

# **Mity SoC Module & Mity SoC Development Kit**

**Mity SoC Module with 2MB/2S/IDE/Parallel/GPIO &  
ISA bus Development for Mity SoC Module**

**User's Manual**

**(Revision1.0)**

## ● Copyright

The information in this manual is subject to change without notice for continuous improvement in the product. All rights are reserved. The manufacturer assumes no responsibility for any inaccuracies that may be contained in this document. And makes no commitment to update or to keep current the information contained in this manual.

Manual No. IUM6000000-01 Ver.1.0

All rights reserved.

● 1<sup>st</sup> issue date: October 25, 2002

● Released date: January 13, 2003

## ● Trademarks Acknowledgment

Other brand names or product names appearing in this document are the properties and registered trademarks of their respective owners. All names mentioned herewith are served for identification purpose only.

# Table of Contents

<b>T A B L E O F C O N T E N T S .....</b>	<b>III</b>
<b>C H A P T E R 0                      S T A R T U P</b>	
<b>0.1 Packing List .....</b>	<b>1</b>
<b>0.2 Option Accessory .....</b>	<b>1</b>
<b>0.3 Specification .....</b>	<b>2</b>
<b>■ Mity SoC Module .....</b>	<b>2</b>
<b>■ Mity Soc Development Board .....</b>	<b>3</b>
<b>0.4 Ordering Information .....</b>	<b>4</b>
<b>0.5 Ordering Selection .....</b>	<b>5</b>
<b>C H A P T E R 1                      I N T R O D U C T I O N</b>	
<b>1.1 Features .....</b>	<b>7</b>
<b>■ Mity SoC Module .....</b>	<b>7</b>
<b>■ Mity Soc Development Board .....</b>	<b>7</b>
<b>1.2 Specification .....</b>	<b>8</b>
<b>■ Mity SoC Module .....</b>	<b>8</b>
<b>■ Mity Soc Development Board .....</b>	<b>9</b>
<b>1.3 VGA Interface .....</b>	<b>10</b>
<b>1.4 DiskOnChip 2000 Flash Disk .....</b>	<b>11</b>
<b>1.5 Network Interface .....</b>	<b>11</b>
<b>C H A P T E R 2                      I N S T A L L A T I O N</b>	
<b>2.1 Board Outline .....</b>	<b>12</b>
<b>■ Mity SoC Module .....</b>	<b>12</b>
<b>■ Mity Soc Development Board .....</b>	<b>12</b>
<b>2.2 Mity SoC Development Kit Installation..</b>	<b>13</b>
<b>2.3 Connectors &amp; Jumpers Summary .....</b>	<b>14</b>
<b>■ Mity SoC Module .....</b>	<b>14</b>
<b>■ Mity Soc Development Board .....</b>	<b>15</b>
<b>2.4 Pin Assignments &amp; Jumper Settings ....</b>	<b>16</b>

<b>■ Mity SoC Module .....</b>	<b>16</b>
J1 : X-ISA Connector.....	16
J2 : I/O Connector.....	17
U2 : DRAM 2MB (Option).....	18
U3 : DRAM 2MB (Standard) .....	18
u8 : BIOS .....	19
<b>■ Mity Soc Development Board .....</b>	<b>20</b>
J1 : X-ISA Connector.....	20
J2 : ISA bus Connector, SL62.....	21
J3 : ISA bus Connector, SL36.....	22
J4 : PC/104 Connector CN1 .....	23
J4 : PC/104 Connector CN2.....	24
J6 : Mity-Mite VGA .....	25
J7 : IDE Connector .....	26
J8 : I/O Connector.....	27
J9 : GPIO .....	28
J10 : COM1 .....	28
J11 : COM2 .....	28
J12 : RESET .....	28
J13 : PS/2 Keyboard .....	29
J14 : VGA .....	29
J15 : DC_INPUT (Terminal Block).....	29
J16 : DC_JACK .....	29
J17 : DC_INPUT (Molex) .....	30
J18 : Mity-Mite VGA .....	30
J19 : Keyboard .....	30
J20 : PRINT .....	31
: LED Display.....	31
U2 : DOC Connector (DiskOnChip).....	32
U5 : 8ØPORT (7 Segment Display).....	32
<b>2.5 DiskOnChip/Flash ROM Disk .....</b>	<b>33</b>
2.4.1 Setup a DiskOnChip ® 2000 Flash Disk.....	33
<b>2.6 Watchdog Timer .....</b>	<b>35</b>
<b>C H A P T E R     3                     S V G A   S E T U P</b>	
<b>3.1 Introduction.....</b>	<b>43</b>
3.1.1 Chipset .....	43
3.1.2 Display memory.....	43

3.2 Flat Panel BIOS and Wiring.....	45
<b>C H A P T E R 4 NETWORK INTERFACE</b>	
4.1 Introduction.....	52
4.2 Software Support .....	52
<b>A P P E N D I X : SCHEMATIC DIAGRAM .....</b>	<b>53</b>
<b>W A R R A N T Y.....</b>	<b>53</b>

This page is intentionally left blank.

# Chapter 0

## Startup

### 0.1 Packing List

Product Name	Function	Package
Mity SoC Module	Mity SoC Module with 2MB/2S/IDE/Parallel/GPIO	● Mity SoC Module x1
Mity SoC Development Kit	ISA bus Development Board for Mity SoC Module	● ISA bus Development Board x1 ● Manual & Drivers CD x 1 ● FDD cable x 1 ● HDD cable x 1 ● VGA cable x1 ● RS232 cable x 2 ● Printer cable x 1 ● GPIO cable x1 ● Keyboard cable x1

### 0.2 Option Accessory

Product Name	Function	Package
Mity Mite VGA/LCD DevKit	VGA/LCD Control Module	● Mity-Mite VGA/LCD Development Kit x1

## 0.3 Specification

### ■ Mity SoC Module

#### **Mity SoC CPU Module 2MB/2S/IDE/Parallel/GPIO**

<b>SoC</b>	DM&P(ALi) M6117D – 386SX System-on-Chip CPU-40MHz Data Bus: 16-bit Bus Speeds: 8MHz, programmable up to 16MHz Watchdog Timer: 30.5uS to 512uS Real Time Clock (Need external Battery)
<b>BIOS</b>	AMI BIOS (Flash disk or optional EPROM)
<b>System Memory</b>	Onboard 2MB (optional 4MB)
<b>Bus Interface</b>	16-bits ISA Interface
<b>I/O Interface</b>	<ul style="list-style-type: none"> <li>● RS-232 pin x2 (optional TTL level)</li> <li>● Bi-directional Parallel interface x1</li> <li>● 16-bit GPIO interface</li> <li>● Keyboard interface</li> <li>● IDE interface</li> <li>● Speaker</li> <li>● Power LED</li> </ul>
<b>ISA Interface</b>	<ul style="list-style-type: none"> <li>● DM&amp;P(ALi) M6117D – 386SX SoC</li> <li>● Support Mity-Mite VGA</li> </ul>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>● 2.0mm Ø, 32x2 pin header for specific I/O Interface x1</li> <li>● 2.0mm Ø, 32x2 pin header for specific X-ISA 16-bit Interface x1</li> </ul>
<b>H/W &amp; S/W Support</b>	<ul style="list-style-type: none"> <li>● DMP Software Library Support</li> <li>● Development Kit Support</li> </ul>
<b>Power Requirement</b>	Single Voltage +5V @400Ma
<b>Board Weight</b>	45g
<b>Board Size</b>	65mm X 45mm (2.56 x 1.77 inches)
<b>Operating Temperature</b>	-20°C ~ +70°C





## ■ Mity SoC Development Board

### **Mity-SoC ISA bus Development board**

<b>Board Type</b>	Half-size ISA-bus Extended I/O Module for Mity-SoC
<b>Bus Interface</b>	PC/104 16-bits ISA Interface
<b>I/O Interface</b>	<ul style="list-style-type: none"> <li>● RS-232 pin x2 (optional TTL level)</li> <li>● Bi-directional Parallel interface x1</li> <li>● 16-bit GPIO interface</li> <li>● Keyboard interface</li> <li>● IDE interface</li> <li>● Speaker</li> <li>● Power LED</li> </ul>
<b>ISA Interface</b>	<ul style="list-style-type: none"> <li>● DM&amp;P(ALi) M6117D – 386SX SoC</li> <li>● Support Mity-Mite VGA</li> </ul>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>● 2.0mm Ø, 32x2 pin header for Mity-SoC x2</li> <li>● 2.0mm Ø, 32x1 pin header for Mity-Mite VGA/LCD Module x1</li> <li>● 40-pin box header for enhanced IDE x1</li> <li>● 20-pin box header for GPIO x1</li> <li>● 26-pin box header for printer x1</li> <li>● 10-pin box header for COM2</li> <li>● 5-pin header for PS/2 keyboard x1</li> <li>● 10-pin box header for VGA x1</li> <li>● PC/104 connector x1</li> <li>● 32-pin socket for for DiskOnChip x1, 8MB~256MB</li> <li>● External 9-pin D-Sub male COM1 connector</li> <li>● External 15-pin D-type female VGA connector</li> <li>● External 6-pin Mini DIN for PS/2 KB</li> <li>● Power input x3 selection: (1)DC Jack, (2)2-pin Terminal strip and (3) 4-pin Molex connector</li> </ul>
<b>LED Indicators</b>	<ul style="list-style-type: none"> <li>● P.O.S.T.Test Indicator : Two digit 7-Segment LED Display</li> <li>● GPIO Input LED indicators x16</li> <li>● GPIO Switch Input x4</li> <li>● IDE LED</li> </ul>
<b>DiskOnChip</b>	<p>One socket supporting –</p> <ul style="list-style-type: none"> <li>● DiskOnChip 8MB~256MB (User GPSC)</li> </ul>

