Welcome

To Advance through Presentation
Use Page Up and Page Down Keys

Hardware Directions

Jon Rubinstein
Sr. V.P., Hardware Engineering

Phil Schiller
V.P., WW Product Marketing

	Consumer/ Education	Professional
Desktop		
Portable	1999	

1999

iMac Magic

- Attracting new customers
  - 32% First time buyers in U.S.
  - 47% First time buyers in Japan
- Growing market share
  - 18.4% desktop market share Japan, Q1’99

iMac Is Everywhere

On Your Favorite TV Shows

Drew Carey Show, Dawson's Creek, Beverly Hills 90210, Spin City, Home Improvement, Melrose Place, News Radio, X-Files, MTV Road Rules, Felicity, Profiler

iMac Is Everywhere

At Your Favorite Movies

Austin Powers 2

Mystery Men

iMac Is Everywhere
In Your Favorite Store Windows

Bloomingdale's
FAO Schwartz
Tag Heuer

iMac Is Everywhere

In Your Favorite Catalog

Crate and Barrel

Pottery Barn

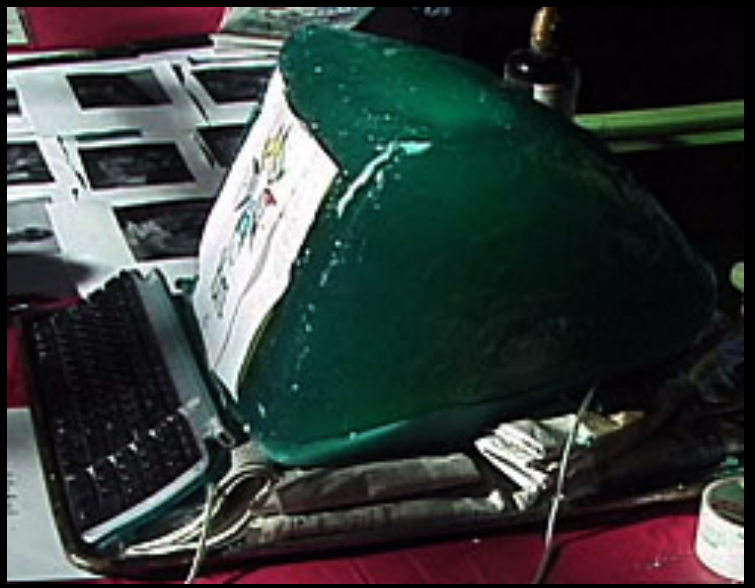
iMac Is Everywhere

At the White House

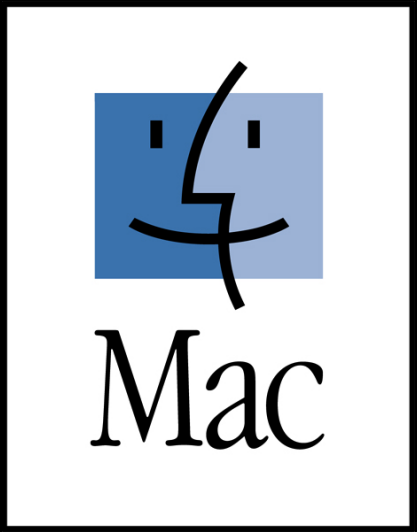
White House
Easter Egg Roll

iMac Is Everywhere
For Dessert

MIT JELL-O contest



Phenomenal Developer Support



- Over 3,000 products since iMac intro
- Including over 175 USB devices announced
- Thank you!

New Epson Stylus Color 740i

Collect All Ten!

1999

The Fastest Mac Ever

Power Macintosh G3

"If you have been waiting for the right time to purchase a Power Mac, carpe diem. . . . It has the features and upgradability to keep users happy well into the next millennium."

— InfoWorld

1999

PowerPC
File Edit Project Make Clip Windows Help
Macintosh PowerBook G3

More brain. Less brawn.

