

# DISTRO

102612 #63



## ON THE SURFACE

MICROSOFT'S FORAY INTO TABLET TERRITORY PUTS THE EMPHASIS ON PRODUCTIVITY ...

DELL'S UNIQUE SPIN  
ON THE WINDOWS 8  
CONVERTIBLE

LG'S OPTIMUS G  
TAKES ON THE  
MOBILE ELITE

**PLUS:** OUR FIRST  
IMPRESSIONS OF  
THE iPad MINI

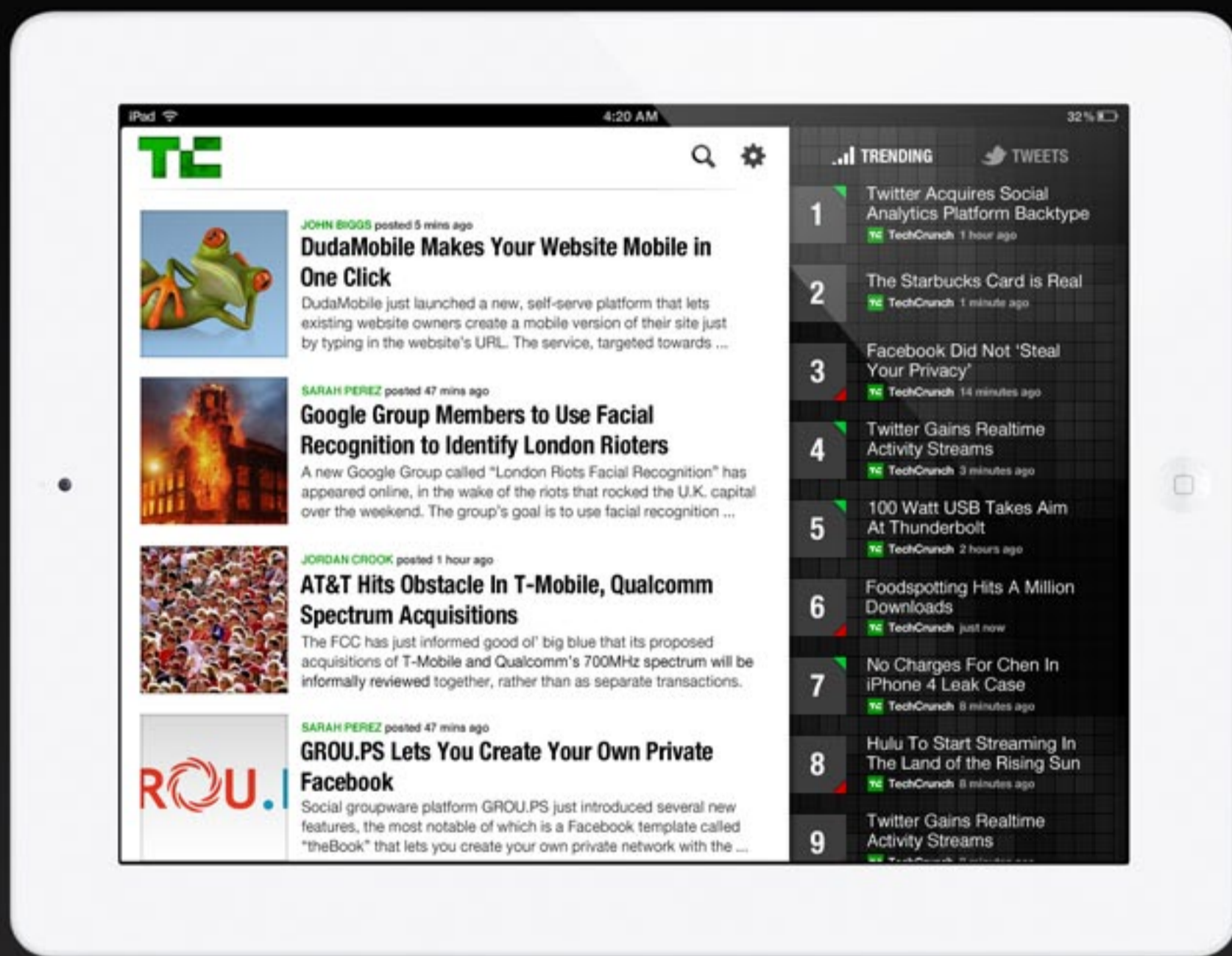


... BUT  
CAN THIS  
WINDOWS RT  
SLATE RISE  
TO THE  
OCCASION?



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DISTRO

10.26.12

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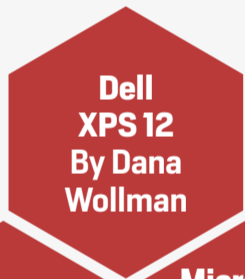
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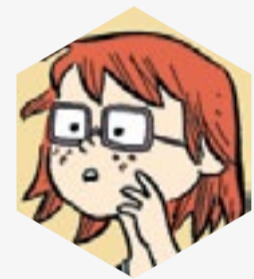
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Photograph  
By Will Lipman for Distro



# PUNCHING ABOVE ITS WEIGHT



DISTRO  
10.26.12

EDITOR'S  
LETTER

**A**nother big-time Apple event has wrapped and, again, we knew a lot about the main attraction before the curtain even lifted. In a show that had a surprising amount of focus on the Mac line, the star attraction, the iPad mini, was more or less just what we expected it to be — but somehow it still surprised me by just how good it felt in the flesh.

We got some hands-on time after the event, as you'll soon see, and for some reason all the leaked case pictures didn't really do the thinness of the thing justice. Here is a device that is as thin as the previous-generation iPod touch (the latest rendition, the fifth, beats it by a millimeter) but is so much more capable. To me it seems like it could be a perfect size and, at \$329 to start, it's a pretty compelling price, too. It starts shipping on November 2nd and we'll have a review for you as soon as we can. It's safe to say I'm looking forward to spending more quality time with one.

That may have been the most talked-about aspect of the show but golly if Apple didn't have a lot of other surprises in store for us, including one that I'm typing on at this moment: the new 13-inch MacBook Pro with Retina display.

It's very much a scaled-down version of the 15-incher we got this summer, both in terms of size and performance. But, it still offers all the same connectivity options as its bigger brother, which is certainly something. A full review of this guy is coming up soon.

There was plenty more, including a revised version of the full-sized iPad, the fourth generation model, into which was grafted a new processor, the A6X, said to offer twice the performance of the "new" iPad that seemingly dropped just a few months ago. It also has a Lightning connector and comes complete with a certificate giving purchasers the right to publicly shame anyone who bought a third-gen unit within the past 60 days.

But wait, there's more. Apple updated the Mac mini, with better performance and more storage, and unveiled a drastically re-profiled iMac. From the front, the all-in-one looks identical to how it did before, but take a peek to one side or the other and you'll see a new thickness of just 5mm — at the edges. That is something of an illusion, as it chubs up progressively as you work your way toward the center-mounted stand, but it's a delicious trick and it



makes for a striking machine.

That was an awful, *awful* lot of stuff to drop on us in a presentation that clocked in at just over 80 minutes, far more than we were expecting but needless to say we weren't disappointed. All the devices will be shipping sometime between now and the end of the year and hopefully by now you know where you'll be able to find reviews of each and every one.


Right here in this issue is where you can find our review of Microsoft's Surface with Windows RT tablet, which, after much anticipation, is now shipping. I won't spoil the review for you, which is just a few pages away, but as you'll see this isn't a cut-and-dry, love it or hate it kind of thing. Microsoft's first Surface (since the last Surface, that is) isn't quite a must-buy, even for Windows lovers, and that in and of itself could be something of a problem.

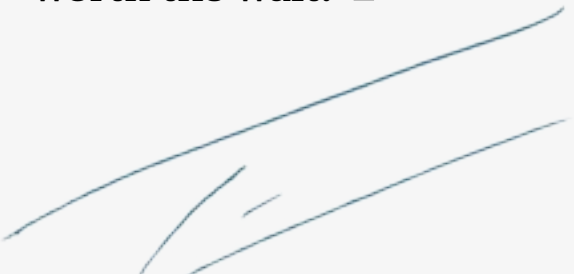
With the Surface RT launch comes the enabling of SmartGlass, Microsoft's second-screen experience that lets you interact with your Xbox 360 games and media on tablets or smartphones — eventually. For now, Windows RT and Windows 8 tablets will be the only things able to interface with the console. The apps for Android and iOS are coming “soon” — we'd estimate rightly 24 hours after Microsoft has done everything it can to encourage gamers to buy a Surface, first.

Financials are on us yet again and Facebook posted its eagerly anticipated fiscal update, showing a \$59 million net

loss. While it's difficult to positively spin a loss in such a freshly minted corporation, changes in accounting practices in the company resulted in it posting \$370 million less profit than it otherwise would have. So, things aren't as bad as that net number suggests, but neither is it exactly painting a rosy picture.

Finally, the CEA bestowed a formal title upon HDTVs with a 4K resolution. Henceforth they shall be known as “Ultra HD” sets. And now, with that branding exercise behind us, expect to see dozens and dozens of the things at the next CES and, a year from now or so, you might actually be able to buy one at something less than an outrageous price. Seriously.

In this week's Distro we have the full review of Microsoft's Surface with Windows RT, an exhaustive tome of analysis and evaluation compiled by yours truly and Dana Wollman. This is perhaps Microsoft's most important product launch since Paul and Bill pitched Altair BASIC a few years back. Also in this issue, Dana takes a look at Dell's unique spin on the Windows 8 hybrid, the XPS 12, and Myriam Joire puts LG's Optimus G through its paces. And, if you haven't heard enough from these two, Ross Rubin weighs the pros and cons of the iPad mini and the Surface in Switched On. Now, go on. Let's see whether Microsoft's first tablet was worth the wait. 



TIM STEVENS  
EDITOR-IN-CHIEF,  
ENGADGET



# 3D TEACHING, TIMELESS NANOS AND ULTRAVIOLET UPCHARGES



Touch article names  
to read full threads

DISTRO  
10.26.12

INBOX



## THE FUTURE OF HIGHER EDUCATION: RESHAPING UNIVERSITIES THROUGH 3D PRINTING

ISSUE 61,  
OCTOBER 12TH, 2012

“This is the beginning of a new curriculum. They need to tree off to: 3D design in science, in engineering and the arts. All need to have an ethics course along with brief law studies on IP, Copyright and patents.

I can see the future and it's POD (Parts on Demand). From metals,

fusion, new materials, recycling and cleaner manufacturing, this can [be] a MAJOR paradigm shift... “

—GOFORAIDE

“I'm simply amazed at how fast this technology is advancing. Hopefully they will learn enough from working

with these materials and concepts that someone can tackle the real endgame for this type of machine — making FOOD from materials that can be stored indefinitely without spoilage. Well ... heck, that's not endgame, that's just another use for it.”

—MCDONALDTIMT

IPOD TOUCH (2012)  
ISSUE 62,  
OCTOBER 19TH, 2012

“It is a very good looking device. Apple should step it up with the camera though. A camera that can compete with the Nokia Lumia 920 and GPS would make this device a no-brainer and a true cutting edge multimedia slate.”

—AMINEV



**IPOD NANO (2012)**  
ISSUE 62,  
OCTOBER 19TH, 2012

“This version seems alright. But they should have kept the 6th generation around too. That form factor was really nice. I didn’t like it at first, but it really grew on me. Having a device so tiny that actually has a screen is a real plus.”

—**DOUBLEDEEJ**

**THIS IS THE MODEM WORLD: IT’S MY MOVIE**  
ISSUE 62,  
OCTOBER 19TH, 2012

“Bought ‘Avengers’ on Blu-ray, decided to see if it had the new fangled Ultraviolet digital copy so I could watch on my tablet. No, you have to buy the 3D version to get Ultraviolet. Why should I have to buy a 3D version (which costs more) in order to legally watch my 2D version on a tablet? Last I checked, most tablets aren’t 3D anyway!”

—**RICH827**

“The whole reason people wanted Bluetooth is so that they could wear the nano like a watch and still actually use it as an iPod. Now they have added Bluetooth, and removed the ability to wear it as a watch. In my opinion, that form factor was the only thing left that the nano had going for it. Overall, I think that this design probably

missed the mark, and doesn’t really do anything that people aren’t already doing with their phones.”

—**GIRORO**

**PLAYSTATION 3 (LATE 2012)**  
ISSUE 62,  
OCTOBER 19TH, 2012

“I think MS [is] doing a much better job of evolving their Xbox system, it still feels fresh due to the complete GUI redesign, service and app enhancements. The PS3 feels stale, so much so that I haven’t bothered repairing my broken Blu-ray drive.

To re-hash the same kit, they should have put it in a PVR style package with PlayTV built in. After all, it was the Blu-ray that gave it the original edge. So multi-function obviously helps sales.”

—**GIMMETOYS**

“They made it a hell of a lot cheaper than the Slim, but they forgot to lower the price. :|”

—**MICHAEL D’EREDITA**





# ENTER

EYES-ON

DISTRO  
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NOISE  
SUPPRESSION

ACE OF  
BASS

Tap for  
detail

LIGHT AS  
A FEATHER

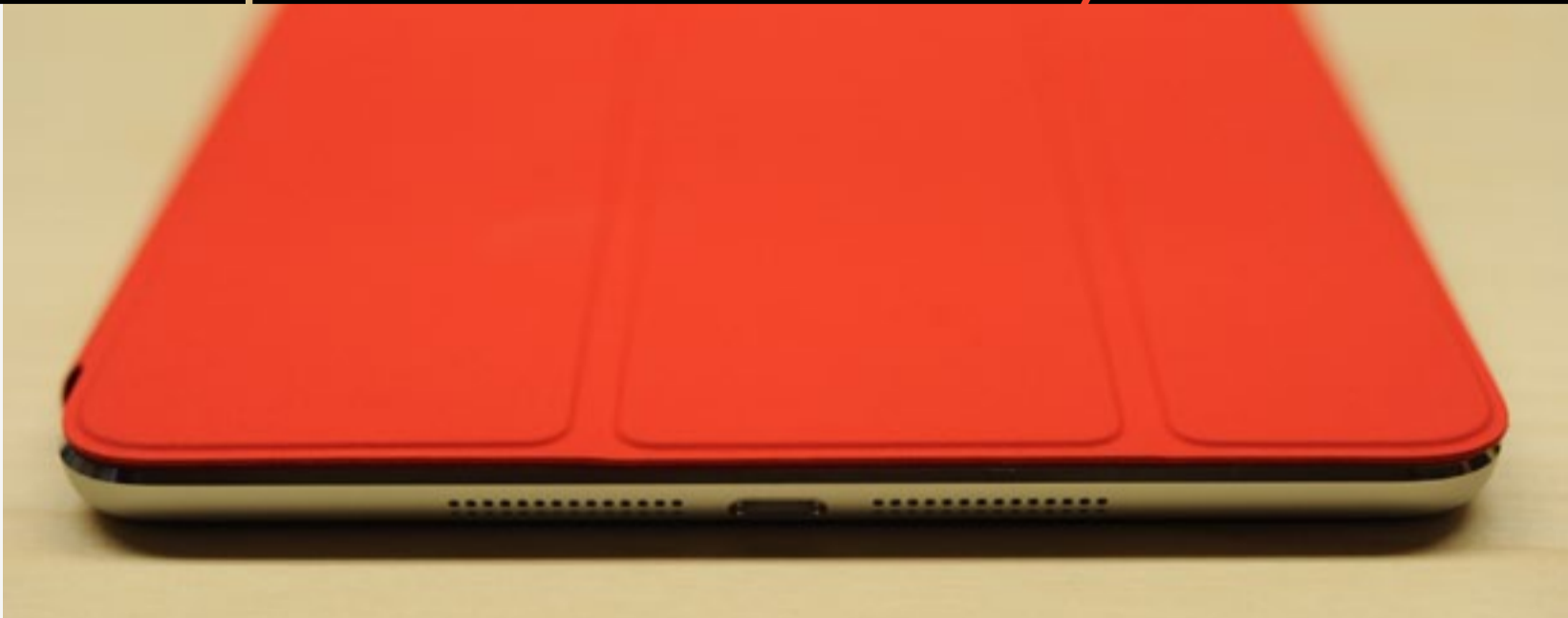
## SONY MDR-X10 HEADPHONES

### **X FACTOR-THEMED CANS THAT PACK A PUNCH**

Following the lead of many hip-hop aficionados, Simon Cowell has officially entered the celebrity-endorsed headphone fray. Sporting the branding of his latest television project, the MDR-X10s tout precision bass in classy silver digs.

