The pin number inside the ( ) are for 40-pin cable.

### ≡ CN13, 14, 15, 16 : Serial Port 10-pin Headers (COM1~COM4)

COM Port	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM 1 ( CN13 )	1(1)	DCD	2(2)	DSR
	3(3)	RXD	4(4)	RTX
	5(5)	TXD	6(6)	CTX
	7(7)	DTR	8(8)	RI
	9(9)	GND	10(10)	NC
COM 2 ( CN 14 )	1(11)	DCD	2(12)	DSR
	3(13)	RXD	4(14)	RTX
	5(15)	TXD	6(16)	CTX
	7(17)	DTR	8(18)	RI
	9(19)	GND	10(20)	NC
COM 1 ( CN15 )	1(21)	DCD	2(22)	DSR
	3(23)	RXD	4(24)	RTX
	5(25)	TXD	6(26)	CTX
	7(27)	DTR	8(28)	RI
	9(29)	GND	10(30)	NC
COM 2 ( CN 16 )	1(31)	DCD	2(32)	DSR
	3(33)	RXD	4(34)	RTX
	5(35)	TXD	6(36)	CTX
	7(37)	DTR	8(38)	RI
	9(39)	GND	10(40)	NC



The HS-4000 also provides for user in select to using the COM4 as an RS422/485. The CN16 for uses as an RS232, the CN11 for uses as an RS422 or RS485.

Please reference to the following for setting the JP22 & JP23 at disable and JP24 at enable if uses as RS232 at CN16. Or setting the JP22 & JP23 at non-disable and JP24 at disable if uses as RS422 or RS485 at CN11. The default setting is RS-232 at CN16.

**CN11 : RS422/485**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTS-
7	RTS+	8	CTS+
9	CTS-	10	NC

**JP22 : Receiver Enable Control**

JP22	DESCRIPTION
1-2	Always Enable
3-4	Enable by writing the REG : 2 EFH BIT1=1
*5-6	Always Disable

\*) : default setting

**JP23 : Transceiver Enable Control**

JP23	DESCRIPTION
1-2	Always Enable
3-4	Enable by " -RTS" signal
5-6	Enable by writing the REG : 2 EFH BIT0=1
*7-8	Always Disable

\*) : default setting

**JP24 : COM4 Selection**

JP24	DESCRIPTION
ON	As RS-422/485 in CN11
*OFF	As RS-232 in CN16

\*) : default setting

---

### 3.5 Keyboard & Mouse Connector

The HS-4000 provides a 8-pin header connector CN7 for connection to Keyboard & Mouse devices.

☞ **CN7 : 8-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	MS-DATA	4	MS-CLK
5	GND	6	VCC
7	KB-DATA	8	KB-CLK

---

### 3.6 Power's LED, FAN and Key-Lock Connectors

The CN1 provides both Power's LED and Key-Lock connector as following pin assignment.

☞ **CN1 : POWER LED & KEYLOCK**

PIN NO.	DESCRIPTION
1	POWER LED ANODE
2	KEY
3	GROUND
4	KEYLOCK
5	GROUND

The CN2 provides a FAN connector as following pin assignment.

☞ **CN2 : FAN CON**

PIN NO.	DESCRIPTION
1	VCC
2	GROUND
3	+12V

---

### 3.7 DC Main and Aux. Power Connectors

The HS-4000 provides a CN18 connector for the main DC power input connection as following pin assignment for +5V and +12V.

**CN18: POWER CONNECTOR**

PIN NO.	DESCRIPTION
1	VCC
2	GROUND
3	GROUND
4	+12V

The HS-4000 provides a CN6 connector for the aux. DC power input connection as following pin assignment for -5V and -12V.

**CN6: POWER CONNECTOR**

PIN NO.	DESCRIPTION
1	-12V
2	GROUND
3	-5V
4	GROUND

---

### 3.8 External Front Panel Connector

The HS-4000 has an on-board buzzer. With CN3, it allows user in connection to a external speaker, IDE' s LED and Reset bottom.

**CN3: Front Panel Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	IDE-LED	2	VCC
3	SPEAKER	4	GROUND
5	GROUND	6	WATCHDOG CLEAR
7	GROUND	8	RESET

---

### 3.9 PS/2 Mouse IRQ12 Selection Connector

The HS-4000 has an on-board PS/2 mouse which using IRQ12. If you do not use the PS/2 mouse and wish to assign IRQ12 for other purposes, you should setting the JP20 to disconnect PS/2 interrupt from IRQ12.

JP20	SELECTION
OFF	No interrupt for PS/2
*ON	IRQ12

\*) : default setting

---

### 3.10 VGA Connector

The HS-4000 has on-board 16-pin external VGA connector.

**⚡ CN10: VGA Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	GROUND	8	GROUND
9	GROUND	10	HSYNC
11	GROUND	12	VSYNC
13	GROUND	14	NC
15	GROUND	16	NC

---

### 3.11 Fast Ethernet Connector

The Fast Ethernet controller provides with 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3 100Base-T specifications.

For 10/100Base-T RJ-45 operation, please connect the network connection by plugging one end of the cable into the RJ-45 to CN19 Connector.

#### **⚡ CN19: Ethernet Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	LED 0
3	RX+	4	RX-
5	LED 1	6	GND
7	LED 2	8	GND
9	TX+	10	TX-

---

### 3.12 PC/104 Bus Connection

The HS-4000's PC/104 expansion bus provides you in connect to all kind PC/104 modules connection. The PC/104 bus has already become the industrial embedded 16-bit PC standard bus, so you can easily install to over thousands of PC/104 modules from hundreds of venders in the world. The detailed pin assignment of the PC/104 expansion bus connectors CN4 and CN5 are specified as following tables:

**Note :** *The PC/104 connector allows to directly plug-in Stack-thru PC/104 modules without the PC/104 mounting kit.*

**CN4&CN5 : PC/104 Expansion Bus**  
**(CN4 = 64-pin female connector; CN5 = 40-pin female connector.)**

Pin No.	CN4 RowA	CN4 RowB	CN5 RowC	CN5 RowD
0	--	--	0V	0V
1	IOCHECK*	0V	SBHE*	
	MEMCS16*			
2	SD7	RESETDRV	LA23	IOSC16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	NOWS* LA17		DACK0*
9	SD0	+12V	MEMR* DRQ0	
10	IOCHRDY	(KEY)	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0V
19	SA12	REFRESH*	(KEY)	0V
20	SA11	SYSCLK --	--	--
21	SA10	IRQ7	--	--
22	SA9	IRQ6	--	--
23	SA8	IRQ5	--	--
24	SA7	IRQ4	--	--
25	SA6	IRQ3	--	--
26	SA5	DACK2*	--	--
27	SA4	TC	--	--
28	SA3	BALE	--	--
29	SA2	+5V	--	--
30	SA1	OSC	--	--
31	SA0	0V	--	--
32	0V	0V	--	--

---

### 3.13 Flat-Panel Connector

The HS-4000 provides a 44-pin 2.0 mm pitch header connector (CN8) for Flat panel connection. The information here also provides some pin information samples to Panel Sharp LM64183P, LM64C35P & LM64C142 and NEC NL8060AC26.

+12V	1	2	+12V
GND	3	4	GND
PV <sub>CC</sub>	5	6	PV <sub>CC</sub>
FPV <sub>ee</sub>	7	8	GND
P <sub>0</sub>	9	10	P <sub>1</sub>
P <sub>2</sub>	11	12	P <sub>3</sub>
P <sub>4</sub>	13	14	P <sub>5</sub>
P <sub>6</sub>	15	16	P <sub>7</sub>
P <sub>8</sub>	17	18	P <sub>9</sub>
P <sub>10</sub>	19	20	P <sub>11</sub>
P <sub>12</sub>	21	22	P <sub>13</sub>
P <sub>14</sub>	23	24	P <sub>15</sub>
P <sub>16</sub>	25	26	P <sub>17</sub>
P <sub>18</sub>	27	28	P <sub>19</sub>
P <sub>20</sub>	29	30	P <sub>21</sub>
P <sub>22</sub>	31	32	P <sub>23</sub>
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	ASHFCLK
V <sub>CC</sub>	43	44	V <sub>CC</sub>

---

## Connections for four standard LCDs

### **Connections to Sharp LM64183P**

**(640 x 480 DSTN MONO LCD)**

Sharp LM64P83		HS-4000 CN8	
<b>Pin</b>	<b>Pin name</b>	<b>Pin</b>	<b>Pin name</b>
CN1-1	S	36	FLM
CN1-2	CP1	38	LP
CN1-3	CP2	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	VDD	6	+5V
CN1-6	VSS	3	GND
CN1-7	VEE	-	-17 V (external power)
CN1-8	DU0	12	P3
CN1-9	DU1	11	P2
CN1-10	DU2	10	P1
CN1-11	DU3	9	P0
CN1-12	DL0	16	P7
CN1-13	DL1	15	P6
CN1-14	DL2	14	P5
CN1-15	DL3	13	P4



## Connections to Sharp LM64C35P

(640 x 480 DSTN Stn Color)

Sharp LM64C35P		HS-4000 CN8	
Pin	Pin name	Pin	Pin name
CN1-1	DL4	16	P7
CN1-2	Vss	3	GND
CN1-3	DL5	15	P6
CN1-4	YD	36	FLM
CN1-5	DL6	14	P5
CN1-6	LP	38	LP
CN1-7	DL7	13	P4
CN1-8	Vss	4	GND
CN1-9	Vss	8	GND
CN1-10	XCK	35	SLFCHK
CN1-11	DL0	24	P15
CN1-12	Vcon	-	Contrast Adjust
CN1-13	DL1	23	P14
CN1-14	Vdd	5	+5V
CN1-15	Vss	33	GND
CN1-16	Vdd	6	+5V
CN1-17	DL2	22	P13
CN1-18	DISP	6	+5V
CN1-19	DL3	21	P12
CN1-20	NC	-	-
CN1-21	Vss	34	GND
CN1-22	DU3	17	P8
CN1-23	DU4	12	P3
CN1-24	DU2	18	P9
CN1-25	DU5	11	P2
CN1-26	DU1	19	P10
CN1-27	Vss	39	GND
CN1-28	DU0	20	P11
CN1-29	DU6	10	P1
CN1-30	Vss	39	GND
CN1-31	DU7	9	P0