## 0.3 Specification ... continuation

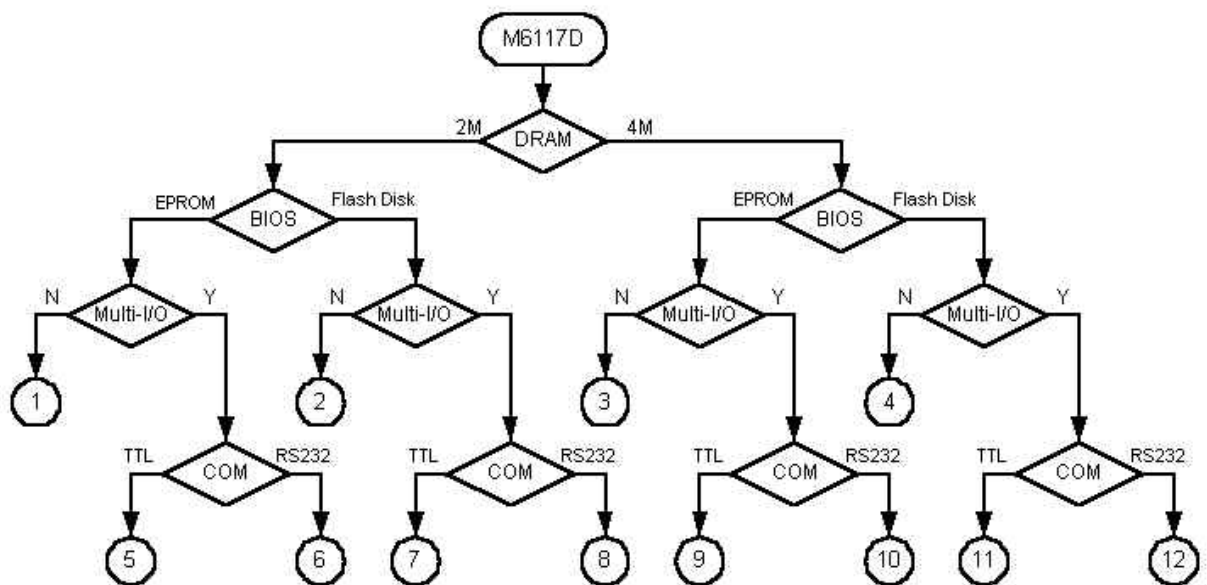
<b>H/W &amp; S/W Support</b>	 DMP Software Library Support  Development Kit Support
<b>Power Requirement</b>	Single Voltage +5V @150mA
<b>Board Weight</b>	225g
<b>Board Size</b>	185mm X 122mm (7.28 x 4.80 inches)
<b>Operating Temperature</b>	-20°C ~ +70°C

## 0.4 Ordering Information

<b>Mity SoC-8/P5</b>	5-Pack of Mity-Mite Module 2MB/2S/IDE/Parallel/ GPIO (TTLx1, RS232 x1)
<b>Mity SoC-12/P5</b>	5-Pack of Mity-Mite Module 4MB/2S/IDE/Parallel/ GPIO (TTLx2)
<b>Mity-Mite VGA/LCD Development Kit</b>	VGA/LCD Development kit for Mity SoC and Mity-Mite Module
<b>Mity-SoC Development Board</b>	ISA bus Development board for Mity-SoC Module
<b>Mity-SoC Development Kit</b>	Complete Development Kit with Mity-SoC module, Mity-Mite VGA/LCD module and ISA Development board.

## 0.5 Ordering Selection

### Mity-SoC Selection



This page is intentionally left blank.

# Chapter 1

## Introduction

### 1.1 Features

#### ■ Mity SoC Module

- Mity size CPU Module (65 x 45 mm)
- DM&P M6117D – 386SX System-On-Chip
- Onboard 2MB SDRAM (optional 4MB)
- Enhanced IDE devices interface
- One Bi-directional Parallel Port
- RS-232/485 interface x2
- Watchdog timer
- Support Keyboard interface
- Single voltage +5 V power connector
- Operating temperature from  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- DM&P H/W & S/W Library support
- Development kit support
- Accept custom modification
- Provide OEM & ODM design

#### ■ Mity-SoC Development Board

- Base board development concept for Mity-SoC
- Provide quick time-to-market I/O integration
- ISA-bus interface
- Expandable PC/104 interface
- Available socket for DiskOnChip
- Onboard Keyboard & Mouse connector

## 1.2 Specification

### ■ Mity SoC Module

- **Embedded CPU:** DM&P M6117D – 386SX System-on-Chip CPU – 40MHz, Realtime clock, and watchdog timer.
- **BIOS:** Y2K compliant AMI system BIOS
- **System Memory:** Onboard 2MB SDRAM (optional 4MB)
- **Data Bus:** 8/16-bit
- **Bus Speeds:** ISA Bus – 40MHz
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **Enhanced IDE:** supports one port and up to two hard drives or Enhanced IDE devices of PIO mode 4. BIOS enabled/disabled
- **Watchdog Timer:** generates either a RESET, NMI or an IRQ when your application loses control over the system. Optionally the watchdog can trigger a user specified interrupt. The watchdog is configurable from 30.5 $\mu$ s to 512 seconds (in 30.5 $\mu$ s segments)
- **Keyboard Connector:** supports PS/2 Keyboard
- **Serial ports:** supports high speed RS-232 port, high speed RS-232/485 port
- **Bi-directional Parallel Port:** supports SPP, EPP and ECP mode. BIOS enabled/disabled
- **Environmental and Power**
  - **Power Requirements:** single voltage +5 V @ 400mA
  - **Board Dimensions:** 65 (L) x 45 (W) mm.
  - **Board Weight :**45 g
  - **Extended Operating Temperature:** -20°C ~+70 °C

## ■ **Mity-SoC Development Board**

- **Bus Interface:** ISA Bus Interface
- **I/O Expansion:** PC/104 ISA Bus Interface
- **I/O Interface:** provides headers for IDE, Serial, Parallel, GPIO, and Speaker.
- **Board Testing :** provides P.O.S.T. Test during design test
- **Disk-On-Chip :** supports 8~256MB
- **Real-time Clock:** included in DM&P M6117D SOC with onboard lithium battery backup for 10 years of data retention. CMOS data backup of BIOS setup and BIOS default.
- **Environmental and Power**
  - **Power Requirements:** single voltage +5 V @ 400mA
  - **Board Dimensions:** 65 (L) x 45 (W) mm.
  - **Board Weight :**45 g
  - **Extended Operating Temperature:** -20°C ~+70 °C

## 1.3 VGA Interface

- **Chipset:** TOPRO TP6508IQ Chip
- **Memory:** Shared system memory up to 128MB
- **System Bus:** 16bit ISA bus
- **Panel Data Bus:** 24-bit
- **Display:** CRT and LCD Flat Panel, Mono/TFT/DSTN/LCD
- **Supported Flat Panels:**
  - NEC NL-6448AC30-10 TFT 9.4" 640X480
  - NEC NL-6448AC30-03 TFT 9.4" 640X480
  - NEC NL-6448AC33-10 TFT 10.4" 640X480
  - NEC NL-6448AC33-13 TFT 10.4" 640X480
  - NEC NL-6448AC33-18 TFT 10.4" 640X480
  - NEC NL-8060BC31-09 TFT 12.1" 800X600
  - NEC NL-8060AC31-02 TFT 10.4" 800X600
  - NEC NL-8060AC31-01 TFT 10.4" 800X600
  - SHARP LQ10D42 TFT 10.4" 640X480
  - SHARP LQ10D421 TFT 10.4" 640X480
  - SHARP LQ12531 TFT 12.1" 800x600
  - SHARP LM64C35P MONO 10.4" 640X480
  - Planar EL640.480-AA1 EL color 10.4" 640X480



## 1.4 DiskOnChip 2000 Flash Disk

- **Flash Disk DiskOnChip® 2000**
- **Package:** Single Chip FlashDisk in 32-pin DIP JEDEC
- **Capacity:** 8-256 MByte capacity
- **Data Reliability:** ECC/EDC error correction
- **Memory Window:** 8 Kbyte

## 1.5 Network Interface

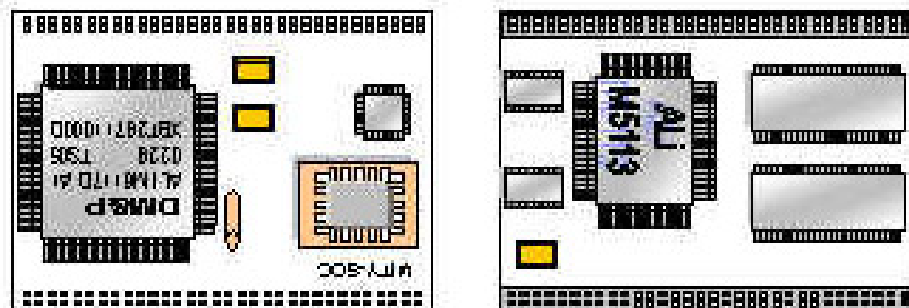
- **Chipset:** Realtek 8019AS single chip
- **Type:** 10BASE-T
- **Connectors:** 8-pin male header , pitch 2.0mm
- **Monitoring LEDs:** network ready indicator, network activity indicator
- **Compatibility:** NE2000