**THE DAMAGE: \$300**





Click on  
product  
names to  
read full  
stories

# APPLE iPad MINI

**At long last,** it's the iPad mini. The slightly more portable iPad most certainly looks like its 9.7-inch elder — equipped with a Lightning port and entirely more eager to slip inside some of the world's largest cargo shorts. The device is precisely what you'd expect it to be: a slightly shrunken iPad, with a rear that resembles the new iPod touch. It's aluminum-clad, finely polished and equipped with a 7.9-inch LCD (1,024 x 768). The volume rocker, orientation / mute switch and bottom-mounted speakers are graciously borrowed from the conventional iPad, while the rest of the exterior maintains a pretty familiar look.

The smaller iPad is clearly aimed at classrooms and readers — two sectors where frills aren't exactly necessary. Where it excels, predictably, is the overall fit and finish. Just like the bigger iPad, this one feels delightful in the hand. Yes, it's lighter and more nimble, making it feel as if Apple concocted its own version of the 7-inch tablet. And indeed, that's precisely what has happened here. It's still not "small," though. While a fully outstretched adult hand can generally grasp it without help from the other, you'll still want both for typing and using apps. It's still too big for your average pocket, and it's not going to save you a heck of a lot of room in your knapsack compared to the 9.7-incher.



**PRICE:**  
\$329-\$659

**AVAILABILITY:**  
NOVEMBER 2ND  
(WIFI MODEL)

**THE BREAKDOWN:**  
THE IPAD 2 GETS A  
SMALLER SIBLING  
THAT PACKS THE  
SAME SCREEN  
RESOLUTION AND A  
LIGHTNING PORT.





# SAMSUNG CHROMEBOOK (2012)



Click on product names to read full stories

**Google really impressed** us in San Francisco with its 11.6-inch, ARM-based Samsung Chromebook. The \$249 laptop is 0.8-inches (20mm) thin and weighs only 2.43 pounds (1.1kg). It features an 11.6-inch 1,366 x 768-pixel matte display, a full-size keyboard, a button-less trackpad and a 30Wh battery for 6.5+ hours of operation. Specs include a fanless dual-core A15-based Samsung Exynos 5 Dual (5250) SoC, 2GB of RAM, 16GB of built-in flash storage, 802.11a/b/g/n and Bluetooth. There's a full-size SD card reader and a standard 3.5mm headphone jack (with mic support) on the left, plus the power input, HDMI output, USB 2.0 port, USB 3.0 connector and SIM slot in back.

First impressions? This is a solid machine — build quality and materials are

fantastic for the price. It's also pleasantly thin and light, a boon for people who are used to carrying a laptop around every day. We're happy with the display, which is bright and crisp. Viewing angles could use some improvement, but you'd be hard-pressed to find a better laptop screen at this price. The keyboard and trackpad feel great and two-finger scrolling works like a charm. Performance is somewhere between the original Atom-based Chromebooks and the current Celeron-equipped Series-5 model. The system didn't have any issues playing back 1080p content in YouTube, but we didn't

get a chance try Hulu or Netflix. Factor in the Google Now integration and 100GB of free Google Drive storage for two years and this latest Chromebook is a winner.

**PRICE: \$249**

**AVAILABILITY: OCTOBER 2012**

**THE BREAKDOWN: GOOGLE OFFERS UP A REDESIGNED CHROMEBOOK WITH ARM-BASED INTERNALS AND 100GB OF GOOGLE DRIVE STORAGE.**



# APPLE 13-INCH MACBOOK PRO WITH RETINA DISPLAY



Click on product names to read full stories

**Introducing Apple's second** Retina display MacBook: the 13-inch MacBook Pro, which starts at \$1,699 and is already shipping. Just months after the 15-incher was gifted with a display that packs more pixels than your existing HDTV, the 13-inch sibling is receiving similar treatment. The intensely dense 13-inch MBP is true to the rumors — there's a 2,560 x 1,600 panel, a pair of Thunderbolt ports, a full-size HDMI socket and a MagSafe 2 power connector. Unfortunately, those yearning for a Retina-equipped MacBook Air won't find their dreams fulfilled just yet.

For starters, it's wildly thin. Outside of that, it's mostly a shrunken version of the 15-incher let loose over the summer. In our estimation, this is Apple's most deliberate move yet to differentiate the 13-inch MacBook Pro from the 13-inch MacBook Air. On one hand, power users longing for a highly portable laptop can rejoice; on the other, this could be seen as a reason for Apple to restrict the use of Retina displays to its Pro range for the foreseeable future. Compared to the 1,280 x 800 resolution of the non-Retina 13-inch MBP, the new display is particularly stunning. Text has never looked crisper, and colors are stupendously vibrant. Of course, apps, websites and graphics that haven't been optimized for Retina still look like utter rubbish, and as more Apple machines transition to these panels, the outcry is going to get even louder.



**PRICE: \$1,699+**

**AVAILABILITY: NOW AVAILABLE**

**THE BREAKDOWN: THE SMALLER MACBOOK PRO GETS A PIXEL-CRAMMED RETINA PANEL AND FEATURES SIMILAR TO THE 15-INCHER.**

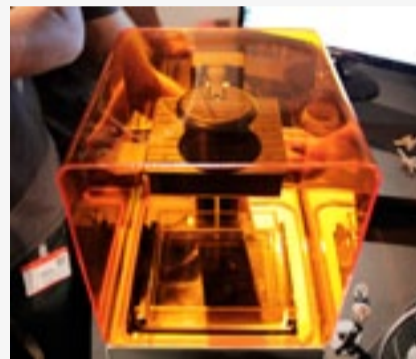




# FORMLABS FORM 1

**Last time we checked in** with the 3D printing upstarts over at Formlabs, their Kickstarter was doing splendidly, netting over 20 times its initial funding target. The outfit's FORM 1 sports some quite striking features that make it worthy of its lofty price tag. Most of the machines we've seen before look like they were imagined by, well, engineers rather than designers. Fit for purpose, and not much else. The FORM 1, however, is dif-

ferent. The orange print cabin, perched on top of the minimal-looking brushed metal base lets you visualize it sitting in the corner of any design studio, or creative environment, perfectly. But the FORM 1 isn't just razzle-dazzle, underneath that outer shell is that self-developed technique for bringing stereolithography to the masses.



For those unfamiliar with the method, stereolithography uses a special resin that solidifies under laser light. This

means it's more interesting to watch than the regular FDM printing, as every few moments a laser "show" hits the pool of resin, and another small part of the product emerges. The difference in resolution is more than just mildly noticeable. Many of the conventional, yet affordable, machines turned out great models, but often with the tell-tale lines of the incremental plastic layering. The models from the FORM 1 are much smoother, more detailed and go beyond the realm of simple prototypes and into potentially complete products.

**PRICE: \$2,699**

**AVAILABILITY: MARCH 2013**

**THE BREAKDOWN: THE FORM 1 SHOWS OFF ITS STEREOLITHOGRAPHY CHOPS IN A WELL-DESIGNED, EYE-CATCHING ENCLOSURE.**



Click on product names to read full stories





# APPLE iMAC (2012)

**Apple has unleashed** its latest iMac, and we agree that it might just be the biggest leap in the platform since we left Bondi Blue. It's hard to overstate just how phenomenal this machine looks in the flesh. It's also unbelievably thin — just 5mm at the edges. We'd be impressed if it was simply a new Cinema Display, but the fact that a computer is in there really takes it over the top. At \$1,299, you'll be hard-pressed to find a sexier all-in-one (assuming you don't need an inbuilt optical drive, of course). You can rest assured that we'll be spending a fair amount of time with this guy in the weeks ahead.

The new models are constructed with “friction stir welding” as well as a gapless, less reflective display that's

**PRICE: \$1,299+**

**AVAILABILITY: NOVEMBER 2012 (21.5-INCH)**

**THE BREAKDOWN: APPLE'S DESKTOP GETS SUPER SLIM AROUND ITS EDGES AND PACKS REFRESHED INTERNALS, TOO.**

laminated together with the glass. Screen sizes remain the same and include both a 21.5-inch, 1080p model and a 27-inch, 2,560 x 1,400 model — sorry, no Retina displays this year. Intel's Ivy Bridge Core i5 and Core i7 processors make an appearance as well as NVIDIA's GeForce 600-era graphics, up to 32GB of RAM. A panoply of storage options includes up to 3TB of spinning storage and a 768GB SSD, or what Apple calls a Fusion Drive that mixes both 128GB of flash with 1TB or 3TB of conventional storage (a hybrid drive, for those of us who've seen it before). <sup>D</sup>



Click on product names to read full stories



# The Global Connection

Last year, the UN's International Telecommunication Union (ITU) told us there were 5 billion mobile subscriptions worldwide at the close of 2010, and now it's reporting that at the end of 2011, that figure hit a staggering 6 billion. China and India account for 1 billion a piece, and it brings us ever closer to having the equivalent of one subscription for every person on the planet. (According to the CTIA, there are already more cellular plans in the US — around 322 million — than there are inhabitants.) In a stat-heavy release from the ITU, it also ranked the 10 most advanced telecoms countries, with South Korea placing first, Japan eighth and countries in Europe filling the remaining spots. — *Jamie Rigg*

## THE NUMBER OF WORLDWIDE MOBILE SUBSCRIPTIONS VS. POPULATION

2010

TAP YEAR  
FOR INFO

2011

GLOBAL POPULATION

6,940,712,355

MOBILE SUBSCRIPTIONS

6,000,000,000+

SOURCE: 2011 UN ITU REPORT (MOBILE BROADBAND NUMBERS). US CENSUS BUREAU INTERNATIONAL DATA BASE (POPULATION ESTIMATES)





## Hosain Rahman's Beautiful Failure

By Alex Konrad with Ryan Bradley  
*Fortune*

**The Jawbone Up wristband** had one of the more infamous product launches in recent years. Most reviewers (Engadget included) found the device to be an interesting and promising product, but few could actually recommend that anyone buy one at all due to its unfortunate tendency to “brick” itself and become useless. With no easy fix in sight, that prompted Jawbone to halt production and issue full refunds to anyone that bought one, even letting them keep the device after the refund if they chose. It’s now been almost a year since its release and Jawbone has yet to release a new version (one is said to be coming “soon”), but we do now at least have a more complete picture of the Up’s failure courtesy of this piece from *Fortune*. It all adds up to a pretty flattering profile of Jawbone CEO Hosain Rahman, but it’s also a fairly rare look inside a company facing a crisis that could have ended quite a bit differently.

**Google Throws Open Doors to Its Top-Secret Data Center**  
By Steven Levy

*Wired*

Google provided its own look inside its data centers last week with some rather striking photos and a video tour, but it also gave *Wired*'s Steven Levy some exclusive access for this in-depth report that examines how the company built its current infrastructure.

**Into the Cyber-Uncanny**  
By Steven Poole

*Hazlitt*

What happens as we become more linked to our gadgets than ever? Steven Poole looks at a few of the symptoms in this essay for *Hazlitt* — including phantom smartphone vibrations and stolen laptops that help their owners find them — and suggests that we’re only just seeing the beginning of what he’s dubbed the “cyber-uncanny.”

**Apple's Secret Garden: The Struggle Over Leaks and Security**  
By Jacqui Cheng

*Ars Technica*

Tim Cook famously said that Apple was “doubling-down on secrecy,” but that’s yet to stop the perpetual drip of leaks and rumors. In this report, Jacqui Cheng offers a glimpse of Apple’s secrecy efforts, and a look at where most folks are laying the blame for its current lapses in security.

**The Battle for Best Buy, the Incredible Shrinking Big Box**  
By Bryan Gruley and Jeffrey McCracken

*Bloomberg Businessweek*

Best Buy has certainly faced its share of problems lately, from a CEO scandal to financial losses, but it’s still quite the behemoth in the retail and technology industries. Here, Bryan Gruley and Jeffrey McCracken look at what went wrong for the company, and what it’s now trying to do to catch up with its more nimble competitors.



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# TABLETS AND TRADEOFFS



DISTRO  
10.26.12

FORUM

SWITCHED  
ON

BY ROSS RUBIN

**THIS WEEK SAW** the debut of two ARM-powered tablets by old rivals. One eschews traditional desktop input methods; the other embraces them. One occupies the high end of pricing in its class; the other is competitive with the market leader. One had the engineering goal of fitting in one hand; the other comes with a kickstand for being set on a desk or table. But perhaps the biggest contrast between the iPad mini and the Surface RT approaches is how well they take advantage of the hardware and software momentum of their predecessors. ¶ The essence of Microsoft's approach with Windows has been to blend the traditional with the new — Intel and ARM processors, touch-

screens and USB ports, desktop and Windows 8-style apps. Regardless of whether one believes that this is worth the tradeoff of regularly switching among two disparate environments, it provides a lot of flex-

ibility both to Microsoft's hardware partners and device users. Surface RT includes many familiar options from the Windows world — USB, a microSDXC slot and clever ways to attach a choice of two physical key-



“What the first Surface doesn’t bring forward is Windows’ traditional greatest strength, its vast software library.”

boards. Its chassis is made of durable and lightweight magnesium.

