Workstation Innovation News

by **Robert Green**, *Cadalyst Contributing Expert*

HP's New Workstations Deliver Power in More Portable Packages

ZBook 14, 15, and 17 models with Intel® Core™ i7 processors are slim, lightweight, business ruggedized, and configurable to meet the demands of your CAD work.

It's no secret that CAD users want their software to run quickly. Yet every year, CAD applications grow larger and require more power to run effectively. So what's the answer for the road warrior who needs reliable CAD performance?

The new generation of HP Mobile Workstations, named ZBooks, includes the world's first Ultrabook™ mobile workstation. Now, mobile workers can take advantage of new Intel® processors, greater RAM and disk options, and Thunderbolt™ support in a compact, business-rugged mobile package. With these features, the ZBook with Intel® Core™ i7 processor is far more than a commercial consumer notebook — it's professional workstation power that fits in a briefcase.

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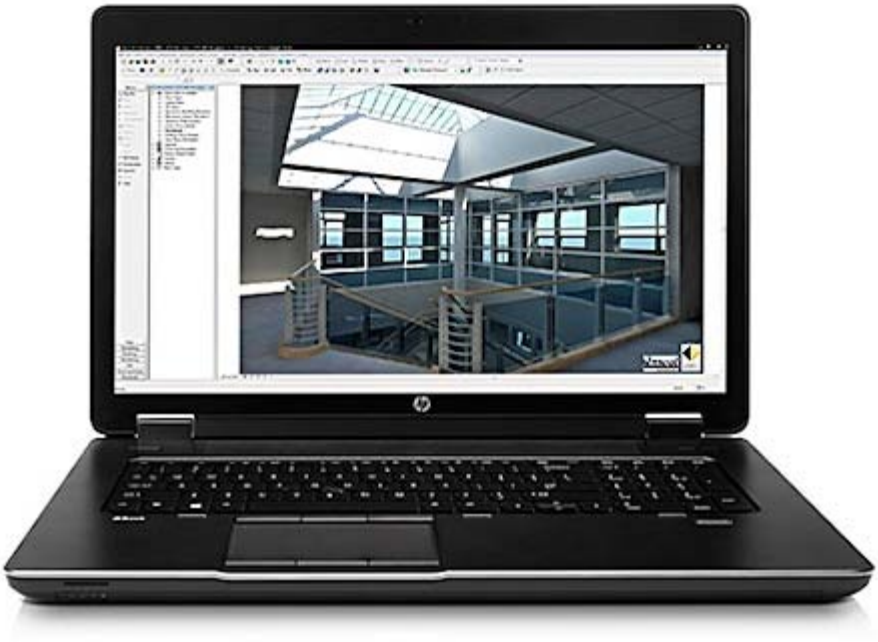

The HP ZBook family with Intel® Core™ i7 processors encompasses 14", 15.6", and 17.3" diagonal models with a variety of processor, RAM, and expansion options. Shown here is the ZBook 17 with Intel® Core™ i7 processor.

The HP ZBooks with Intel® Core™ i7 processors range from an 14" diagonal Ultrabook™ model (it weighs less than 4 lbs) to full-function 15.6" and 17.3" diagonal models (6.2 lbs and 7.67 lbs, respectively), providing a variety of screen and expandability options to suit specific user requirements. All the ZBooks with Intel® Core™ i7 processors share a modern wedge-shaped design and business-ruggedized chassis, so they're easy to grab onto and they can take the rough handling that traveling users dish out.

Mobile Workstations

What differentiates a mobile workstation from a consumer-grade notebook computer? A good one-word answer to that question is: *more*.

Compared with a consumer notebook, a mobile workstation typically has:

- More processor options
- More clock speed
- More RAM
- More (and faster) hard drives
- More advanced graphics
- More expansion options
- More reliability and warranty coverage

In all, the mobile workstation has a purpose-driven design goal: to enable traveling design professionals to use their power-hungry CAD applications just as they would on a desktop machine.

So whether you're an occasional traveler to a branch office or a road warrior spending days on end at a job site, the HP ZBook with Intel® Core™ i7 processor will become your computer tool of choice for getting things done outside the traditional office. In fact, with workstation power in your mobile computer, you may not need a desktop CAD machine.

Processors and Memory

HP Mobile Workstations are built on the Intel® QM87 mobile chipset, with either fourth-generation dual-core Intel® Core™ i5 processors or dual/quad-core Intel® Core™ i7 processors[1] utilizing 1600-MHz DDR3L SDRAM at densities of 2/4/8 GB per module. The

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Z220
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Performance you want. Value you need.
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Our most versatile workstation ever.
Z620
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World's first workstation Ultrabook; coming soon.
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Zbook 15
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dual-core systems are equipped with two memory slots for a maximum of 16 GB of RAM, while quad-core systems have four memory slots for a maximum of 32 GB of RAM[2].

