COM-TC

Intel® Atom™ Processor

Intel® EG20T PCH

Gigabit Ethernet

Onboard SATA SSD, 1 SATA 3.0 Gb/s

7 USB2.0 (6 USB Host, 1 USB Client)

4-Bit SDIO, 2 PCI-E[x1]

LPC Bus, SMBus

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 4 M2.5 Screw
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 COM-TC

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

General Information

1.1 Introduction

The original embedded board manufacturer, is pleased to announce the debut of their new generation COM Express Module-- COM-TC. The COM-TC is a cutting-edge product that provides high performance and low power consumption in the embedded market.

COM-TC adopts the latest Intel® Atom™ E620/E680 processor. The system memory deploys with onboard DDR2 667/800 memory up to 2 GB. In addition, Realtek RTL8211CL supports 10/100/1000Base-TX that allows faster network connections. This model applies two PCI-Express[x1], 4-bit SDIO multiplexed with GPIO pins, one LPC bus, and one SMBus. Moreover, one SATA SSD onboard, one or two SATA 3.0Gb/s, and one PATA are configured on the COM-TC. COM-TC also equips seven USB2.0 (six USB Host and one USB Client) for flexible I/O expansions.

The display of COM-TC supports LVDS/SDVO independent display and High definition video 2D/3D encoder/decoder. This brand new COM Express Module is developed to cater to the requirements of Automation, Medical, ticket machine, transportation, gaming, KIOSK, and POS/POI applications.

1.2 Features

- Intel® Atom™ E620/E680 Processor
- Intel® EG20T IOH
- Onboard DDR2 667/800 Memory Chip, Max. 2 GB
- Gigabit Ethernet
- Up to 24-bit Single Channel LVDS LCD
- High Definition Audio Interface
- SATA SSD x 1 (Optional), SATA 3.0Gb/s x 2 (1), PATA x 1
- USB2.0 x 7 (USB Host x 6, USB Client x 1)
- PCI-Express[x1] x 2
- Compact Module Size, Pin-out Type 2, 95mm x 95mm, COM.0 Rev.2.0

1.3 Specifications

System

Form Factor	COM Express compact Module, Pin-out Type 2, COM.0 Rev. 2.0
Processor	Onboard Intel® Atom™ E620/E680 processor, 0.6GHz to 1.6GHz
System Memory	Onboard DDR2 667/800 memory chip, Max. 2GB
Chipset	Intel® EG20T IOH
Ethernet	Realtek RTL8211CL,10/100/1000Base-TX
BIOS	AMI BIOS SPI type, 16MB ROM
EEPROM	Atmel® AT24C02, save BIOS and configuration data (Optional)
Wake On LAN	Yes
Watchdog Timer	Intel® Atom™ E620/E680 processor integrated
H/W Status Monitoring	Supports CPU temperature monitoring
Expansion Interface	4-bit SDIO: Multiplexed with GPIO pins PCI-Express [x1] x 2 LPC bus x 1 SMBus x 1
Power Requirement	+12V
Power Consumption (Typical)	Intel atom E680 1.6GHz, DDR2 1GB, 0.97A @ +12V 0.46A @ +5V (w/ ECB-916M)
Board Size	3.74”(L) x 3.74”(W) (95mm x 95mm)

● Gross Weight	0.55 lb (0.25 Kg)
● Operating Temperature	32°F ~ 140°F (0°C ~ 60°C), -40°F ~ 185°F (-40°C ~ 85°C) for WiTAS 2
● Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
● Operating Humidity	0% ~ 90% relative humidity, non-condensing

Display: Supports LVDS/SDVO independent display and High Definition Video 2D/3D Encoder/Decoder

● Chipset	Intel® Atom™ E620/E680 processor integrated
● Memory	Shared system memory up to 384MB/ DVMT 4.0
● Resolution	Up to 1280 x 1024 @ 85Hz for SDVO Up to 1280 x 768 @ 65Hz for LCD LVDS default : 800x 600 @ 18-bit
● LCD Interface	24-bit single channel LVDS
● SDVO	Supports SDVO x 1

I/O

● Storage	SATA SSD onboard (Master device), Max. 4 GB (Optional) SATA 3.0Gb/s x 2 (1) PATA x 1
● USB Port	USB 2.0 x 7 (USB Host x 6, USB Client x 1)
● GPIO	Up to 4 in or 4 out
● Audio	High definition audio

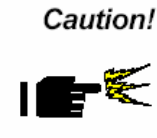
Chapter

2

Quick Installation Guide

2.1 Safety Precautions

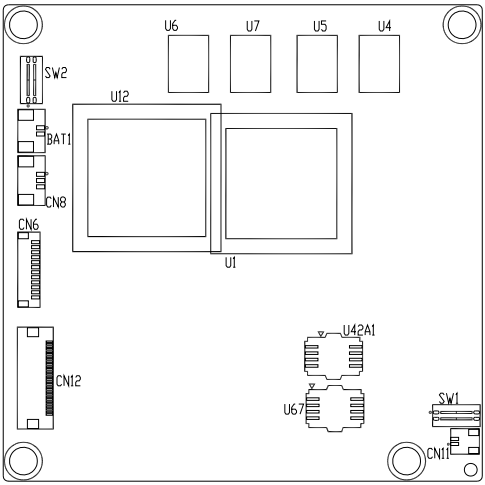
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.