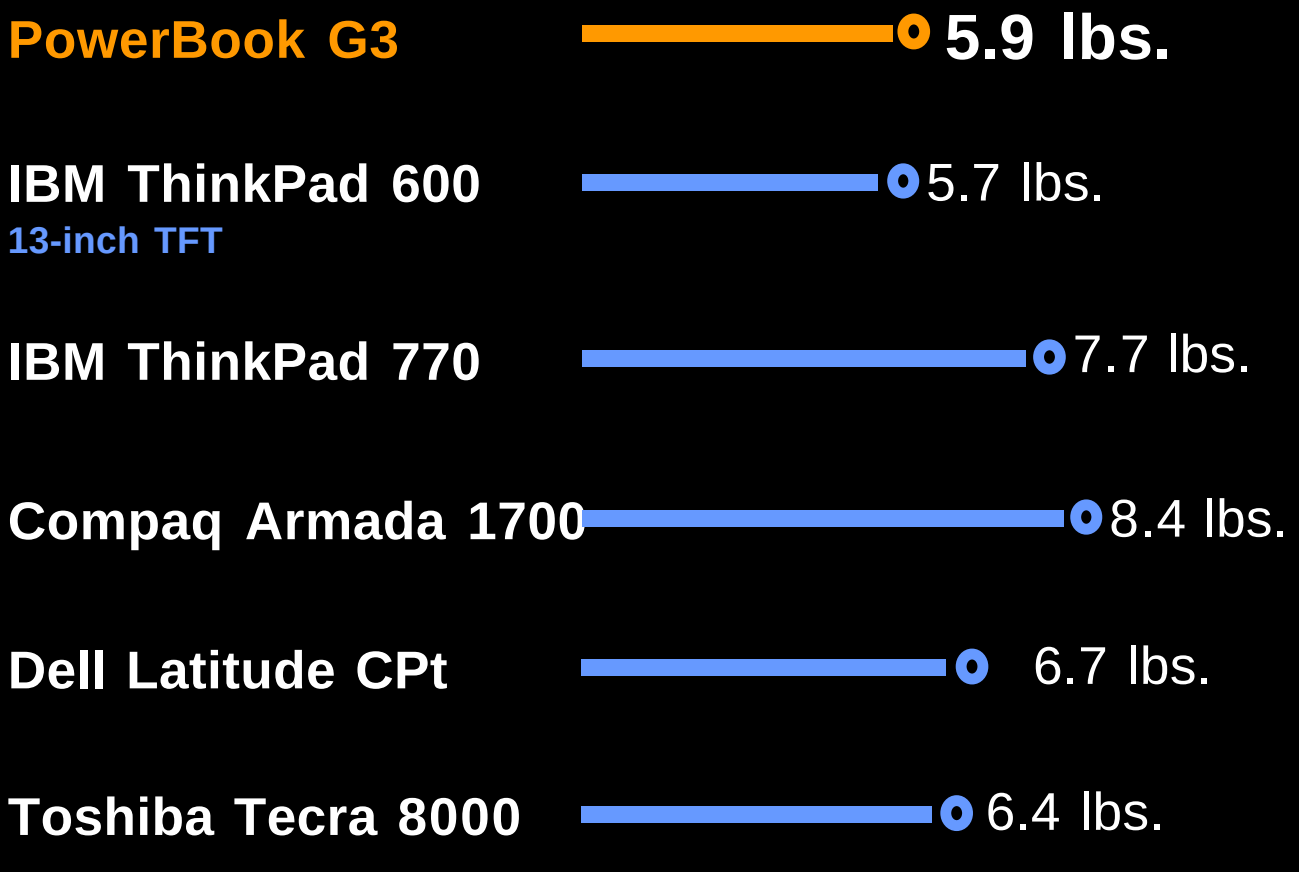
Only 5.9 pounds

Faster

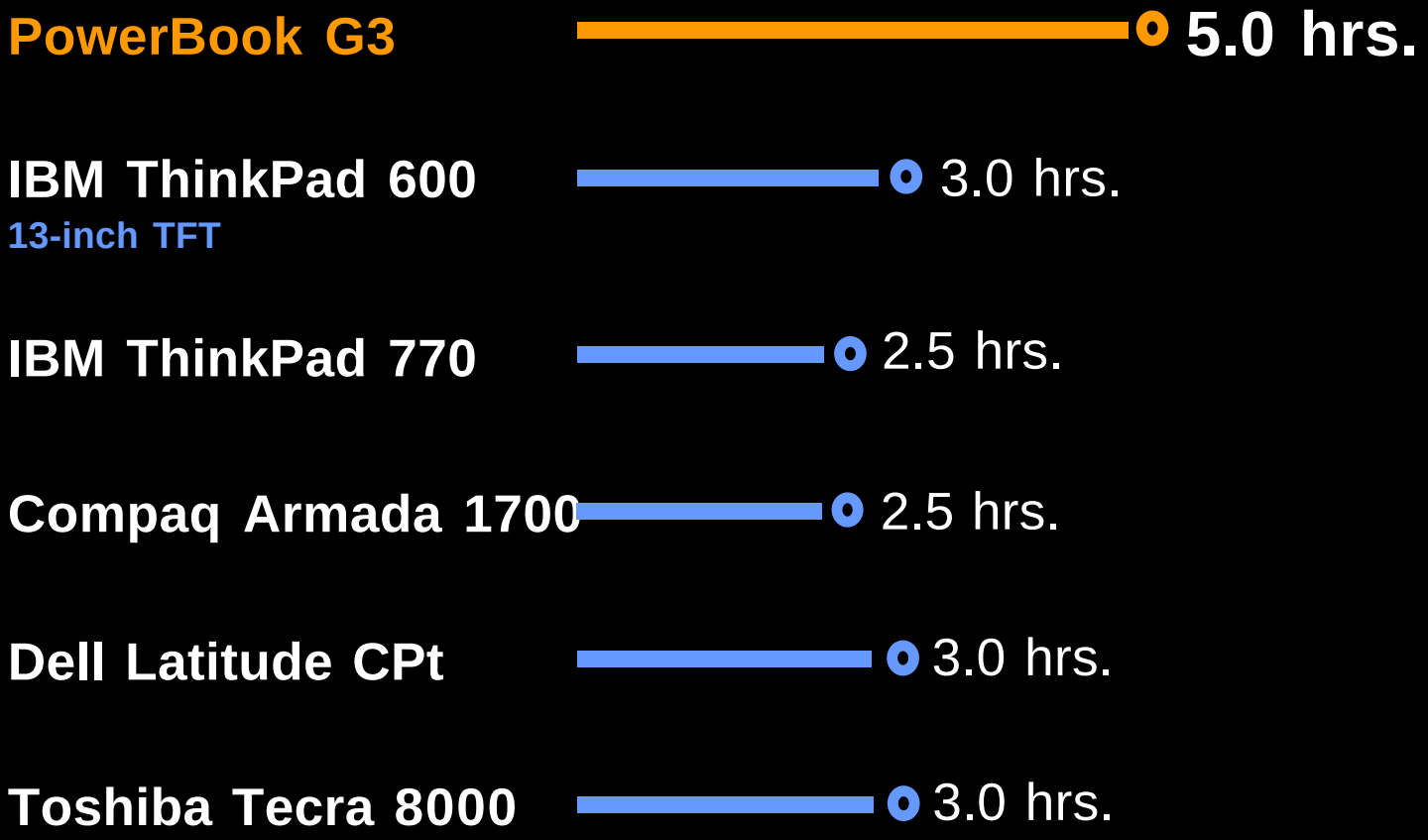
333 MHz
512K L2 cache

400 MHz
1MB L2 cache

Lighter


PowerBook G3
5.9 lbs.
IBM ThinkPad 600
13-inch TFT
5.7 lbs.
IBM ThinkPad 770
7.7 lbs.
Compaq Armada 1700
8.4 lbs.
Dell Latitude CPt
6.7 lbs.
Toshiba Tecra 8000
6.4 lbs.

Longer


PowerBook G3
5.0 hrs.
IBM ThinkPad 600
13-inch TFT
3.0 hrs.
IBM ThinkPad 770
2.5 hrs.
Compaq Armada 1700
2.5 hrs.
Dell Latitude CPt
3.0 hrs.
Toshiba Tecra 8000
3.0 hrs.