With these processors, memory capacities, and form factors, workstation configurations range from a superlight 14" diagonal dual-core machine that supports as much as 16 GB of RAM to a 17.3" diagonal quad-core model with 32 GB of RAM — well within the range of capabilities needed to run most 2D and 3D CAD applications. In fact, specifications of all models are so robust that their performance is comparable to the HP Z230 and Z1 desktop workstations with Intel® Xeon® processors.

Hard Disks, SSDs, and Thunderbolt

CAD users often work with large models and data sets, so getting that data to the RAM and processors is a critical part of the workstation's total performance. And because data resides on a hard drive, it stands to reason that maximizing the speed of that hard drive is crucial for optimizing performance.

In the larger ZBook 15 with Intel® Core™ i7 processor and ZBook 17 with Intel® Core™ i7 processor, multiple drives (as many as four internal hard drives on the larger model) can be used to greatly expand space[3], provide RAID[4] redundancy, or mix up different types of drives. However, you must get beyond mechanical hard drives to find true speed, and these machines come through. They support up to 512-GB solid state drives (SSDs), which have no moving parts and deliver SATA III performance. In the ZBook 15 with Intel® Core™ i7 processor and ZBook 17 with Intel® Core™ i7 processor, an SSD can be combined with a mechanical hard drive to give both solid-state speed and traditional storage space, greatly speeding disk-intensive applications such as CAD.

And for mobile workers who handle enormous data sets that can quickly overflow hard drives — including video capture, point cloud, or geographic data — the new Thunderbolt[5] expansion port opens a whole new world of high-speed external drive expansions.

From a speed, expandability, and storage volume perspective, the new ZBooks with Intel® Core™ i7 processors offer disk functionalities that are a substantial improvement over the previous generation.

Graphics System

With a consumer notebook achieving only 1280 x 800 resolution and 32-bit color depth, you may not be able to produce the high-resolution output needed for animations and renderings required for today's projects. In contrast, HP ZBook Workstations with Intel® Core™ i7 processors support a variety of graphics and screen options that support HD+ (1600 x 900), FHD (1920 x 1080), and 17 FHD DreamColor[6] (1920 x 1080 at more than 1 billion colors; available on the 15.6" and 17.3" models).[7]

For those who want to utilize the ZBook 14 with Intel® Core™ i7 processor in touch mode with Windows 8, a touch screen is available.[8] Of course, all models can interface with external monitors via the included DisplayPort. Utilizing a docking station, an HP ZBook with Intel® Core™ i7 processor can support as many as five independent displays.

For graphics processing, the ZBooks include integrated Intel® HD Graphics as well as a discrete professional graphics card, providing hybrid graphics support that dynamically switches from integrated to discrete depending on the applications being used — which also helps to prolong battery life. Whether you're running 2D CAD or a high-end 3D analysis or visualization application, ZBooks with Intel® Core™ i7 processors deliver the graphics power you need.

ZBook 14

Integrated: Intel® HD Graphics 4400

NEW!

Expand your creative capabilities.
Zbook 17
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NEW!

Visual power to overachieve.
Z24i
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All screen images courtesy of Autodesk

Additional Resources

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HP Remote Graphics

HP Total Care

HP ePrint & Share

HP & Autodesk Brochure

Autodesk Strategic Partners

HP Workstations and Architecture, Engineering & Construction

HP Workstations and Product Development

4th Generation Intel® Core™ i7 Processor

Discrete: AMD FirePro™ M4100 (1 GB GDDR5 dedicated)

ZBook 15

Intel® HD Graphics 4600

NVIDIA Quadro® K610M (1 GB dedicated GDDR5)

NVIDIA Quadro® K1100M (2 GB dedicated GDDR5)

NVIDIA Quadro® K2100M (2 GB dedicated GDDR5)

ZBook 17

NVIDIA Quadro® K610M (1 GB dedicated GDDR5)

NVIDIA Quadro® K3100M (4 GB dedicated GDDR5)

NVIDIA Quadro® K4100M (4 GB dedicated GDDR5)

NVIDIA Quadro® K5100M (8 GB dedicated GDDR5)

The HP ZBook 17 with Intel® Core™ i7 processor has a 17.3" diagonal screen for comfortably working without an expansion monitor.

