

Benchmark Report

The 2.5GHz Power Mac G5 Quad Benchmark Project

Performance and productivity comparison of the
2.5GHz Power Mac G5 Quad with the dual 1.42GHz Power Mac G4
and the dual 2.7GHz Power Mac G5

Client: Apple Computer

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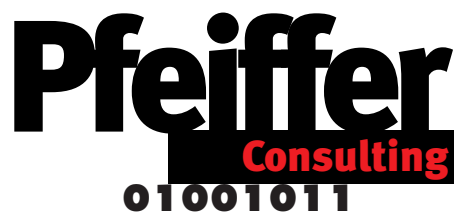



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About the Benchmark Project

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1 Benchmark Overview

This benchmark project was conducted by Pfeiffer Consulting for Apple Computer and analyzes the performance and productivity of the 2.5GHz Power Mac G5 Quad introduced in October 2005, as compared with the dual 1.42GHz Power Mac G4 and the dual 2.7GHz Power Mac G5.

1.1 Performance Benchmarks

The performance benchmarks included system performance and application performance benchmarks.

1.2 Productivity Benchmarks

Productivity benchmarks were conducted using a set of workflow integration measures, executed with Adobe InDesign CS2, Photoshop CS2, Illustrator CS2, Adobe Acrobat 7.0.1, and QuarkXPress 6.5.

1.3 Multitasking-Multiprocessing Benchmarks

Multitasking/multiprocessing benchmarks were conducted to assess the impact of multiple processors on workflow performance in commonly executed tasks.

2 Hardware and Configuration: Details

2.1 Computers Tested

- 2.5GHz Power Mac G5 Quad
- Dual 1.42GHz Power Mac G4
- Dual 2.7GHz Power Mac G5

2.2 Hardware Configuration


- Standard hardware configurations were used.
- All systems were equipped with the standard hard drives shipped with the computer.
- All hard drives were reformatted using a single partition before testing.

2.3 Memory Configurations

- All computers were tested with 4GB of RAM, except for the dual 1.42GHz Power Mac G4 which only supports a maximum of 2GB of RAM

2.4 System Software

All benchmarks were run on a standard, unmodified installation of Mac OS X 10.4.2.

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3 About the Performance Benchmarks

The performance benchmarks were conceived to measure pure performance increase in system operations as well as in some of the more power-hungry applications that are used in the design and publishing workflow, namely Adobe Photoshop, Adobe InDesign, and Adobe Illustrator.

3.1 System Setup

- All tests were performed using the standard system installation and configuration.
- All systems were completely reinitialized before tests, using the default values for installation.
- All hard drives were reformatted using a single partition.
- All software was installed from scratch, using default settings.
- No peripherals were connected to the systems during performance benchmarks.


3.2 Benchmark Basics

- All application software was used in its most recent commercially available release: Adobe Photoshop CS2, Adobe Illustrator CS2, Adobe InDesign CS2, Adobe Acrobat 7.0.1, QuarkXPress 6.5.
- All performance benchmarks were conducted in an identical fashion, and were executed several times to ensure stabilized, reliable results. In Photoshop, the Undo buffer was purged after every individual benchmark.

3.3 Application Settings

- All applications were installed specifically for the benchmark project, and used in their standard configurations.

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4 System Performance Benchmarks: Details

4.1 Performance Benchmarks: System Operations

The following operations were benchmarked:

- System startup
- Application launch (initial launch and relaunch)
- File copy (local): single file, 50MB
- File copy (local): single file, 100MB
- File copy (local): single file, 200MB
- File copy (local): folder 100MB, 4000 files and subfolders
- File open (Adobe Photoshop)
- File save (Adobe Photoshop)

5 Application Performance Benchmarks

5.1 Performance Benchmarks: Adobe Photoshop CS2

Photoshop benchmarks consisted of a variety of common operations, drawing on different aspects of computer performance. All tests were performed on files of three different sizes: 50MB, 100MB, and 200MB. After each test, the Undo buffer was purged.

Functions tested:

- Gaussian Blur (radius 40 pixels)
- RGB-CMYK Conversion
- Unsharp Mask (50%, 10 pixels)
- Lighting Effects (default values)
- Resample Image (150%)

In addition, a separate test measured the time necessary to batch-convert four 11-megapixel RAW digital camera files using Bridge and Adobe Camera Raw.


5.2 Performance Benchmarks: Adobe InDesign CS2/QuarkXPress 6.5

InDesign Benchmarks consisted of five common tasks, such as importing images and large text documents, and exporting PDF files. (See also: **Workflow Integration Benchmarks**)

Functions tested:

- Export PDF
- Switch to high-resolution display (complex file)

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6 Workflow Integration Benchmarks (InDesign CS2, QuarkXPress 6.5)

6.1 Overview

The workflow integration benchmarks measured the time necessary to perform an edit operation for a placed picture in a page layout application. The benchmark included triggering the editing operation in InDesign CS2 or QuarkXPress 6.5, opening the file in the native application, performing a simple edit operation, saving the changes, and returning to the page layout environment to update the placed picture.

6.2 Tests performed

Photoshop Round-trip

- Photoshop Round-trip, 20MB file (Photoshop already launched)
- Photoshop Round-trip, 50MB file (Photoshop already launched)
- Photoshop Round-trip, 100MB file (Photoshop already launched)
- Photoshop Round-trip, 20MB file (including Photoshop launch)
- Photoshop Round-trip, 50MB file (including Photoshop launch)
- Photoshop Round-trip, 100MB file (including Photoshop launch)

Illustrator Round-trip

- Illustrator Round-trip, complex graphic (Illustrator already launched)
- Illustrator Round-trip, complex graphic (including Illustrator launch)

Section: Workflow Integration Benchmarks (InDesign CS2, QuarkXPress 6.5)	
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7 Multitasking—Multiprocessing Benchmark

7.1 Overview

To measure the productivity impact of multitasking on the real-world creative workflow, Pfeiffer Consulting defined a set of six specifically conceived multitasking benchmarks.

First, six frequently encountered, time-consuming tasks of the creative workflow (conversion of a page layout to PDF, backup of a project folder on the Finder level, conversion of RAW image files, and so on) were defined and individually timed.

Using these individual tasks, six multitasking sets were then defined, combining two (and in one case, three) of the six predefined operations.

Execution of the benchmarks was performed by triggering the longest operation first, then switching to the second application, and triggering the second task, measuring the total time to complete both operations.

7.2 Individual Tasks

- Bridge/Camera RAW: Convert and save 12 Raw files
- Bridge/InDesign: Create Contact Sheet of 50 Digital images
- Photoshop: Radial Blur on 125 MB file
- Finder/System: Copy 340 MB of image files from CD to Computer
- Finder/System: Copy 650 MB of files and folders
- QuarkXPress 6.5: Create PDF file
- Illustrator: Apply Warp/fisheye filter to complex postscript file

7.3 Multitasking Benchmarks — Two Tasks

- Multitasking Set 1 (2 Tasks)

Task 1: Bridge/Camera RAW: Convert and save 12 RAW files

Task 2: Photoshop: Radial Blur on 125MB file

- Multitasking Set 2 (2 Tasks)

Task 1: Photoshop: Radial Blur on 125MB file

Task 2: Bridge/InDesign: Create contact sheet of 50 Digital images

- Multitasking Set 3 (2 Tasks)


Task 1: QuarkXPress 6.5: Create PDF file

Task 2: Finder/System: Copy 650MB of files and folders

- Multitasking Set 4 (2 Tasks)

Task 1: Illustrator: Apply Warp/Fisheye filter to complex drawing

Task 2: Photoshop: Radial Blur on 125MB file

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- **Multitasking Set 5 (2 Tasks)**

Task 1: Bridge/Camera RAW: Convert and save 12 RAW files

Task 2: Finder/System: Copy 650MB of files and folders

- **Multitasking Set 6 (3 Tasks)**

Task 1: Photoshop: Radial Blur on 125MB file

Task 2: Illustrator: Apply Warp/Fisheye filter to complex drawing

Task 3: Finder/System: Copy 650MB of files and folders

7.4 Multiprocessing Benchmark

Un additional benchmark measured multiprocessing performance, to assess performance differences between the new 2.5GHz Power Mac G5 Quad and older models using dual processors.

This test measured the time necessary to process a Radial Blur filter on a 125MB Photoshop file.

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System Tests

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System Tests: Complete Results

System Tests 1: Application Launch

Launch Illustrator
Relaunch
Launch Photoshop
Relaunch

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
29.7	24	19
7.4	5.2	4.3
17.4	13.3	11.6
7.4	4.4	3.8

System Tests 2: Application Launch

Launch InDesign
Relaunch
App Launch Acrobat
App Launch QuarkXPress
Relaunch

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
20.9	14.7	13.9
5	3.7	3.1
7.8	5.7	4.7
11.9	8.8	9.5
4.4	4.1	4

System Tests 3: File Copy (Local)

50MB (Single File)
100MB (Single File)
200MB (Single File)
100MB (Folder Copy)

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
4.5	3	4
7.6	5.1	5.3
14.8	9	10.1
24.5	18.3	16

System Tests 4: File Open/Save (Photoshop)

Open 100MB File
Save 100MB File
Open 200MB File
Save 200MB File

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
6.4	3.9	3.3
4.6	3.6	2.9
9.1	6.8	5.5
8.3	5.1	5

System Tests: Average of All Tests

Average

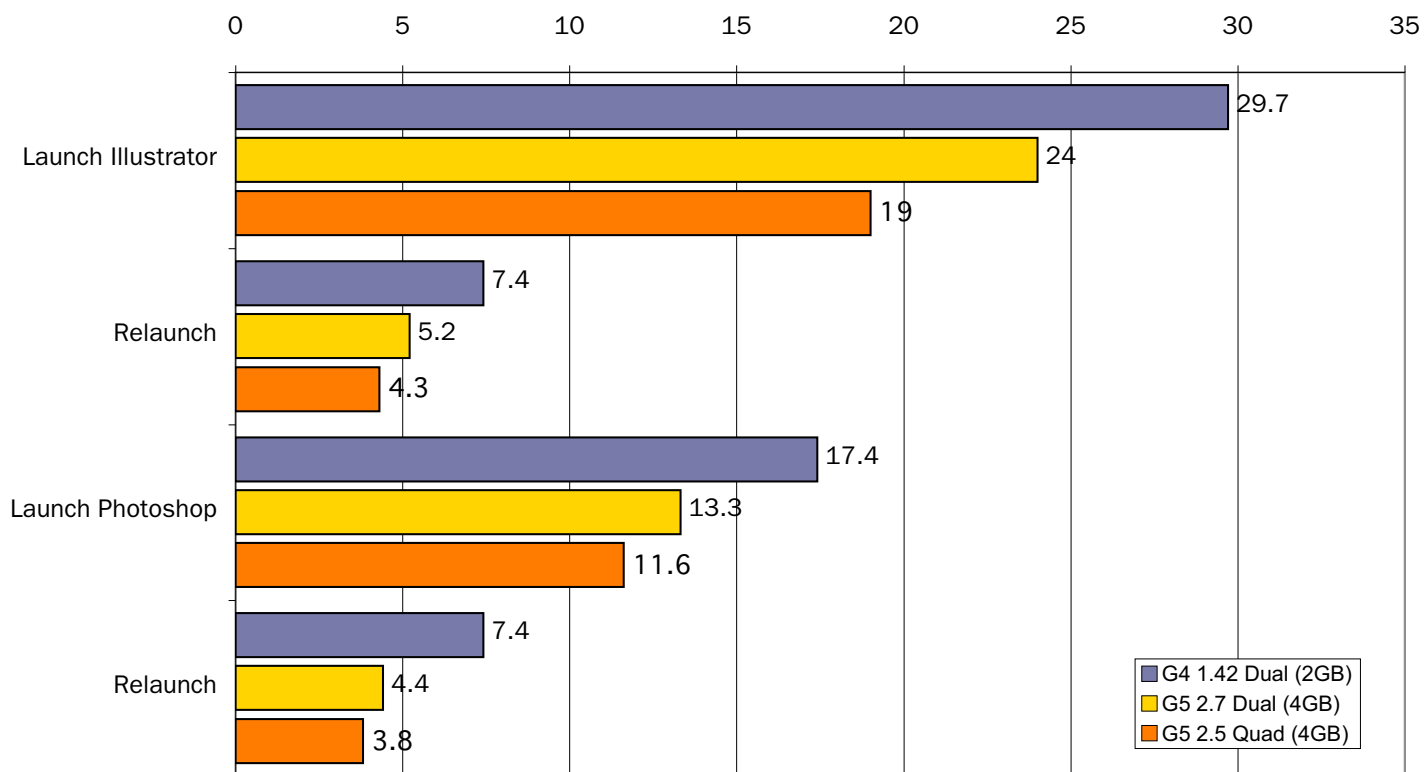
G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
11.28	8.16	7.41

Results in seconds. Shorter/lower is better.

