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## Mobile Power at Your Fingertips

Go anywhere with the HP EliteBook 8470w, 8570w, and 8770w mobile workstations powered by 3rd generation Intel® Core™ i5 or i7 processors.

By Robert Green, *Cadalyst* Contributing Expert



Every year consumer notebooks become more powerful, yet HP mobile workstations become even more powerful and raise the bar on what you can accomplish while on the road. If you want to run CAD at trade shows, on airplanes, or branch offices, you need power you can carry around. Mobile workstations are an ideal solution that brings power, memory, disks, graphics, and business ruggedness well beyond typical consumer notebooks in a package that'll still fit in an overhead bin.

As CAD software grows ever more powerful and resource hungry, HP's Elitebook 8470w, 8570w, and 8770w mobile workstations are up to the task. Need to run renderings? No problem. Need high-resolution graphics? No problem. Need to run CAD, plus rendering, plus other applications? No problem.

### What is a Mobile Workstation

Simply put, HP mobile workstations now offer high speed multi-core processors, powered by 3rd generation Intel® Core™ i5 or i7 processors, more RAM, higher speed hard drives, solid state disks, high-resolution graphics accelerators, and multiple monitor outputs, just like a desktop workstation. Whether you plug into a docking station or not, you'll be able to run CAD applications at performance levels not attainable with consumer notebooks.



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The HP Elitebook 8470w has a compact 14" diagonal screen size making it highly portable. It can drive external monitors and supports up to 16 GB of RAM using 3rd generation Intel® Core™ i5 or i7 processors.

## Processor and Memory

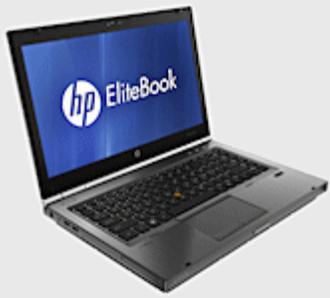
All HP's mobile workstations are built on Intel's QM7 mobile chipset with either 3rd generation Intel® Core™ i5 or i7 processors utilizing 1,600 MHz DDR3 SDRAM at densities of 2/4/8 GB per module.<sup>1</sup> The i5-based systems are equipped with two memory slots for a maximum of 16 GB RAM while i7<sup>2,3</sup> systems have four memory slots for a maximum RAM load of 32 GB.<sup>4</sup>

With these processors and memory capacities, mobile workstations can be configured anywhere from a dual core with 8 GB of RAM to a quad core with 32 GB of RAM, thus yielding a useful range of power for anything from 2D CAD to all but the most challenging 3D modeling and rendering workflows. With these levels of specifications, HP mobile workstations actually have comparable performance levels to HP's Z220 and Z1 desktop workstations.

## Hard Disks

Most consumer notebooks now offer large (500 GB and up) hard drives but may only support 5,400 RPM drives (rather than 7,200 RPM<sup>5</sup>) using SATA 2 drive controllers that max out at 3 GB/second transfer rates (rather than SATA 3 running at 6 GB/second). By supporting faster controllers and drive speeds, HP mobile workstations offer real throughput advantages for data intensive applications like CAD and rendering. Don't believe me? Watch the hard drive light on your consumer notebook as it slows down and grinds through a heavy duty CAD session and you'll see your computer is only as good as its hard drive.

Mobile workstations don't just offer faster mechanical drives; they also support more than one drive and offer 128 to 256 GB solid state drives that have no moving parts at all. Want to see your 3D CAD analysis and rendering processes speed up? Watch what happens when you run them on an SATA 3 technology SSD equipped machine where there simply is no waiting for the disk. I find it hard to overstate how much new drive technologies can speed the performance of your CAD applications — and, in this regard, HP mobile workstations run rings around consumer notebooks.



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Supporting up to three SATA 3 storage devices using the upgrade bay at up to 750 GB<sup>6</sup> per device storage capacity is ample. Or, to achieve optimal processing speed a 256 GB solid state drive<sup>6</sup> (SSD) on a SATA 3 bus delivers up to 2X the disk throughput of even last year's mobile workstations which used the SATA 2 bus.

