



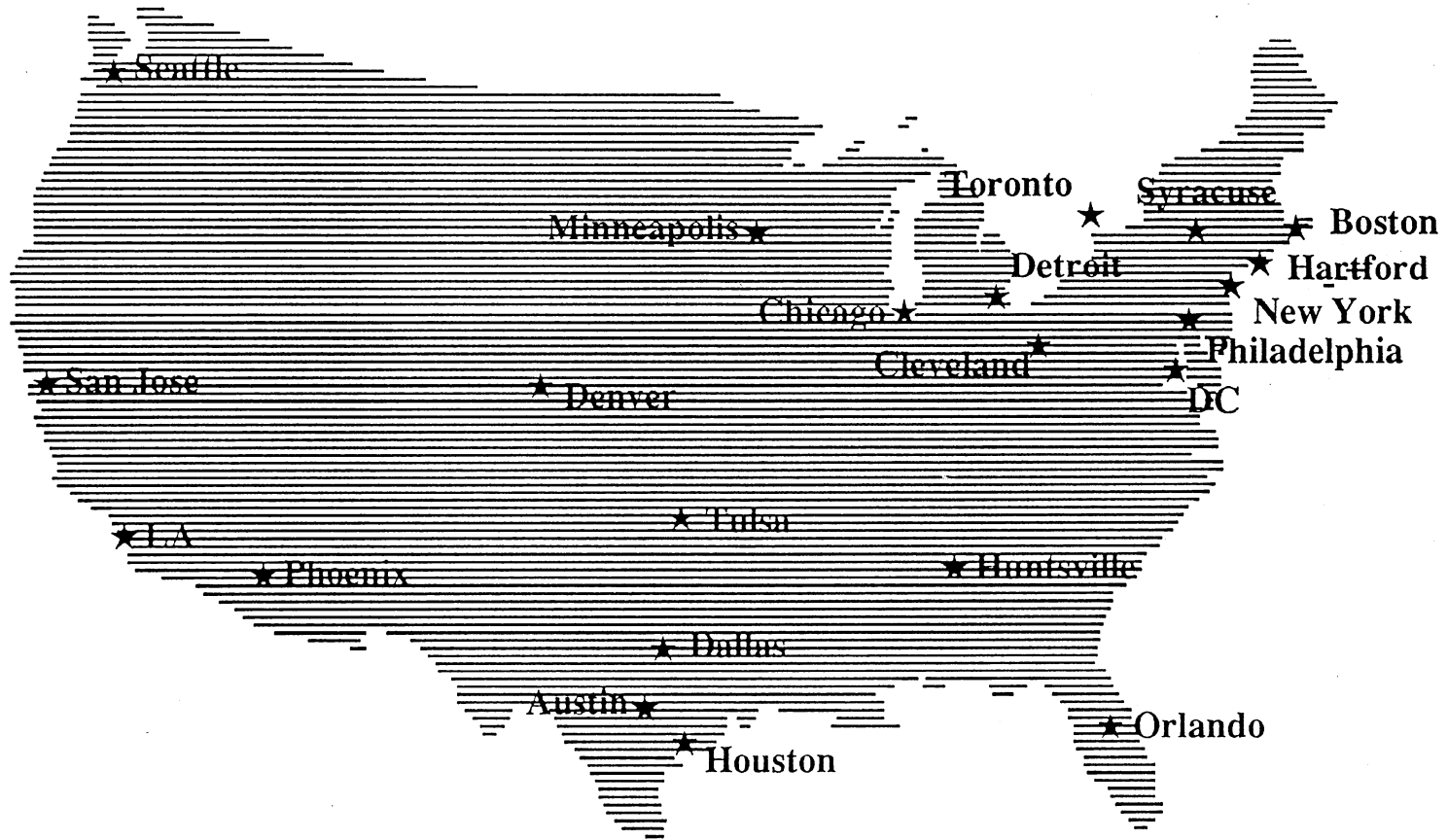
Corporate Overview

Solbourne Background

- **Founded 1986 by Douglas MacGregor**
 - **A principal designer of MC 68020**
- **Over \$50 million committed to date**
- **250+ employees**
- **Facilities in Longmont, Colorado**

Solbourne Sales Offices

Offices Throughout the U.S.



Solbourne Strategy

Requirements for Solbourne's success:

- **Compatibility** *to open doors*

- **Excellent price/performance** *to create initial sales opportunities*
- **Broad product line**

- **Quality**
- **Reliability** *to create brand preference*
- **Service** *to create customer loyalty*
- **Support**

Customer Loyalty is a Prerequisite for Success



Solbourne-Sun Compatibility

Hardware

- SPARC* CPU
- Compatible frame buffer

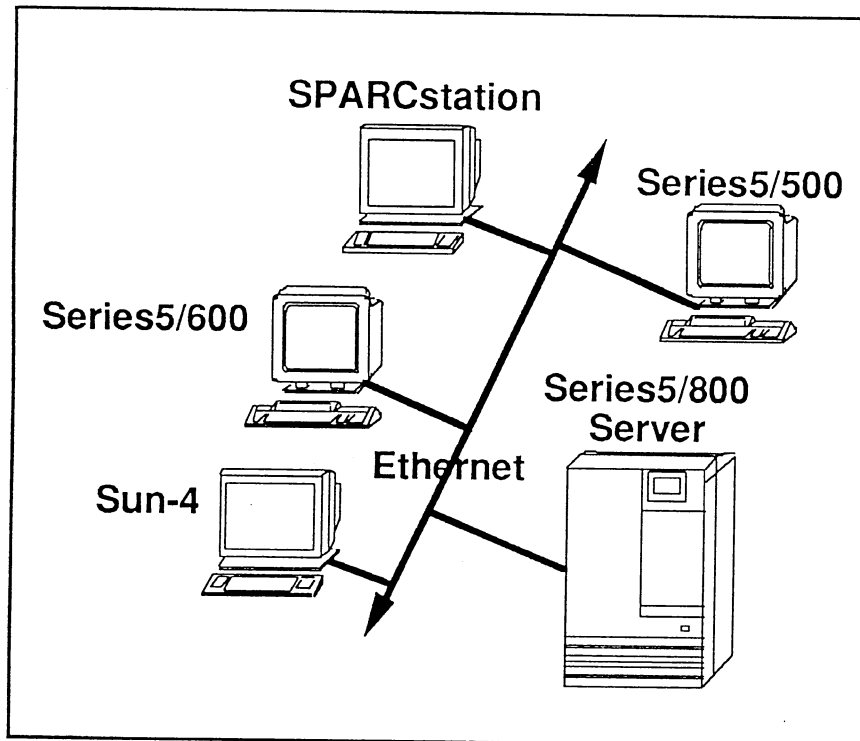
Software

- OS/MP (derived from SunOS*)
- Pixrects* (low level graphics library)
- SunView*, NeWS*, X Window System
- SunTools*
- TCP/IP
- ONC*, NFS*
- C* and Fortran*

