



The science behind the report:

HP ZBook G10 mobile workstations: Get the performance you need to take projects and action plans to the next level

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report [HP ZBook G10 mobile workstations: Get the performance you need to take projects and action plans to the next level](#).

We concluded our hands-on testing on November 22, 2023. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on October 30, 2023 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to <http://facts.pt/calculating-and-highlighting-wins>. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Benchmark results. Higher scores are better. We report the median score of three runs for each test.

	HP ZBook Firefly 14 G10	HP ZBook Power G10	HP ZBook Fury G10
3DMark Time Spy			
Overall score	2,069	8,189	14,087
Graphics score	1,829	7,700	13,988
CPU score	8,196	12,791	14,729
WebXPRT 4 on Microsoft Edge			
Overall score	270	285	291
Procyon® Video Editing Benchmark			
Overall score	3,058	5,836	7,187
Basemark® GPU			
Vulkan score	1,876	7,739	14,892
DirectX 12 score	1,909	7,558	14,359
Geekbench 6 Pro			
GPU Compute OpenGL score	17,422	78,116	147,666

	HP ZBook Firefly 14 G10	HP ZBook Power G10	HP ZBook Fury G10
PugetBench for Creators			
PugetBench for Adobe® Premiere® Pro v0.98.0 using Adobe Premiere Pro v23.6.0 score	262	584	711
PugetBench for Adobe After Effects® v0.95.6 using Adobe After Effects v23.6 score	680	910	980
Blender Benchmark (samples per minute, higher is better)			
Monster render	79.69	1,471.42	2,751.66
Junkshop render	45.02	839.73	1,387.96
Classroom render	31.76	736.00	1,345.52

Table 2 presents our content creation workflow results in detail.

Table 2: Content creation workflow results. Less time is better. We report the median score of three runs for each test.

	HP ZBook Firefly 14 G10	HP ZBook Power G10	HP ZBook Fury G10
Content creation workflows (time, minutes:seconds)			
Rendering a scene from an Autodesk Maya® 2024 video into an image with the Arnold for Maya rendering tool	0:42	0:13	0:11
Upscaling image resolution 4x using Gigapixel AI	0:34	0:14	0:13
Exporting a 5K video to 1080p using DaVinci Resolve 18	4:33	1:28	1:16
Encoding video formats using Handbrake	3:28	1:32	1:22
Creating a panoramic 45MP image using the Photomerge element in Photoshop	0:51	0:49	0:46

System configuration information

Table 3: Detailed information on the systems we tested.

System configuration information	HP ZBook Firefly 14 G10	HP ZBook Power G10	HP ZBook Fury G10
Processor			
Vendor	Intel®	Intel	Intel
Name	Core™ i7-1370P	Core i9-13900H	Core i9-13950HX
Core frequency (GHz)	3.9-5.2	4.10-5.40	4.0-5.5
Number of cores	6 P-cores, 8 E-cores	6 P-cores, 8 E-cores	8 P-cores, 16 E-cores
Cache (MB)	24	24	36
Memory			
Amount (GB)	32	32	32
Type	DDR5	DDR5	DDR5
Speed (MHz)	5,200	5,200	5,600
Integrated graphics			
Vendor	Intel	Intel	Intel
Model number	Iris Xe Graphics	Iris Xe Graphics	Iris Xe Graphics
Discrete graphics			
Vendor	N/A	NVIDIA®	NVIDIA
Model number	N/A	RTX 2000 Ada	RTX 4000 Ada
Storage			
Amount (TB)	1	1	1
Type	PCIe-based flash	PCIe-based flash	PCIe-based flash
Connectivity/expansion			
Wired internet	N/A	1 x RJ-45	1 x RJ-45
Wireless internet	Intel AX211 Wi-Fi 6E	Intel AX211 Wi-Fi 6E	Intel AX211 Wi-Fi 6E
Bluetooth	5.3	5.3	5.3
USB	2 x 3.2 2 4 Type-C	2 x USB Type-A 5Gbps 1 x USB4 Type-C 40Gbps	2 x USB Type-A 5Gbps 2 x USB4 Type-C 40Gbps
Thunderbolt	2	1	2
Video	1 x HDMI	1 x HDMI	1 x HDMI 1 x Mini DisplayPort
Battery			
Type	Lithium-polymer	Lithium-polymer	Lithium-polymer
Integrated	Integrated	Integrated	Integrated
Rated capacity (Wh)	51	83	95