But, because it is based on Windows RT, what the first Surface doesn’t bring forward is Windows’ traditional greatest strength, its vast software library. As Switched On discussed last week, Surface RT is left to stand alone on the UI niceties of the Windows 8-style environment such as Live Tiles, Charms and its embryonic software library.

Things could not be more different for the iPad mini. Apple pounded

away at the 275,000 iPad apps that will work without modification on the (not much) smaller iPad. But that app compatibility has its share of tradeoffs. To preserve the iPad’s aspect ratio at a relatively large screen size meant Apple had to trim the side bezels, making the appearance a bit more iPhone-like than iPad-like and, at best, a snug fit for smaller hands. The iPad mini, like its newborn larger cousin, also has the new Lightning connector, for which there is just a puddle of compatible accessories compared to the sea of options that featured its 30-pin predecessor.

So in this round, the company best known for hardware leads with a software advantage for its product, and the company best known for software leads with a hardware advantage for its product. For Apple, the next key steps are to encourage support for the Lightning connector; key to that will be the trajectories of its hot-selling products such as the iPad and iPhone. For Microsoft, encouraging the development of Windows 8-style apps has a broader imperative than just propping up the Surface RT (or Windows RT in general). As the Intel-based Windows 8 begins to proliferate across a wide range of devices and developers seek to capitalize on distribution via the Windows app store, a broader mosaic of Live Tiles will lie waiting to take advantage of Surface’s attractive hardware options. **D**



# REVIEW

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10.26.12



Dell  
XPS 12



LG  
Optimus G



Microsoft  
Surface  
with  
Windows RT



DELL XPS 12



Dell's **XPS 12** puts a unique spin on the Windows 8 hybrid concept, but will that be enough to set it apart from the pack?  
**By Dana Wollman**

**A Windows 8 PC that** can be used in a tablet mode? Those will come a dime a dozen this fall. But what's fascinating is how each PC maker has approached the challenge of mixing a touchscreen with a more traditional mouse-and-keyboard setup. For some OEMs, this means going the hybrid route, with 10- or 11-inch tablets that slot neatly into an optional keyboard dock. For others, it means a full-fledged PC with a slide-out touchscreen. And for a few, it means a laptop whose screen can fold down, leaving you with what can only be described as an oversized slate.



That's how we would describe the Dell XPS 12, a 12.5-inch notebook whose screen flips inside its hinge, allowing you to use the machine in tablet mode or, if you prefer, with the screen facing away from the keys. It starts at a relatively steep \$1,200 but then again, this is a fairly premium machine we're talking about: it combines all the ingredients of an Ultrabook (lightweight build, Ivy Bridge processor and a solid-state drive) with a 400-nit, 1080p, Gorilla Glass touchscreen. So what's it like to use this unique form factor? And how does it fare as a regular ol' Windows 8 PC? Let's see.

## LOOK AND FEEL

If you thought Dell's other XPS Ultrabooks were pretty, you're going to like the XPS 12; it has the same overarching design as the XPS 13 and 14, save, of course, for that touchscreen and easel-like hinge. Once again, Dell decked the lid out in a lovely carbon fiber weave — a design flourish that lets you know this is indeed a premium system. The palm rest and bottom side, meanwhile, have a pleasing, soft-touch finish that does a good job of repelling scratches and fingerprints. Underneath that soft, touchable

layer is a magnesium alloy frame, which makes the entire machine feel rigid — you won't notice any bending or flexing as you type on the keyboard or hold the PC in one hand.

Dell also makes use of some tasteful metal accents, including a band of aluminum around the keyboard deck. As with the other XPS Ultrabooks, there's even a metal door on the bottom side, hiding the Windows product key and any FCC certifications. The frame housing the display is also made of metal and feels reassuringly sturdy. What's more, the display snaps in and out of position with a comforting clicking sound, which should also inspire confidence in the build quality. To push the display out, you'll need to nudge it from either side, using your fingers. Presumably you don't mind fingerprints, otherwise you wouldn't be considering a touchscreen PC

Tasteful aluminum accents span the edges of the XPS 12.



in the first place.

At 3.35 pounds, this feels heavy for a 12.5-inch laptop — a common tradeoff with touchscreen machines. When it comes to carrying the machine around in your bag or around the house, that weight won't be an issue, though we did find that it's inconvenient to use in tablet mode for long stretches — it's just too large and unwieldy. If you do use it as a tablet, you might appreciate it most when you're hanging out on the couch, and can rest the device against your legs. Ultimately, we'd say we were more likely to use the touchscreen in clamshell mode — touching Live Tiles and other finger-friendly elements instead of using the trackpad.

Given all this, you might wonder why a complicated hinge design like this is even necessary. And yet, we can think of at least one benefit. Unlike, say, the Lenovo IdeaPad Yoga, the XPS 12 doesn't leave the keys exposed while you're in tablet mode. That means if you're cradling it like a slate, you won't feel the keys against your fingers on the back side. (If you do choose the Yoga instead, there's an optional sleeve that covers the keyboard portion of the laptop, though this seems

like a less elegant solution.)

Poke around the edges and you'll find a modest collection of ports: two USB 3.0 sockets (one with support for PowerShare and Windows debugging), a Mini DisplayPort, a 3.5mm headphone jack and dual speakers — one on each side. There's a volume rocker for when you're using this thing as a tablet, though there are also dedicated volume and mute keys on the keyboard. Unfortunately, Dell omitted an SD card reader, as it did on the XPS 13. It's not that we would have wanted to augment the system's storage; it just would have been nice to offload photos and video from a memory card.

## KEYBOARD AND TRACKPAD

As you'd expect, the keyboard, too, is basically the same as on the XPS 13, just a touch smaller. Even in this slightly more cramped chassis, the keys are



The keyboard is surprisingly spacious for its size.



still well-spaced and easy to find by feel. Like we've been saying all along, the buttons have a spring-loaded feel, giving plenty of tactile feedback. Particularly compared to other ultraportables, most of which have shallow, lifeless keys, these are a pleasure to type on. Also worth a mention: the keyboard has a backlight underneath, which you can turn on and off using the F5 button.

The XPS 12's Cypress trackpad has something of a split personality: smooth and reliable in the Modern UI, stubborn and mercurial in the traditional desktop. We had no problem using two fingers to scroll horizontally through our Live Tiles. The touchpad supports other Windows 8 gestures, too, like swiping in from the right side of the pad to expose the Charm Bar, or swiping from the left to toggle between apps. The pad excels at all of these things; these maneuvers are intuitive and easy to replicate.

Where we ran into trouble was with simple cursor navigation, of all things. While using desktop apps like Explorer, we found that it sometimes took multiple tries to get the cursor to go exactly where we wanted it to. Other times, the cursor would stop short on the screen before we got to whatever it was we were trying to click. Even in the Modern UI, single-finger navigation could feel a bit belabored. On the plus side, the trackpad's built-in touch button is easy to press, and thankfully doesn't do that thing where it mistakes left clicks for right ones — something

we frequently complain about when we test buttonless touchpads. In any case, a Dell rep told us the company is still fine-tuning its drivers, so perhaps these kinks will soon be a moot point.

## DISPLAY AND SOUND

Even on larger 14- and 15-inch machines, we're used to screens with 1,366 x 768 resolution, so it's always a surprise when we see small systems like the XPS 12 or Zenbook Prime UX21A, which cram 1,920 x 1,080 pixels into an 11- or 12-inch panel. In the case of the XPS 12's 12.5-inch screen, that 1080p resolution translates to a density of 176 pixels per inch (compared with 118 ppi on the XPS 13). As you'd expect, it's quite crisp in person. We'd be lying if we said we could notice that big of a difference when watching certain movies on Netflix, but with content that was natively shot in 1080p, it's golden. Those extra pixels also make a difference in desktop apps, where everything looks just a little tighter, and



The trackpad executed the Windows 8 gestures quite well.



items on screen look noticeably smaller. Additionally, that 400-nit brightness level means you probably won't lack for suitable viewing angles. Even with the brightness at a median level, you should enjoy good vertical viewing angles while resting the machine on your lap. This bodes well for plane travel, or any kind of on-the-go conditions, really.

Thanks to the Gorilla Glass coating, too, it should also be durable enough to use in tablet mode. As a touchscreen, too, it responds quickly to swipes and pinch-to-zoom, while certain Windows 8 apps like Photos and IE 10 do a good job of quickly resizing content. Our only caveat would be that the screen brightness is clearly a drain on battery life; with a 400-nit rating, it's about on par with other laptops, even when the dimmer's at a moderate setting.

Like so many other ultraportable laptops, the XPS 12 has some real limitations in the audio department. The only surprise is how loud this thing gets, and how minimal the distortion is at top volume. Otherwise, this is a story you've heard before: bass notes tend to get drowned out, so much so that you might find yourself boosting the volume to compensate. On the plus side, things like piano and acoustic guitar sound quite pleasant.

## PERFORMANCE AND BATTERY LIFE

We're at a point where PCs are really, really fast; it's not uncommon for an Ultrabook with 4GB of RAM and a solid-state drive to boot up in less than 20 seconds.

That said, we still did a double-take when we logged the XPS 12's start-up time. It takes just 12 seconds to reach the log-in screen, and another two to load the Start Menu after you've entered your credentials. Its Samsung-made SSD shows promise too: in the disk benchmark ATTO it reached top read speeds of 516 MB/s, putting it in the same league as our favorite ultraportables, including the 13-inch MacBook Air and the 13-inch Samsung Series 9. Write speeds were strong, too, topping out at 263 MB/s. In real-world use, this performance allowed us to switch between apps with ease, and not have to keep track of how many programs we had running at a given time. As for graphics, it managed 4,520 in 3DMark06, which is on par with, or slightly better than, other Ivy Bridge Ultrabooks we've tested.

In PCMark 7, the XPS 12 notched a score of 4,673, but we admittedly can't make much of that score right now, as we only recently started transitioning from PCMark Vantage to PCMark 7 (only the latter runs on Windows 8 — hence, the switch in test-



The XPS 12 has two USB 3.0 ports and a Mini DisplayPort.





BATTERY LIFE	
DELL XPS 12	5:30
SAMSUNG SERIES 9 (15-INCH, 2012)	7:29
LENOVO THINKPAD X230	7:19
SAMSUNG SERIES 9 (13-INCH, 2012)	7:02
MACBOOK AIR (13-INCH, 2012)	6:34 (OSX) / 4:28 (WINDOWS)
DELL XPS 14	6:18
HP FOLIO 13	6:08
HP ENVY SLEEKBOOK 6Z	5:51
TOSHIBA PORTEGE Z835	5:49
SONY VAIO T13	5:39
MACBOOK AIR (13-INCH, 2011)	5:32 (OSX) / 4:12 (WINDOWS)
HP ENVY 14 SPECTRE	5:30
TOSHIBA SATELLITE U845W	5:13
TOSHIBA SATELLITE U845	5:12
ACER ASPIRE TIMELINE ULTRA M3	5:11
LENOVO THINKPAD X1 CARBON	5:07
SAMSUNG SERIES 5 ULTRABOOK (14-INCH, 2012)	5:06
ACER ASPIRE TIMELINE ULTRA M5	5:05
DELL XPS 13	4:58
LENOVO IDEAPAD U310	4:57
ACER ASPIRE S5	4:35

ing methodology). As we review more Windows 8 systems using PCMark 7 as a general performance benchmark, it'll be easier for us to put such scores in context.

After running our standard battery test numerous times, five and a half hours was the longest the XPS 12 could muster. As you can see, that's not particularly impressive, given that other Ultrabooks can manage six hours or better. Interestingly, though, it's in line with the Toshiba Satellite U925t, another 12.5-inch touchscreen Ultrabook. We're still in the process of testing that one, but preliminarily we're finding it lasts even less time on a charge: about five hours and 10 minutes.

## SOFTWARE

It would be wrong to say that Windows 8 spells the end of crapware, but if there *is* any unwanted software on your new system, it's at least likely to be more discreet. In general with Win 8 systems, you won't find random shortcuts littering the desktop when you first boot up the machine, and PC makers also seem to have abandoned their efforts to customize Windows with add-ons like Dell Dock and VAIO Gate. On the Start Menu, OEMs are given a specific place where they're allowed to place their own apps. In the case of the Dell XPS 12, that cluster of pre-installed programs is relatively small. On tap, you've got Amazon's Kindle app, Skype, Photo Gallery, Movie Maker, Microsoft Office, Dell Shop, Dell Sup-



port Center and Amazon Store (not a browser link, but a bona fide app.) All told, this stuff takes up little more than a column on the Start Menu, which seems reasonable.

## CONFIGURATION OPTIONS AND THE COMPETITION

Our entry-level \$1,200 model comes with a 1.7GHz Core i5-3317U processor, 4GB of RAM and a 128GB SSD. For \$1,400, you can get essentially the same configuration, but with eight gigs of RAM. For an extra hundred bucks (we're at \$1,500 now), you get that Core i5 processor, 8GB of memory and a 256GB SSD. Last up, the cream of the crop: a \$1,700 unit with all the above specs, but with a Core i7-3517U processor. Regardless of which configuration you choose, Intel HD 4000 graphics are standard, as is that 1080p, 400-nit, Gorilla Glass display.

For the purposes of whittling down

## The XPS 12 is a compelling option if you're in the market for a high-end, touch-enabled Ultrabook.

a potentially long list of Windows 8 options, we're going to assume that if you're considering the XPS 12, that means you like the idea of a powerful, full-fledged laptop that can also be used in tablet mode from time to time. If you don't mind, we'll just skip over most of those laptop / tablet hybrids we mentioned, as most of them run on Atom processors — get one of those and you'll have to adjust your expectations in terms of performance (the battery life on those will be longer, at least).

As we mentioned earlier, one of the XPS 12's closest competitors is the 13-inch Lenovo IdeaPad Yoga, whose screen folds all the way back so that if you're using it in tablet mode, the keyboard remains exposed on the back side. We already mentioned that the exposed keys



The carbon fiber weave gives the XPS 12 a premium look and feel.





The display clicks out of the frame and flips to tablet mode.

seem like a potential inconvenience, but you can remedy that using an optional sleeve. The Yoga also has a slightly less dense screen: though it's larger, it also has a slightly lower resolution (1,600 x 900 vs. 1080p). Still, it weighs about the same as the XPS 12, despite having a larger footprint, and it also claims longer battery life. (We've yet to test it ourselves.) The Yoga also offers some

things the XPS 12 doesn't — namely, an HDMI port and memory card reader. Another plus: it starts at \$1,100 — a hundred bucks less than Dell's offering. If you do consider the Yoga, keep in mind that the 11-inch Yoga is a very different beast: it has an ARM processor and runs Windows RT, which does not support legacy Windows apps.

