DISTRO

101212 #61

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ACER AIMS HIGH

AN IN-DEPTH PREVIEW OF THE ICONIA W510 WINDOWS 8 HYBRID

CANON GOES MIRRORLESS WITH ITS EOS M ILC

GETTING A GRIP ON THE GALAXY NOTE II

NEVADA'S NEW DIMENSION IN HIGHER EDUCATION

TOURING THE ATLANTIS OV-104

ISSUE 61

ENTER

EL

EDITOR'S LETTER
More iPods and a New Nexus
By Tim Stevens

IN

INBOX
Affordable Nests and Ergonomic E-ink

EYES-ON
Space Shuttle Atlantis

HANDS-ON
Skullcandy Navigator, Parrot Asteroid and Some of Nokia's Newest

WS

WEEKLY STAT
Tech Storms the Big Brands
By Jon Fingas

RR

REC READING
The Patent, Used as a Sword and More
By Donald Melanson

FORUM

MW SO RT

Give Me the Keys, I'll Drive!
By Joshua Fruhlinger

Android's Tablet Troubles
By Ross Rubin

Aliens and Assassins
By Ludwig Kietzmann

REVIEW

Canon EOS M
By Zach Honig

Samsung Galaxy Note II
By Brad Molen

Acer Iconia W510 Preview
By Dana Wollman

FEATURE

Reshaping Education with 3D Printing
By Jason Hidalgo

ESC

VISUALIZED
One Million Volts Always On

Q&A
Nest Co-Founder Matt Rogers

REHASHED
Big Minis, Germs, Gs and Space Dragons

TIME MACHINES
Innovative Attraction

MORE IPODS AND A NEW NEXUS

DISTRO
10.12.12

EDITOR'S LETTER

If you've been waiting to get a new, brightly colored media player in your pocket, this is your week. After teasing us with the devices at the iPhone 5 launch event nearly a month ago, Apple has shipped the new iPod nano and iPod touch. Pre-orderers will have likely received theirs by now and the devices are currently making the slow trickle to retail.

We'll have full reviews for you in Distro soon, but I can at least give you some brief impressions — positive ones, at that. The new touch is thinner and noticeably lighter than before, feeling like as much of an upgrade over the fourth-gen version as the iPhone 5 is over the 4S. It's far more responsive, too and, since it has that iPhone's new 4-inch display, it packs some impressive image quality. Biggest disappointment? Still no GPS!

The new nano is spectacularly tiny, despite being a bit bigger than before, making room for a 2.5-inch LCD. Its 16:9 aspect ratio and the addition of video playback means this one can make for a passably decent media player, but we'd recommend sticking to the tunes if you value your eyesight.

Android lovers this week got something even bigger to get excited about, strong indications that there's a new Nexus handset coming. This one's courtesy of LG and its details have been leaking all over the place this week. Codenamed E960 "Mako," the 4.7-inch handset has similar specs to the Optimus G, with a 1.5GHz quad-core Snapdragon processor inside and 2GB of RAM, but a mere 8GB of storage. Hopefully that's user-expandable, but as of yet we've not had any indications on that front.

Lenovo, meanwhile, gave us all the details on a slew of new products, all of them running Microsoft's latest flavors of Windows. Most slender is the ThinkPad Tablet 2, which makes the jump to Atom-power and Windows 8 software from its previous ARM internals and Android instructions. That ships this month for $649. The company also took the wraps off its Yoga convertible, which we first got our eyes on at CES ages ago. There are now two sizes, a 13-inch Ultrabook with a 1,600 x 900 IPS multi-touch panel that ships this month for $1,099 and an 11-inch ARM-powered version running Windows RT that's coming in December. That one will make do with a 1,366 x 768 panel and starts at $799.

EDITOR'S LETTER

Finally, there's the ThinkPad Edge Twist, a name that gives both business and casual connotations — appropriate, as this is a machine intended to straddle the lines between professionals and consumers. It has a 12.5-inch multi-touch display tucked behind a sheet of Gorilla Glass and, as is the trend, that display swivels around so that this device can be used as a tablet — a chunky tablet, but a tablet nevertheless. This guy ships in a few weeks for $849.

Soon we'll be swimming in Windows 8 and Windows RT convertibles, but Motorola has decided it's time to head the other way. The company is discontinuing its line of Lapdocks, first introduced with the Atrix for the outrageously optimistic price of $500. The devices, which turn your smartphone into a terrifically unusable netbook, would eventually drop to $200, but even that was apparently asking too much.

RIM has mixed up the fruit punch and officially opened its doors for BlackBerry 10 developers, beginning to accept app submissions ahead of the operating system's oft-delayed release sometime early next year. Meanwhile, the company's PlayBook tablet looks to be making its way out to pasture. It has disappeared from numerous online retailers and, while you can still get it through RIM's own store, we're wondering for how much longer. Perhaps a successor is in the cards for CES this year? That might be asking a bit too much.

Finally, Sling Media has, at long last, given the market some new hardware. The company unveiled the $179 Slingbox 350 and $299 Slingbox 500. Both finally bring 1080p streaming to the table, with the latter of the two adding WiFi connectivity to the mix as well as HDMI input. Both go on sale on October 14th and you can read our early reviews of the pair on the site.

In this week's Distro we're giving you an in-depth look at one of the dozens of Windows 8 convertible tablets that will be hitting stores this fall. It's Acer's Iconia W510, a machine that gave Dana Wollman dizzying flashbacks to the company's dark netbook days of yore. We also have Brad Molen's full review of the Samsung Galaxy Note II and Zach Honig's take on Canon's first mirrorless ILC, the eagerly awaited EOS M. Jason Hidalgo has a piece on how 3D printing might just revolutionize education, This Modem World discusses how some people are just better at driving gadgets than others and Switched On takes a broader look at Android's struggles to capture the tablet space. There's more Recommended Reading, Eyes-On with the Space Shuttle Atlantis and Nest co-founder Matt Rogers sets our Q&A at just the perfect temperature. Can your tablet handle all that? There's just one way to find out. D

TIM STEVENS
EDITOR-IN-CHIEF,
ENGADGET

AFFORDABLE NESTS, ERGONOMIC E-INK, QWERTY QUERIES AND CONCEPT CAR SAFETY

Touch article names to read full threads

DISTRO 10.12.12

INBOX

NEST LEARNING THERMOSTAT (2012)
ISSUE 60, OCTOBER 5TH, 2012

"The design on this thing is amazing. I just think that in order for us to usher in a new era of digital, WiFi connected home devices like this we must be able to hit better on the price points. It's extremely useable and functional especially for savings. Just hit a little lower on the price point and it will get purchased significantly more."

—AMIR MUSLIM

[A] lot of people do not understand or underestimate Nest. It makes thermostats more usable and efficient, I installed in the month of August, and I had a huge saving in spite of being hotter than July; my bill was $100 less. I would recommend Nest to any one, [with] it's clean interface and easy tracking, you would get your money back in 3-5 months, and the rest of it is savings.

—SRI

AMAZON KINDLE PAPERWHITE
ISSUE 60, OCTOBER 5TH, 2012

"I've got to admit I like the looks of the Paperwhite display a lot more than my nook, but I enjoy the ergonomics of the nook better, and the display difference doesn't make it any less readable."

—WOODYHD

SAMSUNG GALAXY S RELAY 4G
ISSUE 60,
OCTOBER 5TH, 2012

"A slide out keyboard? What is this, 2008?"

—BRANDON11983

"Frankly if one of the manufacturers were to come out with a high end QWERTY phone with specs like an S4 Pro, 720p screen, microSD card, a real high-end device, and sell it on all the carriers they could sell the same phone for a year, even a year and a half, just update it. This would appease QWERTY fans and give a good QWERTY device that people would be willing to use for years."

—SILVER_ARROW

PARIS AUTO SHOW 2012 MERCEDES-BENZ SLS AMG ELECTRIC DRIVE
ISSUE 60,
OCTOBER 5TH, 2012

"This could be the best Engadget giveaway ever."

—JUST_ANOTHER_ENGADGET_USER

PARIS AUTO SHOW 2012 LEXUS LF-CC CONCEPT
ISSUE 60,
OCTOBER 5TH, 2012

"That looks amazing. But in my honest opinion, I don't think touch is a good idea in cars unless it has some amazing haptic feedback tech behind it. Touchscreens require your focus to be drawn away from the road much more than physical buttons do. Obviously today texting in a car is illegal and I think it's because texting on a touch screen is hard to do. But back when I had a physical keyboard, I could feel out the keys I was pressing without my eyes ever leaving the road."

—AMIRAMI

"Better have Gorilla Glass on that. I'm not paying 40K+ for that car if its interior is going to scratch easily."

—CHPSTCKSRLZ

ENTER

DISTRO
10.12.12

EYES-ON

SPACE SHUTTLE ATLANTIS

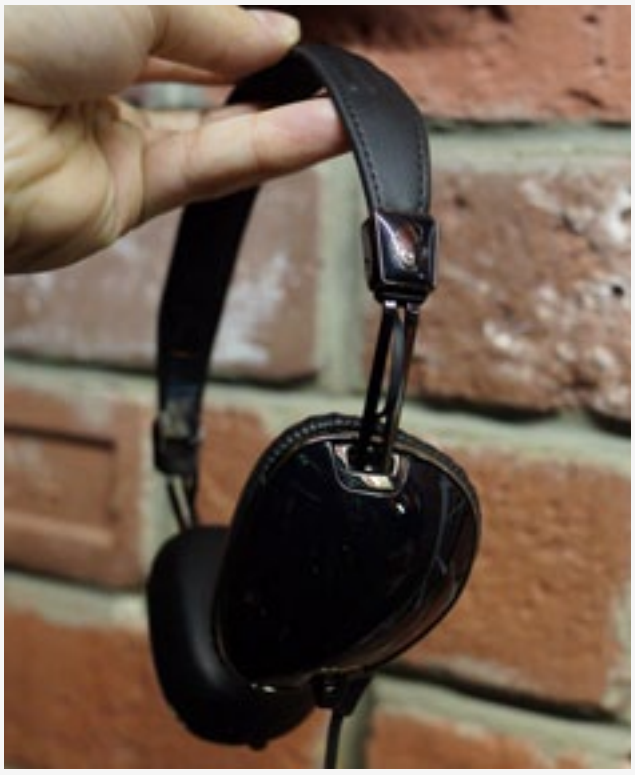
MISSION READY

When Atlantis first docked with Mir in 1995, the pair created the largest orbiting spacecraft to date. Here, the first-ever US in-orbit crew swaps took place. Crew exchanges like these are now a common event on the ISS.