Connectivity and Expandability

Whether you're working at your own desk or on the road, chances are you'll need to plug in some accessories, so being well equipped with interface connectors is a must. Unlike many consumer laptops that cut corners by limiting connectivity options in number and speed, HP ZBooks with Intel® Core™ i7 processors come well equipped to support everything from mobile drives, older VGA data projectors, and wired/wireless[9] networks to external monitors and memory cards from digital cameras. An HD webcam is an option on all models, as well.

HP ZBooks with Intel® Core™ i7 processors come equipped with the following connectivity options:

- USB 3.0/2.0 and charging ports
- Thunderbolt port (ZBook 15/17)
- 1394a FireWire® interface
- SD/MMC reader
- VGA output for analog projectors
- DisplayPort connector
- 1 Gigabit Ethernet adapter
- 802.11 a/b/g/n wireless adapter

- Bluetooth® 2.1
- Microphone input
- Headphone/line output
- Docking connector (docking station optional)

Battery Options

Of course, if you load up these machines with maximum cores, RAM, graphics, and drives, your battery life won't equal that of small consumer notebook. With a 3-cell primary battery on the 14" model and an 8-cell primary battery on the 15.6" and 17.3" models — as well as external secondary batteries available on all models — you can configure your mobile workstation to maximize battery life or minimize weight and still get the battery performance your applications demand.[10]

Finally, optional high-wattage power adapters allow rapid charging of high-density batteries to get you back up to full charge quickly. Dealing with batteries is the least favorite part of traveling with computers, but HP has greatly improved the situation by delivering the options required to tailor your machines to real-world operating conditions — without sacrificing computing power.

Performance Advisor, RGS, and DriveGuard

Like all new HP Workstations, ZBooks with Intel® Core™ i7 processors come preinstalled with HP Performance Advisor[11], a configuration-management utility that keeps CAD-specific graphics and system drivers up to date so you don't have to.

All models also include HP Remote Graphics Software (RGS), which lets you access more workstation power and performance for remote access to an office workstation and real-time collaboration, as well as HP's 3D DriveGuard, which uses a 3-axis digital accelerometer to automatically park the hard drive heads whenever excessive motion is detected — protecting your drive from damage and your data from loss.

Warranty, Availability, and Pricing

HP ZBooks with Intel® Core™ i7 processors include a three-year warranty (parts/labor/on-site next business day service) plus a dedicated number for technical support. The HP ZBook 15 with Intel® Core™ i7 processor (starting at $1,969) and HP ZBook 17 with Intel® Core™ i7 processor (starting at $1,999) are available worldwide now. The HP ZBook 14 with Intel® Core™ i7 processor is scheduled for release in late October.

Wrapping Up

The flood of tablets into the market over the past few years has been a boon for many mobile professionals. However, today's tablets are not equipped to run CAD, let alone demanding simulation and rendering applications. For that, you'll need a mobile workstation. The new HP ZBooks with Intel® Core™ i7 processors take workstation mobility to a new level with their slim design, business-ruggedized chassis, road-worthy battery options, and light weight.

All this power and portability comes at a price due to professional-grade RAM, graphics processors, and drives — but isn't that money well invested if it enables you to get your job done comfortably, efficiently, and reliably? In fact, given the extreme power of these machines, you might even find you no longer need a desktop workstation — so investing in an HP ZBook with Intel® Core™ might even save money!

About the Author

Robert Green provides CAD implementation, consulting, and programming services for a variety of companies throughout the United States and Canada. He holds a degree in mechanical engineering from the Georgia Institute of Technology and is the author of *Expert CAD Management: The Complete Guide*. Reach him via his web site at www.cad-manager.com.

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1. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
2. Maximum memory capacities assume Windows 64-bit operating systems or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.
3. For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) of system and up to 30 GB (for Windows 8) disk is reserved for system recovery software.
4. SATA hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.
5. Thunderbolt™ 1 is available at launch on the HP ZBook 15 and HP ZBook 17. Thunderbolt™ 2 is planned to be available via an optional add-in card in early 2014 on the Z420, Z620, and Z820. Thunderbolt is new technology. Thunderbolt cable and Thunderbolt device (sold separately) must be compatible with Windows. To determine whether your device is Thunderbolt Certified for Windows, see https://thunderbolttechnology.net/products.
6. Sold separately or as an optional feature.
7. HD content required to view HD images.
8. Not all features are available in all editions of Windows 8. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 functionality. See http://www.microsoft.com.
9. Wireless access point and internet access required. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices. Connection speeds will vary due to location, environment, network conditions, and other factors.
10. Battery life will vary depending on the product model, configuration, loaded applications, features, use, wireless functionality and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See MobileMark07 battery benchmark http://www.bapco.com/products/mobilemark2007 for additional details.
11. HP Performance Advisor requires Windows and an internet connection.