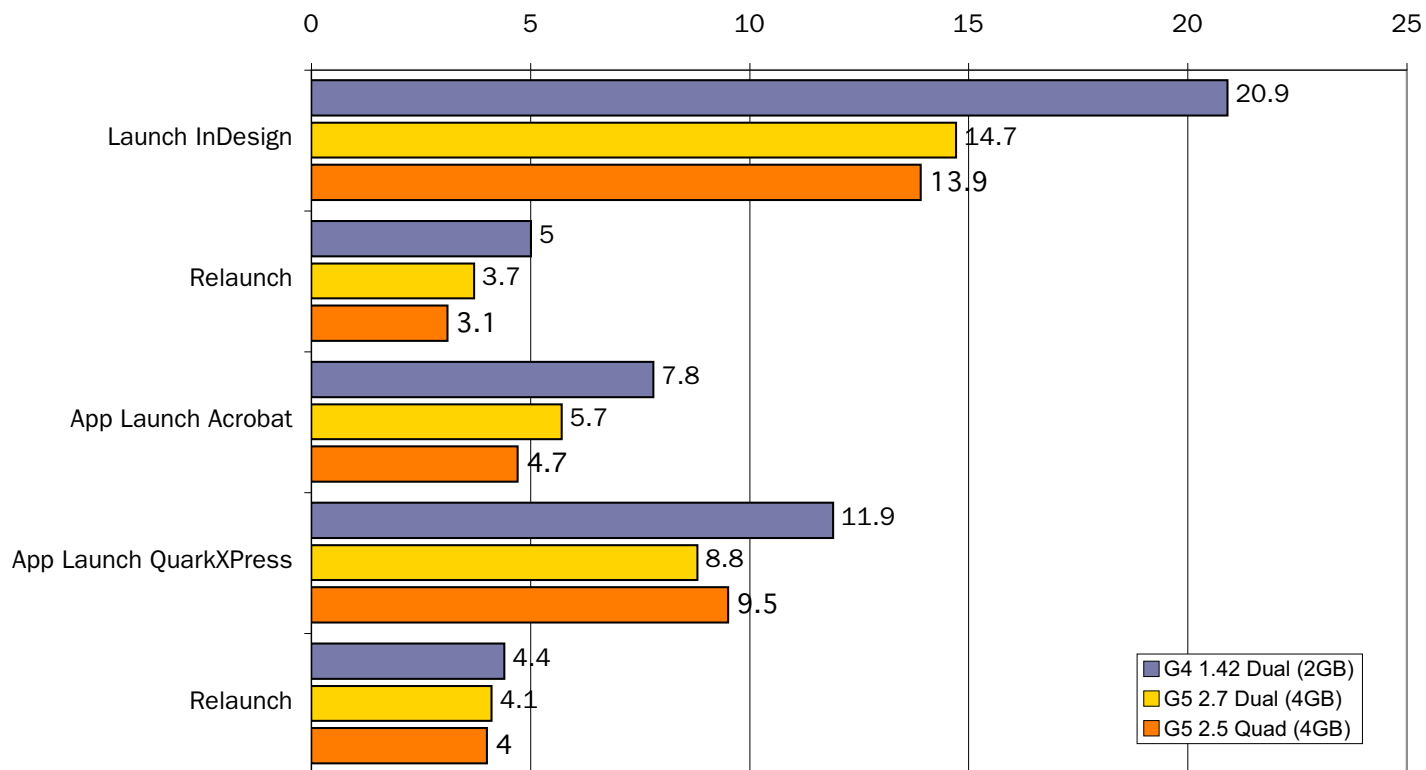
Section: System Tests

System Tests: Application Launch

System Tests 1: Application Launch 1



System Tests 2: Application Launch 2

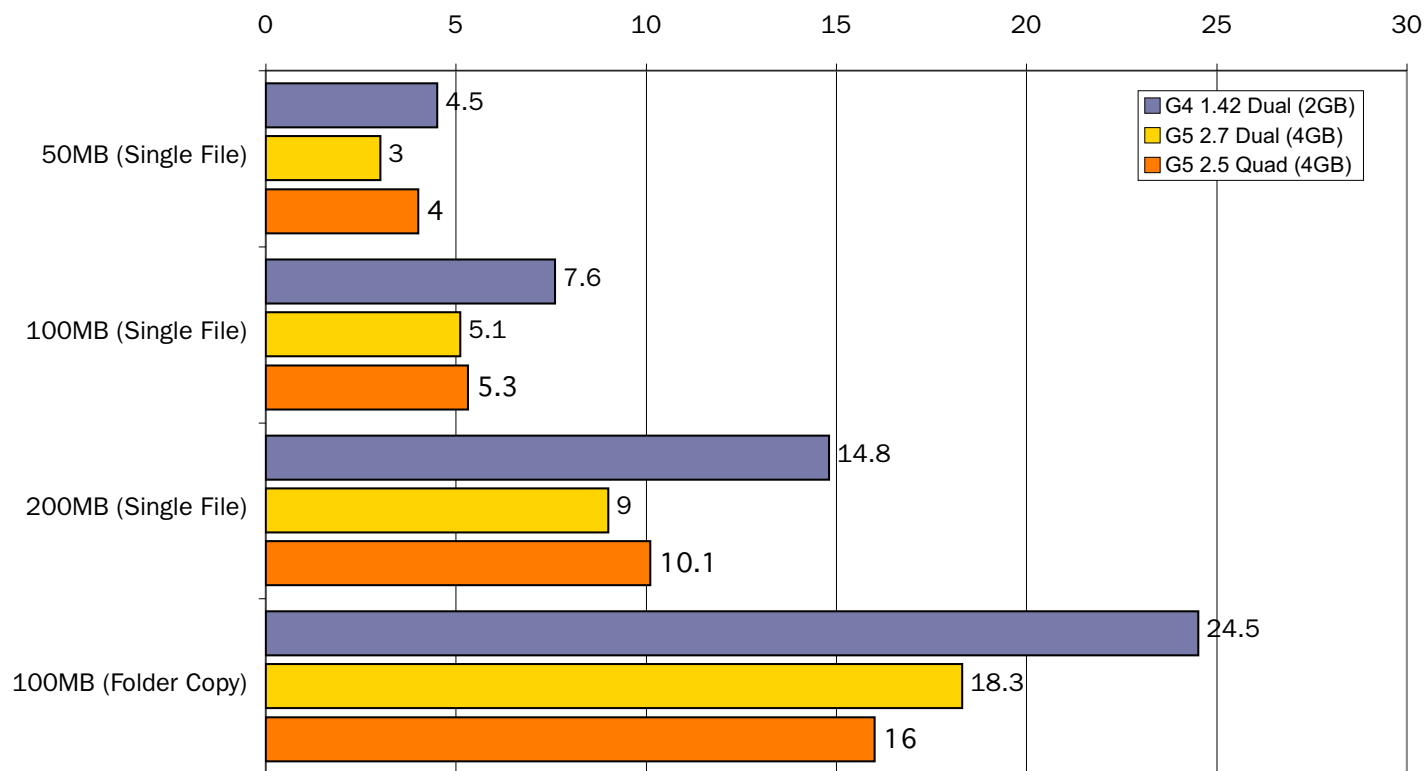


Results in seconds. Shorter/lower is better.

Section: System Tests

System Tests: File Copy

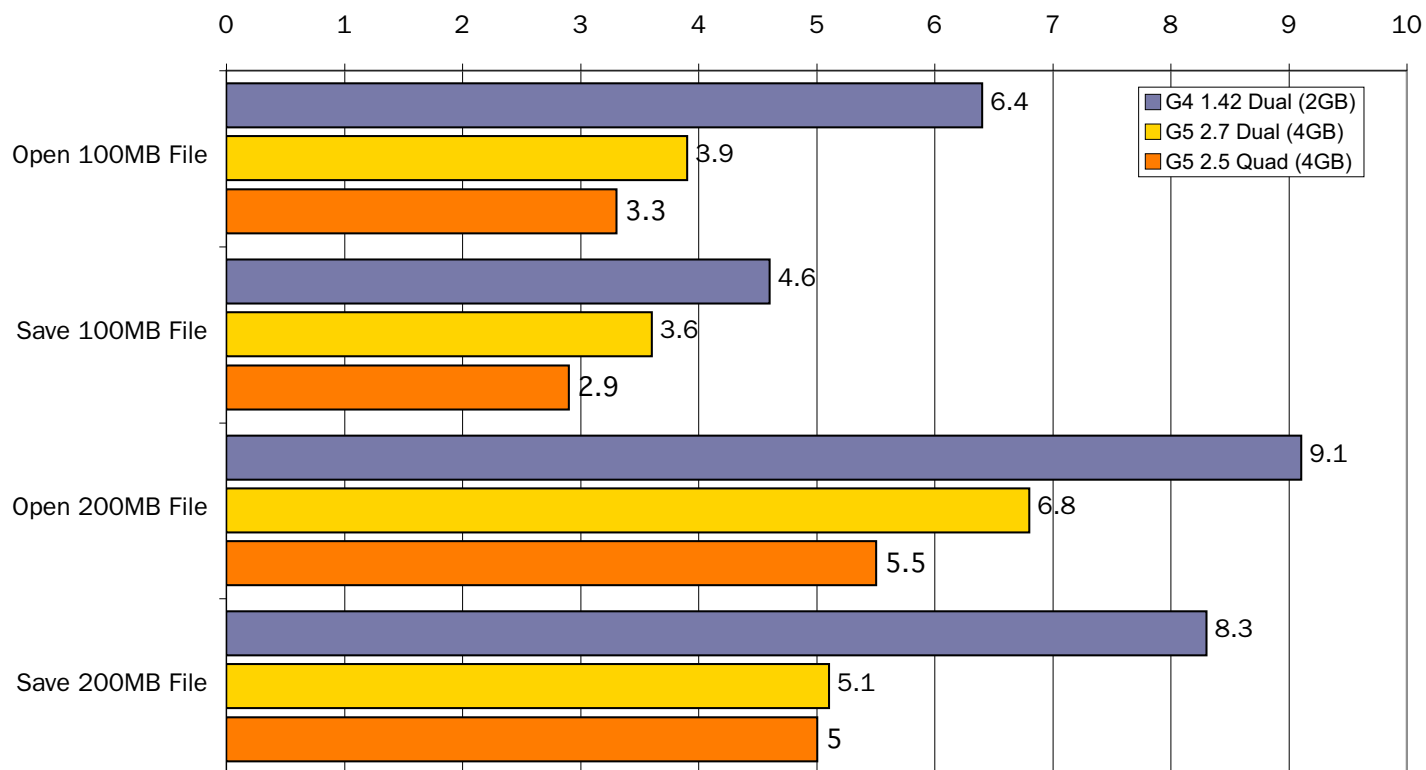
System Tests 3: File Copy (Local)



Results in seconds. Shorter/lower is better.

System Tests: File Open/Save

System Tests 4: File Open/Save (Photoshop)

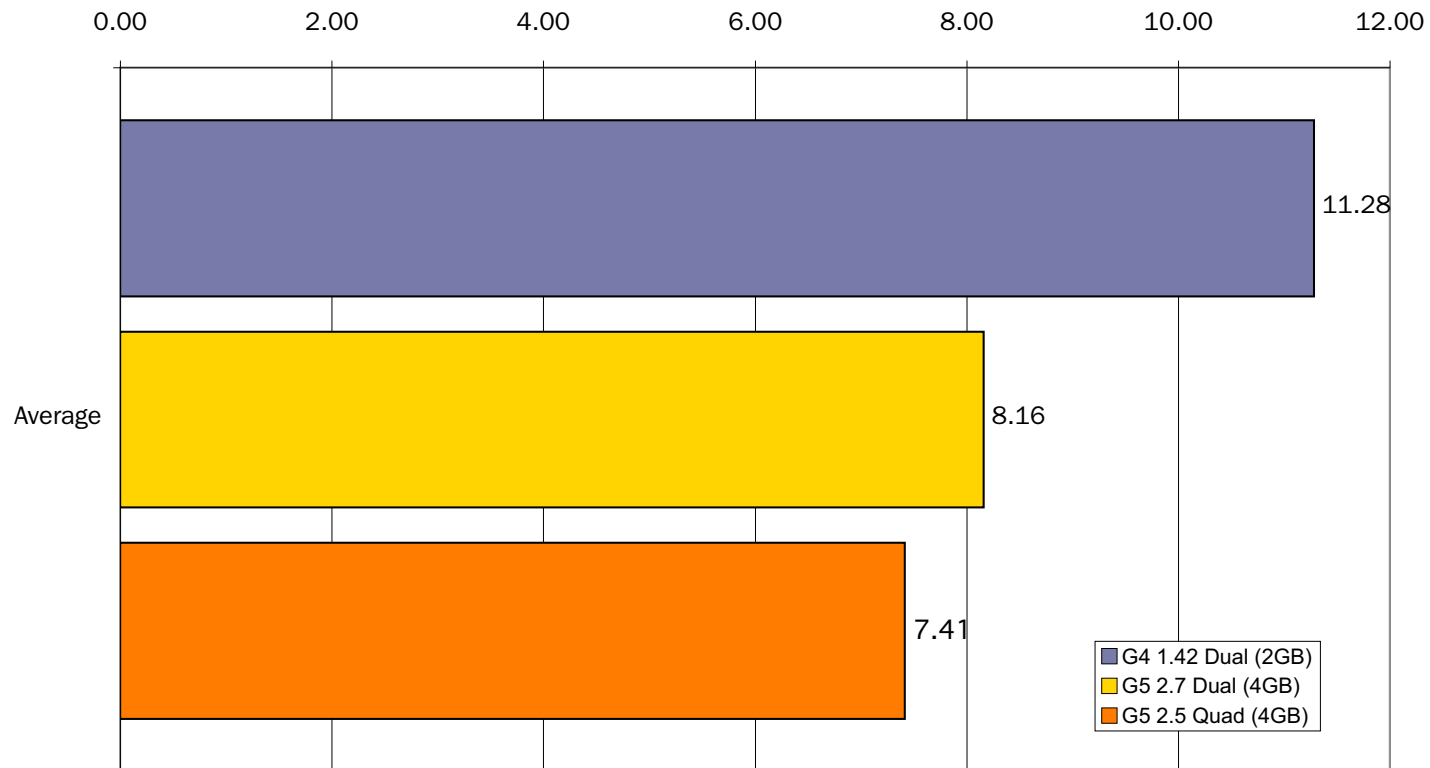


Results in seconds. Shorter/lower is better.

Section: **System Tests**

System Tests: Average of All Tests

System Tests 4: Average of All Tests



Results in seconds. Shorter/lower is better.

