ArcView 3.x

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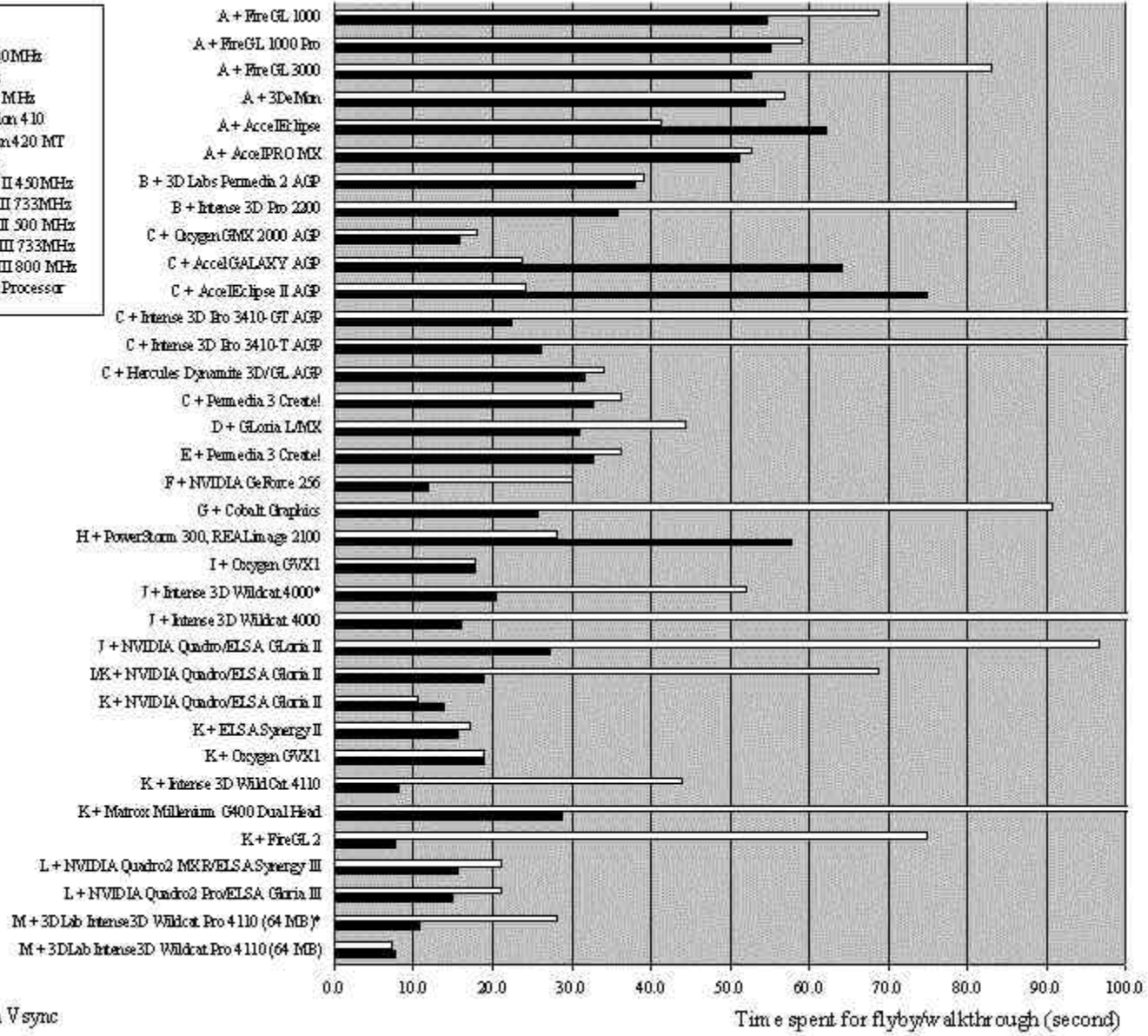- o [Summary of the Benchmark Data Sets](#)

Disclaimer: The performance comparison of OpenGL 3D accelerator graphics cards is for informational purposes only. This list of graphics cards is not comprehensive. ***ESRI tested these graphics cards but neither endorses nor supports them.***

Performance Comparison on Selected Platforms and Graphics Cards

A -- Pentium Pro 200MHz
B -- IBM M Pro Pentium II 300MHz
C -- Dell Pentium II 350 MHz
D -- Dell Dual Pentium II 300 MHz
E -- Dell Pentium II Workstation 410
F -- Dell Precision Workstation 420 MT
G -- SGI Pentium II 450 MHz
H -- Compaq AP500 Pentium II 450MHz
I -- Compaq AP550 Pentium III 733MHz
J -- Compaq SP700 Pentium III 500 MHz
K -- Compaq SP750 Pentium III 733MHz
L -- Compaq SP750 Pentium III 800 MHz
M -- SGI 2x10 1G MHz Dual Processor

