
GP/GS 0405™
GP/GS 0406™
Hot Swap
CompactPCI Systems



User's Guide



ECopyright 2000
All Rights Reserved
095-20094-00 Rev. A

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent commitment on the part of the manufacturer. In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages, or the possibility of such damages, arising out of the use of this information. This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Trademarks

IBM PC is a registered trademark of International Business Machines Corporation. Intel and Pentium are registered trademarks of Intel Corporation. Award is a registered trademark of Award Software, Inc. Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Customer Service

Headquarters: I-Bus/Phoenix, A Maxwell Technologies Company
8888 Balboa Avenue
San Diego, CA 92123
Telephone: (858) 503-3000 (800) 382-4229 (in the U.S.)
Direct Sales: (888) 307-7892
Tech. Support: (877) 777-IBUS (4287)
FAX: (858) 503-3005
E-Mail: **info@ibus.com**
sales@ibus.com
manuals@ibus.com
WEB: www.ibus.com

European Headquarters, Israel:

I-Bus/Phoenix
Units 2-3 Kingscroft Court
Ridgway, Havant
Hampshire PO9 1LS, UK
Telephone: +44 (0) 23 9242 4800
FAX: +44 (0) 23 9242 4801
E-Mail: sales@ibus.co.uk
support@ibus.co.uk

France, Italy:

I-Bus/Phoenix France
B.P. 45 Valbonne
06901 Sophia Antipolis CEDEX
France
Telephone: +33 (0) 493 004 360
FAX: +33 (0) 493 004 369
E-Mail: ventes.fr@ibus.com
support.fr@ibus.com

Germany, Switzerland, Austria

I-Bus/Phoenix Germany
Peter-Henlein-Strasse 4
D-82140 Olching
Germany
Telephone: +49 (0) 81-42 46 79 0
FAX: +49 (0) 81-42 49 79 99
E-Mail: sales@ibus-deutschland.de

Thank You
from the



team for
purchasing this product

I-Bus/Phoenix
Power and Computing Systems

Dear Customer,

Thank you for purchasing an I-Bus/Phoenix product. We hope that this product exceeds your expectations. It is our desire to provide you with accurate, up-to-date information about the product(s) you have purchased. We welcome your comments and suggestions about our manuals.

You may email those comments and suggestions to manuals@ibus.com. Please be sure to include your name, the name of your company, the product you purchased, and the manual number/revision (i.e. 00-00000-00 Rev. *). This number is located on the title page.

At I-Bus/Phoenix, we value our customers and partners, and you can continue to count on I-Bus/Phoenix to be customer focused and to provide you a large range of solutions -- from cost-effective to fully customized industrial computer solutions.

Again, thank you for your commitment to I-Bus/Phoenix. We appreciate your business and look forward to continuing to work with you and helping you reach your goals.



Table of Contents

Chapter 1. Introduction

Introduction	1-1
--------------------	-----

Chapter 2. Specifications

Enclosure	2-1
Power Subsystem	2-2
Environmental	2-2
Safety Agency	2-3

Chapter 3. Hardware

CPU Board	3-1
Add-in Boards	3-4
Rear I/O Transition Modules	3-6
Backplane	3-8
Backplane Cooling Fan	3-8
Chassis Filters	3-8

Chapter 4. Power Distribution

Power Supply	4-1
Input Circuit Breaker	4-3

Chapter 5. Drive Bay

Removing/Installing the Drives	5-1
--------------------------------------	-----

Chapter 6. Software

Software	6-1
----------------	-----

Appendix 1. Technical Reference

P1 Connector Pin Assignments (System Slot)	A1-1
P1 Connector Pin Assignments (I/O Slot)	A1-2
P1 Signal Descriptions	A1-3
P2 Connector Pin Assignments (System Slot)	A1-5
P2 Connector Pin Assignments (I/O Slot)	A1-6

Table of Contents

P2 Signal Descriptions	A1-7
P3, P4, P5 Connectors Pin Assignments (System Slot)	A1-7
P4 Connector Pin Assignments (Computer Telephony Bus) (I/O Slot)	A1-8
P4 Signal Descriptions (Computer Telephony Bus) (I/O Slot)	A1-9

Appendix 2. Glossary of Terms

Appendix 3. Limited Warranty

Appendix 4. FCC Information

Chapter 1 - Introduction

Welcome to the I-Bus/Phoenix family of CompactPCI computer systems. This manual provides information necessary to set up and maintain your GP/GS 0405 or GP/GS 0406. In this manual, when referring to either or both of the systems, the term GP/GS 040X will be used.

The GP/GS 040X System is a CompactPCI platform equipped with either an I-Bus/Phoenix IBC 2600 (Castor) or a Sun Microsystems CP1500 single board computer (SBC). If the IBC 2600 (Castor) SBC is used in the GP/GS 0406 system, 4 expansion slots are available, while the CP1500 will allow for five expansion slots. In the GP/GS 0405, both SBC's allow for only four expansion slots.

The GP/GS 040X is intended to meet the need for a reduced height rackmount CompactPCI system. The 4U high integrated enclosure houses a PICMG H.110 compliant backplane, 320W single power supply, and front access for two 3.5" third height devices and one half height 5.25" device. The enclosure supports 80MM depth rear I.O boards.



Figure 1-1: GP/GS 040X CompactPCI System

Chapter 1 - Introduction

This page was intentionally left blank

Chapter 2 - Specifications

D Enclosure

GDesigned for EIA RS-310 19" and 23" rack mounts

GDetachable rack mount brackets can be positioned for front flush mount or mid-chassis rack mount

GA single rack mount bracket design is used for both 19" and 23" racks.

GThe rack mount brackets incorporate mounting keyways for temporary hanging of the chassis.

GBasic configuration:

- GP/GS 0405: space for 4 expansion slots, plus a one slot or a two slot SBC, justified right (system slot at the top), oriented horizontally, component side up.

- GP/GS 0406: space for 5 expansion slots, plus a one slot SBC; or 4 expansion slots, plus a two slot SBC justified left (system slot at the bottom), oriented horizontally, component side up.

- overall dimensions are 7.00" High, 17.10" Wide, 12.00" Deep.

- total rack height is 4U (7.00"/177.8mm).

- cool air intake is in front, right of the backplane card cage.

- hot air exhaust is in the rear, left of the 6U backplane.

- Eurocard 6U card cage, per PICMG 2.0 R3.0 *CompactPCI* specification.

- 5 slot (GP/GS 0405) or 6 slot (GP/GS 0406) H.110 compliant backplane per PICMG 2.5 R1.0.