PHOTOGRAPHS BY ALEXIS SANTOS

SKULLCANDY NAVIGATOR HEADPHONES

Click on product names to read full stories



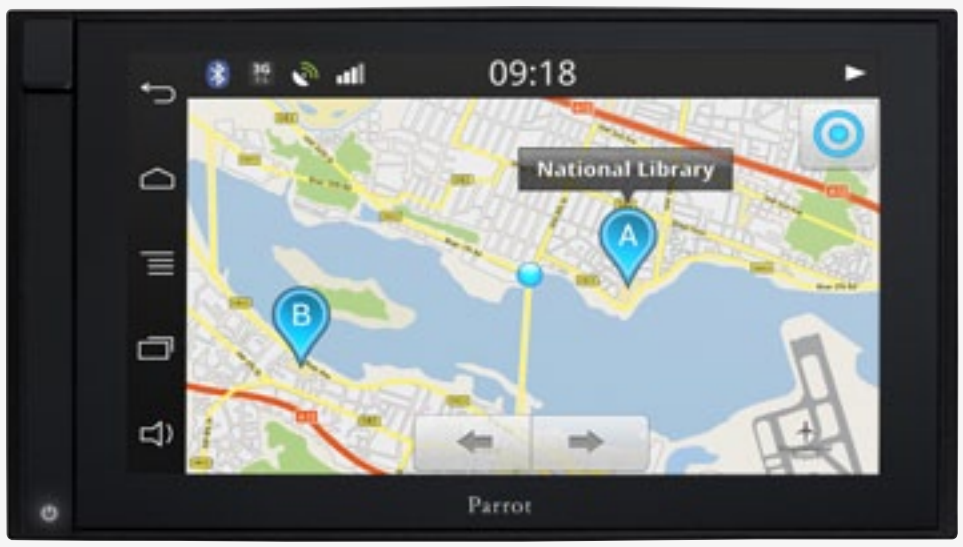
PRICE: $99

AVAILABILITY: NOW AVAILABLE

THE BREAKDOWN: SKULLCANDY CONTINUES TO REBUILD CLOUT WITH THE HEADPHONE FAITHFUL WITH IMPROVED DESIGN AND AUDIO QUALITY.

Believe it or not, what you're looking at is a set of headphones — let's explain. It's no secret that Skullcandy has been working to improve its tattered reputation with headphone junkies for the past two years. Without further ado, say hello to the Navigator. Priced at $99, these cans have collapsible metal earcups with flat earpads, a faux leather-wrapped headband and a flat tangle-resistant cable (detachable) which houses an iDevice-compatible three-button remote and microphone.

We've gotta say it, the build quality of the Nav is on par with that of high-end sunglasses and the earcups adjust into position along the headrails with a satisfying click. The earcups have almost no articulation and we actually had to bend the "frame" into shape to get a usable fit. We're happy to report that the cans sound solid for the price, and while voicing is a bit on the muddy side, the tonality is mostly smooth. It's not boom-heavy sound by any means, but the highs are definitely a bit veiled due to the bass emphasis. The headphones also provide a fair amount of isolation, so they'll spare you the need to crank the volume excessively in the likes of subways.



PARROT ASTEROID SMART, TABLET AND MINI

PRICE: $299 TO $599

AVIALABILITY: OCTOBER 2012

THE BREAKDOWN: PARROT'S ANDROID-POWERED INFOTAINMENT FAMILY TOUTS A TRUCKLOAD OF IN-CAR FEATURES ACROSS THE BOARD.

Back at CES, we got a sneak peek at a trio of successor Asteroid devices from Parrot. Now, a mere 10 months later, the Asteroid Smart, Tablet and Mini have finally arrived in consumer-ready garb. First, there's a flagship in-dash system, the double-DIN Asteroid Smart. It features a 6.2-inch 800 x 480 capacitive display, a Texas Instruments 800MHz processor and runs a heavily skinned version of Android 2.3. The Smart also has a host of ports for connecting external devices like the included GPS antenna or a dongle for cellular data. Locally stored iGo now powers the navigation for the app-friendly unit instead of Google.

The Tablet packs similar specs as the Smart, only it has a 5-inch capacitive screen and is portable, as opposed to an in-dash solution. It runs the same skinned version of Gingerbread, has GPS and Bluetooth radios, and packs 512MB of RAM and 1GB of on-board storage, plus an SD slot. It also comes with a wireless touchpad remote so you can control the system straight from your steering wheel. Meanwhile, the Mini, with its 3.2-inch, non-touch screen has a similar form factor to the Tablet and comes with a wireless remote as well. However, its OS is built on Android 1.5 and it relies upon an external GPS antenna like its bigger, double-DIN cousin.

PRICE: TBD

AVAILABILITY: NOVEMBER 2012

THE BREAKDOWN: THE WINDOWS PHONE 8 FLAGSHIP GETS AT&T BRANDING WITH THE SAME INTERNALS AS THE GLOBAL MODEL.

NOKIA LUMIA 920 FOR AT&T

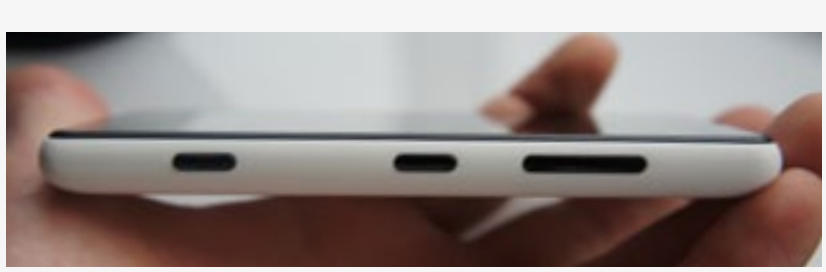
Much like the 900 before it, Nokia's Lumia 920 will be making its US debut on AT&T as an exclusive. Despite not having Microsoft's "signature" blessing, this Windows Phone 8 flagship is poised to ship sometime this November with all the stuffings of its international counterpart. Inside that vibrant polycarbonate hull, of which there are now five colors (including cyan), is a 4.5-inch PureMotion HD+ 1,280 x 768 display, 1.5GHz dual-core Snapdragon S4 processor buffered by 1GB RAM, an 8-megapixel PureView rear camera and a 2,000mAh battery augmented by the inclusion of wireless charging.

This being Microsoft's WP8 game, however, we still weren't able to go past the Live-Tiled start screen and into the meat and potatoes of the fuller app drawer, nor could we truly give the OS a spin — that'll all have to wait until the end of October. Colors on that saturated display pop, while viewing angles remain consistently impressive. What also hasn't changed is the handset's girth and weight — it's still chunky and relatively heavy in hand, but we're willing to overlook it for the PureView rear module alone. Within the frenzied constraints of events like these, it's hard to really dive deep into camera performance, but we don't really have much need for that given our exhaustive coverage of the 920's shooter. Still, expect us to give it a fuller poke when final review units land in our laps (hopefully) later this month.

PRICE: TBD

AVAILABILITY: NOVEMBER 2012

THE BREAKDOWN: THE AT&T LUMIA 820 IS LIMITED TO ONE COLOR, AND STILL FEELS A BIT CHEAP WHEN COMPARED TO THE 800.



NOKIA LUMIA 820 FOR AT&T

As exciting as the 8X and Lumia 920 are, no phone lineup — especially not one launching a new OS — is complete without a midrange competitor. Nokia has answered that call with the Lumia 820, a modestly specced and marketing gimmick-free Windows Phone 8 device that's ready to combine all the advantages of Microsoft's latest mobile platform and AT&T's growing LTE footprint with an easy-to-swallow price point. Or, at least so we assume. Price is still up in the air, but we can only imagine that the 4.3-inch WVGA screen and PureView-less camera won't be commanding top dollar.

Sure, the usual crop of AT&T services are installed, including Navigator, FamilyMap and U-Verse Live TV. There are even a couple of pieces of third-party bloatware in the form of ESPN and Weather Channel included. On the hardware front, things haven't changed one bit from the international version we played with in early September. While the same polycarbonate is used here that made the 900 and 800 such lust-worthy devices, the glossy finish and surprisingly light weight (considering its reasonably bulky frame) make the 820 feel a bit cheap. The carrier also sticks with solid black for the lower-end Lumia. Of course, you can always pop off the shell and add a splash of color later on if you like. D

Tech Storms the Big Brands

Interbrand likes to give the world's top companies a brand value — or a mix of their on-the-ground fiscal performance with an estimate of the premium they can ask through name alone. While there are a lot of traditional names in the consulting company's 2012 list, the surprise this year is just how aggressively technology has invaded the top of the charts. It's a good year to be a part of the mobile ecosystem: a very profitable Apple was by far the fastest grower and clinched second place on the list behind only Coca-Cola, while Kindle Fire creator Amazon (20th place) and Apple's frequent rival Samsung (ninth) also shot past brands as big as Disney and Toyota. A special nod goes out to 69th-place Facebook, whose IPO this year and its recognition put it past companies like Porsche almost overnight. Not everyone in technology came out a winner — Microsoft, Nokia and RIM were among those that took a bruising — but Interbrand's rankings hint that it's better to be making tablets than designer handbags. — *Jon Fingas*