In addition, the HP Elitebooks offer new Intel<sup>®</sup> SRT (Smart Response Technology), which is essentially mSATA-based flash cache coupled with traditional 7,200 rpm hard drives. This can provide performance near SSD, but at a lower cost than SSD and with the capacity sizes of traditional drives.

## Graphics System

With many consumer notebooks achieving only 1,280 x 800 resolution and 32-bit color depth, you simply can't render with the color depth or HD<sup>10</sup> resolutions that are so common in the highly detailed images required in today's publishing environments. HP mobile workstations support HD+ (1,600 x 900), FHD (1,920 x 1,080), and FHD DreamColor (1,920 x 1,080 at 1 billion plus colors).<sup>10</sup> Combined display ports to drive optional additional monitors HP mobile workstations can be easily configured for duty in demo, projection, and trade show environments where flexibility, color depth, and resolution demands can be different at every event.



Running multiple external monitors makes HP Mobile Workstations ideal for presentations or demo environments.

To support popular CAD applications, both machines support high-end ISV-certified graphics accelerators from AMD and NVIDIA that span a wide range of graphics memory and screen configurations. With graphics processors ranging from 1 GB of graphics RAM on the Elitebook 8470w to 4 GB of GDDR5 RAM on the Elitebook 8770w, you can configure your mobile workstation specifically for your CAD/rendering applications specific requirements. HP's Elitebook mobile workstations are certified for CAD ISV's such as AutoCAD, Inventor, SolidWorks, and more.

	AMD FIREPRO™ M2000	AMD FIREPRO™ M4000	NVIDIA QUADRO K1000M	NVIDIA QUADRO K2000M	NVIDIA QUADRO K3000M	NVIDIA QUADRO K4000M	NVIDIA QUADRO K5000M
 8470w	✓						
 8570w		✓	✓	✓			
 8770w		✓			✓	✓	✓

HP mobile workstations support a wide range of NVIDIA and AMD graphics processors.



The HP Elitebook 8770w has a 17.3" diagonal screen size for compelling HD<sup>10</sup> displays even without a supported external display. Supporting 32 GB of RAM spread over four memory slots, the 3rd generation Intel® Core™ i5 or i7 processors yields desktop level computing power.<sup>1</sup>

## Connectivity and Expandability

Whether you're working at your own desk or on the road, chances are you'll want to plug in some sort of accessory, so being well equipped with interface connectors is something HP mobile workstations take seriously. All HP mobile workstations come equipped with the following, extensive, list of connectivity options:

- two USB 3.0 ports
- two USB 2.0 ports (1 charging),
- eSATA/USB 2.0 combo port for portable drives
- 1394a FireWire® interface
- SD/MMC reader
- VGA output for analog projectors
- DisplayPort connector
- AMD Eyefinity Technology for advanced multi-monitor support<sup>7</sup>
- 1 Gigabit Ethernet adapter
- 802.11 a/b/g/n wireless adapter<sup>8</sup>
- Bluetooth 4
- Optional HP Mobile Broadband<sup>9</sup>
- Optional HD<sup>10</sup> webcam<sup>11</sup>
- Microphone input
- Headphone/line output
- Docking connector (docking station optional)
- Second battery connector

Unlike many consumer notebooks that cut corners by not offering fast, or enough, connectivity options, HP mobile workstations comes well equipped to support anything from mobile drives, older VGA data projectors, wired/wireless networks, phones, external monitors, or memory cards from digital camera in stride.

### Battery Options

Of course, if you load up an HP mobile workstation with maximum cores, RAM, graphics, and max out the monitor brightness, your battery life won't equal that of small consumer notebooks, but with the optional, high density battery and/or a second battery, you can run even power hungry CAD applications for several hours.<sup>12</sup>

With 75-, 83-, and 100-Watt Hour battery options, you can configure your mobile workstation to maximize battery life or minimize weight as makes sense for your application. You can even upgrade with an Extended Life Battery or Ultra Extended Life Battery. Your second battery can fit on the bottom of the mobile workstation, so the expansion bay is still available for an optical drive or external hard drive. For example, the HP Elitebook 8570w comes standard with an 8 cell battery which offers up to 6.5 hrs of battery life<sup>13</sup>. If you add the Extended Life Battery, you add up to 12.5 hours<sup>13</sup>, and 14.5 hours<sup>13</sup> if you use the Ultra Extended Life Battery.