System configuration information	HP ZBook Firefly 14 G10	HP ZBook Power G10	HP ZBook Fury G10
Display			
Size (in.)	14.0	15.6	15.6
Type	IPS	IPS	IPS
Resolution	1,920 x 1,200	1,920 x 1,080	3,840 x 2,400
Touchscreen	No	No	No
Operating system			
Vendor	Windows	Windows	Windows
Name	Windows 11 Pro	Windows 11 Pro	Windows 11 Pro
Build number or version	22H2	22H2	22H2
BIOS			
BIOS name and version	HP 8b41 51.2B.00	HP V97 01.01.03	HP V96 01.02.03
Dimensions			
Height (in)	0.75	0.89	1.12
Width (in)	12.40	14.14	14.29
Depth (in)	8.83	9.20	9.86
Weight (lbs.)	3.2	4.4	5.3

How we tested

Setting up the system

Setting up and updating the OEM image

1. Boot the system.
2. Follow the onscreen instructions to complete installation, using the default selections when appropriate.
3. Set the Windows (plugged in) Power Mode to Best Performance.
4. Set Screen and Sleep options to Never:
 - a. Right-click the desktop, and select Display settings.
 - b. From the left column, select System.
 - c. Click Power & Battery.
 - d. For all power options listed under Screen and Sleep, select Never.
5. Disable User Account Control notifications:
 - a. Select Windows Start, type UAC, and press Enter.
 - b. Move the slider control to Never notify, and click OK.
6. Run Windows Update, and install all updates available.
7. Verify the date and time are correct, and synchronize the system clock with the time server.
8. Pause Automatic Windows Updates:
 - a. Click the Windows Start button.
 - b. Type Windows Update settings, and press Enter.
 - c. From the Pause updates drop-down menu, select Pause for 5 weeks.

Performance testing

Geekbench 6 Pro GPU OpenCL

Setting up the test

1. Purchase a Pro license and download and install Geekbench 6 Pro from <https://www.geekbench.com/download/>.

Running the test

1. Launch Geekbench.
2. Click Run Compute Benchmark.
3. Record the result.
4. Wait 5 minutes before re-running.
5. Repeat steps 1 through 4 two more times.

WebXPRT 4 (Microsoft Edge web browser)

Running the test

1. Open the Web browser under test, and go to <https://www.principledtechnologies.com/benchmarkxpert/webxpert/>.
2. Click Run WebXPRT 4.
3. At the Ready to test your browser screen, click Continue.
4. Click Start.
5. When the test completes, record the results.
6. Click Run Again, and click Start to rerun WebXPRT. Record the results.
7. Repeat step 6 two more times.

Blender Benchmark

Setting up the test

1. Download and install the Blender Benchmark from <https://opendata.blender.org/>.

Running the test

1. Launch the Blender Benchmark Launcher.
2. To accept the agreement, click Next.
3. Leave the default 3.6.0 Blender Version selected, and click Next.
4. Confirm the scenes the benchmark will render, and click Next.
5. Ensure the correct Benchmark Device is selected, and click Start Benchmark.
6. Record the results.
7. Wait 5 minutes before re-running.
8. Repeat steps 1 through 7 two more times.

3DMark: Time Spy

Setting up the test

1. Download the 3DMark benchmark from <http://www.futuremark.com/benchmarks/3dmark/all>.
2. To install 3DMark with the default options, double-click the 3DMark installer.exe file.
3. To launch 3DMark, double-click the 3DMark desktop icon, enter the registration code, and click Register.
4. Exit 3DMark.

Running the test

1. To launch the benchmark, double-click the 3DMark desktop icon.
2. At the top of the 3DMark Home screen, click the Benchmarks tab.
3. Select the desired benchmark to run (Time Spy).
4. Click Run.
5. When the benchmark run completes, record the results.
6. Perform steps 1 through 6 two more times.

