
HP puts NYSE at technology forefront



"The performance and flexibility of our new panels -- America's first commercial application of large-scale, high-definition, flat-screen plasma technology -- will allow us to meet current and future exchange information display needs," says Catherine Kinney, Executive Vice President of the NYSE. "And this is critical if we're to remain the leading, most cost-competitive equity marketplace in the world."

Financial Services Application Note

Customer:

New York Stock Exchange

Challenge:

- *Reengineer exchange floor trading systems with advanced technologies to enhance trader and broker operations*
- *Provide traders with information displays to accommodate ever increasing trading volume*
- *Deliver clear, legible information at wide viewing angles*
- *Provide full color, full motion video monitors*
- *Accommodate space and display system weight limitations*

Results:

- *Twice the volume of data displayed in same space*
- *Increased clarity at all viewing angles*
- *Less total display panel weight*
- *Improved trading floor operations*

The New York Stock Exchange (NYSE) – the world's largest equity marketplace, with an average daily stock trading volume of 300 million shares and a roster of 2,500 listed companies – continues to experience rapid growth in both trading volume and listings.

To maintain its number-one position, the NYSE has invested \$1 billion in new technology over the past 20 years, beginning with an automated order-routing system and culminating in a \$125 million Integrated Technology Plan (ITP). Through the ITP, which calls for a complete reengineering of floor trading systems and information displays, the exchange intends to provide faster and more complete information access, reduce transaction time, and increase systems reliability, trading volume capacity, and trader productivity.

Facelift for the trading floor

Perhaps the most tangible evidence of the NYSE's reengineered systems is the sleek new flat-panel information displays suspended over the trading floor. These easy-to-read units replace the bulky, 20 year old, 23" monochrome CRTs that were clustered overhead at 17 trading posts.

"The old CRTs could not keep pace with growth" says Lois Zarembo, NYSE vice president of equity systems. "We had to

find a way to increase the information displayed at each trading post. But, because of space and structural constraints, we couldn't use more room or add weight," she adds.

Stringent display requirements

The ITP team decided that the new displays needed to:

- *Provide twice the data density of the CRTs to support projected exchange capacity through the year 2000 and beyond*
- *Be easy to read from wide angles to prevent annoying distortion*
- *Support Windows*
- *Be easily replaceable to minimize downtime*
- *Meet rigorous NYSE standards for structural integrity and radiation emissions*
- *Project a compact, modern, high-technology look*
- *Be functionally and visually compatible with new, full-color specialist and floor broker workstations*

But to meet the NYSE's safety and environmental requirements and to enable a three-by-three array of new 21" units to replace each four-monitor CRT array, the commercial displays would need to be reconfigured.

NYSE selects HP to customize displays

The ITP team recognized that outside assistance would be required to integrate the new displays into the existing environment. So they looked for a hardware integration specialist who was familiar with the latest plasma display technology, could provide mechanical design, component assembly, and testing services to support the aggressive schedule, and had a reputation for quality and consistent product support.

"We had already selected HP to provide a major portion of the new ITP hardware – including the smaller flat-panel workstation displays, clients, and servers," says Zarembo. "When we learned about HP's Integrated Systems Division (ISD), we were confident they could customize the crowd displays and provide the ongoing, high-quality support to meet our requirements."