We're also excited about the Toshiba Satellite U925t, another 12.5-inch UI-



trabook, this one with a slider form factor. Though we've yet to put it through a full review, we've had some hands-on time with the device, and came away impressed with its generous keyboard layout and IPS touchscreen. That starts at \$1,150, putting it in roughly the same ballpark as the XPS 12 being reviewed here.

If we've convinced you that a 12-inch laptop with a touchscreen isn't very comfortable to use as a tablet substitute, perhaps you'd be happier with a traditional clamshell laptop that has a touchscreen. (After all, the XPS 12 is a pleasure to use in that mode.) Though we haven't yet had a chance to review any of the following options, we'll at least toss them out for your consideration. Some notable contenders: the Acer Aspire S7 Ultrabook (\$1,200 and up), the Samsung Series 5 Ultra Touch (\$799 and up), the ASUS Zenbook Prime with touch (price TBA) and the Sony VAIO T13 with an optional touchscreen (\$770+).

## WRAP-UP

Though the XPS 12's size and weight make it a bit unwieldy as a substitute tablet, it's still a compelling option if you're in the market for a high-end, touch-enabled Ultrabook. The XPS 12 is almost as light as other Ultrabooks, with a premium industrial design, comfortable keyboard, gorgeous 1080p screen and a super-fast boot-up time. The biggest drawbacks seem to be the flaky trackpad and the relatively short battery life, which doesn't improve much when you dim that 400-nit display. We'll be curious to see how other touchscreen Ultrabooks fare, particularly those with similarly versatile designs. In the meantime, though, the XPS 12 represents a solid start for this new wave of Windows 8 shape-shifters. **D**

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*Dana Wollman is Reviews Editor at Engadget, a marathoner, lover of puns and a native Brooklynite.*

## BOTTOMLINE

### DELL XPS 12

# \$1,200+



### PROS

- Lovely design, solid build quality
- 400-nit, 1080p display
- 12-second boot-up
- Comfortable keyboard

### CONS

- Finicky trackpad
- Relatively short battery life
- No SD slot

### BOTTOMLINE

Even if you never use it in tablet mode, this 12.5-inch convertible is a solid Ultrabook in its own right.



## LG OPTIMUS G



LG's powerful new **Optimus G** is looking to take a spot among the smartphone elite, but will carrier customization keep it from its goal?  
**By Myriam Joire**

**You've heard it before:** the more things change the more they stay the same. It wasn't that long ago that we reviewed LG's flagship Optimus 4X HD, the world's first quad-core HSPA+ handset. Despite representing the company's best engineering and design effort to date, it wasn't quite able to match the competition's global offerings — Samsung's mighty Galaxy S III and HTC's lovely One X. Today, just a few months later, quad-core LTE superphones are the state of the art. Samsung's selling the global Galaxy Note II, HTC's just announced the One X+



and LG's betting everything on the Optimus G — the first handset to feature Qualcomm's Snapdragon S4 Pro together with an LTE radio.

The Optimus G is a pivotal device for the Korean manufacturer, especially in the US, where rival Samsung is massively popular and LG's success has been hampered by a series of forgettable products (hello, Intuition) and a lackluster track record for software updates. It's so critical that LG even invited us to spend some quality time with the Optimus G at the launch event in Seoul last month. In the US, LG's partnering with Sprint and AT&T and there's strong evidence that Google's upcoming Nexus will be based on the Optimus G. So, does the company's latest powerhouse measure up to the competition? How different are the US versions from the Korean model? Does LG finally have a winning formula with the Optimus G?

## HARDWARE

LG provided us with three Optimus G review units: an unlocked white handset with the 13-megapixel camera for Korea's Olleh LTE network, Sprint's almost identical black version and AT&T's bespoke model with the 8-megapixel shooter. Unlike Samsung's curved, pebble-like, "inspired by nature" theme, the Optimus G inherits LG's chiseled, angular, slab-like design

language. The details are more subtle than with the Optimus 4X HD — it's more of a simple and elegant tribute to past Chocolate and Prada phones. While Sprint's version shares the same appearance and dimensions as the Korean model (the reference, if you will), AT&T's handset is 2.8mm (0.11 inches) wider and 1mm (0.04 inches) shorter. Thickness is uniform at 8.45mm (0.33 inches) and weight varies between 145g (5.11oz) and 147g (5.19oz). Regardless of which Optimus G you handle, build quality is superb — it's like holding on to a solid block of technology. AT&T's phone feels slightly too wide, but

The Optimus G is a solid slab-like chunk of technology.

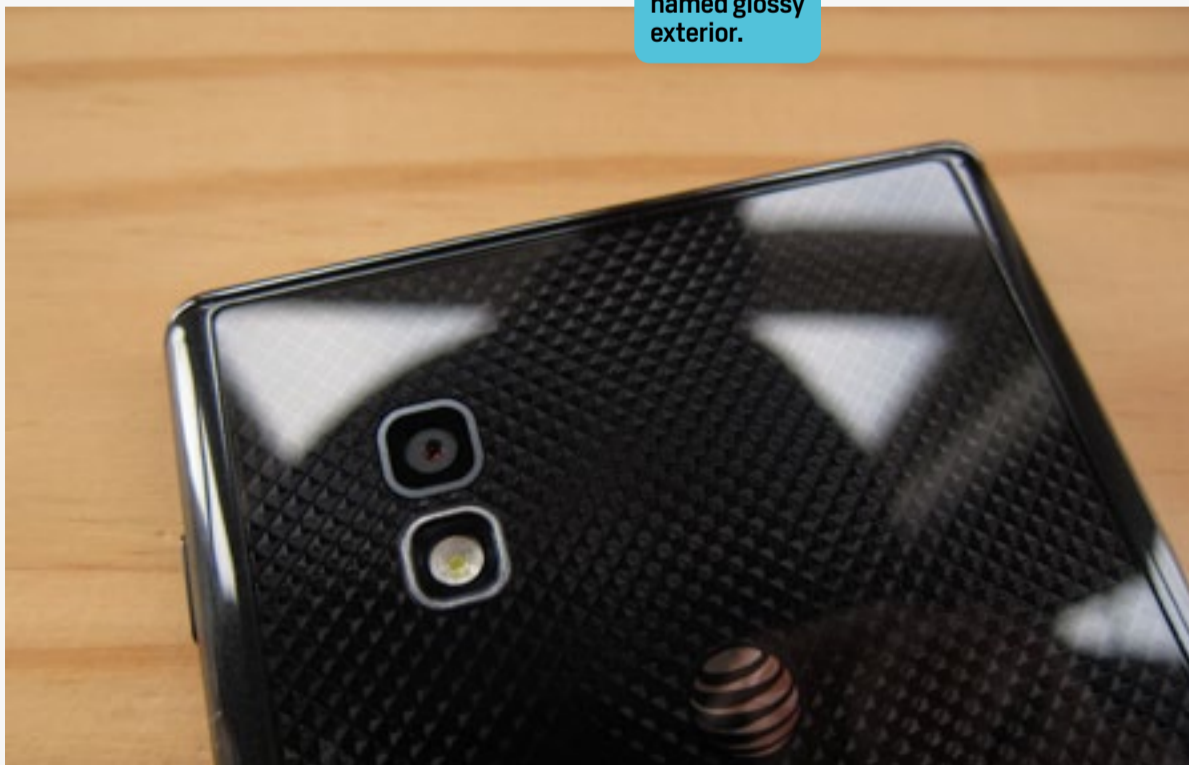


## Regardless of which Optimus G you handle, build quality is superb — it's like holding on to a solid block of technology.

the other two are extremely comfortable in hand, thanks to subtly curved edges where the sides meet the back.

In front, all three devices feature a beautiful 4.7-inch True HD IPS PLUS panel fitted under an edge-to-edge sheet of Gorilla Glass 2. The earpiece is flanked by sensors on the left and a 1.3-megapixel camera on the right. The Sprint and Korean versions also include an RGB notification light next to the earpiece (it's been relocated to the power / lock key on AT&T's model).

"Crystal Reflection," the aptly named glossy exterior.



You'll find three capacitive buttons below the screen (Back, Home and Menu) which are only visible when backlit. Interestingly, the bezel surrounding the display is black even on the white Korean model. There's no branding in front other than LG's silver logo up top and centered. Around the back, the Optimus G is covered by another sheet of what appears to be glass incorporating a pattern that's only visible at certain angles. This glossy finish, which LG calls "Crystal Reflection," is a veritable fingerprint magnet, especially on the black versions (Sprint and AT&T). It's interrupted only by the camera lens above the single LED flash in the top-left and a vertical slit hiding the mono speaker in the bottom-right. LG's silver logo returns along with carrier branding, except on Sprint's unit which is pleasantly free of network labels. There's no way to remove the back cover — the Optimus G's sealed 2,100mAh Li-polymer battery is rated for 800 charge cycles.

The most obvious difference between the three handsets is also our biggest design gripe. The Optimus G is available with either a choice of 8-megapixel or 13-megapixel shooters. Sprint follows the same recipe as



the Korean model with the 13-megapixel camera sensor mounted in a protruding square pod and the LED flash embedded in the back. On AT&T's version, it's the reverse: the 8-megapixel module is located under the glass surface and the LED flash is recessed in its own divot. This inconsistency is annoying — it makes AT&T's phone less visually appealing than the other two. We understand that the eight and 13-megapixel modules have different thicknesses, but LG could have used a similar square pod to house both cameras and simplified its assembly process while maintaining a cohesive design across models.

Each device sports identical controls and ports: a standard 3.5mm headphone jack and secondary microphone on top; the power / lock key on the right; a micro-USB / MHL connector, primary microphone and two screws at the bottom; and the volume rocker on the left. While Sprint's Optimus G is devoid of any extra openings, the Korean version includes a micro-SIM tray on the left side below the volume rocker and AT&T's model puts a flap in the same location covering both micro-SIM and microSD card slots. Our Korean unit also rocks a retractable T-DMB antenna in the top-left corner for that extra bit of street cred. Beyond the wider body and lower resolution camera, AT&T's handset deviates further with a completely different edge design. Where the Sprint and Korean versions have mostly flat sides with two handsome silver rings — one along the edge of

the front glass and the other a quarter of the way down the side — AT&T's model features curved edges with a dark chrome finish on the left and right along with textured flat sides at the top and bottom. As mentioned above, the notification light on AT&T's Optimus G is located around the power / lock key (instead of living next to the earpiece in front).

By now you're probably wondering how that 4.7-inch True HD IPS PLUS panel stacks up to the competition. LG's Zerogap Touch technology puts the capacitive layer right inside the non-PenTile, 1,280 x 768-pixel screen for an ultra-thin design. It's definitely a top-notch display — bright and crisp, with deep blacks and rich colors. Still, it falls short of HTC's gorgeous Super LCD 2 panel on the One X, which offers better viewing angles and remains the best screen on any phone we've ever used. Our Korean unit also suffers from a yellow discoloration at the bottom of the display — it's mostly noticeable with a white background and we've alerted LG to the issue, which is likely the result of an early batch of defective panels. The Sprint and AT&T devices are flawless.

Under the hood is where the Optimus

**This inconsistency is annoying — it makes AT&T's phone less visually appealing than the other two.**





G really shines. Reading the specs will put a smile on the face of even the most jaded tech journalist. It's the first handset built around Qualcomm's Fusion 3 chipset, which pairs a 1.5GHz quad-core Snapdragon S4 Pro SoC (APQ8064) with a 2G / 3G / LTE radio (MDM9615). Beyond the quad-core Krait CPU and Adreno 320 GPU, you'll find 2GB of DDR RAM and 32GB of built-in flash storage on board (reduced to 16GB on AT&T's unit, which also supports microSD and ships with a 16GB card). In terms of radios, the Korean version is quad-band GSM / GPRS (no EDGE), dual-band UMTS / HSPA+ (2100 / 900MHz) and LTE capable (Band 3, possibly 1 and 5). The Sprint model works on the carrier's CDMA and LTE technology in the US but should be able to roam on GSM / GPRS / EDGE (quad-band) and UMTS / HSPA+ (dual-band 2100 / 900MHz) networks abroad. AT&T's phone supports quad-band GSM / GPRS / EDGE, tri-band UMTS / HSPA+ (2100 / 1900 / 850MHz) and LTE (Bands 4 and 17). Other specs include 802.11a/b/g/n, Bluetooth 4.0 + LE, A-GPS, NFC and a bevy of sensors (ambient light, proximity, magnetometer, accelerometer and orientation).

**It's definitely a top-notch display — bright and crisp, with deep blacks and rich colors.**

## PERFORMANCE AND BATTERY LIFE

Let's make one thing perfectly clear: the Optimus G is a performance beast. Subjectively, it never skips a beat — everything is snappy and fluid, with no lag or delays. Despite launching with Ice Cream Sandwich (Android 4.0.4, to be exact), it feels quicker than our Galaxy Nexus and on par with our Galaxy Note II, both running Jelly Bean. This is a testament to LG's UI optimizations, Qualcomm's engineering chops or both. In our benchmarks, the Optimus G slots right between our reigning champions — the global Galaxy S III (ICS) and the Galaxy Note II (Jelly Bean) — for most tests, while handily beating both with the best Quadrant score we've ever recorded for a handset (7,628) and barely lagging behind in AnTuTu (11,284). The results are similar across all three versions, with the Sprint model falling a smidgen behind the other two. It will be interesting to see how much these numbers improve once the Optimus G is updated to Android 4.1.

We didn't have any issues with overall radio performance but calls sounded a little flat in our tests. AT&T's handset was the clearest, followed closely by Sprint's, with the Korean Optimus G (likely not optimized for US networks) trailing behind. The built-in speaker is somewhat tinny but loud enough. We didn't have much time to compare music playback with other phones, but audio quality with various headphones and earbuds was up to our higher-than-



BENCHMARK	OPTIMUS G (KOREAN MODEL)	OPTIMUS G (SPRINT MODEL)	OPTIMUS G (AT&T MODEL)
QUADRANT ADVANCED	<b>7,628</b>	7,593	7,531
VELLAMO 1	2,116	2,078	<b>2,143</b>
ANTUTU	11,230	11,236	<b>11,284</b>
SUNSPIDER 0.9.1 (MS)	1,312	1,358	<b>1,283</b>
CF-BENCH	<b>14,398</b>	14,322	14,372
BATTERY LIFE	8:40	7:53	<b>8:43</b>

SUNSPIDER: LOWER SCORES ARE BETTER

average standards. It's worth mentioning that LG's bundled music and video players feature Dolby Mobile, if you're into audio enhancement. Speed tests on AT&T's LTE network in San Francisco yielded about 12 Mbps down and 10 Mbps up (on average) with four out of five bars of signal. Until Sprint deploys LTE in the Bay Area we're stuck doing speed tests on CDMA, which means peaks of 2.3 Mbps down and 1 Mbps up with full signal. Our Korean unit only supports GPRS data here in the US, but we saw some impressive numbers with a prototype Optimus G on Korea's U+ LTE network while in Seoul.