* licensed from Sun Microsystems



Compatibility



- **Binary compatibility**
 - No modification or porting required
- **Network compatibility**
 - Look like a Sun-4 to network
 - Share data & application libraries
- **Solutions Catalog, 3rd Edition**
 - 300+ applications from 130 vendors
 - Hardware products from 3rd parties

Human Compatibility

- **Same user interface—SunView, SunTools, etc.**
- **Documentation—Familiar Sun format and contents, but adapted to the Solbourne platform**
- **Same keyboard layout: (both engineering (Type 3) and PC (Type 4) keyboards available; same mouse**

No conversion or retraining is required



Strategic Alliance

Electronics manufacturing giant
Matsushita Electric Industrial Co., Ltd.

Panasonic

Quasar

Technics

- World's 19th largest corporation—
revenues US \$39.3 billion* in fiscal year ended
March, 1989
- Largest Japanese electronics manufacturer
- World's ninth largest
semiconductor manufacturer

* \$1 = ¥140



Solbourne—A New Approach

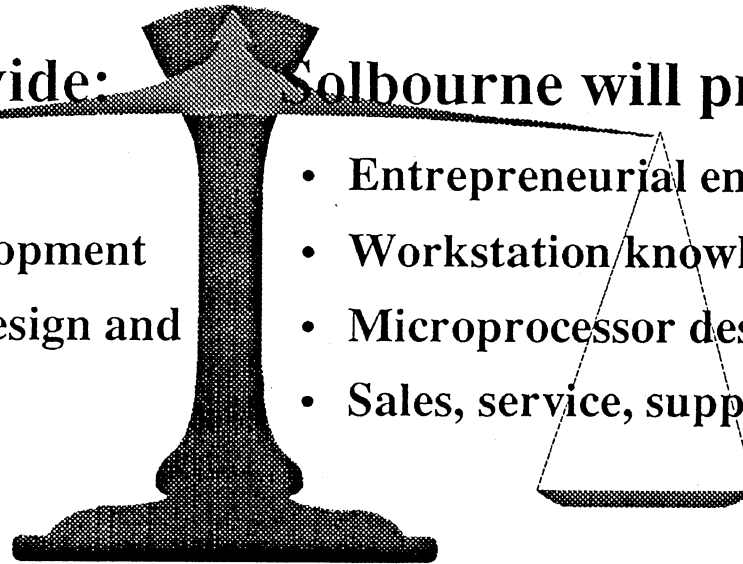
A Balanced Partnership

Matsushita will provide:

- Access to technology
- Joint engineering development
- Custom SPARC chip design and manufacturing
- Manufacturing support
- Financing

Solbourne will provide:

- Entrepreneurial environment
- Workstation knowledge
- Microprocessor design knowhow
- Sales, service, support base



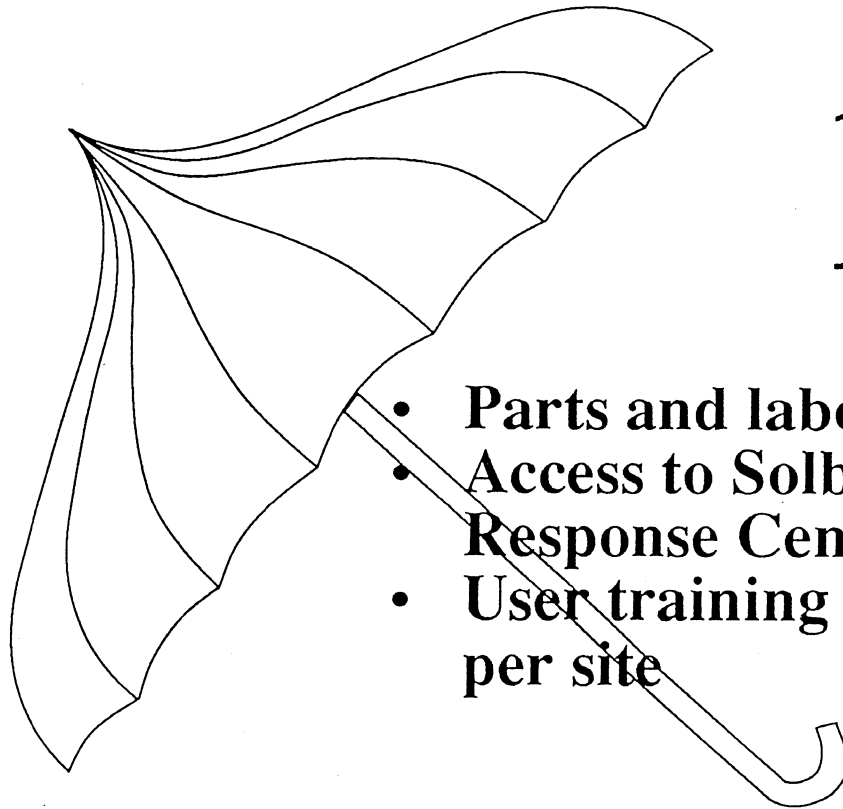
Quality, Reliability

- Quality designed into products
- Japanese manufacturing expertise
- Custom SPARC chip means fewer parts, greater reliability
- One year warranty & support

$$\begin{array}{ccccccc} & \textit{Quality} & & & & & \textit{Brand} \\ & + & & & & & \textit{Preference} \\ \textit{Reliability} & + & \textit{Customer} & = & \textit{Satisfaction} & = & + \\ & + & & & & & \textit{Loyalty} \\ \textit{Good Service \& Support} & & & & & & \end{array}$$



Parasol Protection Program



1 year

- **Parts and labor**
- **Access to Solbourne User Response Center (SOURCE)**
- **User training for two persons per site**



UNIX[®]

Today!

017 APRIL 17, 1989

The Newspaper For The UNIX User Community

A CMP Publication

Solbourne: An Early 'A'

BY ANN SUSSMAN

Newton, Mass.—The first multiprocessing Sun-workalike appears to be quietly gaining—and pleasing—early customers.

In a random survey by *UNIX Today!*, users and beta testers of the Series4 workstation from Solbourne Computer give it high marks for performance, price and responsive servicing.