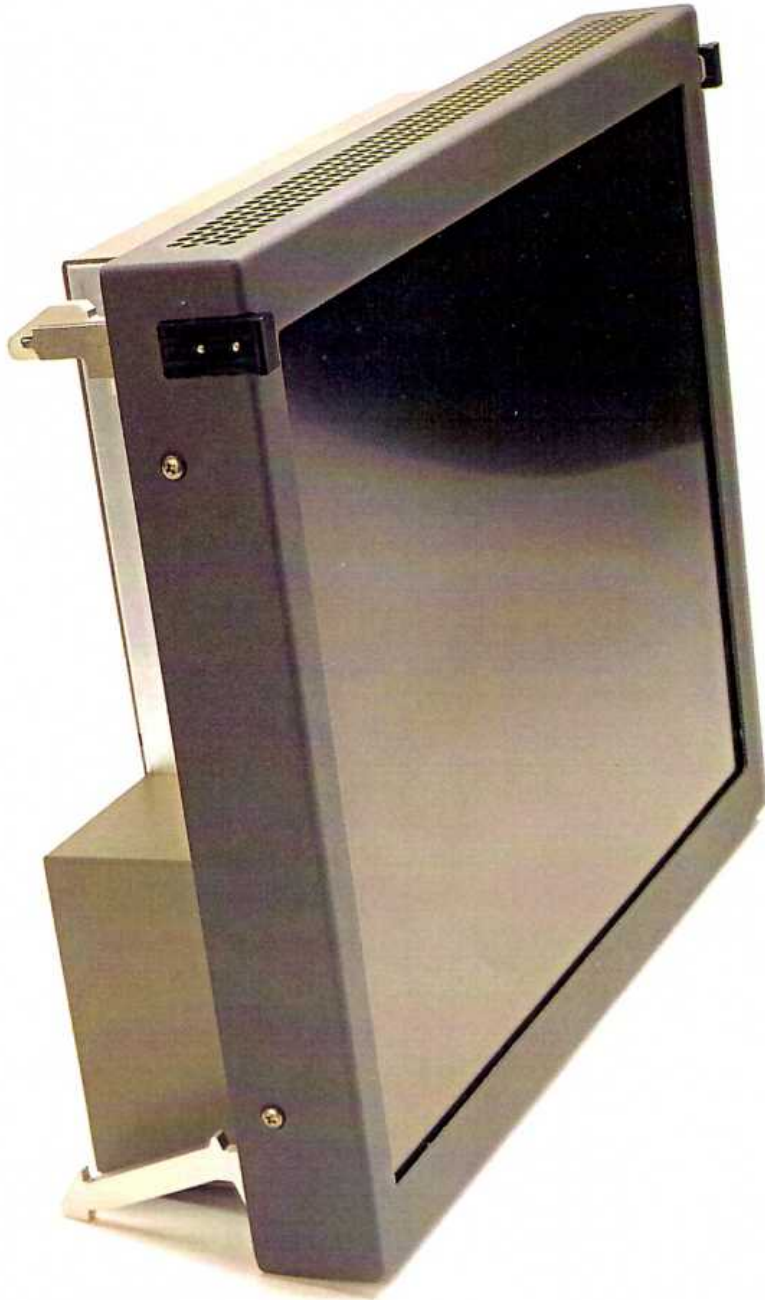
Once on board, ISD's team quickly identified all display panel requirements and constraints and developed detailed specifications for the supplemental power units, electrical connections, physical enclosure, and mechanical supports. After assembling a prototype panel, the team performed extensive tests for shock and vibration, extreme temperature and humidity, and electromagnetic radiation emissions.

Based on the results of these tests, ISD added supplemental cooling fans and modified the optical filter specifications. They also developed a support and maintenance manual covering all panel components.

"We were impressed with ISD's ability to integrate all this hardware in a panel only six inches thick to create a crowd display that's attractive and fully compatible with the look and functionality of our workstation displays," states Zarembo. "Not only did they meet or exceed all our technical expectations, they also bent over backwards to support our accelerated schedule."

New displays double information delivery, enhance productivity

The ability of the new panels to display more information has changed the way stock trade and quote data are provided to floor traders. And traders are enthusiastic about the new displays. "They appreciate the reduced distortion when they look at the displays from an angle and the characters that are large, bright, and easy-to-read – even from 30 feet," Zarembo says. "They also like the fact that the upper tier of the new screens is actually lower than the old CRTs, which means less neck strain," she adds.



<u>Specifications</u>	
Power Input	120 VAC, 60 Hz, <3.0A. maximum
AC Voltage Limits	85 to 127 VAC, 45 to 65 Hz
Input Signal	X-Window terminal video or monochrome video
Video Level	RGB, analog, 660 mV \pm 5% above set up level: 54 mV, (NTSC)
Input Impedance	Normal; 75 Ohms \pm 2%
Temperature Range	Operating: 0° C to 30° C Non-operating: -20° C to 65° C
Humidity	Operating: 20% to 80% RH at 30° C (non-condensing) Non-operating: 90% RH to 65° C (non-condensing)
Vibration	Operating: 0.21 G RMS, 5 to 500 Hz Non-operating: 1.0 G RMS, 5 to 500 Hz
Shock	Operating: half-sine wave form, duration - <3 ms, velocity change based on product weight as configured, x and y axis only Transportation: trapezoidal wave form, 40 G, 11 ms on x and y axis, 20 G, 11 ms on z axis excluding the face
ESD	Operating: 0-15 kV air discharge 0-4 kV contact discharge Survival: 15-25 kV air discharge
Electromagnetic Susceptibility	10 V/m over the frequency range of 14 KHz to 1 GHz
EMI Emissions Radiated and Conducted	FCC Level A
Weight	26 pounds
Fused Circuits	10A (on power supply input)

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Printed in U.S.A. (2/95)
P. N. 5963-7098 E