

Heterogeneous SKYchannel-based System Uses PowerPC and SHARC Processors in 58 GFLOP Radar Subsystem

SKY Computers, Inc. has been chosen by PIT, the Telecommunications Research Institute, in Warsaw, Poland to supply the rugged signal processing subsystems for PIT's new mobile 3D radar systems. The first system, configured with 180 processors, delivers compute performance of 58 GFLOPS using SKY's SHARC-based SHARCpool and PowerPC-based Excalibur. The 6U rugged system includes 7 SHARCpools and 32 Excaliburs.

PIT is building next-generation ground-based mobile radar systems capable of longrange 3D surveillance. Designed as a C3I system, the TRD-1211 radar automatically detects and tracks objects up to 350 km in range and 40 km in altitude. The radar's three main electronic equipment units, the transmitter container, antenna unit, and operational container are carried on a flat bed truck. The antenna can be folded down and dismounted for alternate transportation. Eight separate receiving antenna beams with low-level sidelobes, sophisticated signal processing with adaptive MTI systems, pulse compression, post detection filtration of tracks provide effective operation in the presence of jamming.

Early in their design process PIT decided to use a commercial-off-the-shelf signal processing subsystem. PIT's evaluation criteria included: feasibility of a real-time implementation, prospect for a long-term relationship with the selected supplier and cost. The evaluation team considered only products available on the market today. According to Mr. Jacek Majewski, senior research engineer, "The SKYchannel solution is a simple and elegant solution which we estimate will give the higher level of successful implementation. The solution overcomes at least two apparent bottlenecks in competing architectures, one in the distribution of data among processing elements, the other with the memory bandwidth at the node responsible for processing detections."

Mr. Michael Drake, director of SKY's European operations observes, "Such



technology transfers to the formerly Soviet block country of Poland would have been forbidden just a few years ago. SKY is well positioned to supply these kind of systems to large programs throughout the world."

SKYchannel

The SKYchannel 320 MB/sec 64-bit Packet Bus is an ANSI standard (ANSI/VITA 10-1995) for high performance communication over VME P2. Since August of 1994 over 1,000 SKYchannel systems have been shipped to leading defense industry and medical equipment suppliers for high performance image and signal processing applications.

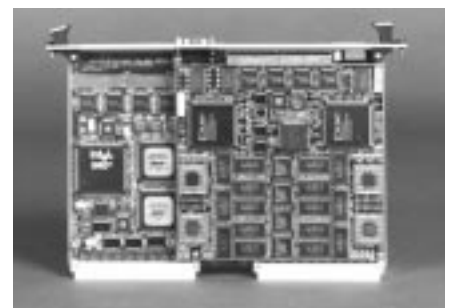
SKYchannel provides high performance communication between daughtercards and motherboards, between boards, and between chassis for truly scalable multiprocessing. Up to 256 VME boards in multiple chassis can be connected in a single SKYchannel system. When used with SKY compute daughtercards, SKYchannel enables thousands of PowerPC, SHARC, or Intel i860 microprocessors to work together in a Distributed Shared Memory Architecture.

SHARCpool

The 12 processor SHARCpool compute daughtercard delivers a powerful 1.44 GFLOPS of DSP performance. One SHARCpool on a 6U motherboard delivers 1.44 GFLOPS, four SHARCpools on a 9U SKYbolt II motherboard deliver 5.76 GFLOPS. SKY's architecture provides scalability up to 256 boards of 12,288 processors in a single system.

Excalibur

Excalibur is based on the new PowerPC 740 microprocessor and is configured with four PowerPC 740 microprocessors and up to 256 MB DRAM. A single Excalibur on a 6U VME motherboard delivers 2 GFLOPS of performance. Four Excaliburs on a 9U VME motherboard deliver 8 GFLOPS, with total performance in a single VME chassis of 128 GFLOPS. The key to accessing this superior processing performance is the PowerPC 740 microprocessor's memory access rate of 83.3 MHz at 64-bits wide.



The combination of 2 GFLOPS and 2.66 GB/sec makes Excalibur ideal for very demanding image and signal processing applications such as radar, sonar, medical imaging, and image analysis.

SKY Computers is on the web at: <http://www.sky.com>.