# Chapter 2

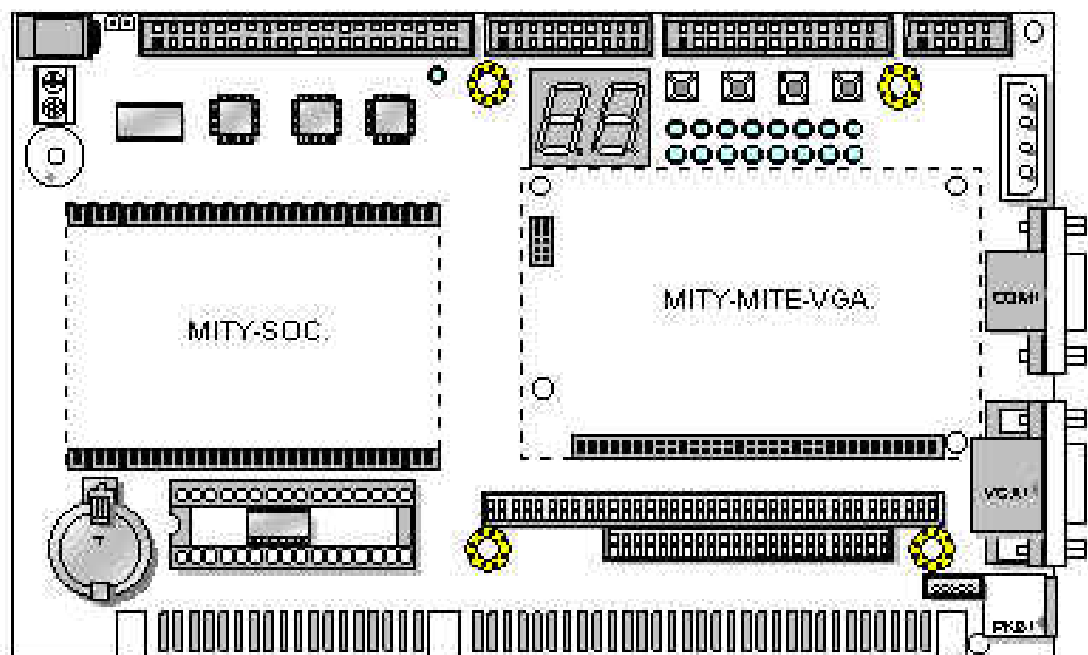
## Installation

### 2.1 Board Outline

#### ■ Mity SoC Module

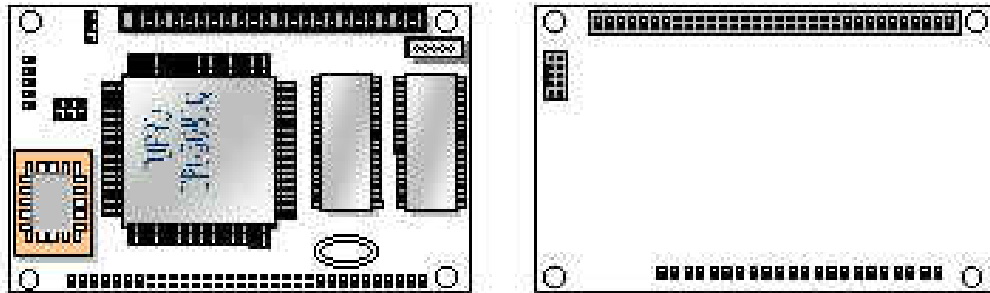


#### ■ Mity SoC Development Board

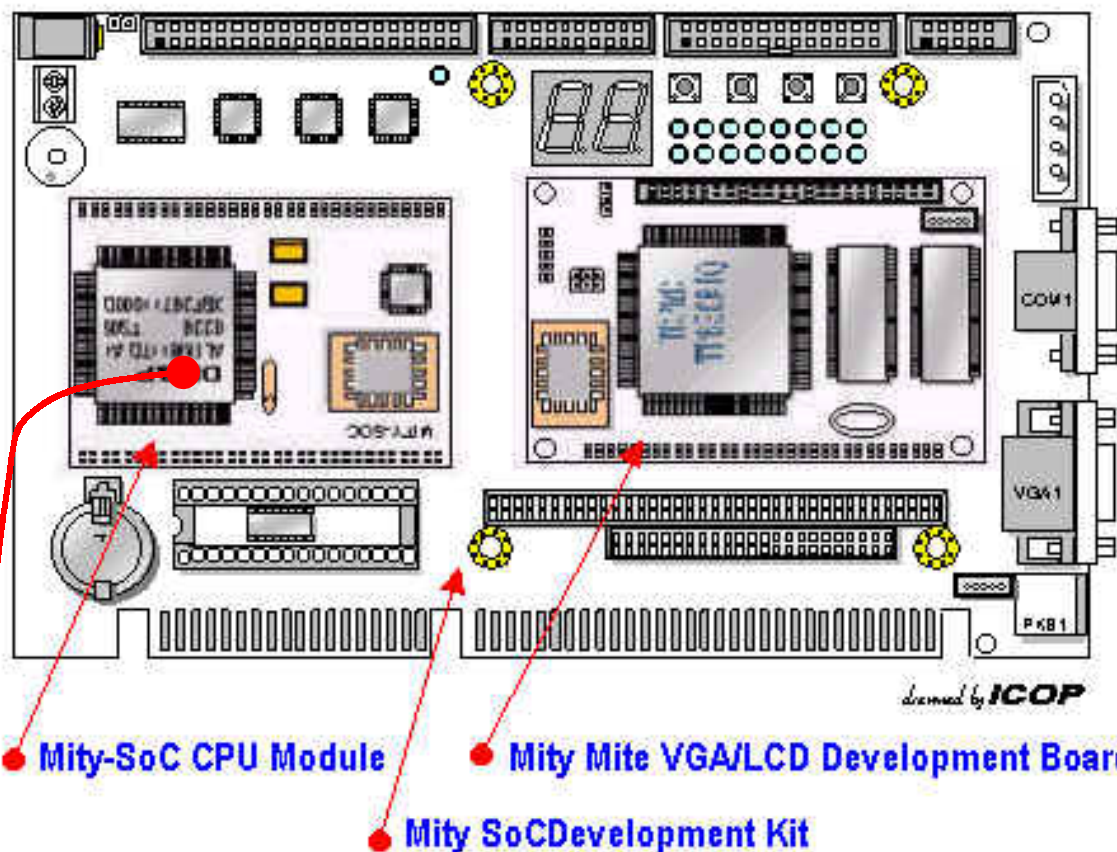


Amnaly **ICOP**

## ■ Mity Mite VGA/LCD Development Board



## 2.2 Mity SoC Development Kit Installation

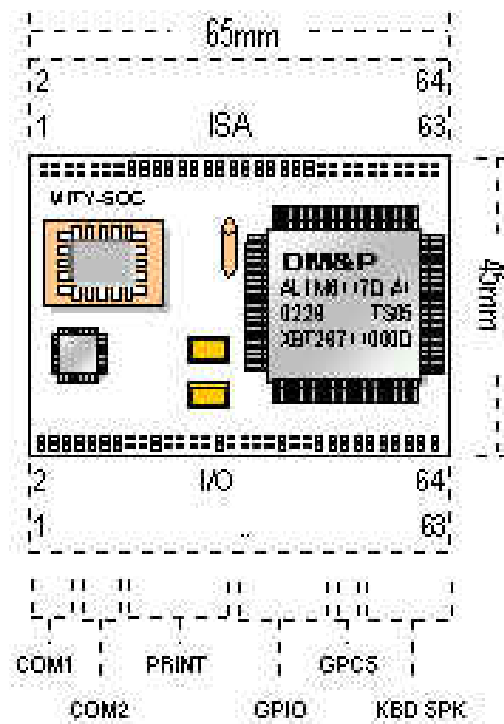


**Warning :** Be sure that you have the right orientation of Mity SoC Module before plugging it into the ISA Bus & I/O headers of the Mity SoC Development Board. Take note that the CPU DMP M6117D must be situated on the right side. The Manufacturer is not liable for any damage caused by wrong orientation.

## 2.3 Connectors & Jumpers Summary

### ■ Mity SoC Module

SUMMARY		
J1:	ISA	2.0 Ø 32x2 Pin Header
J2:	I/O	2.0 Ø 32x2 Pin Header
U2:	DRAM 2MB (Option)	42-pin DIP SSD
U3:	DRAM 2MB (Standard)	42-pin DIP SSD
U8:	BIOS	32-pin PLCC Socket



## ■ Mity SoC Development Board

### SUMMARY

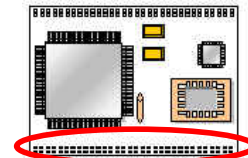
J1:	Mity SoC	2.0 Ø 32x2 Pin Header
J2:	ISA bus Connector, SL62	62-pin Gold finger (Total 98 pins)
J2:	ISA bus Connector, SL36	36-pin Gold finger (Total 98 pins)
J4:	PC104 Connector	104-pin Female Box Header
J6:	Mity-Mite VGA	2.0 Ø 32x2 Pin Header
J7:	IDE Connector	40-pin Box Header
J8:	I/O	2.0 Ø 32x2 Pin Header
J9:	GPIO	20-pin Box Header
J10:	COM1	9-pin D-Sub Connector
J11:	COM2	10-pin Box Header
J12:	RESET	2-pin Pin Header
J13:	PS/2 Keyboard	6-pin Mini Din Connector
J14:	VGA	15-pin D-Sub Connector
J15:	DC_INPUT	2-pin Pin Header
J16:	DC_JACK	3-pin Jack
J17:	DC_INPUT	4-pin Pin Header
J18:	Mity-Mite VGA	2.0 Ø 10-pin Box Header
J19:	Keyboard	2.0 Ø 5-pin Molex Header
J20:	PRINT	26-pin Box Header
	LED Display	Green LED x16
U2:	DOC Connector (DiskOnChip)	32-pin DIP Socket
U5:	8Ø PORT (7 Segment Display)	18-pin DIP SSD

## 2.4 Pin Assignments & Jumper Settings


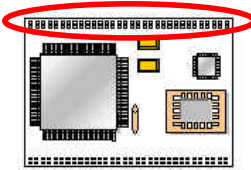
### ■ Mity SoC Module

#### J1: X-ISA Connector - 2.0 Ø 32x2-Box Header

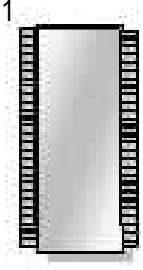
			
Pin #	Signal Name	Pin #	Signal Name
1	GND	2	SBHE
3	RSTDRV	4	SD7
5	VCC	6	SD6
7	SD8	8	SD5
9	SD9	10	SD4
11	SD10	12	SD3
13	SD11	14	SD2
15	SD12	16	SD1
17	SD13	18	SD0
19	GND	20	IOCHRDY
21	SMEMW	22	AEN
23	SMEMR	24	SA19
25	XIOW	26	SA18
27	XIOR	28	SA17
29	SD14	30	SA16
31	SD15	32	SA15
33	MEMCS16	34	SA14
35	TOCS16	36	SA13
37	REFRESH	38	SA12
39	SYSCLK	40	SA11
41	IRQ7	42	SA10
43	IRQ6	44	SA9
45	IRQ5	46	SA8
47	IRQ4	48	SA7
49	IRQ3	50	SA6
51	IRQ10	52	SA5
53	IRQ11	54	SA4
55	BALE	56	SA3
57	VCC	58	SA2
59	XOSC	60	SA1
61	GND	62	SA0
63	IRQ12	64	IRQ14

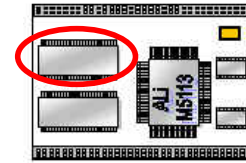


## J2: I/O Connector - 2.0 Ø 32x2-Box Header

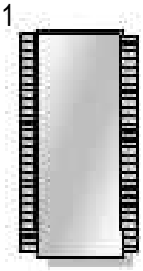
									
Pin #		Signal Name	Pin #	Signal Name					
COM1	1	DCD1	2	RXD1					
	3	TXD1	4	DTR1					
	5	GND	6	DSR1					
	7	RTS1	8	CTS1					
	9	RI1	10	VCC					
COM2	11	DCD2	12	RX2					
	13	TXD2	14	DTR2					
	15	GND	16	DSR2					
	17	RTS2	18	CTS2					
	19	RI2	20	VCC					
PRN	21	PD0	22	SLCT					
	23	PD1	24	PR					
	25	PD2	26	BUSY					
	27	PD3	28	ACK\					
	29	PD4	30	SLCTIN\					
	31	PD5	32	INIT\					
	33	PD6	34	ERROR\					
	35	PD7	36	AUTOFD\					
GPIO	37	GND	38	STORBE\					
	39	GP0	40	GP8					
	41	GP1	42	GP9					
	43	GP2	44	GP10					
	45	GP3	46	GP11					
	47	GP4	48	GP12					
	49	GP5	50	GP13					
	51	GP6	52	GP14					
(DOC)	53	GP7	54	GP15					
GPCS	55	GPCS0	56	VBAT					
KBD.	57	KBDAT	58	HDCS0					
	59	KBCLK	60	HDCS1					
SPK.	61	SPKR	62	RESETL					
	63	GND	64	PWG					