Many respondents said they decided to test out Solbourne's Sun-compatible wares because of their relatively low prices. In addition, the users were particularly pleased that the four-month-old Series4/600 delivers on its promise of bug-free software compatibility with Sun platforms.

"This is completely binary-compatible with Sun—it looks, walks and talks like the SunOS," said Dr. Ed Marshall, a University of Pennsylvania researcher who is using the Series 4/600 as a network server.

"The Solbourne price/performance is better than Sun, which doesn't have a multiprocessor capability yet, and won't have one for at least a year. And their service is excellent," added Marshall.

Marshall uses a dual-SPARC processor Series4/600 on a large network in the lab that needed "a lot of computing muscle." He first turned to the SPARC-based computer from Solbourne because it was "well enough ahead" of comparable DEC and Sun platforms on a MIPS/dollar rating.

The reports on the Solbourne products—which emulate earlier Sun products, not those introduced

last week—come as Sun has been trying to spur the creation of a Sun clone market. To that end, Sun this year licensed its key software and chip components to outside vendors.

Despite Sun's best efforts, skepticism about the desirability of using Sun clones does persist.

"Why fool around with an imitation if you can get the original?" asked consultant Len Yencharis, voicing a sentiment heard several times at UniForum recently.

Tom Hagen, president of Camex, a Sun OEM that tailors workstations for some major metropolitan newspapers, also indicated he is hesitant to try out the Solbourne wares. "I'm aware they're out there," he said, "but we'd be reluctant to be a pioneer.

However, other computer end users and resellers said the price/performance of the Solbourne machines was too compelling to ignore.

A single-SPARC Solbourne costs about \$37,800 with a monitor and some 16 Mbytes of RAM; with a 327-Mbyte hard disk, it's about \$45,400. Those figures are some 25 percent below a comparable single-CPU Sun-4, and the Solbourne can take on an additional three SPARC chips should users eventually require them.

A four-processor Series4 comes in at \$65,000 with monitor.

"We're under strong budgetary constraints, and have a strong demand for power, so we're willing to take a risk," said Dr. Scott Leadly, a senior systems analyst at the University of Rochester, who turned to Solbourne for a server for the school's computer center.

Brian Hinel, UNIX software engineering manager at supercomputer builder ETA Systems, turned to a three-CPU Solbourne when the firm needed a central-file server on a network with 70 diskless Suns.

"My guess is I'll save \$200,000 by buying one Solbourne server instead of buying two Suns" to perform the same function, Hinel said. "Plus, I reduce my network administration. Less servers mean less administration problems."

Hinel, too, commended Solbourne on its willingness to respond to customer needs. "It's like going back 10 years and finding a computer company that's like a full-service gas station," Hinel said.

That Solbourne, of Longmont, Colo., is 52 percent owned by the Matsushita appears to have calmed many users' fears about the dangers of dealing with a startup.

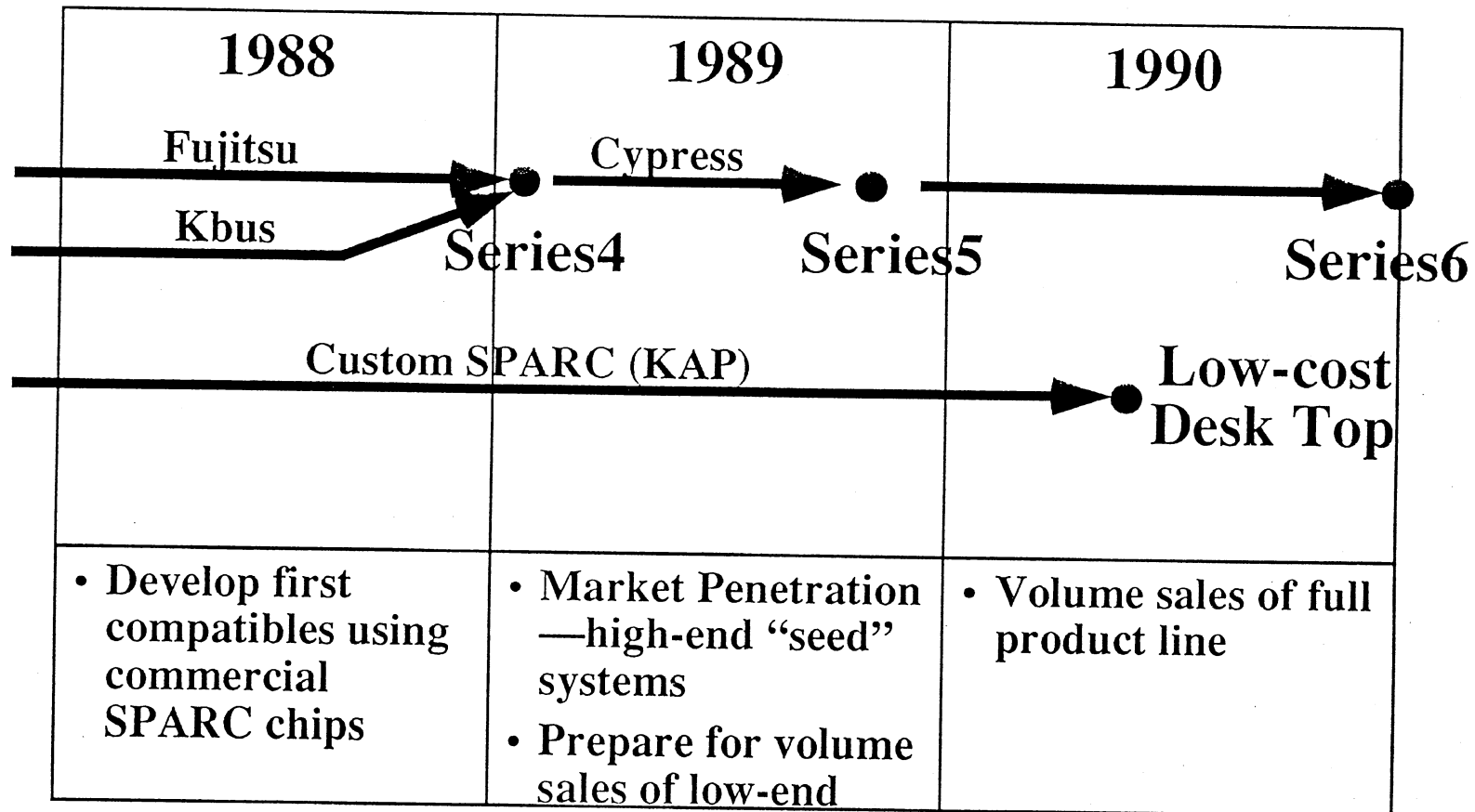
"That's why we decided their being a small company wasn't a handicap, since it's clear Matsushita is willing to sink more money [into the operation] to stay at the leading edge," said the University of Rochester's Leadly.

