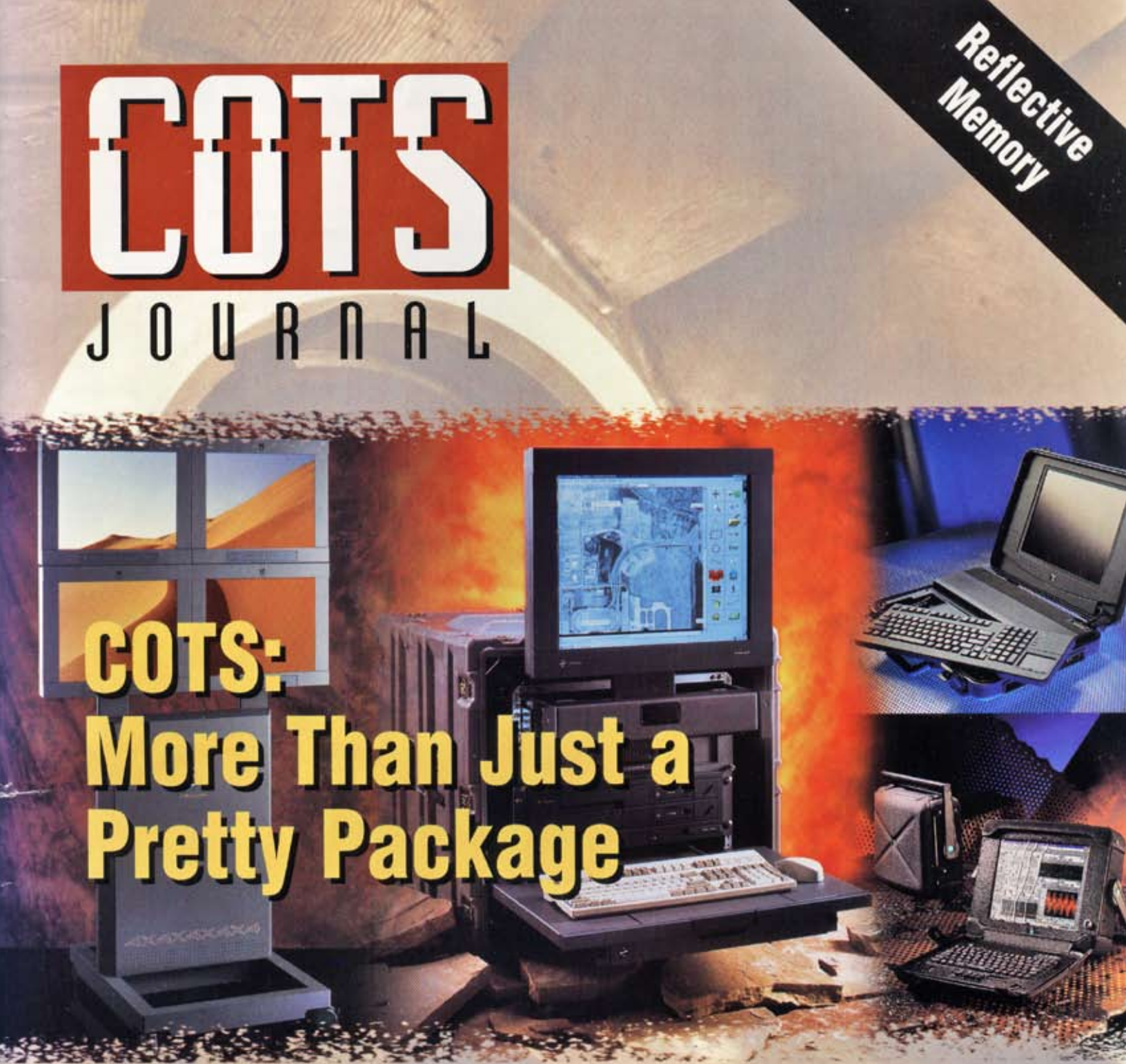


COTS

JOURNAL

Reflective
Memory



**COTS:
More Than Just a
Pretty Package**

COTS Technology Opportunities

Commercial Standards Give COTS a Good Name

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On The Rugged Side

Cocoon Packaging

Ruggedness and Attention to Operational Environments Ensures COTS System Usability

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Z Microsystems

Ruggedized equipment must work properly under rough conditions while helping users do the work comfortably and well. Therefore, we must make products that perform well in rugged environments.