Section: System Tests

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Application Performance Benchmarks

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Results: Adobe Photoshop Performance Benchmarks

Photoshop Performance (50MB File)

Gaussian Blur (radius 40)
 RGB -> CMYK
 Unsharp Mask (50%, 10 pix)
 Lighting Effects (default)
 Resample 150%

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
3.2	1.6	1.2
2.5	2.1	1.2
3.1	1.5	1.1
2.7	1.3	1.2
2.3	1.1	1

Photoshop Performance (100MB File)

Gaussian Blur (radius 40)
 RGB -> CMYK
 Unsharp Mask (50%, 10 pix)
 Lighting Effects (default)
 Resample 150%

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
5.6	2.7	2
3.9	3.3	1.6
5.9	2.7	2
5	2.5	1.9
3.5	1.9	1.5

Photoshop Performance (200MB File)

Gaussian Blur (radius 40)
RGB -> CMYK
Unsharp Mask (50%, 10 pix)
Lighting Effects (default)
Resample 150%

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
11.71	5.2	3.7
6.7	5.4	2.7
13.1	5.1	3.8
9.4	4.1	3.9
8.3	3.3	2.8

Photoshop Performance (Acquisition of RAW files)

Camera RAW Acquire
(4 x 11MP)

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
23	20.2	11.6

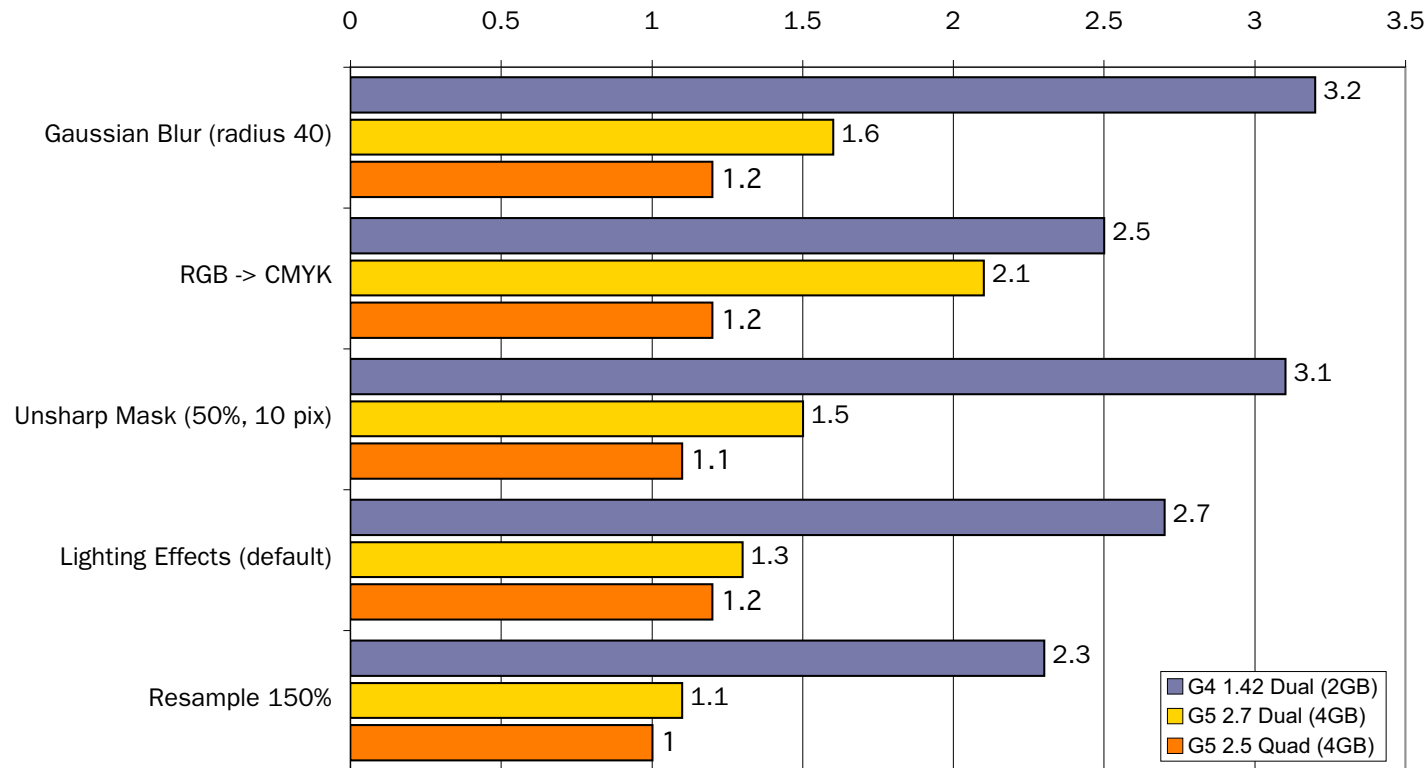
Photoshop Performance (Average of all Benchmarks)

Photoshop Performance (Average)

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
6.87	4.00	2.70

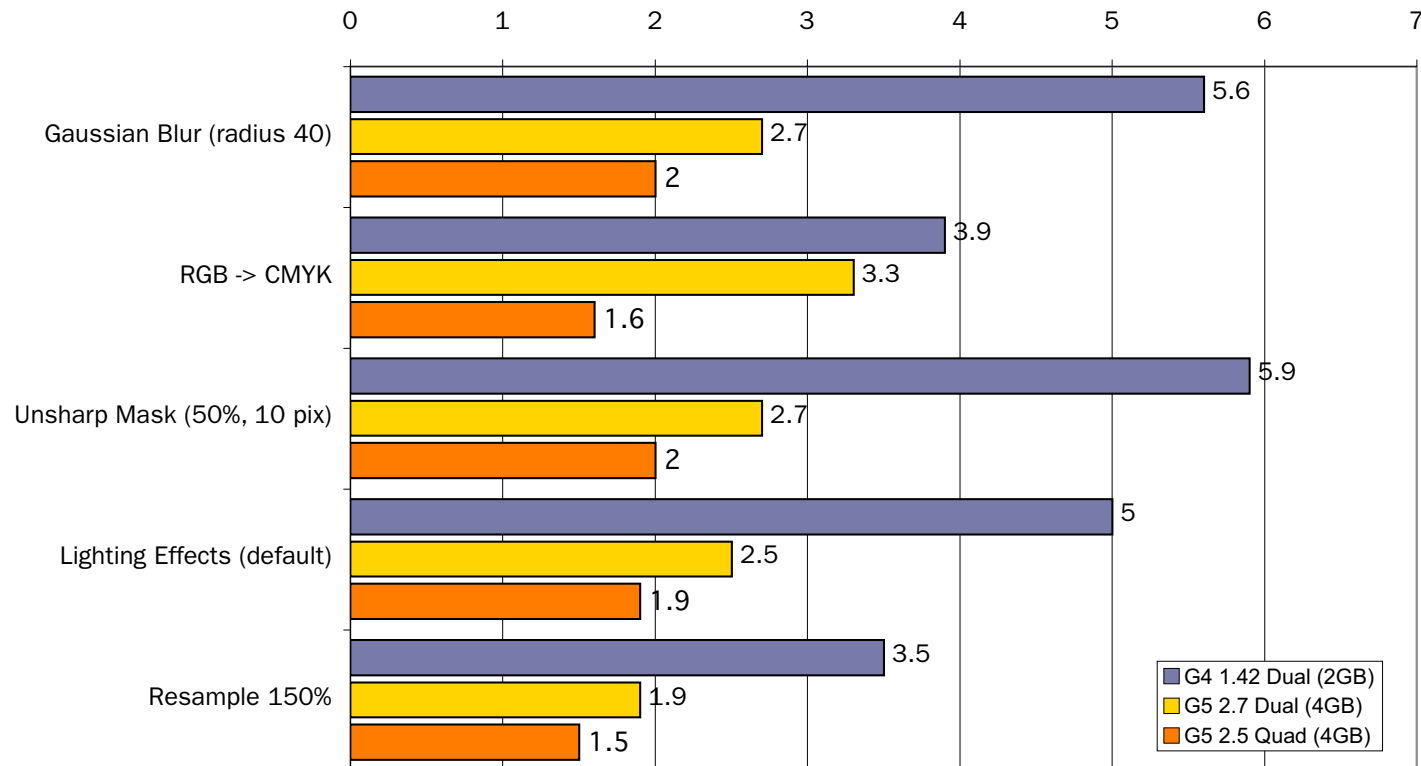
Adobe Photoshop Benchmarks (50MB File)

Photoshop Performance (50MB File)



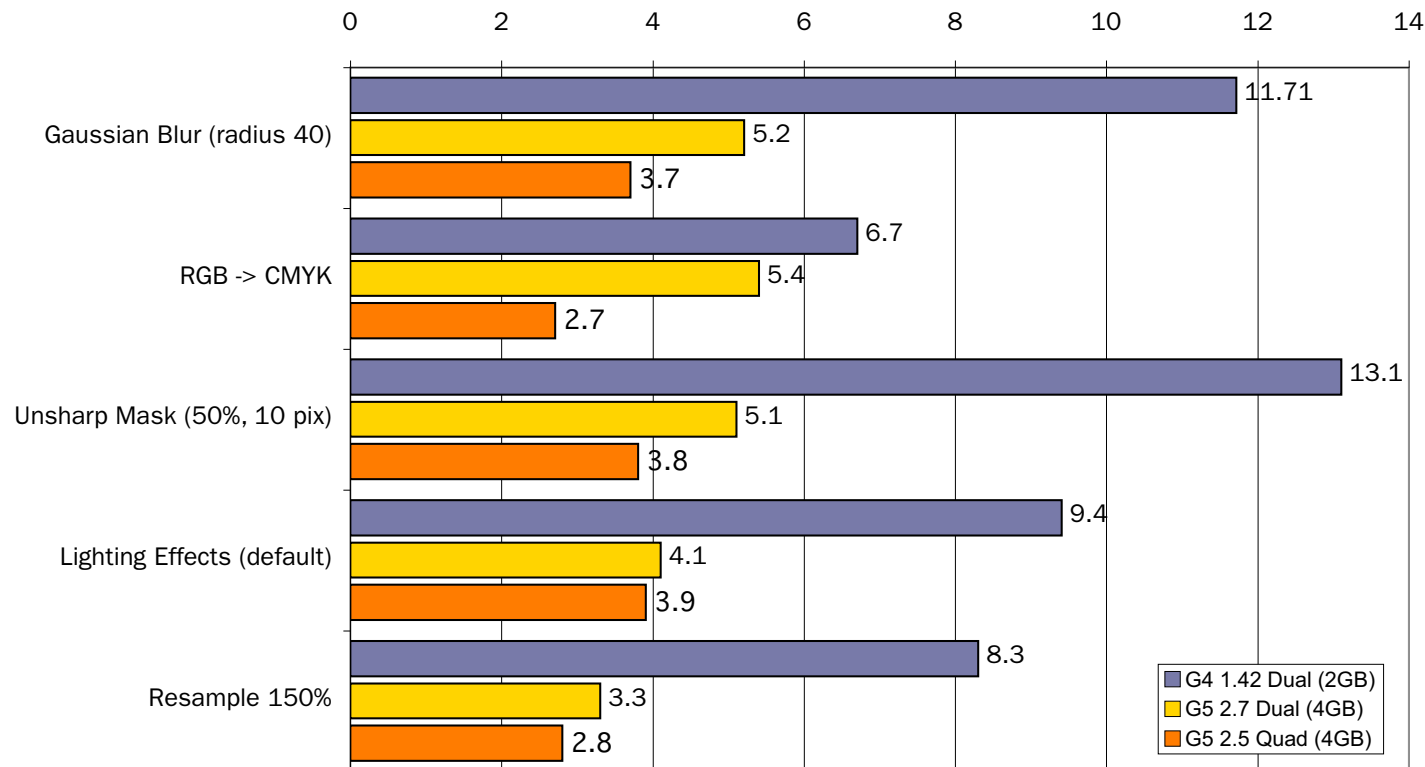
Adobe Photoshop Benchmarks (100MB File)

Photoshop Performance (100MB File)



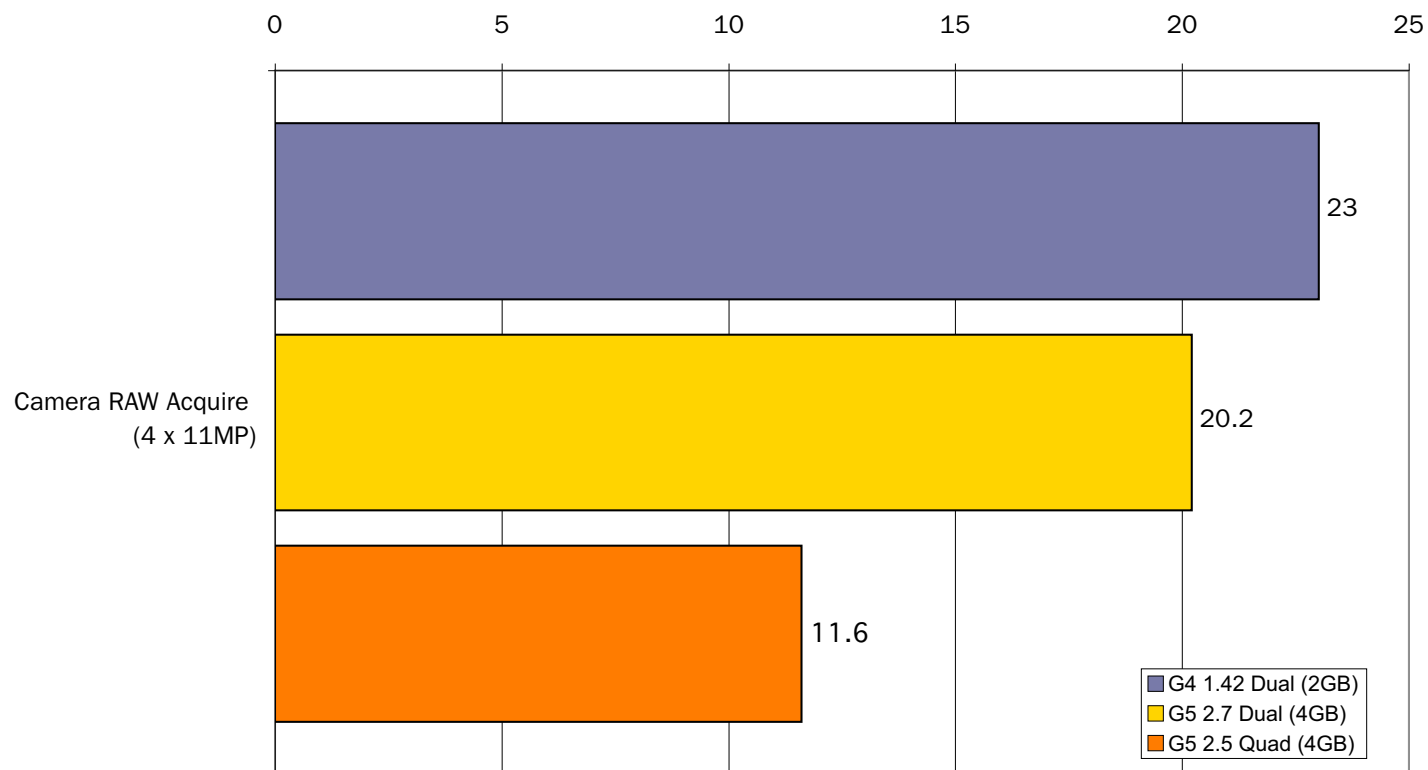
Adobe Photoshop Benchmarks (200MB File)