Basemark GPU

Setting up the test

1. Download the Basemark GPU benchmark from <https://www.basemark.com/benchmarks/basemark-gpu/>.
2. To install Basemark GPU with the default options, double-click the Basemark GPU installer file.
3. Follow the installation instructions and install any necessary Microsoft Visual Redistributable components.

Running the test

1. To launch the benchmark, double-click the Basemark GPU desktop icon.
2. Select the Graphics API, Graphics Device, Texture Compression, and Content Quality.
3. Click Run Official Test.
4. When the benchmark run completes, record the results.
5. Repeat steps 1 through 4 two more times.

Procyon Video Editing Benchmark

Setting up the test

1. Download and install Procyon.
2. Open Procyon.
3. Click Video Editing Benchmark.
4. Click Register.
5. Enter the license key for the Video Editing Benchmark, and click Register.
6. Before running the benchmarks, make sure to install licensed versions of Adobe Premiere Pro 22.0 or higher.

Running the test

1. Boot the system.
2. Launch Procyon.
3. Click Video Editing Benchmark.
4. Click Run.
5. When the benchmark is complete, record the results.
6. Wait 15 minutes before rerunning the benchmark.
7. Repeat steps 1 through 6 twice more.

PugetBench Adobe Content Creation Benchmark

Puget Systems Adobe CC benchmarks are designed to thoroughly test many of the most popular Adobe software packages using real-world projects and workflows.

PugetBench for Premiere Pro

We used the following application:

- Adobe Premiere Pro

Setting up the test

1. Launch Adobe Premiere Pro.
2. Click through the tutorial pop-up tips.
3. Close Adobe Premiere Pro.
4. Purchase a PugetBench for Premiere Pro license from <https://www.pugetsystems.com/labs/articles/PugetBench-for-Adobe-Creative-Cloud-1642/>.
5. Click Get on Adobe Marketplace, and log into your Adobe account.
6. Click the PugetBench Premiere Pro Plug-in to install it.
7. Open Adobe Premiere Pro.
8. Click Create New Project → Create.
9. Click Window → Extensions → PugetBench for Premiere Pro.
10. Next to License Key, click Change, and enter your license key. Click Save.
11. Click Download Project Files, and download the test assets.
12. Go to the Downloads folder, and extract the PugetBench for Premiere Pro 0.95.7 test assets.

Running the test

1. Boot the system.
2. Open Adobe Premiere Pro.
3. Go to Downloads → PugetBench for Premiere Pro, and open the Benchmark_Project_23.prproj file.
4. Click Window → Extensions → PugetBench for Premiere Pro.
5. Click Run Benchmark.
6. When the benchmark finishes, record the overall score.
7. Close Adobe Premiere Pro, and restart the system under test.
8. Wait 30 minutes before performing the next run.
9. Repeat steps 1 through 8 twice more and record the median result.

PugetBench for After Effects

We used the following application:

- Adobe After Effects

Setting up the test

1. Launch Adobe After Effects.
2. Click through the tutorial pop-up tips.
3. Close Adobe After Effects.
4. Purchase and download the PugetBench for After Effects license from <https://www.pugetsystems.com/labs/articles/PugetBench-for-Adobe-Creative-Cloud-1642/>.
5. Click Get on Adobe Marketplace, and log into your Adobe account.
6. Click the PugetBench After Effects Plug-in to install it.

7. Open Adobe After Effects.
8. Click Edit → Preferences → Scripting & Expressions.
9. Select Allow Scripts to Write Files and Access Network, and click OK.
10. Click Edit → Preferences → Memory & Performance.
11. The benchmark requires After Effects to have 12 GB of RAM space. Adjust the RAM reserved for other applications to get to 12 GB RAM reserved for After Effects, and click OK.
12. Click Composition → New Composition.
13. Accept the default Composition Settings, and click OK.
14. Click Composition → Preview, and uncheck Cache Frames When Idle.
15. Click Window → Extensions → PugetBench for After Effects.
16. Next to License Key, click Change, and enter your license key. Click Save.

Running the test

1. Boot the system.
2. Open Adobe After Effects.
3. Click Window → Extensions → PugetBench for After Effects.
4. Click Run Benchmark.
5. When the benchmark finishes, record the overall score.
6. Close Adobe Photoshop, and restart the system under test.
7. Wait 30 minutes before performing the next run.
8. Repeat steps 1 through 7 twice more, and record the median result.