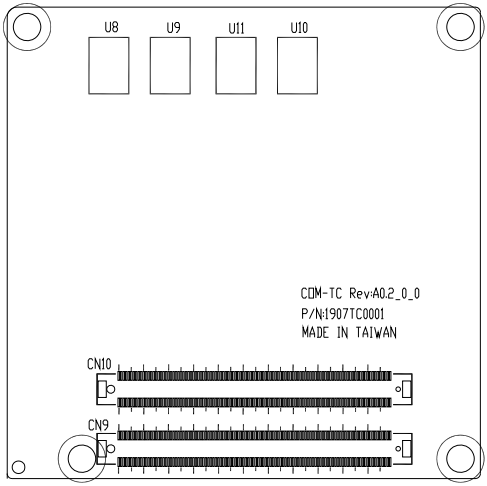
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Switch

Component Side

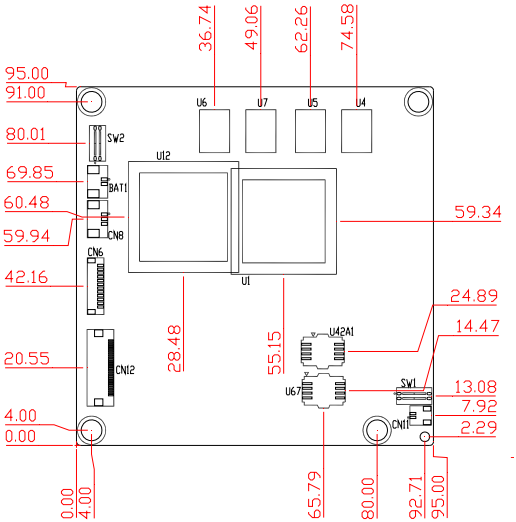


Solder Side

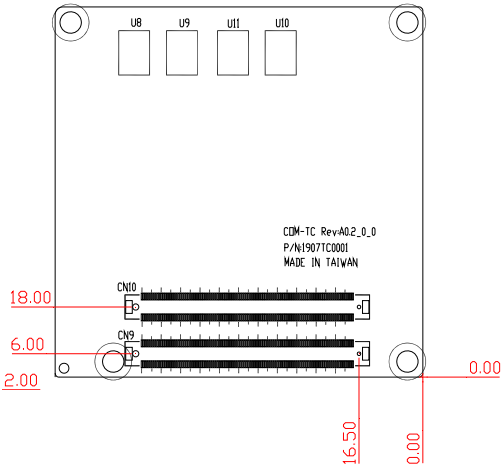


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Switch

There is a switch on the board that allows you to configure your system to suit your application. The table below shows the function of the switch.

Label	Function
SW2	AT/ATX & SSD Writing Protection Setting Switch

2.5 List of Connectors

There are a number of connectors of the board that allow you to configure your system to suit your application. The table below shows the function of each connector in the board:

Label	Function
CN6	LPC Connector(Optional)
CN7	SPI Flash Programming Connector (Optional)
CN8	FAN Power Connector
CN9	COM Express ROW A/B Connector
CN10	COM Express ROW C/D Connector
CN12	EC Programming Connector
BAT1	Battery Connector (Optional)

2.6 AT/ATX & SSD Writing Protection Setting Switch (SW2)

	ON	OFF
1	AT Power-on Mode	ATX Power-on Mode
2	SSD Writing Protection Function Enable	SSD Writing Protection Function Disable

2.7 LPC Connector (Optional) (CN6)

Pin	Signal
1	LPC_AD0
2	LPC_AD1
3	LPC_AD2
4	LPC_AD3
5	VCC3
6	LPC_FRAME#
7	LPC_RST#
8	GND
9	LPC_CLK
10	NC
11	NC
12	LPC_SERIRQ

2.8 SPI Flash Programming Connector (Optional) (CN7)

Pin	Signal	Pin	Signal
1	SPI_POWER	2	GND
3	SPI_CS#0	4	SPI_CLK
5	SPI_SO	6	SPI_SI

7	N.C.	8	N.C.

2.9 CPU FAN Connector (CN8)

Pin	Signal
1	Ground
2	+5 Volt.
3	FAN Sense

2.10 COM Express Connector (Row A & B) (CN9)

Row A		Row B	
A1	GND (FIXED)	B1	GND (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK	B8	N.C.
A9	GBE0_MDI1-	B9	N.C.
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND (FIXED)	B11	GND (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	N.C.	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#