PowerBook G3

333MHz G3 – 512K	400MHz G3 – 1MB
64MB DRAM	64MB DRAM
4GB	6GB
CD	DVD
Rage LT Pro 8MB	Rage LT Pro 8MB
USB, 10/100 BASE-T	USB, 10/100 BASE-T
56K Modem	56K Modem
$2,499	$3,499

1999

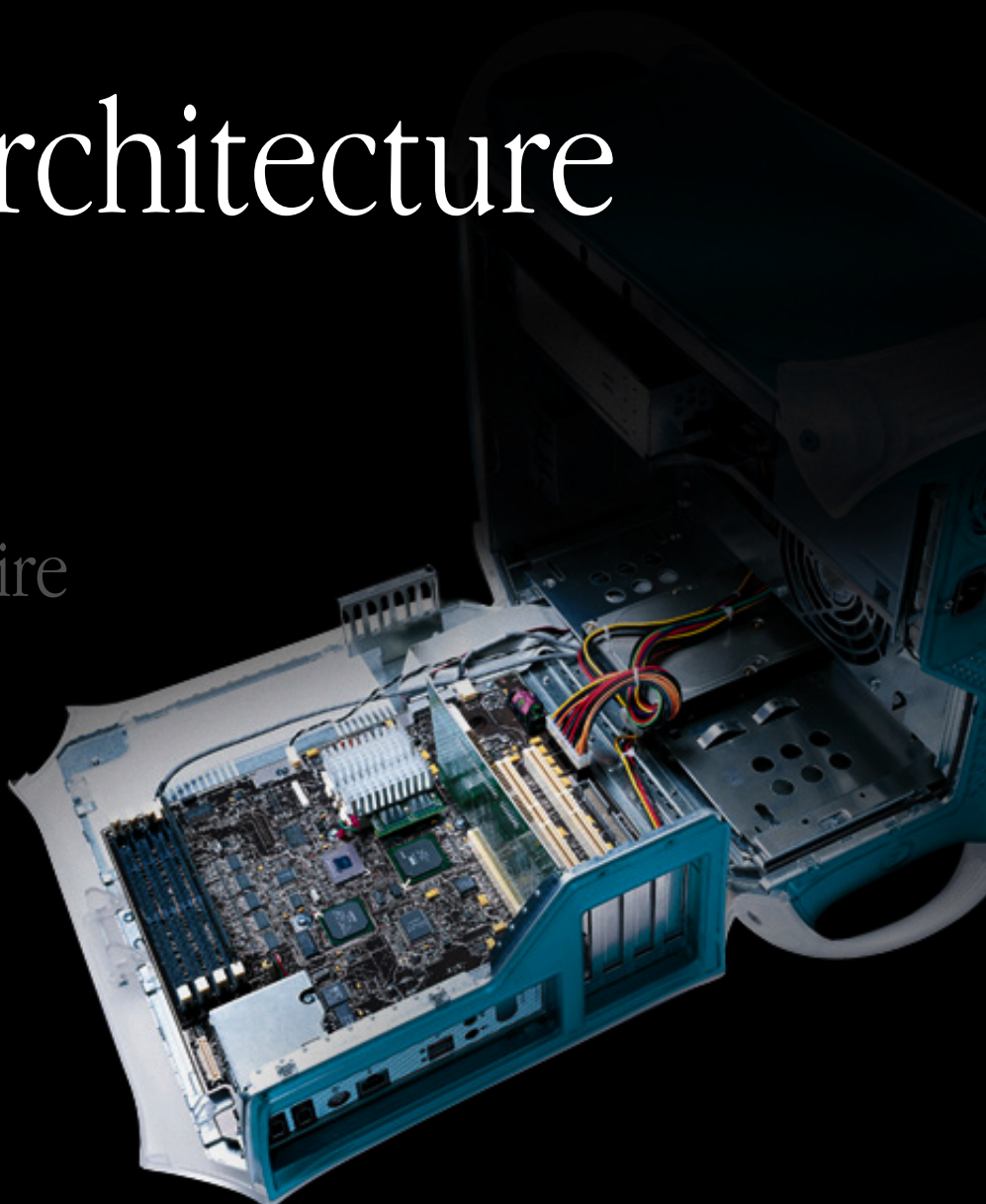
1999

Four Product Lines

One Unified Architecture

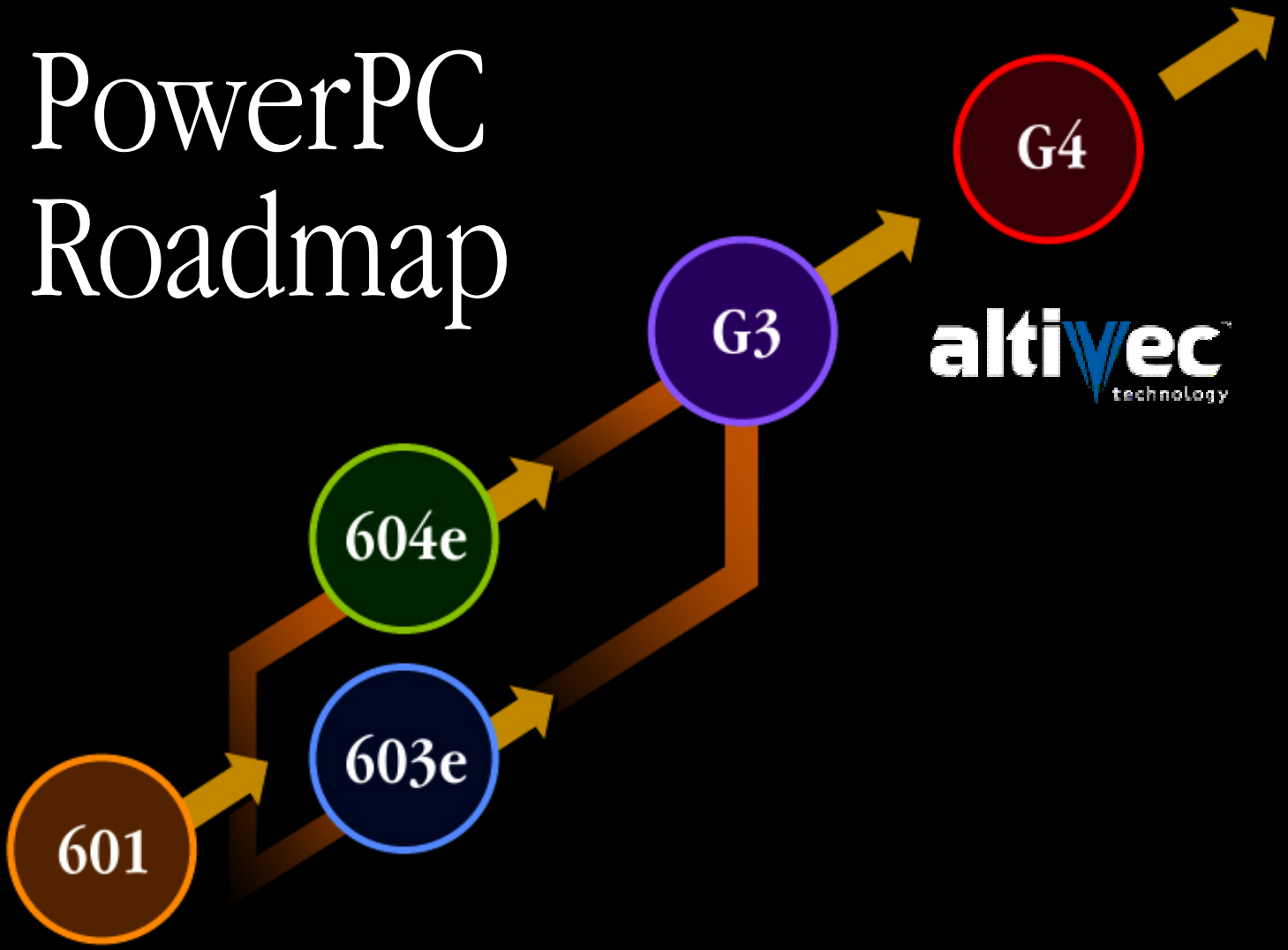
Unified Architecture

- PowerPC
- Subsystems
- USB & FireWire



PowerPC

PowerPC Roadmap



AltiVec is a trademark of Motorola

Superior Chip Design

	G4	P-III
Transistors	10.5M	9.5M
Die size	83 mm^2	130 mm^2
Power	<12 watts	40 watts

Next Generation PowerPC

- Dramatically improved memory interface
  - Pre-fetching
  - Streaming
  - 3x bandwidth
  - Faster access