Battery life on Qualcomm's dual-core

Let's make one thing perfectly clear: the Optimus G is a performance beast.

Snapdragon S4 devices is usually fantastic, and we're happy to report this trend continues with the quad-core Snapdragon S4 Pro-equipped Optimus G. While all three versions have the same sealed 2,100mAh Li-polymer battery, we focused our attention on AT&T's model since it's the only one with an active LTE connection. Our standard battery rundown test involves setting the brightness and volume to half, using 4G in a 75 percent or better signal area, enabling GPS and WiFi (not connected) and disabling Bluetooth while looping a video from a full charge until the battery is drained. AT&T's Optimus G ran for eight hours and 43 minutes; Sprint's lasted seven hours and 53 minutes on 3G (LTE off); and our Korean phone kept going for eight hours and 40 minutes on 2G (LTE and HSPA+ disabled). In our moderate battery usage test, which consists of using a handset lightly from a full charge until it shuts down — emailing, texting, checking social networks, making a few brief calls, tak-



BENCHMARK	OPTIMUS G (ALL MODELS)	GALAXY NOTE II	GLOBAL GALAXY S III	GLOBAL HTC ONE X
QUADRANT ADVANCED	<b>7,628</b>	6,819	5,189	4,906
VELLAMO1	2,143	<b>2,482</b>	1,751	1,617
VELLAMO2 HTML 5	1,710	<b>1,831</b>	1,565	1,364
ANTUTU	11,284	<b>13,539</b>	11,960	11,030
SUNSPIDER 0.9.1 (MS)	1,283	<b>1,023</b>	1,460	1,773
GLBENCHMARK 2.5 EGYPT HD C24Z16 OFFSCREEN (FPS)	<b>31</b>	17	15	7.5
CF-BENCH	14,398	<b>15,267</b>	13,110	13,233
BATTERY LIFE	8:43	<b>10:45</b>	9:02	6:00

SUNSPIDER: LOWER SCORES ARE BETTER

ing some pictures, etc. — all three review units went on for almost 20 hours. As such, we're pretty sure most people will have no problems using the Optimus G for an entire day. Heavy users can use "Eco Mode," a setting which extends battery life by dynamically switching between quad- and dual-core operation.

## CAMERA

This is really a tale of two different cameras with identical functionality — the story of promising shooters held back by a frustrating user experience. Both the Sprint and Korean versions of the Optimus G use a 13-megapixel, 1/3.2-inch BSI sensor with 1.1µm pixels and a five-element, f/2.4 autofocus lens. AT&T's model sports an 8-megapixel BSI sensor with identical 1.1µm

pixels, but it's unclear if the autofocus lens is the same (the 13-megapixel module captures a wider field of view). Both cameras are capable of recording video at 1080p and are complemented by a single LED flash. The user interface is similar on all three phones — it's intuitive, customizable and offers a full range of settings. You'll find HDR, panorama and burst modes, plus features like "Time Catch Shot" (which buffers pictures in the background and stores

**This is the story of promising shooters held back by a frustrating user experience.**





five images centered around the time when you press the shutter button) and “Cheese Shutter” (which takes a shot when you say the word “cheese” or “whiskey”).

What makes both shooters problematic for casual users and photography buffs alike is the way the autofocus is implemented. It’s continuous, but unlike competing systems, it re-triggers too often. There’s no way to sidestep this — no dedicated two-stage camera key, no ability to lock focus and exposure by tapping and holding the on-screen shutter button then releasing it to snap a picture. While touch-to-focus

AT&T's  
8MP shots  
compared  
with Sprint's  
13MP images.

is available, it only locks focus and exposure momentarily before resuming continuous autofocus, which only gives you a brief window of opportunity to take that special shot. Other recent LG handsets like the Optimus 4X HD, Intuition and Escape suffer from the same problem, so hopefully the company is paying attention. It’s an easy fix — just add a setting to disable continuous autofocus.

Now that we have that out of the way, how do these cameras fare? We’re pretty satisfied with the resulting pictures, actually. Both shooters do a reasonably good job with white balance



and exposure. We prefer the softer, more natural colors captured by the 13-megapixel camera — the 8-megapixel sensor tends to produce overly warm and saturated colors. Low-light performance is generally excellent, but here again, the 13-megapixel shooter comes out ahead, with less visible noise. The 8-megapixel lens flares up a bit when shooting into bright light. Video recording is decent, if perhaps somewhat over-sharpened — the Optimus G captures 1080p HD video at 30fps (10.5 Mbps bitrate) with continuous autofocus and mono audio. Overall, the 13-megapixel camera gathers tons of detail and edges out the One X and Galaxy S III. The 8-megapixel module slots right below the competition.

## SOFTWARE

All three phones are running the manufacturer's now-familiar UI 3.0 skin on top of Android 4.0.4 (Ice Cream Sandwich). While it's somewhat disappointing that LG is launching the Optimus G without Jelly Bean, we're told this will be remedied soon. Of course, everyone knows the company's track record with software updates has been less than stellar. We shared our concerns with several executives during our recent trip to Seoul, who assured us that LG is aware of this and is committed to providing timely upgrades for the Optimus G. In other words, stay tuned. Unlike the handset's refined industrial design, UI 3.0 still looks dated and boring, like

UI 3.0 still looks dated and boring, like an nth-generation copy of Samsung's cartoonish TouchWiz interface.

an nth-generation copy of Samsung's cartoonish TouchWiz interface. It's probably not going to offend anyone, but it's not particularly compelling either. At least it's lightweight, with little (if any) impact on performance.

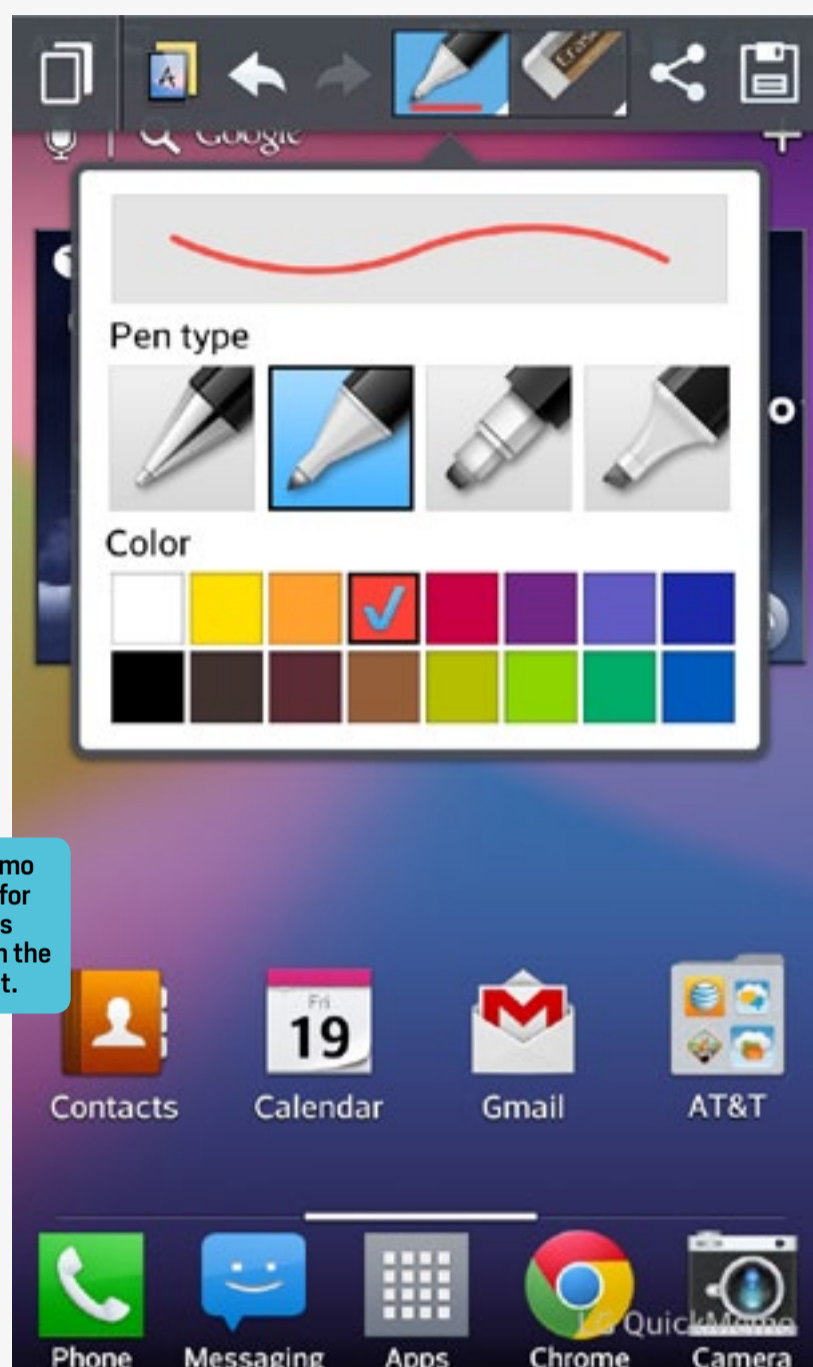
We've detailed UI 3.0 in other reviews before (Optimus L7, Optimus 4X HD and Intuition) but some of the existing features stand out. We're rather fond of the quick settings menu, a scrollable (and customizable) bar of icons at the top of the notification tray which provides shortcuts for various settings. Strangely, the hotspot quick settings icon is missing on AT&T's version (like on the LG Escape, it turns out). Perhaps it's an attempt by the carrier to discourage tethering? The app tray includes some welcome additions like folders and the ability to sort icons alphabetically or by installation date. "Icon Personalizer" lets you swap icons for any home screen app. "Quiet time" works like Apple's "Do Not Disturb" by defining times when notifications are muted. You'll also find a few Optimus G-specific tricks. "Wise Screen"



is similar to Samsung's "Smart Stay" and prevents the phone from going to sleep when you're looking at the display. "Dual Screen Dual Play" lets you play back content on an external monitor connected via MHL or LG's Miracast dongle while you're performing other tasks on the device. "Live Zooming" enables pinch-to-zoom during video playback (up to 5x). Last but not least, "QSlide" overlays videos in a transparent window that floats over whatever app you're currently running — it's really quite slick.

The Optimus G comes with a bunch of pre-installed LG apps. Each model features a slightly different bundle, and while apps like SmartWorld (LG's app store) are self-explanatory, others are worth a closer look. QuickMemo is a lot like Samsung's S Memo — it lets you annotate what's on the screen and save the result as an image. The app is invoked by pressing both volume keys simultaneously or by touching on the appropriate quick settings icon. LG Tag+ (called Olleh NFC on our Korean unit) is used to program the supplied NFC tags and set up profiles which are then activated by tapping the handset on the appropriate tag. Video Editor (oddly missing from AT&T's phone) and Video Wiz are, unsurprisingly, video editing apps, the former being similar to Apple's iMovie and the latter providing a quick way to create music videos by combining content from your music library with your

QuickMemo settings for the stylus shown on the AT&T unit.



own video clips. All three devices also include Polaris Office 4.0.

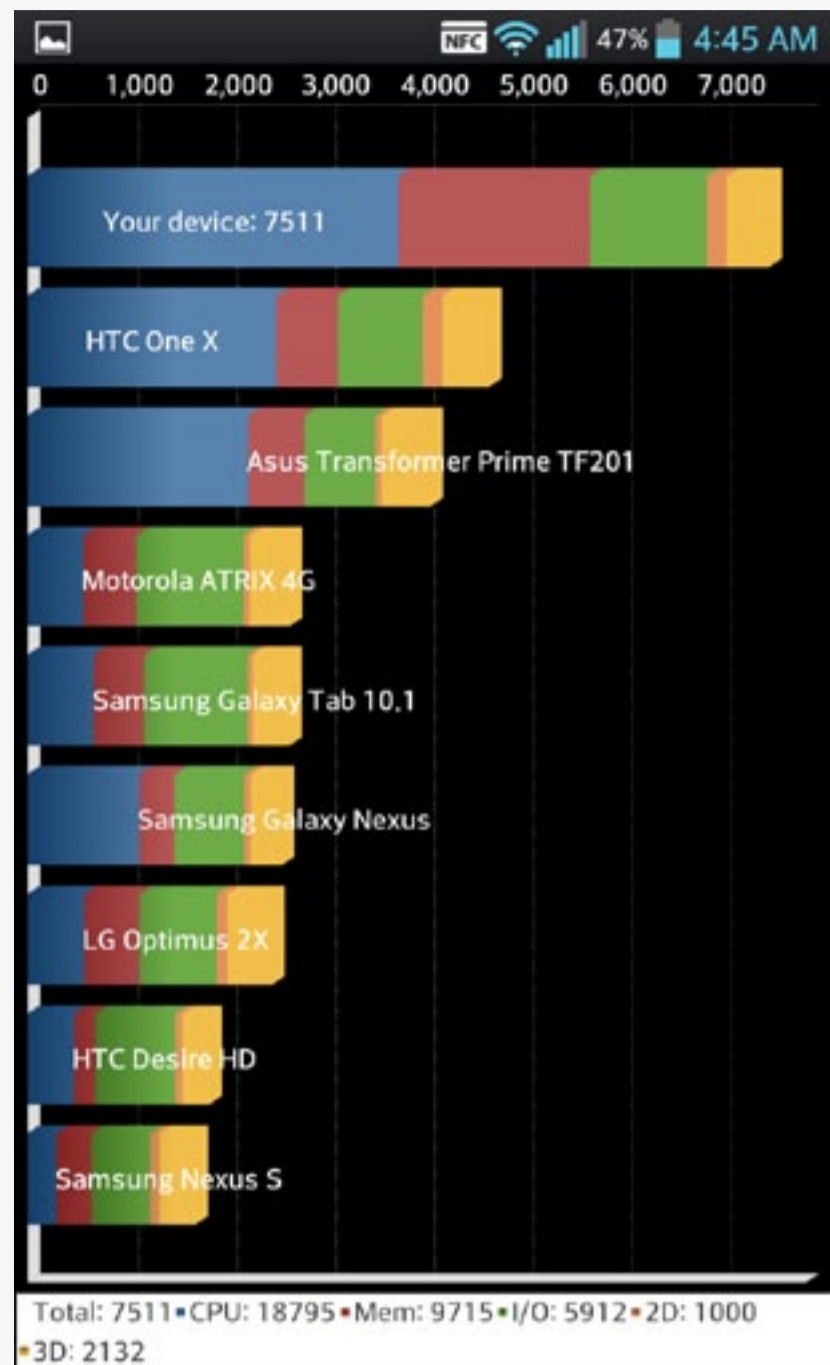
Kudos to Sprint for keeping clutter to a minimum and bundling just two apps: Sprint ID and Sprint Zone. By contrast, AT&T makes a mess of the Optimus G by pre-loading 11 mostly

**Kudos to Sprint for keeping clutter to a minimum and bundling just two apps.**





The Korean handset's version of the LG Tag+ application.



useless apps that cannot be uninstalled: Amazon Kindle (useful, but readily available in the Play Store), AT&T Code Scanner, AT&T FamilyMap, AT&T Locker, AT&T Navigator, AT&T Ready2Go, AT&T Smart Wi-Fi, Device Help, Live TV, myAT&T and YPmobile. Adding insult to injury, AT&T chose to further customize LG's UI 3.0. The settings have been regrouped into tabs instead of using Android's standard sectioned list, the Gallery sorting order is set to descending by default (why?) and the default browser is contaminated with

an utterly meaningless "browser bar" (which is thankfully defeatable).