A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	N.C.
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND (FIXED)	B21	GND (FIXED)
A22	N.C.	B22	N.C.
A23	N.C.	B23	N.C.
A24	N.C.	B24	PWR_OK
A25	N.C.	B25	N.C.
A26	N.C.	B26	N.C.
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	N.C.
A29	AC_SYNC	B29	AC_SDIN1
A30	AC_RST#	B30	AC_SDIN0
A31	GND (FIXED)	B31	GND (FIXED)
A32	AC_BITCLK	B32	SPKR
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DIS0#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	N.C.	B36	USBDEV-
A37	N.C.	B37	USBDEV+
A38	N.C.	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-

A40	USB4+	B40	USB5+
A41	GND (FIXED)	B41	GND (FIXED)
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	EXCD1_PERST#
A48	EXCD0_PERST#	B48	N.C.
A49	N.C.	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND (FIXED)	B51	GND (FIXED)
A52	N.C.	B52	N.C.
A53	N.C.	B53	N.C.
A54	GPI0 or SDIO_DATA0	B54	GPO1 or SDIO_CMD
A55	N.C.	B55	N.C.
A56	N.C.	B56	N.C.
A57	GND	B57	GPO2 or SDIO_WP
A58	N.C.	B58	N.C.
A59	N.C.	B59	N.C.
A60	GND (FIXED)	B60	GND (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1 or SDIO_DATA1	B63	GPO3 or SDIO_CD#

A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2 or SDIO_DATA2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND (FIXED)	B70	GND (FIXED)
A71	LVDS_A0+	B71	N.C.
A72	LVDS_A0-	B72	N.C.
A73	LVDS_A1+	B73	N.C.
A74	LVDS_A1-	B74	N.C.
A75	LVDS_A2+	B75	N.C.
A76	LVDS_A2-	B76	N.C.
A77	LVDS_VDD_EN	B77	N.C.
A78	LVDSA_DATA3	B78	N.C.
A79	LVDSA_DATA3#	B79	LVDS_BKLT_EN
A80	GND (FIXED)	B80	GND (FIXED)
A81	LVDS_A_CK+	B81	N.C.
A82	LVDS_A_CK-	B82	N.C.
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A85	GPI3 or SDIO_DATA3	B85	VCC_5V_SBY
A86	KBD_RST#	B86	VCC_5V_SBY
A87	KBD_A20GATE	B87	VCC_5V_SBY

A88	PCIE0_CK_REF+	B88	BISO_DIS1#
A89	PCIE0_CK_REF-	B89	N.C.
A90	GND (FIXED)	B90	GND (FIXED)
A91	SPI _POWER	B91	N.C.
A92	SPI_MISO	B92	N.C.
A93	GPO0 or SDIO_CLK	B93	N.C.
A94	SPI_CLK	B94	N.C.
A95	SPI_MOSI	B95	N.C.
A96	GND	B96	N.C.
A97	N.C.	B97	SPI_CS#
A98	N.C.	B98	RSVD
A99	N.C.	B99	RSVD
A100	GND (FIXED)	B100	GND (FIXED)
A101	N.C.	B101	N.C.
A102	N.C.	B102	N.C.
A103	N.C.	B103	N.C.
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND (FIXED)	B110	GND (FIXED)

2.11 COM Express Connector (Row C & D) (CN10)

Row C		Row D	
C1	GND (FIXED)	D1	GND (FIXED)
C2	IDE_D7	D2	IDE_D5
C3	IDE_D6	D3	IDE_D10
C4	IDE_D3	D4	IDE_D11
C5	IDE_D15	D5	IDE_D12
C6	IDE_D8	D6	IDE_D4
C7	IDE_D9	D7	IDE_D0
C8	IDE_D2	D8	IDE_REQ
C9	IDE_D13	D9	IDE_IOW#
C10	IDE_D1	D10	IDE_ACK#
C11	GND (FIXED)	D11	GND (FIXED)
C12	IDE_D14	D12	IDE_IRQ
C13	IDE_IORDY	D13	IDE_A0
C14	IDE_IOR#	D14	IDE_A1
C15	N.C.	D15	IDE_A2
C16	N.C.	D16	IDE_CS1#
C17	N.C.	D17	IDE_CS3#
C18	N.C.	D18	IDE_RESET#
C19	N.C.	D19	N.C.
C20	N.C.	D20	N.C.
C21	GND (FIXED)	D21	GND (FIXED)
C22	N.C.	D22	N.C.