- support for 80mm depth rear I/O boards.

GCool air intake incorporates a removable, washable filter element.

GMounting provisions for two 3.5" third height (1" thick) drives and one 5.25" half height drive.

GEnclosure front panel incorporates a main switch, plus an LED indication of power-on.

GThe main switch is protected from accidental trip.

GBackplane cooling fan is pluggable, after removing the chassis front panel.

GMain power input is in the rear of the enclosure.

Chapter 2 - Specifications

D Power Subsystem

GA single power supply, delivering a minimum of 320W throughput from AC main input.

GAC input range: 90-132VAC and 180-264VAC, 47-63Hz, auto sensing, auto ranging.

GInternal Power Factor Correction (PFC) to meet IEC EN61000-3 Amendment 14 requirements for harmonic distortion and flicker.

GMaximum loads: +5VDC @ 30A, +3.3VDC @ 22A, +12VDC @ 11A, -12VDC @ 1A, combined total output not to exceed 320W; combined total output of +5V and +3.3V not to exceed 160W

GMinimum loads: +5VDC @ 4A, +3.3VDC @ 0.5A, +12VDC @ 1A, -12VDC @ 0.0A.

GRipple: 50mV for +5V and 3.3V, 100mV for +12V, 150mV for -12V.

GRegulation: $\pm 5\%$ for +5V, +3.3V, and +12V; $\pm 10\%$ for -12V.

GMTBF: 100,000 hrs, full load at 25°C (MIL-217).

GOperating temperature range: 0°C-50°C.

D Environmental

GSystem operating temperature range 0°C to 40°C
short-term operating temp -5°C to 55°C.
non-operating temp -40°C to 70°C.

Goperating humidity 5-85% @ 40°C (non-condensing).

G non-operating humidity 0-95% @ 40°C (non-condensing).

Goperating altitude 6000 ft at operating temp, 15,000ft at derated temp.

Gnon-operating altitude 40,000 ft.

Goperating vibration 0.25g @ 2-100 Hz, 1.5g @ 100-500 Hz.
storage/transport vibration 2g @ 5-500 Hz.

Goperating shock 10g @ 11 msec, and NEBS earthquake zone 4.

Gstorage/transport shock 30g @ 11 msec.

Chapter 2 - Specifications

- D **Safety Agency**
 - GUL 1950, Recognized Component
 - GcUL or CSA 950 Approved
 - GTUV EN 60950 Certified
 - GCE Certified
 - GFCC Class A

Chapter 2 - Specifications

This page was intentionally left blank

Chapter 3 - Hardware

This chapter discusses the removal and installation of the CPU board module, add-in board modules, rear I/O modules, backplane, system fan, and air filter.

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electronic components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.

CPU Board

In the GP/GS 0405, the CPU board is mounted in the top slot; in the GP/GS 0406, the CPU board is mounted in the bottom slot. The GP/GS 040X supports either a SunSPARC CP1500 or an Intel based SBC Module. (With the SunSPARC CP1500 SBC in the GP/GS 0405, the space above the top slot must be covered with a filler panel.) The CPU module is mounted through the front of the enclosure. It is held in place with two injector/ejector handles that stabilize the board when they are engaged. It is also secured by two captive screws located on the CPU module's faceplate. See the following instructions if the CPU module needs to be removed for maintenance or replacement

Removal and installation of the CPU board module

- 1 Shut down the system and turn off the main system power.
- 2 Place the chassis on an ESD-safe work surface.

Chapter 3 - Hardware

- 3 Loosen the two screws on the CPU board module's faceplate.
Note: When loosened, the screws should be pushed inward to prevent obstructing the movement of the injector/ejector handles.
- 4 Completely retract the injector/ejector handles by pressing them away from each other.
Note: Some force may be required.
- 5 Slide the CPU board module out of the chassis.
- 6 Using the module guides, slide the new CPU board into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.
- 7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.
- 8 Secure the CPU board module by tightening the two captive screws.



Figure 3-1: I-Bus/Phoenix IBC 2600 IBC 2600 (Castor) CPU Board



Figure 3-2: SunSPARC Ultra Ili CPU Board

Chapter 3 - Hardware

Add-in boards

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electronic components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.

All add-in board modules are mounted through the front of the enclosure. They are held in place with two injector/ejector handles that stabilize the boards when they are engaged.

The GP/GS 040X provides for full hot swap of add-in boards to PICMG 2.1 R1.0 and PICMG 2.12 R1.0 standards, supporting Pigeon Point Systems Hot Swap Kit software. The following steps should be taken to remove and install add-in boards on systems running the Pigeon Point software.

- 1 The system must be running a Full Hot Swap compliant operating system. Examples are
 - a) Microsoft Windows 2000 (Advanced Server, Server, Professional)
 - b) Microsoft Windows NT with a Hot Swap Manager
- 2 Choose which card is to be hot swapped.
- 3 Toggle the bottom injector/ejector handle of the card down or activate the hot swap thumb switch.

Chapter 3 - Hardware

- 4 The card's blue LED should light, indicating that the card is safe to remove.
- 5 Remove the card as normal.

To insert or re-insert a card back into that slot, the following must be done.

- 1 Insert the card.
- 2 The blue LED will light momentarily and should extinguish after full insertion is complete.
- 3 The operating system should recognize the card and accomplish the correct steps to allocate resources and load drivers.

For hot swap instructions on other third party hot swap software, consult the applicable instruction manual for the software.

Removal and installation of non-hot swap add-in boards for systems without hot swap software installed,

- 1 Shut down the system and turn off the main system power.
- 2 Place the chassis on an ESD-safe work surface
- 3 Loosen the screws on the add-in board's faceplate, if any.
- 4 Completely retract the injector/ejector handles of the add-in board module by pressing them away from each other.
Note: Some force may be required.
- 5 Slide the add-in board module out of the chassis.
- 6 Using the module guides, slide the new add-in board into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.
- 7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.

Note: If you do not plan on immediately replacing a removed add-in board, you must close the space left open with a filler panel in order to maintain EMI specifications.

Chapter 3 - Hardware

Rear I/O Transition Modules

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electronic components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.

The GP/GS 040X is configured to support rear I/O transition modules. As an optional feature, the IBC 2600 (Castor) or the SunSPARC rear transition module may be installed.

NOTE, however, that the Intel based IBC 2600 (Castor) rear I/O transition module occupies two slot spaces. The SunSPARC rear I/O transition module occupies only one space, but because of the space required for cabling, the next slot is not available for other transition modules, and must be covered with a filler panel. For this reason, only four slots are available for rear I/O transition modules, other than that for the CPU module, in the GP/GS 0406, and only three in the GP/GS 0405.