---

### Connections to NEC NL8060AC26 (800 x 600 TFT Color)

NEC NL8060AC26		HS-4000 CN8	
Pin	Pin name	Pin	Pin name
CN1-1	GND	3	GND
CN1-2	Dot Clock	35	SHFCLK
CN1-3	GND	4	GND
CN1-4	Hsync	38	LP
CN1-5	Hsync	38	FLM
CN1-6	GND	8	GND
CN1-7	GND	8	GND
CN1-8	GND	8	GND
CN1-9	R0	27	P18
CN1-10	R1	28	P19
CN1-11	R2	29	P20
CN1-12	GND	8	GND
CN1-13	R3	30	P21
CN1-14	R4	31	P22
CN1-15	R5	32	P23
CN1-16	GND	39	GND
CN1-17	GND	39	GND
CN1-18	GND	39	GND
CN1-19	G0	19	P10
CN1-20	G1	20	P11
CN1-21	G2	21	P12
CN1-22	GND	39	GND
CN1-23	G3	22	P13
CN1-24	G4	23	P14
CN1-25	G5	24	P15
CN1-26	GND	41	GND
CN1-27	GND	41	GND
CN1-28	GND	41	GND
CN1-29	B0	11	P2
CN1-30	B1	12	P3
CN1-31	B2	13	P4
CN1-32	GND	41	GND
CN1-33	B3	14	P5
CN1-34	B4	15	P6
CN1-35	B5	16	P7
CN1-36	GND	41	GND
CN1-37	DE	37	M
CN1-38	PVcc	43	PVcc
CN1-39	PVcc	44	PVcc
CN1-40	PVcc	5	PVcc
CN1-41	MODE	-	---

---

## Connections to Sharp LM64C142 (640 x 480 DSTN Stn Color)

Sharp LM64C142		HS-4000 CN8	
Pin	Pin name	Pin	Pin name
CN1-1	YD	36	FLM
CN1-2	LP	38	LP
CN1-3	XCX	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	PVdd	6	+5V
CN1-6	PVss	3	GND
CN1-7	PVee	-	+27 V (external power)
CN1-8	DU0	20	P11
CN1-9	DU1	19	P10
CN1-10	DU2	18	P9
CN1-11	DU3	17	P8
CN1-12	DU4	12	P3
CN1-13	DU5	11	P2
CN1-14	DU6	10	P1
CN1-15	DU7	9	P0
CN2-1	Vss	4	GND
CN2-2	DL0	24	P15
CN2-3	DL1	23	P14
CN2-4	DL2	22	P13
CN2-5	DL3	21	P12
CN2-6	DL4	16	P7
CN2-7	DL5	15	P6
CN2-8	DL6	14	P5
CN2-9	DL7	13	P4
CN2-10	Vss	8	GND

# Chapter-4

---

## AMI BIOS Setup

For maintain the HS-4000's basic input/output system operating, the HS-4000 is now using AMI BIOS for the system configuration and operation. The BIOS's setup program is designed to provide the maximum flexibility in configuring the system by offering various optional which allowing for select and meet all of the end-user requirements.

To access AMI BIOS Setup program, press <Del> key when after Power-On-Reset memory test. The first show out prompt screen is the BIOS setup Main Menu.

User is now may select for Standard CMOS Setup, Advanced COMS Setup, Advanced Chipset Setup, Power Management Setup, PCI/PnP Setup, Peripheral Setup, Auto-Detect Hard Disks, Change User Password, Change Supervisor Password, Change Language Setting, Auto Configuration with Optional Settings and Auto Configuration with Fail Safe Settings. After any selecting or setting, please choice Save Settings and Exit or choice Exit Without Saving.

Any miss type in parameters of BIOS setup may cause a screen error display out. You may load again the default setting of the BIOS by press End key and power-on.

---

## 4.1 Main Menu

Once when you enter the AMI BIOS CMOS Setup Utility, the first prompt out screen is the BIOS's Main Menu. From the Main Menu, the BIOS allow you to select from several setup functions and two exit choices. Use the arrow keys to select the demand items and press <Enter> to accept and enter its sub-menu. Press Esc key if abandoned the selection item.

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.16
(C)1996 American Megatrends, Inc. All Rights Reserved

Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Change Language Setting
Auto Configuration with Optimal Settings
Auto Configuration with Fail Safe Settings
Save Settings and Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit  ↑↓:Sel  F2/F3:Color  F10:Save & Exit
```

---

## 4.2 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for this setup. When the IDE hard disk drive you are using is larger than 528MB, please set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

AMIBIOS SETUP - STANDARD CMOS SETUP									
(C)1996 American Megatrends, Inc. All Rights Reserved									
Date (mm/dd/yyyy):	Thu	Nov	19,	1998					0 KB
Time (hh/mm/ss) :	17:45:48								0 MB
Floppy Drive A:	Not Installed								
Floppy Drive B:	Not Installed								
	Type	Size	Cyln	Head	WPcom	Sec	Mode	Blk	PIO 32Bit
Pri Master :	Not Installed								
Pri Slave :	Not Installed								
Boot Sector Virus Protection	Disabled								
Month:	Jan - Dec						ESC:Exit	↑:Sel	
Day:	01 - 31						PgUp/PgDn:Modify		
Year:	1901 - 2099						F2/F3:Color		

---

## 4.3 Advanced CMOS Setup

This advanced setup is designed for the customers to achieve the highest performance of the HS-4000 board. As for normal operations, customers don't have to change any default settings. The default setting is pre-set for most reliable operations. Please refer to the following screen for the Advanced Setup.

This setup is working for the on-board Multi-I/O Chip (ALI M5113 or UM8669). These options are used to change the Chipset's registers. Please carefully change any default settings to meet your application requirements.

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
1st Boot Device	Disabled	Available Options:
2nd Boot Device	Disabled	▶ Disabled
3rd Boot Device	Disabled	IDE-0
4th Boot Device	Disabled	IDE-1
Boot From Card BIOS	Yes	IDE-2
Try Other Boot Devices	Yes	IDE-3
S.M.A.R.T. for Hard Disks	Disabled	FLOPPY
Boot From SCSI/IDE	IDE	FLOPTICAL
Quick Boot	Disabled	CDROM
BootUp CPU Speed	Low	SCSI
BootUp Num-Lock	Off	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
Floppy Access Control	Normal	
HDD Access Control	Normal	
PS/2 Mouse Support	Disabled	
System Keyboard	Absent	
Primary Display	Absent	ESC:Exit ↑:Sel
Password Check	Setup	PgUp/PgDn:Modify
Boot To OS/2	No	F2/F3:Color



AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
Primary Display	Absent	Available Options:
Password Check	Setup	12BTFT NEC64
Boot To OS/2	No	18BTFT NEC64
Wait For 'Fl' If Error	Disabled	▶ 18BTFTSHAP64
Hit 'DEL' Message Display	Disabled	18BTFT NEC86
CPU MicroCode Updation	Disabled	16B D-S STN
Internal Cache	Disabled	8BD-S MONSTN
External Cache	Disabled	4Bit Plasma
System BIOS Cacheable	Disabled	8Bit D-S EL
Hard disk Delay	Disabled	
C000,16k Shadow	Disabled	
C400,16k Shadow	Disabled	
C800,16k Shadow	Disabled	
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	
DC00,16k Shadow	Disabled	
<b>Flat Panel Display Type</b>	<b>18BTFTSHAP64</b>	ESC:Exit ↑:Sel
DISPLAY MODE	CRT	PgUp/PgDn:Modify F2/F3:Color

Note: The default Flat Panel Display types currently are:

### Default BIOS Panel Types

No	Resolution	Data	Panel Type
1	640x480	12bit Color TFT	NL6448AC30-10 (NEC)
2	640x480	18bit Color TFT	NL6448AC33-18 (NEC)
<b>*3</b>	<b>640x480</b>	<b>18bit Color TFT</b>	<b>LQ10D41(SHARP)</b>
4	800x600	18bit Color TFT	NL8060AC26-11(NEC)
5	640x480	16 bit Dual-Scan Color STN	LM64C08P(SHARP)
6	640x480	8 bit Dual-Scan Monochrome STN	LM64P11(SHARP)
7	640x480	4 bit Plasma	PG640480RM16-3(OKI)
8	640x480	8 bit Dual-Scan EL	LJ64H052(SHARP)

\*) : default setting

Note: The DISPLAY MODE selects the type of display used for the primary system monitor.

Display Mode selected LCD means display Flat-Panel only; selected CRT means display CRT monitor only; selected Both means both display monitor and Flat-Panel; selected Auto means auto detect LCD or CRT.

---

## 4.4 Advanced Chipset Setup

The advanced chipset setup functions are mostly working for the Chipset ALI M5113. These options are used to change the Chipset's registers. Please carefully change any default settings, otherwise the system could be unstable or may not use.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
<b>Auto Config Function</b>	<b>Disabled</b>	Available Options:
AT Bus Clock	7.16MHz	▶ Disabled
DRAM Read Timing	Slow	Enabled
DRAM Write Timing	Slow	
SRAM Type	2-1-1-1	
SRAM Read Timing	Fast	
SRAM Write Timing	Fast	
Memory Parity Check	Disabled	
DRAM Hidden Refresh	Disabled	
DRAM Refresh Period Setting	15us	
Memory Hole At 15-16M	Disabled	
ISA I/O Recovery	Disabled	
ISA I/O Recovery time	Reserved	
System Hidden Refresh	15us	
Cyrix CPU L1 Cache Mode	WT	
Cx5x86 Linear Wrapped Mode	Disabled	
		ESC:Exit ↑:Sel
		PgUp/PgDn:Modify
		F2/F3:Color

---

## 4.5 Power Management Setup

The Power Management Setup allows user to configure the system for save energy in a most effective way while operating in a manner consistent with his own style of computer use.

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
<b>Power Management Mode</b>	<b>Disabled</b>	<b>Available Options:</b>
APM Function	Disabled	▶ Disabled
Doze Mode Timeout	Disabled	Enabled
Standby Mode Timeout	Disabled	
Suspend Mode Timeout	Disabled	
Suspend Date Time Update	Disabled	
Event : Keyboard/VGA	Disabled	
Event : HDD/IRQ	Disabled	
Event : LPT/COM Port	Disabled	
Event : FDD/DRQ	Disabled	
Power Down HDD In	Disabled	
Hard Disk Time Out (Minute)	Disabled	
Power Down VGA In	Disabled	
IRQ3	Disabled	
IRQ4	Disabled	
IRQ5	Disabled	
IRQ7	Disabled	
IRQ9	Disabled	
IRQ10	Disabled	
IRQ11	Disabled	
		ESC:Exit ↑↓:Sel
		PgUp/PgDn:Modify
		F2/F3:Color

---

## 4.6 Peripheral Setup

For completed all input and output devices (i.e. FDD Drivers, IDE Drivers, Serial Ports, IR and Parallel Port), please refer to the following example.

AMIBIOS SETUP - PERIPHERAL SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	AUTO	Available Options:
OnBoard Serial Port1	AUTO	▶ AUTO
Serial Port1 Mode	Normal	Disabled
Serial Port1 Duplex	Full	Enabled
OnBoard Serial Port2	AUTO	
Serial Port2 Mode	Normal	
Serial Port2 Duplex	Full	
OnBoard Serial Port3	AUTO	
Serial Port3 Mode	Normal	
Serial Port3 Duplex	Full	
OnBoard Serial Port4	AUTO	
Serial Port4 Mode	Normal	
Serial Port4 Duplex	Full	
OnBoard Parallel Port	AUTO	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port DMA Channel	N/A	
Parallel Port IRQ	AUTO	ESC:Exit ↑:Sel
OnBoard IDE	Reserved	PgUp/PgDn:Modify
		F2/F3:Color

# *Chapter-5*

---

## A Brief Browse of 100 base-T LAN RTL-8139' s Installation Software

The Boser HS-4000 provides an on board 32-bit PCI 100 base-T Ethernet LAN interface RJ-45 connection for easy using the HS-4000 486 Little All-in-one L/VGA Industrial Single Board in connection to-with Novell NE2000 compatible LAN network system.

The HS-4000' s design which is basing on RTL 8139 chipset with provides an RJ-45 100 base-T NE2000 compatible interface. We here provide some information on the installation for your first reference.

The delivery of the software packages with HS-4000 which including a easy access help manual by files from. The version of this help manual is 1.00 on dated Jun.19.1997. Please read all following help manual first before your installation of this LAN system.

For completed information, please browse at <http://www.realtek.com.tw>

---

## 5.1 Text files list of help documents

TX\GENERAL\DIRS.TXT  
TX\GENERAL\FILES.TXT  
TX\NETWARE\NETWARE.TXT  
TX\NETWARE\NWODIDOS.TXT  
TX\NETWARE\NW312.TXT  
TX\NETWARE\NW41.TXT  
TX\NETWARE\NW411.TXT  
TX\NETWARE\CLIENT32.TXT  
TX\IBM\IBM.TXT  
TX\IBM\LANSVR23.TXT  
TX\IBM\LANSVR40.TXT  
TX\MS\MS.TXT  
TX\MS\MSCLIENT.TXT  
TX\MS\MSLANMAN.TXT  
TX\MS\MSWFW310.TXT  
TX\MS\MSNT.TXT  
TX\MS\MSWIN95.TXT  
TX\UNIX\UNIX.TXT  
TX\UNIX\SCO4.TXT  
TX\UNIX\SCO5.TXT  
TX\OTHERS\OTHER.TXT  
TX\OTHERS\PACKET.TXT  
TX\OTHERS\LANTAS60.TXT

---

## 5.2 Diskette Contents

### **Files and Dirs**

VERSION.DOC

HELP8139.EXE

MAINMENU.TXT

FILEPATH.LST

### **Description**

This document describes some information for this version of the RTL8139 driver disk;

Help file viewer;

HELP8139 menu contents. locate it in the same subdirectory with HELP8139.EXE;

HELP8139 text files path. locate it in the same subdirectory with HELP8139.EXE;

RSET8139.EXE	RSET8139 program set up the adapter's hardware configuration and running diagnostics;
OEMSETUP.INF	The setup file for NT3.5, NT3.51 & NT4.0;
NETRTP.INF	The setup file for Win95 & OSR2;
\TXT	This subdirectory includes all text files for instruction to install various drivers;
\CLIENT32	Subdirectory for Netware Client 32 driver;
\MSCLIENT	Subdirectory for Microsoft Network Client for MS-DOS driver;
\MSLANMAN.DOS	Subdirectory for DOSNDIS drivers for Microsoft LAN Manager Versions 1.x and 2.x;
\MSLANMAN.OS2	Subdirectory for OS/2 NDIS drivers for Microsoft LAN Manager Versions 1.x and 2.x;
\NDIS	Subdirectory for OS/2 LAN server & DOS LAN requester driver;
\DOS	Subdirectory for IBM DOS LAN requester driver;
\OS2	Subdirectory for IBM OS/2 LAN server driver;
\NWCLIENT	Subdirectory for Novell NetWare ODI driver;
\DOS	Subdirectory for Novell NetWare DOS/ODI driver;
\NWSERVER	Subdirectory for Novell NetWare Drivers;
\312	Subdirectory for Novell NetWare ODI Ver 3.12 server driver;
\41	Subdirectory for Novell NetWare ODI Ver 4.1 server driver;
\411	Subdirectory for Novell NetWare ODI Ver 4.11 server driver;
\RTSPKT	Subdirectory for FTP spec-compliant packet driver and Sun Microsystems PC/NFS Driver;
\SCO	
\4.X	Subdirectory for SCO UNIX 4.X drivers;
\5.X	Subdirectory for SCO UNIX 5.X drivers;
\FWF31	Subdirectory containing Windows for WorkGroup 3.10 driver files;
\WIN95	Subdirectory containing Win95 & OSR2 driver files;
\WINNT	Subdirectory containing Windows NT3.5, NT3.51 & NT4.0 driver files;

---

## 5.3 Files on Configuration Disk

### **ROOT DIRECTORY**

VERSION.DOC	Describe some information for this version of the RTL8139 driver disk;
HELP8139.EXE	Readme Viewer;
FILEPATH.LST	LST file for Readme Viewer;
MAINMENU.TXT	TXT file for HELP8139 Mainmenu Title;
RSET8139.EXE	RSET8139 program set up the adapter's hardware configuration and running diagnostics;

---

OEMSETUP.INF	The setup file for NT3.5, NT3.51 & NT4.0;
NETRTP.INF	The setup file for Win95 & OSR2;
<b><u>\TXT\GENERAL</u></b>	
DIRS.TXT	All subdirectory contents about this RTL8139 driver diskette;
FILES.TXT	All files abstract in this RTL8139 driver diskette;
<b><u>\TXT\IBM</u></b>	Text files about IBM NOS Installation Notes :
LANSVR23.TXT	
LANSVR40.TXT	
<b><u>\TXT\MS</u></b>	Text files about Microsoft NOS Installation Notes :
MSCLIENT.TXT	
MSLANMAN.TXT	
MSWFW310.TXT	
MSNT.TXT	
MSWIN95.TXT	
<b><u>\TXT\NETWARE</u></b>	Text files about Novell NOS Installation Notes :
NWODIDOS.TXT	
NW312.TXT	
NW41.TXT	
NW411.TXT	
CLIENT32.TXT	
<b><u>\TXT\OTHERS</u></b>	Text files about Other NOS Installation Notes :
LANTAS60.TXT	
PACKET.TXT	
<b><u>\TXT\UNIX</u></b>	Text files about Information on UNIX drivers :
SCO4.TXT	
SCO5.TXT	
<b><u>\CLIENT32</u></b>	
RTSSRV.LAN	ODI 32-bit driver;
ODIRTL.INF	
<b><u>\MSCLIENT</u></b>	
RTSND.DOS	NDIS 2.0 driver;
OEMSETUP.INF	Configuration file;
PROTOCOL.INI	Protocol.ini stub for LAN Manager install;
<b><u>\MSLANMAN.DOS\DRIVERS\ETHERNET\RTL8139</u></b>	
RTSND.DOS	DOS NDIS 2.01 driver;
PROTOCOL.INI	Protocol.ini stub for LAN Manager install;
<b><u>\MSLANMAN.DOS\DRIVERS\NIF</u></b>	
RTL8139.NIF	Standard NIF file for DOS;
<b><u>\MSLANMAN.OS2\DRIVERS\ETHERNET\RTL8139</u></b>	
RTSND.OS2	OS/2 NDIS 2.0 driver;
PROTOCOL.INI	Protocol.ini stub for LAN Manager install;
<b><u>\MSLANMAN.OS2\DRIVERS\NIF</u></b>	



RTL8139.NIF	Standard NIF file for OS/2;
<b><u>\NDIS\DOS</u></b>	
RTSND.DOS	DOS NDIS 2.0 driver;
RTL8139.NIF	Extended NIF file for IBM OS/2;
OEMSETUP.INF	Extended NIF file for DOS LAN Requester;
<b><u>\NDIS\OS2\RTSND.OS2</u></b>	
RTSND.OS2	OS2 NDIS 2.0 driver;
RTL8139.NIF	Extended NIF file for IBM OS/2;
<b><u>\NWCLIENT\DOS</u></b>	
RTSODI.COM	ODI driver for DOS;
NET.CFG	Sample Net.cfg for ODI;
RTSODI.INS	
<b><u>\NWSERVER\312</u></b>	
RTSSRV.LAN	3.12 Server driver;
MSM31X.NLM	
ETHERTSM.NLM	
NBI31X.NLM	
<b><u>\NWSERVER\41</u></b>	
RTSSRV.LAN	4.0 Server driver;
ETHERTSM.NLM	
MSM.NLM	
NBI.NLM	
<b><u>\NWSERVER\411</u></b>	
RTSSRV.LAN	4.11 Server driver;
RTSSRV.LDI	
<b><u>\RTSPKT</u></b>	
RTSPKT.COM	Packet Driver;
<b><u>\SCO\4X</u></b>	
DRIVER.O	SCO UNIX driver;
SETUP	
INFO	
INIT	
MASTER	
NODE	
RECONF	
REMOVE	
SPACE.C	
SYSTEM	
<b><u>\SCO\5X</u></b>	
DRIVER.O	SCO UNIX driver;
SETUP	
MASTER	
SYSTEM	

NODE  
SPACE.C  
SPACE.H  
LKCFG  
AOF/R8E

**\WFW31**

RTSND.DOS           NDIS 2.0 driver for WfW 3.10;  
OEMSETUP.INF        Configuration file for WfW 3.11 install;

**\WIN95**

RTL8139.SYS         NDIS 3.1 mini-port driver for Windows 95& OSR2;

**\WINNT**

RTL8139.SYS         NDIS 3.1 mini-port driver for Windows NT3.5, NT3.51

---

## 5.4 Installing Novell network drivers to Workstation for DOS ODI Client

**Introduction:**

This document describes the procedure to setup the NetWare v3.X , v4.X workstation driver for REALTEK RTL8139 PCI ethernet adapter.

Location of Driver:   \NWCLIENT\DOS\RTSODI.COM

**Sample Configuration Files:**

STARTNET.BAT:

LSL  
RTSODI  
IPXODI  
NETX or VLM (VLM's for NetWare 4.x)

NET.CFG:

LINK DRIVER RTSODI  
SPEED 100     --Specify adapter's speed.  
BUSNO NN     --where NN is the PCI bus identifier of the PCI bus which  
              connect to the adapter.  
DEVICENO NN   --where NN is the specific PCI BIOS device identification  
              umber of the specified PCI adapter.  
[ or you can use "EtherID" to select a specific RTL8139 adapter:  
EtherID NNNNNNNNNNNNNN --Where NNNNNNNNNNNNNN specify  
                          a RTL8139 adapter's node address. This is only  
                          required when more than one RTL8139 adapters  
                          exist on one system.

]

FRAME Ethernet\_802.2 --Specify frame type  
FRAME Ethernet\_802.3  
FRAME Ethernet\_SNAP  
FRAME Ethernet\_II

NetWare DOS Requester  
FIRST NETWORK DRIVE = F  
NETWARE PROTOCOL = NDS BIND  
PREFERRED SERVER = NW411

#### Setup Procedures for NetWare 3.11/3.12 Client :

Before you start with the installation process, make sure that the adapter is properly installed and configured. Make sure that your NetWare workstation is properly installed.

1. Copy RTSODI.COM from the Realtek Driver Diskette subdirectory A:\NWCLIENT to your harddisk.
2. Create a batch file, or add to your STARTNET.BAT file the commands listed above under STARTNET.BAT
3. Edit the NET.CFG file that you copied over. Edit the file per your requirements (see examples above). If there are two frame types listed, whichever frame type is listed first, that is the one that the driver will load. See above for examples. The NET.CFG file should be in the same directory with the LSL.COM file.

#### Setup Procedures for NetWare 4.X Client with vlm:

The installation utility INSTALL.EXE is located on NetWare's "Workstation for DOS" disk. Run INSTALL.EXE from the Workstation for DOS Disk.

The NetWare Client Install program screen will appear. You must complete each of the questions. These options are specific to your needs.

1. Enter the destination directory for the NetWare Client.  
(The default directory is C:\NWCLIENT).
2. Gives you the option to automatically update the CONFIG.SYS and the AUTOEXEC.BAT files or modify them at a later time manually.
3. Do you wish to install support for MS Windows ? (Y/N)  
(MS Windows Subdirectory: default C:\WINDOWS)
4. Asks you to select a network driver and provide configuration options. It uses the specifications you select to create the file NET.CFG. Insert the Realtek drivers disk when prompted for the driver disk and specify the driver path A:\NWCLIENT\DOS
5. Press <Enter> to install

#### **NOTE:**

1. Be sure to add LASTDRIVE=Z to your CONFIG.SYS file for the network mappings to work properly.
2. When you have multiple RTL8139 Adapters on your system:  
Use "BUSNO" and "DEVICENO" KEYWORD in NET.CFG to select which

adapter to use with your netware client.(or you can use "EtherID")

---

## 5.5 Server Driver for NetWare 3.12

### **Introduction:**

This document describes the procedure to install the NetWare v3.12 server driver for REALTEK RTL8139 Fast Ethernet adapter.

Location of Driver: \NWSERVER\312\RTSSRV.LAN

### **Installation Procedure:**

Before you start with the installation process, make sure that the Novell NetWare v3.12 server is properly installed. Similarly, your adapter should also be properly installed in your server.

1. These files can be obtained from Realtek driver disk subdirectory  
A:\NWSERVER\312  
NBI31X.NLM  
MSM31X.NLM  
ETHERTSM.NLM
2. If you can log into the server as a supervisor, copy RTSSRV.LAN relative files from the Realtek Driver Diskette subdirectory A:\NWSERVER\312 into the NetWare 386 subdirectory SYSTEM of your server. (If some files exists, rename the existing files in the SYSTEM subdirectory).
3. When the NetWare server prompt appears (indicated by a colon),load your server driver. Simply type:  
: LOAD NBI31X <Enter>  
: LOAD RTSSRV <Enter>  
or, you can directly load file from Realtek RTL8139 driver disk :  
: LOAD A:\NWSERVER\312\NBI31X <Enter>  
: LOAD A:\NWSERVER\312\RTSSRV <Enter>
4. Bind IPX to the adapter driver. At the NetWare server prompt, type:  
:BIND IPX TO RTSSRV <Enter>
5. After pressing <Enter> the computer prompts you for the Network Number. For details on how to assign this number, please consult your NetWare Server Installation Manual.
6. Add the load and bind statements you require to the server's AUTOEXEC.NCF file so that the LAN driver will load automatically each time the server starts up.

### **NOTES:**

1. Installing Multiple LAN Adapters:

The keyword "SLOT" is provided for multiple LAN adapters in a single server by the driver RTSSRV.LAN. So, add "SLOT" in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1  
BIND IPX TO LAN_A NET=11  
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_B SLOT=2  
BIND IPX TO LAN_B NET=22
```