In the midst of the positive reviews, users mentioned a few items that could stand improving.

Dr. Scott Lamson, of General Electric's research division, in Schenectady, N.Y., said his Solbourne workstation, used for solving computational physics problems, "works just fine," but "it seems like networking isn't as fast" as on an earlier Sun platform.

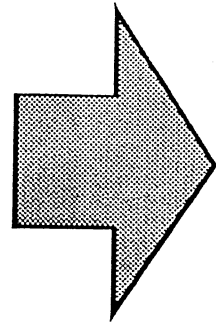
"The documentation, the pages and layout isn't as flashy or quite as smooth as Sun's," reported J.R. Jesson, software manager at Merit Technology, a defense contractor in Plano, Texas.

Solbourne Product Strategy

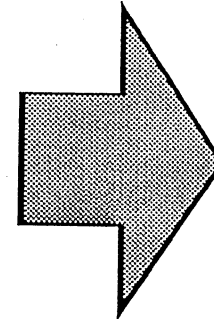


Field Upgradability

Series4
Fujitsu

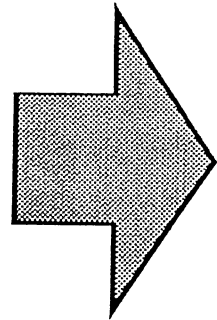


Series5
Cypress

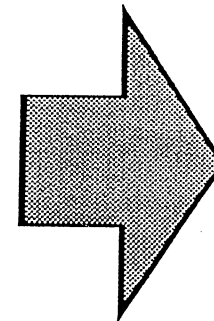


Series6

**16 Mbyte
Memory**



**32 Mbyte
Memory**

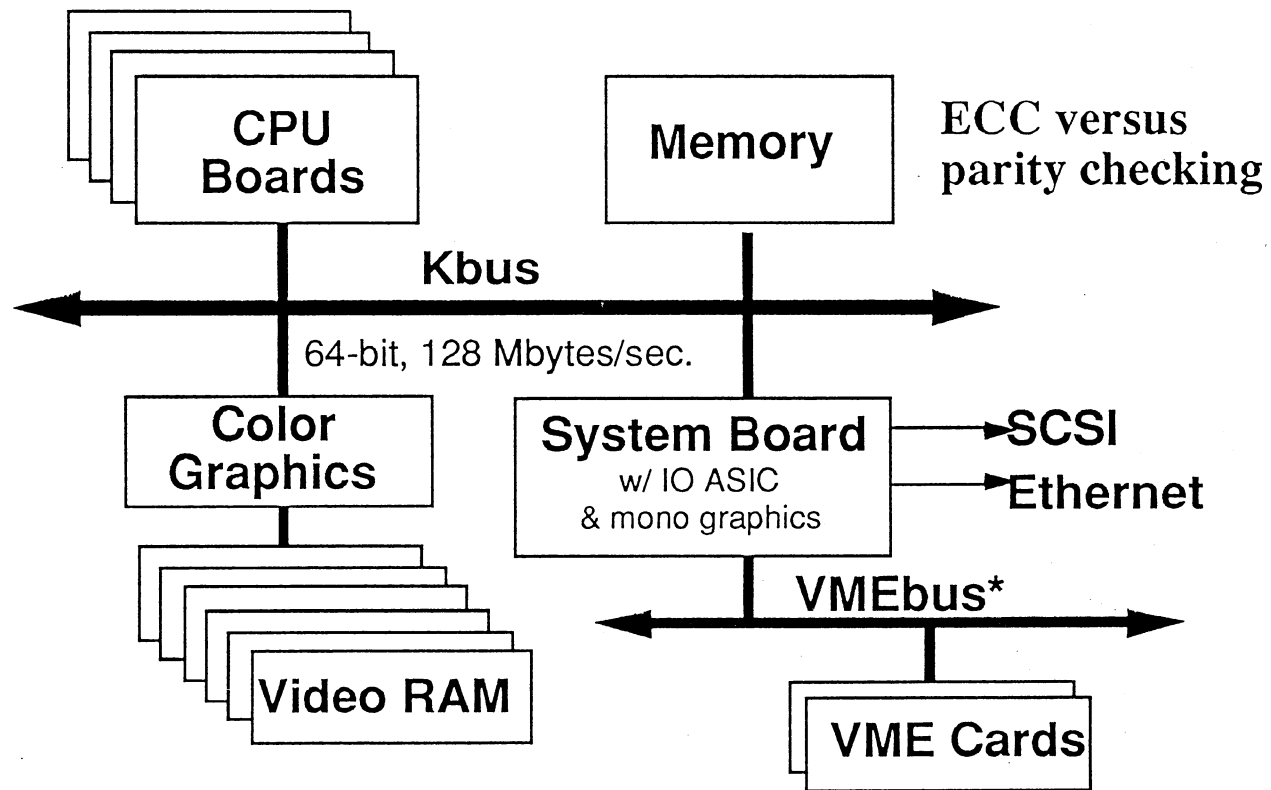


**128 Mbyte
Memory**

- Preserves your investment
- Minimizes disruption of operations



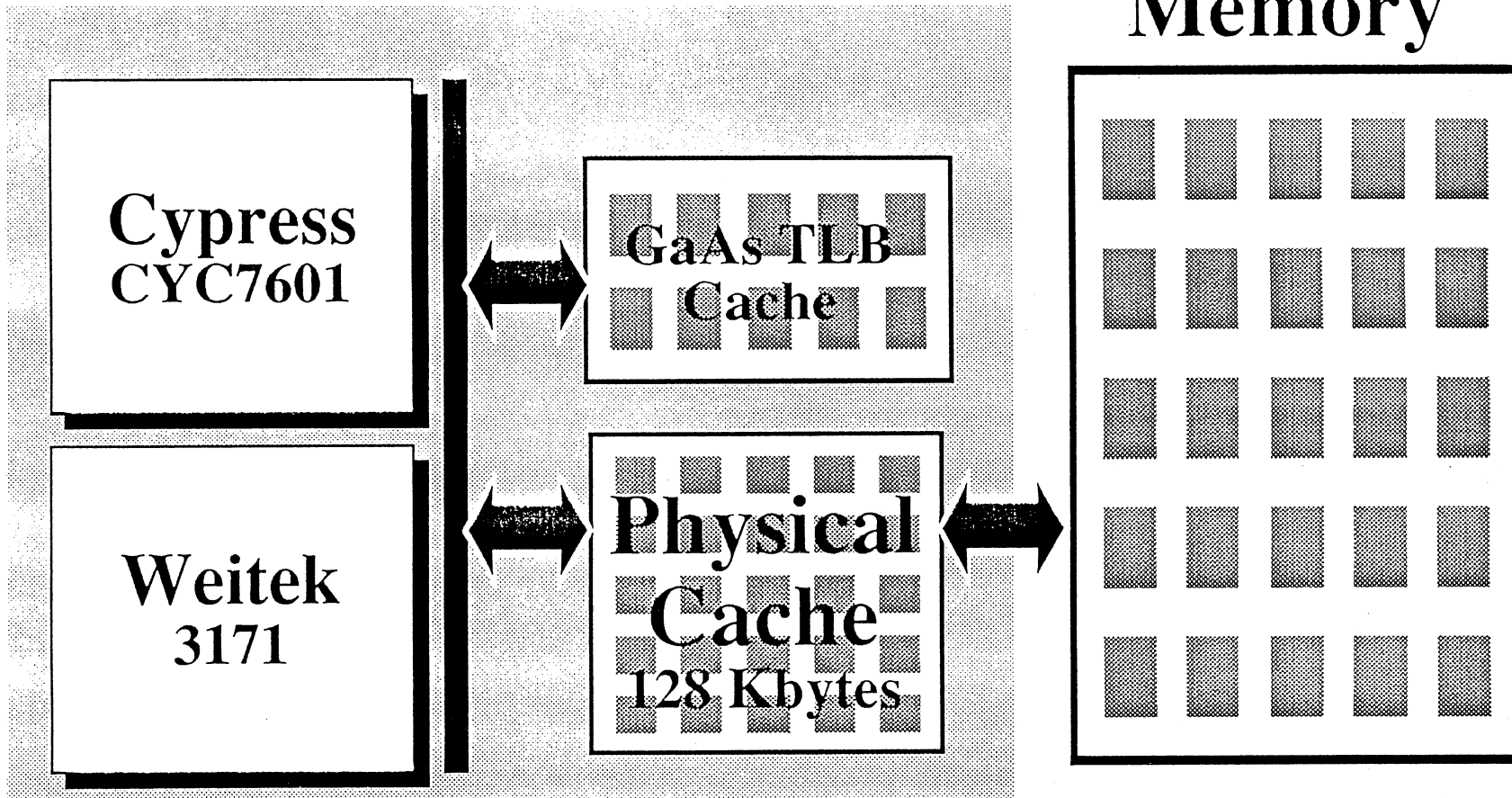
Series5 Architecture



*VMEbus not on Series5/500 or 530

Series5 Processor

Memory



ANOTHER COUP FOR SOLBOURNE

BY TOM MANUEL

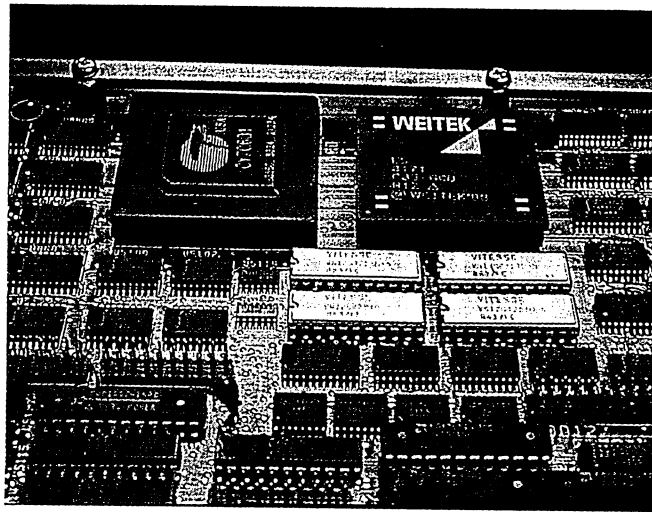
The brash startup that brought the first Sun Sparc work station clones to market has done it again. Just 10 months after it started shipping its work stations, Solbourne Computer Inc. has unveiled its second-generation machines—a line that sets the new standard for general-purpose work stations.

The Longmont, Colo., company's Series 5 central processing unit offers more than double the performance of the first-generation Solbourne Series 4. The Series 5 employs several advanced technologies to achieve 22 million instructions per second in a single-processor configuration and up to 65 mips in a four-processor setup, making it the top-performing general-purpose work station on the market. The Series 5 CPU board is available in new work stations and as a field upgrade for Series 4 products.

Solbourne was the first company after Sun Microsystems Inc. of Mountain View, Calif., to bring a Scalable Processor Architecture product to market. Sun, which originated the Sparc reduced-instruction-set computer scheme, made Sparc an open architecture by licensing the chip design and the Sun operating software. Although several work station makers have licensed Sparc and announced plans to offer products, Solbourne remains the sole supplier of Sun-compatible Sparc equipment.