Photoshop Performance (200MB File)



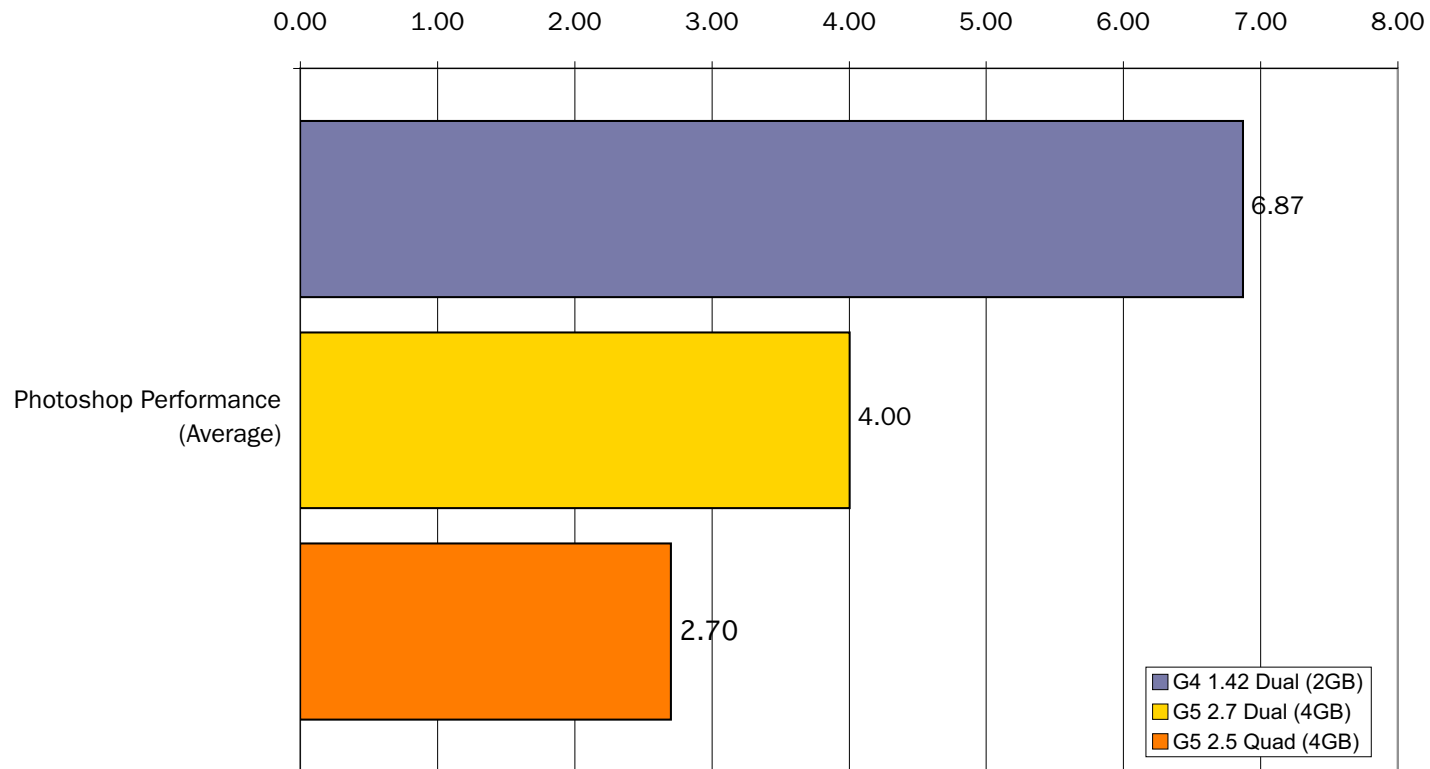
Adobe Photoshop Benchmarks (RAW Acquisition)

Photoshop Performance (Acquisition of RAW Digital Camera Files)



Adobe Photoshop Benchmarks: Average

Photoshop Performance (Average of All Benchmarks)



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Workflow Integration Benchmarks

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Results: Workflow Benchmarks

QuarkXPress 6.5

Photoshop Round-trip (Photoshop already launched)

20MB file

50MB file

100MB file

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
	10.4	7.1	6.3
	12.8	8.8	7.3
	20.9	12.9	9.9

QuarkXPress 6.5

Photoshop Round-trip (including Photoshop launch)

20MB file

50MB file

100MB file

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
	17.2	11.8	10.2
	20.3	13.5	10.3
	26.2	17.6	14.6

QuarkXPress 6.5

Illustrator Round-trip (Illustrator already launched)

Illustrator Round-trip (including Illustrator launch)

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
	24.3	15.6	15.2
	31.1	19.9	19.4

QuarkXPress 6.5

Preview EPS Image

Create PDF file for client approval

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
	10.9	7.0	6.5
	38.8	25.9	25.1

Adobe InDesign CS2

Photoshop Round-trip (Photoshop already launched)

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
20MB file	7.7	5.8	4.6
50MB file	10.9	7.1	6.0
100MB file	12.8	8.4	7.5

Adobe InDesign CS2

Photoshop Round-trip (including Photoshop launch)

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
20MB file	15.6	10.3	9.3
50MB file	17.2	12.3	10.8
100MB file	19.4	12.7	12.3

Adobe InDesign CS2

Illustrator Round-trip (Illustrator already launched)

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
Illustrator Round-trip (including Illustrator launch)	25.7	17.8	16.9
	35.7	21.1	20.2

Adobe InDesign CS2

Preview Complex Page
Create PDF file for client approval

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
Preview Complex Page	3.8	1.7	1.7
Create PDF file for client approval	28.2	16.1	16.0

Creative Workflow Tests 4: Average of All Tests

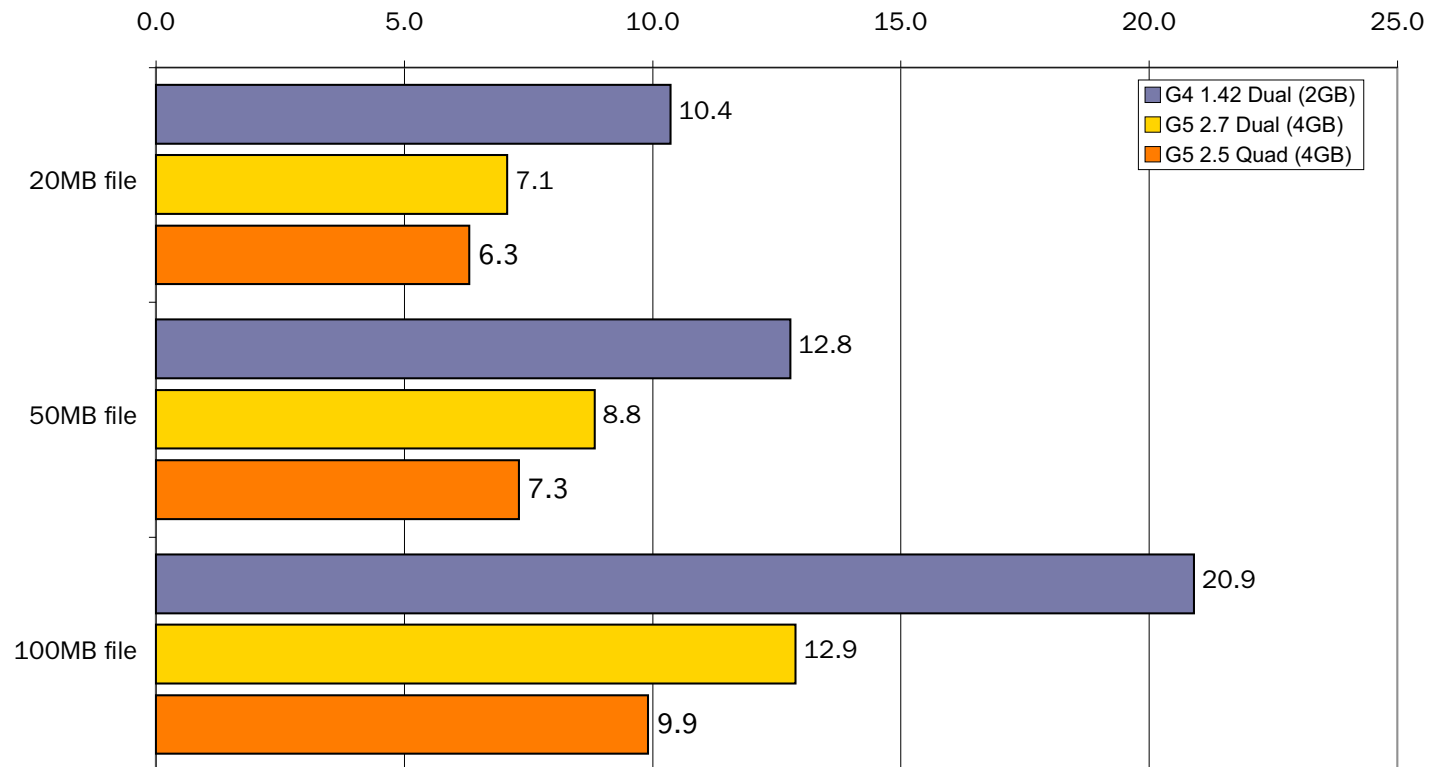
Creative Workflow (Average)

	G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
Creative Workflow (Average)	19.49	12.67	11.5

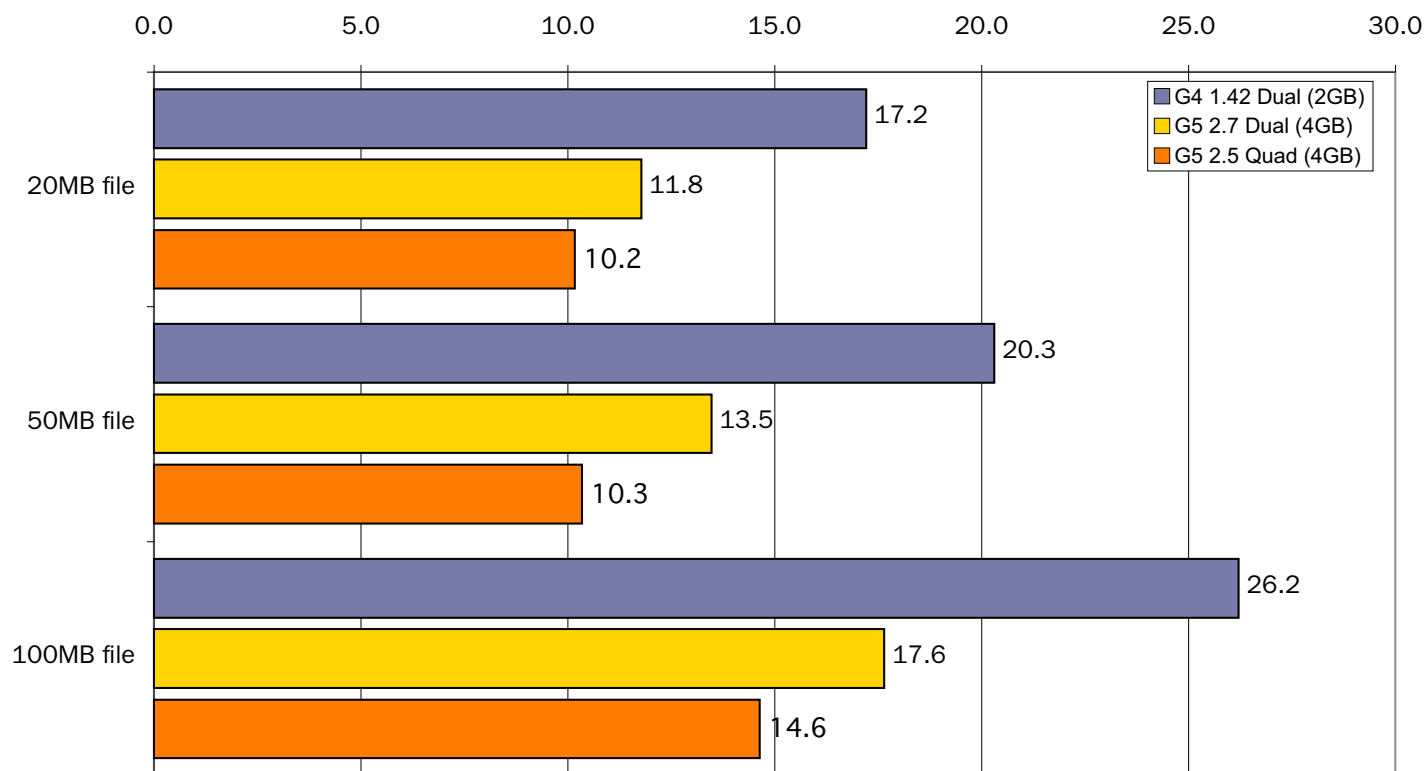
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Workflow Integration: QuarkXPress 6.5