2. The keyword "SPEED" is provided for specifying adapter's speed (10M/100M), add SPEED in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1  
SPEED=100  
BIND IPX TO LAN_A NET=11
```

3. Installing One LAN adapter with Multiple Frame Types:

When binding multiple frame types to one adapter, enter a LOAD and BIND statement for each frame type. Each LOAD statement will use a different network number is required on the bind statement. You need to supply a name on each load line in order to avoid being prompted for which board to bind IPX to. If you do not have the name option in the AUTOEXEC.NCF, it will not execute completely without user intervention. Example:

```
LOAD RTSSRV FRAME=ETHERNET_802.3 NAME=IEE8023  
BIND IPX TO IEE8023 NET=11111  
LOAD RTSSRV FRAME=ETHERNET_802.2 NAME=IEE8022  
BIND IPX TO LAN8022 NET=22222
```

If problems occur during the binding process, your screen will prompt you with error messages. Please refer to your NetWare 386 manual for details on these messages.

---

## 5.6 Server Driver for NetWare 4.1

### **Introduction:**

This document describes the procedure to install the NetWare v4.1 server driver for REALTEK RTL8139 Fast Ethernet adapter.

Location of Driver: \NWSERVER\41\RTSSRV.LAN

### **Installation Procedure:**

Before you start with the installation process, make sure that the Novell NetWare v4.10 server is properly installed. Similarly, your adapter should also be properly installed in your server.

1. These files can be obtained from Realtek driver disk subdirectory  
A:\NWSERVER\41  
NBI.NLM

MSM.NLM

ETHERTSM.NLM

2. If you can log into the server as a ADMIN , copy RTSSRV.LAN relative files from the Realtek Driver Diskette subdirectory A:\NWSERVER\41 into the NetWare 4.1 subdirectory SYSTEM of your server. (If some files exists, rename the existing files in the SYSTEM subdirectory).
3. When the NetWare server prompt appears (indicated by a colon),load your server driver. Simply type:

```
:LOAD NBI <Enter>
```

```
:LOAD RTSSRV <Enter>
```

or, you can directly load file from Realtek RTL8139 driver disk :

```
:LOAD A:\NWSERVER\41\NBI <Enter>
```

```
:LOAD A:\NWSERVER\41\RTSSRV <Enter>
```

4. Bind IPX to the adapter driver. At the NetWare server prompt, type:  
:BIND IPX TO RTSSRV <Enter>
5. After pressing <Enter> the computer prompts you for the Network Number. For details on how to assign this number, please consult your NetWare Server Installation Manual.
6. Add the load and bind statements you require to the server's AUTOEXEC.NCF file so that the LAN driver will load automatically each time the server starts up.

### **NOTES:**

1. Installing Multiple LAN Adapters:

The keyword "SLOT" is provided for multiple LAN adapters in a single server by the driver RTSSRV.LAN. So, add "SLOT" in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
```

```
BIND IPX TO LAN_A NET=11
```

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_B SLOT=2
```

```
BIND IPX TO LAN_B NET=22
```

2. The keyword "SPEED" is provided for specifying adapter's speed (10M/100M), add SPEED in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
```

```
SPEED=100
```

```
BIND IPX TO LAN_A NET=11
```

3. Installing One LAN adapter with Multiple Frame Types:

When binding multiple frame types to one adapter, enter a LOAD and BIND statement for each frame type. Each LOAD statement will use a different network number is required on the bind statement. You need to supply a name on each load line in order to avoid being prompted for which board to bind IPX to. If you do not have the name option in the AUTOEXEC.NCF, it will not execute completely without user intervention. Example:

```
LOAD RTSSRV FRAME=ETHERNET_802.3 NAME=IEE8023
BIND IPX TO IEE8023 NET=11111
LOAD RTSSRV FRAME=ETHERNET_802.2 NAME=IEE8022
BIND IPX TO LAN8022 NET=22222
```

If problems occur during the binding process, your screen will prompt you with error messages. Please refer to your NetWare 386 manual for details on these messages.

