SPECIAL REVIEW

GETAC V100

LIGHT, COMPACT, YET FULLY RUGGED NOTEBOOK CONVERTIBLE

By Conrad H. Blickenstorfer, Ph.D., October 2007

If your job or application requires a very compact, lightweight rugged computer that can take a beating AND function both as a standard notebook and a tablet computer, the GETAC V100 can do all this, and more. The display part of the notebook has a special hinge that lets you rotate it and then fold it down, with the LCD screen facing up. This way you have the best of both worlds -- a regular notebook when you need it, and a handy slate computer when that is required. It adds a great deal of flexibility, and that is what this GETAC computer is all about.

Before we go into describing the GETAC V100, a few words about this type of computer and what it is meant to be. In the early 1990s, applying computer technology to the pen and paper clipboard metaphor intrigued the industry and gave rise to a first generation of pen computers. Most were slates that sought to combine computing power with the ease of use and familiarity of paper and pencil. Such slate computers could be carried around easily, and they were ideally suited for data collection, the filling out of electronic forms, and any task where a keyboard was not needed or got in the way. This first generation of pen computers was not commercially successful but the technology lived on in vertical markets and applications.

Microsoft revived pen computing in 2002 with the introduction of the Tablet PC -- computers with an active digitizer and a special version of the Windows operating system. Early Tablet PC concepts were all slates, but even before the new platform was officially introduced, the Tablet PC "convertible" was added as sort of a hybrid between a notebook and a slate. The GETAC V100 is a ruggedized and much more technologically advanced version of those early Tablet PC convertibles.

Why did GETAC, founded by General Electric-Aerospace and Mitac Group of Tai-
wan in 1989, add the V100 to its lineup? Because the company has been a pioneer in ruggedized mobile and portable innovation for military and other demanding markets worldwide and having a small, light convertible fills an important niche. With almost 20 years of experience in building water-tight housings and thermally optimized no-vent equipment that is resistant to shock and vibration and can accommodate operation in very wide temperature ranges as well as handle dust, sand, snow, water, hazardous materials and other environmental conditions, we expected a competent and polished product. Does the V100 deliver?

What you get with the GETAC V100
The GETAC V100 is a notebook that provides flexibility and computing power in a compact package. Its footprint of 12.2 x 8.7 inches is barely larger than that of a pad of paper. Despite its inherent ruggedness, it’s under two inches thick and weighs less than five pounds. A 1.2GHz Ultra Low Voltage Intel Core Duo U2500 processor combines good performance with long battery life. And customers can select from a large variety of wireless options and several display technologies. The V100 is available with a standard touch screen LCD (running Windows XP) or one with an active digitizer (using the XP Tablet PC 2005 Edition). There are also two screen sizes. Our review machine had the 10.4-inch XGA (1024 x 768 pixel) display, but a model with a 12.1-inch WXGA (1280 x 800 pixel) wide-screen is also available. And GETAC offers an outdoor viewable screen option as well.

Exemplary design
Good industrial design never hurts, and the V100 is undoubtedly a ruggedly handsome device. Its case is made of magnesium alloy with hardened plastics along the edges and small rubber bumpers in the corners for extra impact protection. The plastic parts are black, the magnesium alloy finished in a military-style dark gray. Form very much follows function on this machine. Small black Phillips screws are left visible, structural elements likewise, and it all comes together in a design that exudes toughness and purpose but also looks good enough to win design awards. GETAC did an excellent job here. Good industrial design, however, goes beyond good looks. It means attention to detail, ergonomics, ease of use, and the application of common sense. Looking at some of the details of the V100 shows that its designers spent time thinking things through. Some examples:

Even though this is a very compact notebook, the V100 has a full-size, 100%-scale QWERTY keyboard layout. I cannot overstate the importance of that. We all grow up with keyboards, and whether we touch-type or just hunt-and-peck, we’re used to the exact size of a standard keyboard. Throw that off by even a small fraction and things don’t feel right and typing becomes frustrating. Over the years we’ve had all too many compact notebooks in our lab that all felt like toys because their designers inexplicably compressed the QWERTY part of the keyboard even though there might have been enough space. Go figure. GETAC did not make that mistake. The V100’s keyboard is exemplary. It’s standard size, has large white letters on black, and there is excellent tactile feedback. All keys are clearly marked without being cluttered. Functions assigned to keys are labeled in blue. A good keyboard can make the difference between a useful computer and one that is a pain, and GETAC certainly aced it.

