

NOVA- 600 EBX Pentium®

Embedded Board

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Introduction

Welcome to the NOVA-600 EBX Pentium® Embedded Board. The NOVA-600 board is an EBX form factor board, which comes equipped with high performance Pentium® CPU and advanced high performance LCD/CRT interface, 10/100Mbps Ethernet..etc. excellent features designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

This board built-in DiskOnChip™ (DOC) Flash Disk for embedded application. The DOC Flash Disk is 100% compatible to hard disk. User can use any DOS command without any extra software utility. The DOC currently is available from 2MB to 72MB.

An isolated digital I/O function is designed on the board. The function provides 4-bit digital inputs and 4-bit digital outputs. It is very useful in embedded application.

In addition, the NOVA-600 built-in C&T 65555 HiQPro™ LCD/CRT Chipset and 2MB EDO RAM. The LCD interface can drive up to 1280x1024 with 256 colors. The support flat panel will cover Color STN, TFT, EL,..etc. and also 3.3V or 5V version.

1.1 Specifications :

The NOVA-600 Pentium® with HiQPro™ LCD/CRT Single Board Computer provides the following specification:

- **CPU** : Pentium® MMX up to 233Mhz, AMD K6 processor up to 300MHz, Cyrix 6x86MX and IDT C6 processor
- **Bus** : ISA bus and PCI 32-bit local bus,PCI 2.1 standard
- **Chipset** : ALI Alladin 4+
- **LCD/CRT Interface** : C&T 655555 Chipset with 2MB EDO RAM
CRT Resolution : 1280x1024,256 colors
1024x768, 64K colors
800x600, 16M colors
36-bit LCD Interface Resolution :
1280x1024,256 colors
1024x768, 64K colors
800x600, 16M colors

Please contact www.chips.com to get more information.

- **Ethernet** : Built-in the RTL8139 Chipset
IEEE 802.3u 100BASE-TX standard
Auto-sensing interface to 10MBps or 100MBps networks
Full duplex capability

More information : www.realtek.com.tw

- **Real-time clock/calendar** : in Alladin 4+ chipset,backup by industrial Li-battery,3V/850mAH.
- **RAM memory** : up to 128MB,SDRAM supported
- **Second Cache memory** : 512KB Pipelined Burst SRAM on board

- **Ultra DMA/33 IDE Interface** : up to four PCI Enhance IDE hard drives. The Ultra DMA/33 IDE can handle data transfer up to 33MB/s. The best of all is that this new technology is compatible with existing ATA-2 IDE specifications. So there is no need to do any change for customer's current accessory.
- **Floppy disk drive interface** : two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives.
- **Four high speed Serial ports** : NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **IrDA port** : Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- **USB port** : Support two USB ports for future expansion.
- **Watch-dog timer** : 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. Your program use hex 043 and 443 to control the watch-dog and generate a system reset.
- **Flash Disk - DiskOnChip™** : The Flash Disk provide 100% compatible with hard disk. The built-in TrueFFS Transparent Flash Block Management and Space Reclamation will let customer to use the Flash Disk with DOS command, no need any extra software utility.
- **Keyboard connector**
- **Mouse** : PS/2 Mouse Port on-board.
- **Power Consumption** : +5V @ 5.1A
(Pentium/MMX-200,32MB SDRAM)
- **Operating Temperature** : 0° ~ 55° C (CPU needs Cooler)

1.2 What You Have

In addition to this *User's Manual*, the NOVA-600 package includes the following items:

- NOVA-600 Pentium® with HiQPro™ LCD/CRT Single Board Computer

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Installation

This chapter describes how to install the NOVA-600. At first, the layout of NOVA-600 is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the NOVA-600's configuration, such as CPU type selection, system clock setting, and watch dog timer, are also included.