---

## 5.7 Server Driver for NetWare 4.11

### **Introduction:**

This document describes the procedure to install the NetWare v4.11 server driver for REALTEK RTL8139 Fast Ethernet adapter.

Location of Driver: \NWSERVER\411\RTSSRV.LAN

### **Installation Procedure :**

Before you start with the installation process, make sure that the Novell NetWare v4.11 server is properly installed. Similarly, your adapter should also be properly installed in your server.

1. Insert the Realtek Driver Diskette into drive A and check the contents of subdirectory \NWSERVER\411, It should contain the following file :

RTSSRV.LAN:	Novell NetWare V4.11 Server Driver
RTSSRV.LDI:	Novell NetWare V4.11 Server Driver Installation Information File

2. At the NetWare prompt (indicated by the Server name), run the INSTALL.NLM program by typing:  
server name: LOAD INSTALL <Enter>
3. Select "Maintenance/Selective Install" and press <Enter>.
4. Select " LAN Driver Options (Configure/Load/...)" and press <Enter>.
5. Press the <Ins> key to specify other drivers to install.
6. Press <F3> and specify the driver path (A:\NWSERVER\411) and press <Enter>.

7. The RTSSRV.LAN driver should appear in your choice list for the 'Select a LAN Driver' field. Choose this driver to start the driver loading and binding procedure. This will allow you to load and bind all 4 frame types supported by NetWare.
8. Add the LOAD and BIND statements you require to the server's AUTOEXEC.NCF file so that the LAN driver will load automatically each time the server starts up.

### **Installation Notes:**

1. Installing Multiple LAN Adapters:

The keyword "SLOT" is provided for multiple LAN adapters in a single server by the driver RTSSRV.LAN. So, add EtherID in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
BIND IPX TO LAN_A NET=11
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_B SLOT=2
BIND IPX TO LAN_B NET=22
```

2. The keyword "SPEED" is provided for specifying adapter's speed (10M/100M), add SPEED in LOAD commands. For example:

```
LOAD RTSSRV FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
SPEED=100
BIND IPX TO LAN_A NET=11
```

---

## 5.8 Client 32 for Windows 95

### **Introduction:**

This document describes the procedure to install the NetWare Client32 driver for REALTEK RTL8139 Fast Ethernet adapter.

Location of Driver: \CLIENT32\RTSSRV.LAN

### **Sample Configuration Files:**

STARTNET.BAT (Client 32 for DOS will contain):

```
C:\NOVELL\CLIENT32\NIOS.EXE
LOAD C:\NOVELL\CLIENT32\LSLC32.NLM
LOAD C:\NOVELL\CLIENT32\CMSM.NLM
LOAD C:\NOVELL\CLIENT32\ETHERTSM.NLM
LOAD C:\NOVELL\CLIENT32\RTSSRV.LAN RAME=ETHERNET_802.2
LOAD C:\NOVELL\CLIENT32\RTSSRV.LAN FRAME=Ethernet_802.3
LOAD C:\NOVELL\CLIENT32\RTSSRV.LAN FRAME=Ethernet_II
LOAD C:\NOVELL\CLIENT32\RTSSRV.LAN FRAME=Ethernet_SNAP
```



### **A. Driver Installation Procedures on Client32 for DOS :**

1. If you have completed installed the Netware Client 32 for DOS, all you have to do is to modify STARTNET.BAT. Please see the sample STARTNET.BAT above. If not, Please follow the next step 2 - step 7.
2. Run INSTALL.EXE from Netware Client 32 for DOS diskette 1 (or from Netware 4.11 CD). When the product manual appears, mark the "Netware Client 32 for DOS" item, then press <Enter>.
3. Select "OTHER DRIVERS" item from "32-bit Network Board Drivers" menu, then press <Enter>.
4. Insert Realtek RTL8139 Driver Diskette, then specify the driver path A: or B:
5. Select "Realtek RTL8139 Fast Ethernet driver", then press <Enter>.
6. Following instructions to complete the Client32 for DOS software installation.
7. Reboot your machine.

### **Installation Notes:**

Installing Multiple LAN Adapters:

The keyword "SLOT" is provided for multiple LAN adapters in a single server by the driver RTSSRV.LAN. So, add "SLOT" in LOAD commands. For example:

```
C:\NOVELL\CLIENT32\NIOS.EXE
LOAD LSLC32.NLM
LOAD CMSM.NLM
LOAD ETHERTSM.NLM
LOAD RTSSRV FRAME=Ethernet_802.2 SLOT=1
LOAD RTSSRV FRAME=Ethernet_802.2 SLOT=2
```

### **B. Driver Installation Procedures on Client32 for Windows 3.x :**

Refer to Content A. On step 2, mark "Netware Client 32 for DOS" and "Client 32 for Windows". On step 4, specify the driver path like A:\CLIENT32\RTSSRV.LAN, then following step 3..7 to complete the installation.

### **C. Driver Installation Procedures on Client 32 for Windows 95 :**

If you have installed the Microsoft Client in your Windows 95 system, you should remove the adapter object & NDIS 2/3 driver of the RTL8139 adapter from the Windows 95 system. If you have installed previously Realtek's RTL8139 NDIS 2/3 driver, you should do the following steps before installing the RTL8139 Client 32 driver. (Note: If you never plugged Realtek RTL8139 adapter into your PC, Procedure C.1 is not necessary. And you just start from Procedure C.2)

#### **C.1 Remove the previously installed adapter object & driver of Realtek RTL8139, if any.**

1. Under Windows 95 system directory C:\WIN95\INF\, you should delete NETRTS.INF, \*.BIN files.

2. Click the "My Computer" icon in the Main Program Group.
3. Click the "Control Panel" icon from My Computer window.
4. Click the "System" icon from the Control Panel window.
5. Click the "Device Manager" item.
6. Click the "Network adapter" item from System window.
7. Click the "Realtek RTL8139 Fast Ethernet Adapter" icon from System window.
8. Click <Remove> button, then click <OK> button.
9. Close the opened windows.

### **C.2 Driver Installation on Client 32 for Windows 95 :**

1. Plug Realtek's RTL8139 adapter into your PC machine.
2. Turn the power on to bootup the Windows 95.
3. Windows 95 will then prompt the "Realtek RTL8139 Fast Ethernet Adapter" in New Hardware Found dialog box.
4. Following instructions to complete the installation, Window 95 will ask you the proper path of the following diskette:
  - a. Netware Client 32 for Windows 95 Disk
  - b. Realtek RTL8139 Fast Ethernet Adapter Driver Diskette:  
Insert RTL8139 Driver Diskette, then, assign the path to A:\Client32
  - c. Windows 95 CD-ROM

## 5.9 Installing IBM network drivers to LAN Server for OS/2 2.3

### **Introduction:**

This document describes the procedure to install NDIS driver on DOS LAN Requester and OS/2 LAN server 2.0 (or 3.0) for Realtek RTL8139 Fast PCI ethernet adapter.

Location of Driver:        \NDIS\DOS\RTSND.DOS (for DOS LAN Requester)  
                              \NDIS\OS2\RTSND.OS2 (for OS/2 LAN Server)

### **Installing driver procedure on DOS LAN Requester :**

1. Insert the IBM LAN Support Program (LSP) Version 1.30 (or 1.31) Diskette into your floppy drive A: .
2. Type A:\dxmaid and press <Enter> .
3. The screen will display the IBM logo. Press <Enter> twice until the "Environment Information" appears on screen.
4. Responds to the screen prompts, specifying the following values for each field, use the <Space Bar> to toggle between choices:

Configuration for this computer?	Yes
----------------------------------	-----

Use existing configuration information?	Yes
Do you have adapter option diskettes?	Yes
Are you configuring for two adapters?	No
Do you need 802.2 interface support?	Yes
Source for LSP	A:\
Target for new configuration	C:\LSP

Make sure that the values given above are correct, then press <Enter> to store your choices.

5. Insert the Realtek RTL8139 driver diskette in floppy A, and specify your path name A:\NDIS\DOS, then press ENTER.
6. Follow screen instructions to complete the process. Simply pressing <Enter> for each screen display will select the default options. Press <Enter> until you reach the display prompting you to insert the LSP diskette.
7. Insert the LSP diskette as prompted. Press <Enter> to acknowledge completion of the action.
8. A screen showing the current configuration detected will be displayed. It should show the Realtek RTL8139 adapter and the protocols already selected (i.e., "IBM IEEE 802.2" and "IBM OS/2 NETBIOS").
9. Press <F4>. to save the new configuration. This completes the LSP installation.
10. Save the configuration and reboot your computer.
11. Insert the DOS LAN Requester Install Diskette 1 into your floppy drive.
12. Type A:\INSTALL <Enter>
13. The IBM logo will again appear on the screen. Press <Enter> to move on to the next screen.
14. Follow screen instructions, pressing <Enter> to move from screen-to-screen until you are prompted to indicate the path name of the DOS LAN Requester directory (C:\DOSLAN).
15. Specify the path name (C:\DOSLAN is the default) for the DOS LAN Requester directory . Then press <Enter> to continue.
16. The program will ask you for the services that you require.
17. Highlight the appropriate option. Select either "Send messages" or "Send, View, Edit, and Log message" option. (Normally, second option "Send, View, Edit and Log message" is selected).
18. Specify the PC's ID and domain ID.
19. Follow screen prompts to complete the installation.

### **Installing driver procedure on OS/2 LAN Server 2.0/3.0:**

Before you start with the installation process, make sure that OS/2 LAN Server is properly installed. Similarly, your adapter should also be properly installed in your server.

1. Copy RTSND.OS2 and RTL8139.NIF files from your Driver diskette (\NDIS\OS2) to C:\IBMCOM\MACS.
2. Click the OS/2 LAN Service icon.

3. Select "Installation and configuration". The IBM logo should appear onscreen.
  4. Click <OK>.
  5. Select <Advance> and press <Enter>.
  6. Select "Install or Configuration this Workstation."
  7. Select server type, adding a server or domain controller. The "install or remove" selections should appear.
  8. Select "Configure a component."
  10. Click the "Configure" button.
  11. Select "Configure workstation."
  12. Select "RTL8139 Fast ethernet adapter" when prompted to identify you Network Adapter. Then click the <Add> button.
  13. Select IBM NETBIOS from the list and click the <Add> button.
  14. Select <OK> to confirm all selections.
  15. Follow screen instructions to complete the process, selecting <OK> to accept default selections.
  16. Continue pressing <OK> until your screen prompts you to backup old CONFIG.SYS and AUTOEXEC.BAT and create a new CONFIG.SYS and AUTOEXEC.BAT. Also select <OK> to confirm this.
17. Installation is complete now. Reset your PC by turning it off and on.

**Note:**

1. The DOS version must be bellow DOS 5.0 when install DOS LAN requester into your system.
2. Sample protocol.ini:

```
[RTL8139]
DriverName=RTSNDS
EtherID=@52544C111111 ;This keyword is used to designate to a RTL8139
                        ;adapter by assigning it's ethernet ID
                        ;when more than one adapters exist on one
                        ; system.