C23	PCIE_RESET#	D23	N.C.
C24	N.C.	D24	N.C.
C25	N.C.	D25	N.C.
C26	N.C.	D26	N.C.
C27	N.C.	D27	N.C.
C28	N.C.	D28	N.C.
C29	N.C.	D29	N.C.
C30	N.C.	D30	N.C.
C31	GND (FIXED)	D31	GND (FIXED)
C32	N.C.	D32	N.C.
C33	N.C.	D33	N.C.
C34	N.C.	D34	N.C.
C35	N.C.	D35	N.C.
C36	N.C.	D36	N.C.
C37	N.C.	D37	N.C.
C38	N.C.	D38	N.C.
C39	N.C.	D39	N.C.
C40	N.C.	D40	N.C.
C41	GND (FIXED)	D41	GND (FIXED)
C42	N.C.	D42	N.C.
C43	N.C.	D43	N.C.
C44	N.C.	D44	N.C.
C45	N.C.	D45	N.C.
C46	N.C.	D46	N.C.

C47	N.C.	D47	N.C.
C48	N.C.	D48	N.C.
C49	N.C.	D49	N.C.
C50	N.C.	D50	N.C.
C51	GND (FIXED)	D51	GND (FIXED)
C52	SDVO_TVCLK+	D52	SDVO_RED+
C53	SDVO_TVCLK-	D53	SDVO_RED-
C54	N.C.	D54	N.C.
C55	SDVO_INT+	D55	SDVO_GREEN+
C56	SDVO_INT-	D56	SDVO_GREEN-
C57	N.C.	D57	N.C.
C58	SDVO_STALL+	D58	SDVO_BLUE+
C59	SDVO_STALL-	D59	SDVO_BLUE-
C60	GND (FIXED)	D60	GND (FIXED)
C61	N.C.	D61	SDVO_CLK+
C62	N.C.	D62	SDVO_CLK-
C63	N.C.	D63	N.C.
C64	N.C.	D64	N.C.
C65	N.C.	D65	N.C.
C66	N.C.	D66	N.C.
C67	N.C.	D67	GND
C68	N.C.	D68	N.C.
C69	N.C.	D69	N.C.
C70	GND (FIXED)	D70	GND (FIXED)

C71	N.C.	D71	N.C.
C72	N.C.	D72	N.C.
C73	SDVO_CTRLDATA	D73	SDVO_CTRLCLK
C74	N.C.	D74	N.C.
C75	N.C.	D75	N.C.
C76	GND	D76	GND
C77	N.C.	D77	IDE_CBLID#
C78	N.C.	D78	N.C.
C79	N.C.	D79	N.C.
C80	GND (FIXED)	D80	GND (FIXED)
C81	N.C.	D81	N.C.
C82	N.C.	D82	N.C.
C83	N.C.	D83	N.C.
C84	GND	D84	GND
C85	N.C.	D85	N.C.
C86	N.C.	D86	N.C.
C87	GND	D87	GND
C88	N.C.	D88	N.C.
C89	N.C.	D89	N.C.
C90	GND (FIXED)	D90	GND (FIXED)
C91	N.C.	D91	N.C.
C92	N.C.	D92	N.C.
C93	GND	D93	GND
C94	N.C.	D94	N.C.

C95	N.C.	D95	N.C.
C96	GND	D96	GND
C97	N.C.	D97	N.C.
C98	N.C.	D98	N.C.
C99	N.C.	D99	N.C.
C100	GND (FIXED)	D100	GND (FIXED)
C101	N.C.	D101	N.C.
C102	N.C.	D102	N.C.
C103	GND	D103	GND
C104	VCC_12V	D104	VCC_12V
C105	VCC_12V	D105	VCC_12V
C106	VCC_12V	D106	VCC_12V
C107	VCC_12V	D107	VCC_12V
C108	VCC_12V	D108	VCC_12V
C109	VCC_12V	D109	VCC_12V
C110	GND (FIXED)	D110	GND (FIXED)

2.12 EC Programming Connector (CN12)

Pin	Signal
1	NC
2	NC
3	GND
4	NC
5	NC

6	KSO3
7	NC
8	NC
9	KSO1
10	NC
11	NC
12	KSO10
13	KSO9
14	KSO8
15	KSO7
16	NC
17	NC
18	KSO6
19	KSI5
20	KSI4
21	KSO5
22	KSI3
23	KSO4
24	KSI2
25	KSO3
26	KSI1
27	KSO2
28	KSO1
29	KSI0

30	KSO0

2.13 Battery Connector (Optional) (BAT1)

Pin	Signal
1	+3V_BAT
2	GND

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外部信号连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

Chapter

3

AMI BIOS Setup

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The COM-TC CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable disable boot option for legacy network devices.

Chipset

host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Chapter

4

Driver Installation

The COM-TC comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Install AHCI Driver

Step 2 – Install Chipset Driver

Step 3 – Install VGA Driver

Step 4 – Install Audio Driver (Audio IC on Carrier board ECB--916M Rev B)

Step 5 – Install LAN Driver

Step 6 – Install TPM Driver (Optional)

Note: If the system OS is Windows® XP, you have to install the AHCI driver first.

Please read following instructions for detailed installations.

4.1 Installation:

Insert the COM-TC CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install AHCI Driver

Please refer to the Appendix C AHCI Settings.