Next Generation PowerPC

No-Compromise Architectural Extensions

- 4-state MP-optimized cache architecture
- Specially designed for media and DSP applications

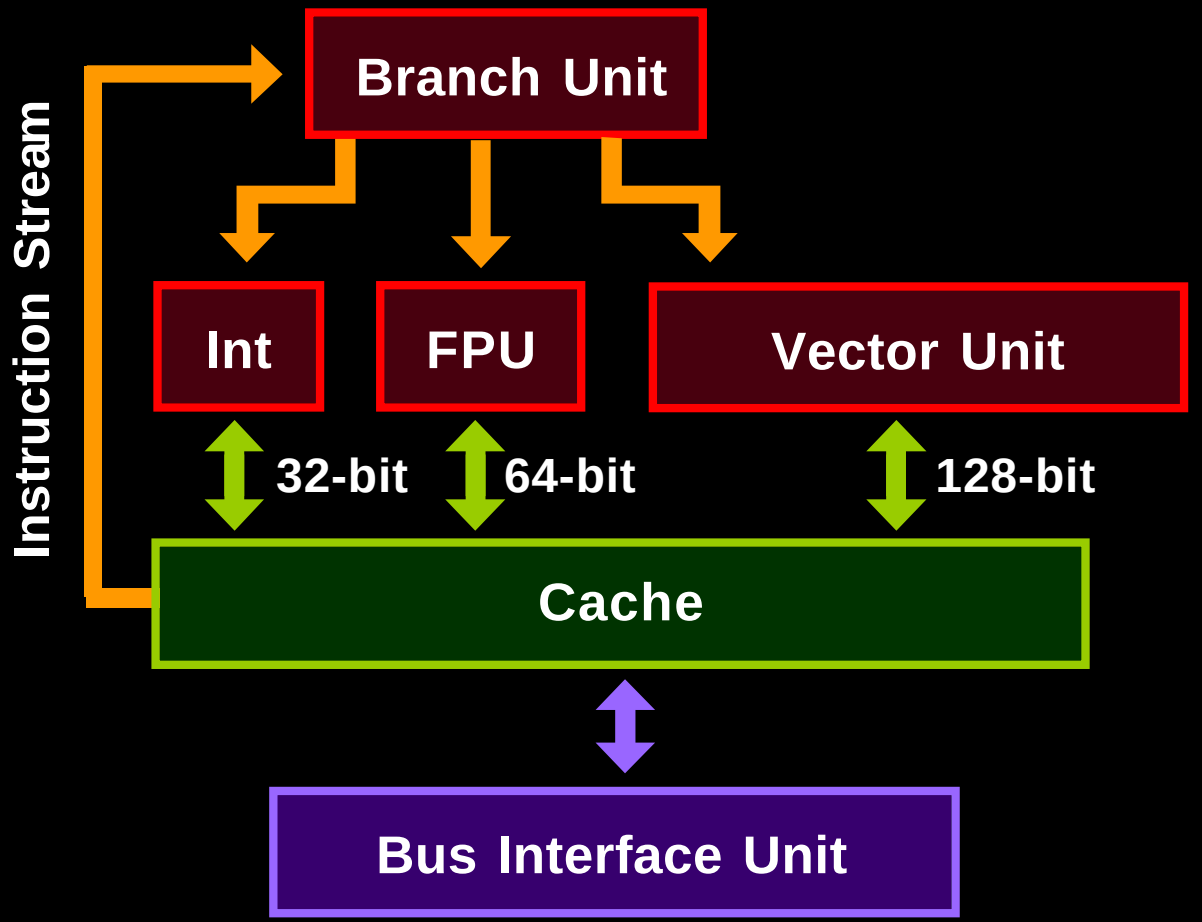
AltiVec

Vector Processing in a Macintosh

- 128-bit architectural extension
- 32 new registers and 162 new instructions for SIMD processing
- Designed for processor-intensive programs

  Multimedia, graphics, 3D, DSP, sound/music, matrix and vector computations

AltiVec Architecture



G4 AltiVec vs. P-III SSE

- Richer instruction set
- True streaming support
- More advanced instruction handling
  - Independent units — no mode switching, concurrent computation
  - More registers
- Maintains simplicity of RISC