Among the advanced technologies used in the Series 5 is the CPU. The Solbourne machine is the first product to contain the 33-MHz CY7C601 integer CPU from Cypress Semiconductor Corp. of San Jose, Calif. It's also the first Sparc computer to employ Weitek Corp.'s new Abacus 3171 floating-point coprocessor, which was designed to support the Cypress 7C600 CPU family. Weitek's coprocessor integrates the floating-point data path and controller on one CMOS chip. Abacus chips come in 25-, 33-, and 40-MHz versions; Solbourne uses the 33-MHz part to match the Cypress CPU in the Series 5.

With the Weitek coprocessor, the Se-



Powered by a 33-MHz Cypress Sparc chip, the Solbourne Series 5 CPU board blazes away at 22 mips

ries 5 offers up to 3 million floating-point operations per second (double-precision Linpak megaflops) in a uniprocessor work station and up to 8.9 megaflops in a four-processor configuration.

In another technology coup, the Series 5 is the first work station to employ high-speed gallium arsenide circuitry. Solbourne's engineers selected GaAs input/output random-access memories from Vitesse Semiconductor Corp. of Camarillo, Calif., to create a fast physical cache memory—the first purely physical cache in a Sparc design.

A physical cache is much better suited for maintaining cache consistency in multiprocessor systems than the virtual cache used in earlier Sparc designs, including the Series 4. "The overhead associated with maintaining cache consistency in a multiprocessor system made using virtual cache very difficult," says Nick Mati, Solbourne's founder and engineering manager for the Series 5 board. The

Series 5's 128-Kbyte physical cache replaces the 64-Kbyte virtual cache used in the Series 4.

With a physical cache, all processors in a multiprocessor system can work with identical data addresses, something that can't be done with a virtual cache. By eliminating areas of data contention—hot spots in the cache—a physical cache improves system performance.

