



READY FOR ANYTHING.

RUGGED NOTEBOOKS GET DOWN TO BUSINESS WHEREVER AND WHENEVER.

Warning: your firm's notebook computers are at risk. They get carried around in offices, taken home and may even travel around the world. This means they face hazards that desktop computers rarely, if ever, face.

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Notebook computers fall or get dropped, usually from table or desk height. Coffee, soda and other liquids get spilled on their keyboards. Their cases get bumped, thumped, banged into and squished.

Transit via cabs, trains, busses and aircraft — storage in overhead compartments — can prove adversarial. And they're often picked up one-handed by the edge or corner.

These incidents all too often result in damage to business users' notebooks. They can hurt the hard drive, crack the display, break the hinges, disable the keyboard, short out electrical circuitry, bend the motherboard, snap connectors or warp ports.

To minimize hardware failures from these inevitable events — and the resulting loss of employee productivity while waiting for repair or replacement — vendors have been making many of their notebooks more durable with different degrees of ruggedness.

» DEGREES OF TOUGHNESS

Semi-rugged and fully-rugged machines, as the names suggest, reflect increasingly greater types and degrees of protection than “business-rugged.”

While there are no uniform industry definitions for ruggedness, a notebook called fully-rugged is expected to have been put through some of the tests found in MIL-STD-810F. This is a military standard, created by the U.S. government, to define degrees of resistance to shock, vibration, water, dust, temperature and other environmental situations.

Another common measure of ruggedness is defined by the Ingress Protection (IP) rating system. Known as the IP Code, it indicates how sealed the machine is against solid objects, dust or water getting in and coming in contact with the electronics.

“We test our notebooks in a chamber, open and running,” says Kyp Walls, director of product management, Panasonic Computer Solutions company. “We spray water on them from all directions for an hour.”

Both semi-rugged and fully-rugged machines should survive more drops from a slightly greater distance compared to business-rugged machines. They are also required to work while being vibrated or shaken.

Fully-rugged notebooks — often referred to simply as “ruggedized” — are designed to be used in extreme environments. This includes offering resistance to things like heat, cold, rain, snow, dirt, dust, wind and other weather conditions.

A fully-rugged machine will be expected to work in a significant temperature range, for example, between minus 10 and over 140-degree Fahrenheit. A typical notebook is expected to work in 40- to 95-degree Fahrenheit temperatures.

Some rugged notebooks even offer options like hard-drive heaters, for starting up and using notebooks in freezing

temperatures. Fully-rugged machines may also be expected to survive “thermal shock.” This can occur, for example, if the user is doing freezer repair in a tropical climate, moving from a 110 degree to a 20-degree Fahrenheit environment and back again.

A fully-rugged machine should also handle a wide range of altitude and humidity. For example, it should work anywhere from Death Valley to Pikes Peak. “We certify up to 15,000 feet,” says Panasonic's Walls. (Note, some hard drives may not work at high altitudes. This is due to the lower air pressure. However, Solid-State Drives (SSD) should still work under these conditions.)

In fact, ruggedized computers, including General Dynamics Itronix's Duo-Touch Tablet PC and GoBook MR-1 Ultra-Mobile PC, along with the Panasonic Toughbook CF-18, have been used at the top of Mount Everest. That's nearly 30,000 feet above sea level.

The screen hinges and latches for many rugged notebooks are also considerably strengthened compared to mainstream notebook PCs. In addition, rugged notebooks, like the Panasonic Toughbook CF-30 and the General Dynamics Itronix GoBook XR-1, come with an integrated handle for outdoor use.

Semi-rugged notebooks are more robust than business-rugged models. However, they don't offer all the weather protection of fully-rugged units. This makes them less expensive than fully-rugged machines. It also makes it easier for them to be more powerful, since they can use fans for cooling, instead of having to be tightly sealed.

Semi-rugged machines may also have to survive and work in high-vibration environments, like being mounted in a car, truck or helicopter. “We test for the equivalent of five years of continuous use like this,” Panasonic's Walls says.

Because ruggedized notebooks are also used in applications featuring various levels of ambient light — bright sunlight outdoors, in an airplane cockpit or dark conditions — they are more likely to have brighter, sunlight-readable displays and backlit keyboards.