## WRAP-UP

The Optimus G is a phenomenal piece of hardware that combines refined design, superb build quality and specs to die for. Qualcomm's quad-core Snapdragon S4 Pro provides gobs of performance without sacrificing battery life. While LG's 4.7-inch True HD IPS PLUS panel is beautiful, it still ranks behind HTC's gorgeous Super LCD 2 display on the One X. Despite that pesky continuous autofocus,





The LG Optimus G compared with the rival Note II.

both 13- and 8-megapixel cameras are capable of capturing top-notch photos and videos. Where the Optimus G falls short is in the software department — LG’s UI 3.0 skin is mediocre and Ice Cream Sandwich is somewhat disappointing on such a great handset. Apparently, there’s an Optimus G-based Nexus phone running Jelly Bean in the works — problem solved, then.

The question remains: should you plunk down \$200 (on contract) for

Sprint’s Optimus G when it goes on sale November 11th or AT&T’s version when it hits the shelves on November 2nd? We prefer the simple and elegant design of the Sprint and Korean models — not to mention the marginally better 13-megapixel shooter. Sprint’s device is held back by poor LTE coverage and an embedded SIM. AT&T’s unit suffers from excessive carrier tweaks (both hardware and software) and a slightly lower-grade 8-megapixel camera, but benefits from a mature LTE network and expandable storage. With AT&T about to offer HTC’s One X+ and Samsung’s Galaxy Note II, it’s a tough call. So, did we mention that upcoming Nexus? **D**

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*Myriam was born wearing combat boots and holding a keyboard; moments later she picked up a soldering iron. She’s been stomping, typing and hacking ever since.*

**BOTTOMLINE**

**LG OPTIMUS G (KOREA)**

**\$700**  
(ESTIMATED)

**SPRINT / AT&T**

**\$200**  
(ON CONTRACT)

**PROS**

- Refined, elegant design
- Superb build quality
- Phenomenal performance
- Great battery life

**CONS**

- Jelly Bean missing at launch
- Frustrating camera software

**BOTTOMLINE**

The Optimus G is a phenomenal piece of hardware that combines refined design with superb build quality and provides gobs of performance without sacrificing battery life.





## MICROSOFT SURFACE WITH WINDOWS RT



Microsoft gets down to business with the **Surface RT**, but will its app ghost town be a buzzkill?  
**By Tim Stevens**

**W**hen Microsoft unveiled its Surface tablets with a flashy, top secret Los Angeles event, it didn't just mark the beginning of a new (and utterly critical) phase for the history of the company. It marked the repurposing of a name that was already quite familiar to us — though in the guise of a big table. That device lives on as PixelSense, thus putting a period at the end of one definition of the word, a definition Microsoft kindly requests we put behind us as we move on to something that is wholly different.

This new Surface device could be said to re-



late more closely to the active form of the word in question. That is, the verb: to rise up — for something to appear that was not there before. It's a very apt definition for what Microsoft is doing, attempting to go from zero to hero on the tablet hardware front in just one shot. Is this, the Surface for Windows RT, good enough to erase decades of mediocre touchscreen Windows devices? Will it help Microsoft and its latest operating systems float up to the top of the tablet hierarchy?

## HARDWARE

It's not an easy feat to make a tablet that looks or feels different from those hundreds of slabs that have come before, yet this Surface is indeed quite distinctive on both fronts. It's genuinely hard to differentiate our visual impressions from our tactile ones.

The exterior of the slate is a cool, matte surface that looks dark and feels quite strong and durable. It's constructed using Microsoft's Vapor Mg process, which relies on vapor deposition to create this distinctive tactility, which we found ourselves quite drawn to. The material feels amazing in the hand and here it's used to create

**The exterior of the slate is a cool, matte surface that looks dark and feels quite strong and durable.**

a structure that is quite complex, flat on the front and back of course, but with the sides angling outward, connecting a facade slightly wider than the rear.

This inclination makes for a very reassuring feel when walking around carrying this tablet under one arm, and also gives room for a display that is slightly larger than your average 9.7- or 10.1-inch slates. In fact, its display clocks in at 10.6 inches, nearly a full notch greater than the new iPad, but its resolution is far lower, at just 1,366 x 768. As we saw

Surface's proprietary magnetic charging connector.



when we got to go behind the scenes of the device's design and development, that 16:9 display and size were custom-crafted to make the most of Windows RT's ideal orientation and, as we'll detail in the next section, the quality of this panel *mostly* makes up for its relative lack of resolution.

That rim around the edge is perforated in many places, much more than your average tablet, including two new proprietary magnetic connectors. The first, and biggest, is on the bottom of the tablet. It has six contacts, providing power and data connectivity for Microsoft's first-party keyboard covers and, hopefully, more peripherals down the road. On the lower-right is another, similar but incompatible magnetic connector, this one with only five pins. It's here that the device's AC adapter plugs in, that custom plug meaning you'll have to bring it with you whenever you hit the road, but this does at least mean it pushes more juice through than your average USB connector and therefore charges faster. We do, though, wish that connector was a bit more grabby. With MagSafe it seems like if you get the plug anywhere near the connector the two pull themselves together. Microsoft's option requires a good bit more precision and doesn't hold nearly as tightly.

Following up the right edge the next port you'll find is a full-size USB 2.0 connector that's ready and waiting for thumb drives, keyboards, hubs, mice and anything else you can throw at it.

We can't help but be slightly disappointed it isn't USB 3.0, but having this port is incredibly useful — as is the micro-HDMI connector that sits above. Then comes the right speaker, with its mate to be found over on the other side. Up top you'll find a pair of microphones along with the power button, which can be found toward the right edge. On the left side is the 3.5mm headphone jack positioned just above a volume rocker. Finally, tucked behind the fold-out kickstand on the rear is a microSDXC port, which means near-ininitely expandable storage is just one tiny little chip away.

Fitting all those ports means this slate is on the large side, and not just because of the display. Full dimensions are 10.81 x 6.77 x 0.37 inches (275 x 172 x 9.4mm), considerably wider and taller than the new iPad, but only 0.2mm thicker — not bad, considering you get that full-sized USB port out of the

**When combined with either of the keyboards that Microsoft offers at launch, this becomes a surprisingly capable laptop replacement. Or surrogate, at least.**



equation. Its 1.5 pounds means it hits the scales at 0.1 pounds greater than the latest iPad, but for some reason it feels heavier still.

It's around the back that one of the most distinctive hardware features is found — the kickstand. While useful, we typically find ourselves deriding the presence of such appendages when they spring out of phones and tablets. Here, though, it comprises a major part of the DNA of the device. Yes, it can be used to prop this thing up and watch a movie, but when combined with either of the keyboards that Microsoft offers at launch, the \$120 Touch Cover or \$130 Type Cover, this becomes a surprisingly capable laptop replacement. Or surrogate, at least. Its hinge is complex but feels durable, though we do wish Microsoft had put a notch on either side of the stand, instead of just the one on the left. Flipping it out with your right hand can be a little tricky at times.

And while we're focusing on look and feel, we'd be remiss if we didn't discuss the sounds of the device, too — if only because Microsoft is making such a big deal out of the acoustic nature of the thing in its commercial. Indeed, the kickstand flips out with a very satisfying click and the Touch Cover magnetically pops on to the bottom with a reassuring “thunk.” Reassuring, because that magnetic connection is strong enough to comfortably support the weight of the tablet dangling below — though we wouldn't recommend swinging it around with too much verve.

When it comes to the *other* sounds this thing can make, those that you might actually want to listen to through the built-in stereo speakers, the Surface is merely adequate. Despite having twice as many speakers as the iPad, it actually can't match that product's maximum volume output. But, it does at least offer stereo separation, and overall audio quality is average for tablets — that is to say, completely lacking in bass.

And when it's time to reach out and get this thing online, as it is, of course, of limited use when disconnected, you have WiFi and... that's it. Microsoft is not offering a 3G- or LTE-equipped model, at least not yet, but you do get a comprehensive suite of 802.11 interconnects: a/b/g/n with 2x2 MIMO sending and receiving. There's Bluetooth 4.0, too.

## DISPLAY

Back when Surface for RT was first revealed, Microsoft shied away from confirming the tablet's screen resolution. We can now understand why: if people knew then that it had a 1,366 x 768 pixel count, they might have pooh-poohed it for not having a 1,920 x 1,200 panel, or better. And that would have been a shame; as any digital camera aficionado will tell you, there's more to image quality than resolution. For starters, Surface uses Microsoft's ClearType sub-pixel rendering technology to help smooth out jagged edges. Additionally, the Surface has an optically bonded display, in which the touch panel and



## As any digital camera aficionado will tell you, there's more to image quality than resolution.

LCD comprise a single layer, all protected behind Gorilla Glass. A technique already used in smartphone manufacturing, this allows for the panel to be thinner, and also creates fewer opportunities for light to refract. As a result, there are some pleasantly versatile viewing angles here.

It helps, too, that the screen has an impressively

ClearType technology works to improve the display.

high 400-nit brightness rating; thanks to that spec, in particular, outdoor visibility won't be a problem. (And with such robust battery life, as you'll see below, you needn't worry about temporarily cranking up that brightness slider; you'll still have plenty of charge to spare.) Viewing angles are also world-class. You *could* watch a movie with this slate lying face-up on a table in front of you, but that kickstand means you'll probably have an easy time keeping it perpendicular to your gaze.

All told, the Surface's display stands up well against the competition. We still consider the new iPad panel to be the best on the market, but there is noticeably less glare on Microsoft's latest



and, when placed side by side, the Surface also shows slightly deeper blacks. (The color temperature is generally cooler, too — we're not sure that's good, per se, just different.)

That said, there's no escaping that this is indeed a lower-resolution tablet. In viewing an eye chart on the Surface and the new iPad, the smaller text elements (the ones you may find yourself squinting hopefully at while standing at the DMV) are noticeably cleaner on the iPad's 2,048 x 1,536 display. Still, since the iPad scales up all its content to match the older, lower-res tablets, much of that resolution is going to waste. In fact, load up the same webpage on both tablets and you'll see far more content on the Surface than the iPad, thanks at least in part to the 16:9 aspect ratio here.

## KEYBOARD COVERS

You wouldn't think a 3mm-thick piece of polyurethane could make for a comfy keyboard, but the pressure-sensitive Touch Cover is a compelling companion to your written missives. Just give yourself a little time to get used to it. Microsoft warns it could take four to five days to reach your peak touch-typing speed. That sounds about right to us, which is a bit unfortunate; you'll need to pay up to buy one before you know for sure whether you'll really like it, even if you get a chance to sample Surface at a Microsoft Store.

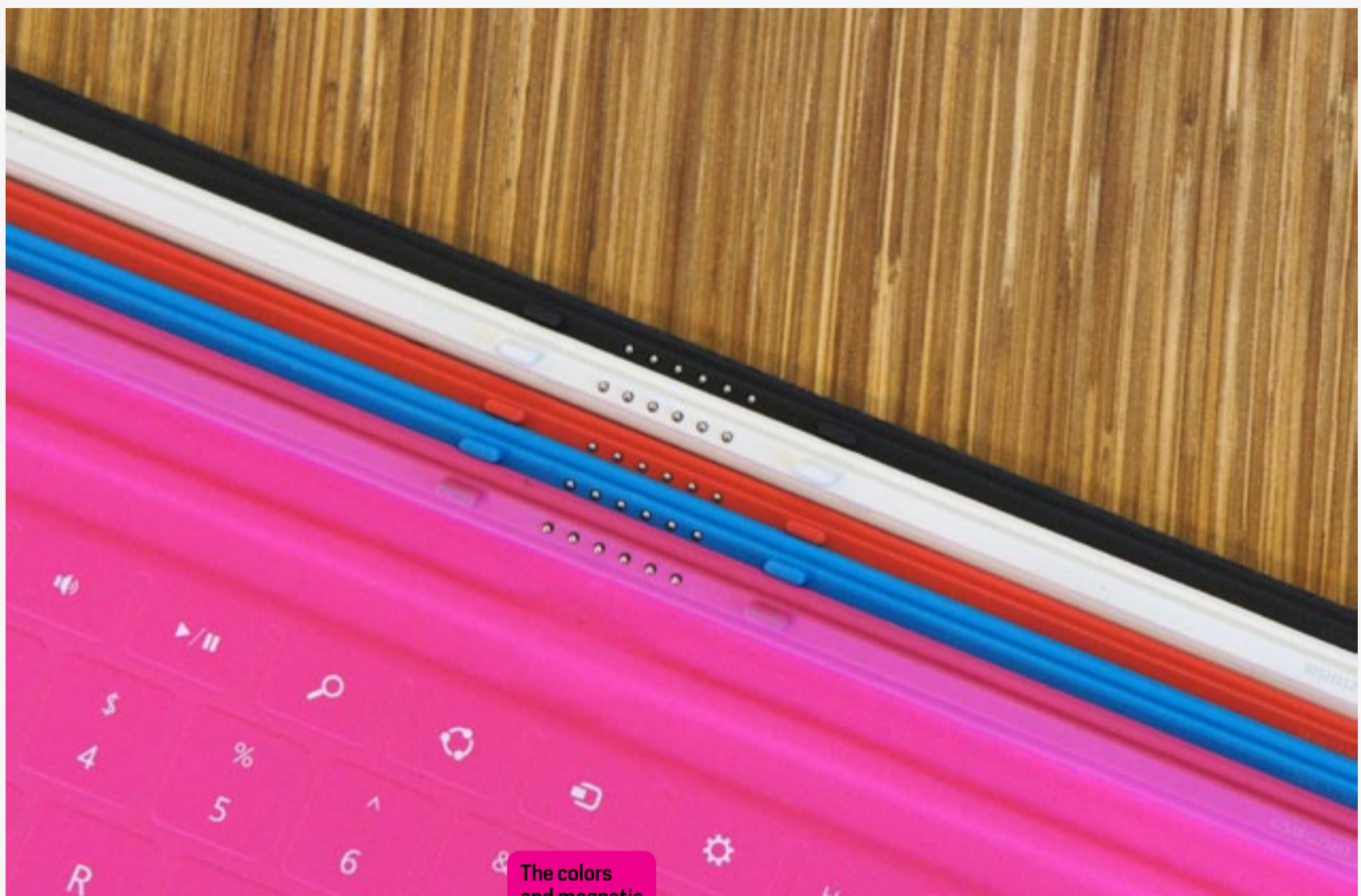
But, if you're on the fence, we'd rec-

You wouldn't think a 3mm-thick piece of polyurethane could make for a comfy keyboard, but the pressure-sensitive Touch Cover is a compelling companion to your written missives.

ommend making the extra investment for the cover. The first 30 seconds or so will feel mighty disorienting, a sensation that evolves into uneasiness over the next few minutes as you figure out how to successfully insert an exclamation point and experiment with how much pressure is really necessary. It's also a matter of trust: think about how gingerly you used your first BlackBerry's keyboard, or how carefully you typed out text messages on your first touchscreen phone. It took time to figure those typing systems out, and there's another learning curve to ride here.