Three conditions present major challenges to equipment and its use:

In-storage rugged environments.

Equipment must often withstand extreme ranges of environmental conditions, typically from -45 to +60 °C temperatures, wet and dry, for extended periods without deterioration. Because we have designed all our equipment from the ground up, we offer integrated options to address and control dust, humidity, temperature conditions, and other adverse conditions. Storage products, for example, come with heating or cooling elements as an option.

In-transport rugged environments.

Equipment must withstand transport on ships, airplanes, Hum-V's, etc. It must move across hot, dry deserts, arctic tundra terrain, and potholed city streets. It must take the abuse of being dropped off loading docks or stood upon. After these cruel journeys, it must arrive intact, ready to function. Much of our equip-



Workstation configuration with space constraints in a typical transit case; it consists of a 20" LCD flat panel, CPU, storage modules and a complete 2-U expandable desktop.

ment is die-cast and machined from metal. Sensitive component mounting uses various composite materials for shock and vibration dampening. Specialized, patented fastening mechanisms hold down LCDs, drives, CPUs, and accessories.

In-use rugged environments.

Ergonomic factors become vital where weight and space are crucial factors. For

example, to pack into a small transit case, an LCD 20" flat panel must swivel, collapse, and fold into a small footprint (shown above). To use it, the user must be able to open the case and construct a working high-tech environment by sliding, unfolding, swiveling, and setting up sensitive electronic equipment. These motions must happen easily, without damaging the equipment, injuring personnel, or frustrating the user.



Fold-out expandable desktop in the storage or closed position.



Desktop in its ergonomically correct and user-ready position.



Desktop in the open position, revealing a full-size Sun keyboard and mouse.

Producing equipment for ruggedized environments is not just a matter of what you do, but also how well you do it. Our approach is to design and create COTS building blocks out of reliable systems that can be custom-configured to exact user specifications. We're probably the first company to offer a system of COTS building blocks for custom-configured deployable applications.

These COTS building blocks allow us to meet user needs. They are configured by working with our users and understanding completely how the user functions in limited space, time, and often very stressful conditions. We provide flexible customizable components to make the equipment work smoothly and rapidly from set-up to operation to breakdown.

Skipping the details of test specifications, simply put, all components are tested to destruction, because we have found that 99% of mechanical components (rack fasteners, thumbscrews, catches, etc.) do not always function properly. It is almost impossible to find anything in this area that does not rip off your fingernails or is not so hard to undo that you want to kick it in frustration. Customers have told us that their most frustrating items with deployed rugged equipment are the catches and latches that fasten many of these products to the rack itself. Since they cannot be bought,

we have had to invent, patent, and manufacture these components ourselves to make life easier for users operating the equipment.

Making equipment for use under rugged conditions where space and weight are critical has been one of our biggest challenges and accomplishments. For example, 20" LCD flat panels are too wide in their landscape orientation to fit into 19" racks, so we have had to invent new ways for folding, rotating, and nesting them into padded trays where they can be slid in place and securely fastened for shipping. We successfully made 20" LCD flat panels usable in a 2U-rack slot as a field-ready rugged COTS item. This mechanism allows the display to unfold like a genie as it swings and rotates into perfect performance-ready position for the user.

Another problem we have solved is how to provide an adequate work surface for the user in a temporary and hostile environment. We have invented ways of producing desktop surfaces called expandable keyboards, as shown above. These desktop/work surfaces fold and collapse into 1U and 2U rack slots. They slide out of the rack slot on rails, lift out, rotate, and lock into place. Designed with consideration for left- or right-handed users, the expandable keyboards provide a desktop work area for even the widest computer keyboard with additional slide-out area for mouse operation.

The larger (2U) keyboard is a full desktop with compartments that not only store a full-size Sun keyboard and mouse but also allows room for accessories (pens, pencils, maps, CDs, etc.) users need to do their jobs. We make these components from aluminum to ensure a lightweight, excellent fit and lasting durability for the toughest operations. This 2U keyboard kit pulls out of the rack; wings open from the center and expand into a 24-28" fully usable desktop—strong enough for a marine to dance on!

We have also developed an intelligent power management strip, the MUGU smart strip, that controls power distribution throughout a workstation. It can gauge the environmental temperature conditions and power requirements, and will turn on the power to that component or subsystem only when it comes within its operating range. ■■

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