Removal and installation of the rear I/O modules

- 1 Shut down the system and turn off the main system power.
- 2 Place the chassis on an ESD-safe work surface
- 3 Loosen the two screws on the rear I/O module's faceplate as much as possible.

Note: The screws are captive to the faceplate and cannot be completely removed. (Note: some modules may not have screws on the faceplate).

Chapter 3 - Hardware

- 4 Completely retract the injector/ejector handles by pressing them away from each other.

Note: This may require some force.

- 5 Slide the rear I/O module out of the chassis.
- 6 Using the module guides, slide the new rear I/O module into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.
- 7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.
- 8 Secure the rear I/O module by tightening the two faceplate screws if they are present.

Note: If you do not plan on immediately replacing a removed I/O module, you must close the space left open with a filler panel in order to maintain EMI specifications.

- 9 Turn on the main system power.



Castor



SunSPARC

Figure 3-3: Rear I/O Transition Modules

Chapter 3 - Hardware

Backplane

Backplane Connector Pin Assignments

The GP/GS 0405 supports a 5-slot CompactPCI backplane. The GP/GS 0406 supports a 6-slot CompactPCI backplane. See Appendix 1, Tables A1-1 thru A1-5 for connector information for the CompactPCI backplane.

Do not attempt to remove the backplane from the chassis. The backplane is not a user serviceable item. Please contact I-Bus/Phoenix Technical Support for further information.

Backplane Cooling Fan

Removal and Replacement of Backplane Cooling Fan.

- 1 Shut down the system and turn off the main system power.
- 2 Remove the chassis front panel (12 screws hold it in place).
- 3 Remove the screw holding the fan module in place (see Figure 3-4) and slide the fan module out.
- 4 Disconnect the power connector and remove the fan module.
- 5 To replace the fan module, follow the above steps in reverse.

Chassis Filters

The cool air intake filter is located in the front right of the backplane card cage. To access and remove the filter, it is necessary to remove the chassis front panel (12 screws hold it in place).

Using a vacuum cleaner or compressed air, clean the chassis filter once a month or whenever dust accumulates on it. Failure to do so will cause the unit to overheat and fail. The filter may also be washed, but it should be thoroughly dried before replacing it in the chassis.

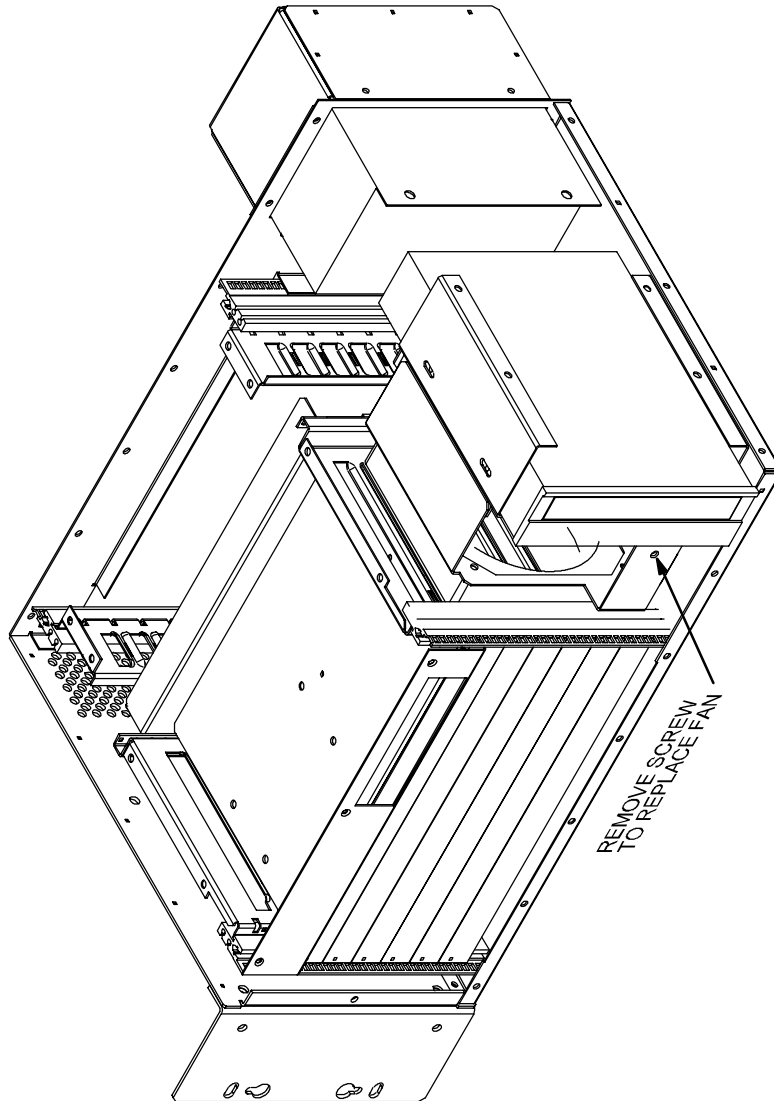


Figure 3-4: Backplane Cooling Fan Replacement

Chapter 3 - Hardware

This page was intentionally left blank

Chapter 4 - Power Distribution

This chapter discusses the power supply and input circuit breaker, and provides installation and removal instructions for each.

CAUTION!

Unless working with hot-swap components, always shut down the system, turn OFF all power, and disconnect the power cords before working on the system.

Power Supply

Chassis DC power is provided by a single 320W AC input power supply housed in a bracket located at the rear of the unit (see Figure 4-1).

Removing and installing the power supply module

- 1 Shut down the system and turn off the main system power.
- 2 Disconnect the power cord/cable.
- 3 Remove the GP/GS 0406 unit from its rack and place it on an ESD-safe work surface.
- 4 Remove the rackmount brackets from the sides of the chassis.
- 5 Remove the top cover from the chassis. This involves removing 16 screws from the top surface of the top cover, five screws from along the top edge of each of the two sides, six screws from the top edge of the front of the chassis, and seven screws from the top edge of the rear of the chassis (a total of 39 screws).
- 6 Disconnect all power cable connectors as follows:
 - to floppy drive
 - to hard drive
 - to CD-Rom drive
 - to input circuit breaker
 - to front panel LED
 - to backplane power cable
- 7 Remove the remaining seven screws that hold the power supply bracket to the chassis rear panel.
- 8 Remove the power supply bracket with the power supply attached from the chassis.