2.1 NOVA-600's Layout and Dimensions

< reference next page >

2.2 Setting the CPU of NOVA-600

- CPU Clock Setting :

CPU Speed/Clock	JP15 1-2	JP15 9-10	JP15 11-12
60MHz	CLOSE	OPEN	OPEN
66MHz	OPEN	OPEN	OPEN

- CPU to Bus Multiple :

Multiplier	JP15 3-4	JP15 5-6	JP15 7-8
1.5 x	OPEN	OPEN	OPEN
2x	CLOSE	OPEN	OPEN
2.5x	CLOSE	CLOSE	OPEN
3 x	OPEN	CLOSE	OPEN
3.5 x	OPEN	OPEN	OPEN
4 x	CLOSE	OPEN	CLOSE
4.5x	CLOSE	CLOSE	CLOSE

**CPU Frequency = CPU Clock x Multiplier for example
Pentium® 200MHz = 66MHz CPU Clock x 3**

- CPU Core Voltage Selection :

Please check the CPU Core Voltage before you install the CPU. Right now new Intel MMX CPU is dual voltages for core and I/O, the I/O is 3.3V but the core is 2.8V. This kind of CPU design will enhance the low power consumption capability. As for the general Pentium CPU is one voltage for I/O and Core - 3.3V, 3.4V, or 3.5V

• **JP1 CPU Core Voltage Setting :**
(JP1 is in the DC Power Module)

CPU Core Voltage	JP1 1-2	JP1 3-4	JP1 5-6	JP1 7-8
3.5V(P54C/CS) VRE	CLOSE	CLOSE	CLOSE	CLOSE
3.4V(P54C/CS) STD	OPEN	CLOSE	CLOSE	CLOSE
3.3V	CLOSE	OPEN	CLOSE	CLOSE
3.2V	OPEN	OPEN	CLOSE	CLOSE
3.1V	CLOSE	CLOSE	OPEN	CLOSE
3.0V	OPEN	CLOSE	OPEN	CLOSE
2.9V	CLOSE	OPEN	OPEN	CLOSE
2.8V	OPEN	OPEN	OPEN	CLOSE
2.7V	CLOSE	CLOSE	CLOSE	OPEN
2.6V	OPEN	CLOSE	CLOSE	OPEN
2.5V	CLOSE	OPEN	CLOSE	OPEN
2.4V	OPEN	OPEN	CLOSE	OPEN
2.3V	CLOSE	CLOSE	OPEN	OPEN
2.2V	OPEN	CLOSE	OPEN	OPEN
2.1V	CLOSE	OPEN	OPEN	OPEN
2.0V	OPEN	OPEN	OPEN	OPEN

• **Dual / Single CPU Voltage setting :**

Vcore & VIO	JP13 1-2	JP13 3-4	JP14 1-2	JP14 3-4
Pentium® (P54C) IDT C6	CLOSE	CLOSE	OPEN	OPEN
Pentium® MMX AMD K6 Cyrix 6x86MX Dual Voltage	OPEN	OPEN	CLOSE	CLOSE

• **Cyrix 6x86MX PR Rating Table**
(Vcore : 2.9V,dual voltage)

PR Rating	Bus MHz	CPU Core MHz	Clock Multiplier
6x86MX-PR133	50	100	2x
6x86MX-PR133	55	110	2x
6x86MX-PR150	60	120	2x
6x86MX-PR150	50	125	2.5x
6x86MX-PR166	66	133	2x
6x86MX-PR166	55	138	2.5x
6x86MX-PR166	50	150	3x
6x86MX-PR166	60	150	2.5x
6x86MX-PR200	55	165	3x
6x86MX-PR200	66	166	2.5x
6x86MX-PR200	60	180	3x
6x86MX-PR233	66	200	3x
6x86MX-PR266	66	233	3.5x

• **AMD K6 MMX Rating Table, dual voltage**

Product Name	Core Freq	Vcore	Bus MHz	Multiplier
K6-233 model 6	233MHz	3.2V	66	3.5x
K6-200 model 6	200MHz	2.9V	66	3x
K6-166 model 6	166MHz	2.9V	66	2.5x
K6-300 model 7	300MHz	2.2V	66	4.5x
K6-266 model 7	266MHz	2.2V	66	4x
K6-233 model 7	233MHz	2.2V	66	3.5x

2.3 Watch-Dog Timer

The Watch-Dog Timer is enabled by reading port 443H. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a reset signal to start again, or activate NMI to CPU. The Watch-Dog Timer is disable by reading port 043H.