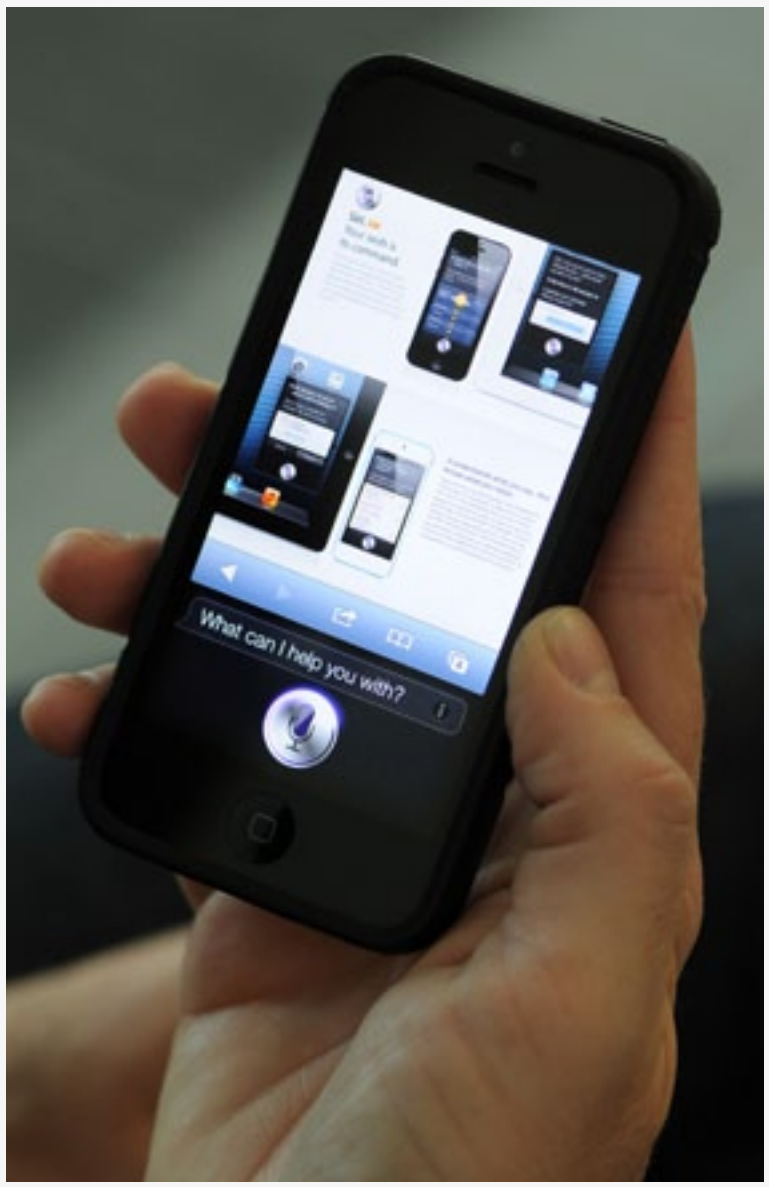
BEST GLOBAL BRAND RANKINGS FOR 2011 AND 2012

SOURCE: INTERBRAND

Swipe to View All Top 20 Brands

The Patent, Used as a Sword

By Charles Duhigg and Steve Lohr
The New York Times



PHOTOGRAPH BY WILL LIPMAN

Click on headlines to read full stories

The latest in *The New York Times'* ongoing "iEconomy" series, this exhaustive piece by Charles Duhigg and Steve Lohr takes a look at the complicated state of the patent system in the United States as it has shifted from the mechanical to the digital age. Expectedly, Apple occupies much of the focus here, including an in-depth look at the patent history behind Siri and an inside look at the company's general patent practices. As you may also expect, Duhigg and Lohr found plenty of conflicting opinions about the current patent system, as well as some evidence that companies are simply getting tired of the perpetual litigation that only seems to have been increasing in recent years. Like the other articles in the series, this one also includes a short video and a slew of supplemental material for those interested in digging even deeper into the topic.

The CIA and Jeff Bezos Bet on Quantum Computing
By Tom Simonite
Technology Review
Regular Engadget readers may be familiar with D-Wave, a company that's made quite a name for itself in the field of quantum computing. Here, Tom Simonite looks at how it's attracted the interest of everyone from Amazon and Google to the CIA, and what it hopes to do next now that millions in investments are flowing in.

Mapping a Path Out of Steve Jobs' Shadow
By Brad Stone, Adam Satariano and Peter Burrows
Bloomberg Businessweek
There was no shortage of stories written on the first anniversary of Steve Jobs' death last week, but this piece from three of *Bloomberg Businessweek's* top technology writers managed to stand out. Drawing on interviews with more than two dozen current and former Apple employees and partners, it offers a portrait of Tim Cook and the state of the company he leads.

The Beauty of the Airline Baggage Tag
By Mark Vanhoenacker
Slate
Quite possibly everything you ever wanted to know, and didn't know you wanted to know, about the humble airline baggage tag. That adhesive-backed strip, as Mark Vanhoenacker explains, is both a fascinating piece of technology and a remarkable feat of design — one that is far more reliable than you may think.

GIVE ME THE KEYS, I'LL DRIVE!

DISTRO 10.12.12 | FORUM | THIS IS THE MODEM WORLD

BY JOSHUA FRUHLINGER

"GIVE ME THAT," I huffed, teeth clenched. ¶ Snatching the iPhone from my friend's hands, I swiftly pulled up directions to The Grove despite the inadequacies of Apple's new Google Maps replacement. While I'd rather have the old Google Maps back, I was able to work around the quirks and get what I needed. ¶ On Saturday, my fiancée and I sat down to watch a movie on Netflix. She simply handed the remote to me as she knew I'd have things set up in no time: I knew which activity to select on the Harmony One, to switch on the PS3 and how to search on the console's version of the Netflix app (each one is bizarrely different for some reason).

Yes, she could have gotten us there, but I'm a better driver. She would have used the Netflix app on our connected TV. It works, but it uses the TV's speakers and I need to watch things with glorious 5.1. Does she care? Not so much.

But she knows that I drive our tech better than she does and she's happy to leave it to me.

It used to be common practice in software to offer what was called an "expert mode" that simplified interfaces and allowed users to employ shortcuts to get what they needed. It was like a manual transmission for word processors and spreadsheets.

Today, "expert mode" still exists, but even it is being dumbed down.

“Is there an innate ability in some of us to just pick up a smartphone, laptop, tablet or home theater remote and know how to drive?”

Mac experts, for instance, can be seen using keystrokes and multi-touch gestures to move from app to app and trigger other OS-level actions. The problem — if you can call it a problem — is that Apple is trying to get everyone to use these shortcuts. They tell us this is better for all of us, but we just want our keystrokes.

The intention is good: get people to use their tech more quickly and easily. The results, though, are people confused by the gestures or not using them at all while the experts are stuck stumbling through unnecessary steps to do what they need to do. In extreme situations, we resort to installing middleware that enables old-school keystrokes and shortcuts.

Are some people simply better drivers of technology? Outside of years of practice, is there an innate ability in some of us to just pick up a smartphone, laptop, tablet or home theater remote and know how to drive because we know what kind of processors and operating systems are between us and what needs to be done?

The answer is an obvious “yes,” but when I watched my fiancée toss me the remote without a care in the world, I realized that it’s less about skill than it is desire. Some people just don’t want to be bothered.

“Just put the movie on,” they say. They don’t care how they got there.

Similarly, auto enthusiasts watch other drivers creep by in automatic transmission slush boxes and wonder why they even bother. Truth is, though, that in most cases, they’re moving around in a more efficient, cost-effective car the whole time.

Meanwhile, those who just use their smartphones to make calls, update their social networks, take photos and watch some videos are, possibly, having more fun than we are because at the end of the day they don’t care how they got there. They’re sitting at the bar with their friends Instagramming and tweeting while the rest of us are agonizing over browser choices.

In truth, though, we’re not moving much faster than they are. We just want to play with our stuff on the way. Maybe that’s why we all rush for the new gear: it’s unexplored and challenging and brings us back to those rare moments when we didn’t know how to drive. In secret, maybe, we love it when things are hard to use. D

ANDROID'S TABLET TROUBLES

BY ROSS RUBIN

IF GOOGLE HAD TO PICK a device category in which it wanted Android to dominate, it would certainly be mobile phones for many reasons. Indeed, the original band of Android backers was dubbed the Open Handset Alliance. However, a strong position in tablets would not only have helped to round out the Android ecosystem, it would also have created a beachhead from which to take on Microsoft prior to the launch of its tablet strategy.

Alas for Google, sales of Android tablets have been lackluster and several PC-centric licensees — including Acer, Dell, Lenovo, Sony, Toshiba and even Android standard-bearer Samsung — are hoping to improve their standing in the tablet market with imminent products based on Windows.

With just a few weeks before that onslaught and a new iPad expected, Google recently implored developers yet again to optimize for tablets, detailing guidelines to enrich their apps for the larger form factors. This is at least the fourth major attempt by the Android benefactor to step up developer support for its tablets.

ROUND ONE

After the lackluster performance of the original 7-inch Galaxy Tab, Google seemed to start things off on the right foot (at least in terms of encouraging optimization) with the Honeycomb release of Android. However, the relatively low volumes of that operating system may

have put off developers to the idea of optimizing Android apps for tablets. Indeed, Google set a precedent by refusing to establish a tablet-optimized classification for what was then Android Market, a stark contrast to the highlighting of iPad apps in Apple's App Store.

ROUND TWO

Things seemed as if they would get better with the release of Ice Cream Sandwich, which finally reunited the tablet and handset (and TV) versions of Android under code that Google made available. At its launch, Google promised to make an extra effort to encourage optimizations for tablets while sticking to its guns on not highlighting tablet-optimized versions of software. Apple continued to showcase the higher quality of iPad apps versus their Android tablet counterparts, including Twitter (which has likely been turned off by Google's aggressive marketing of a competitor in Google+).

ROUND THREE

The success of the original Amazon Kindle Fire brought Google back to a play from its handset playbook. It partnered with a licensee to create a Nexus device and, like Amazon, highlighted the digital media commerce integration of the Nexus 7 at a low device price. The Nexus 7 served to raise the profile of Android tablets, but hasn't moved the needle dramatically and of course has had almost no impact on where the real volume has been in terms of the iPad and the hybrid-honed ambitions of PC vendors.

> "Google has continued to push for tablet apps while trying to cling to the idea that all apps should be scalable."

Throughout all this, Google has continued to push for tablet apps while trying to cling to the idea that all apps should be scalable. That, though, is an inordinately developer-focused message. Consumers don't care about how apps come to take advantage of their devices, but they do notice an experience that doesn't measure up to what a device is capable of. Google must match its Google Play push with its Android app efforts. It doesn't necessarily need to create a tablet app category. However, much as it wouldn't want to sell low-fidelity music or movies riddled with compression artifacts, it must do a better job of consistently matching optimized apps to a tablet audience. That is the best way to reward developer effort. D

ALIENS, ASSASSINS AND THE WAY THINGS WERE

joystiq

REACTION TIME

DISTRO 10.12.12

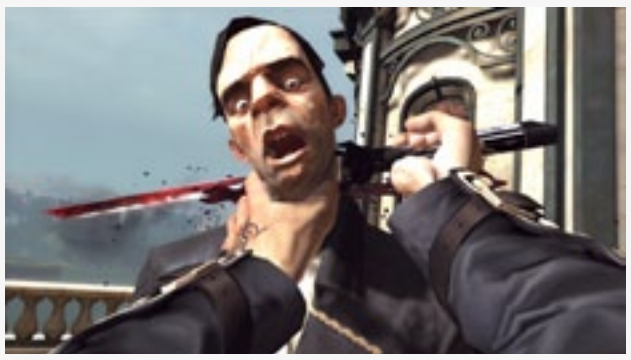
FORUM

BY LUDWIG KIETZMANN

THIS HOLIDAY'S UNCEASING GLUT OF games is officially underway, with store shelves making room for the onslaught of snarling aliens, sneering assassins and slow-mo soldiers walking away from a large explosion — or sometimes a partially melted helicopter. These are the usual, commercially sexy suspects. It's best not to judge a game by its cover, though, and this week's front-facing embellishments are exceptionally deceptive. At a shallow glance, *XCOM: Enemy Unknown* may seem like another case of meathead military dudes mowing down extraterrestrials, while *Dishonored* conveys a stylish stab-a-thon with its masked, supernaturally talented anti-hero out for revenge. Look longer and you'll find that both have roots in classic PC gaming, and both sell something console owners might not even know they want.