It's worth it, though. Within minutes we were typing at a brisk clip, making surprisingly few errors along the way. It helps that there are small indentations on the F and J keys just like a proper keyboard, marking the





The colors and magnetic connectors of the Surface Touch Cover.

home position for each of your index fingers. The keys are also spaced well enough that you're unlikely to hit the wrong letter by mistake. It's no sweat if you do: the backspace and spacebar keys are easily found without looking down. In fact, as Microsoft was developing the product, it gradually widened the spacebar after some large-handed focus group testers found themselves mistakenly striking

the touchpad instead.

It's the familiar layout and functionality that's the best part of the Touch Cover. If you're a regular PC user you'll quickly and happily find that all your typical keyboard shortcuts work exactly as you'd expect them. Arrow keys make for quick and easy navigation through text files, like the one in which this review was written. We're inclined to think that touch typists will come to

**We're inclined to think that touch typists will come to grips with the Touch Cover more quickly than with a more tactile keyboard on another tablet OS.**



grips with the Touch Cover more quickly than with a more tactile keyboard on another tablet OS.

Still, that tactility is something to overcome. The biggest challenge we had in acclimating to the Touch Cover was learning just how much pressure to apply. Use it for a few minutes and you'll

realize you can tap the "keys" lightly and quickly while watching as full, perfectly spelled sentences flow onto the screen. Get too cavalier, though, and a letter will fail to register, forcing you to back up and try again with a little more force. Again, though, you'll likely overcome such missteps after practicing for the prescribed business week.

Because the Touch Cover is so photogenic — it is available in five colors, after all — you might not have known about the Surface's other keyboard, the Type Cover, so named for its tactile, conventional-looking keys. Here, too, there's a slight learning curve, though perhaps gentler than the Touch Cover's. Once again, we found we could type quickly with a low error rate, though we never totally got used to the closeness of the keys — they're packed very tightly and feature flat caps, meaning they very nearly bleed into one another.



The Surface's more tactile keyboard option, the Type Cover.

We wouldn't be surprised if you came to prefer the Touch Cover once you got used to it — provided, of course, you were willing to spend an extra \$130 on a spare keyboard for comparison's sake. It's a bit of a shame that there aren't more Microsoft Stores: the ideal solution would be to wander in, play with both keyboards and see if you're a more of a Touch or a Type fan.

In either case, you'll find a small elf of a touchpad sitting beneath the spacebar. Our prediction: you won't bother with it much. It comes in handy if you're working in a desktop app like Explorer or Microsoft Word and need the kind of precision finger input can't offer. Most of the time, though, we followed our intuition and just tapped on the far more responsive touchscreen. The trackpad does support two-finger scrolls, which you might use if you're looking at a website





and don't want to get your finger in the way while you're reading — or if you're a stickler for staying as close to the home row as possible. Just don't expect such gestures to be recognized in the smoothest of manners.

And, in case you were wondering, closing either cover will disable the display on the Surface, much like the magnetic iPad covers from Apple. But, we were rather disappointed by the lag here. There's a good three-second wait before the display pops back on after flipping open the cover. That compares unfavorably to the one second or less time on Apple's option. Not the end of the world, but a bit annoying if you're just flipping it open to take a quick peek at something.

## PERFORMANCE AND BATTERY LIFE

Under the hood, the Surface purrs along on 2GB of RAM and a quad-core NVIDIA Tegra T30 chip, the same SoC powering other Windows RT tablets, like the ASUS VivoTab RT. Since we're not yet aware of any benchmarks tailored to this operating system, we'll stand on this: Tegra 3 is more than capable of handling Windows RT's Live Tiles and Modern UI. The tablet cold-boots in just under 25 seconds and launches apps briskly. It responds smoothly to taps and swipes, and we also found that the tablet is quick to respond if you open an app, change your mind and hit the home button before the app is finished loading.

BATTERY LIFE	
MICROSOFT SURFACE FOR WINDOWS RT	9:36
SAMSUNG GALAXY TAB 7.7	12:01
APPLE IPAD 2	10:26
ACER ICONIA TAB A510	10:23
ASUS EEE PAD TRANSFORMER PRIME	10:17/16:34 (KEYBOARD DOCK)
AMAZON KINDLE FIRE HD	9:57
SAMSUNG GALAXY TAB 10.1	9:55
APPLE IPAD (2012)	9:52 (HSPA) / 9:37 (LTE)
APPLE IPAD	9:33
ASUS TRANSFORMER PAD INFINITY TF700	9:25 / 14:43 (KEYBOARD DOCK)
MOTOROLA XOOM 2	8:57
SAMSUNG GALAXY TAB 2 (10.1)	8:56
HP TOUCHPAD	8:33
ASUS TRANSFORMER PAD TF300	8:29 / 12:04 (KEYBOARD DOCK)
ACER ICONIA TAB A700	8:22
ACER ICONIA TAB A200	8:16
SAMSUNG GALAXY TAB 7.0 PLUS	8:09
SAMSUNG GALAXY NOTE 10.1	8:00
AMAZON KINDLE FIRE	7:42
GALAXY TAB 2 7.0	7:38



That said, we did notice some occasional pauses when quickly swiping the left side of the screen to toggle between open apps. To be clear, it didn't matter how many apps we had open: in fact, we frequently lost count of how many were running. We rarely bothered to manually close any and the machine never seemed to suffer for it. In short, the performance has a few limitations, but overall, Surface is fast, responsive and stable.

The only benchmark we felt comfortable running is the browser-based and platform-agnostic SunSpider JavaScript benchmark. Here the Surface returned a very, very healthy average score of 994ms. That's nearly twice as fast as the latest iPad and nearly as quick as our record holder, the iPhone 5, which burned through the test in 924ms when we reviewed it. Indeed, the initial rendering of webpages is far faster than the iPad, with the main content and text popping in earlier. But, if you wait for all the content to filter in, overall page load times are comparable between the two.

You caught the part earlier where we said this thing has robust battery life, right? How does nearly 10 hours sound? In our standard battery run-down test for tablets, which involves looping a locally stored video with WiFi on and brightness fixed at 50 percent, the Surface's 31.5 watt-hour battery held out nine hours and 36 minutes, which puts it just short of the new iPad

(9:52) and just ahead of ASUS' high-end Transformer Pad Infinity (9:25).

## SOFTWARE

We'll be honest: we're still a little unclear on how Microsoft plans to educate consumers on the difference between Windows RT (for ARM-based devices) and Windows 8 (for full x86 machines), especially since there's going to be a whole lot of similar-looking tablet / laptop hybrids running Windows 8. Case-in-point? The Surface with Windows Professional, which comes out in a few months and will cost a bunch more than the RT, but looks nigh-identical, both on the outside and in the OS.

So, it might be useful, then, to start by addressing some common misconceptions about Windows RT. First of all, contrary to what some readers might believe, it does, indeed, have a desktop, just like regular Windows. Pinned to the Taskbar are various apps from Office Home & Student 2013 RT: Word, Excel, PowerPoint and OneNote.

That said, you won't be spending

**We're still a little unclear on how Microsoft plans to educate consumers on the difference between Windows RT and Windows 8.**



much time down here on the desktop, since Windows RT can't run legacy programs written for traditional, x86-based Windows systems. In other words, while you can install an app like Photoshop on a full Windows 8 machine, you can't do it here, nor any other Windows application written since the dawn of the OS. Additionally, we have our doubts about whether anyone going forward will bother to write desktop apps versus those more optimized for running in the de facto Live Tile interface.

Still, the desktop can be a godsend in certain situations. For one, that USB port is a perfect match for Windows RT. Though this isn't "full" Windows, per se, it's still compatible with almost any USB-powered storage device or peripheral that you'd normally use with a Windows machine, a massive pile of legacy devices. It really is lovely to plug in a USB drive and start dragging and dropping files. Or, feel free to connect that comfortable keyboard you've been using for a decade, or that old tank of an HP LaserJet that's still doing the business after all these years. These are the sorts of luxuries you might take for granted but will appreciate more as you start comparing the Surface to other

**It really is lovely to plug in a USB drive and start dragging and dropping files.**

tablets. In short, that USB connection isn't just a spec or a talking point: it means you can use this Windows *tablet* like a PC, whenever it's convenient for you.

Other than the fact that Windows RT can't run legacy apps, it looks and feels like Windows 8. As you probably know, there's no Start button, and the Start Menu is comprised of Windows Phone-esque Live Tiles. Here, you'll find all the usual native apps, such as Mail, Calendar, People, Camera and Internet Explorer 10. (There are two versions of IE, by the way: one on the desktop, and a more touch-friendly one that exists as a Live Tile. They do, at least, share bookmarks now.) The desktop, too, is an app unto itself on the Start screen. What's more, all the same gestures apply: swipe from the right to expose the Charm Bar, which contains options for searching content and adjusting system settings. Swipe from the left to toggle apps, and swipe from the top or bottom to view certain app-specific options, like playing a movie on loop. That these options are all hidden means there is a bit of learning users will have to do before making the best use of their tablets, but once mastered you'll find options and commands are usually just a few taps away.

From the Start Screen, you can just start typing to begin a search for something — a trick you can use on the Windows Store home screen, too. On the desktop, windows have a flatter,



two-dimensional feel, meaning the old transparent bordering is a thing of the past. Things are, by default, a bit more finger-friendly than your average Windows desktop, with bigger buttons and menu options.

Video playback support is rather limited at this point. The system will play WMV and MK4 files, but the system has no idea what to do with MKV files by default, and even an old AVI file we tried to play failed miserably. So, if you were hoping this machine would be as adept at playing back video files in any 'ol format you throw at it, like the x86 version of Windows is, you're bound for disappointment. At least, until someone ports VLC over to ARM.

When they do, you'll have to download it from the Windows Store. In fact, you'll be getting *everything* from the Windows Store. Mind you, there's nothing stopping you from downloading legacy apps from the browser, but none will run on Windows RT. As we discovered, you can go so far as to create desktop shortcuts for apps. But when you try and load them, a banner will stretch across the screen, telling you the app won't run on your device. As for apps you *can* run, the selection is small, but growing. Netflix, for instance, just arrived in the Windows Store, and we expect plenty more soon (including our own app). So far, there's a comforting group of heavy hitters, including Skitch, Box.net, Associated Press, Evernote, eBay, StumbleUpon, Pandora and

Slacker Radio. We'd like to believe that bodes well for other major apps that still haven't arrived on the platform.

There is, at least, a Kindle app, but it's decidedly less than optimal at this point. Page-turning is sometimes done very quickly, sometimes met with five seconds of a spinning progress indicator. Voice playback (and, therefore, Whispersync for Voice) are unsupported and we got an error whenever we tried to open a comic, and what's the point of having such a nice display if you can't read *Watchmen*?

We searched on for other popular apps, more often than not coming up empty-handed. Notables we're still waiting for inclusion: Facebook, Twitter, Foursquare, Dropbox, Mint, PageOnce, TripIt, NPR, NYTimes, *Angry Birds*, *Draw Something*, *Words with Friends*, *Temple Run*, Spotify, Springpad, Remember the Milk, Amazon, Instapaper, Pocket (formerly Read it Later), Flipboard, Steam, Instagram, Nook, Zinio and Rdio. You can't even install Microsoft's own Silverlight browser plugin, which should be the final nail in

**There's nothing stopping you from downloading legacy apps from the browser, but none will run on Windows RT.**



that platform's coffin.

We also couldn't find any airline apps. Now, we can't make any guarantees, but it seems to us that Twitter, Foursquare and Rovio would be nuts *not* to develop for Windows RT and Windows 8. This is, basically, a new ecosystem and it will certainly grow — we're just advising patience if you insist on buying the Surface as an early adopter.

## CAMERAS

The Surface has dual 720p cameras, but unless you're in the mood for video chatting, you probably won't be us-

ing them much. Even by tablet standards, the image quality here is pretty poor. Our full-res, 1,280 x 720 shots look awfully pixelated, even in brightly lit environments that shouldn't have yielded any noise. You'll also notice a good deal of color saturation. As for the Surface's 720p video recording, we noticed some motion blur, but we were pleasantly surprised by how gentle the audio rendering was. Too often, our clips taken with tablets have a buzzing, distorted quality. In this case, the tablet didn't pick up any stray gusts of wind that might have otherwise spoiled our recording.

Surface's dual 720p cameras offer poor image quality.



## CONFIGURATION OPTIONS AND THE COMPETITION

The Surface is available in just two flavors, one with 32GB of built-in storage and the other with 64 gigs. The 32GB version starts at \$499. That entry-level kit doesn't include a keyboard, but for \$599, you can get one in the box. As for that 64GB model, Microsoft is selling it as a bundle with the Touch Cover keyboard for \$699. If you do buy the tablet by itself and later decide you want a keyboard to go with it, the Touch will sell for \$120, while the Type Cover (the one with physical keys) will retail for \$130. As a side note, Microsoft will only ever bundle the black Touch Cover, so start saving your pennies if you just have to have it in blue.

The Surface arrives in lockstep with several other tablets running Windows RT. We've been testing the ASUS VivoTab RT, which is priced identically to the Surface with a thinner, lighter design but slightly shorter battery life and a less comfortable typing experience. Dell's XPS 10 should also go on sale soon, though we unfortunately don't know yet how much it will cost. We're also intensely curious about the Lenovo IdeaPad Yoga 11, which has a screen that folds all the way backward,

but that won't go on sale until December. When it does, it will come at a premium: it will start at \$799.