Custom workload testing

Conducting Autodesk Maya 2024 with Arnold Renderer tests

Setting up the test

1. Download and install the Maya 2024 7-day trial from <https://www.autodesk.com/products/maya/free-trial>. Verify that the installation will include Arnold Renderer as an additional component.
2. Launch Maya 2024, and point the Project Window to the correct directory.
 - a. Go to File → Project Window.
 - b. Click New, and type `Dinner_scene`
 - c. Set the Location to Documents/maya/projects.
 - d. Click Accept.
3. Create a Maya 2024 test workload scene named Dinner_scene. We used the YouTube tutorial created by Creative Tap.
4. Copy the Dinner_scene test workload to the Documents\maya\projects directory onto the other test system. When prompted, select Yes to overwrite the Dinner_scene directory.
5. Close Maya 2024.

Running the test

1. Launch Maya 2024, and select the test workload scene by browsing to Documents\maya\projects\Dinner_scene\Dinner_scene_v1.mb.
2. From the top menu bar, select the Display render settings icon.
3. Next to the Render Using field, select Arnold Renderer.
4. Under the System tab, select GPU as the Render Device, if available.
5. Under the Dinner_scene project, click the folder icon to choose a folder, and click Select.
6. Close the Render Settings dialog.
7. From the top menu, select Open Render View.
8. Start the timer, and click the green arrow to begin rendering the scene.
9. When the render completes, stop the timer, and record the time.
10. Repeat steps 1 through 9 two more times.

Adobe Photoshop

We recorded how long it took to photo merge a panorama to create a 45MP image.

Running the test

1. Launch Photoshop.
2. Select File → Automate → Photomerge → Panorama.
3. Browse to the directory where the images are located, select them, and click OK.
4. Simultaneously start the timer and click OK.
5. When the panoramic picture appears, stop the timer.
6. Repeat steps 1 through 5 two more times.

DaVinci Resolve 18

We recorded how long it took to export a 5K RED video file to H.264.

Running the test

1. Launch DaVinci Resolve 18.
2. Click New Project, name the test project, and click Create.
3. Drag and drop the test footage into the Media Pool. Click Change to change the project frame rate to match the source footage.
4. Drag and drop the test footage into the project timeline.
5. Click Quick Export.
6. Leave the default options for H.264 Master.
7. Start the timer, and click Export.
8. When the export completes, stop the timer, and record the result.
9. Repeat steps 1 through 9 two more times.

Gigapixel AI: Upscale Image 4x

Setting up the test

1. Register, download, and install the Topaz Labs Gigapixel AI free trial from <https://www.topazlabs.com/gigapixel-ai>.
2. Launch Gigapixel AI and enter the username and password to start the free trial.
3. Close Gigapixel AI.

Running the test

1. Launch DeNoise AI.
2. Open the File → Preferences menu, select the appropriate AI Processor, and set Allowed Memory Consumption to High.
3. Click Browse, and select the test image.
4. Leave the default Scale and AI Model resize options selected.
5. To start the upscale process, click Save.
6. Once the save process is complete, record how long it took, which appears in the box at the bottom of the screen.
7. Wait 5 minutes before performing the next run.
8. Repeat steps 1 through 7 two more times.

HandBrake

Setting up the test

1. Download HandBrake from <https://handbrake.fr/downloads.php>.
2. Install HandBrake with default options.
3. Copy the 4K file you will be transcoding to the test system.
4. Launch HandBrake.
5. Browse to the 4K source file, and click Open.

Fast 1080p30 preset test

Running the test

1. Click the Chapters tab, and uncheck the Create chapter markers box.
2. Click Start Encode.
3. When encoding is complete, click the Show Queue menu item to view the encoding statistics.
4. Repeat steps 1 through 3 two more times.

Cloud file access: time to download 10GB file from Box.com

Running the test

1. Navigate to Box.com with the Edge browser, and log in with the test account.
2. Navigate to the test file you will download.
3. Start the timer, and click Download.
4. Stop the timer when the download completes, and record the result.
5. Repeat steps 1 through 4 two more times.

Read the report at <https://facts.pt/aN635le>



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