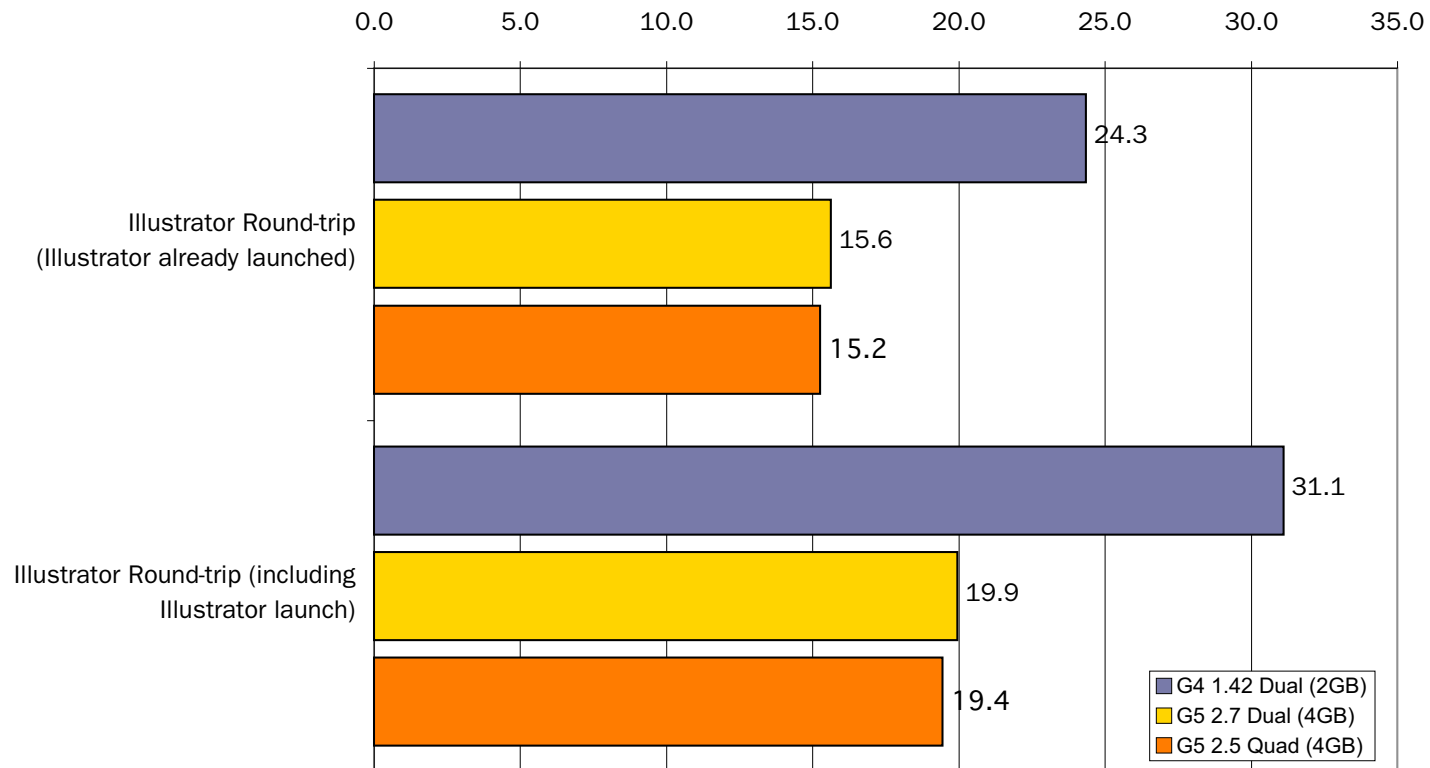
QuarkXPress-Photoshop Round-trip (Photoshop already launched)



QuarkXPress-Photoshop Round-trip (including Photoshop launch)