Step 2 – Install Chipset Driver

1. Click on the ***STEP2-CHIPSET*** folder and select the OS your system is
2. Double click on ***.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 3 – Install VGA Driver

1. Click on the ***STEP3-VGA*** folder, click on the folder of ***WIN_XP_7*** and select the relevant folder based on the BIOS SETUP MENU
2. Double click on ***WindowsDriverSETUP*** file located in each folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 4 – Install Audio Driver (Audio IC on Carrier board ECB--916M Rev B)

1. Click on the ***STEP4-AUDIO*** folder and select the OS folder your system is
2. Double click on ***.exe*** file located in each OS folder

3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 5 – Install LAN Driver

1. Click on the ***STEP5-LAN*** folder and select the OS your system is
2. Double click on ***PROWin32.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 6 – Install TPM Driver (Optional)

1. Click on the ***STEP6-TPM*** and double click on the ***setup.exe*** file
2. Follow the instructions that the window shows you
3. The system will help you install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 General Information

The COM-TC utilizes EC fucntion as its watchdog timer Controller.
The other Watchdog timer is set to second or minute and the range is 1 to 255 seconds or minutes.
When the timeout has occurred, that will generate a status bit to indicate it and write one will be clear.

A.2 Access Interface

The EC provides LPC access interface, to read/write internal registers. The index of LPC interface is 610(Hex) , the data of LPC interface is 611 (Hex) .

The LPC I/O interface wil be mapping to virtual memory address . The EC/Host communication interface registers can be accedssed on follow register.

A.3 Registers Description

EC/Host Communication Interface Registers Address Map

Index	Register Name	Default	Type
00h	Device	00h	R/W
01h	Type/ Offset	00h	R/W
02h	Control and Status	00h	R/W, RO
03h~0Dh	Data 0 ~ Data A	00h	R/W
Reserved	Reserved	Reserved	Reserved

The following Table describes WDT functions that allow the EC host to access. To access different functions, register with offset 00h and 01h should be changed accordingly.

Device (Offset 0)	Type/Offset (Offset 1)	Configuration Register
A8h	00h	WDT Access

The following Control and Status register in offset 02h is for controlling EC function and replying the result status.

Control and Status Register Definition

Bit	Description
7:6	Reserved
5	Write Enable 1b = write 0b = read
4	Start 1 = Start
3	Reserved
2	Progressing 1 = progressing 0 = not progressing
1	Error 1 = Error occurred 0 = No Error occurred
0	Done 1 = Operation Done

The register map is following.

WDT Access(Device = A8h, Type/Offset = 00h)

Register	Description
Data 0	WDT Countdown Timer , write 0 will stop count.

Data 1 WDT Control

Bit	Description
7:1	Reserved
0	Time Type 0 = Second 1 = Minute

A.4 F75111 Watchdog Timer Initial Program

```
#include <stdio.h>

#include <conio.h>
#define     BRAM1_Index     0x610
#define     BRAM1_Data      0x611
#define     BRAM_Device     0x00
#define     BRAM_Type               0x01
#define     BRAM_Conf       0x02
#define     BRAM_Data0      0x03
#define     BRAM_Data1      0x04
#define     BRAM_Data2      0x05
#define     BRAM_Data3      0x06
#define     w_unit          0x00 ( bit 0: 0 second , 1 minute)
#define     w_count         0x05 // WDT count


//Setting device
outportb(BRAM1_Index, BRAM_Device);
outportb(BRAM1_Data, 0xA8);
//Setting Type
outportb(BRAM1_Index, BRAM_Type);
outportb(BRAM1_Data, 0x00);
//Setting WDT count
outportb(BRAM1_Index, BRAM_Data0);
outportb(BRAM1_Data, w_count);
//Setting WDT unit
outportb(BRAM1_Index, BRAM_Data1);
outportb(BRAM1_Data, w_unit);
//Start Active
outportb(BRAM1_Index, BRAM_Conf);
outportb(BRAM1_Data, 0x30); // Start and Write
```

Appendix

B

I/O Information

B.1 I/O Address Map

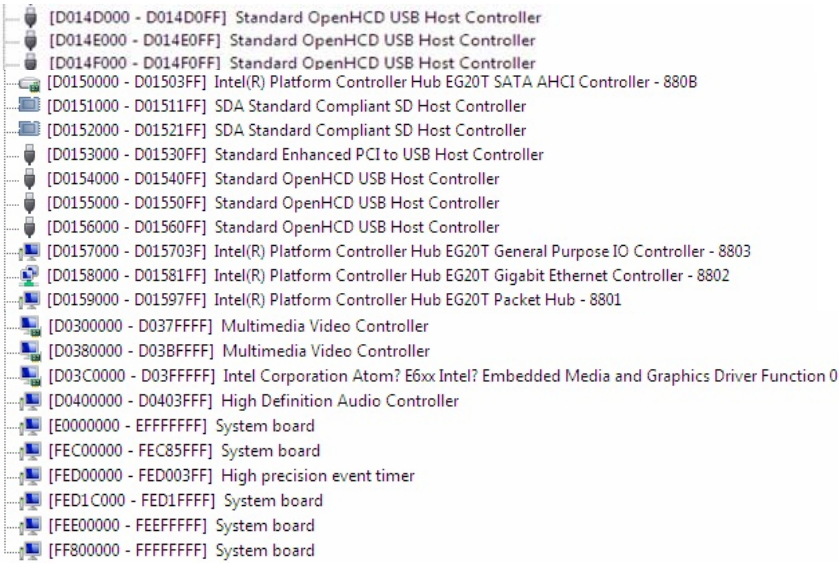
Input/output (IO)