• **JP18 : Watch-Dog Active Type Setting**

JP18	DESCRIPTION
2-3	RESET WHEN WDT TIME-OUT
1-2	ACTIVATE NMI TO CPU WHEN WDT TIME-OUT
OPEN	DISABLE WDT

• **JP11: WDT Time-Out Period**

PERIOD	1-2	3-4	5-6	7-8
1 sec.	OPEN	OPEN	CLOSE	OPEN
2 sec.	OPEN	OPEN	CLOSE	CLOSE
10 sec.	OPEN	CLOSE	OPEN	OPEN
20 sec.	OPEN	CLOSE	OPEN	CLOSE
110 sec.	CLOSE	OPEN	OPEN	OPEN
220 sec.	CLOSE	OPEN	OPEN	CLOSE

2.4 DiskOnChip™ Flash Disk

The DiskOnChip™ Flash Disk Chip(DOC) is produced by M-Systems. Because the DOC is 100% compatible to hard disk and DOS. Customer don't need any extra software utility. It is just "plug and play", easy and reliable.

• **JP16 : DiskOnChip Memory Address Setting**

Address	JP16
CE000	1-2
D6000	3-4
DE000	5-6

2.5 LCD Voltage Setting

The NOVA-600 supports 3.3V or 5V LCD panel by jumper setting. The setting will control the CN5's Pin 29 & 30 as 3.3V or 5V output.

- **JP10 : LCD Voltage Setting**

Function	JP10
3.3V	1-2
5V	2-3

2.6 Clear CMOS Setup

If want to clear the CMOS Setup(for example forgot the password you should clear the setup and then set the password again.),you should close the CN26 pin 3-4 about 3 seconds,then open again. Set back to normal operation mode,close pin 2-3.

- **CN26 : Clear CMOS Setup (Reserve Function)**

CN26	DESCRIPTION
2-3	Normal Operation
3-4	Clear CMOS Setup

2.7 Battery Backup for CMOS Setup

There have one 4-pin header CN26 using for battery backup function. When close the pin 2-3 will use the on board battery. When use external battery you should take off the jumper and use the connector as external battery connector.

- **CN26: Battery Backup Function**

CN26	DESCRIPTION
2-3 CLOSE	Using Internal Battery
1- Vbat 4- Ground	Use as External Battery Connector

2.8 BIOS Flash Chip Write Voltage Setting

The BIOS Flash Chip could be two types, one is 12V write voltage and other one is 5V.

- **JP17 : 5V/12V Flash Chip Write Voltage Setting**

(This jumper is factory setting ,customer may not change it)

JP17	Description
1-3 2-4	+12V 1Mbit Flash Write Voltage
1-3 4-6	+12V 1Mbit/2Mbit Flash Write Voltage
3-5 4-6	+5V 1Mbit/2Mbit Flash Write Voltage

2.9 PortB RS-232,RS-422,or RS-485 setting

The PortB on CN6 can be set as RS-232,RS-422,or RS-485 mode by the JP4,JP6,or JP12.

PortB Mode	JP4	JP6	JP12
RS-232	Don't care	2-3	1-9 , 3-10 5-11 , 7-12
RS-422	2-3	1-2	1-2 , 3-4 5-6 , 7-8
RS-485	1-2	1-2	1-2 , 3-4 5-6 , 7-8

2.10 PortC/PortD RI pin setting

The PortC's RI pin(pin 19) on CN7 and the PortD's RI pin (pin 19) on CN6 can be set as RI,+5V,or +12V mode.

