June 2000 – Subject to Change

Please, try to not print on paper this file - Save the planet !

RIORED PPC
Product Brief   Rev. 0.7

**By offering high performance, the RIORED motherboard provides an
easy, cost-effective solution for companies developing high-performance
products with LINUX and other operating systems running with Power PC microprocessors familly.**

**RIORED motherboard is designed to use standard PC components such as synchronous DRAM (SDRAM) DIMMs and
PCI 32/64-Bits option cards.
The RIORED offers four PCI 32-Bits/33MHz and two PCI 64-Bits/66MHz slots, one AGP slot, two IDE ports (Ultra-DMA
66), four USB ports, and four PC-100 SDRAM DIMMs providing access to up to 1 gigabytes of high bandwidth
interleaved memory. The mainboard contains the IBM CPC710 chipset (north bridge) and the AMD VIPER chipset
(south Bridge).
The CPC710 interfaces to the CPUs, main memory, FLASH memory and the AGP and PCI buses.
The VIPER interfaces to the IDE & USB ports, the RTC, Timers and INTerrupts engine, and the Power Management
system.
The CPU is not on the mainboard, but on a daughterboard by a SLOT1 type connector. RIORED has two of these
connectors. One or two daughtercards may be used for uni-processor or dual-processor (SMP) configurations.**

**In the early version of RIORED, each daughtercard contains a 550 MHz PowerPC G3cx microprocessor 'SideWinder'
from IBM. In the next versions, the clock frequency of the G3cx may be increased up to 700 MHz.**

Hardware Features

- RIORED mainboard supports one or two daughtercards.
Each daughtercard contains one PowerPC G3cx microprocessor operating at a speed of 550 MHz.
- 64MB to 1GB memory by four interleaved sockets (used 2 by 2) consisting of 64 or 72-Bits (ECC) unbuffered SDRAM
168pins DIMMs.
- Memory speed support of 100MHz (PC-100) for up to 800MB/s.
- 512KB of FLASH memory for the BIOS and SETUP.
- Four 33MHz PCI-32 (32-Bits) slots with BURST transfers at 133MB/s.
- Two 66MHz/3.3V PCI-64 (64-Bits) slots with BURST transfers at 528MB/s.
- AGP (3.3V) bus support with onboard DMA capabilities.
- PCI IDE for four devices (Ultra-DMA 66).
- PCI USB for four onboard ports (1.5 & 12Mb/s).
- I2C port to pilot a front panel LCD to show the system information.
- I2C port for geeks.
- Time-of-year clock & NVRAM (256Bytes) with 3V lithium battery.
- Interrupt management with clear distribution (not shared int lines).
- Power management with wake up capability from USB events (keyboard/modem) and PCI cards (Ethernet).
- Ambiant thermical sensor.

Software Features

The BIOS is a program located on a Flash ROM on the motherboard. It can be modified only with a specific software. It is
also referred to as the boot program. Its main function is to initialise the hardware, to setup the motherboard and interface
cards parameters and to launch the operating system. It provides also system functions which can be called by an
operating system to deal with the hardware.

Bios working steps

- Initialisation of the chips (cpu(s), bridges) & pci bus.
- Quick memory test (check only what memory is onboard)
- Installation of the I2C driver to handle the lcd screen
- Install PS/2 Keyboard & mouse drivers
- Get information from the PCI cards
- Video card(s) initialisations
- Display Logo (on each screen)
- Test memory
- Install IDE / SCSI driver
- Install NE2000 driver
- Get IDE / SCSI hard disk(s) info
- Display info
- Display setup
- Install system calls
- Load MBR from boot disk to memory / Boot from network
- Execute MBR program

Main features

- Supports Intel PCI 2.1 specification
- Supports APM specification
- Boots from IDE / SCSI / ZIP device
- Boots from NE2000 PCI ethernet card
- Graphical setup program
- Displays information on I2C LCD screen

Setup program features (very incomplete)

- Choose boot disk / disks order
- Set Date / Time
- Cache memory configuration
- Enable / Disable USB
- AGP Aperture Size
- Power Management Setup
- PCI Setup (Busmaster / IRQ)
- Password Setup

Basic drivers

These drivers supply low level functions which can be called by operating systems, they give access to some peripherals
:

- PS/2 keyboard & mouse driver
- Disk driver (enumeration, format, read, write tracks)
- PCI functions (cards enumeration)
- Video driver (supports standard vesa modes)
- I2C driver
- RTC functions
- APM functions

We've thought about a cool and funny (and absolutely useless) feature : if there's no boot disk and no network card, the bios could run a small built-in basic language !