XCOM: Enemy Unknown is a challenging and consuming turn-based strategy game, complete with resource management and long-term research goals. There's no reward for twitchy reflexes or the seamless piloting of a crosshair onto an alien's head — only thoughtful shepherding of troops through hostile environments. When a soldier dies, they are dead forever.

5 NEW GAME RELEASES FOR THE WEEK OF OCTOBER 12TH



DISHONORED

Xbox 360, PS3, PC – $60

XCOM: ENEMY UNKNOWN

Xbox 360, PS3, PC – $60

Click on game to buy

Played on higher difficulties, it's entirely possible to start the single-player campaign, make significant progress, and then lose to the E.T. encroachers. Despite all the UFOs, there is so much in this game that just does not fly.

Or, so you'd think — *XCOM* has been met with critical acclaim and been praised for its expert modernization of the classic game of the same name, which debuted in a time when your processor's megahertz (mere MEGA-hertz!) might have been the subject of gloating. 2K Games and developer Firaxis deserve every credit for diving into the holidays with a game so bold and unapologetic, and so defiant of the general audience's expectations. I can't say for sure that it'll be a big hit (the alien-blasting soldiers on the cover must help a little bit), but I'm sure it'll find fans ready to lament how little of the serious, turn-based strategy genre has made it to consoles.

Meanwhile, *Dishonored* is also raking in the positive reviews, and it too

FABLE: THE JOURNEY

Xbox 360 – $50

RETRO CITY RAMPAGE

PS3, PC, Vita – $15

THE WALKING DEAD: EPISODE FOUR

Xbox 360, PS3, PC – $5

You can summon a swarm of rats to attack guards or dispose of an unsightly corpse (gross!), and you can possess people and creatures to keep a low profile in restricted areas. So ... why not try possessing one of your own rats?

comes from a background of complex PC games. One of its lead designers, Harvey Smith, had a hand in *Deus Ex*, the so-far-ahead-of-its-time shooter and RPG hybrid that, come to think of it, is still ahead of its time. The "immersive" first-person sim with stealth and action elements isn't as fresh as it used to be — most recently hitting a high note in *Deus Ex: Human Revolution* — but the style of game design is relatively uncommon, and a startling antithesis to the linear, script-heavy approach of a *Call of Duty*.

Dishonored's steampunk-ish setting is unique in itself, but the layered, systemic approach to mission design is what sets it apart from most games this holiday, and what most brings to mind PC classics like *System Shock*. Your assassin, a wronged man named Corvo, can combine his subtle movements with flashy supernatural abilities, all of which can interact with enemies and complex environments in ways that obey the general rules of the game, but don't follow a prescribed course.

(The game's vermin population carries the simplest example of that emergent, improvisational style: You can summon a swarm of rats to attack guards or dispose of an unsightly corpse (gross!), and you can possess people and creatures to keep a low profile in restricted areas. So ... why not try possessing one of your own rats?)

Between *XCOM: Enemy Unknown* and *Dishonored*, we're seeing an atypical start to Q4's annual abundance of games. Their successful attempts to retrieve and retool old-school concepts for modern audiences is worth noting now, because by November we'll probably be hearing complaints about how everything is basically a dumbed down shooter with aliens, assassins and soldiers. D

REVIEW

DISTRO
10.12.12

CONTENTS

Canon EOS M

Samsung Galaxy Note II

Acer Iconia W510

REVIEW

CANON EOS M

Image quality is key and the new Canon EOS M mirrorless ILC excels, but will this new shooter capture your full attention?

By Zach Honig

It's here. Finally. Well, that is, if you happen to live in Japan. Canon's very first mirrorless interchangeable lens camera should be hitting shops the world over just as you begin to make room for that decked-out evergreen conifer, but the EOS M is already making the rounds in Canon's home country. It's available at select Japanese retailers for ¥109,900 (about $1,410, including sales tax). That lofty price will net you the EOS M in black, white or silver (the glossy red model remains elusive), complete with 55mm f/2 and 18-55mm f/3.5-5.6 EF-M optics, a Speedlite 90EX external

flash and the EF-M Lens Adapter, enabling full compatibility with any and all of your EF and EF-S lenses. The US variant, which comes bundled with only the black 22mm "pancake" STM lens, should run you $799 when it appears stateside beginning October 15th, though neither country's model carries a particularly competitive price tag, especially considering how diverse (and well-equipped) the mirrorless ILC market has become.

You might argue that Canon is borrowing a play out of Nikon's book when it comes to pricing the EOS M — had the camera offered full DSLR functionality, including an advanced user interface, a $799 sticker might be justified. But the company has crippled its new compact shooter so as to avoid cannibalizing its still-successful full-size APS-C DSLR lineup, which includes models ranging from the Rebel T3 (about $475) to the EOS 7D (about $1,350). Appropriately, the EOS M falls right in the middle in terms of capabilities, with the added benefit of a new, nearly pocketable design that should win over more than its fair share of amateurs. That said, there's a reason larger SLRs remain on the market, and Canon very much wants to retain that solid footing. The EOS M isn't for everyone, and that's by design. But is it the right pick for *you*? Join us as we try it on for size.

Canon chose not to include its useful mode dial on the EOS M.

HARDWARE

All cameras are not created equal — not even all EOS Ms. Sure, each of the four compact flavors may carry the same 18-megapixel APS-C CMOS sensor, 1,040,000-dot 3-inch touchscreen and arguably mediocre UI, but only one has a remotely premium shell. We're not talking about white, or red, or even silver. Only the black model, which drops the glossy plastic housing in favor of a matte coat, offers the look and feel of an $800-plus mirrorless compact. As cheap and plasticky as its (relatively) colorful counterparts may be, the black version has a fantastic, slightly textured finish. That's not to say it'll necessarily

The EOS M sports a new quick and easy-to-attach strap.

be the SKU that flies off store shelves, but photographers who are at all serious about their work will likely steer clear of the other three.

Color aside, there's a bit more bad news to get out of the way. Perhaps you've seen the dedicated mode dial that's become the trademark of anything premium at Canon. Even the new PowerShot SX160 IS has the familiar controller, and that model tips the till at just $199. So, does $800 and up deliver direct access to shooting modes, advanced or otherwise? No, it does not. And, well, we can't express our disappointment enough here — not only does a mode dial simplify the process of selecting your primary shooting preference, it also serves to provide confirmation of your current pick, letting you know that you're in manual before you fire off a half dozen now-useless frames. The EOS M does provide this feedback on-screen, but it's just not the same, and the requisite triple tap to bounce between modes is inconvenient, to say the least. Canon could have done a heck of a lot better than this.

Speaking of taps, you'll be using that touch-enabled display for far more than you may have assumed. The touch-to-focus (and expose/capture) option is nice, but it's easily outweighed by the need to touch the LCD to adjust ISO, for example. As a side note, the EOS M offers an image sensitivity range of 100 to 25,600 (up to 12,800 when capturing video) — we'll get into that in further detail later on. There's also a 31-point AF system, continuous shooting modes of 4.3 frames-per-second with fixed focus on any lens or autofocus using

an EF or EF-S lens, 1.7 fps with autofocus on the 18-55mm EF-M optic or 1.2 fps with autofocus on the 22mm EF-M lens, and 1080/30p and 24p, 720/60p and 50p and 640 x 480 shooting at 30 or 25 frames per second.

Now, back over to those rather horrid controls. The EOS M's rear is akin to that of most Canon point-and-shoots, but given that this isn't a low-cost model, that layout has no business making an appearance here. At the top of the camera, there's a power toggle, a dial to select from auto, standard and movie modes, and a shutter release. There's also a full-size hot shoe (huzzah!) and stereo mics (yes, they're on the top and not the front, making them perfectly fine for narration but less than ideal for interviews). You can counteract that mic placement by adding your own audio capture device thanks to the standard microphone input jack that joins HDMI and USB connectors on the left side. Plus, since there is in fact a standard hot shoe, you will have somewhere to mount an external mic.

Around back, just to the right of the LCD, is a thumb rest and adjacent video record button, followed by Canon's standard lineup of menu, playback, info and dial controls. There's also a five-way toggle that can be used to navigate menus, jump through images during review, and directly access shutter mode, exposure compensation and delete options. On the bottom, there's a standard tripod socket, an SD card slot and a battery compartment, complete with an 875mAh LP-E12 cell (replacements should run you about 75 bucks). You'll find the requisite shoulder strap in the box, this time with a nifty connector that simply slides onto the camera and locks into place with a thin coin or key, along with a USB cable, AC adapter and, in the case of our test model, a Japanese-language user manual. We mostly like the strap design, but because it's able to rotate when locked into position, it's very easy to end up with a bunch of tangles.

What you won't find is a built-in electronic viewfinder, or even an optional attachment (there's no connector present, so it won't be coming in the future, either). The 3-inch LCD is quite sharp, at just over 1 million dots, but it's fixed in place, so there's no way to get it to tilt or swivel. We use this feature on the NEX-C3 on a daily basis, so not having it here really is a significant drawback, especially considering Canon's implementation on models like the PowerShot G12 (sadly its G15 successor does indeed drop this feature). The display's viewing angles are decent, even in bright light, but looking from above or below is really no match for a straight-on view.

USER INTERFACE

The EOS M surely isn't the first mirrorless camera to pack a touchscreen, and even though there are a handful of hardware controls, there's no way to completely eliminate the need to tap. While

The EOS M has a solid, but immobile 3-inch LCD display.

it's often inconvenient, you *can* get through most of the menus with a few clicks, but you'll likely find yourself tapping the LCD more frequently than you'd wish. There is a rather limited dial on the top — options here are restricted to a full-automatic mode, an adjustable mode and video capture — and while this switch will get plenty of use, we wish there were an option for accessing scene modes and manual, aperture and shutter priority in the same way.