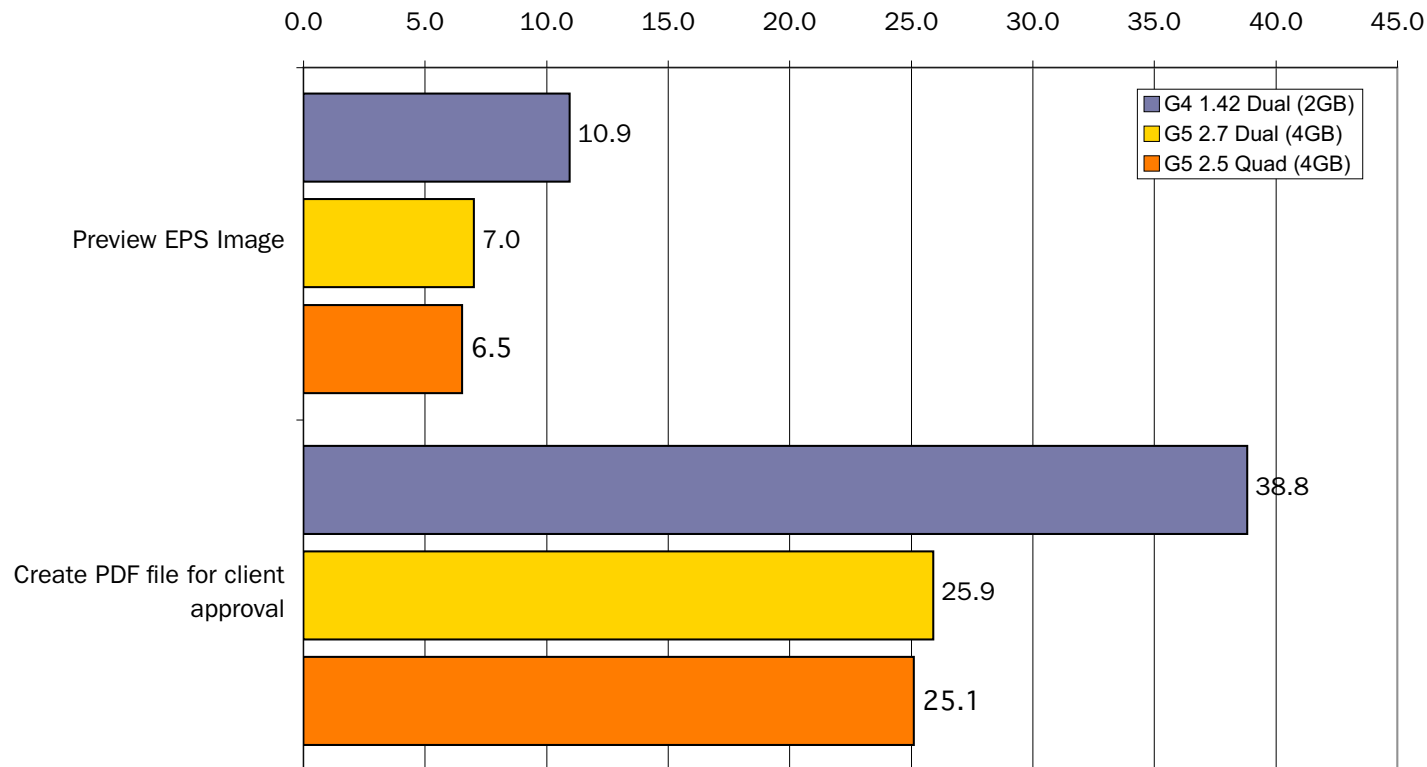


QuarkXPress-Illustrator Round-trip



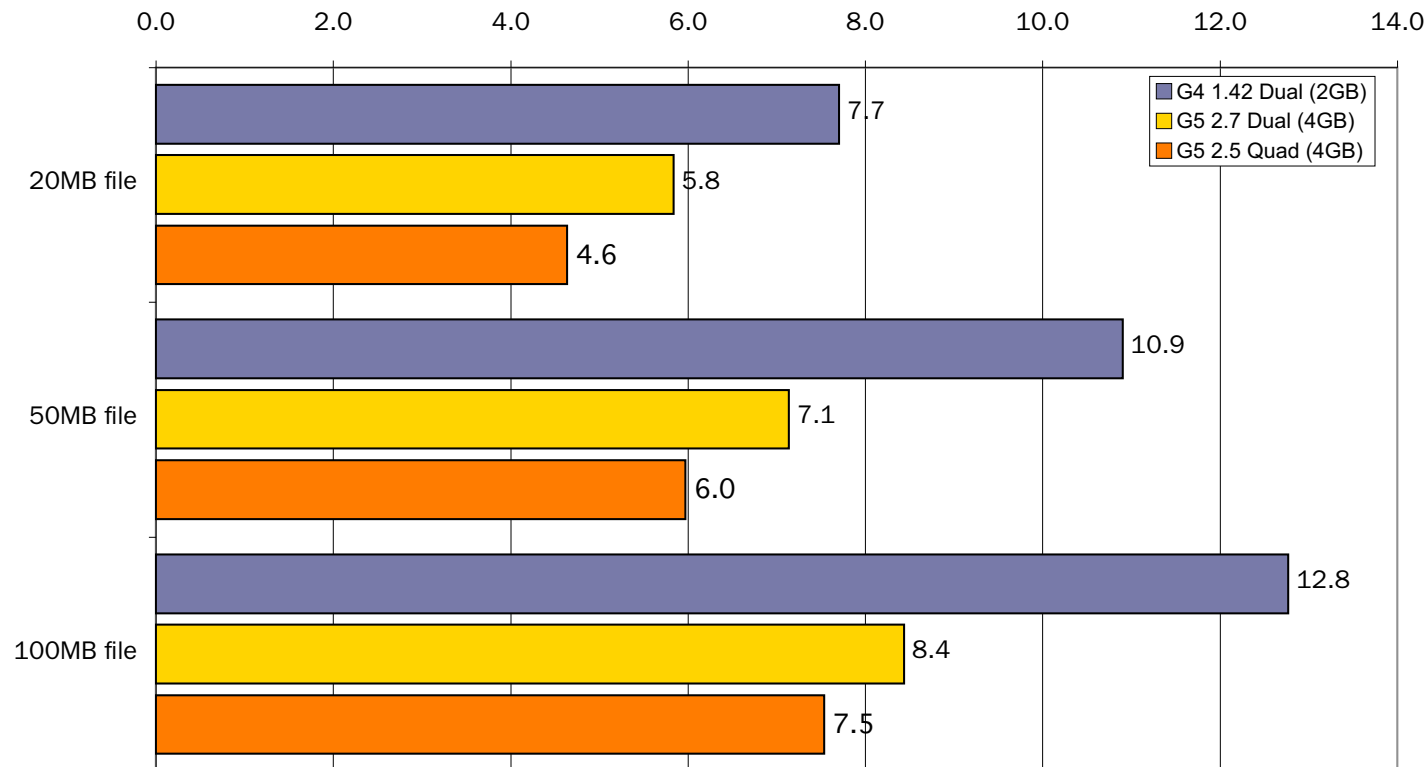
QuarkXPress 6.5 Performance

QuarkXPress 6.5 Performance

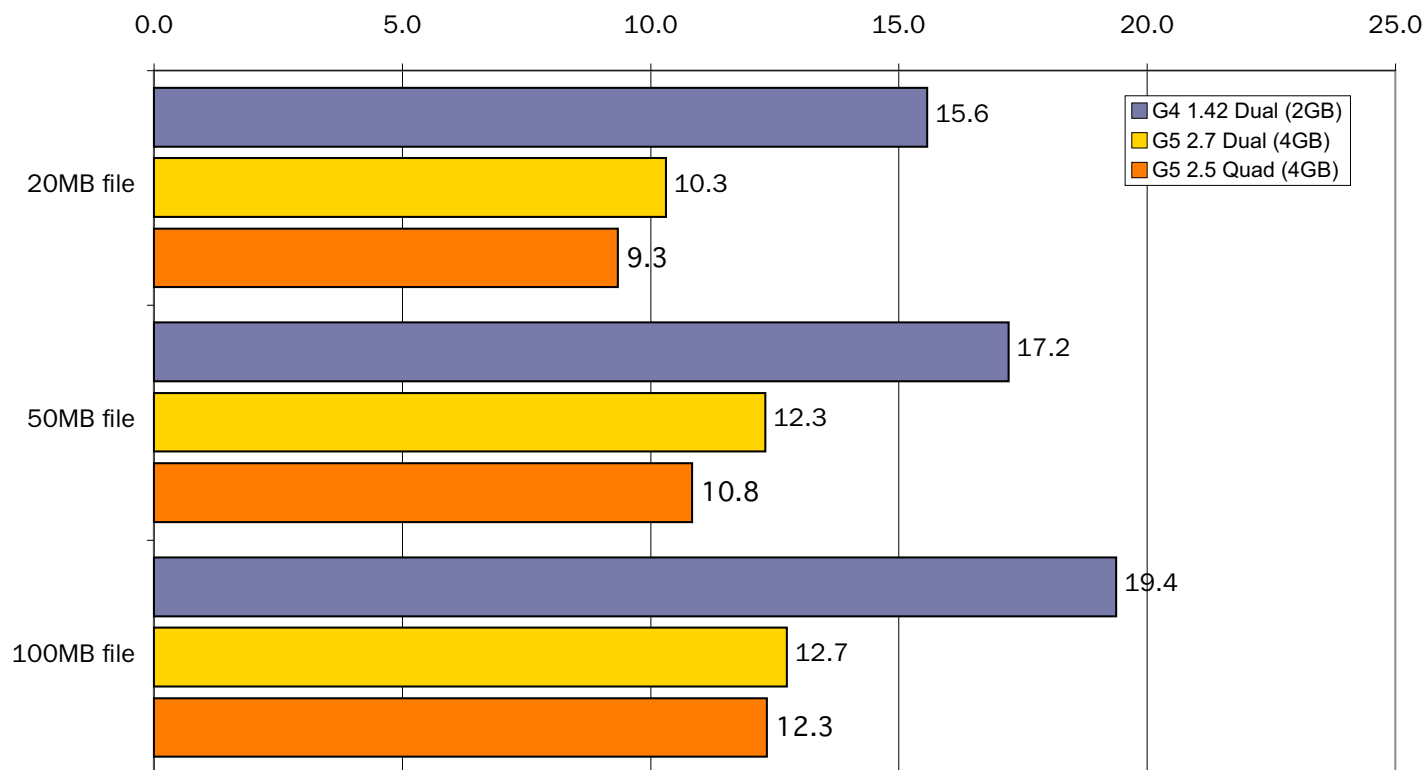


Workflow Integration: InDesign CS2

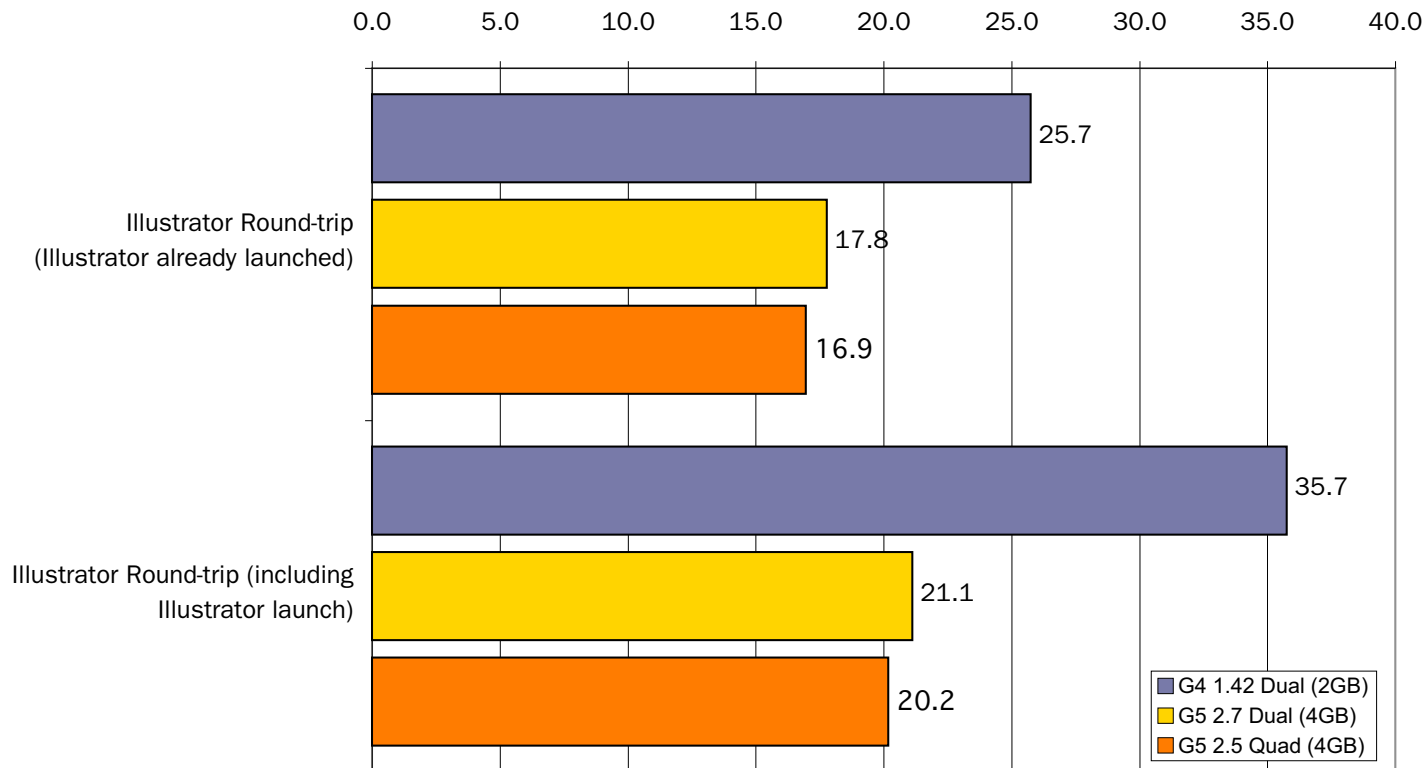
InDesign-Photoshop Round-trip (Photoshop already launched)



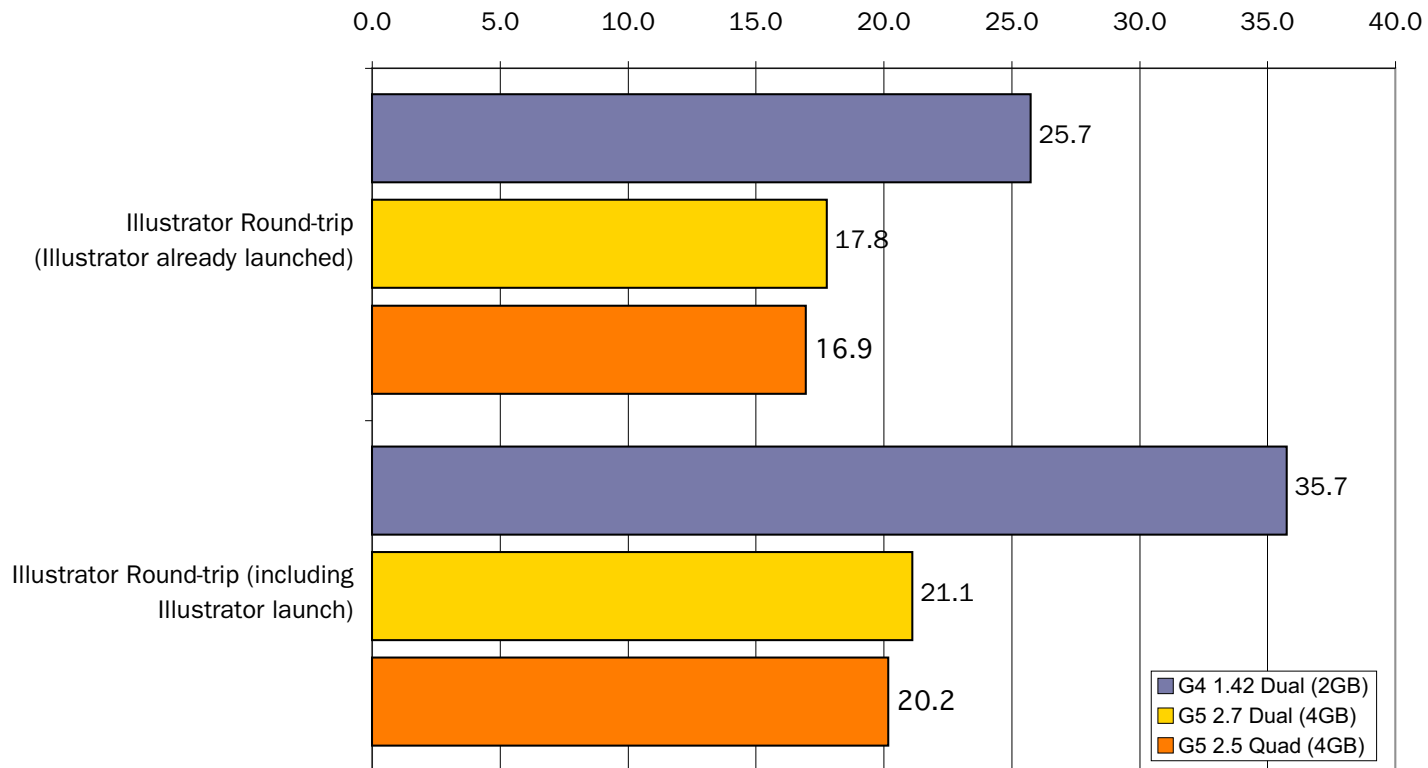
InDesign-Photoshop Round-trip (including Photoshop launch)



InDesign-Illustrator Round-trip

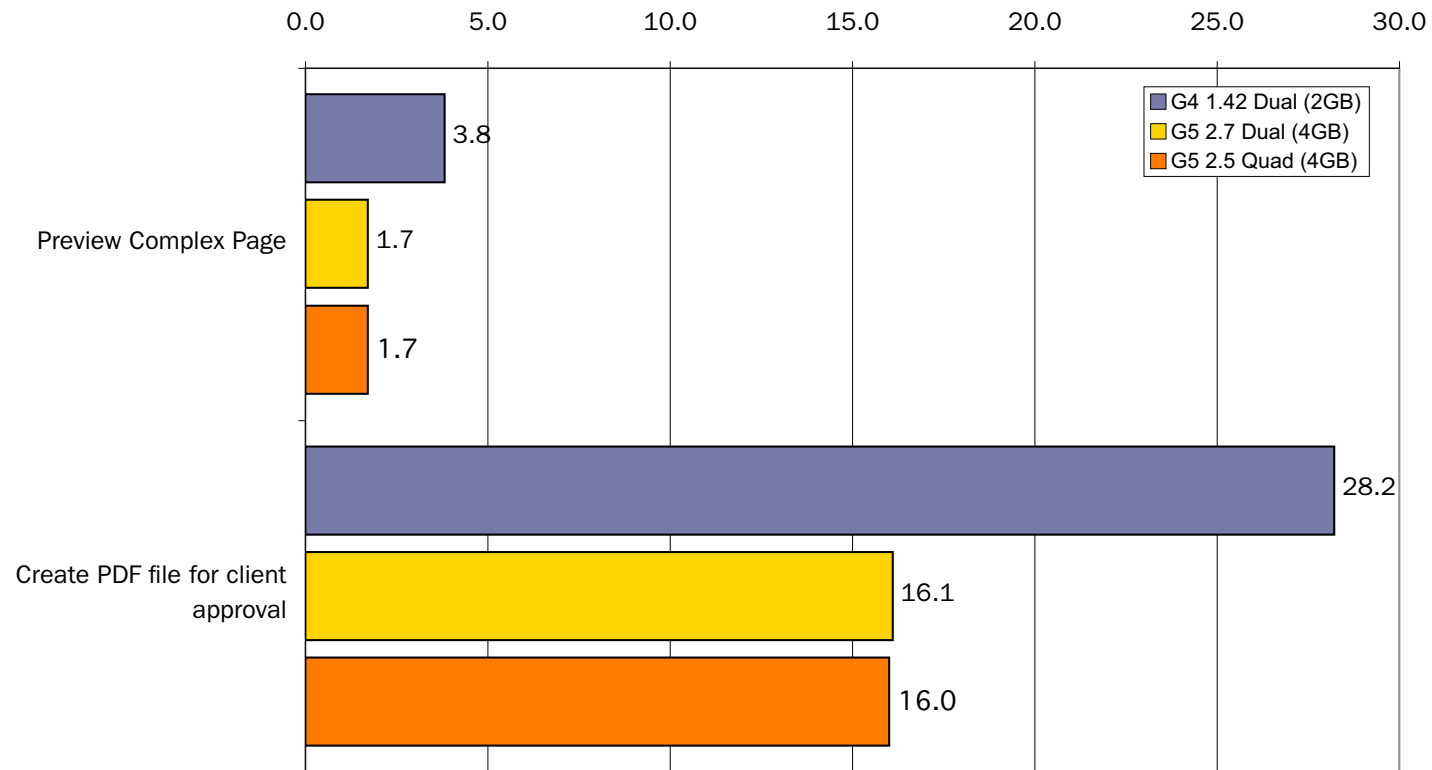


InDesign-Illustrator Round-trip



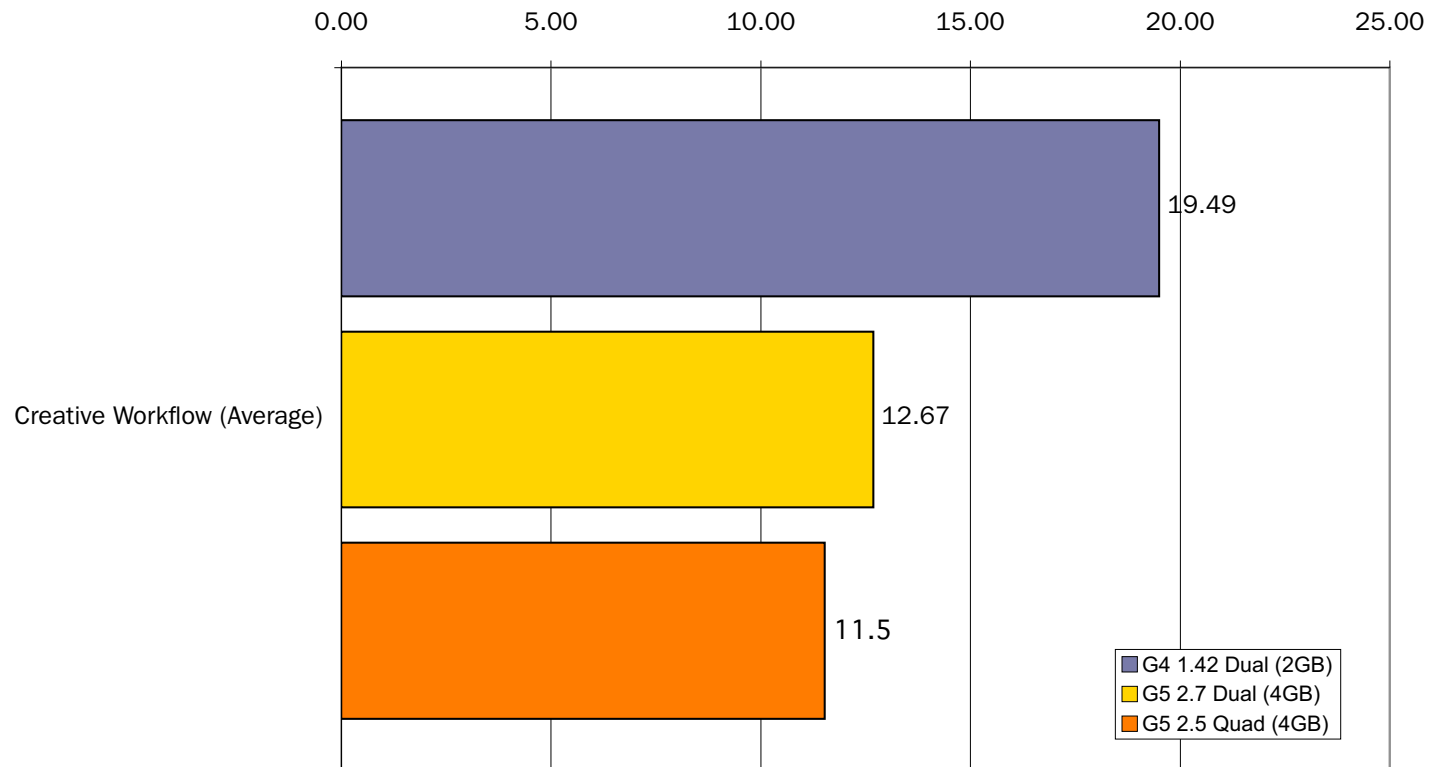
InDesign CS2 Performance

InDesign Performance



Workflow Integration: Average

Creative Workflow Tests 4: Average of All Tests



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Multitasking Benchmarks

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Results Multitasking Benchmarks