G4 vs. G3 Performance

Maxon Perspective Shading Engine	3x
Photoshop	
Rotate CW90	1.6x
Gaussian Blur 1	2x
Gaussian Blur 85	1.5x
Unsharp Mask	1.6x
Media 100 Audio Processing	4x
32 tap 1024 Dimension FIR filter (bfir)	8x
Mac OS Block Move	1.5x

AltiVec

What Apple Is Doing

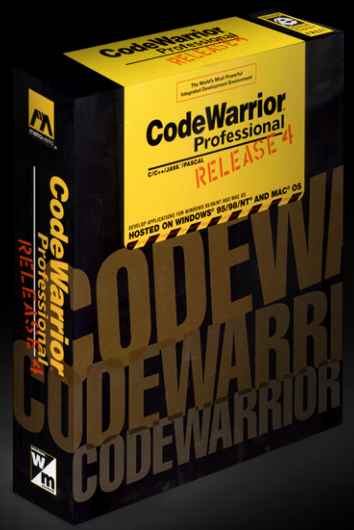
- OS integration — transparent app support

  OS 8.6 and OS X will support AltiVec

  Core graphics routines: QD, QT, OpenGL

- Core libraries for developer use

AltiVec for Developers



- AltiVec SDK available now

developer.apple.com/hardware/altivec

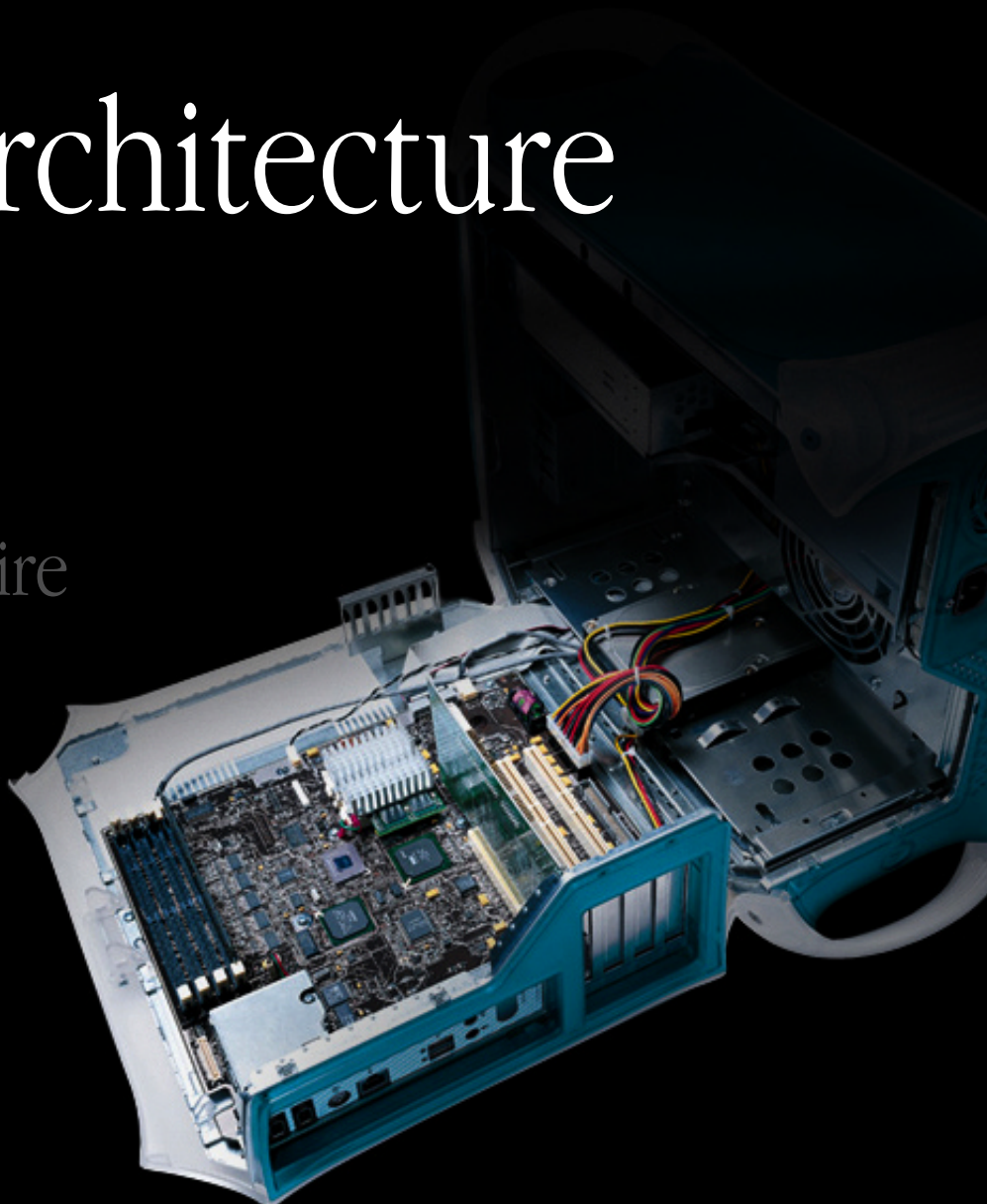
- C-based programming model
- CodeWarrior supports AltiVec
- Kitchens, technical support available now

AltiVec Opportunities

- Processor-intensive or large data sets
  - Audio & video decode / encode
  - Image processing filters
  - Scientific calculations
  - Table look-ups
  - Data encryption / key generation
  - Speech processing & handwriting analysis