The movie position is also an unnecessary addition — we would have much rather seen Canon follow the lead of other manufacturers and let you launch a shoot simply by tapping the video record button, rather than requiring you to first flip to movie mode, *then* hit that little red dot. You can still shoot stills in movie mode, but they're captured with a 16:9 aspect ratio, so you'll need to keep this in mind and flip back to one of the two other settings before you start snapping away — unless, of course, you don't mind super-wide shots.

The menu itself is a cross between Canon's point-and-shoot setup and its full-size DSLR offering — settings are far more limited than what you'd find on the 5D, for example, though also more generous than what's available with most of the company's compact models. Options change depending on your current mode, which helps to reduce clutter, but adds confusion, since you can only tweak movie settings while in video mode, for example. There's also a fairly basic Custom Functions page, which is where you'll select such options as ISO expansion (to 25,600) and the AF-assist beam status.

PERFORMANCE AND BATTERY LIFE

We've seen mirrorless cameras that pack absolutely fantastic focusing systems. Then, there are those that nearly drive us to tears, instantly tarnishing our opinion of otherwise capable models. We were devastated to see that the EOS M's focusing performance falls just shy of that latter grouping — the cameras that just plain stink at bringing a

The battery life here is far from optimal, you may want spares.

subject into focus quickly. We feared as much during our hands-on this past summer, but Canon reps at the time reminded us that the flavor we were sampling was but a pre-production version. At that point, the M struggled with everything from the 22mm and 18-55mm EF-M kit lenses to a massive 400mm f/2.8 L.

This time around, with our store-bought final model, we weren't able to test it alongside any of the company's tried-and-true heavy hitters, but both EF-Ms indeed fell far short. It's not the most sluggish focusing we've seen, but it's darn close. We did notice a slight speed boost in FlexiZone - Multi mode, so you'll probably want to opt for that if you don't need to choose a single point. Granted, focusing is perfectly accurate, but if you're looking for speed, it's time to pack up your bags and hurry along. If this move was intentional, Canon's message has been received loud and clear — serious photographers can ogle at the company's compact creation all they like, but once they dig deep, they'll come running back home to their tried-and-true form factors, leaving the svelte M to more casual types. Canon surely could have done better here, but it didn't, and we can't help but think

that call was made far up the food chain, amid some decidedly heated engineering debates.

Battery life, meanwhile, is far from stellar. We were barely able to get through a full day on a charge, so you'll want to pick up spares before your next safari. Perhaps we've been spoiled by Canon's pro offerings, but this device won't suffice for more intense shoots unless you have backup nearby. The battery meter itself isn't terribly useful — there are only three positions in the indicator with no remaining percentage, and we were completely dead shortly after the battery displayed two bars, after capturing just over 250 stills and 12 minutes of 720/60p video.

IMAGE QUALITY

The shooting process itself may not be the EOS M's banner feature, but image quality is quite impressive, even in low light. As we mentioned, you can kick the ISO all the way up to 25,600, though we didn't find any need to venture beyond 6400 when using the camera's 18-55mm image-stabilized kit lens. Nighttime and day-lit shots alike looked fantastic, with sharp details even when viewing each 18-megapixel image at 100 percent zoom.

The EOS M captured quality shots in a variety of lighting situations.

The M's f/2.0 prime kit lens not only enables low-light captures with faster shutter speeds, but it also yields beautiful bokeh. Color balance, exposure and sharpness are superb.

The sharpness and exposure are excellent as well.

Scenes yielded spot-on color accuracy and exposure. The camera's 18-megapixel sensor even let us make out text on a highway sign hundreds of feet away.

Night scenes are never easy, even for the most powerful DSLRs. The M tackled an Akihabara street with ease, in full-auto mode (we found this setting to be more accurate than aperture priority when shooting after dark or in low light).

Dark laptops aren't easy to photograph, especially when displayed against a backlit surface, but the EOS M did excellent work, with great color balance to boot.

A recent photoshoot of Toyota's Smart Insect prototype EV was shot at ISO 3200, and offered excellent color accuracy and limited noise, even when viewed at 100 percent. In fact, we spent a day shooting at CEATEC with the M fixed at ISO 3200, which came in handy in dimly lit booths, with great results overall.

You can't properly test a mirrorless camera these days without shooting plenty of video, so we hit the streets of Tokyo to grab some footage in Harajuku, the subway and an Akihabara arcade in order to evaluate image quality and audio in a variety of situations. In video mode, ISO tops out at 12,800, and there's a full manual option that enables you to set aperture, shutter speed and sensitivity. When set to auto, exposure compensation is the only adjustable setting. You can also choose from one-shot or continuous focus — if you opt for the latter, simply tap on the bottom left corner of the display to jump back to continuous, or press the shutter halfway to adjust focus once. You can shoot stills during recording by pressing the shutter fully, but the video will freeze for about one second, so you'll probably want to avoid that feature.

We found the microphone to be excellent when used for narrations, even in noisy environments, but the top-mounted mics were less effective for interviews — for these shoots, we'd recommend taking advantage of the M's audio input jack by adding an external mic. We also brought the camera along for a day of trade show hands-ons at CEATEC — while focus was occasionally an issue, the STM kit lenses enabled silent focusing and smooth manual zoom.

THE COMPETITION

There's plenty of good news here, just not much for Canon. With dozens of mirrorless cameras coming onto the market each year, there is now a wide range of options available to consumers — many models are priced well below Canon's $799 sticker. If fast focusing doesn't top your list of priorities, the $500 Sony

NEX-F3 kit is a relative bargain, building upon the NEX-C3's strengths while adding features that have become key in 2012. The NEX-6 ($850, body only) is also worth your consideration, adding a built-in EVF and a mode dial that the EOS M so desperately needs.

If you do have a need for speed, the Olympus E-M5 ($999, body only) or the company's latest PEN kits, the E-PL5 ($700) and E-PM2 ($600), have certainly proven their worth on that front — focusing performance is on par with top DSLR options, and you also get more advanced controls and a tilting LCD. For video buffs, Panasonic has made a huge push with its Lumix GH3, and while that option has yet to hit stores, you shouldn't have long to wait.

WRAP-UP

We like the Canon EOS M — far more than we might have expected, given its mediocre performance during our hands-on — but the company's first mirrorless ILC falls short on several fronts. Professional photographers can affix their pricey L lenses, which is nice, but the dismal focusing performance means SLRs will probably be far more appealing to these users. With the M, Canon is providing a digital camera bridge of sorts in the hopes of capturing the hearts (and wallets) of amateurs looking to step up from point-and-shoots. Indeed, this is far more versatile than what these beginners are used to, yet it's still built on a simple interface that isn't intimidating. Granted, this isn't what the pros had been hoping for, but Canon's DSLR series clearly isn't ready to free these users from their hefty housings, leaving the company's ever-strong professional lineup to live another day. D

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BOTTOMLINE

CANON EOS M

$799

PROS

- Excellent image quality
- Attractive, sturdy build
- EF and EF-S lens compatibility

CONS

- Sluggish focusing performance
- No mode dial and sub-par UI
- Below-average battery life

BOTTOMLINE

Canon's first mirrorless camera offers top-notch image quality, but it fails to meet our expectations in terms of focusing and usability.

REVIEW

SAMSUNG GALAXY NOTE II

The original Note made it big by breaking the smartphone mold, but is the new Galaxy Note II its worthy successor?

By Brad Molen

Samsung's first crack at a smartphone larger than five inches came last year in the form of the Galaxy Note. It was wildly different than most phones we'd seen before: it was massive, for one, and involved the use of a ~~stylus~~ pen, a sorely outdated concept at the time. Who would be willing to buy this thing? Yet, despite its enormous size, this tablet / phone (forgive us: *phablet*) captured more hearts and wallets than even Sammy had probably expected. The S Pen showed that it was more than just a simple stylus, artists and tech enthusiasts alike loved it

and a successful marketing campaign helped push millions of units. The Note was an undeniable hit.

Did Samsung realize at the time that it was sitting on a gold mine? It's hard to know for sure, but its success meant only one thing: an inevitable sequel. The Galaxy Note II, introduced a year after its parent, has some big shoes to fill. We believe it's up to the task, though: it boasts a quad-core Exynos processor, twice the RAM, an even larger display and a whole new bag of S Pen tricks. It sounds compelling, but does the new version truly trump the old? Is it worth another sound investment (pricing varies, but it starts around £530 for a SIM-free version) just a year down the road?

HARDWARE

To gaze upon the newborn Galaxy Note II is to take a crash course in Samsung's preferred design language. Whereas the original bears the same overall look and squarish corners as the Galaxy S II, its successor is — you guessed it — just as inspired by nature and "designed for humans" as the Galaxy S III. We wouldn't rule out the possibility of you mixing them up (the size difference is a dead giveaway, but the phones look quite similar otherwise). Indeed, Samsung is now in the habit of changing things up on a yearly basis, which may seem more boring than once every couple months. By adopting an annual design cycle, however, devices like the Note II likely get pushed through the initial stages of development much faster than they would otherwise. We also imagine that the company's new strategy of consistency will have a significant impact on Samsung's brand recognition.

Owners of the original Galaxy Note — whether it be the global N7000 or one of its many variants — know all too well how it feels to get the occasional "what *is* that thing?" from random passersby. So will the peanut gallery continue to snicker when you take this out in public? At 3.16 inches (80.5mm) wide, 5.95 inches (151.1mm) tall and 0.37 inches (9.4mm) deep, the Note II is slightly thinner, narrower and taller than its parent. This, along with the pebble-like shape, definitely offers a more comfortable experience when you're cradling it in your hand, though it's just a tad heavier at 6.35 ounces (180g). Despite being more attractive than the first Note, it's none-

Side-by-side comparison of the original Note and the Note II.

Samsung bumped up the battery to 3,100mAh for the Note II.

theless an indisputably large device, and will continue to draw stares for that reason. (In other words, you'll want to come up with a standard talk track for those times you're approached by curious strangers.)

While we all want our smartphones to stick around for a long time, the matter of build quality is extremely important here, given the fact that the phone's size makes it more prone to drops. That's why we're happy with the company's decision to use a polycarbonate chassis, similar to the one on the Galaxy S III. After handling the Note II on a regular basis, we're confident that Samsung's crafted a durable, solid device. (As an aside, you can find a few drop tests circulating the web. Spoiler: it holds up extremely well.)