☐ Texture
■ Geometry

A + Fire GL 1000
A + FireGL 1000 Pro
A + Fire GL 3000
A + 3DeMon
A + AccelEclipse
A + AccelPRO MX
B + 3D Labs Permedia 2 AGP
B + Intense 3D Pro 2200
C + Oxygen GMX 2000 AGP
C + AccelGALAXY AGP
C + AccelEclipse II AGP
C + Intense 3D Pro 3410-GT AGP
C + Intense 3D Pro 3410-T AGP
C + Hercules Dynamite 3D/GL AGP
C + Permedia 3 Create!
D + GLoria L/MX
E + Permedia 3 Create!
F + NVIDIA GeForce 256
G + Cobalt Graphics
H + PowerStorm 300, REALimage 2100
I + Oxygen GVX1
J + Intense 3D Wildcat 4000*
J + Intense 3D Wildcat 4000
J + NVIDIA Quadro/ELSA GLoria II
I/K + NVIDIA Quadro/ELSA GLoria II
K + NVIDIA Quadro/ELSA GLoria II
K + ELSA Synergy II
K + Oxygen GVX1
K + Intense 3D WildCat 4110
K + Matrox Millenium G400 Dual Head
K + FireGL 2
L + NVIDIA Quadro2 MXR/ELSA Synergy III
L + NVIDIA Quadro2 Pro/ELSA Gloria III
M + 3DLab Intense3D Wildcat Pro 4110 (64 MB)*
M + 3DLab Intense3D Wildcat Pro 4110 (64 MB)

0.0   10.0   20.0   30.0   40.0   50.0   60.0   70.0   80.0   90.0   100.0

* Sync swap buffer with V sync

Time spent for flyby/walkthrough (second)

Note: This chart is related to performance only, not rendering quality. Some cards improved performance more than others. Some cards improved the rendering quality after the driver update. In general, those with geometry setup and texture mapping support performed better. These cards have various restrictions that include operating system version and PCI bus version. We would recommend users check card requirements and your system configuration before purchasing. The statistics shown on this chart are results of tests performed over a period of time since before the product was released. They offer one type of performance measurements for each individual card and comparisons between cards should be careful if the base machine is different.

Summary of Tested 3D Graphics Card Specifications

Graphics Card	OS	Cost Rating ($US) $<250 $$<1000 $$$<2000 $$$$<3000	Year Released	Resolution width x height x colors x refresh rate	Manufacturer	Geometry Co-processor Chip	Rasterization Chip	Tested Driver Version
FireGL 1000	NT & 95	$-	1996	640-1600 x 480-1200 x 256-16M x 60-200 Hz	Diamond Multimedia	3DLabs GLINT Delta	3DLabs Permedia NT	2.70, 4.0.27
FireGL 1000 Pro	NT & 95	$	1998	640-1980 x 480-1200 x 256-16M x 60-120 Hz	Diamond Multimedia	3DLabs GLINT Delta (Integrated)	3DLabs Permedia II	0997
FireGL 3000	NT & 95	$$+	1996	640-1600 x 480-1200 x 256-16M x 60-100 Hz	Diamond Multimedia	3DLabs GLINT Delta	3DLabs GLINT 500TX	0997, 2.70, 4.0.27
Fire GL 1 AGP	NT	$$	1999	640-1920 x	Diamond	IBM E 256-	IBM E 256-bit	4.00.1381.1036,

				480-1200 x 8-24 bpp x 60-100 Hz	Multimedia	bit Graphics Rasterizer	Graphics Rasterizer	4.0.0
4.0								
FireGL 4000	NT	$$$+	1996	640-1280 x 480-1024 x 256-16M x 60-200 Hz	Diamond Multimedia	Mitsubishi 3DPro/2mp Evan & Sutherland REALimage Technologies	Evan & Sutherland RealImage Technologies	1, 2, 27, 7, 4.0.0
GLoria L/MX	NT & 95	$$$	1997	640-1600 x 480-1200 x 256-16M x 60-200 Hz	ELSA	3DLabs GLINT Delta	3DLabs GLINT MX	5.25.00.174, 4.0.52
GLoria L	NT & 95	$$$-	1996	640-1600 x 480-1200 x 256-16M x 60-200 Hz	ELSA	3DLabs GLINT Delta	3DLabs GLINT 500TX	5.25.00.174, 4.0.52
3DMon	NT & 95	$$$	1998	640-1600 x 480-1200 x 256-16M x 60-200 Hz	Omnicomp	3DLabs GLINT Delta	3DLabs GLINT MX	2.9-0030B, 4.0.0
AccelECLIPSE	NT	$$$-	1996	640-1280 x 480-1024 x 16M x 60-120 Hz	AccelGraphics	Evan & Sutherland RealImage Technologies	Evan & Sutherland RealImage Technologies	1.3.09, 4.0.0
AccelECLIPSE II AGP	NT 4.0	$$$+	1998	640-1280 x 480-1024 x 16M x 60-120 Hz	AccelGraphics	Evan & Sutherland RealImage Technologies	Evan & Sutherland RealImage Technologies	Not Available
AccelPRO MX	NT	$$	1997	640-1600 x 480-1200 x 256-16M x 60-200 Hz	AccelGraphics	3DLabs GLINT Delta	3DLabs GLINT MX	4.4.01