BusNo=@00 ;This keyword is used to designate a RTL8139
           ;adapter by assigning it's PCI bus number
           ;when more than one adapters exist on one
           ; system.(must be used with 'DeviceNo' keyword)

DeviceNo=@0A ;This keyword is used to designate a RTL8139
              ;adapter by assigning it's PCI Device number
              ;when more than one adapters exist on one
              ; system.(must be used with 'BusNo' keyword)
```

Speed= 100/10

;This keyword is used to force RTL8139 adapter  
;to speed 10M or 100M mode. If not present,  
;the driver will auto-detect the speed.

---

## 5.10 LAN Server for OS/2 4.0

### **[1]. Introduction:**

This document describes the procedure to install NDIS driver on DOS LAN Requester and OS/2 LAN server 4.0 for Realtek RTL8139 ethernet adapter.

Location of Driver:        \NDIS\DOS\RTSND.DOS (for DOS LAN Services)  
                              \NDIS\OS2\RTSND.OS2 (for OS/2 LAN Server)

### **[2]. Installing driver procedure on DOS LAN Requester :**

Before you start with the installation process, make sure that DOS LAN Services is properly installed. Similarly, your adapter should also be properly installed in your client PC.

1. Copy RTSND.DOS from your Driver diskette (A:\NDIS\DOS) to DOS LAN Services subdirectory C:\DLS.
2. Under DOS LAN Requester subdirectory C:\DLS, run INSTALL.
3. The screen display some description. If it's correct, move highlight to "The listed options are correct" item, then press ENTER.
4. Move highlight to "Network Card", then press ENTER.
5. Select "Change driver for network card." item, then press ENTER.
6. Select "Network card not shown in list below..", then press ENTER.
7. Insert the Realtek RTL8139 driver diskette in floppy A, and specify your pathname A:\NDIS\DOS, then press ENTER.
8. Realtek 8139 driver is now installed on your computer, reboot your computer.

### **[3]. Installing driver procedure on OS/2 LAN Server 4.0:**

Before you start with the installation process, make sure that OS/2 LAN Server is properly installed. Similarly, your adapter should also be properly installed in your server.

1. In OS/2 window, Click the "MPTS" icon.
2. The screen will display the IBM Log, press "OK".
3. Select "Install" button.
4. Insert the REALTEK RTL8139 driver diskette, specify the driver path A:\NDIS\OS2 and press <Enter>.
5. When complete above step to load RTSND.OS2 into OS/2 system, then configure your system.
6. The same step as step 3, select "Configure" button.

7. The screen will display "Configure" dialog box and select "LAN adapters and protocols" then press "configure" button.
8. The screen will display "LAPS Configuration" dialog box, move highlight to "RTL8139 Fast PCI Ethernet Adapter" item in "Network Adapter" window, and select "NetBios" protocol. Press "OK".
9. Installation is complete now. Reset your PC by turning it off and on.

**[4]. Installing Multiple LAN Adapters:**

1. follow [3]. 1-9 and add tow RTL8139 Adapter driver
2. in IBM Lan Services icon, OS/2 Lan Services Installation /Configuration  
 Select your the server of the insatllted,[OK].  
 Do you want to re-install this version.[No].  
 Installing to card driver [OK]  
 Configure a component. [OK]  
 Lan Services Adapters. [OK]  
 Configure. [OK]  
 Two Adapter [V]. OK

**[5]. A sample PROTOCOL.INI file:**

[RTL8139]

DriverName=RTSNDS

EtherID=@52544C111111 ;This keyword is used to desinate a RTL8139  
 ;adapter by assigning it's ethernet ID  
 ;when more than one adapters exist on one  
 ;system.

BusNo=@00 ;This keyword is used to designate a RTL8139  
 ;adapter by assigning it's PCI bus number  
 ;when more than one adapters exist on one  
 ; system.(must be used with 'DeviceNo' keyword)

DviceNo=@0A ;This keyword is used to designate a RTL8139  
 ;adapter by assigning it's PCI Device number  
 ;when more than one adapters exist on one  
 ; system.(must be used with 'BusNo' keyword)

Speed= 100/10 ;This keyword is used to force RTL8139 adapter  
 ;to speed 10M or 100M mode. If not present,  
 ;the driver will auto-detect the speed.

## 5.11 Installing Microsoft network drivers to Microsoft

# Network Client for DOS

## **Introduction:**

This document describes the procedure to setup the Microsoft Network Client for DOS driver on REALTEK RTL8139 Fast PCI adapter.

Location of Driver: \MSCLIENT\RTSND.DOS

## **Sample Configuration Files:**

Ex1: [PROTOCOL.INI] (install creates this file)

```
[network.setup]
version=0x3110
netcard=RTL8139,1,RTL8139,1
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,MS$NETBEUI
lana0=RTL8139,1,ms$netbeui
lana1=RTL8139,1,ms$ndishlp
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP
```

```
[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=RTL8139
```

```
[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=RTL8139
LANABASE=0
```

```
[RTL8139]
; RTL8139 RPOTOCOL.INI SAMPLE
DriverName=RTSND$
EtherID=@52544C111111 ;This keyword is used to designate a RTL8139
;adapter by assigning its ethernet ID
;when more than one adapters exist on one
; system.
```

```
BusNo=@00 ;This keyword is used to designate a RTL8139
;adapter by assigning it's PCI bus number
```

	;when more than one adapters exist on one ; system.(must be used with 'DeviceNo' keyword)
DeviceNo=@0A	;This keyword is used to designate a RTL8139 ;adapter by assigning it's PCI Device number ;when more than one adapters exist on one ; system.(must be used with 'BusNo' keyword)
Speed = 100/10	;This keyword is used to force RTL8139 adapter ;to speed 10M or 100M mode. If not present, ;the driver will auto-detect the speed.

### **Installation Procedure :**

Before you start with the installation procedure, make sure that the adapter is properly installed and configured. Similarly, Make sure that your Microsoft Network Client is properly installed.

(If not, The installation utility SETUP.EXE is located on Microsoft Network Client v3.0 for MS-DOS Disk. Run SETUP.EXE from Disk and the SETUP program screen will appear, and You must complete each of the questions. These options are specific to your needs. The installation procedure will transfer files to a specific directory on the client and modify existing configuration files to fit your specific needs.)

1. Change to the Microsoft Network Client subdirectory, and run SETUP.EXE
2. The screen will display some information. Press <Enter> .
3. Responds to the screen prompts, selecting "Change Network Configuration", then press <Enter>.
4. Move the highlight to "Add Adapter", press <Enter>.
5. Select "Network adapter not shown on list below ...".
6. Insert the Realtek RTL8139 driver diskette in floppy A, and specify your pathname A:\MSCLIENT ,then press <Enter>.
7. Follow screen instructions to complete the process. Simply pressing <Enter> for each screen display will select the default options. Press <Enter> until you reach the display prompting you to reboot your system.

### **Installing Multiple LAN Adapters:**

There are two different method to complete it:

To Follow Installation Procedure and add two adapter,

- (a) Under DOS mode, you can modify the EtherID or BusNo+DeviceNo keyword field in file C:\MSCLIENT\PROTOCOL.INI.
- (b)Or you can also use the SETUP program and follow above setup procedure step 4, but move the highlight to "Change Setting, then press <Enter>, the screen will prompt you to fill EtherID value .



---

## 5.12 LAN Manager Workstation / Server

### **Introduction:**

This document describes the procedure to setup LAN Manager 2.1 Workstation/Server driver for REALTEK RTL8139 Fast PCI ethernet adapter.

Location of Driver:

(DOS) \MSLANMAN.DOS\DRIVERS\ETHERNET\RTL8139\RTSND.DOS  
(OS/2)\MSLANMAN.OS2\DRIVERS\ETHERNET\RTL8139\RTSND.OS2

### **Sample Configuration Files:**

CONFIG.SYS (for DOS will contain):

```
DEVICE=C:\LANMAN.DOS\DRIVERS\PROTMAN\PROTMAN.DOS
/I:C:\LANMAN.DOS
DEVICE=C:\LANMAN.DOS\DRIVERS\ETHERNET\RTL8139\RTSND.DOS
```

CONFIG.SYS (for OS/2 will contain):

```
DEVICE=C:\LANMAN.OS2\DRIVERS\PROTMAN\PROTMAN.OS2
/I:C:\LANMAN.OS2
DEVICE=C:\LANMAN.OS2\DRIVERS\ETHERNET\RTL8139\RTSND.OS2
```

PROTOCOL.INI (will contain):

```
[RTL8139]
; RTL8139 RPOTOCOL.INI SAMPLE
DriverName=RTSNDS
EtherID=@52544C111111 ;This keyword is used to designate a RTL8139
;adapter by assigning its ethernet ID
;when more than one adapters exist on one
; system.