- [00000000 - 0000000F] Direct memory access controller
- [00000000 - 00000CF7] PCI bus
- [00000010 - 0000001F] Motherboard resources
- [00000020 - 00000021] Programmable interrupt controller
- [00000022 - 0000003F] Motherboard resources
- [00000024 - 00000025] Programmable interrupt controller
- [00000028 - 00000029] Programmable interrupt controller
- [0000002C - 0000002D] Programmable interrupt controller
- [00000030 - 00000031] Programmable interrupt controller
- [00000034 - 00000035] Programmable interrupt controller
- [00000038 - 00000039] Programmable interrupt controller
- [0000003C - 0000003D] Programmable interrupt controller
- [00000040 - 00000043] System timer
- [00000044 - 0000004D] Motherboard resources
- [00000050 - 00000053] System timer
- [00000050 - 0000005F] Motherboard resources
- [00000060 - 00000060] Standard PS/2 Keyboard
- [00000061 - 00000061] System speaker
- [00000063 - 00000063] Motherboard resources
- [00000064 - 00000064] Standard PS/2 Keyboard
- [00000065 - 00000065] Motherboard resources
- [00000067 - 0000006F] Motherboard resources
- [00000070 - 00000077] System CMOS/real time clock
- [00000072 - 0000007F] Motherboard resources
- [00000080 - 00000080] Motherboard resources
- [00000081 - 00000083] Direct memory access controller
- [00000084 - 00000086] Motherboard resources
- [00000087 - 00000087] Direct memory access controller
- [00000088 - 00000088] Motherboard resources
- [000000B4 - 000000B5] Programmable interrupt controller
- [000000B8 - 000000B9] Programmable interrupt controller
- [000000BC - 000000BD] Programmable interrupt controller
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000FF] Numeric data processor
- [00000295 - 000002A4] Motherboard resources
- [000002F8 - 000002FF] Communications Port (COM2)
- [000003B0 - 000003BB] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
- [000003C0 - 000003DF] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
- [000003F8 - 000003FF] Communications Port (COM1)
- [00000400 - 0000043F] System board
- [00000480 - 000004BF] System board
- [000004D0 - 000004D1] Motherboard resources
- [000004D0 - 000004D1] Programmable interrupt controller

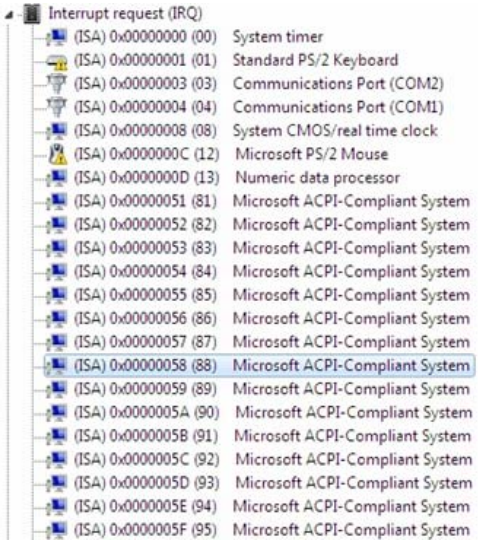
```
[00000900 - 0000097F] System board
[000009C0 - 000009FF] System board
[00000D00 - 0000FFFF] PCI bus
[0000E000 - 0000E01F] Intel(R) Platform Controller Hub EG20T SATA AHCI Controller - 880B
[0000E000 - 0000EFFF] PCI Express standard Root Port
[0000E000 - 0000EFFF] PCI standard PCI Express to PCI/PCI-X Bridge
[0000E020 - 0000E03F] Intel(R) Platform Controller Hub EG20T Gigabit Ethernet Controller - 8802
[0000E040 - 0000E047] Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
[0000E050 - 0000E057] Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
[0000E060 - 0000E067] Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
[0000E070 - 0000E077] Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
[0000F000 - 0000F007] Multimedia Video Controller
[0000F010 - 0000F017] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
```