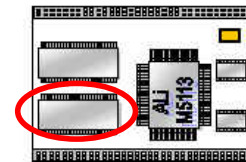
## U2: DRAM 2MB (Option)

	Pin #	Signal Name	Pin #	Signal Name
	1	VCC	42	GND
	2	DO	41	D15
	3	D1	40	D14
	4	D2	39	D13
	5	D3	38	D12
	6	VCC	37	GND
	7	D4	36	D11
	8	D5	35	D10
	9	D6	34	D9
	10	D7	33	D8
	11	NC	32	NC
	12	NC	31	CASL
	13	WE	30	CASH
	14	RAS	29	OE
	15	A11	28	A9
	16	A10	27	A8
	17	A0	26	A7
	18	A1	25	A6
	19	A2	24	A5
	20	A3	23	A4
	21	VCC	22	GND



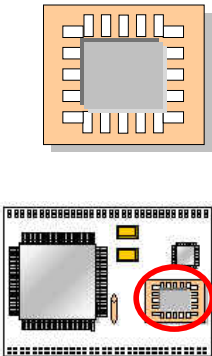
## U3: DRAM 2MB (Standard)

	Pin #	Signal Name	Pin #	Signal Name
	1	VCC	42	GND
	2	DO	41	D15
	3	D1	40	D14
	4	D2	39	D13
	5	D3	38	D12
	6	VCC	37	GND
	7	D4	36	D11
	8	D5	35	D10
	9	D6	34	D9
	10	D7	33	D8
	11	NC	32	NC
	12	NC	31	CASL
	13	WE	30	CASH
	14	RAS	29	OE
	15	A11	28	A9
	16	A10	27	A8
	17	A0	26	A7
	18	A1	25	A6
	19	A2	24	A5
	20	A3	23	A4
	21	VCC	22	GND



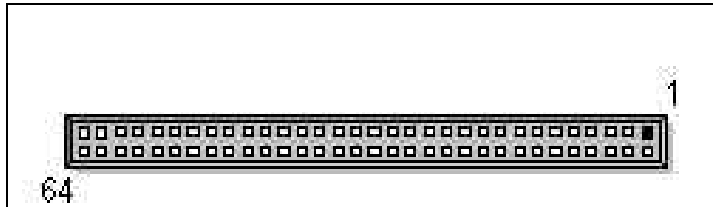


## U8: BIOS – 32-pin PLCC Socket

	Pin #	Signal Name	Pin #	Signal Name
	1	MA18	2	SA16
	3	SA15	4	SA12
	5	SA7	6	SA6
	7	SA5	8	SA4
	9	SA3	10	SA2
	11	SA1	12	SA0
	13	XD0	14	XD1
	15	XD2	16	GND
	17	XD3	18	XD4
	19	XD5	20	XD6
	21	XD7	22	KBSJ
	23	SA10	24	MEMR
	25	SA11	26	SA9
	27	SA8	28	SA13
	29	SA14	30	MA17
	31	SMEMW	32	VCC

## ■ Mity SoC Development Board

### J1: X-ISA Connector - 2.0 Ø 32x2-Box Header



Pin #	Signal Name	Pin #	Signal Name
1	GND	2	SBHE
3	RSTDRV	4	SD7
5	VCC	6	SD6
7	SD8	8	SD5
9	SD9	10	SD4
11	SD10	12	SD3
13	SD11	14	SD2
15	SD12	16	SD1
17	SD13	18	SD0
19	GND	20	IOCHRDY
21	SMEMW	22	AEN
23	SMEMR	24	SA19
25	XIOW	26	SA18
27	XIOR	28	SA17
29	SD14	30	SA16
31	SD15	32	SA15
33	MEMCS16	34	SA14
35	TOCS16	36	SA13
37	REFRESH	38	SA12
39	SYSCLK	40	SA11
41	IRQ7	42	SA10
43	IRQ6	44	SA9
45	IRQ5	46	SA8
47	IRQ4	48	SA7
49	IRQ3	50	SA6
51	IRQ10	52	SA5
53	IRQ11	54	SA4
55	BALE	56	SA3
57	VCC	58	SA2
59	XOSC	60	SA1
61	GND	62	SA0
63	IRQ12	64	IRQ14

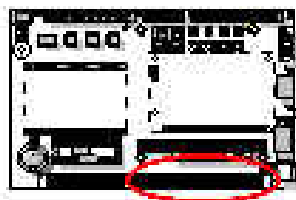
## J2 : ISA Bus SL62 – 62-pin Gold finger (Total 98 pins)



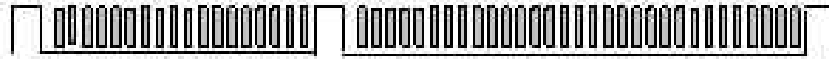
J3 : 36-pin

J2 : 62-pin

Pin #	Signal Name	Pin #	Signal Name
1 (A1)	IOCHCK	2 (B1)	GND
3	SD7	4	RSTDRV
5	SD6	6	VCC
7	SD5	8	IRQ9
9	SD4	10	-5V
11	SD3	12	DRQ2
13	SD2	14	-12V
15	SD1	16	OVS
17	SD0	18	+12V
19	IOCHRDY	20	GND
21	AEN	22	SMEMW
23	SA19	24	SMEMR
25	SA18	26	IOW
27	SA17	28	IOR
29	SA16	30	DACK3
31	SA15	32	DRQ3
33	SA14	34	DACK1
35	SA13	36	DRQ1
37	SA12	38	REFRESH
39	SA11	40	SYSCLK
41	SA10	42	IRQ7
43	SA9	44	IRQ6
45	SA8	46	IRQ5
47	SA7	48	IRQ4
49	SA6	50	IRQ3
51	SA5	52	DACK2
53	SA4	54	TC
55	SA3	56	BALE
57	SA2	58	VCC
59	SA1	60	OSC
61	SA0	62	GND



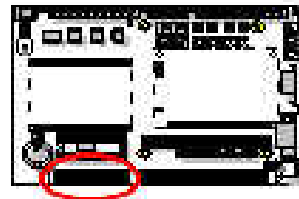
### J3 : ISA bus SL36 – 36-pin Gold finger (Total 98 pins)



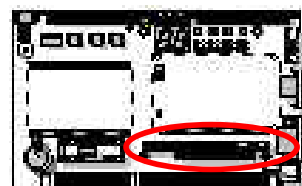
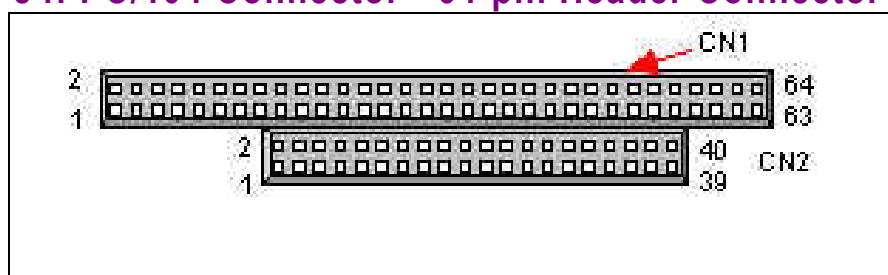
J3 : 36-pin

J2 : 62-pin

Pin #	Signal Name	Pin #	Signal Name
1 (A1)	SBHE	2 (B1)	MEMCS16
3	LA23	4	IOCS16
5	LA22	6	IRQ10
7	LA21	8	IRQ11
9	LA20	10	IRQ12
11	LA19	12	IRQ15
13	LA18	14	IRQ14
15	LA17	16	DACK0
17	MEMR	18	DRQ0
19	MEMW	20	DACK5
21	SD8	22	DRQ5
23	SD9	24	DACK6
25	SD10	26	DRQ6
27	SD11	28	DACK7
29	SD12	30	DRQ7
31	SD13	32	VCC
33	SD14	34	MASTER
35	SD15	36	GND

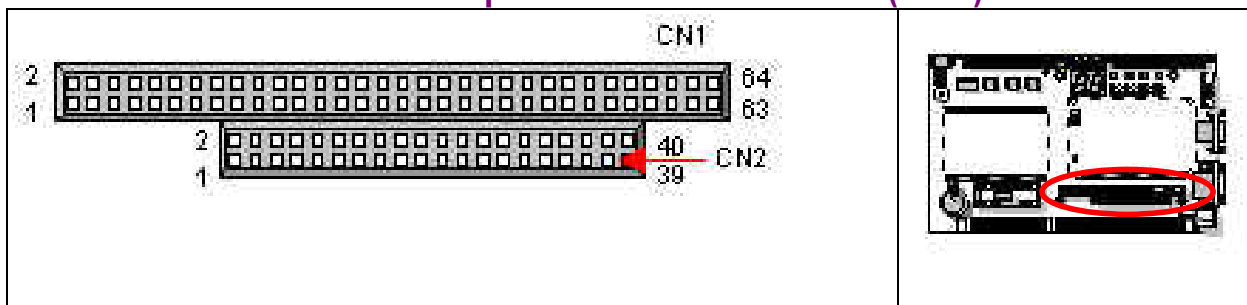


## J4: PC/104 Connector - 64-pin Header Connector (CN1)



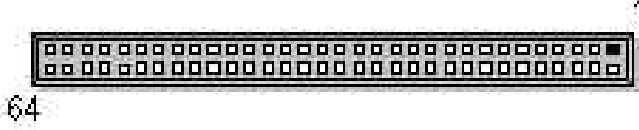
Pin #	Signal Name	Pin #	Signal Name
1	IOCHCHK *	2	GND
3	SD7	4	RSTDRV
5	SD6	6	VCC
7	SD5	8	IRQ9
9	SD4	10	-5V
11	SD3	12	DRQ2
13	SD2	14	-12V
15	SD1	16	OVS*
17	SD0	18	+12V
19	IOCHRDY	20	GND
21	AEN	22	SMEMW *
23	SA19	24	SMEMR *
25	SA18	26	XIOW *
27	SA17	28	XIOR *
29	SA16	30	DACK3 *
31	SA15	32	DRQ3
33	SA14	34	DACK1 *
35	SA13	36	DRQ1
37	SA12	38	REFRESH *
39	SA11	40	SYSCLK
41	SA10	42	IRQ7
43	SA9	44	IRQ6
45	SA8	46	IRQ5
47	SA7	48	IRQ4
49	SA6	50	IRQ3
51	SA5	52	DACK2 *
53	SA4	54	TC
55	SA3	56	BALE
57	SA2	58	VCC
59	SA1	60	XXOSC
61	SA0	62	GND
63	GND	64	GND