BusNo=@00 ;This keyword is used to designate a RTL8139
;adapter by assigning it's PCI bus number
;when more than one adapters exist on one
; system.(must be used with 'DeviceNo' keyword)

DeviceNo=@0A ;This keyword is used to designate a RTL8139
;adapter by assigning it's PCI Device number
;when more than one adapters exist on one
; system.(must be used with 'BusNo' keyword)
```

Speed= 100/10

;This keyword is used to force RTL8139 adapter  
;to speed 10M or 100M mode. If not present,  
;the driver will auto-detect the speed.

### **Setup driver procedures on LAN Manager workstation/server :**

Before you start with the installation process, make sure that the adapter is properly installed and configured. Make sure your Microsoft LAN Manager is properly installed.

1. Run the appropriate Microsoft Lan Manager SETUP for computer you are setting up.(DOS, OS/2 or OS/2 Server). Select "Configuration" item ,(the Realtek driver isn't included on the Lan Manager disk) and insert the Realtek RTL8139 driver disk, select the Realtek driver and follow the directions.
2. When completed, reboot your computer.

### **Installing Multiple LAN Adapters:**

To Follow Setup driver Procedure and add two adapter,

Under DOS mode, you can modify the EtherID or BusNo+DeviceNo Keyword field in file C:\LANMAN\PROTOCOL.INI.

---

## 5.13 Windows for Workgroups v3.0

### **Introduction:**

This document describes the procedure to install Microsoft Windows for Workgroups v3.10 driver for REALTEK RTL8139 Fast ethernet adapter.

Location of Driver: \WFW31\RTSND.DOS

### **Sample Configuration Files:**

CONFIG.SYS (install will add these lines)

```
DEVICE=C:\WINDOWS\PROTMAN.DOS /I:C:\WINDOWS
DEVICE=C:\WINDOWS\RTSND.DOS
*** DEVICE=C:\WINDOWS\MSIPX.SYS (Added if running NetWare)
DEVICE=C:\WINDOWS\WORKGRP.SYS
LASTDRIVE=P
```

PROTOCOL.INI (install creates this file)

```
[network.setup]
version=0x3100
netcard=RTL8139,1,RTL8139
```

```

transport=ms$netbeui,MSS$NETBEUI
*** transport=ms$ipx,MSS$IPX           (Added if running NetWare)
*** lana0=RTL8139,1,ms$netbeui
*** lana0=RTL8139,1,ms$ipx           (Added if running NetWare)

```

```

[protman]
DriverName=PROTMANS
PRIORITY=MSS$NETBEUI

```

```

[RTL8139]
; RTL8139 RPOTOCOL.INI SAMPLE
DriverName=RTSNDS
EtherID=@52544C111111 ;This keyword is used to designate a RTL8139
;adapter by assigning its ethernet ID
;when more than one adapters exist on one
; system.

```

```

BusNo=@00 ;This keyword is used to designate a RTL8139
;adapter by assigning it's PCI bus number
;when more than one adapters exist on one
; system.(must be used with 'DeviceNo' keyword)

```

```

DeviceNo=@0A ;This keyword is used to designate a RTL8139
;adapter by assigning it's PCI Device number
;when more than one adapters exist on one
; system.(must be used with 'BusNo' keyword)

```

```

Speed= 100/10 ;This keyword is used to force RTL8139 adapter
;to speed 10M or 100M mode. If not present,
;the driver will auto-detect the speed.

```

```

[MSS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=32
BINDINGS=RTL8139
LANABASE=0

```

```

*** [MSS$IPX]           (Added if running NetWare)
*** Drivename=IPX$     (Added if running NetWare)
*** MediaType=Novell/Ethernet (Added if running NetWare)
*** Bindings=RTL8139   (Added if running NetWare)

```

```
AUTOEXEC.BAT
C:\WINDOWS\NET START
*** C:\WINDOWS\MSIPX      (Added if running NetWare)
*** C:\WINDOWS\NETX      (Added if running NetWare)
```

### **New Windows for Workgroups Installation:**

1. When installing Windows for Workgroups, you are prompted for a network driver. Select the "Unlisted or Updated Network Driver".
2. Insert the REALTEK adapter driver disk containing OEMSETUP.INF and RTSND.DOS files.
3. Specify the directory for the driver (A:\WFW31) and select the Adapter driver.
4. Select Advanced options, and make sure the parameters match the card settings. Check keyword "EtherID", which is provided by RTSND.DOS. The installation program copies the necessary files and creates PROTOCOL.INI for use with the adapter.
5. Continue the installation per Windows for Workgroups instructions.

### Existing Windows for Workgroups Installation:

1. Select the "Control Panel" icon in the Main Group.
2. Select the "Network" icon.
3. Select the "Adapters" button.
4. Select the Add option.
5. Select "Unlisted or Updated Network Adapter"
6. Insert the adapter driver disk with OEMSETUP.INF and RTSND.DOS and specify the path A:\WFW31.
7. Select the REALTEK adapter driver.
8. The installation program copies the necessary files and creates PROTOCOL.INI for use with the adapter.
9. Select "Close" and when prompted, restart computer for changes to take affect and complete the installation.

NOTE: You must have a terminated cable attached to the adapter when you start Windows for Workgroups. If you don't, Windows for Workgroups hangs.

### **TO ADD NETWARE:**

1. Select the "Control Panel" icon in the Main Group.
2. Select the "Network" icon.
3. Select the "Networks" button.
4. Select "Novell Netware" and select the add button.
5. Select "OK" and close the Network icon.
6. Select reboot computer and restart Windows.

### **Installing Multiple LAN Adapters:**

There are two different method to complete it:

---

- (a) Under DOS mode, you can modify the EtherID or BusNo+DeviceNo keyword field in file C:\WF31\PROTOCOL.INI.
- (b) Or you can enter Windows for WorkGroup and follow above setup procedure step 2, then click on "Setup.." button, select "Advanced...", fill EtherID in Value item. Last step to select OK and close NETWORK SETUP.

---

## 5.14 Windows NT 3.5, 3.51, & 4.0

### **Introduction:**

This document describes the procedure to install Windows NT v3.5, v3.51 & v4.0 driver for Realtek RTL8139 PCI Fast Ethernet adapter.

Location of Driver: \WINNT\RTL8139.SYS

### **Installing driver procedure on Microsoft Windows NT :**

When you are in Windows NT :

1. In the Main group of NT, select the "Control Panel" icon.
2. In the Control Panel window, choose the "Network" icon.
3. In the Network Settings dialog box, choose the "Add Adapter" button. The Add Network Adapter dialog box appears.
4. In the list of network cards, select "<other> Requires disk from manufacturer", and then press <Enter> button.
5. Insert the Realtek driver disk in drive A, enter drive and pathname A:\ which is the path where the setup file OEMSETUP.INF is located, and then choose the OK button.
6. The screen will appear "Select Line Speed" dialog box which is provide by RTL8139.SYS driver. The default value is "auto" so that the RTL8139 PCI Fast Ethernet adapter and its driver RTL8139.SYS will auto-detect the line speed, 10 Mb or 100Mb, while the RTL8139.SYS is loading. The other values, "10" or "100", are only used when you want to forced RTL8139 PCI Fast Ethernet adapter to 10Mb or 100Mb.
7. The screen will appear "Input EthernetID" dialog box which is provide by RTL8139.SYS driver. This option is only required when you have more than one Realtek RTL8139 PCI Fast Ethernet adapters on this computer. Select "SKIP" if only one adapter is installed on this computer.
8. "Bus Location" display in next screen. Your machine contains more than one hardware bus, please select the Bus Type and Bus number on which your network adapter card is installed.
9. NT will then perform the binding process. If any additional network software options were installed, you may be prompted for specific information for these packages.

10. Restarting your system you will acquire network service.

**NOTES:**

Installing Multiple LAN Adapters:

Enter Windows NT and follow above setup procedure step 2, in the "Network Settings" dialog box, choose the "Configure.." button. The "Input Ethernet ID" dialog box appears and input adapter's Ethernet ID. Last step to select OK and close NETWORK SETUP. Select SKIP if only one adapter is installed on this computer.

---

## 5.15 Windows 95 & OSR2

**Introduction:**

This document describes the procedure to install Windows 95 and OSR2 driver for Realtek RTL8139 PCI Fast Ethernet adapter.

Location of Driver: \WIN95\RTL8139.SYS

**Installing driver procedure on Microsoft Windows 95 :**

Before you start with the installation process, make sure that your adapter should be properly installed in your PCI bus slot. Executing Windows 95, it will auto-detect your system configuration and find the adapter hardware. (If Win95 does not prompt that it detects the PCI Ethernet adapter, there must be something wrong with the RTL8139 PCI Fast Ethernet adapter or your system environment.)

1. Ask you to select which driver you want to install, select "Driver from disk provided by hardware manufacturer".
2. Insert the Realtek RTL8139 driver disk into drive A and specify the setup file pathname A:\.
3. Windows 95 will appear some messages to insert Windows 95 system disk to complete setup step.
4. Windows 95 will finish the other installation procedure automatically, then you restart the system.

---

## 5.16 Installing UNIX network drivers to SCO UNIX 4.x

**Introduction:**

This document describes the procedure to install the SCO UNIX driver for REALTEK RTF8139 PCI fast ethernet adapter.

Location of Driver: \SCO\4.X\DRIVER.O

**The following files will be used in this installation:**

DRIVER.O : RTFSCO Driver Program

INSTALL : Transfer dos format to unix format setup program  
 INFO : Used by netconfig  
 INIT : Used by netconfig  
 MASTER : Used by netconfig  
 NODE : Used by netconfig  
 RECONF : Used by netconfig  
 REMOVE : Used by netconfig  
 SPACE.C : Used by netconfig  
 SYSTEM : Used by netconfig

### **Installing driver procedure on SCO UNIX :**

Before you start with the installation process, make sure that the SCO UNIX system is properly installed. Similarly, your adapter should also be properly installed in your machine.

1. Login as root user. (On maintenance mode)
2. If you own installation Diskette in DOS format :  
Put RTL SCO UNIX Driver diskette to floppy A: and use doscp command to copy the file "install" for installing RTF SCO UNIX PCI Driver into UNIX's directories as following :