Chapter 4 - Power Distribution

- 9 Remove the four screws that attach the power supply to its bracket and, using these screws, attach the new power supply to the bracket.
- 10 Reverse the above steps to reassemble all components and restart the computer.

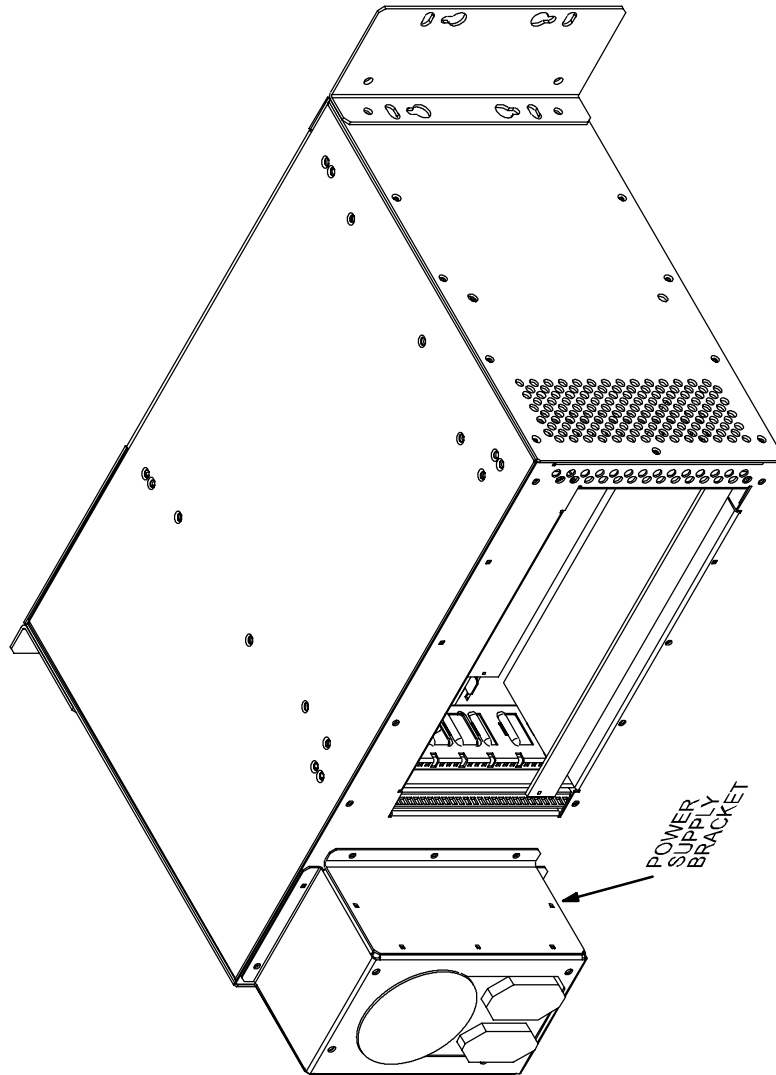


Figure 4-1: GP/GS 040X Chassis Rear View

Chapter 4 - Power Distribution

Input Circuit Breaker

The main power switch is an input circuit breaker located on the front panel.

Removing/Replacing the input circuit breaker

- 1 Shut down the system and turn off the main system power.
- 2 Disconnect the input power cord/cable.
- 3 Remove the GP/GS 040X unit from its rack and place it on an ESD-safe work surface.
- 4 Remove the rackmount brackets from the sides of the chassis.
- 5 Remove the top cover from the chassis. This involves removing 16 screws from the top surface of the top cover, five screws from along the top edge of each of the two sides, six screws from the top edge of the front of the chassis, and seven screws from the top edge of the rear of the chassis (a total of 39 screws).
- 6 With the wires still connected, squeeze the spring clips on the sides of the old circuit breaker, pushing it through the front panel of the chassis until it pops out.
- 7 Remove the wires, one by one from the old circuit breaker, and attach each one to the new circuit breaker as it is removed from the old breaker, placing it on the correct terminal.
- 8 Push the new circuit breaker back into position in the front plate until the spring clips on the breakers side snap into place.
- 9 Reverse steps 5 through 1 to reassemble and repower the unit.

Chapter 4 - Power Distribution

This page was intentionally left blank

Chapter 5 - Drive Bay

This chapter describes the removal and installation of the drives.

Removing/installing the drives

The GP/GS 040X provides for two 3.5" third height (1" thick) drives, located above the card cage, plus one 5.25" half height drive located directly to the right of the cool air intake. Normally, the two 3.5" drives will consist of one floppy disk drive and one IDE (or SCSI) hard disk drive. The 5.25" drive will be a CD-ROM (either IDE or SCSI). Alternatively, the 5.25" drive space may be occupied by a combination CD-Rom/floppy drive module. This might be the case, for example, if the two 3.5" drives were both hard drives. The 3.5" hard drive and the 5.25" CD-ROM drive must both be either IDE or SCSI (not one of each).

To remove and replace the 3.5" drives:

- 1 Shut down the system and turn off the main system power.
- 2 Remove the three screws from the front of the drive bay.
- 3 Pull the drive bay forward and out far enough to access the power and data cable connections at the rear of the drive to be replaced. See Figure 5-1.



Figure 5-1: Drive Bay Withdrawn

Chapter 5 - Drive Bay

- 4 Disconnect the cables and remove the drive. Each drive is secured to the bay by four screws.
- 5 Secure the replacement drive with the four screws just removed, and reverse the above procedure to reassemble the drive bay in place.
- 6 Turn the power on.

To remove and replace the 5.25" drive:

- 1 Shut down the system and turn off the main system power.
- 2 Remove the GP/GS 040X unit from its rack and place it on an ESD-safe work surface.
- 3 Remove the chassis front panel by removing the 12 screws that hold it in place.
- 4 Remove the four screws from the right side that are designated in Figure 5-2.
- 5 You can now remove the module containing the 5.25" CD-ROM drive and the backplane cooling fan.
- 6 Disconnect the power and data cable connectors at the rear of the drive.
- 7 Remove two screws each from the top and bottom of the module that secure the drive to the module (See Figure 5-3).
- 8 Remove and replace the drive and reverse the above procedure to reassemble the unit.
- 9 Remount the unit in the rack and reconnect and turn the power on.