As an ARM-based tablet promising healthy battery life, the Surface goes toe-to-toe with the iPad, along with a handful of high-end Android tablets. Beginning with the iPad, both tablets start at \$499, though for that price the Surface offers twice as much built-in storage (not to mention a memory card slot and support for USB storage). The iPad is thinner and lighter, but perceived build quality is comparable. (Besides, if you dig the Surface's kickstand and USB port, it probably couldn't have been much skinnier anyway.) As we've said, the displays are both nice, though neither completely bests the other: the iPad looks crisper and cleaner while the Surface is less prone to glare. When it comes to typing, Surface

Surface boasts full keyboard support built into the OS.



## As an ARM-based tablet promising healthy battery life, the Surface goes to toe-to-toe with the iPad.

has the advantage of full keyboard support built into the OS and two keyboards designed by Microsoft itself. They're comfortable — more so than many of the third-party offerings for iPad — but it remains to be seen how many tablet buyers will truly value the typing experience.

Other than that, the key difference between the two isn't about millimeters or pixels. It's about software. We've already established, we hope, that Windows RT is easy to use, and well-suited for this form factor as well as for designs of productivity. The problem is app selection: as of this writing, the iPad has over 250,000 available that are optimized for its display. Don't get us wrong: Windows 8 and Windows RT are quickly gaining momentum, but until your favorites do show up in the Windows Store you'll have to show a little patience — or be willing to find new favorites.

Finally, on the Android front you've obviously got many more choices, including a bunch offered with optional keyboard docks. If you're looking for something with just as nice a display as the Surface, we'd recommend the ASUS Transformer Pad Infinity, a 10-inch tablet

with a 1,920 x 1,200 IPS panel, excellent battery life and a solid spun metal build. Be warned, though, that ASUS' keyboard docks tend to have relatively cramped layouts. For a better typing experience, we'd suggest the new Lenovo IdeaTab S2210 (\$430), though as a mid-range tablet it makes do with a lower-res screen than the Infinity. It also offers shorter battery life than ASUS' Transformer tablets, and most 10-inch slates, really.

### WRAP-UP

The Microsoft Surface with Windows RT's \$499 starting MSRP means those thinking about making the investment here will be carefully cross-shopping against same-priced offerings from Apple, ASUS and others. Where does this one rate? Very well — but very differently. While those devices are primarily targeted at content-hungry consumers, the Surface is a slate upon which you can get some serious work done, and do so comfortably. You can't always say that of the competition.

It's in the other half of the equation, that of the content consumption and entertainment, where the Surface is currently lacking. It needs a bigger pile of apps and games to make up for that and, while we're sure they're coming, we don't know when. If those apps arrive soon, then early adopters will feel vindicated. If, however, the Windows RT market is slow to mature, not truly getting hot for another six months or so, holding off will prove to have been the smarter option.





The Surface's integrated kickstand supports its unique look.

So, if gaming and music and movies and reading are what you're looking to enjoy, then we might advise sitting this one out for a few months just to make sure that all your bases will indeed be covered. If, however, you're looking for an impeccably engineered tablet upon which you can do some serious work, a device that

doesn't look, feel or act like a toy, then you should get yourself a Surface with Windows RT. **D**

*Dana Wollman contributed to this review.*

*Tim Stevens is Editor-in-chief at Engadget, a lifelong gamer, a wanna-be racer, and a born Vermonter.*

## BOTTOMLINE

## SURFACE WITH WINDOWS RT

**\$499 - \$699**



### PROS

- Impressive build quality
- Bright display with low glare
- Solid performance and battery life
- Full-sized USB port
- Touch Cover enables fast text input

### CONS

- Limited app selection

### BOTTOMLINE

Microsoft's Surface with Windows RT is a great tablet for those who need a strong dose of productivity with their mobility.



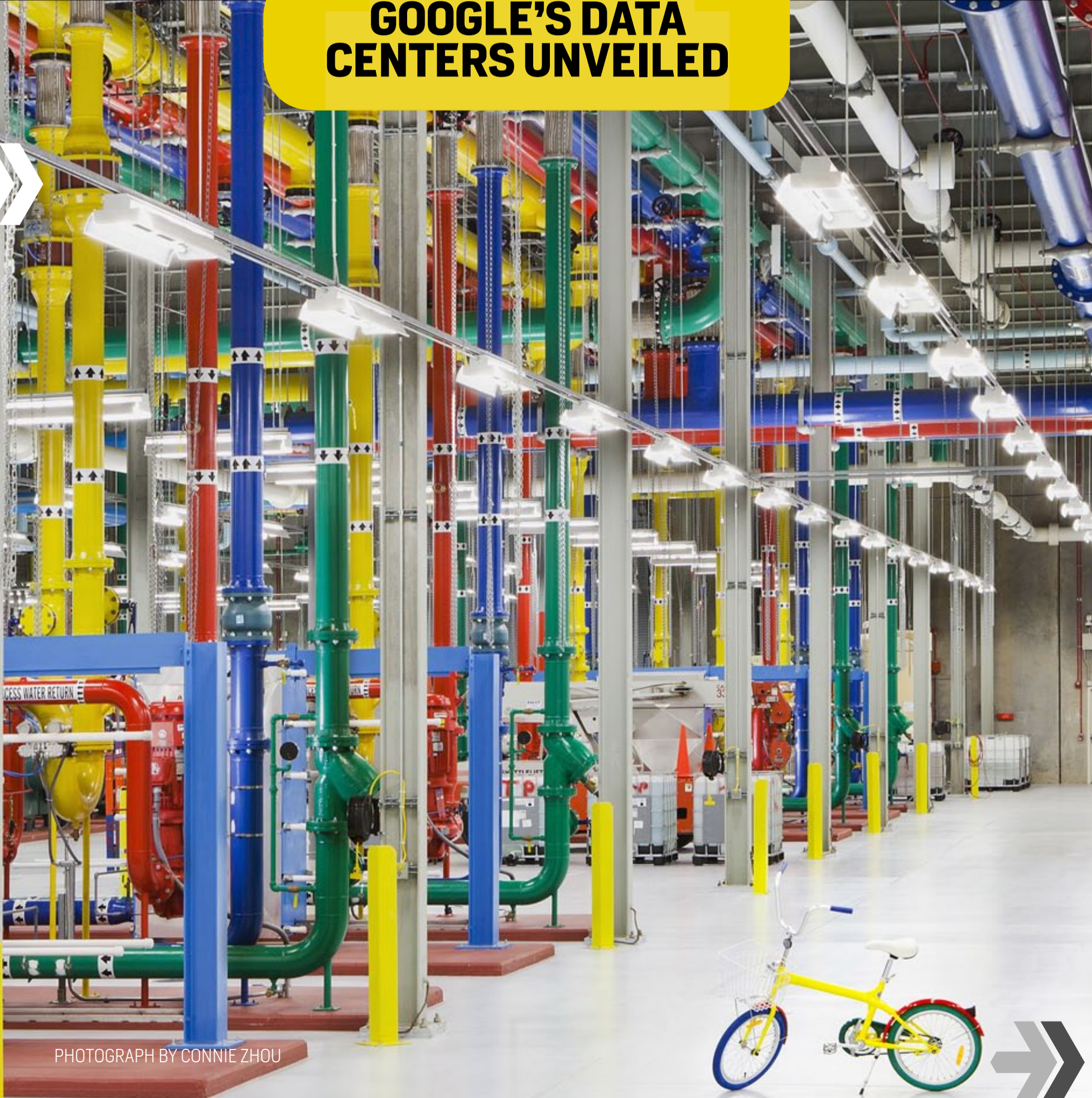


# TESC

**VISUALIZED**

DISTRO  
10.26.12

**GOOGLE'S DATA  
CENTERS UNVEILED**



PHOTOGRAPH BY CONNIE ZHOU



# ERIC WILHELM

**THE INSTRUCTABLES FOUNDER** takes a break from the DIY grind to tout the merits of Post-it notes, self-driving cars and governmental innovation.

**What gadget do you depend on most?**

Bicycle. I can do without everything else, but when society collapses, I'm riding my bike to the local stream to collect water.

**Which do you look back upon most fondly?**

Opening up a cable box with the assumption that I could figure out how to rewire it to unscramble the pay cable TV channels.



**Which company does the most to push the industry?**

The machinations of any company pale in comparison to those of the government.

**What is your operating system of choice?**

Post-it notes and a "Space Pen" followed closely by MacOS.

**What are your favorite gadget names?**

Walkman.

**What are your least favorite?**

"I have Bojangles on my iPod." Are we discussing a disease only old people get, or something else?

**Which app do you depend on most?**

Google Maps for allowing me to navigate like a local when I'm not.

**What traits do you most deplore in a smartphone?**

Inability to make and receive calls due to poor reception. Weak vibrate motor.

**Which do you most admire?**

Size considering overall usefulness.



# No technological advancement is despicable; only people's choices are despicable — in particular, some choices of ringtones.

**What is your idea of the perfect device?**

Teleporter. If I'm being more reasonable, cars that drive themselves.

**What is your earliest gadget memory?**

Wristwatch with integrated calculator!

**What technological advancement do you most admire?**

Anything that will take something abundant, and turn it into energy at wildly inexpensive rates — could be fusion, solar, wind ...

**Which do you most despise?**

No technological advancement is despicable; only people's choices are despicable — in particular, some choices of ringtones.

**What fault are you most tolerant of in a gadget?**

Needing to charge every day.

**Which are you most intolerant of?**

Slow response waking up, slow app switching and telling me there's bad traffic ahead too slow

to take the exit.

**When has your smartphone been of the most help?**

Helping me find good wind for kitesurfing.

**What device do you covet most?**

Teleporter. If I'm being more reasonable, a car that drives itself.

**If you could change one thing about your phone what would it be?**

Much stronger vibrate motor.

**What does being connected mean to you?**

Taking an important business meeting from my car at the beach between kitesurfing sessions while the other party assumes I'm somewhere a bit more traditional.

**When are you least likely to reply to an email?**

I regularly get to inbox zero, so all emails are eventually processed.

**When did you last disconnect?**

During a multi-day wild boar hunt. 



The week that was in 140 characters or less.

# A Tablet with a View, Risky Investments and Intrepid Embargoes

DISTRO  
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ESC

REHASHED

@hipstermermaid

I just hope  
this iPad  
Mini finally  
makes my  
tiny hands  
look normal.

@shanethevein

Now that the iPad Mini is out I might actually be able to see the concert while you're videoing it.

@parislemon

Why on Earth would Microsoft set a Surface embargo for the day of iPad mini reveal? There's confidence, and then there's insanity.

@ryan

I dare you to invest in ZNGA. Double dog dare you.

@kevinrose

Which is better,  
the iPad2  
or the iPad?  
answer: iPad...  
confusing.

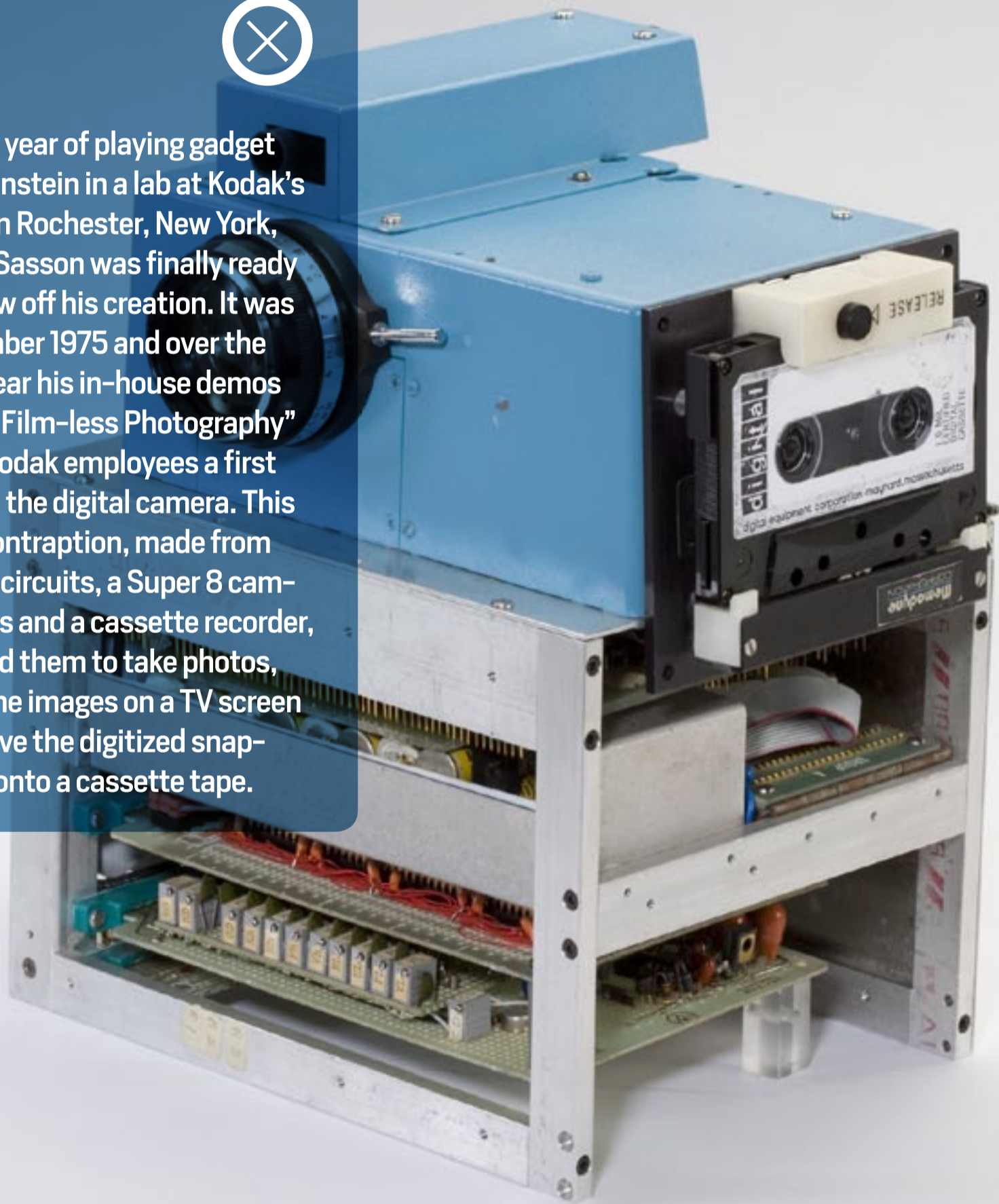
THE STRIP

BY DUSTIN HARBIN



## THE FIRST DIGITAL CAMERA

After a year of playing gadget Frankenstein in a lab at Kodak's plant in Rochester, New York, Steve Sasson was finally ready to show off his creation. It was December 1975 and over the next year his in-house demos titled "Film-less Photography" gave Kodak employees a first look at the digital camera. This new contraption, made from digital circuits, a Super 8 camera lens and a cassette recorder, allowed them to take photos, view the images on a TV screen and save the digitized snapshots onto a cassette tape.



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