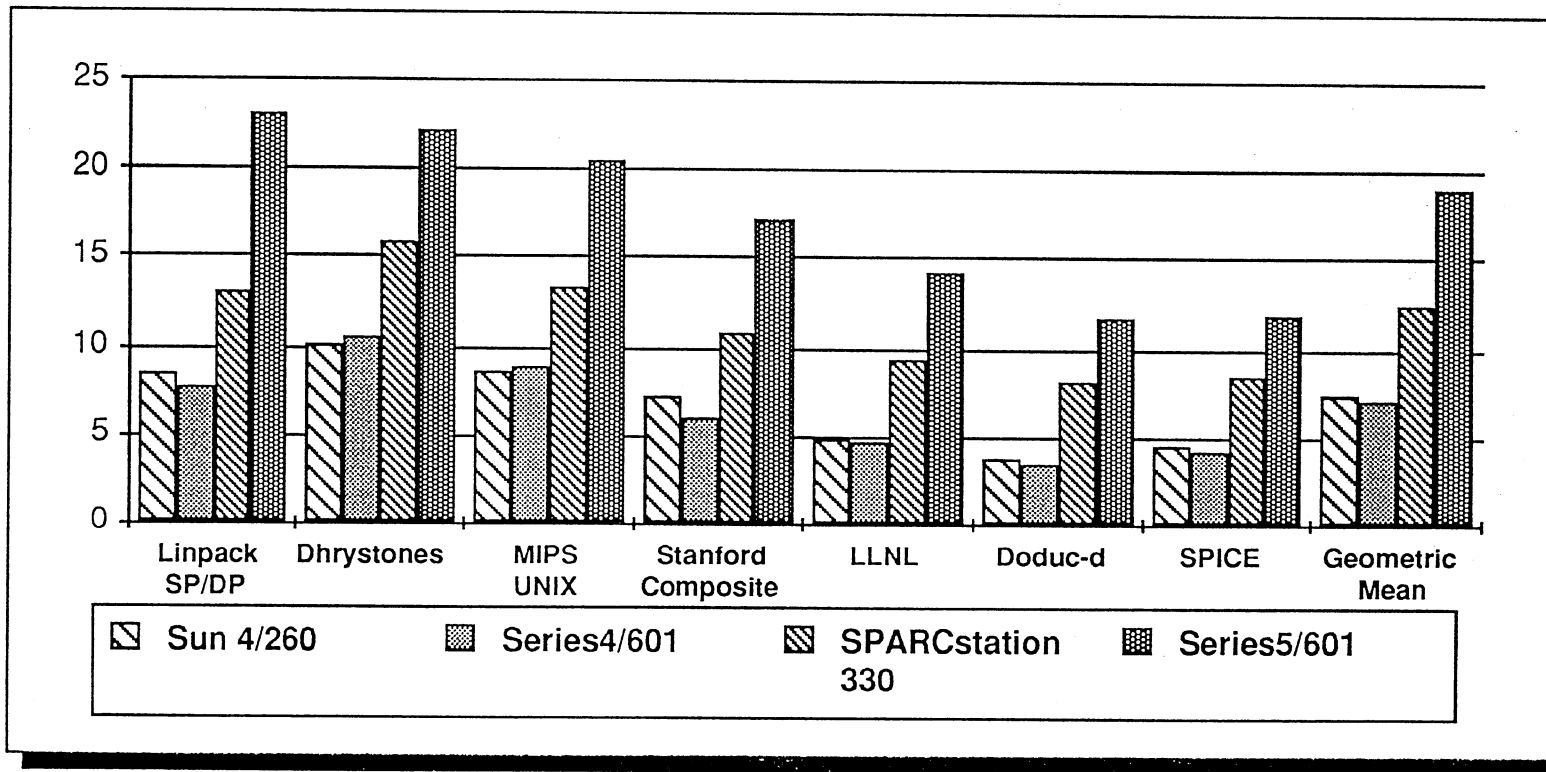
Making all these advanced technologies work efficiently requires a fast advanced bus

system. Solbourne uses a high-performance dual-bus system: a 64-bit K-bus system bus for multiprocessing support and a VMEbus for robust I/O activity. This bus structure, designed for the initial Series 4 work stations, offers enough capacity for faster generations of processors and cache memories, such as the Series 5 upgrade.

Solbourne is using Series 5 boards in several models of work stations and servers. Solbourne offers six server models ranging from single-processor 22-mips machines starting at \$33,400 all the way up to a 65-mips, 64-Mbyte, four-processor model at \$172,600.

In work stations, Solbourne offers two desktop models, a single-processor machine at 22 mips and a dual-processor model at 40 mips, priced from \$31,900 to \$62,200. Four desk-side work station models are also available, with one to four processors. They run at 22 to 65 mips and are priced at \$45,400 to \$122,400. □

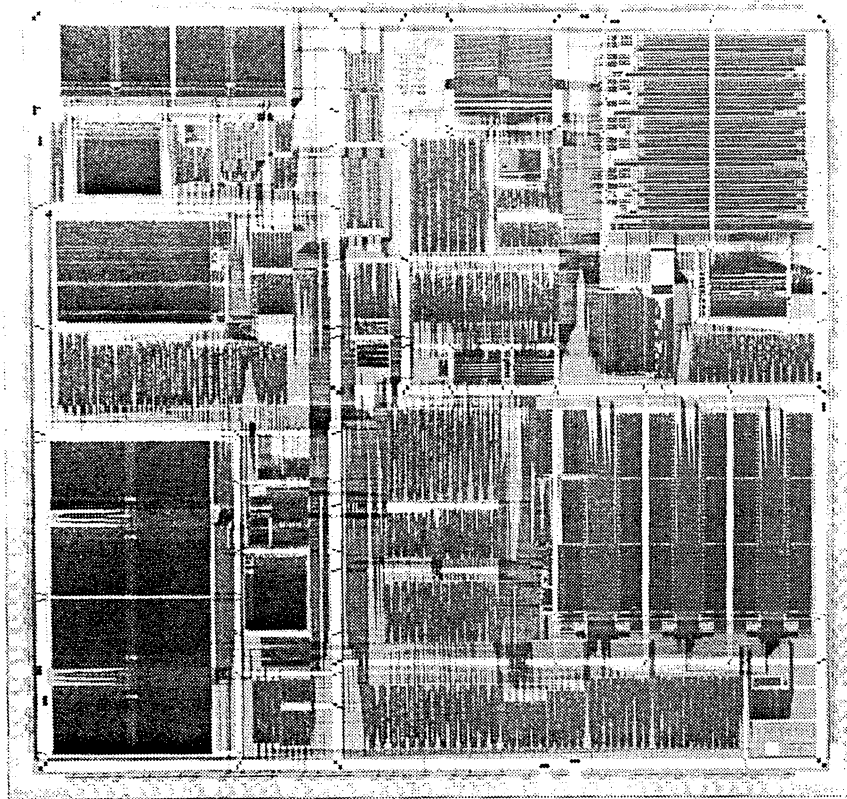
Series5 Performance



(Relative to Sun Microsystems benchmark data)