That said, the above applies to the standard keyboard our tester came with. Customers with special environmental needs can order a waterproof membrane keyboard, or one with a backlight for use at night.

Attention to detail is also visible in other areas. Take the cover latch, for example. Almost all notebook computers have some sort of latch or mechanism that makes sure it doesn’t open inadvertently. There are many different ways of securing the display case to the bottom part. There are springloaded latches, levers, snaps, guides or bolts. With a notebook convertible it gets a bit more complicated because you need to be able to secure the display
REVIEW: GETAC V100

Whether faces up or down. How did GETAC accomplish this task?

They used an intricate tension-loaded latch that, once secured, will absolutely keep the computer from opening on its own. The latch works the same way whether the LCD is facing up or down. Securing the latch requires a conscious effort on behalf of the user; you don’t just close the lid. That’s good because sometimes you may not want the lid to be secured, like when you need to open and close it frequently or when you wear gloves that would make it difficult to operate a small latch or release. It is an interesting solution that makes sense.

Another convincing design detail is the way the V100’s ports and connectors are covered and protected. Many rugged devices use a single door to cover a whole bank of connectors. That makes little sense as you often need just one, so why expose the rest? The V100 has separate rubber/plastic covers for almost every port. An ear on top serves to open a cover. To close one you push it in and friction keeps it in place. Each is clearly marked with a large white icon.

Above you see the front and back of the V100. You can see the above-described latch, or clasp, and how it very securely holds the display case in place. The little circle top center is the V100’s digital camera. It is a 1.3 megapixel CMOS imager that rotates 225 degrees so it can be used for video conferencing, and taking pictures both in notebook and in tablet mode. The power button is on the right side of the system unit. The left side has a series of push button controls. There is a hardware LCD brightness up/down rocker as well as three buttons you commonly find on Tablet PCs: screen rotation, onscreen keyboard, and the “security button” that does a alt-ctrl-del. On the left and right bottom corners are handstrap rings. The strap itself has karabiner clasps for quick release.

Along the left front of the V100 is a row of device indicator lights. They show AC power, battery charge, hard disk ac-

Ports, buttons, and lights

Like all GETAC computers, the V100 is a well connected machine. Almost everything you’re likely to need is right on the computer – no need for a port replicator or special dock (though both are available). Let’s take a look at all sides.

Above: Front and back show individually sealed ports, hardware controls, camera and the spring-loaded clasp that firmly secures the LCD case.

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cess, scroll lock, num lock and caps lock.

The backside has, from left to right, separate audio output and microphone connectors, a Kensington lock, and standard VGA and serial connectors. The VGA port can optionally be replaced by a second RS232 connector.

Above is the left side of the V100, with ports closed and opened. You can see the port covers with their ears on top and the large white icons that indicate what port or connector is beneath. From left to right are the power connector (covered), two USB 2.0 ports, modem and gigabit LAN jacks, and the card slot compartment that can accommodate two PC Type II cards or one Type III card. Below that is a SD Card slot. Customers can sacrifice one Type II slot and get a Smart Card reader instead.

The right side, finally, provides access to the V100’s battery and hard disk compartments. Both are covered and sealed by hinged doors secured by two latches each so there is no way that they accidentally open. The Toshiba hard disk is mounted in a separate protective cage heavily cushioned with shock-absorbing materials. The standard Li-Ion battery provides 58 watt-hours; an optional 87 watt-hour battery is also available. The batteries are “smart” and come with calibration utilities and “gas gauges” on the packs that show charge in 25% increments.

**Communications**

Communication is key in today’s mobile computers, and the V100 is well equipped. For wired network connectivity there is gigabit Ethernet (10/100/1000base-T). On the wireless side you get Bluetooth EDR (Enhanced Data Rate) Version 2.0 and the Intel PRO/Wireless 3945 chipset that provides 802.11a/b/g Wifi. A GPS module is optional (you can have either GPS or the camera, but not both). The V100 can also be equipped with 3G cellular voice/data radios. CDMA 2000 1x EV-DO is available via a Sierra Wireless module. On the GSM side of things, 3G UMTS (Universal Mobile Telecommunication System) technology supports the W-CDMA/HSDPA interface. The V100 has room for internal antennas for those Wireless Wide Area networks inside the black protective end caps to the left and right of the LCD case. There is no IR port; that technology has now largely been replaced by Bluetooth.