Unified Architecture

- PowerPC
- Subsystems
- USB & FireWire

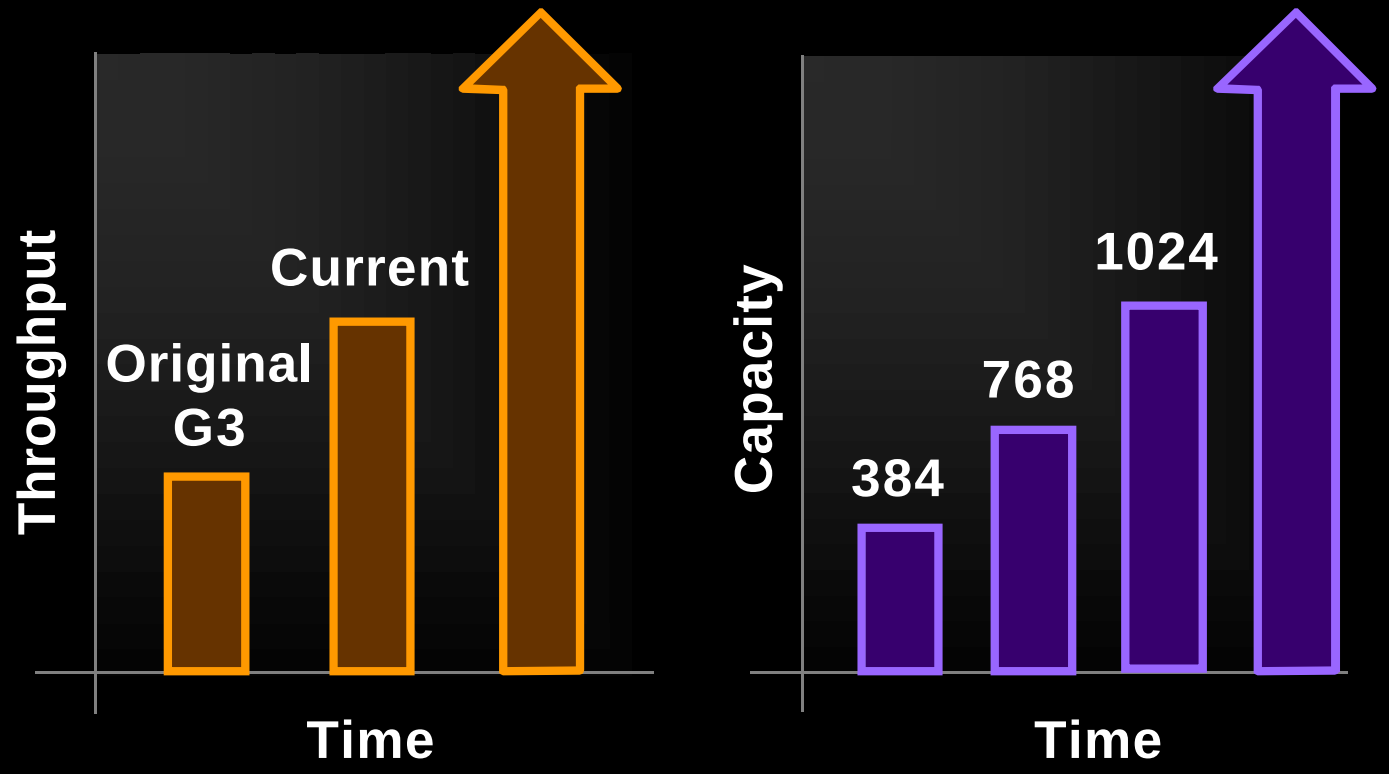


Subsystem Architecture

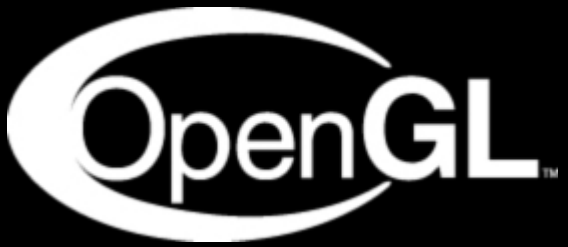
System ROM

- Reliability and compatibility
- Fast revisions and updates
- Simplifies developer support of CPUs

Memory


Throughput
Original G3
Current
Time
Capacity
384
768
1024
Time

Graphics



Audio

- Migration to Digital
- FireWire and USB for external connects
- Enhancement technologies
  - 3D positional sound
  - Multi-channel virtual surround sound
  - Bass enhancement

Power Management

- More consistent — not just for portables
- More sophisticated — Wake on LAN
- More robust — turn off subsystems, including PCI, USB, FireWire
- More to come — 8.6 is just the beginning
- Follow Power Manager 2.0 guidelines (Session #209)

PCI

- What developers should do
  - Update drivers to take advantage of new Power Manager architecture
  - Provide Open Firmware 3.0-compatible code for boot devices
  - Don’t rely on slot names or numbers

Time Manager

- Now PPC-native
- No longer relies on legacy HW (VIA)
- API calls up to 200x faster
- No longer affects PCI bus performance