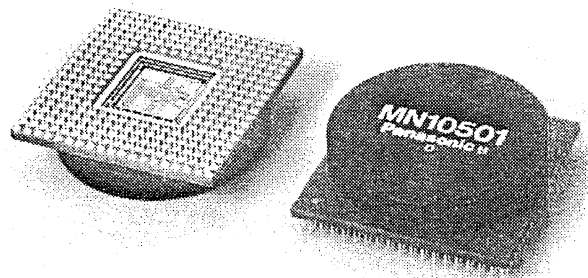
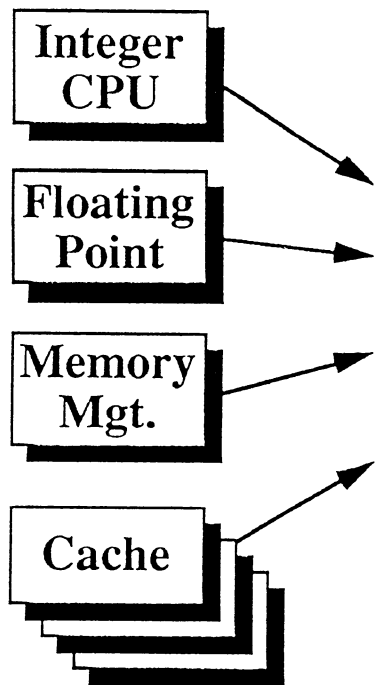
Custom SPARC Chip



- **Jointly developed by Solbourne & Matsushita Electric**
- **64-bit**
- **Sub-micron CMOS**
- **~1,000,000 transistor-equivalents**



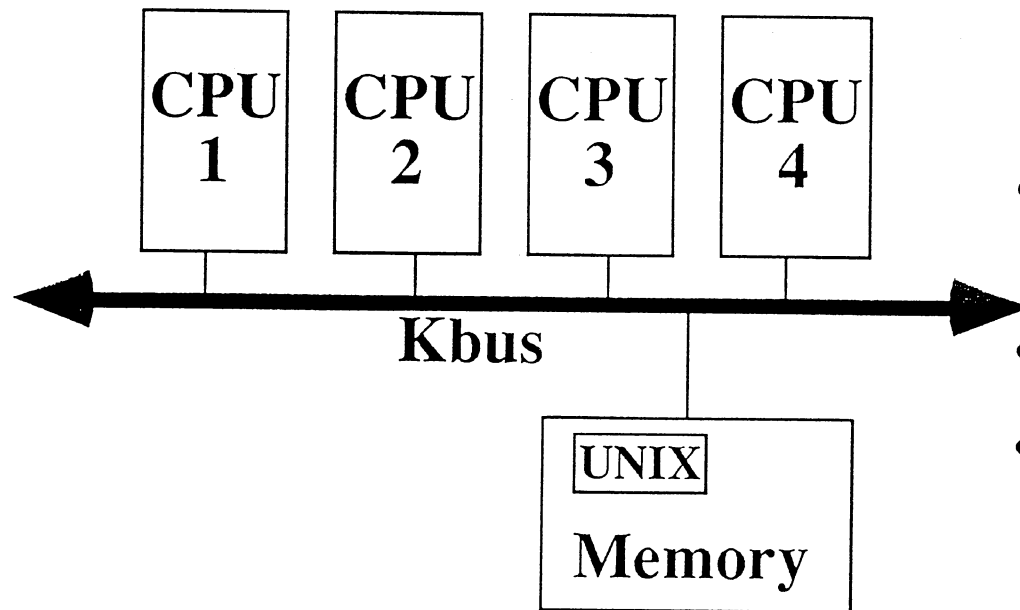
Low Cost, High Performance



- All performance-critical elements on one chip
- Multiprocessing
- 64-bit data path-widths



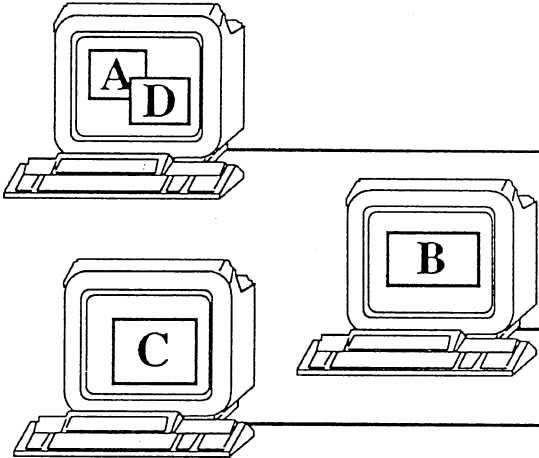
Solbourne Multiprocessing



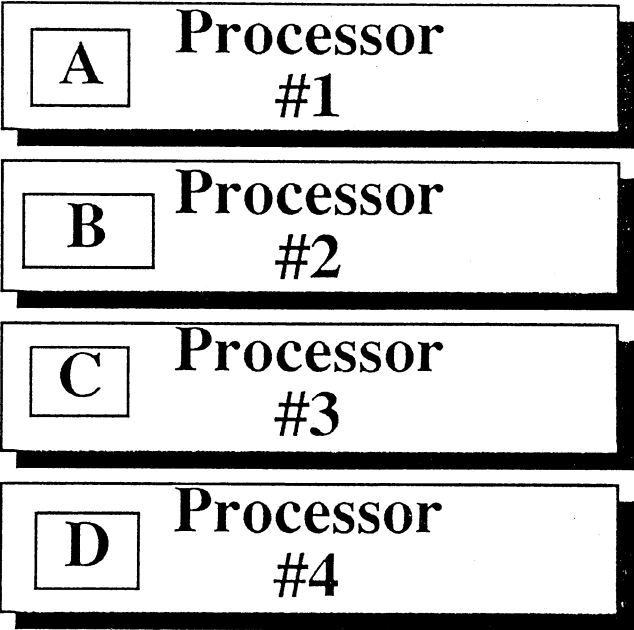
- CPUs communicate via Kbus
- Share one memory
- Single copy of UNIX