PortC CN7 Pin 19	JP1	JP3
RI	2-3	Don't Care
+5V	1-2	1-2
+12V	1-2	2-3

PortD CN6 Pin 19	JP2	JP21
RI	2-3	Don't Care
+5V	1-2	1-2
+12V	1-2	2-3

Please note when set the +12V output, the board should have +12V input from power supply by the CN4 power connector.

3

Connection

This chapter describes how to connect peripherals, switches and indicators to the NOVA-600 board.

3.1 Floppy Disk Drive Connector

NOVA-600 board equipped with a 34-pin daisy-chain driver connector cable.

• CN11: FDC 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 GATE#
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 Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) hard disk drives to the NOVA-600 IDE controller. The IDE support Ultra DMA/33 interface.

CN13(IDE 1) : Primary IDE Connector,2.54mm pitch

**CN10(IDE 2) : Secondary IDE Connector,2.0mm pitch
for 2.5" IDE HDD**

• CN13: Primary IDE Interface 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

• **CN10: Secondary IDE Interface 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
41	+5V	42	+5V
43	Ground	44	Pull High

3.3 Parallel Port

This port is usually connected to a printer, The NOVA-600 includes an on-board parallel port, accessed through a 26-pin flat-cable connector CN8.

• CN8 : 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		

3.4 Serial Ports

The NOVA-600 offers four high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports.

• CN6(PorB,PortD) : 20-pin Header

Pin	Description	Pin	Description
1	DCD2/TX2-	11	DSR2/RX2+
2	RXD2/TX2+	12	RTS2/RX2-
3	TXD2	13	CTS2
4	DTR2	14	RI2
5	GND	15	NC
6	DCD4	16	DSR4
7	RXD4	17	RTS4
8	TXD4	18	CTS4
9	DTR4	19	RI,+5V,or +12V
10	GND	20	NC

• **CN7(PortA,PortC) : 20-pin Header**

Pin	Description	Pin	Description
1	DCD1	11	DSR1
2	RXD1	12	RTS1
3	TXD1	13	CTS1
4	DTR1	14	RI
5	GND	15	NC
6	DCD3	16	DSR3
7	RXD3	17	RTS3
8	TXD3	18	CTS3
9	DTR3	19	RI,+5V,or +12V
10	GND	20	NC

3.5 Keyboard and Mouse Connector

The NOVA-600 provides 5-pin keyboard and mouse connectors. The connector is 2.5mm pitch model Say Yea 2570-05P or equivalent one.

• **CN20 : 5-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

• **CN21 : 5-pin Mouse Connector**

PIN NO.	DESCRIPTION
1	MOUSE CLOCK
2	MOUSE DATA
3	N/C
4	GND
5	+5V

3.6 External Switches and Indicators

There are many external switches and indicators for monitoring and controlling your CPU board.

- **CN15 : Reset Connector**

PIN NO.	DESCRIPTION
1	RESET SIGNAL
2	GROUND

- **CN2 : Speaker Connector**

PIN NO.	DESCRIPTION
1	+5V
2	SPEAKER

- **CN25 : IDE LED Connector**

PIN NO.	DESCRIPTION
1	+5V
2	HDD ACTIVE#

- **CN22 : KeyLock & Power**

PIN NO.	DESCRIPTION
1	+5V
2	N/C
3	GROUND
4	KEYLOCK
5	GROUND

3.7 USB Port Connector

The NOVA-600 built-in two USB ports for the future new I/O bus expansion.

- **CN18 : USB 0/1**

1	+5V	2	GND
3	D0-	4	D1+
5	D0+	6	D1-
7	GND	8	+5V

3.8 IrDA Infrared Interface Port

The NOVA-600 built-in a IrDA port which support Serial Infrared(SIR) or Amplitude Shift Keyed IR(ASKIR) interface. When use the IrDA port have to set SIR or ASKIR model in the BIOS's Peripheral Setup's PortD. Then the normal RS-232 PortD will be disabled.