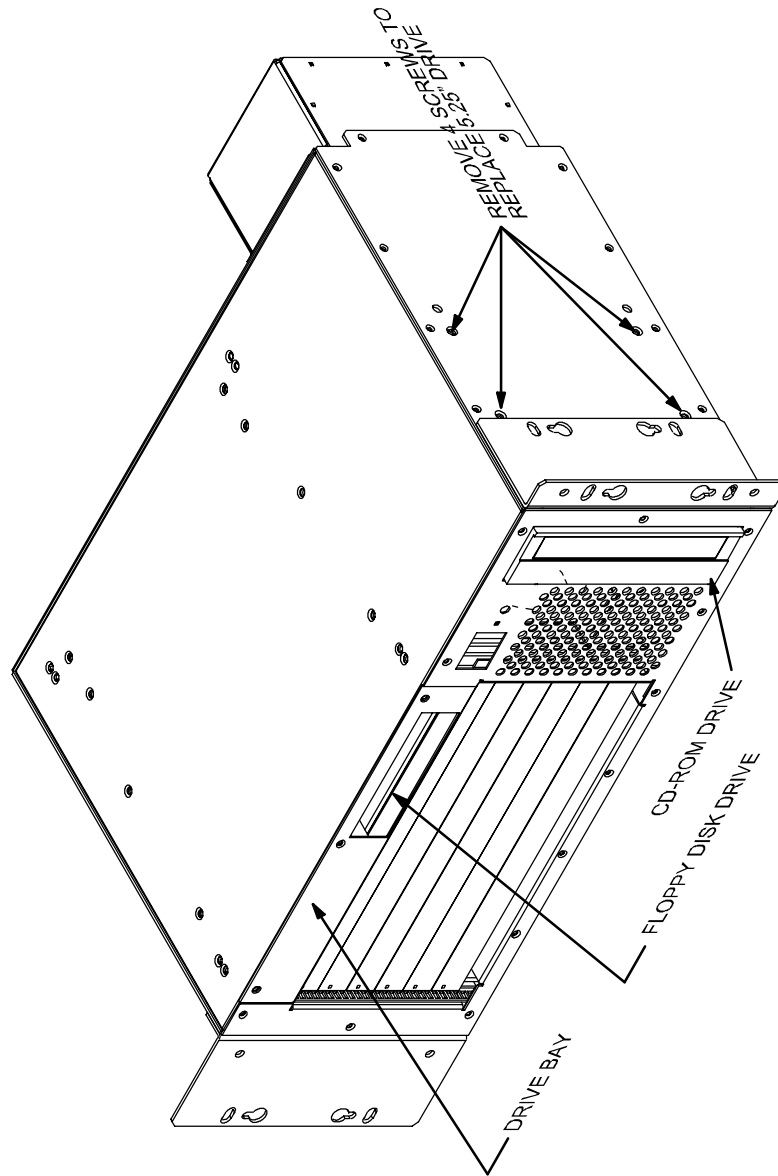


Figure 5-2: Drive Replacement

Chapter 5 - Drive Bay

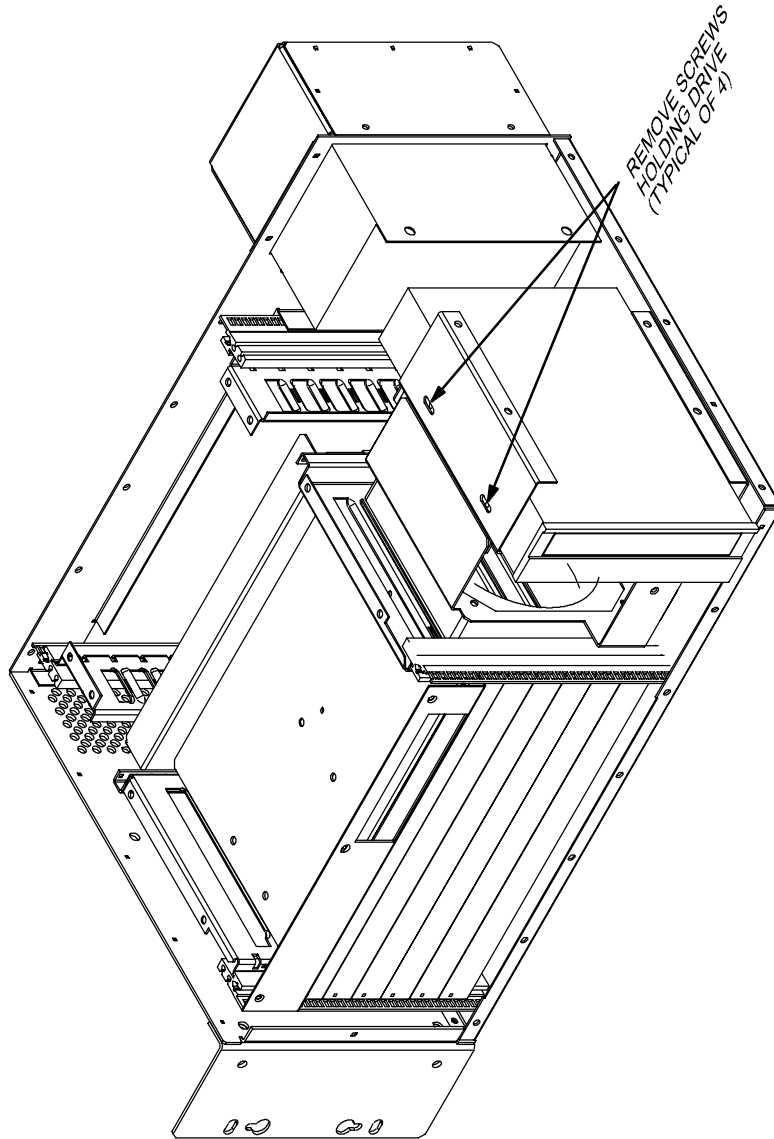


Figure 5-3: 5.25" Drive Replacement

Chapter 6 - Software

Software

The GP/GS 040X can be preloaded with Microsoft Windows 2000 or Windows NT 4.0 or Sun Solaris 2.6, 7, or 8 Operating System. For software configuration support on this platform, refer to the software manufacturer's Installation and Configuration manual.

For Pigeon Point (or other third party) Hot Swap Kit software, refer to the appropriate User's Manual.