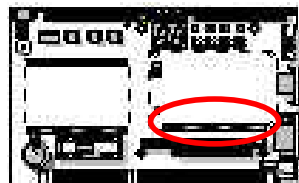
## J4 PC/104 Connector – 40-pin Header Connector (CN2)



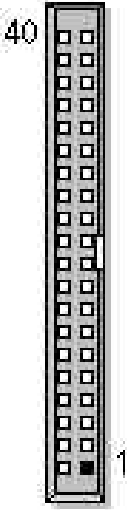
1	GND	2	GND
3	MEMCS16 *	4	SBHE *
5	IOCS16 *	6	LA23
7	IRQ10	8	LA22
9	IRQ11	10	LA21
11	IRQ12	12	LA20
13	IRQ15	14	LA19
15	IRQ14	16	LA18
17	DACK0 *	18	LA17
19	DRQ0	20	MEMR *
21	DACK5 *	22	MEMW *
23	DRQ5	24	SD8
25	DACK6 *	26	SD9
27	DRQ6	28	SD10
29	DACK7 *	30	SD11
31	DRQ7	32	SD12
33	VCC	34	SD13
35	MASTER *	36	SD14
37	GND	38	SD15
39	GND	40	NC

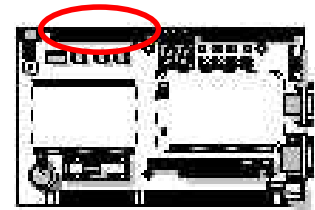
## J6: Mity-Mite VGA Connector - 2.0 Ø 32x2-Box Header

			
Pin #	Signal Name	Pin #	Signal Name
1	GND	2	SBHE
3	RSTDRV	4	SD7
5	VCC	6	SD6
7	SD8	8	SD5
9	SD9	10	SD4
11	SD10	12	SD3
13	SD11	14	SD2
15	SD12	16	SD1
17	SD13	18	SD0
19	GND	20	IOCHRDY
21	SMEMW	22	AEN
23	SMEMR	24	SA19
25	XIOW	26	SA18
27	XIOR	28	SA17
29	SD14	30	SA16
31	SD15	32	SA15
33	MEMCS16	34	SA14
35	TOCS16	36	SA13
37	REFRESH	38	SA12
39	SYSCLK	40	SA11
41	IRQ7	42	SA10
43	IRQ6	44	SA9
45	IRQ5	46	SA8
47	IRQ4	48	SA7
49	IRQ3	50	SA6
51	IRQ10	52	SA5
53	IRQ11	54	SA4
55	BALE	56	SA3
57	VCC	58	SA2
59	XOSC	60	SA1
61	GND	62	SA0
63	IRQ12	64	IRQ14



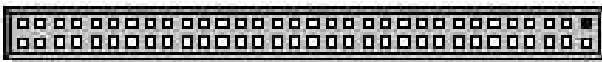

## J7: IDE Connector - 2.0 Ø pitch 40-pin Box Header

40		Pin #	Signal Name	Pin #	Signal Name
		1	RESETL	2	GND
		3	SD7	4	SD8
		5	SD6	6	SD9
		7	SD5	8	SD10
		9	SD4	10	SD11
		11	SD3	12	SD12
		13	SD2	14	SD13
		15	SD1	16	SD14
		17	SD0	18	SD15
		19	GND	20	VCC
		21	NC	22	GND
		23	XXIOW	24	GND
		25	XXIOR	26	GND
		27	NC	28	NC
		29	NC	30	GND
		31	IRQ14	32	IOCS16
		33	SA1	34	NC
		35	SA0	36	SA2
		37	HDCS0	38	HDCS-1
		39	IDELED	40	GND

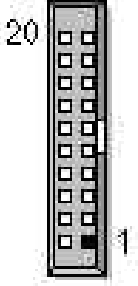


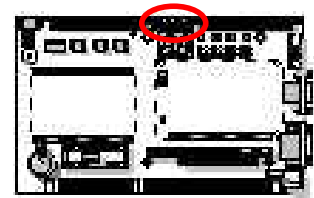


## J8: I/O Connector - 2.0 Ø 32x2-Box Header


					
		64			
		<b>Pin #</b>	<b>Signal Name</b>	<b>Pin #</b>	<b>Signal Name</b>
COM1		1	DCD1	2	RXD1
		3	TXD1	4	DTR1
		5	GND	6	DSR1
		7	RTS1	8	CTS1
		9	RI1	10	VCC
COM2		11	DCD2	12	RX2
		13	TXD2	14	DTR2
		15	GND	16	DSR2
		17	RTS2	18	CTS2
		19	RI2	20	VCC
PRN		21	PD0	22	SLCT
		23	PD1	24	PR
		25	PD2	26	BUSY
		27	PD3	28	ACK\
		29	PD4	30	SLCTIN\
		31	PD5	32	INIT\
		33	PD6	34	ERROR\
		35	PD7	36	AUTOFD\
		37	GND	38	STORBE\
		39	GP0	40	GP8
GPIO		41	GP1	42	GP9
		43	GP2	44	GP10
		45	GP3	46	GP11
		47	GP4	48	GP12
		49	GP5	50	GP13
		51	GP6	52	GP14
		53	GP7	54	GP15
		55	GPCS0	56	VBAT
(DOC)		57	KBDAT	58	HDCS0
GPCS		59	KBCLK	60	HDCS1
KBD.		61	SPKR	62	RESETL
SPK.		63	GND	64	PWG

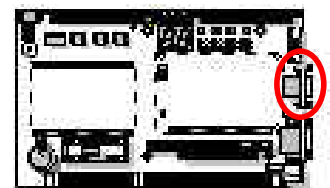
## J9: GPIO - 20-pin Box Header

	Pin #	Signal Name	Pin #	Signal Name
	1	GND	2	VCC
	3	GP0	4	GP8
	5	GP1	6	GP9
	7	GP2	8	GP10
	9	GP3	10	GP11
	11	GP4	12	GP12
	13	GP5	14	GP13
	15	GP6	16	GP14
	17	GP7	18	GP15
	19	VCC	20	GND

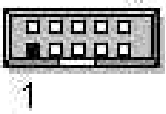


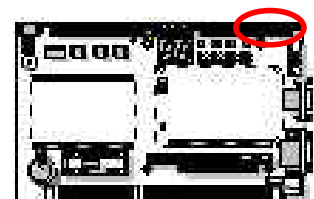
## J10 : COM1 – 9-pin D-Sub Connector

	Pin #	Signal Name	Pin #	Signal Name
	1	DCD1	2	RXD1
	3	TXD1	4	DTR1
	5	GND	6	DSR1
	7	RTS1	8	CTS1
	9	RI1	--	--




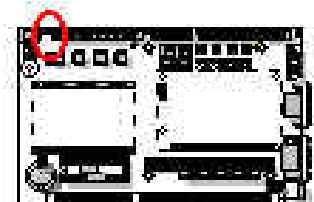
## J11 : COM2 - 10-pin Box Header

	Pin #	Signal Name	Pin #	Signal Name
	1	DCD2	2	RXD2
	3	TXD2	4	DTR2
	5	GND	6	DSR2
	7	RTS2	8	CTS2
	9	RI2	10	VCC

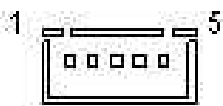


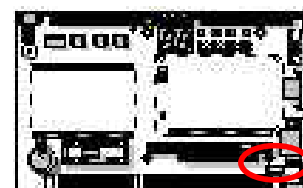
## J12: RESET - 2-pin Header

	Pin #	Signal Name
	1	PWG
	2	GND

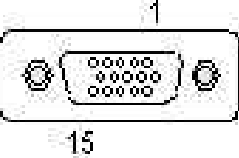


### J13 : PS/2 Keyboard - 5-pin Molex Header


	Pin #	Signal Name
	1	KBCLK
	2	KBDAT
	3	NC
	4	GND
	5	VCC

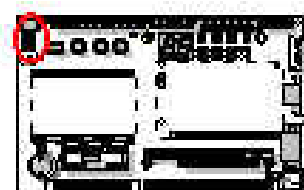


### J14: VGA Connector - 15-pin D-Sub Connector (female)


	Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
	1	R	6	GND	11	NC
	2	G	7	GND	12	NC
	3	B	8	GND	13	HYSYNC
	4	NC	9	NC	14	VSYSNC
	5	GND	10	GND	15	NC

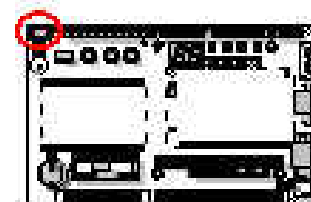
### J15: DC\_INPUT - 2-pin Terminal Block

	Pin #	Signal Name
	1	VCC
	2	GND

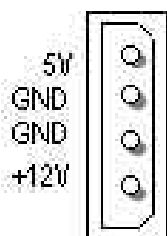


### J16: DC\_JACK - 3-pin Jack

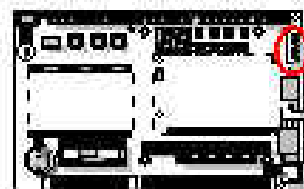
	Pin #	Signal Name
	1	VCC
	2	GND
	3	NC



### J17: DC\_INPUT - 4-pin Molex Header

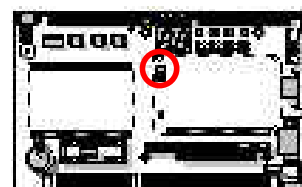


Pin #	Signal Name
1	VCC
2	GND
3	GND
4	+12V



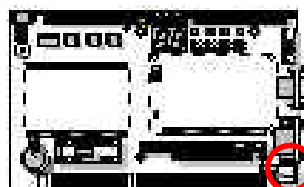
### J18 : Mity-Mite VGA - 2.0 Ø 10-pin Box Header

Pin #	Signal Name	Pin #	Signal Name
1	R	2	GND
3	G	4	GND
5	B	6	GND
7	HSYNC	8	GND
9	VSYNC	10	GND

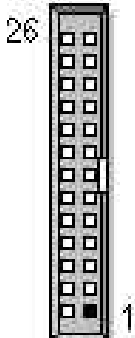


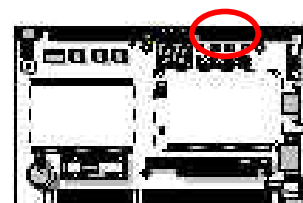
### J19 : PS/2 Keyboard & Mouse - 6-pin Mini-Din Connector

