SKYbolt Family

- i960® Processor Handles Interrupts and I/O
- Four i860™ Processors in a Single 6U VME Slot Provides 320 MFLOPS of Processing Speed
- 16 i860 Processors in a Single 9U VME Slot Provides 1.28 GFLOPS of Processing Speed
- 16/64 Mb of Memory Per Daughtercard Can be Shared or Distributed
- i860 Processors Can Operate as a Cluster of Four or Can Operate Independently
- Barrier Synchronization Registers Provide Processor Synchronization With No Impact to Memory
- Easy to Use SKYvec Software Development Environment Speeds Development Time
- SKYvec Includes Automatic Vectorizing and Parallelizing C, FORTRAN and Ada Compilers
- Synchronization is Handled Transparently; Simply Compile and Execute Your Program

The SKYbolt family includes motherboards in 6U and 9U form factors. The 6U can be configured with a single daughtercard; the 9U with up to four daughtercards. An i960 superscalar processor chip located on the motherboard manages all I/O tasks, freeing the i860 processors for their role as compute processors. The i960 processor is optimized to handle these operating system and I/O functions, and the compute power of the i860 processors is focused on solving the application problem.

SKY adds a 256 Kb SRAM used as zero-wait-state RAM and a 512 Kb Flash RAM for non-volatile storage of configurable boot code. This configuration makes the i960 processor ideal for system-level tasks. It quickly fields all interrupts and informs an i860 processor only when there is a task for that i860 processor. This quick interrupt response enables effective scheduling of the SKYmpx real-time executive. The bulk of the operating system is provided by the i960 processors, freeing the i860 processors to run more efficiently with a small kernel.

One of the key advantages of the i960 processor is the powerful I/O interface it provides. Because it is a programmable device rather than simple DMA hardware, it can execute a repetitive list of I/O operations. The I/O list is created in the i860 processor application and downloaded to the i960 processor at runtime. The I/O list can include long, short, or variably sized blocks. Adding conditional branches provides different transfers based on the data received. The user programs only the i860 processor – the i960 processor orchestrates variable asynchronous, overlapped I/O concurrent with the i860 processing.

SKYbolt daughtercards are available in two basic configurations. The uni-processor daughtercard has a single i860 processor and up to 8 Mb of SRAM or 16 Mb of DRAM. The Shamrock daughtercard is configured with four i860 processors and either 16 or 64 Mb of DRAM.

Shamrock Daughtercard
The Shamrock daughtercard contains four i860 processors and 16 or 64 Mb of memory. The memory is divided into four banks that can either be shared among all four processors or distributed one bank per processor. The SKYcrossbar provides a 64-bit, 160 Mb/sec. pathway between each processor and each memory bank for an aggregate processor to memory bandwidth of 640 Mb/sec. per Shamrock daughtercard.

SKY's exclusive Parallel Compute Cluster Architecture* allows all four processors to work in parallel on the same problem. The data is automatically striped across the four memory banks. Performance is maintained during processor-to-processor synchronization by using hardware-based Barrier Synchronization Registers for memory-based semaphores.

All four processors run a single program together efficiently, with nearly linear speedup.

Shamrock processors, the SKYcrossbar and memory are implemented with a uniform memory access architecture, giving each processor a linear address range for all four banks of memory and equal access to each bank. This advanced design gives the Shamrock the highest processing density, the greatest programming flexibility and the highest performance available in a single slot today.

HOST SYSTEMS SUPPORTED:
VME-based computing systems

PROCESSORS SUPPORTED:
i960 KA Processor

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