Chapter 6 - Software

This page was intentionally left blank

Appendix 1 - Technical Reference

P1 Connector Pin Assignments (System Slot)

Pin #	Z	A	B	C	D	E	F
25	GND	VCC	REQ 64	ENUM	VCC3	VCC	GND
24	GND	AD[1]	VCC	V(I/O)	AD[0]	ACK64_	GND
23	GND	VCC3	AD[4]	AD[3]	VCC	AD[2]	GND
22	GND	AD[7]	GND	VCC3	AD[6]	AD[5]	GND
21	GND	VCC3	AD[9]	AD[8]	M66EN	C/BE[0_]	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	VCC3	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR_	GND	VCC3	PAR	C/BE[1]	GND
17	GND	VCC3	IPMB_SCL	IPMB_SDA	GND	PERR	GND
16	GND	DEVSEL_	GND	V(I/O)	STOP_	LOCK_	GND
15	GND	VCC3	FRAME_	IRDY_	GND	TRDY_	GND
Key 12-14							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2_]	GND
10	GND	AD[21]	GND	VCC3	AD[20]	AD[19]	GND
9	GND	C/BE[3]	GND	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ_	GND	VCC3	CLK0	AX[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	PCI_RST_	GND	GNT0	GND
4	GND	IPMB_PWR	HEALTHY	V(I/O)	INTP	INTS	GND
3	GND	INTA_	INTB_	INTC_	VCC	INTD_	GND
2	GND	TCK	VCC	TMS	TDO	TDI	GND
1	GND	VCC	-12V	TRST_	+12V	VCC	GND

Table A1-1: P1 Connector Pin Assignments (System Slot)

Appendix 1 - Technical Reference

P1 Connector Pin Assignments (I/O Slot)

Pin #	Z	A	B	C	D	E	F
25	GND	VCC	REQ 64	ENUM	VCC3	VCC	GND
24	GND	AD[1]	VCC	V(I/O)	AD[0]	ACK64_	GND
23	GND	VCC3	AD[4]	AD[3]	VCC	AD[2]	GND
22	GND	AD[7]	GND	VCC3	AD[6]	AD[5]	GND
21	GND	VCC3	AD[9]	AD[8]	M66EN	C/BE[0_]	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	VCC3	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR_	GND	VCC3	PAR	C/BE[1]	GND
17	GND	VCC3	IPMB_SCL	IPMB_SDA	GND	PERR	GND
16	GND	DEVSEL_	GND	V(I/O)	STOP_	LOCK_	GND
15	GND	VCC3	FRAME_	IRDY_	BD_SEL_	TRDY_	GND
Key 12-14							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2_]	GND
10	GND	AD[21]	GND	VCC3	AD[20]	AD[19]	GND
9	GND	C/BE[3]	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ_	GND	VCC3	CLK	AX[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	PCI_RST_	GND	GNT	GND
4	GND	IPMB_PWR	HEALTHY	V(I/O)	INTP	INTS	GND
3	GND	INTA_	INTB_	INTC_	VCC	INTD_	GND
2	GND	TCK	VCC	TMS	TDO	TDI	GND
1	GND	VCC	-12V	TRST_	+12V	VCC	GND

Table A1-2: P1 Connector Pin Assignments (I/O Slot)

Appendix 1 - Technical Reference

P1 Signal Descriptions

General	VCC	5V power
	VCC3	3.3V power
	+12V	12V power
	-12V	-12V power
	V(I/O)	5V or 3.3V power
	GND	To digital signal ground plane
	PCI_RST_	Master reset
PCI Bus Signals	AD(31:0)	32 bit Address/Data bus
	C/BE(3:0)_	Command/Byte Enable bus
	PAR	Bus parity
	BRSVPxxx	PCI bus reserved signals
PCIbus arbitration signals	GNT0_	Bus grant 0
	REQ0_	Bus request 0
Interrupt Request Signals	INTA_, INTB_, INTC_, INTD_	
PCI Bus transaction control signals	FRAME_	Cycle Frame
	TRDY_	Target Ready
	IRDY_	Initiator Ready
	STOP_	Target/Initiator transaction stop bit
	IDSEL	Initialization Device Select
	LOCK_	Resource Lock bit
DEVSEL_	Device Select	
PCI bus error reporting signals	PERR_	Data Parity Error
	SERR_	System Error
PCI bus speed signals	M66EN	66MHz bus enable
PCI bus clock	CLK0	
System Management Bus	IPMB_SCL	
	IPMB_SDA	
	IPMB_PWR	
64-bit Extension Signals	REQ64_	Request 64-bit Transfer
	ACK 64_	Acknowledge 64-bit Transfer

Appendix 1 - Technical Reference

JTAG/Boundary Scan Signals	TCK	Test Clock
	TDI	Test Input
	TDO	Test Output
	TMS	Test Mode Select
	TRST_	Test Reset
IDE Interrupts	INTP	Primary Interrupt
	(IRQ14)	INTS Secondary Interrupt
	IRQ15)	
Hot Swap compatible signals	ENUM_	System Enumeration
	BD_SEL_	Board Slot Control
	HEALTHY_	Board Healthy

Appendix 1 - Technical Reference

P2 Connector Pin Assignments (System Slot)

Pin #	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND
17	GND	BRSVP2A17	GND	PRST	REQ6	GNT6_	GND
16	GND	BRSVP2A16	BRSVP2B16	DEG_	GND	BRSVP2E16	GND
15	GND	BRSVP2A15	GND	FAL_	REQ5	GNT5	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]	GND	V(I/O)	C/BE[4_	PAR64	GND
4	GND	V(I/O)	BRSVP2B4	C/BE[7_	GND	C/BE[6_	GND
3	GND	CLK4	GND	GNT3_	REQ4_	GNT4_	GND
2	GND	CLK2	CLK3	SYSEN_	GNT2_	REQ3_	GND
1	GND	CLK1	GND	REQ1_	GNT1_	REQ2_	GND

_ = signal is active low

" = signal is not currently used

Table A1-3: P2 Connector Pin Assignments (System Slot)

Appendix 1 - Technical Reference

P2 Connector Pin Assignments (I/O Slot)

Pin #	Z	A	B	C	D	E	Z
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	RSV"	RSV"	RSV"	RSV	RSV	GND
20	GND	RSV"	RSV"	RSV"	GND	RSV	GND
19	GND	RSV"	RSV"	RSV"	RSV	RSV	GND
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND
17	GND	BRSVP2A17	GND	RSV"	RSV	RSV	GND
16	GND	BRSVP2A16	BRSVP2B16	RSV"	GND	BRSVP2E16	GND
15	GND	BRSVP2A15	GND	RSV"	RSV	RSV	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]	GND	V(I/O)	C/BE[4]_	PAR64	GND
4	GND	V(I/O)	BRSVP2B4	C/BE[7]_	GND	C/BE[6]_	GND
3	GND	RSV"	GND	RSV"	RSV	RSV	GND
2	GND	RSV"	RSV"	UNC	RSV	RSV	GND
1	GND	RSV"	GND	RSV"	RSV	RSV	GND