```
# cd /
# doscp A:/sco/install /install
# chmod +x /install
# ./install
```

Then, the install program will ask you for path of the files, you can key in:

```
a:/sco/4.x
or
b:/sco/4.x
```

3. Use netconfig utility, available options :  
# netconfig

The screen will display the following messages, and Select item (1) to Add a chain :

- 1) Add a chain
- 2) Remove a chain
- 3) Reconfigure an element in a chain
- 4) Quit

4. After the above option completed, the screen display next option messages :

Select item (4) : sco\_tcp SCO TCP/IP for UNIX

5. When the user completed the above option, then various adapter drivers in SCO UNIX occur and select "RTL PCI Family Fast Ethernet Driver board 0" item.
6. Add chain sco\_tcp -> r7e0 (y/n), TYPE 'y'
7. Type in the line speed parameter, or just key in "ENTER" for auto detecting line speed.

Key in speed parameter	Explanation
------------------------	-------------

100	100 Mbps
10	10 Mbps
auto or "ENTER"	auto detect

8. Enter the internet Address of this interface, for example : 192.9.9.1
9. Enter the netmask for this interface (default 255.255.255.0).
10. Does the interface use a broadcast address of all 1's (y/n),  
default : y
11. Enter the boardcast address for this interface,  
default : xxx.xx.x.255           press ENTER
12. Are these values co rrect ? (y/n) TYPE 'y'
13. Pseudo ttys are currently configured, do you want to:
  - 1) Add Pseudo ttys
  - 2) Remove Pseudo ttys
 Select an option or enter q to quit [q] TYPE 'q'
14. Available options:
  - 1) Add a chain
  - 2) Remove a chain
- 3) Reconfigure a element in a chain
  - q Quit
  - Select option: q
15. Do you want to relink to kernel now ?                           y
16. Do you want this kernel to boot by default (y/n)                   y
17. Do you want the kernel environment rebuilt (y/n)                   y
18. Reboot unix
- # shutdown -g0

## 5.17 SCO UNIX 5.x

### **Introduction:**

This document describes the procedure to install the SCO UNIX driver for REALTEK RTL8139 PCI ethernet adapter.

Location of Driver:    \SCO\5.X\DRIVER.O

### **The following files will be used in this installation:**

driver.o                : RTL 8139 MDI Driver Program  
 install                : Transfer dos format to unix format setup program  
 Master                 : Used by netconfig  
 System                 : Used by netconfig  
 Node                  : Used by netconfig  
 Space.c                : Used by netconfig  
 Space.h                : Used by netconfig



lkcfg : Used by netconfig  
AOF/r8e : Used by netconfig

### **Installing driver procedure on SCO UNIX :**

Before you start with the installation process, make sure that the SCO UNIX system is properly installed. Similarly, your adapter should also be properly installed in your machine.

1. Installation Diskette in DOS format.  
Put RTL SCO UNIX Driver diskette to floppy A: and use doscp command to copy RTL SCO UNIX PCI Driver into UNIX's directories.

```
# cd /  
# doscp A:install /install  
# chmod +x /install  
# ./install
```

Then, the install program will ask you for path of the files, you can key in:

```
a:/sco/5.x  
or b:/sco/5.x
```

2. Use netconfig utility  
Available options:  
# netconfig
3. To add adapters, select "Add New Lan Adapter" from "Hardware".
4. Select the line speed from the menu:  
(1) 100 Mbps (2) 10 Mbps (3) auto detect
5. Add Protocol to select SCO TCP/IP.
6. Enter the internet Address of this interface, for example : 192.9.9.1
7. Enter the netmask for this interface (default 255.255.255.0)
8. Enter the boardcast address for this interface use default: n.n.n.n
9. Do you want to relink to kernel now ? (y/n)  
type in 'y'
10. Do you want this kernel to boot by default (y/n)  
type in 'y'
11. Do you want the kernel environment rebuilt (y/n)  
type in 'y'
12. Reboot unix  
# shutdown -y -g0

---

## 5.18 Other Ntework of Operating System Information of Packet Driver

### **Introduction:**

This document describes the procedure to setup the Packet driver for REALTEK RTS8139 PCI ethernet card.

Location of Driver: \RTSPKT\RTSPKT.COM

### **Sample Configuration Files:**

AUTOEXEC.BAT  
RTSPKT 0x60

### **Notes:**

1. Load the packet driver using the software interrupt and any optional switches if required.

Usage: RTSPKT [options] <software\_int\_no>

Example: RTSPKT -i 0x7e

The only required parameter is the software interrupt. A packet driver needs to have a software interrupt assigned to it for other programs to access it. The recommended interrupt 0x7e. If you need any of the options listed below, place them before the software interrupt on the command line.

- I - Force driver to report itself as 802.3 instead of Ethernet II.
- d - Delayed initialization. Used for diskless booting
- n - NetWare conversion. Converts 802.3 packets into 8137 packets
- w - Windows hack, obsoleted by winpkt
- p - Promiscuous mode disable
- h - Help
- u - Uninstall
- f - Line Speed = Fast ethernet 100Mbps
- e - Line Speed = Ethernet 10Mbps

3. Type command, C:\RTSPKT 0x60, the screen will appear following message:

```
System: [345]86 processor, PCI bus, Two 8259s
Packet driver software interrupt is 0x60
Interrupt number is 0x9
I/O port is 0x6100
```

My Ethernet address is 52:54:4C:29:29:AD

#### 4. Installing Multiple LAN Adapters:

If there are multiple network cards on the main board. the user run RTSPKT 0x60 directly, then the screen will display :

Packet driver for RTS8139, PCI version 1.00 Copyright 1997 (c), Realtek Semiconductor Inc.

There are 2 network cards on your main board :

Card 1. IRQ= 0x9 I/O= 0x6100 NodeID= 52:54:4C:29:29:AD

Card 2. IRQ= 0xA I/O= 0x6000 NodeID= 52:54:4C:29:29:64

Please select a Card No.(1-2): 1

System: [345]86 processor, PCI bus, Two 8259s

Packet driver software interrupt is 0x60

Interrupt number is 0x9

I/O port is 0x6100

My Ethernet address is 52:54:4C:29:29:AD

---

## 5.19 LANtastic 6.0 with NDIS driver

### **Introduction:**

This document describes the procedure to setup NDIS driver on LANtastic 6.0 operation system for REALTEK RTL8139 PCI ethernet card.

Location of Driver: \WFW31\RTSND.DOS

### **Sample Configuration Files:**

CONFIG.SYS:

DEVICE=C:\LANTASTI\PROTMAN.DOS /I:C:\LANTASTI

DEVICE=C:\LANTASTI\RTSND.DOS

FILES=40

BUFFERS=30

STARTNET.BAT:

@echo off

rem LANtastic Version 6.00 installed 95/05/23 14:11:21

rem (for Windows)

C:

cd C:\LANTASTI

```

SET LAN_CFG=C:\LANTASTI
rem If LANtastic is disabled, skip everything.
IF EXIST DISABLED GOTO :STARTNET_DONE
@echo ===== Begin LANtastic configuration =====
PATH C:\LANTASTI;C:\LANTASTI\NW;%PATH%
SET LAN_DIR=C:\LANTASTI.NET
SET NWDBPATH=C:\LANTASTI\NW
rem Please obtain the NETBEUI.EXE program from Microsoft
LOADHIGH NETBEUI
LOADHIGH AI-NDIS BIND_TO=RTSND_NIF
AILANBIO @STARTNET.CFG
REDIR TEST @STARTNET.CFG
IF EXIST NOSHARE GOTO :NOSHARE
SERVER C:\LANTASTI.NET @STARTNET.CFG
NET LOGIN \TEST
GOTO :CONTINUE
:NOSHARE
@echo LANtastic server was installed but turned off.
:CONTINUE
rem If CONNECT.BAT exists, run it to set up connections.
IF EXIST CONNECT.BAT GOTO :CONNECT
rem Otherwise set up connections specified during install.
NET LPT TIMEOUT 10
GOTO :CONNECT_DONE
:CONNECT
@echo Setting up LANtastic connections from CONNECT.BAT
rem Build CONNECT.BAT like this: "NET SHOW/BATCH >
C:\LANTASTI\CONNECT.BAT"
rem (or run the batch file SETNET.BAT)
call CONNECT.BAT
:CONNECT_DONE
NET POSTBOX
@echo ===== End LANtastic configuration =====
:STARTNET_DONE
cd\

```

PROTOCOL.INI:

```

;PROTOCOL.INI for LANtastic Version 6.00
;----- using
;
;
[PROTMAN]

```

DRIVERNAME = PROTMANS  
DYNAMIC = YES

[RTSND\_NIF]  
DRIVERNAME = RTSNDS  
Adapters=RTL8139  
;EtherID=@0123456789AB

### **Install Realtek drivers for LANtastic 6.0: (Using NDIS driver)**

The installation procedure will transfer files to a specific directory on the workstation and modify existing configuration files to fit your specific needs. The installation utility INSTALL.EXE is located on LANtastic Network Software Disk 1. Run INSTALL.EXE from Disk 1 and the LANtastic Install program screen will appear. You must complete each of the questions. These options are specific to your needs.

1. Prompt you to enter a unique Computer Name.
2. Ask you to select the drive that you want LANtastic to be installed on. The default is Drive C:.
3. Ask you to specify a directory where you want the LANtastic files to be installed. The default is \LANTASTI.
4. Ask you if you want to Share your Computers Drives or Printers.
5. Ask you to select the Maximum Number of Connected Computers.
6. Prompt you to select any other LANtastic features that you may want to install.
7. A summary screen of the options you will appear. If it looks correct continue with the installation.
8. Prompt you to select a network adapter to run your LANtastic software on. From the list of adapters, select "NDIS SUPPORT FOR NETWORK ADAPTERS".
9. Ask you to insert the manufacturers driver diskette containing the driver files. Insert the RTL8139 driver diskette into drive A: and specify the source path for driver files as A:\
10. Ask you if you want to Set Up Permanent Drive or Printer Connections.
11. Another summary screen of the options will appear. If this looks correct then select Perform the Installation and LANtastic will now install the files.