Because the new Note has a larger display and thinner chassis, the buttons on each side have been scaled down a notch. The power key, for instance, now rests in a much more natural position that's easier to find by feel. The only downside? It's also much easier to press the button accidentally.

Since we're discussing button placement, we'll continue with the full Vanna White-style tour: beginning with the front, you'll find an LED notification light (which wasn't on the first Note), an earpiece, sensors and a 1.9-megapixel camera above the display, while the large physical home button found below the screen is flanked by two capacitive keys (menu and back) on either side. The bezel on the top and bottom are smaller than on the OG Note, though the left and right bezels are about the same.

The front is frankly the busiest part of the phone; Samsung professes a policy of minimalism the rest of the way around the Note II. There's a power button on the right, volume rocker on the left, S Pen holder and micro-USB charging port (with MHL capabilities —

SPECIFICATIONS	GALAXY NOTE N7000	GALAXY NOTE II N7100
DIMENSIONS	5.78 X 3.27 X 0.38 INCHES (146.9 X 83 X 9.7 MM)	5.95 X 3.16 X 0.37 INCHES (151.1 X 80.5 X 9.4 MM)
WEIGHT	6.28 OZ. (178G)	6.35 OZ. (180G)
SCREEN SIZE	5.3 INCHES	5.5 INCHES
SCREEN RESOLUTION	1,280 X 800 PIXELS (285PPI)	1,280 X 720 PIXELS (267PPI)
SCREEN TYPE	HD SUPER AMOLED	HD SUPER AMOLED
BATTERY	2,500MAH	3,100MAH
INTERNAL STORAGE	16GB	16 / 32 / 64GB
EXTERNAL STORAGE	MICROSD (UP TO 32GB)	MICROSDXC (UP TO 64GB)
REAR CAMERA	8MP	8MP
FRONT-FACING CAM	2MP	1.9MP
VIDEO CAPTURE	1080P	1080P
NFC	IN SELECT VARIANTS	YES
RADIOS	HSPA+ / UMTS, GSM / EDGE, LTE	HSPA+ / UMTS, GSM / EDGE; LTE (IN THE N7105)
BLUETOOTH	VERSION 3.0	VERSION 4.0 LE (WITH APT-X SUPPORT)
SOC	1.4GHZ DUAL-CORE EXYNOS 4212	1.6GHZ QUAD-CORE EXYNOS 4412
RAM	1GB	2GB
MHL	YES	YES, BUT REQUIRES SAMSUNG ADAPTER
OPERATING SYSTEM	ANDROID 2.3 (UPGRADED TO 4.0)	ANDROID 4.1 JELLY BEAN

more on that later) on the bottom and 3.5mm headphone jack up top. Even the back keeps relatively quiet, sporting the 8-megapixel camera module and LED flash just barely above the singular Samsung logo, as well as a speaker grille that hangs out near the bottom. The battery cover lies completely flat across the back of the phone (with the exception of the slightly raised camera and speaker) and curves inward as it prepares to meet up with the edge.

A design decision we've always appreciated from Samsung is the removable battery, which has been increased to 3,100mAh (up from 2,500mAh on the original Note). Above it you'll see slots for micro-SIM and microSDXC

cards as well as contacts for NFC and wireless charging.

Our particular review unit, provided to us by our friends at Negri Electronics, is the white N7100, the global version which lacks the superfast LTE speeds many users crave. Thus, folks looking for the fastest Note II around will need to grab the N7105, which offers the next-gen data in bands 7 (2600MHz) and 20 (800MHz). For those keeping score, you can see if your country utilizes these frequencies here. Speed demons in the US may also be interested in variants of the Note II coming out to AT&T, Verizon, Sprint and US Cellular, though there should be very few cosmetic discrepancies between them and their global counterparts — much like we saw with the Galaxy S III series.

Both global versions of the Note II are capable of 21.6Mbps HSPA+ (850, 900, 1900 and 2100MHz) along with quadband GSM / EDGE. They also boast dual-band (2.4 and 5GHz) WiFi 802.11 a/b/g/n with WiFi Direct, Bluetooth 4.0, DLNA and NFC.

This display packs a BGR matrix , breaking the PenTile mold.

DISPLAY

The Note II's display has earned a whole section unto itself because it's, well, a little *different*.

And we're not just talking about the fact that the newer version uses a larger panel with even fewer pixels than the original: there's more to it than meets the eye (the naked eye, at least). First, a little background: when the sequel was announced with a 1,280 x 720 HD Super AMOLED panel, we naturally assumed that it would be sporting a PenTile matrix. After all, that's exactly how this type of display has been laid out in other handsets, so it's easy to break out the 'ol jump-to-conclusions mat. However, the microscope (and Samsung's spokespeople) tell us that this isn't the case at all.

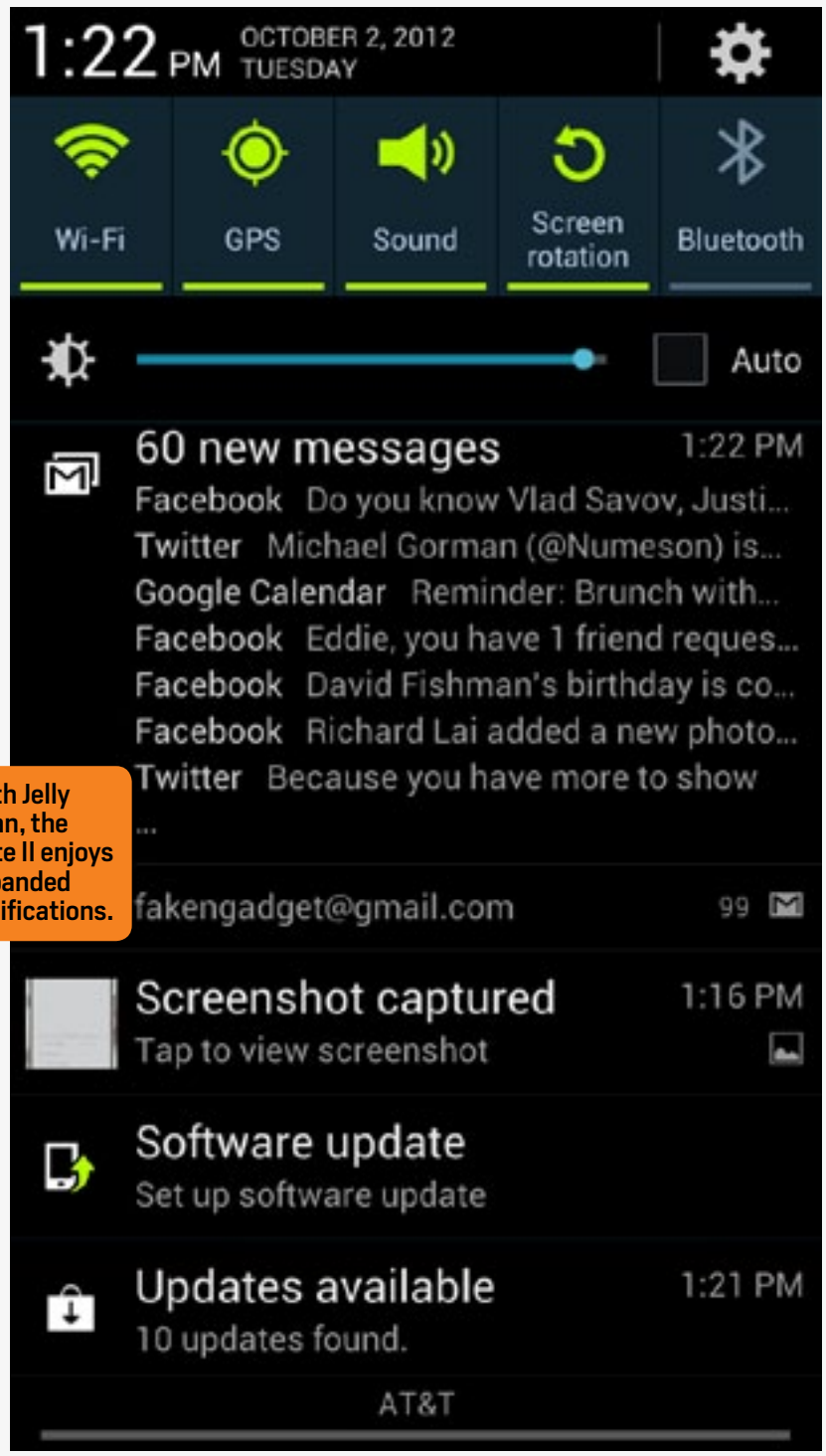
Oddly, though, it isn't the traditional RGB matrix as we've been accustomed to on most non-PenTile phones,

either. Instead, it appears to be laid out in a non-striped BGR matrix in which the blue subpixels are perpendicular to green and red, rather than in parallel. This puts the display in a magical place where few Super AMOLEDs have gone before, but it's still a hefty improvement over the first Note. Don't get us wrong: we raved about the OG's 1,280 x 800 display (and rightfully so), but its follow-up looks slightly better despite the lower ppi (267, versus the original's 285). We doubt casual observers will notice the difference, but when closely viewing the two side by side, we found more pixels on the older device. Darks are a little darker on the second-gen model, and colors are just a bit more saturated, too. The viewing angles on the next-gen Note are also great for watching movies, but they're essentially the same as the original. Daylight viewing wasn't a problem with the brightness cranked up above 75 percent.

SOFTWARE

The Galaxy Note II is the first Samsung device to ship with Jelly Bean (Android 4.1.1, to be exact). All of the OS' new and enhanced features have been worked into the TouchWiz UI. This includes Google Now (long-press the menu button to activate it), expandable notifications and predictive keyboard — heck, even the Jelly Bean easter egg is there. It also includes the laundry list of new services Sammy introduced on the Galaxy S III, such as Smart Stay, S Voice, AllShare Cast and S Beam. (S Beam, by the way, adds the ability to transfer Note II docs to other Note II devices, but since we only have one tester phone, we haven't had the chance to try this out.) Popup video, which allows your selected video to "hover" over other apps, allowing you to multitask, also makes a repeat appearance here, and it's definitely a better experience when you have such a large screen to use it on.