_ = signal is active low

" = signal is not currently used

Table A1-4: P2 Connector Pin Assignments (I/O Slot)

Appendix 1 - Technical Reference

P2 Signal Descriptions

General	V(I/O) GND	5V or 3.3V power To digital ground plane
PCI Bus Signals (64-bit extension)	AD(32:63) C/BE(4:7)_ PAR64 BRSVPxxx	Address/Data bus Command/Byte Enable bus 64-bit Bus parity PCI bus reserved signals
PCI bus arbitration signals	GNT(6:1)_ REQ(6:1)_	Bus grants Bus requests
PCI bus clocks	CLK(6:1)	
Miscellaneous signals	PRST_ DEG_ FAL_ GA(4:0) SYSEN_ 64EN_	Push Button Reset Degrade signal (Power Supply) Supply Fail Signal (Power Supply) Geographic Addressing System slot identification (Grounded at the system slot) 64-bit bus enable

P3, P4, P5 Connectors Pin Assignments (System Slot)

P3, P4, and P5 are used for the purpose of providing access to the rear I/O. There is no connection on the backplane to these connectors at the system slot. The P3, P4, and P5 connector pinouts are unique to the CP1500 Sparc CPU board and described in the SPARCengine CP1500 360MHz/440MHz Technical Reference and Manual, located at the Sparc web site: <http://www.sun.com/microelectronics/SPARCengineCP/1500>

Appendix 1 - Technical Reference

P4 Connector Pin Assignments (Computer Telephony Bus) (I/O Slot)

Pin #	Z	A	B	C	D	E	F
25	NP	SGA4	SGA3	SGA2	SGA1	SGA0	FG
24	NP	GA4	GA3	GA2	GA1	GA0	FG
23	NP	+12V	CT_Reset_	CT_EN_	-12V	CT_MC	FG
22	NP	RSV	RSV	RSV	RSV	RSV	FG
21	NP	-SELVbat	RSV	RSV	RSV	SELVBatRtn	FG
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	VRG	NP	NP	NP	VRGRtn	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	-Vbat	NP	NP	NP	VBatRtn	NP
Key 12-14							
11	NP	CT_D29	CT_D30	CT_D31	V(I/O)	CT_FRAME_A_	GND
10	NP	CT_D27	VCC3	CT_D28	VCC	CT_FRAME_B_	GND
9	NP	CT_D24	CT_D25	CT_D25	GND	FR_COMP_	GND
8	NP	CT_D21	CT_D22	CT_D23	VCC	CT_C8_A	GND
7	NP	CT_D19	VCC	CT_D20	GND	CT_C8_B	GND
6	NP	CT_D16	CT_D17	CT_D18	GND	CT_NETREF_1	GND
5	NP	CT_D13	CT_D14	CT_D15	VCC3	CT_NETREF_2	GND
4	NP	CT_D11	VCC	CT_D12	VCC3	SCLK	GND
3	NP	CT_D8	CT_D9	CT_D10	GND	SCLKx2	GND
2	NP	CT_D4	CT_D5	CT_D6	CT_D7	GND	GND
1	NP	CT_D0	VCC3	CT_D1	CT_D2	CT_D3	GND

_ = signal is active low

Table A1-5: P4 Connector Pin Assignments (Computer Telephony Bus)
(I/O Slot)

Appendix 1 - Technical Reference

P4 Signal Descriptions (Computer Telephony Bus)(I/O Slot)

General	VCC	5V power
	VCC3	3.3V power
	V(I/O)	5V or 3.3V power
	+12V	12V power
	-12V	-12V power
	GND	To digital signal ground plane
	FG	To chassis (frame) ground
	SGA(4:0)	Shelf enumeration bus signals
	GA(4:0)	Slot ID signals; not bussed
	RSV	Reserved pin
	NP	Pin and pad to Not be Populated
H.110 TDM Bus (Computer Telephony)	CT_Dxx	H.110 TDM bus signals (8Mfpbs)
	CT_C8A	8.192 MHz data clock
	CT_C8_B	Redundant 8.192 MHz data clock
	CT_FRAME_A_8	kHz frame clock
	CT_FRAME_B_	Redundant 8kHz frame clock
	CT_NETREF_1	8kHz, 1.544MHz or 2.048MHz telecom network timing reference
	CT_NETREF_2	Secondary 8kHz,1.544MHz or 2.048MHz telecom network timing reference
	CT_MC	2Mbps message channel
	FR_COMP_	8kHz SCbus compatibility frame clock
	SCLK	8.192MHz SCbus compatibility data clock
	SCLKx2	Skewed 8.192MHz SCbus compatibility data clock
CT_EN_	Logical equivalent of the CPCI signal BD_SEL_ on P1	
CT_Reset	Reset for use by CT Front Cards that do not populate P1	

Appendix 1 - Technical Reference

Telecom Power Bus	-Vbat	Telecom power source
	VbatRtn	Telecom power source return
	-SELVbat	Short loop battery (voltage within SELV limits)
	SELVbatRtn	Short loop battery return (voltage within SELV limits)
Telecom Ringing Bus	VRG	Bussed ringing voltage
	VRGRtn	Bussed ringing voltage return for VRG

Appendix 2 - Glossary of Terms

B

backplane: A device inside the chassis that contains slots, or sockets, for plugging in I/O cards or cables.

bidirectional parallel port: An eight-bit port that can be used as an input as well as an output device.

bus: One or more electrical conductors that transmit power or data to the various sections of a computer or any common pathway between hardware devices. A computer bus connects the CPU to its main memory and the control units of peripheral devices.

C

card cage: A cabinet or metal frame that holds printed circuit cards.

CMOS (Complementary Metal Oxide Semiconductor): A technology of arranging transistors on a semiconductor which uses very low power.

D

disk access LED: The LED located on the front control panel that indicates when the hard disk drive is active.

DRAM (Dynamic Random Access Memory): A type of computer memory that needs to be refreshed by a memory controller or it loses its information.

drive bay: Area in the chassis where drives are mounted.

E

electrostatic discharge (ESD): A sudden uncontrolled movement of accumulated electrical charge from one location to another. Voltage potentials and discharge currents associated with ESD can damage many types of electronic components used in computers. ESD prevention methods should always be employed when servicing computer hardware.