Pin #	Signal Name
1	KBCLK
2	NC
3	GND
4	KBDAT
5	NC
6	VCC
7	GND
8	GND
9	GND

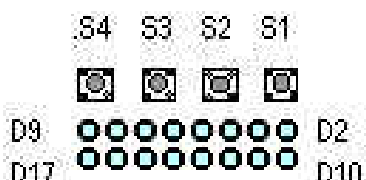


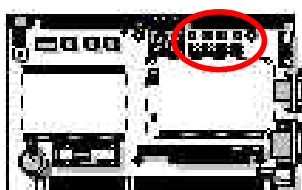
## J20 : PRINT - 26-pin Box Header

	Pin #	Signal Name	Pin #	Signal Name
	1	STORBE	2	PD0
	3	PD1	4	PD2
	5	PD3	6	PD4
	7	PD5	8	PD6
	9	PD7	10	ACK\
	11	BUSY	12	PE
	13	SLCT	14	AUTOFD
	15	ERROR\	16	INIT\
	17	SLCTIN\	18	GND
	19	GND	20	GND
	21	GND	22	GND
	23	GND	24	GND
	25	GND	26	NC

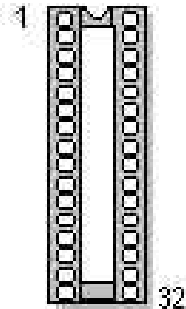


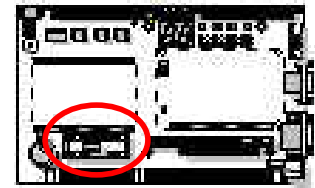
## LED DISPLAY: Green LED x16

	Pin #	Signal Name	Pin #	Signal Name
	D2	XGP0	D3	XGP1
	D4	XGP2	D5	XGP3
	D6	XGP4	D7	XGP5
	D8	XGP6	D9	XGP7
	D10	XGP8	D11	XGP9
	D12	XGP10	D13	XGP11
	D14	XGP12	D15	XGP13
	D16	XGP14	D17	XGP15

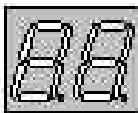


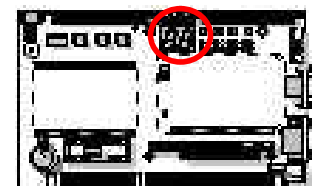
## U2 : DOC (DiskOnChip) : – 32-pin Grid hole DIP Socket

	Pin #	Signal Name	Pin #	Signal Name
	1	NC	2	NC
	3	SA15	4	SA12
	5	SA7	6	SA6
	7	SA5	8	SA4
	9	SA3	10	SA2
	11	SA1	12	SA0
	13	SD0	14	SD1
	15	SD2	16	GND
	17	SD3	18	SD4
	19	SD5	20	SD6
	21	SD7	22	GPSC0
	23	SA10	24	SMEMR
	25	SA11	26	SA9
	27	SA8	28	SA13
	29	SA14	30	NC
	31	SMEMW	32	VCC



## U5 : 8Ø PORT – 18-pin 7-Segment DIP SSD

	Pin #	Signal Name	Pin #	Signal Name
	1	H_SEGE	2	H_SEGD
	3	H_SEGC	4	NC
	5	L_SEGE	6	L_SEGD
	7	L-SEGG	8	L_SEGC
	9	NC	10	L_SEGB
	11	L_SEGA	12	L_SEGF
	13	VCC	14	VCC
	15	H_SEGB	16	H_SEGA
	17	H_SEGG	18	H_SEGF



## 2.5 DiskOnChip Flash Disk

### 2.5.1 Setup a DiskOnChip ® 2000 Flash Disk

#### Installation Instructions

1. Make sure the power of Mity SoC Module is turned OFF.
2. Plug the DiskOnChip 2000 device into its socket. Verify the mounting orientation of the DiskOnChip 2000 is correct (DiskOnChip 2000 pin 1 must be aligned with pin 1 of the socket).
3. Set the address for both DiskOnChip and Flash Disk devices following the instructions below:

Step1: Enter to AMI BIOS Setup Utility while system power on.

Step2: Enter to "Advanced Chipset Setup".

Step3: Select "GPCS Function" to "Enable".

(For DiskOnChip)

Step4: Select "GPCS0 Command" to "MEMR/W 8bit".

Step5: Select "GPCS0 Start Address" to "0C8000 HEX".

Step6: Select "GPCS0 Size" to "8 KBYTE" (go to Step 10).

(For Flash Disk)

Step4: Select "GPCS0 Command" to "MEMR/W 8bit".

Step5: Select "GPCS0 Start Address" to "0E0000 HEX".

Step6: Select "GPCS0 Size" to "64 KBYTE".

Step7: Select "GPCS1 Command" to "IOW 8bit".

Step8: Select "GPCS1 Start Address" to "000100 HEX".

Step9: Select "GPCS1 Size" to "2 BYTE".

Step10: Save changes and exit.

4. Power up the system.
5. During power up, you may observe the messages displayed by the DiskOnChip 2000 when its drivers are automatically loaded into system's memory.
6. At this stage, the DiskOnChip 2000 can be access as any disk in the system.
7. If the DiskOnChip 2000 is the only disk in the system, it will appear as the first disk (drive C: in DOS).
8. If there are more disks besides the DiskOnChip 2000, the DiskOnChip 2000 will appear by default as the last drive, unless it was programmed as first drive. (please refer to the DiskOnChip 2000 utilities user manual).
9. If you want the DiskOnChip 2000 to be bootable: a - copy the operating system files into the DiskOnChip by using the standard DOS command (for example: sys d:) b - The

DiskOnChip should be the only disk in the systems or should be configured as the first disk in the system (c: ) using the DUPDATE utility

For more information on DiskOnChip2000 technology, visit M-Systems Web site <http://www.m-sys.com> where you can find Utilities Manual, Data Sheets and Application Notes. In addition, you can find the latest DiskOnChip 2000 S/W Utilities.



## 2.6 Watchdog Timer

The watchdog timer uses a 32.768 KHz frequency source with a 24-bit counter. Its time range stretches from 30.5 ms to 512 sec. with a resolution of 30.5 ms. When the watchdog times out, a System RESET, NMI or IRQ can be invoked. Watchdog timer control and the 24-bit counter itself occupy 6 consecutive 8-bit address locations.

When functioning properly, the system resets the watchdog timer periodically to prohibit that it times out. If the watchdog timer times out, it will RESET the system, or generate an NMI or IRQ, depending on its configuration.

### Watchdog or System Timer

Another great application is to generate a periodic IRQ signal. Under DOS environment, the 8254, system timer 0, will generate IRQ0 every 54.9 ms. The watchdog is like a system timer 0. It can be programmed to periodically generate a configurable IRQ. It may be clear that the selected IRQ, will no longer be available to the system.

### Configuring the Watchdog Timer in the BIOS

The Vortex86 watchdog configuration register can be controlled by software or can be setup in the BIOS. To do so, go to BIOS Setup's "Advanced Chipset Setup"

Watchdog Function = Enable/Disable

Watchdog Signal = RESET, NMI or IRQ 3/4/5/6/7/9/10/11/12/14/15

Watchdog Timer = 1/2/4/8/16/32/64/128/256/512 Seconds

The BIOS setup only offers a limited amount of time-out values. To obtain a more higher resolution of timeout values, refer to the next paragraph "Configuring the Watchdog Timer by Software". Note that in case of using the BIOS setup, the watchdog starts counting the moment it passes the BIOS setup. This means that if you set the time-out period to 1 second, the system will keep rebooting before being able to load operating system or software!

After you have finished configuring your watchdog timer, it reads "Timeout Status & Reset - INDEX 3CH" on page 23; and look at the example on page 24 to find out how to periodically resetting the timeout status to prevent the watchdog timer from invoking a RESET, NMI or IRQ.

## Configuring the Watchdog Timer by Software

### Chipset configuration registers

The Vortex86 configuration register INDEX 37H, 38H, 39H, 3AH, 3BH, 3Ch are used to control the watchdog functions and/or display its current status.

#### Enable/Disable watchdog - INDEX 37H

Bit	Value	Action
7	reserved	Do not modify the value of these bits!
6	0	Disable watchdog timer
	1	Enable watchdog timer
5-0	Other function	Do not modify the value of these bits!

#### Watchdog time out action - INDEX 38H

Bit	Value	Action
7-4	0000	No output signal
	0001	IRQ3
	0010	IRQ4
	0011	IRQ5
	0100	IRQ6
	0101	IRQ7
	0110	IRQ9
	0111	IRQ10
	1000	IRQ11
	1001	IRQ12
	1010	IRQ14
	1011	IRQ15
	1100	NMI
	1101	System RESET
	1110	No output signal
	1111	No output signal
3-0	Other function	Do not modify the value of these bits!

#### Watchdog timer - INDEX 39H, 3AH, 3BH

Index	3Bh	3Ah	39h
Bits	D7.....D0	D7.....D0	D7.....D0
counter	[VSB.....]	.....	.....LSB]

## For example

Index	3Bh	3Ah	39h	Time out
	00h	00h	01h	30.5µs
	00h	00h	02h	61µs
	00h	01h	00h	7.8 ms
	00h	02h	00h	15.6 ms
	01h	00h	00h	2 s
	02h	00h	00h	4 s
	FFh	FFh	FFh	512 s

## Timeout Status & Reset - INDEX 3CH

Bit	Value	Action
7	0	Timeout has not occurred
	1	Timeout has occurred
6	1	Reset timer
	0	Has no meaning
5-0		Other function, do not modify these bits

## Programming the watchdog

To perform any operation on the Vortex86 configuration registers you always have to unlock first and lock the registers afterwards.

### Unlock configuration register

```

mov al, 013h
out 22h, al
nop
nop
mov al, 0c5h
out 23h, al
nop
nop

```

### Lock configuration register

```

mov al, 013h
out 22h, al
mov al, 000h
out 23h, al

```

## Read the value of a configuration register

For example, read INDEX 3Ch :

### Unlock configuration register

```
mov al, 03ch
```

```
out 22h, al
```

```
nop
```

```
nop
```

```
in al, 23h
```

```
nop
```

```
nop
```

```
push ax
```

### Lock configuration register

```
pop ax ;AL - result
```

## Write data to configuration register

For example, write 0FFh to INDEX 3Bh :

### Unlock configuration register

```
mov al, 03bh
```

```
out 22h, al
```

```
nop
```

```
nop
```

```
mov al, 0ffh
```

```
out 23h, al
```

```
nop
```

```
nop
```

### Lock configuration register

## Watchdog Program Example

We use the following sequence to initialize the watchdog timer:

- (1) Unlock configuration register.
- (2) Disable watchdog timer by setting INDEX 37H Bit 6 to '0'.
- (3) Set the expected counter value to INDEX 3BH, 3AH, 39H.
- (4) Select timeout action from INDEX 38H Bit 7-4.
- (5) Enable watchdog timer by setting INDEX 37H Bit 6 to '1'.

(6) Lock configuration register.