TouchWiz on Jelly Bean isn't unlike



With Jelly Bean, the Note II enjoys expanded notifications.

the experience you've had on Ice Cream Sandwich — Samsung, as you'd expect, wants to keep the UX as consistent as possible. One of the biggest areas of change is the notification menu: in addition to the expandable notifications (which can be accessed by taking two fingers and pulling down on the notification), the brightness settings are now accessible underneath the quick toggles, and the status bar now houses the settings button and offers the date and time in a larger font. There are plenty of other new tweaks that make excellent use of the new S Pen capabilities, which we'll explain in more detail shortly.

Blocking mode is Samsung's take on Do Not Disturb. You can disable a number of various notifications, set a specific timeframe for them to be turned off and even set up a whitelist of allowed contacts that can bypass the block and sound a notification when they call you.

While we expect a device like the Note II to appeal mainly to smartphone buffs, Samsung is at least making an attempt to make first-time users feel comfortable. You can opt to change from the standard home screen to what's called "easy mode," which is essentially just a different launcher complete with customized pages and large widgets. Aside from that, there are very few things that differ from your normal TouchWiz experience — it's a rather half-baked attempt at wooing a new demographic.

Samsung's set of motion controls are much improved from the old Note to the new, with the sequel now matching (and exceeding, in a couple cases) the Galaxy S III's functionality in this department. To recap, you can scroll to the top of a screen by double-tapping the top edge of the phone; tilt to zoom in and out of the screen in the gallery or browser; pan the phone to move icons on the main screen; shake your phone to look for updates; turn over the phone to mute sounds; directly call whatever contact is displayed on the screen; and more. There are a few newcomers to the Samsung fold: quick glance shows you a few basic notifications when you wave your hand over the proximity sensor and there are a few new advanced settings to adjust the level of sensitivity required to trigger motion when panning or tilting your device.

Finally, another slick new feature is Smart Rotation. If you're like us, there's a certain annoyance that comes with using the phone while in bed or on the couch because it switches screen orientation on a frequent basis. While you can typically find toggles that lock this, it's not always the best solution — watching movies or looking at pictures are a couple of examples. Smart Rotation uses the front-facing camera to determine where your face is, and will prevent the screen from switching to landscape mode if you're still using your phone in a portrait position.

One more thing: as with the Galaxy S III, Note II owners are entitled to 50GB of Dropbox storage.

S PEN

The crown jewel of any Note device is its accompanying stylus (we know, we're not supposed to call it that), also known as the S Pen, and Samsung continues to improve on it with each new version. Indeed, the original Note, Note 10.1 and Note II all have somewhat unique pens, but they all have the same overarching design and can work interchangeably. That's handy information for anyone who loses their Wacom appendage, though there's one drawback: not all S Pens are shaped the same, so they don't all fit interchangeably in each other's cradles. The original Note pen fits loosely inside the Note II's cradle, and we wouldn't count on it staying in for very long before popping out.

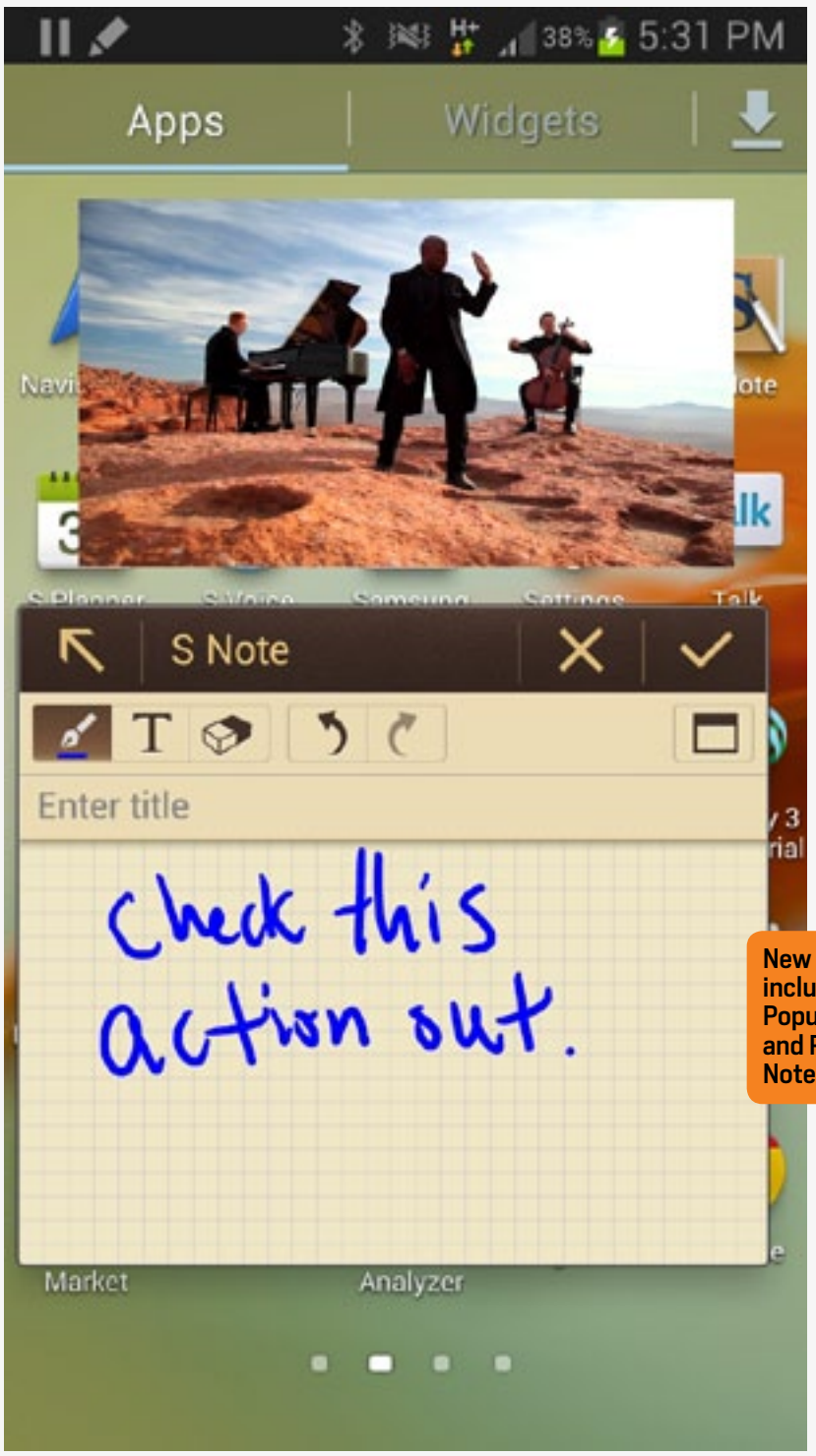
Ergonomics are a huge consideration when Samsung designs its pens and indeed, each iteration seems to have a better in-hand feel. The Note II's S Pen is slightly fatter on the button side, which — when pressing your thumb against it — contributes to more of a true pencil feel. Also adding to the nostalgia of using an old-fashioned number two is the larger rubber tip, slightly bigger diameter (8mm) and increased length of the pen itself. It also doesn't hurt that you can tell the phone if you're right- or left-handed (sorry, ambidextrous users, you have to choose).

We suppose it shouldn't come as a revelation that the second Note's S Pen and Wacom digitizer have more in common with the Note 10.1 than the original Note. First, the device recognizes when you've removed the pen from its holster and, smartly assuming you'll imminently be using it, takes you to a special page with several pen-optimized apps. (It also lets you set an alarm that activates if your S Pen and Note get too far away from each other.) Also, much like the tablet, the Note II is capable of recognizing up to 1,024 levels of pressure sensitivity, a four-fold increase over the OG Note's 256. As a result, we noticed an

Unholstering the S Pen takes you to a pen-related apps page.

improvement in accuracy and precision when using the pen for writing, sketching and other activities. What's more, the screen does a much better job of calculating how much pressure you're applying.

This only scratches the surface of what the S Pen is capable of. The Note II not only ushers in enhancements to existing features; it also brings a suite of new features that make the phone even more tantalizing than last year's model. Even the button itself is refreshed: you can now hold down the button while drawing gestures on the screen to access features like the Quick Command tool (we'll cover this later) and a few other navigational abilities. Additionally, you can now copy specific parts of the screen with Easy Clip, which is activated by holding down the button and drawing around the area you want to clip. Once it's clipped, you can choose to save or discard what you've selected. You can also select text by holding the button, tapping the screen and dragging the pen across. And we're just getting started — the button is capable of plenty more, and we'll discuss its many new talents later in the review.



New features include Popup Video and Popup Notes.