B.2 Memory Address Map

```
[000A0000 - 000BFFFF] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[000A0000 - 000BFFFF] PCI bus
[000C0000 - 000DFFFF] System board
[000E0000 - 000EFFFF] System board
[000F0000 - 000FFFFF] System board
[3F6F0000 - 3F6FFFFF] System board
[3F700000 - 3F7FFFFF] System board
[3F800000 - 3FFFFFFF] System board
[40000000 - FFFFFFFF] PCI bus
[B0000000 - BFFFFFFF] Multimedia Video Controller
[C0000000 - CFFFFFFF] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[D0000000 - D00FFFFF] Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[D0100000 - D01FFFFF] PCI standard PCI Express to PCI/PCI-X Bridge
[D0100000 - D02FFFFF] PCI Express standard Root Port
[D0140000 - D0141FFF] Intel(R) Platform Controller Hub EG20T USB Client Controller - 8808
[D0142000 - D01420FF] Intel(R) Platform Controller Hub EG20T IEEE 1588 Hardware Assist - 8819
[D0143000 - D01431FF] Intel(R) Platform Controller Hub EG20T Controller Area Network (CAN) Controller - 8818
[D0144000 - D01440FF] Intel(R) Platform Controller Hub EG20T I2C Controller - 8817
[D0145000 - D014501F] Intel(R) Platform Controller Hub EG20T Serial Peripheral Interface Bus - 8816
[D0146000 - D01460FF] Intel(R) Platform Controller Hub EG20T DMA Controller #2 - 8815
[D0147000 - D014700F] Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
[D0148000 - D014800F] Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
[D0149000 - D014900F] Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
[D014A000 - D014A00F] Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
[D014B000 - D014B0FF] Intel(R) Platform Controller Hub EG20T DMA Controller #1 - 8810
[D014C000 - D014C0FF] Standard Enhanced PCI to USB Host Controller
[D014D000 - D014D0FF] Standard OpenHCD USB Host Controller
[D014E000 - D014E0FF] Standard OpenHCD USB Host Controller
[D014F000 - D014F0FF] Standard OpenHCD USB Host Controller
[D0145000 - D014501F] Intel(R) Platform Controller Hub EG20T Serial Peripheral Interface Bus - 8816
[D0146000 - D01460FF] Intel(R) Platform Controller Hub EG20T DMA Controller #2 - 8815
[D0147000 - D014700F] Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
[D0148000 - D014800F] Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
[D0149000 - D014900F] Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
[D014A000 - D014A00F] Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
[D014B000 - D014B0FF] Intel(R) Platform Controller Hub EG20T DMA Controller #1 - 8810
[D014C000 - D014C0FF] Standard Enhanced PCI to USB Host Controller
```



B.3 IRQ Mapping Chart



(ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
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(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
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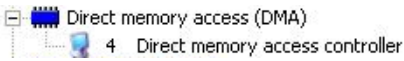
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System

(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(PCI) 0x00000005 (05) Intel(R) Platform Controller Hub EG20T DMA Controller #2 - 8815
(PCI) 0x0000000B (11) Multimedia Video Controller
(PCI) 0x00000010 (16) High Definition Audio Controller
(PCI) 0x00000010 (16) Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
(PCI) 0x00000010 (16) Intel(R) Platform Controller Hub EG20T Gigabit Ethernet Controller - 8802
(PCI) 0x00000010 (16) Intel(R) Platform Controller Hub EG20T General Purpose IO Controller - 8803
(PCI) 0x00000010 (16) PCI Express standard Root Port
(PCI) 0x00000010 (16) PCI Express standard Root Port
(PCI) 0x00000010 (16) PCI Express standard Root Port
(PCI) 0x00000010 (16) PCI Express standard Root Port
(PCI) 0x00000010 (16) PCI standard PCI Express to PCI/PCI-X Bridge
(PCI) 0x00000010 (16) Standard Enhanced PCI to USB Host Controller
(PCI) 0x00000010 (16) Standard OpenHCD USB Host Controller
(PCI) 0x00000010 (16) Standard OpenHCD USB Host Controller
(PCI) 0x00000010 (16) Standard OpenHCD USB Host Controller
(PCI) 0x00000011 (17) Intel(R) Platform Controller Hub EG20T SATA AHCI Controller - 880B
(PCI) 0x00000012 (18) Intel(R) Platform Controller Hub EG20T Serial Peripheral Interface Bus - 8816
(PCI) 0x00000012 (18) Intel(R) Platform Controller Hub EG20T I2C Controller - 8817
(PCI) 0x00000012 (18) Intel(R) Platform Controller Hub EG20T Controller Area Network (CAN) Controller - 8818
(PCI) 0x00000012 (18) Intel(R) Platform Controller Hub EG20T IEEE 1588 Hardware Assist - 8819
(PCI) 0x00000012 (18) SDA Standard Compliant SD Host Controller
(PCI) 0x00000012 (18) SDA Standard Compliant SD Host Controller
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T USB Client Controller - 8808
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T DMA Controller #1 - 8810
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
(PCI) 0x00000013 (19) Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
(PCI) 0x00000013 (19) Standard Enhanced PCI to USB Host Controller
(PCI) 0x00000013 (19) Standard OpenHCD USB Host Controller
(PCI) 0x00000013 (19) Standard OpenHCD USB Host Controller
(PCI) 0x00000013 (19) Standard OpenHCD USB Host Controller
(PCI) 0xFFFFFFFE (-2) Intel(R) Platform Controller Hub EG20T Packet Hub - 8801

