

## C.3.5 DIMM Configurations

TABLE C-3 describes supported DIMM memory configurations for the Sun Blade 1500 workstation.

TABLE C-3 Sun Blade 1500 Workstation Supported DIMM Configurations

SDRAM Organization	Number of DRAMs	Physical Bank per DIMM	Module Configuration	DIMM Capacity	Minimal Memory	Maximum Memory
128Mbit (32Mx4)	18	1	32Mx72	256MB	512MB	1GB
128Mbit (16Mx8)	18	2	2x(16Mx72)	256MB	512MB	1GB
256Mbit (32Mx8)	9	1	32Mx72	256MB	512MB	1GB
256Mbit (64Mx4)	18	1	64Mx72	512MB	1GB	2GB
256Mbit (32Nx8)	18	2	2x(32Mx72)	512MB	1GB	2GB
512Mbit (64Mx8)	9	1	64Mx72	512MB	1GB	2GB
512Mbit (128Mx4)	18	1	128Mx72	1GB	2GB	4GB
512Mbit (64Mx8)	18	2	2x(64Mx72)	1GB	2GB	4GB
1Gbit (256Mx4)	18	1	256Mx72	2GB	4GB	8GB
1Gbit (128Mx8)	18	2	2x(128Mx72)	2GB	4GB	8GB

## C.3.6 Memory Interleaving

The UltraSPARC IIIi supports four interleaving modes:

- Bank
- Rank
- DIMM
- XOR

### C.3.6.1 Bank Interleaving

Bank interleaving is interleaving within a single device on a DDR1 SDRAM. Each DDR SDRAM used by the workstation contains 18 devices.

### C.3.6.2 Rank Interleaving

Rank interleaving is interleaving between a pair of memory devices on a single DIMM. Each DDR SDRAM used in by the workstation contains 18 devices, nine on one half and nine on the other half. To perform rank interleaving, one discrete device on the left half of the memory module must pair with its adjacent memory module on the right half of the module.

### C.3.6.3 DIMM Interleaving

DIMM interleaving is interleaving between pairs of DIMMs. Interleaving between DIMMs can be done only if all four DIMMs are the same. If the pairs are different, it is still possible to interleave external banks (in double bank DIMMs) and internal banks.

For maximum interleaving performance all DIMMs need to be the same Sun part number.

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**Note** – There are no constraints for bank or rank interleaving within the same pair.

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TABLE C-4 shows the different interleaving modes supported based on the DIMMs used.

TABLE C-4 Interleaving Modes

DIMM Pairs	DIMM Type	Interleaving Mode Support
1	Single bank	Bank
1	Dual bank	Bank/rank
2	Diff, single-single	Bank
2	Diff, single-double	Bank/rank, bank/rank
2	Diff, double-double	Bank/rank, bank/rank
2	Same, single-single	Bank/DIMM
2	Same, single-double	Bank/DIMM/rank (on double)
2	Same, double-double	Bank/DIMM/rank

### C.3.6.4 XOR Interleaving

The Sun Blade 1500 workstation also supports a fourth interleaving mode called XOR interleaving. This interleaving mode is used to distribute L2 cache conflict misses and L2 cache read/writeback pairs across more banks.

To use XOR interleaving, all DIMMs must be identical. XOR interleaving is a special case that is not described in [TABLE C-4](#).

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## C.4 Internal Interfaces

This section discusses system buses and interfaces that are on the motherboard:

- “JBus and JIO” on page C-15
- “PCI Bus and ASICS” on page C-17
- “Graphics Accelerators” on page C-20
- “Other Buses” on page C-27

### C.4.1 JBus and JIO

#### C.4.1.1 JBus Information

JBus is a 128-bit MUX address and data bus running at 200MHz SDR with approximately 171 DTL signals. JBus is a multidrop with a peak bandwidth of 2.56GB/s@200MHz. JBus can insert a dead cycle between transactions of 2 different masters if needed. The bus supports two loads — the UltraSPARC IIIi processor and the JIO I/O bridge.

#### *Key Features*

The following are the key features of JBus:

- Simple SMP protocol that is SPARC-V9 and Sun4u correct, high performance for 1-4 CPUs
- 128-bit wide bus
- Full duplex shared multidrop bus up to four loads
- DTL driver/receiver technology
- Snoopy MOESI protocol