Appendix 2 - Glossary of Terms

EMI (ElectroMagnetic Interference): Noise generated by the switching action of the power supply and other system components. Conducted EMI is interference generally conducted into the power line, and is normally controlled with a line filter. Radiated EMI is that portion that radiates into free space, one way to suppress it is by enclosing circuitry in a metal case.

EPROM (Erasable Programmable Read Only Memory): A programmable device which stores information regardless of power.

expansion card: A printed circuit board that plugs into an expansion slot.

F

floppy drive: A device for reading information from or writing information to external, portable computer disks called floppy disks.

front control panel: The small panel on the front of the computer that usually contains one or more of the following: power switch, reset switch, Power ON LED, disk access LED, keyboard connector, status display, etc.

H

hard drive: A non-volatile data storage device. Hard drives magnetically store computer data on spinning internal disks.

I

IDE (Integrated Drive Electronics): A standard protocol for signalling and communicating with a hard drive, CD-ROM drive, or other peripheral device.

I/O card: A printed circuit board that plugs into an I/O slot.

I/O slot: A slot for plugging in additional I/O cards to expand the capability of a computer.

Appendix 2 - Glossary of Terms

ISA: The original IBM/PC expansion bus standard released into the public domain by IBM..

K

keyboard connector: The connector through which keyboard signals are input to a computer.

kilobyte (KB): 1,024 bytes.

L

LED: Light Emitting Diode. Long-lasting light emitters usually used as indicators.

load board: A board having specific power load characteristics which are typically used for testing.

P

parallel port: I/O connector used to hook up a printer or other parallel interface device. The parallel port is usually a 25-pin female DB25 connector.

PCI(Peripheral Component Interconnect): A PC expansion bus standard maintained by the PCI Special Interest Group, a consortium of industrial partners..

port: Ports are used to connect peripheral devices such as external drives and printers to your computer.

power good: A logic signal used to indicate that DC output from a PC power supply has stabilized. The power good line switches from 0 to +5 volts within one tenth to one half second after the power supply reaches normal voltage levels. Whenever output voltage is out of normal operating range for any reason, the power good signal goes back to zero.

power ON/diagnostic LED: The LED located on the front control panel that indicates that power is applied to the computer.

power supply: Electrical system that converts AC or DC source power into the lower level DC power required by the computer circuitry. In a personal computer, 3.3, +5, -5, +12 and -12 voltages are generated by the system power supply.

Appendix 2 - Glossary of Terms

power switch: The power switch turns main source power ON/OFF to the computer. It is usually located on the front computer panel or the rear panel near the input power cable.

R

RAID (Redundant Arrays of Independent Disks): A storage technology using an array of two or more disks to redundantly store information. If one disk fails in a RAID array, the unit continues to function without loss of data.

RAM (Random Access Memory): The memory used to execute applications while your computer is turned ON. When you turn your computer OFF, all data stored in RAM is lost.

real-time clock (RTC): A periodic interrupt used to derive local time.

reset switch: Button or key that reboots the computer. All current activities are stopped and any data in memory is lost.

S

SCSI (Small Computer System Interface): A high speed, general purpose interface to storage devices.

serial port: A two-channel port, one channel used for "In" transmissions and one for "Out" transmissions.

W

watchdog timer: A device that monitors CPU activity and resets the CPU when no activity is detected for a user specified period.

Appendix 3 - Limited Warranty

LIMITED WARRANTY

I-Bus/Phoenix warrants this product to be free of defects in material and workmanship for an initial period of two (2) years from date of delivery to the original purchaser from I-Bus/Phoenix.

During this period, I-Bus/Phoenix will, at its option, repair or replace this product at no additional charge to the purchaser, except as set forth in this warranty agreement.

I-Bus/Phoenix will, at its option, repair or replace this product at no additional charge to the purchaser, if the defect is related to the I-Bus/Phoenix manufactured product, such as power supply, backplanes, other chassis components, or CPUs. I-Bus/Phoenix is not liable for any defects in material or workmanship of any peripherals, products or parts which I-Bus/Phoenix does not design or manufacture. However, I-Bus/Phoenix will honor the original manufacturer's warranty for these products.

I-Bus/Phoenix will analyze the defective component and the customer will be charged in the following instances:

- No problem found: \$75 (U.S. dollars).
- Damage: parts and labor at \$75 per hour with a \$100 minimum charge (U.S. dollars). Receipt of damaged goods voids the I-Bus/Phoenix warranty.

Repair parts and replacement products will be furnished on an exchange basis and will be either new or reconditioned. All replacement parts and products shall become the property of I-Bus/Phoenix, if such parts or products are provided under this warranty agreement. In the event a defect is not related to the I-Bus/Phoenix manufactured product, I-Bus/Phoenix shall repair or replace the defective parts at purchaser's cost and deliver the defective parts to the purchaser.

This Limited Warranty shall not apply if the product has been misused, carelessly handled, defaced, modified or altered, or if unauthorized repairs have been attempted by others.

The above warranty is the only warranty authorized by I-Bus/Phoenix and is in lieu of any implied warranties, including implied warranty of merchantability and fitness for a particular purpose.

In no event will I-Bus/Phoenix be liable for any such damage as lost business, lost profits, lost savings, downtime or delay, labor, repair or material cost, injury to person or property or any similar or dissimilar consequential loss or damage incurred by purchaser, even if I-Bus/Phoenix has been advised of the possibility of such losses or damages.

In order to obtain warranty service, the product must be delivered to the I-Bus/Phoenix facility, or to an authorized I-Bus/Phoenix service representative, with all included parts and accessories as originally shipped, along with proof of purchase and a Returned Merchandise Authorization (RMA) number.

The RMA number is obtained, in advance, from I-Bus/Phoenix Customer Service Department and is valid for 30 days. The RMA number must be clearly marked on the exterior of the original shipping container or equivalent. Purchaser will be responsible and liable for any missing or damaged parts. Purchaser agrees to pay shipping charges one way, and to either insure the product or assume the liability for loss or damage during transit. Ship to:

I-Bus/Phoenix

ATTENTION: RMA REPAIR DEPT.

RMA ####

8888 Balboa Avenue

San Diego, CA 92123

Appendix 3 - Limited Warranty

This page was intentionally left blank

Appendix 4 - FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

WARNING: This equipment has been tested and found to comply with the limits for a Class "A" digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This product was FCC verified under test conditions that included the use of shielded I/O cables and connectors between system components. To be in compliance with FCC regulations, the user must use shielded cables and connectors and install them properly.

Appendix 4 - FCC Information

This page was intentionally left blank