MP for Network Servers

Any Compatible Workstation



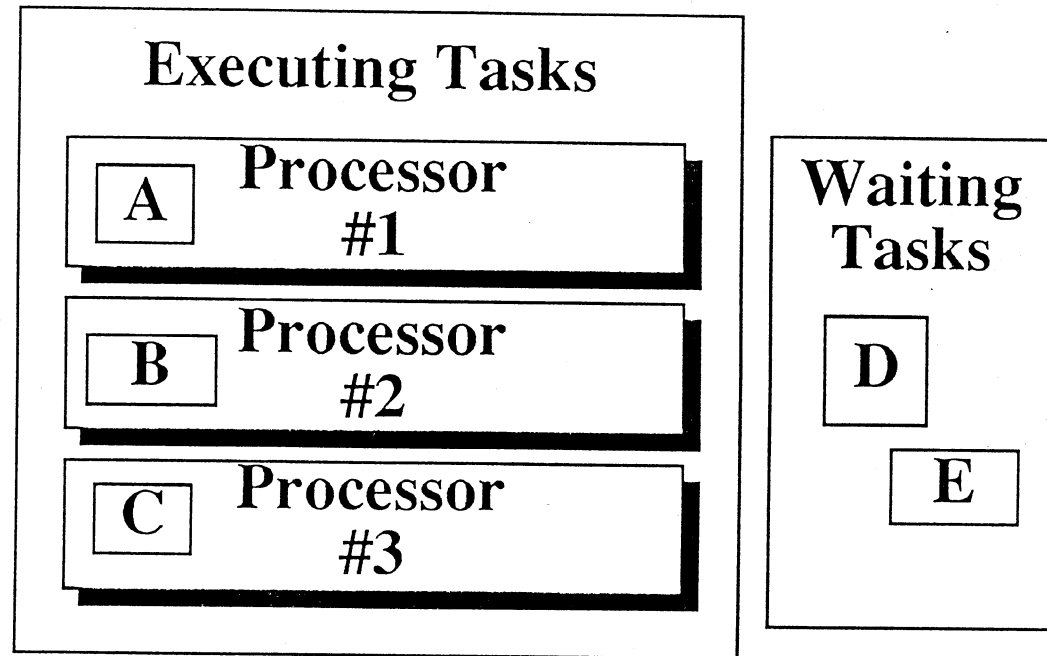
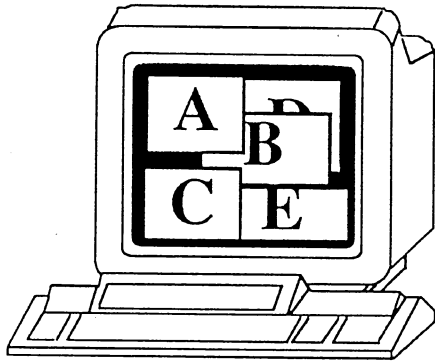
Solbourne Server



- Transparent sharing
- Automatic load balancing



MP for a Workstation



- No reprogramming whatsoever
- Transparent to user and application

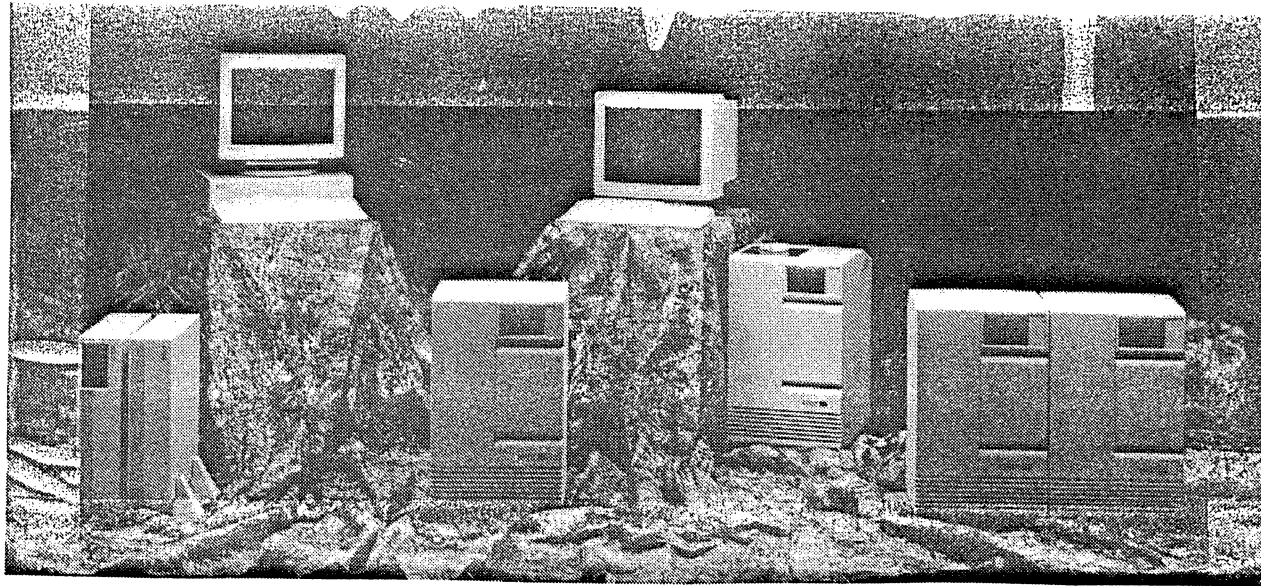
Benefits of Multiprocessing

- Go beyond limits of current μ -processor technology
- MP performance increases throughput, therefore productivity
- MP Scalability:
 - Add power as you need it
 - Upgrade installed workstations

...yet complete SPARC compatibility is maintained



Series5 Product Family



Workstation features:

Display: Monochrome or Color
1152x900 pixels, 256 colors

Mouse: Optical 3-button

Keyboard: Sun compatible
Engineering (Type-3)
or PC (Type-4)

Workstation & server features:

Ethernet: 10 Mbits/second

Ports: RS-423-A (RS-232
compatible)



Why Solbourne?

- **Product leadership**
 - 1st Sun compatible
 - 1st 33 Mhz SPARC
 - 1st Multiprocessing SPARC
 - Custom SPARC Chip
 - **Compatibility**
 - Immediate benefits
 - Strategic direction
 - **Excellent price/performance**
 - Alternative to Sun
 - Lower overall cost of ownership
 - **Upgradability**
 - Protect your investment
 - **Customer Satisfaction**
 - Quality, reliability
 - Service, support
- ...Fundamental to Solbourne's strategy*





End