Rugged notebooks may also have RS-232 COM ports. They are still actively used by industrial equipment. These notebooks are also likely to offer a high-capacity and/or second battery option, so the employee can use it for a full workday.

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» FIELD TESTED

At Cox Communications, the third-largest cable television company in the United States, equipping field-service employees with mobile-broadband-enabled ruggedized notebooks adds 45 minutes to one hour of productive work time per employee.

The reason, according to Michael Kovash, senior IT project manager, is because they provide instant access to accounts and work-order details, diagnostics and other information.

In addition, by streamlining dispatch communication and real-time assignment changes, including avoiding having to handle some tasks via phone, Cox Communications is saving at least \$4 per work order.

Cox Communications serves more than 6.2 million residential and commercial customers in 27 metropolitan areas throughout the United States. Given that the company's 3,500 field-service employees are handling approximately six million work orders, the value of these time and dollar savings add up quickly.

Obviously, keeping the notebooks working is critical to the firm. That's because Cox Communications' field technicians aren't just working indoors.

"We need hardware rugged enough to withstand being carried around in the field," states Kovash. "Our machines are used outdoors no matter what the weather, temperature or brightness. They're even being taken up the outdoor utility poles for troubleshooting.

"It's important that our field resources are able to get their work done," he adds. "We don't want to worry about whether they can."

The firm's default standard, according to Kovash, is rugged computers, in particular, Panasonic Toughbooks. As of mid-2008, Cox Communications' field-service team had about 1,700 Toughbooks in use, along with other devices, he says.

"Most of our field service employees, who may be going up poles, use the Panasonic's Toughbook CF-18, Toughbook CF-19 or Toughbook CF-30 notebooks, which are from Panasonic's fully-rugged Toughbook line," Kovash adds.

"The technicians who don't do service appointments or climb poles get the semi-rugged Toughbook CF-52," Kovash says. "These units are more durable than Panasonic's business-rugged Toughbook line."

» DURABILITY PLUS

According to Casey Holmes, mobile and wireless analyst at research group Venture Development Corporation, Inc. (VDC), the global rugged notebook market for 2008 is around \$1.7 billion. And the market is steadily expanding at a compound annual growth rate (CAGR) of 6 percent.

Machines like Lenovo's ThinkPad X300 and X301, Panasonic's Toughbook Y7, W7 and T7, and HP's new EliteBook Series of notebooks garner a business-rugged moniker. Each incorporates new materials or design approaches.

Things like magnesium-alloy chassis, carbon-fiber "roll cage" protection for displays and 3-axis accelerometers, that prevent hard drive damage by parking the heads when motion is detected, provide added durability. Solid-state drives, instead of spinning-disk hard drives, and spill-proof keyboards with drain channels offer additional toughness.

As noted, business-rugged notebooks aren't tough enough for the more challenging environments where many employees work. To meet these users' needs, vendors like Fujitsu, General Dynamics Itronix, GETAC and Panasonic offer machines classified as semi-rugged and fully-rugged notebooks.

All of Panasonic's Toughbook products are deemed rugged. This includes the business- and travel-oriented business-rugged models.

Panasonic's fully-rugged family includes the Toughbook CF-18, CF-19 and CF-30; semi-rugged models include the Toughbook CF-52 and Toughbook CF-74. Panasonic also offers the ultra-mobile, rugged Toughbook U1.

"Our most popular models include the B300 fully-rugged notebook and the V100 fully-rugged convertible tablet," says John Lamb, director of marketing, GETAC Inc. "The GETAC A790, our newest ultra-rugged model, includes two multi-bays which can be used for additional batteries or storage capacity."

The General Dynamics GoBook family of rugged notebooks includes the GoBook XR-1, a fully-rugged notebook with touchscreen and the GoBook VR-2, a semi-rugged designed and optimized for vehicle-mounted applications.

Other models include the GoBook MR-1 fully-rugged ultra-mobile PC, about one-quarter the size of a regular notebook, and the Duo-Touch II Tablet PC, with a touchscreen that's highly viewable in direct sunlight.

» INDUSTRY ENVIRONMENTS

Semi-rugged and fully-rugged notebooks are often used in utility companies, oil and gas production, emergency responders, retail sales and at repair shops like automobile and heavy-equipment facilities. This is where work is often done outside rather than in a shop.