B.4 DMA Channel Assignments



Appendix

C

AHCI Settings

C.1 WIN XP OS installation

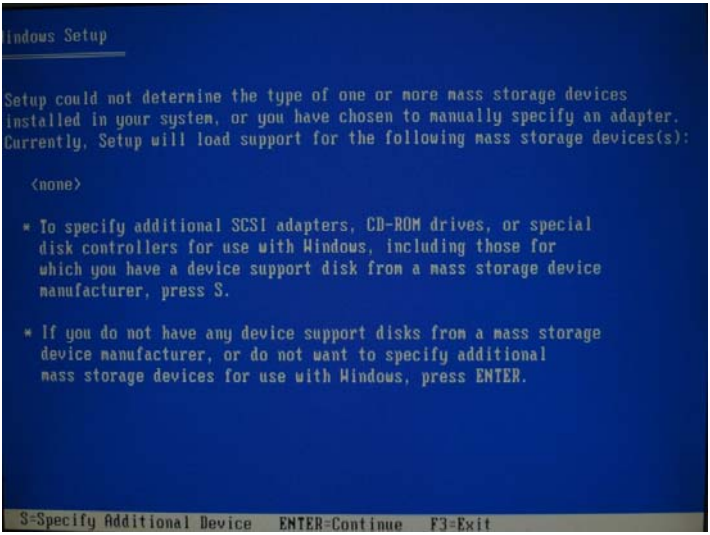
Step 1: Copy the files below from "***Driver CD -> "STEP 1- AHCI_WINXP" to Disk".***

Step 2: Connect the USB Floppy (disk with ACHI files) to the board

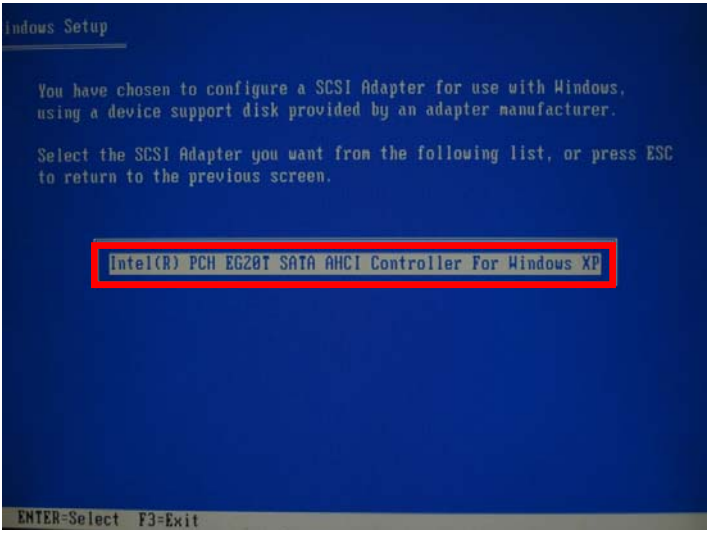
Step 3: Setup OS

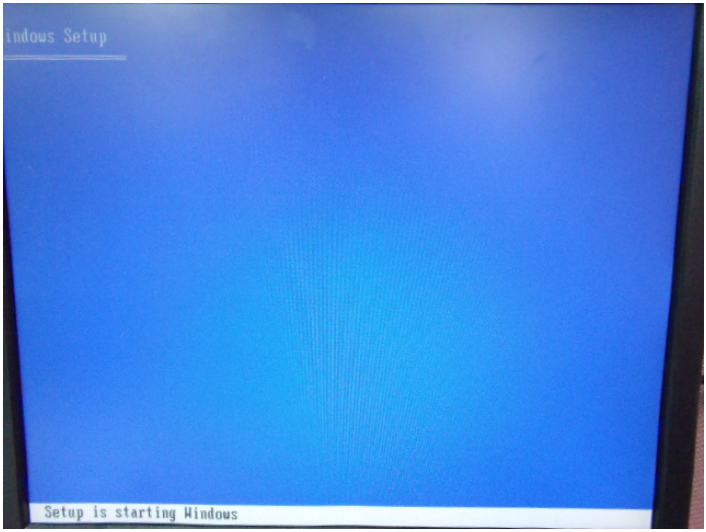
Step 4: Press "**F6**"

Step 5: Choose "**S**"



Step 6: Choose "**Intel(R) PCH EG20T SATA AHCI Controller For Windows XP**"



Step 7: It will show the model number you select and then press "**ENTER**"

Step 8: Setup is starting Windows