Multitasking Set 1 (2 Tasks)

Task 1: Bridge/Camera RAW: Convert and save 12 RAW files

Task 2: Photoshop: Radial Blur on 125MB file

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
159	110	44

Multitasking Set 2 (2 Tasks)

Task 1: Photoshop: Radial Blur on 125MB file

Task 2: Bridge/InDesign: Create Contact Sheet of 50 Digital

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
126	68	40

Multitasking Set 3 (2 Tasks)

Task 1: QuarkXPress 6.5: Create PDF file

Task 2: Finder/System: Copy 650MB of files and folders

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
94	66	64

Multitasking Set 4 (2 Tasks)

Task 1: Illustrator: Apply Warp/Fisheye filter to complex drawing

Task 2: Photoshop: Radial Blur on 125MB file

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
132	75	48

Multitasking Set 5 (2 Tasks)

Task 1: Bridge/Camera RAW: Convert and save 12 RAW files

Task 2: Finder/System: Copy 650MB of files and folders

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
111	83	47

Multitasking Set 6 (3 Tasks)

Task 1: Photoshop: Radial Blur on 125MB file

Task 2: Illustrator: Apply Warp/Fisheye filter to complex drawing

Task 3: Finder/System: Copy 650MB of files and folders

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
191	117	66

Multiprocessing Performance: Photoshop Filter

Photoshop: Radial Blur (125MB file)

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
91	54	28

Multitasking Performance (Average of All Benchmarks)

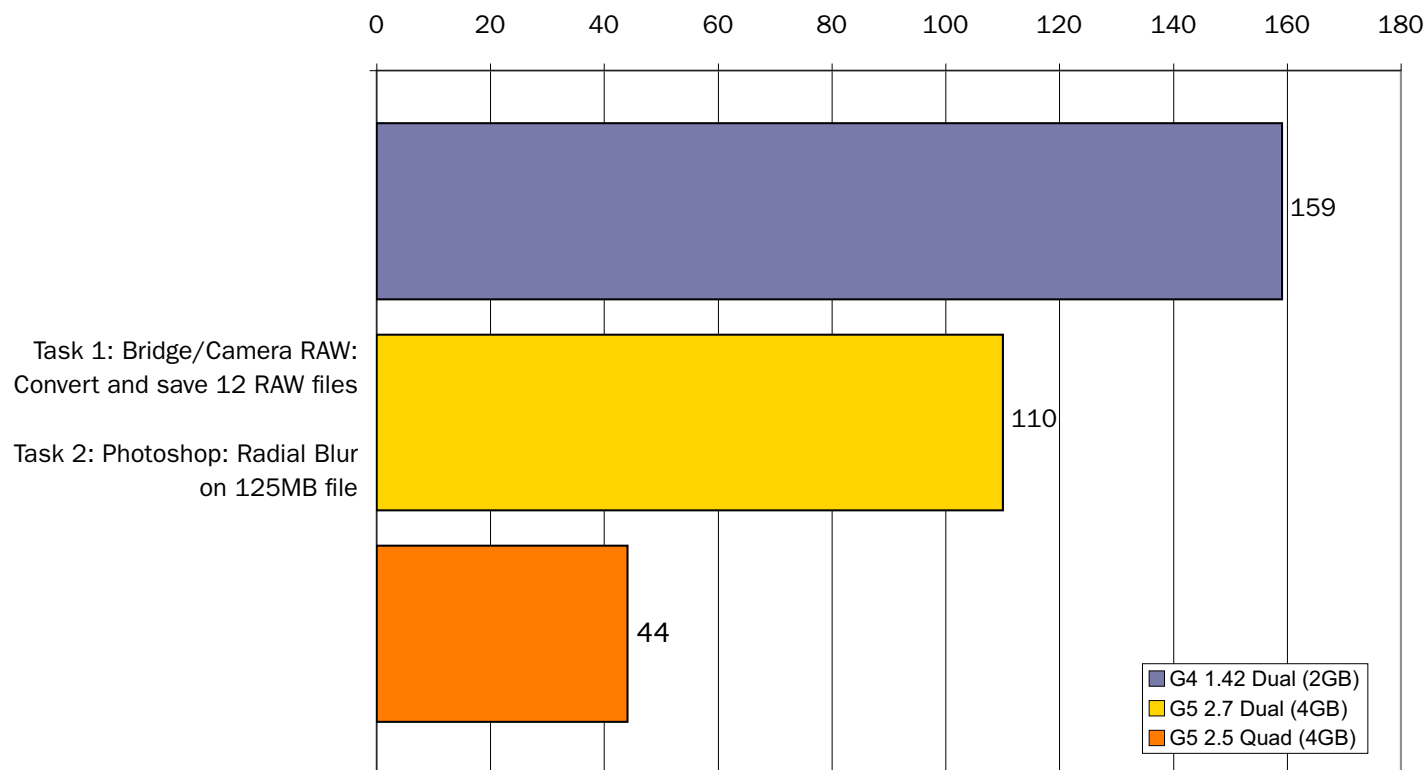
Multitasking (Average)

G4 1.42 Dual (2GB)	G5 2.7 Dual (4GB)	G5 2.5 Quad (4GB)
135.50	86.50	51.50

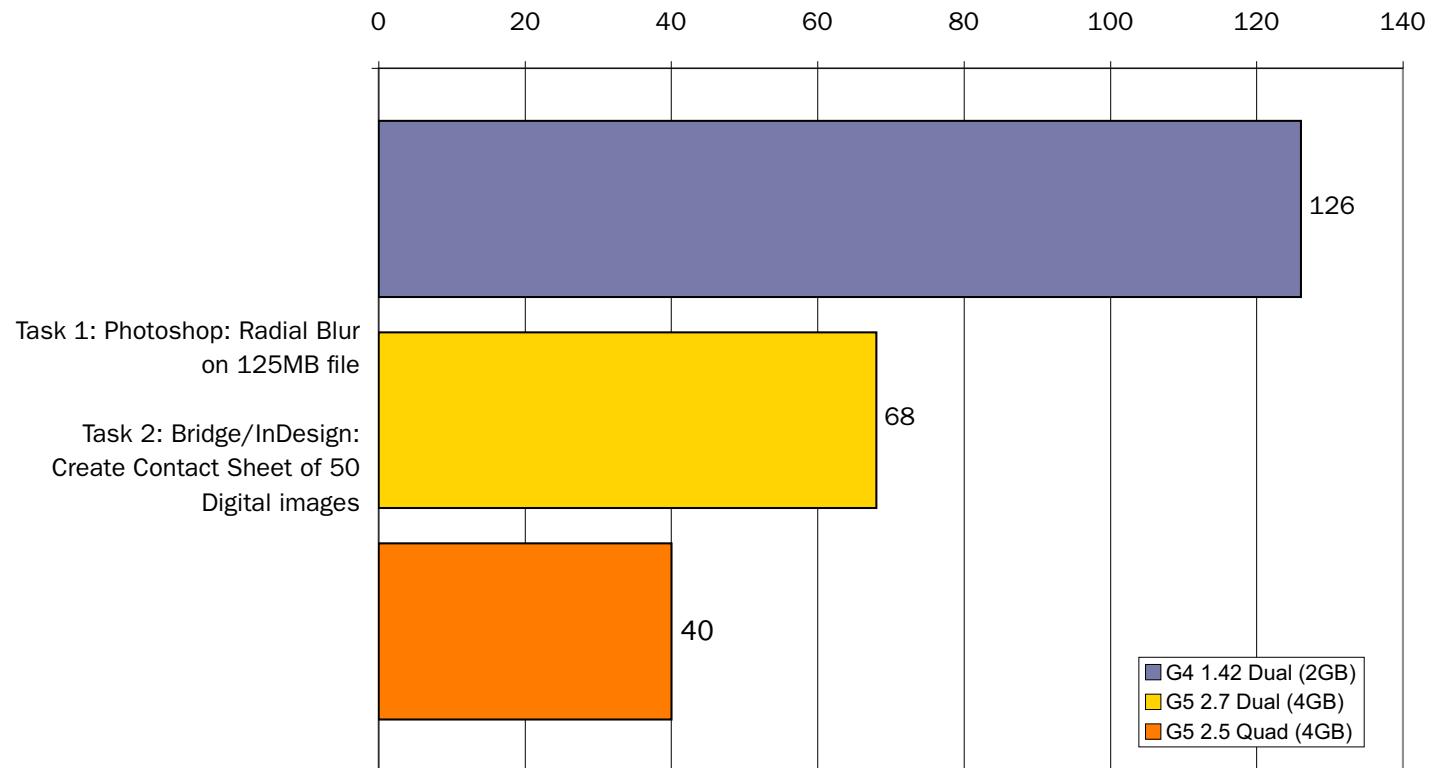
Section: Multitasking Benchmarks

Multitasking Benchmarks (2 Tasks)

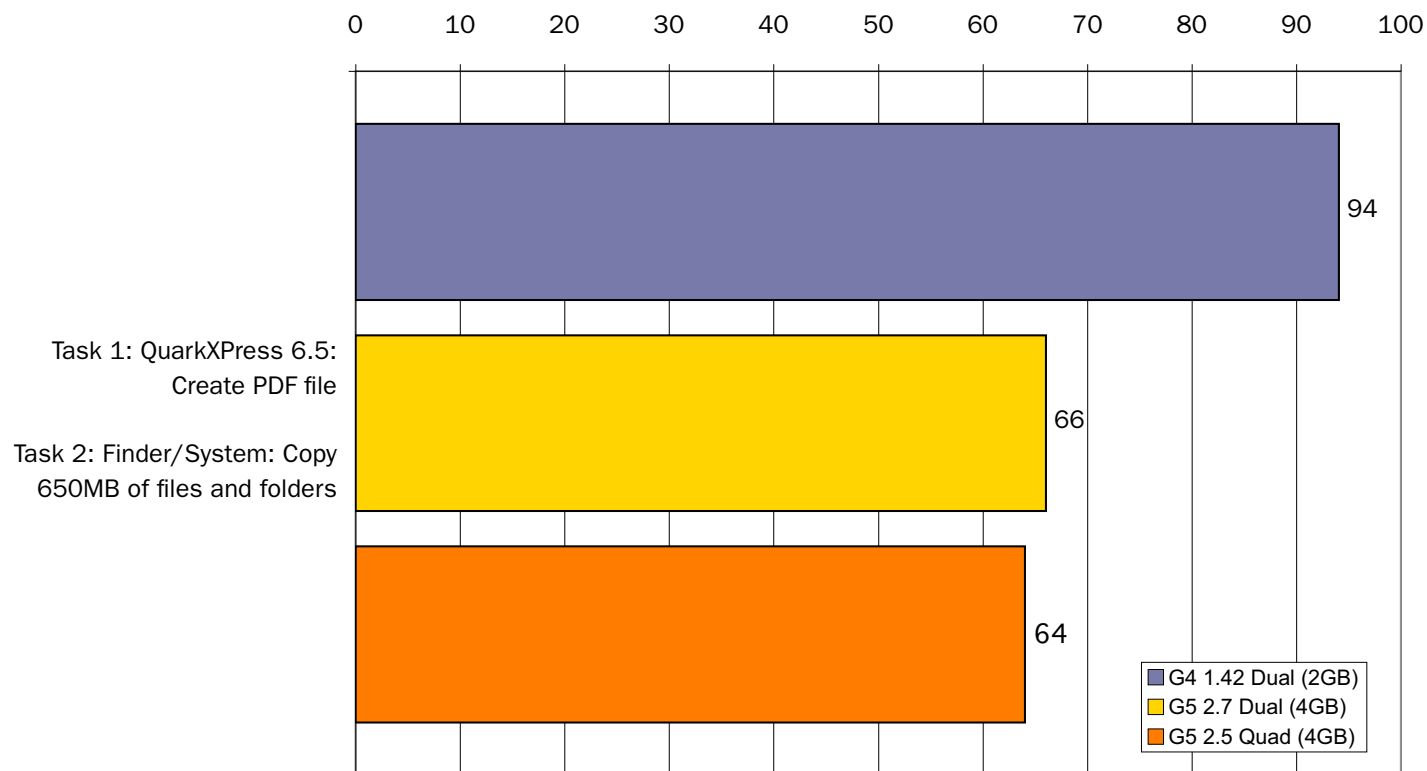
Multitasking Set 1 (2 Tasks)