- **CN23 : IrDA connector***

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	Ground
5	IR-TX

3.9 LCD/CRT Connector

The NOVA-600 built-in 10-pin VGA connector directly to your CRT monitor. And the built-in 50-pin connector for LCD interface.

- **CN9 : 10-pin VGA Header Connector**

1	RED	6	N/C
2	GREEN	7	N/C
3	BLUE	8	GROUND
4	HSYNC	9	GROUND
5	VSYNC	10	GROUND

- **CN5 : 50-pin LCD Interface Connector**

1	VPCLK	2	P33
3	P34	4	P31
5	P35	6	P32
7	P30	8	P28
9	P29	10	P27
11	P25	12	P26
13	P24	14	P21
15	P23	16	P22
17	P16	18	P20
19	P17	20	P18
21	P19	22	P14
23	P13	24	P12

25	P15	26	P11
27	P7	28	P10
29	5V or 3.3V	30	5V or 3.3V
31	P9	32	P8
33	P4	34	P6
35	P3	36	P5
37	P2	38	P1
39	M	40	P0
41	SHFCLK	42	ENABKL`
43	FPVDD	44	FLM(V SYS)
45	FPVEE	46	LP(H SYS)
47	GND	48	GND
49	+12V	50	+12V

3.10 Fan Connector

The NOVA-600 provides CPU cooling fan connector, chassis fan connector. These connectors can supply 12V/500mA max. to the cooling fan. The 12V on the fan connector is converted from 5V,so it is limited in fan using. Don't use it for other purpose.

- **CN27 : CPU Fan Connector**

PIN NO.	DESCRIPTION
1	N/C
2	12V
3	Ground

3.11 Lan RJ45 Connector

The NOVA-600 built-in a RJ45 Lan connector for 10/100Mbps Ethernet communication.

- **CN1 : Lan RJ45 Connector**

Pin	Description	Pin	Description
1	TX+	5.	NC
2	TX-	6.	RX-
3.	RX+	7.	NC
4.	NC	8.	NC

- **CN24 Lan Active LED Connector**

Pin.	Description
1.	5V
2.	RX/TX

LED1 YELLOW : RX/TX Active
LED2 GREEN : 100Mbps Active
LED3 GREEN : 10Mbps Active

3.12 Power Connector

The NOVA-600 provides a 8-pin power connector, The connector type is Molex 26-60-4080 or equivalent one. The power connector's each pin max. rating is 7A. It will accept max. 14A by the 2pin 5V input.

- **CN4 : Power Connector**

PIN NO.	DESCRIPTION
1	+5V
2	Ground
3	Ground
4	+12V
5	N/C
6	Ground
7	+5V
8	-12V

3.13 Isolated Digital I/O Connector

The NOVA-600 built-in 4-bit IN and 4-bit OUT digital I/O connector. The connector type is DINKLE ED350V-10P.

Because this is isolated Digital I/O design , it will need an external power supply to the connector's Pin 9 and Pin10 to active the circuit. You may refer the following block diagram to know the details. The external power supply's DC output should be not connected with the NOVA-600's power supply at either 5V,12V or ground to isolate the NOVA-600 main system and the external I/O device.

In case you could not find an external power supply to active the Digital I/O,you may use the 5V or 12V from the system's power supply. Under the situation the digital I/O function will be not isolated.

• CN14 : DIO Connector

Pin#	Signal Name	Function
1	IN00	Data IN
2	IN01	Data IN
3	IN02	Data IN
4	IN03	Data IN
5	OUT00	Data OUT
6	OUT01	Data OUT
7	OUT02	Data OUT
8	OUT03	Data OUT
9	COM -	External Power Ground
10	COM +	External Power 5 – 30V

The digital I/O are addressed at 220H,240H,260H,or Disable through CMOS peripheral setup selection. You may refer the following table for the address and matching I/O port.

Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
IN00	IN01	IN02	IN03	OUT00	OUT01	OUT02	OUT03

The Digital Input specifications are :
Isolated channel with common power
Digital input level
Logic level 0 : +1V max.
Logic level 1 : +3.5V to 30V
Input impedance : 3K ohm ,0.5W

The Digital Output specifications are :
Isolated channel with common power
Open collector to 30V
Output current : 600mA per channel, total 3A max.

- **Windows 95/NT Driver for DIO application**

The WDT-01 Windows 95/NT software utility are included in the CD ROM. From the WDT-01 utility you may use the **DIO.H** , **DIO.LIB**, and **DIO.DLL** for the digital I/O application.

The software user manual are also in the CD ROM. You may print it out for better reference.

4

AMI BIOS Setup

The NOVA-600 uses the AMI BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Start

When power on the system, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test and initialization and system configuration verification. After the POST routines are completed, the following message appears :

" Hit DEL if you want to run SETUP"

To access AMI BIOS Setup program, press key, then you could see the screen to make some options as follows,

When choose **Load BIOS Defaults** will load the minimized settings for Troubleshooting. The performance should be very poor when use this setting.

When choose **Load Setup Defaults** will load optimized defaults for regular use. Choosing this setting, will modify all applicable settings.

4.2 Standard CMOS Setup

The Standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk Drive setting. Please refer the following screen for this setup.

For IDE hard disk drive setup, please check the following possible setup procedure,

1. Use the Auto setting for detection during bootup.
2. Use the IDE HDD AUTO DETECTION in the main menu to automatically enter the drive specifications.
3. Manually enter the specifications by yourself from the "User" option.

4.3 Advanced CMOS Setup

This Advanced CMOS Setup is designed for customer's tuning best performance of the NOVA-600 board. As for normal operation customers don't have to change any default setting. The default setting is pre-set for most reliable operation. You also can option the system keyboard, primary display, PS/2 mouse to enable or disable. The system boot sequence is also set here by first, second, third and fourth boot device setting.

4.4 Advanced Chipset Setup

This setup functions are almost working for ChipSet(ALI 4+). These options are used to change the ChipSet's registers. Please carefully change any default setting, otherwise the system could be running un-stable.

Auto Configuration : Enable or Disable

When use the 60nS general type DRAM, please enable the setting to get the optimal timings.

SDRAM Speculative Read : Enable or Disable

When enable this option, the PCU will send predict commands to the SDRAM, if a miss happens, the CPU will cancel this command. Because some OS under certain situations have problem for this feature, it is normally disable.

4.5 Peripheral Setup

This setup is almost working for Multi-I/O Chip(W83877F and ALI Alladin 4+ chipset). These options are used to change the ChipSet's registers. Please carefully change any default setting to meet your application need perfectly. The only special concern is Onboard Serial PortD. If you are using the IrDA port, you have to set this port accordingly.

Customer also can set the **Isolated Digital I/O** function's I/O addressing here by **220h,240h,260h,or disable**.

The most important setting in this setup is **LCD Type setting**. In the most right bottom item – Panel Type selection, customer can choose 15 different panel type. The 15 panel types are :

- 1. 1024x768 Dual Scan STN Color**
- 2. 1280x1024 TFT**
- 3. 640x480 STN**
- 4. 800x600 STN**
- 5. 640x480 TFT**
- 6. 640x480 18bit**
- 7. 1024x768 TFT**
- 8. 800x600 TFT**
- 9. 800x600 TFT**
- 10. 800x600 TFT**
- 11. 800x600 STN**
- 12. 800x600 STN**
- 13. 1024x768 TFT**
- 14. 1280x1024 STN**
- 15. 1024x600 STN**

4.6 Power Management Setup

Power Management Setup help user handles the NOVA-600 board's "green" function. The features could shut down the video display and hard disk to save energy for example. The power management setup screen is as following,