"The people who need rugged notebooks tend to work in any environment," says VDC's Holmes. "These may be dirty, dusty, wet, in-motion, vibrating, hot, cold or generally hostile conditions."

Semi-rugged notebooks are popular with network technicians and other people who are involved in service roles but don't need to work outside. For example, according to Tim Hill, group manager, General Dynamics Itronix, the firm's VR-2 is optimized for vehicle-deployed work forces, where the vehicle is the office. "We see these being used by utility firms as well as by insurance adjusters and law enforcement," says Hill.

Other users of rugged notebooks include meter readers, construction crews and even customer-service representatives.

The computer may allow them to take care of issues on the spot.

“We’re seeing interest from retail customer service, for example in a consumer-electronics superstore,” says Paul Moore, senior director of mobile product management, Fujitsu Computer Systems.

“A clerk will have a mobile computer with them, which they can use to show information to the customer, send information, even take the order,” he says. “This is rather than having to walk with the customer to a counter workstation.”

» PREMIUM PRICE

Semi-rugged and fully-rugged notebook computers aren’t appropriate — or necessary — for everyone. They cost more, weigh more and are bulkier than their mainstream business-rugged siblings. And, because of cooling limitations, fully-rugged notebooks may not have the necessary performance power required for some programs.

Regardless, if some of your firm’s employees need to use notebook computers out of the office, where conditions would interfere with operation of a regular business model — plan to fit ruggedized notebooks into your budget.

If they are what you need to do business, the ROI in increased productivity and in reduced replacement and refresh costs can justify their purchase. “Consider the cost of getting a damaged or broken unit back, evaluated and repaired,” says Itronix’s Hill. “It’s expensive, not just in the transportation cost but also in lost productivity.”

According to VDC’s 2007 “Mobile Computing Total Cost of Ownership” study, the five-year hard and soft costs for a rugged notebook are \$16,212, compared with \$25,666 for a commercial-grade device. “This is based on calculations of mobile devices deployed to support similar applications,” VDC’s Holmes states.

Rugged devices are not appropriate in all use cases, Holmes notes. However, the same study also shows durable notebooks — those labeled business-rugged — have a five-year TCO of \$22,842. Also, he says, rugged notebooks have a typical refresh period of four years versus 2.5 years for business-class notebooks.

Having a notebook on hand — often only possible if the machine is ruggedized — can also be a revenue generator, notes Itronix’s Hill “When a telecom or cable employee is out in the field, having a notebook can let them show customers new services,” he says.

“It may allow them to run a presentation on why the customer might want a higher-speed web connection or expanded cable package,” he adds. “And make the sale right there.” ♦

RUGGED NOTEBOOK ACCESSORIES

The utility of rugged notebooks, like their business and consumer cousins, is enhanced by accessories. These range beyond the standard wireless mice, spare batteries and USB hubs.

Ruggedized units can be enhanced with carrying cases and protective display overlays. And they can incorporate rugged mobile docks that support power recharging, port replication and may also have Radio Frequency (RF) pass-through.

For example, Panasonic Toughbook accessories include a MIL461-compliant AC adapter along with a vehicle-mount port replicator with integrated dual high-gain antenna pass-through. Also offered are protective films for tablets and touchscreens, and, for the Toughbook tablet, the ToughMate Always-On 19 convertible case providing enhanced protection and durability.

Targus offers a wide variety of accessories suitable for business and “rugged activity” users, including carrying cases like its 15.4-inch Sport Standard Backpack, the Targus Mobile 70 Universal AC/DC Adapter, suitable for car/boat/airplane use, and the Targus Mobile Power Inverter.

And APC offers backpacks and messenger bags, which include pockets designed to secure and protect mobile devices, power adapters and supplemental notebook batteries.

To extend runtime in the field, APC offers its UPB70 and UPB90 Universal Notebook Batteries with adapter tips for leading notebook models, plus a USB port for powering and charging USB devices.

SAVE TIME AND INCREASE PRODUCTIVITY BY HAVING CDW CONFIGURE YOUR NOTEBOOK PCs PRIOR TO DELIVERY.