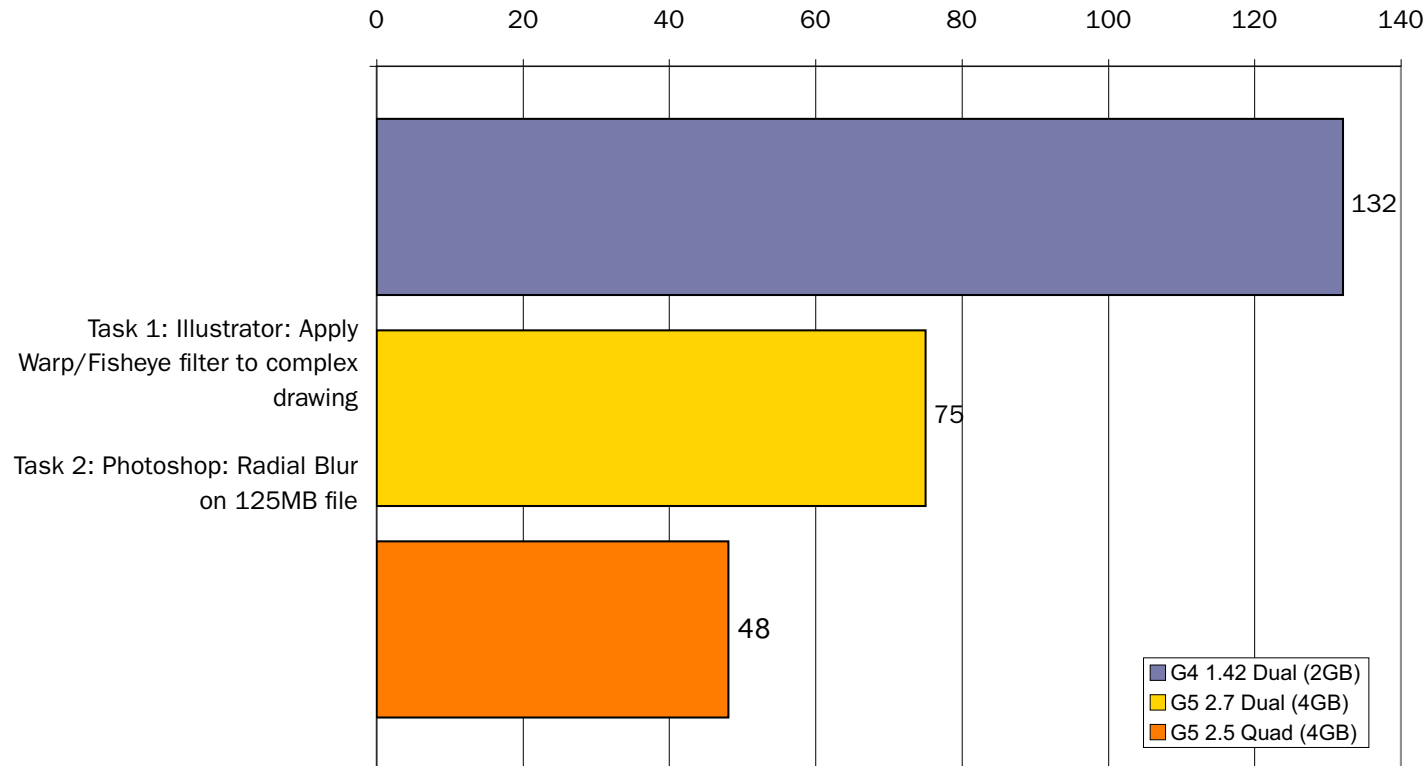
Multitasking Set 2 (2 Tasks)



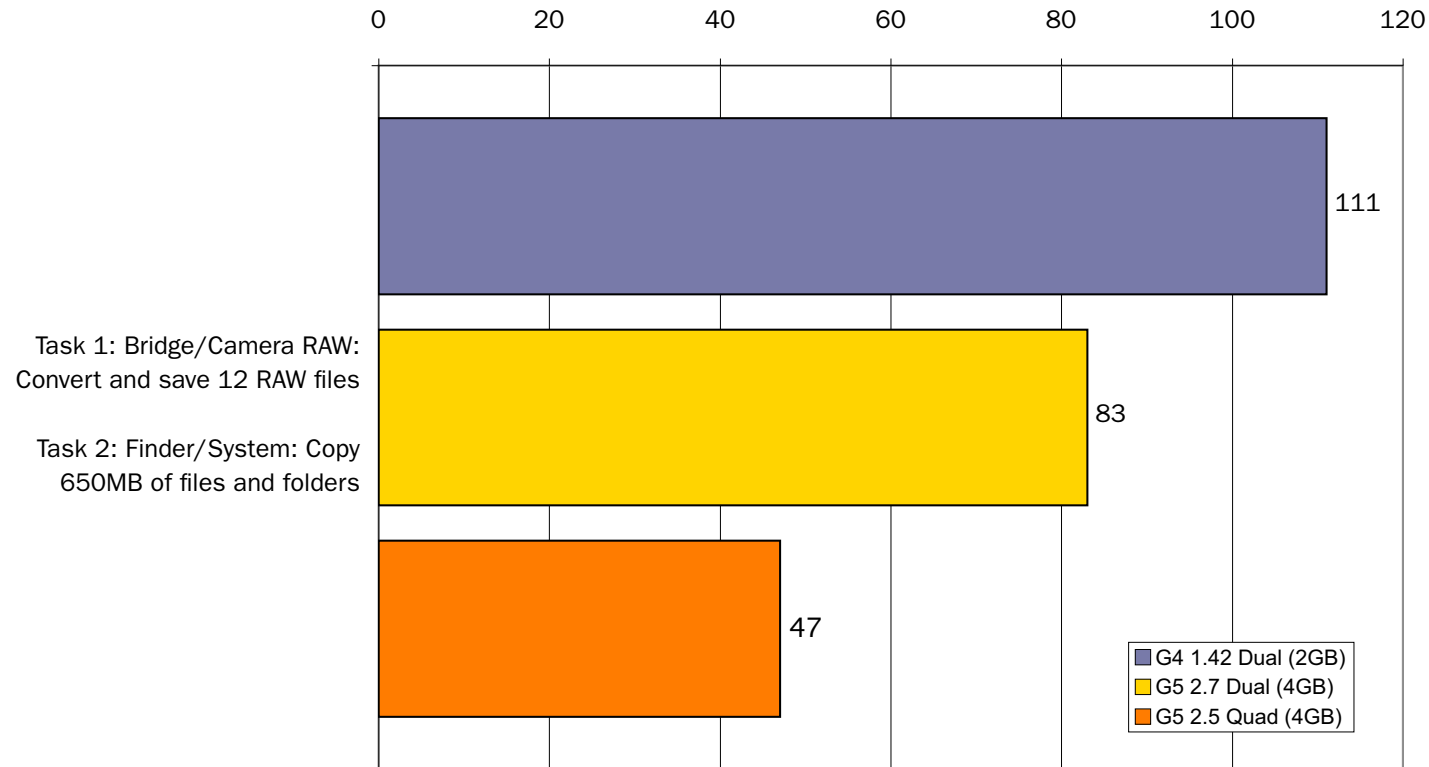
Multitasking Set 3 (2 Tasks)



Multitasking Set 4 (2 Tasks)

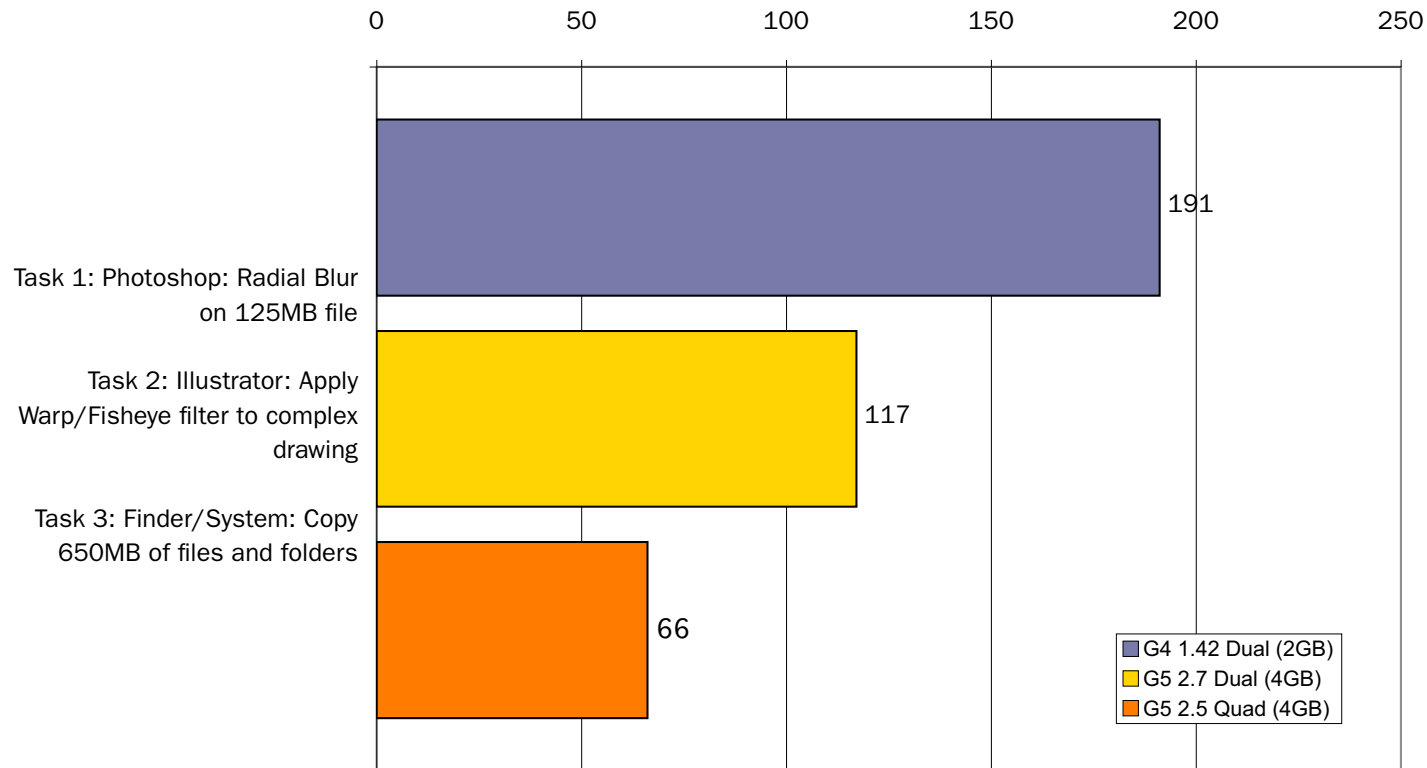


Multitasking Set 5 (2 Tasks)



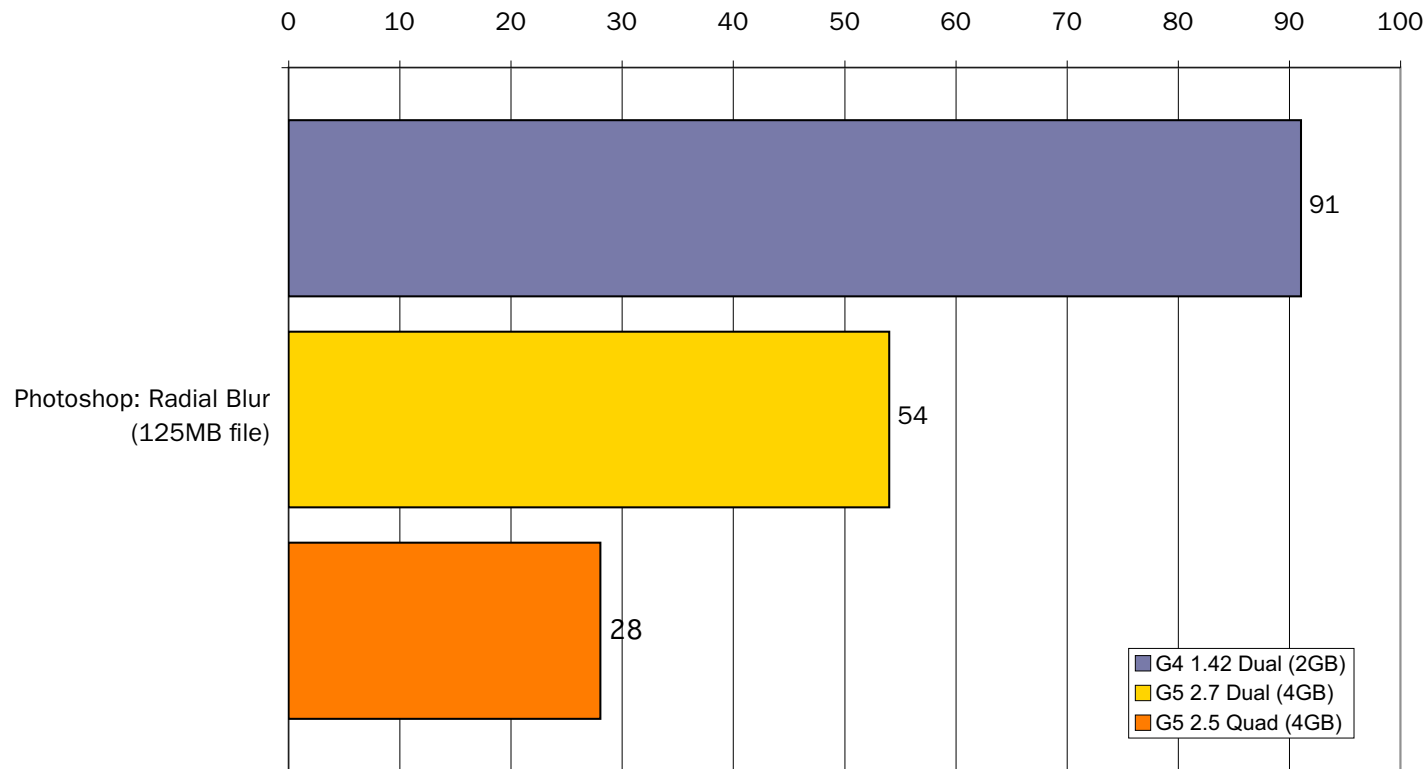
Multitasking Benchmarks (3 Tasks)

Multitasking Set 6 (3 Tasks)



Multiprocessing Benchmark (Photoshop)

Multiprocessing Performance: Photoshop Filter



Multitasking Benchmarks: Average

Multitasking Performance (Average of All Benchmarks)