  Reliable performance for
  high-end AV solutions

Drives

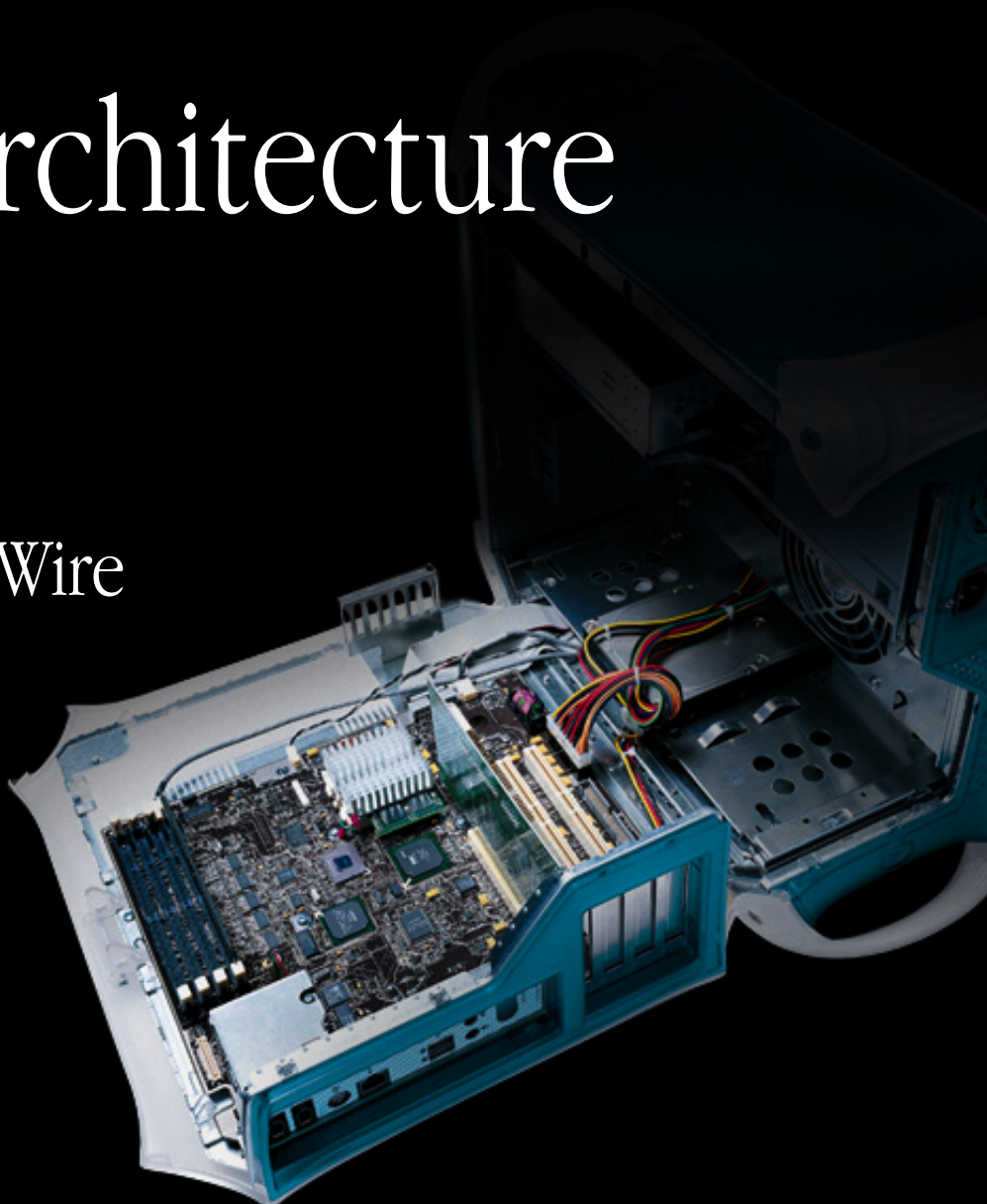
ATA Ultra DMA 66 Mainstream	SCSI Ultra 2 LVD Special-purpose
Ideal for DV, publishing, image editing	Ideal for multiple drive RAID, external expansion
20MBps single-drive sustained R/W	20MBps single-drive sustained R/W
MLB interface	PCI card
Standard	BTO

Removable and External Drives

- No built-in floppy
- More DVD
- Software support for USB and FireWire devices

Unified Architecture

- PowerPC
- Subsystems
- USB and FireWire



Entry and Consumer Peripherals	Multimedia and Pro Peripherals
Up to 12 Mbps	Up to 400 Mbps
127 devices on bus	63 devices on bus
Hot plug / unplug	Hot plug / unplug
Power on bus	Power on bus
Replaces Serial, ADB	Replaces SCSI, Analog AV

Product Lines with USB

New in USB

- In Mac OS 8.6 (USB 1.2)
  - Isochronous and interrupt-out data transfers
  - Complex USB device configurations
  - PostScript printers

Just Posted

- Mass storage class driver

USB Roadmap

Core Features

USB 1.0
- Interrupt
- Control
- Bulk

USB 1.1
- Multiple buses
- Composite driver replacement
- PCI Cards

USB 1.2
- Isochronous
- Sleep/Wake
- Interrupt-Out
- Multiple Drivers per file

Planned
- Suspend/Resume
- Remote wake up
- Net Download
- Boot from USB
- CardBus Cards