**Ruggedness**

GETAC generally classifies the V100 as...
"rugged -- vibration, dust, water
and temperature resist-
ant. The terms
"durable," "semi-
rugged," "rugged"
and "ultra-rugged"
are relative and so it
is usually a matter of
perusing the environ-
mental specifications
and test results and then
determining if a device
fits the intended applica-
tion. Here’s where the
GETAC V100 fits in:

IP ratings refer to
Ingress Protection stan-
dards for electrical en-
closures, with the first
number describing the
protection level against
solids and the second
protection against liquids.
The V100’s IP54 rating
means the computer is almost totally pro-
tected against dust intrusion, and it is also
protected against water spray from all di-
rections.

In terms of temperature resistance, a
standard V100 can operate between tem-
peratures of 32 to 131 degrees Fahrenheit.
A low temperature option allows opera-
ation in as low as 4 degrees Fahrenheit.
The computer also passed non-condensing hu-
midity testing up to 95% and can operate
in altitudes up to 15,000 feet (and obvi-
ously in aircraft with pres-
\mbox{\textemdash}\mbox{\textemdash}urized cabins).
The device is RoHS-com-
pliant. RoHS stands for Re-
\mbox{\textemdash}\mbox{\textemdash}striction of Hazardous Sub-
stances and regulates the
use of certain hazardous
substances in electronic
equipment. The RoHS
standard is fully imple-
mented in Europe, with
lesser restrictions applying
in the US.

Shock, vibra-
tion, drop and
ESD resistance
are all tested
according to
MIL-STD-810F
and other
relevant
regulatory
procedures.

Not all results
are in the promotional literature or own-
er’s manual, so inquire with GETAC for
specifics.

Security
Data and access security is becoming an
every more important issue in mobile com-
puting. The V100 offers TPM 1.2 func-
tionality to store secured information. An
optional Smart Card reader can be used to
provide additional access security. A Kens-
ington lock slot offers simple but effective
defense against theft. We’d like to see a
fingerprint reader option and a way to
lock the removable hard disk bay.

Operating System
The V100 currently ships with either Wind-
\mbox{\textemdash}\mbox{\textemdash}ows XP Professional or with the XP Pro-
fessional Tablet PC Edition 2005 for units
equipped with an active digitizer. With its
Mobile Intel 945GMS chipset, the V100
should also run Windows Vista.

Competition
Let’s not beat around the bush. The Pan-
asonic Toughbook CF-18 (and now CF-19)
has occupied this very niche in the rugged
mobile computing market for several years.
Like all Toughbooks, it is a formidable ma-
\mbox{\textemdash}\mbox{\textemdash}chine, but it now has met its match in the
new GETAC V100. Very similar in appear-
ance, size, weight and functionality, the
V100 meets or beats the Panasonic in almost
every category. Wireless options are
similar as are environmental specs and bat-
tery power. The GETAC comes with a quick-
er processor, a larger hard disk, faster LAN
communication and it has two PC Card
slots instead of just one. It is available in
more different configurations and offers
a 12.1-inch wide-screen version, which
Panasonic does not. The Panasonic has an
optional fingerprint scanner, but you can’t
get it with an integrated camera. It’s a
tough race, but one where GETAC offers
a newer and more powerful machine.

Summary: GETAC V100

The V100 is GETAC’s entry in the compact rugged mobile
computer market. It is a small, lightweight notebook that can
either be used as a standard laptop or, by rotating the dis-
play, as a Tablet PC slate.

Up-to-date technology in-
cludes an energy-efficient ul-
tra-low voltage Intel Core Duo
processor, a large 120 or 160GB
serial ATA hard disk, gigabit
Ethernet, fast wireless PAN and
WAN implementations, SD
Card reader and an integrat-
ed camera.

Like all GETAC units, the
V100 uses advanced thermal
design to keep heat buildup at
an absolute minimum. Heat
pipes and the sturdy aluminum
alloy case keep the computer
cool and alleviate the need for
a noisy fan.

Customers can select differ-
ent 3G cellular data options,
add an integrated GPS recei-
vier, an optional Smart Card
reader, and even opt for a
12.1-inch wide-format touch
dscrew instead of the standard
10.4-inch touch display. There
are sunlight readable as well
as active digitizer options.

In everyday use, the GETAC
V100 excels thanks to an opti-
\mbox{\textemdash}\mbox{\textemdash}mal balance between per-
formance, long battery life,
good ergonomics, silent op-
eration, a full size keyboard and
a high quality feel.

– Conrad H. Blickenstorfer