Finally, optional high wattage power adapter HP Fast Charge lets you rapidly charge high-density batteries. While dealing with batteries is my least favorite aspect of dealing with portable computers, HP delivers the options required to tailor your machines to the real world circumstances you operate under without sacrificing computing power.

### Performance Advisor and DriveGuard

Like all HP machines, HP mobile workstations powered by 3rd generation Intel® Core™ i5 or i7 processors are preinstalled with HP Performance Advisor, a configuration-management utility that keeps CAD specific graphics and system drivers up to date so you don't have to. Why worry about having the right video, software, or operating system drivers when Performance Advisor can take care of it for you?



HP Performance Advisor keeps track of device and driver configurations automatically.

All HP mobile workstations also include HP's 3D DriveGuard which used a 3-axis digital accelerometer to automatically park the hard drive heads when adverse motion conditions are sensed — perfect for rough service in the field or on bumpy airline flights.



HP's 3D DriveGuard protects the disk against mechanical jarring and parks the drive automatically so you can move your workstation without worrying about data loss.

HP ProtectTools offer security, protecting the mobile workstation and your data via authentication and encryption. ProtectTools comes standard and is easy to setup and customize using fingerprint, smart card, passwords, tokens, and more.<sup>14</sup>

HP's Elitebooks give you reliability on the go, with the extreme testing each machine goes through via the Military Spec Testing (MIL Spec 810G) for dust, operational vibration, shock, altitude, transit drop, and high temperature. These tests make sure that the mobile workstation can handle being used on the field, in your car, on the train, or anywhere you need to be.<sup>15</sup>

### Wrapping Up

Given all the attention that iPads and other ultralight weight computing devices are getting, you might think that workstations — especially mobile ones — are on the way out. But, because you can't run CAD on an iPad and because you can't run CAD applications well on consumer notebooks, mobile workstations are the option for high power CAD road warriors.

While mobile workstations can cost more due to the high amounts of RAM, graphics, and drives, but isn't it money well invested if it allows you to do your work well? In fact, you

might find you don't even need a desktop workstation anymore, given the extreme power you can get in these mobile workstations. If you have CAD professionals out in the field, check out what a real mobile workstation can do for your company.

## About the Author

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Robert 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](http://www.cad-manager.com).

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### Disclaimers

\* Prices, specifications, availability and terms of offers may change without notice.

\*\* Windows 7 systems may require upgraded and/or separately purchased hardware to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://www.microsoft.com/windows/windows-7/> for details.

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1. 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.
2. 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.
3. Intel® Active Management Technology requires an Intel® AMT-enabled chipset, network hardware and software, as well as a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications or implementation of new business processes. Microsoft Windows required.
4. 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.
5. For hard drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 20 GB (Windows 7) of system disk is reserved for the system recovery software.
6. GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 15GB (for Windows 7) of system disk is reserved for system recovery software.
7. Requires AMD discrete graphics configuration. HP EliteBook 8470w supports up to five total displays when using with the HP Advanced docking station. The advanced docking station is sold separately.
8. Wireless access point and Internet service required. Availability of public wireless access points limited.
9. Wireless use requires separately purchased service contract. Check with your local vendor for coverage area and availability in your area. Connection and speeds will vary due to location, environment, network conditions, and other factors.
10. HD content required to view HD images.

11. Sold separately or as an optional feature.
12. Fast Charge Technology recharges your battery up to 90% within 90 minutes when the system is off. Fast Charge Technology does not apply to the HP Ultra Extended Life or 9-cell batteries. When the PC is powered on, charge time may increase and will vary based on the workload of the notebook PC.
13. Battery life will vary depending on various factors including 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 [www.bapco.com](http://www.bapco.com) for additional details.
14. Microsoft Windows required.
15. Testing was not intended to demonstrate fitness for Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions.

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