Example: Set timeout to 128 sec to generate a system RESET.

```
; Please use MASM to compiler the following program
; Execute under DOS environment
dosseg
. model small
. stack 100h
.code
main proc
    mov ax, 0c513h ; Unlock config. register
    call writechip
    mov ax, 03737h ; Disable watchdog timer
    call readchip
    and al, 10111111b
    xchg ah, al
    call writechip
    mov ax, 0403bh ; Set the expected counter
                    ; value
    call writechip ; to [400000h]
    mov ax, 0003ah ; 30.5*sec*400000h= 128 sec
    call writechip
    mov ax, 00039h
    call writechip
    mov ax, 03838h ; Select "system reset" as
                    ; timeout action
    call readchip
    and al, 00001111b
    or al, 11010000b
    xchg ah, al
    call writechip
    mov ax, 03737h ; Enable watchdog timer
    call readchip
    or al, 01000000b
    xchg ah, al
    call writechip
    mov ax, 00013h ; Lock config. register
    call writechip
    mov ax, 04c00h
    int 21h
main endp
```

```

readchip proc
    out 22h, al
    nop
    nop
    in al, 23h
    nop
    nop
    ret
readchip endp
writechip proc
    out 22h, al
    nop
    nop
    xchg ah, al
    out 23h, al
    nop
    nop
    xchg ah, al
    ret
writechip endp
end main

```

## Reset watchdog timer

Resets the watchdog timer periodically to prevent timeout.

```

    mov ax, 0c513h ; Unlock configuration
                    ; register
    call writechip
    mov ax, 03C3Ch ; Reset watchdog timer
                    ; counter
    call readchip
    or al, 01000000 ; The counter is reset at
    xchg ah, al ; out 23h, al
    call writechip
    mov ax, 00013h ; Lock configuration
                    ; register
    call writechip

```

(the above code uses readchip and writechip procedures)

## 2.6 General Purpose I/O

M6117D supports 16 independent GPOs and GPIs. This group of GPOs does not need external 74LS373 to latch as generate purpose output. Also this group of GPIs do not share signals with the ISA data bus, so no external 74LS245 is required either.

At boot time the state of the GPIO ports can be set in the BIOS.

Go to BIOS Setup's "**Advanced Chipset Setup**"

### GPIO Sample Program

```
; Please use TASM to compiler the following program.
; Execute under DOS environment.
;
.286
.model small
.code
mov al,13h ; Unlock M6117D configuration register.
out 22h,al ;
mov al,0c5h ;
out 23h,al ;
mov al,4eh ; Enable GPIO[7-0] is output pin.
out 22h,al ;
mov al,0ffh ; If AL fill "FF", then
; GPIO[7-0] set as output pin.
out 23h,al ; User can be set logic "1"
; of OUT direction.
mov al,4fh ; Enable GPIO[15-8] is input pin
out 22h,al ;
mov al,00 ; If AL fill "00", then
; GPIO[15-8] set as input pin.
out 23h,al ; User can be set logic "0"
; of IN direction.
mov al,47h ; Output data port.
out 22h,al ;
mov al,55h ; Example data out value is 55,
; to output pin
out 23h,al ; GPIO[7-0]. So user can
; repeat this loop.
mov al,46h ; If GPIO[7-0] is set input direction, then data
out 22h,al ; input port is 46.
in al,23h ; Example data input value
```

```

                                ; from data input GPIO[7-0]
mov al,4ch    ; Input data port
out 22h,al    ;
in al,23h     ; Read data from GPIO[15-8]
                                ; into AL register.
mov al,4dh    ; If GPIO[15-8] is set output
                                ; direction, then data
out 22h,al    ; output port is 4d.
mov al,55h    ; output data value is 55.
out 23h,al    ; Example data output value
                                ; to data input GPIO[15-8]
..... continue program
end

```



# Chapter 3

## SVGA Setup

### 3.1 Introduction

The ICOP-6054VE has an on-board VGA interface. The specifications and features are described as follows:

#### 3.1.1 Chipset

The ICOP-6054VE uses a HMC HM86508 for its SVGA controller, which supports conventional analog CRT monitor or flat panel. In addition, it also supports interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Multiple frequency (multisync) monitors are handled as if they were analog monitors.

#### 3.1.2 Display memory

With 1 MB memory, the VGA controller can drive CRT displays or color panel displays with resolutions up to 1024 x 768 at 256 colors.

### 3.1.3 VGA/Flat Panel Connectors

**Flat Panel Connector Pin Assignment  
(44 Pin for all ICOP 386 Series)**

Pin	Description	Pin	Description
1	+12V	2	+12V
3	GND	4	GND
5	PVcc	6	PVcc
7	ENAVEE	8	ENAVEE
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	GND	42	ASHFCLK
43	Vcc	44	Vcc

### Description for the Pin of the Flat Panel Connector

Name	Description
P0~P23	Flat panel data output
ENABKL	Activity Indicator and Enable Backlight outputs
SHFCLK	Shift clock. Pixel clock for flat panel data
M	M signal for panel AC drive control
LP	Latch pulse. Flat panel equivalent of HSYNC
FLM	First line marker. Flat panel equivalent of VSYNC
+12V	+12V power from PC power supply
ENAVDD	Power sequencing controls for panel LCD bias volt
ENAVEE	Power sequencing controls for panel LCD bias volt
-SHFCLK	The inverter signal of SHFCLK
VDDM	3.3V or 5V selected by JP6

## 3.2 Flat Panel BIOS and Wiring

Below is a list of optional Flat Panel SVGA BIOS. The VGA BIOS is combined with the system BIOS in a single. To change to another BIOS please contact your local dealer.

**MLCD.dat** - Data File for MONO DSTN640\*480 (**Default**)

example : (1) HOSIDEN HLM6667  
(2) HITACHI LMG5160XUFC  
(3) CASIO MD650TS00-01  
(4) OPTREX DMF\_50260NFU-FW-8

**DSTN.dat** - Data file for Color DSTN640\*480

example : (1) Sanyo LCM-5331-22NTK  
(2) SHARP LM64C35P

**TFT\_S1.dat** - Data File for TFT640\*480-Sync (16 BIT)

**TFT\_S2.dat** - Data File for TFT640\*480-Sync (18/24 BIT)

example : (1) HITACHI TX26D60/TX24D55  
(2) TOSHIBA LTM09C015A  
(3) SHARP LQ10D321

**TFT\_LP1.dat** - Data File For TFT640\*480-LP (16 BIT)

**TFT\_LP2.dat** - Data File For TFT640\*480-LP (18/24 BIT)

example : (1) Toshiba LTM09c015A)

**TFT86\_S1.dat** - Data File for TFT800\*600\_sync (16 BIT)

**TFT86\_S2.dat** Data File for TFT800\*600\_sync (18/24 BIT)

example : (1) NEC NL8060AC26-05  
(2) NEC NL8060AC26-04  
(3) NEC NL8060BC31-02

**EL.dat** - Data File for EL640\*480

example : (1) PLANAR EL640.480-A

**PLASMA.dat** - Data File for PLASMA640\*480

example : (1) PANASONIC S817

### **CRT/Flat Panel Mode**

All the above BIOS support either CRT only, Flat Panel only or CRT/Flat Panel simultaneously. To set the mode a Panel Switching Utility is used.

USAGE:

At DOS prompt type >**SW508** then Screen will show

1. CRT Only
2. Panel Only
3. CRT/Panel Simutaneous

## NEC NL6448AC33-18 wiring

NEC NL6448AC33-18		ICOP-6054VE CON1	
Pin	Pin Name	Pin	Pin Name
CN1-1	GND	3	GND
CN1-2	CLK	35	SHFCLK
CN1-3	Hsync	38	LP
CN1-4	Vsync	36	FLM
CN1-5	GND	4	-
CN1-6	R0	27	P18
CN1-7	R1	28	P19
CN1-8	R2	29	P20
CN1-9	R3	30	P21
CN1-10	R4	31	P22
CN1-11	R5	32	P23
CN1-12	GND	33	-
CN1-13	G0	19	P10
CN1-14	G1	20	P11
CN1-15	G2	21	P12
CN1-16	G3	22	P13
CN1-17	G4	23	P14
CN1-18	G5	24	P15
CN1-19	GND	34	-
CN1-20	B0	11	P2
CN1-21	B1	12	P3
CN1-22	B2	13	P4
CN1-23	B3	14	P5
CN1-24	B4	15	P6
CN1-25	B5	16	P7
CN1-26	GND	39	-
CN1-27	ENAB	37	MDE
CN1-28	Vcc	43	Vcc
CN1-29	Vcc	44	Vcc
CN1-30	NC	-	-
CN1-31	NC	-	-

## NEC NL6448AC30-10 wiring

NEC NL6448AC30-10		ICOP-6054VE CON1	
Pin	Pin Name	Pin	Pin Name
CN1-1	CLK	42	SHFCLK
CN1-2	Hsync	38	LP
CN1-3	Vsync	36	FLM
CN1-4	DE	37	MDE
CN1-5	-	-	P0
CN1-6	B0	10	P1
CN1-7	B1	11	P2
CN1-8	B2	12	P3
CN1-9	B3	13	P4
CN1-10	-	14	P5
CN1-11	-	15	P6
CN1-12	G0	16	P7
CN1-13	G1	17	P8
CN1-14	G2	18	P9
CN1-15	G3	19	P10
CN1-16	-	20	P11
CN1-17	R0	21	P12
CN1-18	R1	22	P13
CN1-19	R2	23	P14
CN1-20	R3	24	P15
CN1-21	-	-	P16
CN1-22	-	-	P17
CN1-23	-	27	P18
CN1-24	-	28	P19
CN1-25	-	29	P20
CN1-26	-	30	P21
CN1-27	-	31	P22
CN1-28	-	32	P23
CN1-29	PVcc	5	LCD Vdd
CN1-30	Vcc	43	Vcc
CN1-31	MODE	44	Vcc
CN1-32	GND	3	GND
CN1-33	GND	4	GND
CN1-34	Vdd +12	1	+12
CN1-35	ENABKL	40	ENABKL
CN1-36	GND	39	GND

## LJ32H028 wiring

LJ32H028		ICOP-6054VE CON1	
Pin	Pin Name	Pin	Pin Name
CN1-1	D1	11	P2
CN1-2	D0	12	P3
CN1-3	D3	9	P0
CN1-4	D2	10	P1
CN1-5	CP2	35	SHF_CLK
CN1-6	GND	3,4	GND
CN1-7	CP1	38	LP
CN1-8	GND	33,34	GND
CN1-9	S	36	FLM
CN1-10	-	-	-
CN1-11	-	-	-
CN1-12	-	-	-
CN1-13	+5V	43,44	+5V(Vdd)
CN1-14	-	-	-
CN1-15	+12V	1,2	+12V