Power Management/APM : Disable, Max Saving, Min Saving, or User Defined

Note : Advanced Power Management(APM) have to be installed to keep the system time updated when the computer enters suspend mode activated by the Power Management. Under DOS environment, you need to add `DEVICE=C:\DOS\POWER.EXE` in your `CONFIG.SYS` Under Windows 3.x and Windows 95, you have to install Windows with APM feature. A battery and power cord icon labeled "Power" Will appear in the "Control Panel"

5

E² Key™ Function

The NOVA-600 provides an outstanding E²KEY™ function for system integrator. Based on the E²KEY™ you could free to store the ID Code, Pass Word, or Critical Data in the 1Kbit EEPROM. Because the EEPROM is nonvolatile memory, you don't have to worry the losing of the very important data.

Basically the E²KEY™ is based on a 1Kbit EEPROM which is configured to 64 words(from 0 to 63). You could access(read or write) each word at any time.

When you start to use the E²KEY™ you should have the utility in the package. The software utility will include four files as follows,

README.DOC
E2KEY.OBJ
EKEYDEMO.C
EKEYDEMO.EXE.

The E2KEY.OBJ provides two library function for user to integrate their application with E²KEY™ function. These library (**read_e2key and write_e2key**) are written and compiled in C format. Please check the following statement, then you will know how to implement it easily.

unsigned int read_e2key(unsigned int address)

/* This function will return the E²KEY™'s data at address. The address range is from 0 to 63. Return data is one word,16 bits */

void write_e2key(unsigned int address,unsigned data)

/* This function will write the given data to E²KEY™ at address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

To easy start to use the function, please refer the include EKEYDEMO.C code at first.

Please note the E²KEY™ function is based on the working of parallel port. So you should enable the NOVA-600's parallel port, otherwise will be not working.

If you need the Windows NT/95 driver,please down load the driver from ftp.icpacquire.com.tw .

Appendix A. Watch-Dog Timer

The Watch-Dog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that caused the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a non-maskable interrupt (NMI) to bring the system back to a known state.

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

443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
043 (hex)	Read	Disable the Watch-Dog Timer.

To enable the Watch-Dog Timer, a read from I/O port 443H must be performed. This will enable and activate the countdown timer which will eventually time out and either reset the CPU or cause an NMI depending on the setting of JP18. To ensure that this reset condition does not occur, the Watch-Dog Timer must be periodically refreshed by reading the same I/O port 443H. This must be done within the time out period that is selected by jumper group JP11.

A tolerance of at least 30% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming. Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: when exiting a program it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.

Appendix B. FP24-01 Flat Panel Connection Module

The FP24-01 connection module is installed on the NOVA-600 as a standard product. The FP24-01 converts NOVA-600's on board 50pin LCD interface signal to the 44-pin (2x20 pin header) and 41pin (Hirose DF9-41P-1V) LCD connectors. The 44-pin or 41-pin connector will only support 24-bit flat pane.

• J3 : 44-pin LCD Interface Connector

1	+12V	2	+12V
3	GND	4	GND
5	5V or 3.3V	6	5V or 3.3V
7	FPVVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M	38	LP
39	GND	40	ENABKL
41	N/C	42	N/C
43	FPVDD	44	5V or 3.3V

• **J1 : 41-pin LCD Interface Connector**

1	P20	2	GND
3	P16	4	5V or 3.3V
5	P21	6	P0
7	P17	8	P8
9	P22	10	P1
11	P18	12	P9
13	P23	14	P2
15	P19	16	P10
17	5V or 3.3V	18	P3
19	FLM	20	P11
21	M	22	P4
23	LP	24	P12
25	SHFCLK	26	P5
27	5V or 3.3V	28	P13
29	5V or 3.3V	30	P6
31	ENABKL	32	P14
33	FPVDD	34	P7
35	FPVEE	36	P15
37	GND	38	+12V
39	GND	40	+12V
41	N/C		

• **J2 : LCD Backlight Power Connector***

PIN NO.	DESCRIPTION
1	N/C
2	GND
3	12V (0.9A max.)
4	GND
5	FPVEE Inverter Enable