Drivers

USB 1.0
- Hub
- Mouse
- Keyboard
- Composite
- Input Sprocket

USB 1.2
- PostScript Printers
- Input Sprocket

- Mass Storage Class

Planned
- Comm Class
- Audio Class
- HID Class
- Force Feedback

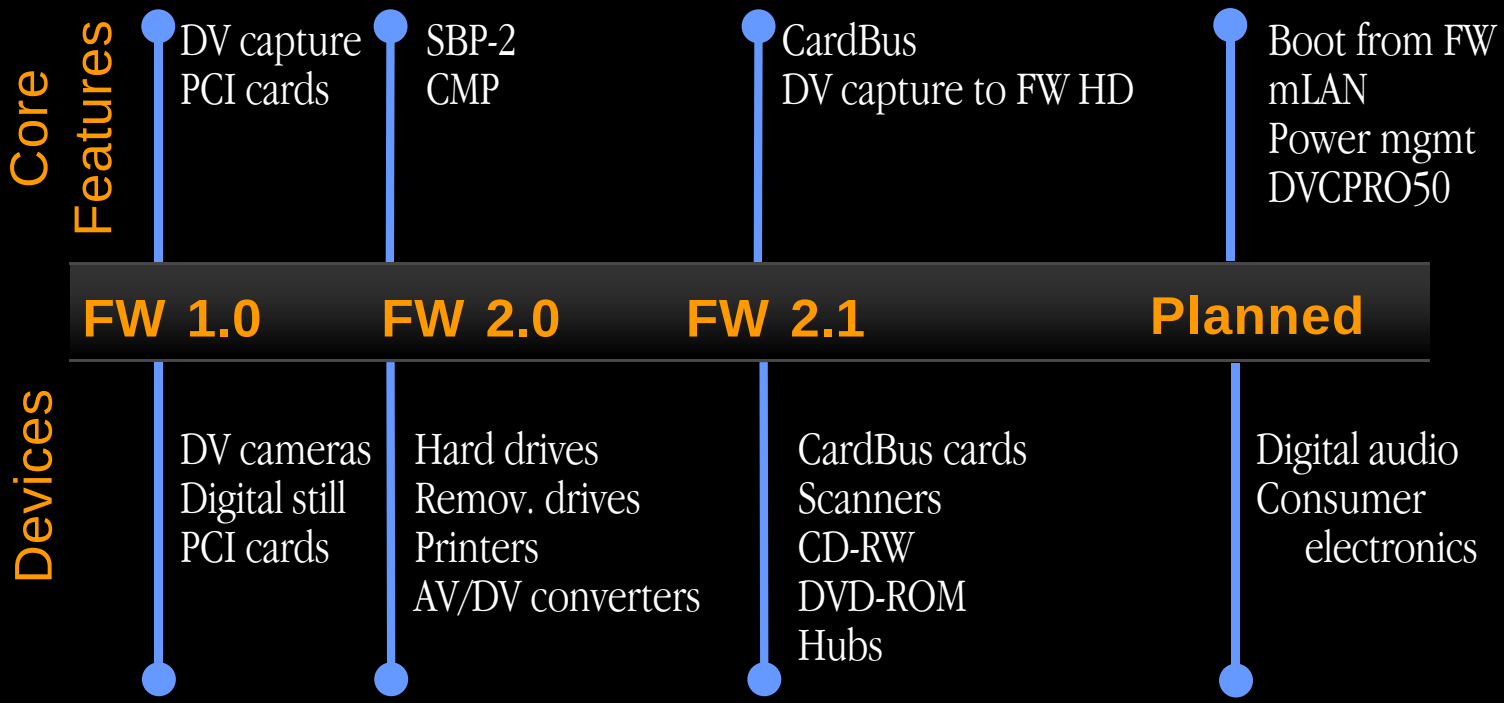
FireWire Hardware

- Standard on Power Macintosh G3, new option for PowerBook G3
- Outstanding developer support!

New in FireWire

- In Mac OS 8.6 (FireWire 2.0)
  - SBP-2 for hard drives, printers
  - CMP for multiple cameras
- Coming soon in FireWire 2.1
  - DV Capture to FW drives
  - CardBus support

FireWire Roadmap

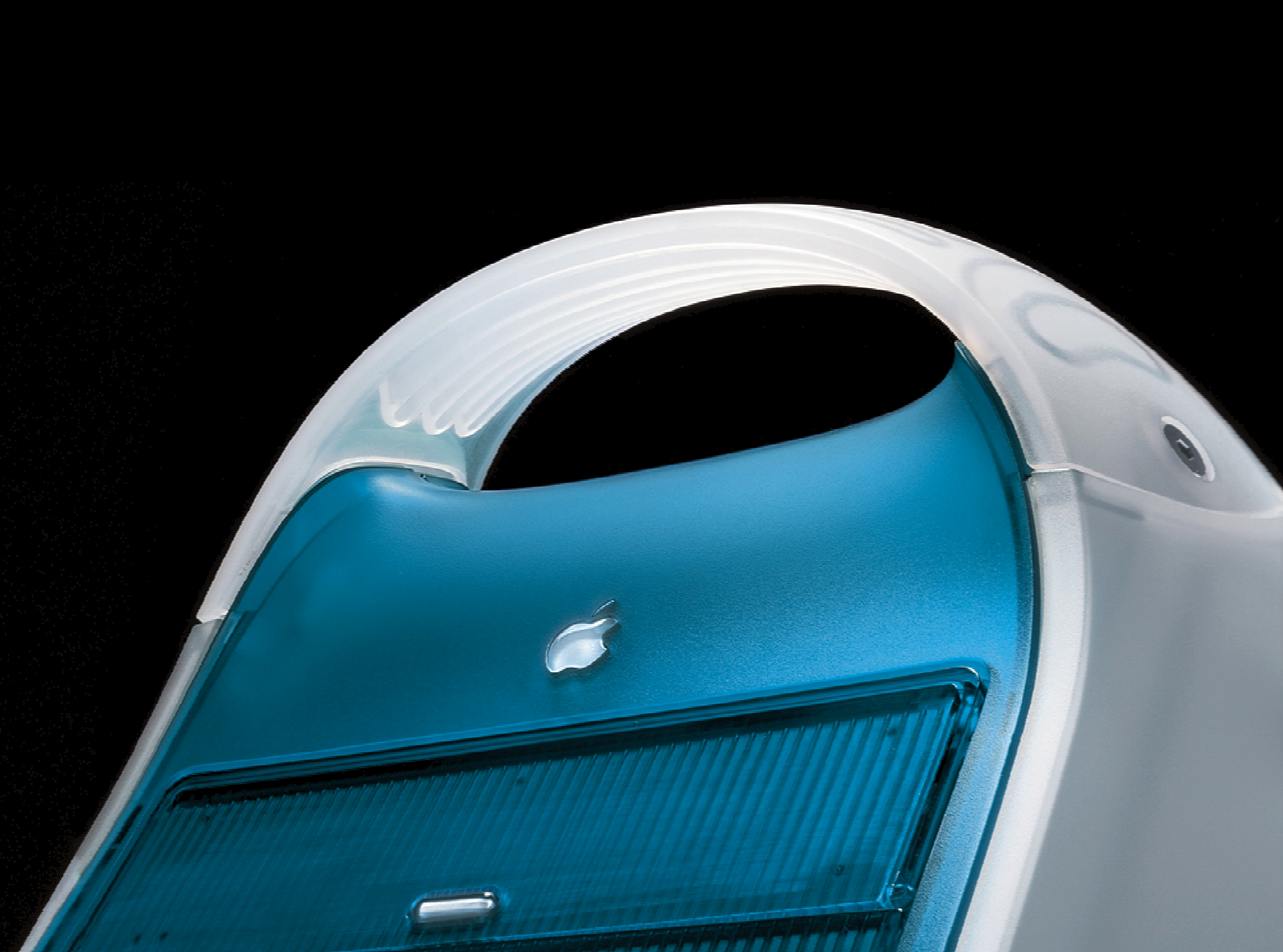


DV: Format for the Future

- Professional quality at consumer prices
- Pixel-perfect generations

DV	DVCPRO50
25Mbps stream	50Mbps stream
4:1:1 sampling	4:2:2 sampling

Design



A Sustainable Advantage?

Color Series Transparent Plastic Cases

AT7614B

AT7814B

ISO 9002/CE/FCC/UL/CSA/TUV Approvals

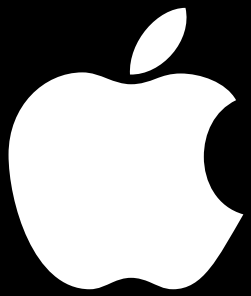
5 basic colors:

Lime Strawberry Grape Orange Blackish Green

Blueberry, White, Black- coming soon

*Welcome OEMs for color and front panel design

1999



Think different.™

Welcome

To Advance through Presentation
Use Page Up and Page Down Keys