## SHARP LQ10D42 wiring (640 X 480 TFT Color)

SHARP LQ10D42		ICOP-6054VE CON1	
Pin	Pin Name	Pin	Pin Name
CN1-1	GND	3,4	GND
CN1-2	CLK	42	SHFCLK
CN1-3	Hsync	38	LP
CN1-4	Vsync	36	FLM
CN1-5	GND	3,4	GND
CN1-6	R0	21	P12
CN1-7	R1	22	P13
CN1-8	R2	23	P14
CN1-9	R3	24	P15
CN1-10	R4	25	P16
CN1-11	R5	26	P17
CN1-12	GND	3,4	GND
CN1-13	G0	15	P6
CN1-14	G1	16	P7
CN1-15	G2	17	P8
CN1-16	G3	18	P9
CN1-17	G4	19	P10
CN1-18	G5	20	P11
CN1-19	GND	3,4	GND
CN1-20	B0	9	P0
CN1-21	B1	10	P1
CN1-22	B2	11	P2
CN1-23	B3	12	P3
CN1-24	B4	13	P4
CN1-25	B5	14	P5
CN1-26	GND	3,4	GND
CN1-27	ENAB	40	M
CN1-28	Vcc	43,44	Vcc +5V
CN1-29	Vcc	43,44	Vcc +5V
CN1-30	R/L	-	-
CN1-31	U/D	-	-



**SHARP LQ12S31 wiring  
(800 X 600 TFT Color)**

SHARP LQ12S31		ICOP-6054VE CON1	
Pin	Pin Name	Pin	Pin Name
CN1-1	GND	3	GND
CN1-2	CLK	35	SHFCLK
CN1-3	GND	4	GND
CN1-4	Hsync	38	LP
CN1-5	Vsync	36	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	
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	ENAR	37	M
CN1-38	TST	-	-
CN1-39	Vcc	43	+5Vcc
CN1-40	Vcc	44	+5Vcc
CN1-41	TST	-	-

# Chapter 4

## Network Interface

### 4.1 Introduction

The Realtek RTL-8019AS 10Mbps Ethernet controller board supports both 10BASE-T and Coax 10Base-2 'BNC' connectors, and allows direct connection to your 10Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

I/O and IRQ settings can be done by software with the supplied utility software, or it can be set for Plug and Play compatibility. The controller supports : Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

### 4.2 Software Support

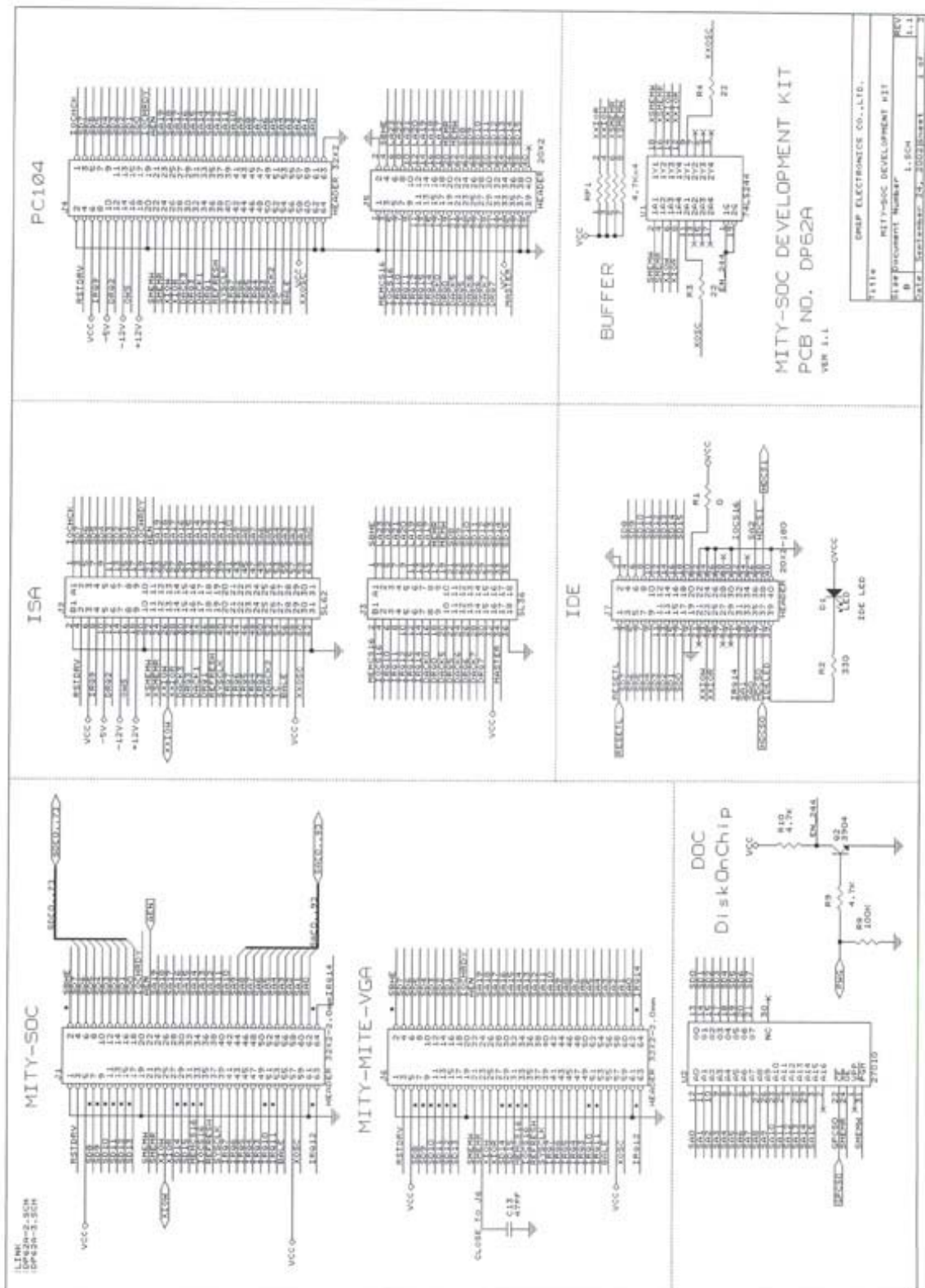
- On-board EEPROM (93C46) programming
- Setup/Diagnostic program for DOS
- Help utility for easy installation
- RPL boot ROM for Novell Netware, Microsoft NT
- NDIS2 (DOS, OS/2, Lantastic, WFW3.11; K; K)
- NDIS3, NDIS4, NDIS5 for WIN95, 98, NT3.51, 4.0, 5.0, WFW3.11
- Netware 16-bit ODI driver for DOS, OS/2 and 32-bit ODI driver for Netware 3.x, 4.x, 5.0 Server
- Packet driver for UNIX Client
- SCO Unix driver
- Linux driver

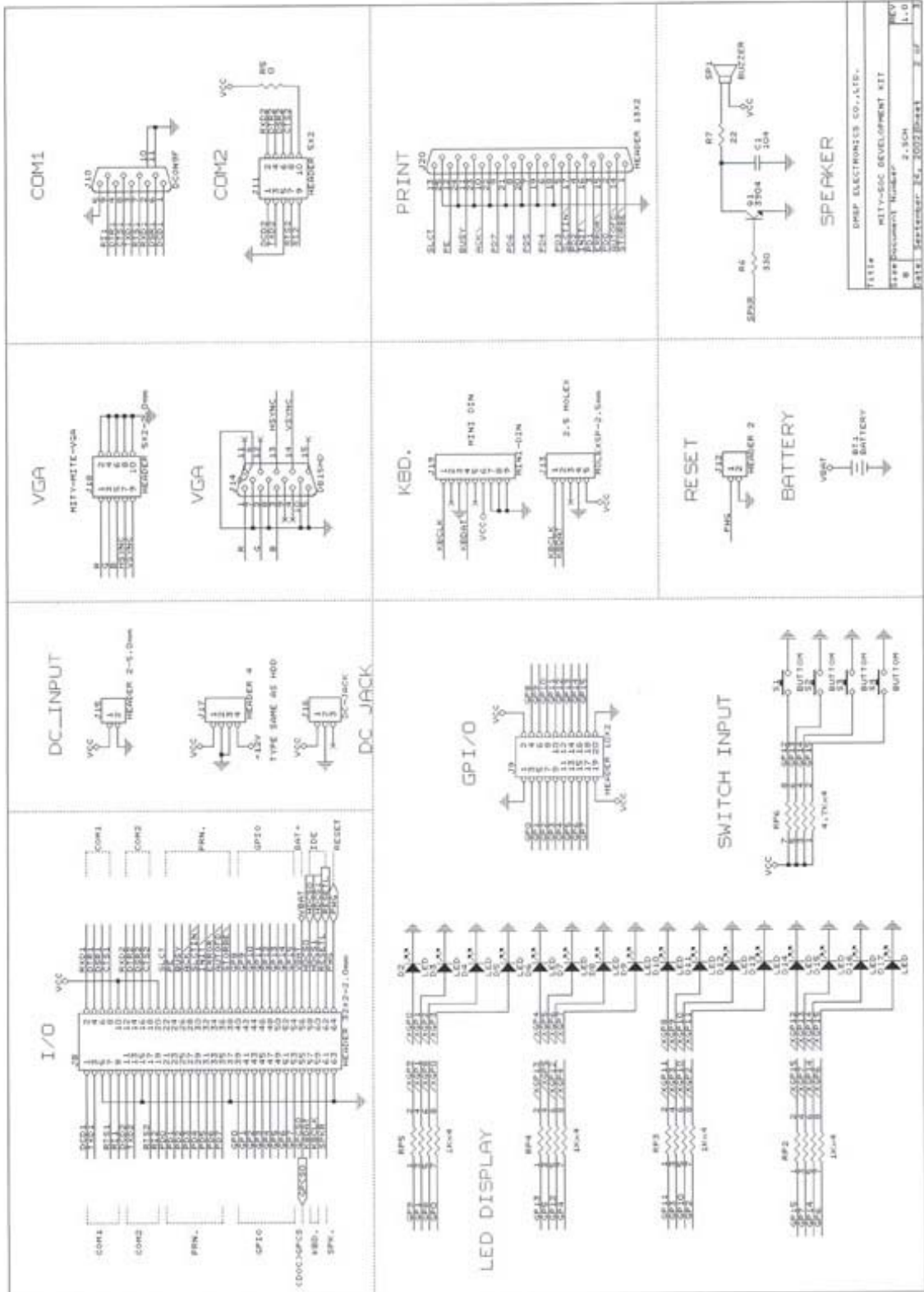
All operating systems that support standard NE2000

# A p p e n d i x

## Schematic Diagram

- Please refer to the schematic diagram on the preceding 3 pages. -







# Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.