Graphics Card	OS	Cost Rating ($US) $<250 $$<1000 $$$<2000 $$$$<3000	Year Released	Resolution width x height x colors x refresh rate	Manufacturer	Geometry Co-processor Chip	Rasterization Chip	Tested Driver Version
AccelGALAXY AGP	NT 4.0	$$+	1999	640-1280 x 480-1024 x 16M x 60-120 Hz	AccelGraphics	REALImage 2100	REALImage 2100	4.00.1381.1100, .027 4.0.0
Dynamite 3D/GL AGP/3D Labs Permedia II AGP	NT 4.0	$-	1998	640-1980 x 480-1200 x 256-16M x 60-120 Hz	Hercules	3DLabs GLINT Delta	3DLabs Permedia II	2.10-0230, 4.0.0
Power Storm 300 AGP	NT 4.0	$$$+	1999	640-1280 x 480-1024 x 24 bpp x 60-85 Hz	Evans & Sutherland	REALImage 2100	REALImage 2100	2, 2, 1107, 1219, 4.0.0
OxygenGMX 2000 AGP	NT 4.0	$$$+	1999	640-1920 x 480-1080 x 8-24 bpp x 60-100 Hz	3DLabs	3DLabs GMX2000, GLINT Gamma	Dual 3DLabs GLINT MX	2.1 2-0626, 4.0.0
OxygenGVX1	NT 4.0	$$	1999	640-1920 x 480-1000 x 8-24 bpp x 60-100 Hz	3DLabs	3DLabs GLINT Gamma	3DLabs GLINT R3	4.10.01.2105-2.14-0929, 4.0.0

Note:

1. Graphics cards listed in the table may not match those shown in the above
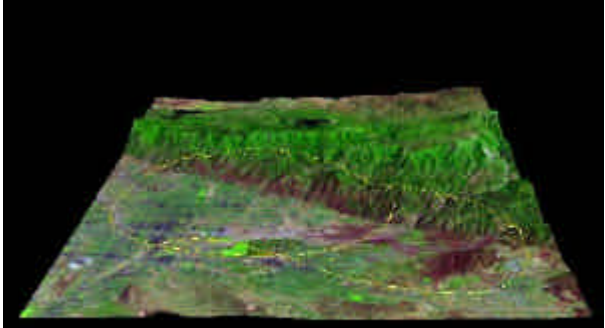
performance comparison chart.
2. Please check with the card vendors for exact and up-to-date card prices.
3. The releasing year is only approximated. Please check the individual card manufacturer for more accurate information.

Summary of the Benchmark Data Sets

Geometry and texture performances are the two fundamental measuring benchmarks for the 3D graphics cards. The Enschede, Netherlands, data set was selected for the geometry performance test and a Redlands, California, USA, data set was selected for the texture performance test. The following are a summary about the data sets used.

Data set	Data type and use	No. of themes	Size or no. of features
Enschede	TIN (Terrains)	1	1499 Nodes, 2977 Triangles
	Polygon Shape (Buildings)	8	881 Features
	Line Shape (Roads)	3	1073 Features
	Graphics (Trees)	12	N/A
Redlands	TIFF Image (Aerial Photo, true color,	1	3876 KB, 1206x1096 pixels

uncompressed)		
TIN (Terrains)	1	1431 Nodes, 2789 Triangles
Line Shape (Streets)	1	7093 Features

The two projects were built using the data sets as listed in the above table. The TIFF image used in the Redlands project was texture mapped onto the underlying TIN surface.

All themes were loaded into a 3D Scene viewer document. A fixed path line was defined in the 2D View and used in the 3D Scene viewer for a walk-through or fly-by operation. Time spent for the walk-through or fly-by for each fixed path line was recorded, and the results are shown in the top performance comparison chart.

Special thanks to the Workstation Division at Compaq Computer Corporation for providing various workstations and graphics cards through the Compaq's Graphics Excellence Program. More in-depth information about various graphics cards and other related resources (e.g., latest drivers, graphics dictionary, and so forth) can be found on Compaq's Workstation Graphics Information page.