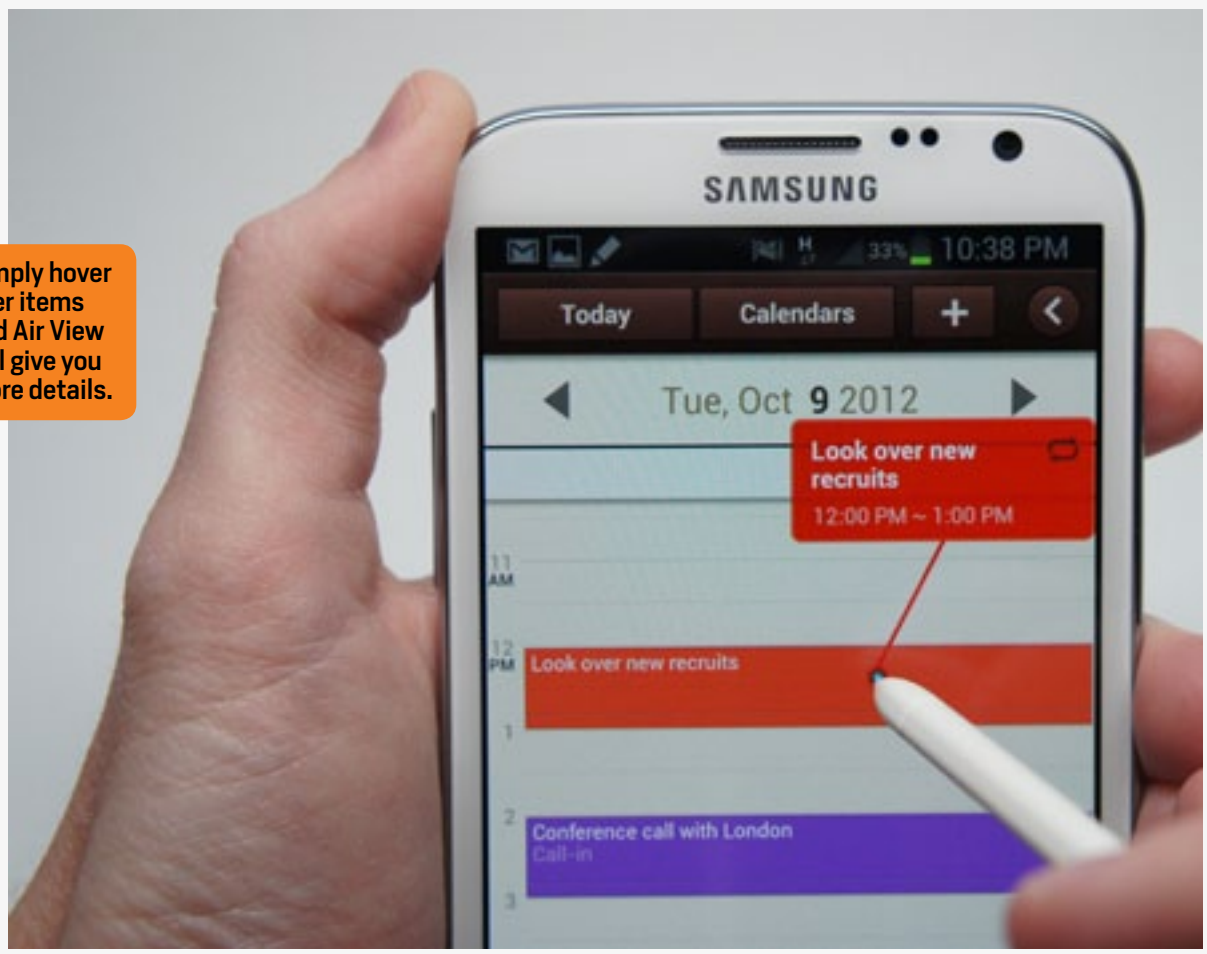
Before we dive into the first feature, it's important to note that the Wacom digitizer included in the phone is capable of sensing the S Pen as it hovers over the screen, in the same fashion that we've seen in Bamboo Pads for the last few years. As you hold the pen above the panel you'll notice a floating cursor on the screen. This opens up a lot of interesting possibilities, one of them being Air View. Using this feature, the Note II takes advantage of the hover functionality in several ways. For instance, you can hold the pen over emails in your inbox (in the general email app for now, at least) and a pop-up box displays the first few lines. Do the same in your calendar and those pesky appointments

pop out at you in more detail as you scan through. Hold your pen over an unknown icon and its function will appear, the same way as when your mouse is held over something on your computer). Our favorite use of Air View is the ability to see GIF-like previews of movies just by holding the S Pen over a thumbnail. (Cool feature worth a mention: all of the video thumbnails in the player show these same types of previews without the pen, which makes the whole screen look alive, but the S Pen makes the pop-up screen larger.)

Next up on the list of hover-friendly additions, you can now use your S Pen to scroll up and down on a page or list. In other words, it's now just a matter of holding the pen directly above the top or bottom of the scrollable screen. Sure, it seems gimmicky and unnecessary, but we discovered that we used this feature more often than we thought we would. The scrolling action is a little slow, so it's doubtful you'd want to use this on a lengthy website, but it's handy when you just need to go down the screen a little bit at a time — say, in a settings menu or Twitter feed.

Another neat feature that takes advantage of the newfound hovering capability is the ability to toggle between brush, pencil and eraser simply by holding the pen above the screen and clicking the button. This makes for a quick and seamless experience when you're constantly making mistakes (or changing your mind) as you draw.

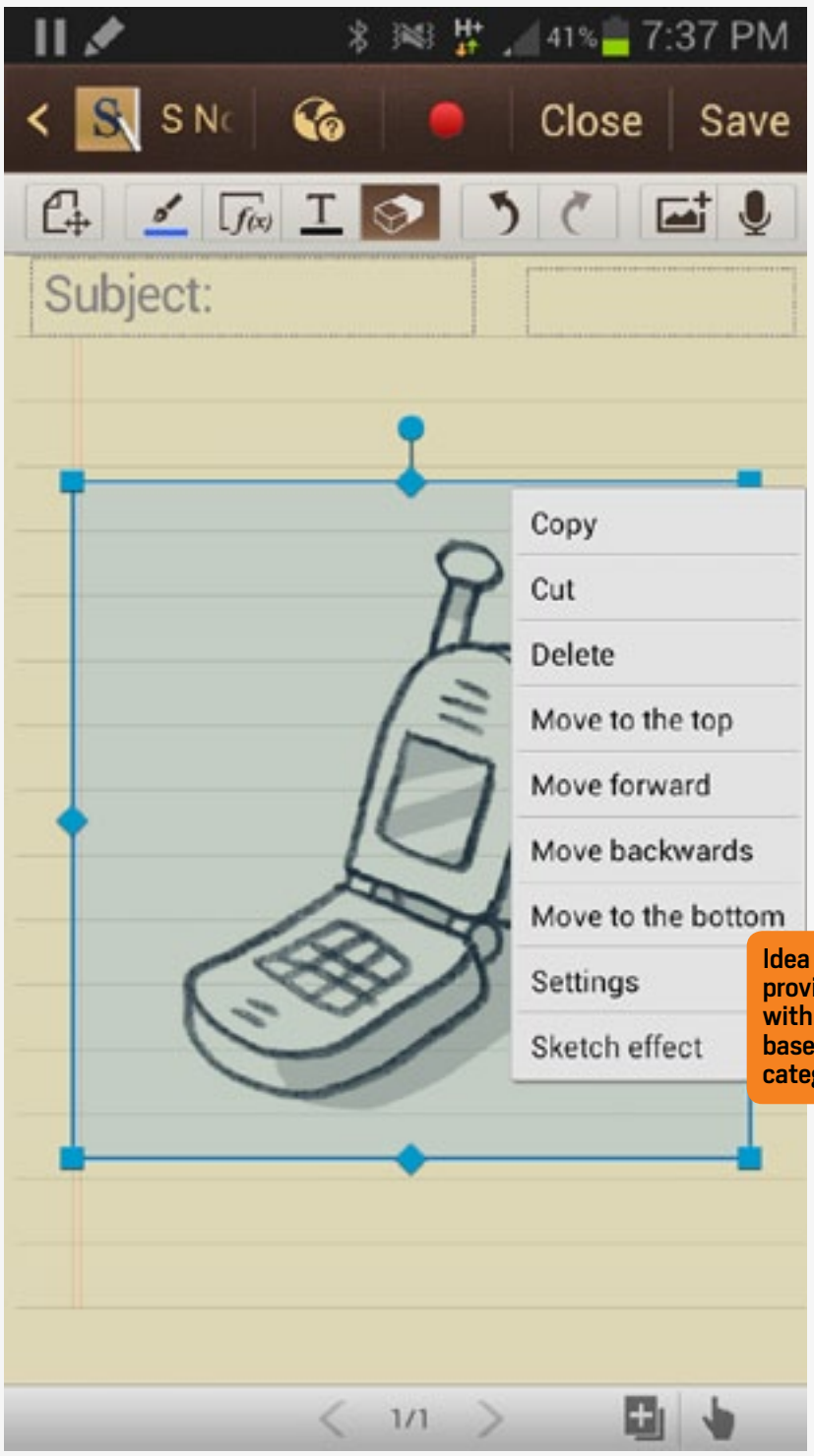
When you're in S Note, you can also hold the pen above the screen and long-press its button to activate another new feature called Idea Sketch. A blank notepad appears, you write down the name of a particular category (or just browse through the list) and a whole bunch of possible illustrations show up for you to choose from. Once you choose one that suits your fancy, it appears in S Note where you can adjust the size and outline style — and then



Simply hover over items and Air View will give you more details.

you can either find inspiration from it, or just color between the lines like it's a coloring book.

Earlier we mentioned that Popup Video is available on the Note II, but that isn't the only thing that pops up — you can do the same thing with Popup Note, which is activated by holding the S Pen button and double-tapping on the screen. This is basically a miniature version of the S Note app, which takes up less than half of the screen real estate. This means you can take notes and watch videos simultaneously. (Popup Browser is also available.) This is the best example of true multitasking that we've ever seen on a smartphone, and there were no lags, coughs, stutters or any sign whatsoever that the quad-core Exynos processor was buckling under the load. If this is only the beginning of what these phablets are capable of with the right engine under the hood, color us impressed.



Idea Sketch provides you with clip-art based on categories.

We're not done quite yet, multitasking fans. Samsung advertises another feature called Multi-Window that parallels — nay, *exceeds* — the aforementioned Popup Note in awesomeness. We recently saw an implementation of this in the Galaxy Note 10.1, and it's back, here in the Note II as Multi-Window. The implementation is a little different this time around, with a long press on the back button brining up a side bar of apps to choose from. On its tablet incarnation, this consisted of a choice of six. This time we have much more to choose from, including YouTube, ChatOn, GMail, Maps, Internet and, well, you get the idea. This list is also customizable so you can cut the ones you don't want, and bring your faves to the top. In practice, it works well. We had videos running while we checked our email, and happily scoured Google maps whilst we kept some restaurant reviews open in the other pane. Likewise, it's nice to see that you can use this in both orienta-

tions, with the phone's buttons being applied to the window that is currently in focus (sounds obvious, but anything's possible). We'd be interested to see how this might scale down onto something with a little less display going on, but the Note II's ample square-inchage certainly makes this a feature worth using. If you've ever used a dual-monitor setup for your desktop, you'll understand the massive productivity boost such a feature could bring to your smartphone — especially given the amount of screen space the Note II offers.

Quick Command is another new feature that takes advantage of the S Pen's gesture prowess. It's activated by pressing the button while dragging the pen up from the bottom. A familiar-looking handwriting box shows up, prompting you to write a command symbol followed by a keyword. For instance, write "@ Susie" to send an email to Susie; "? [search term]" performs a web search; "# Joseph" tells the phone to call Joseph, and so on. On the surface, this doesn't seem particularly useful when S Voice or Google voice search can do the same stuff, but here's the kicker: it's fully customizable, and you can add in whatever commands you want — and these commands can open up applications or perform a set of automated tasks (think SmartActions or Tasker). You could program it to turn WiFi, GPS and Blocking Mode on just by drawing a "C," if that's what floats your boat.

S Voice makes a return appearance, despite the existence of similar functionality in Jelly Bean. Not a surprise. What did take us aback is that it now includes S Pen handwriting recognition. This is definitely an interesting addition; from our perspective, it doesn't make much sense to write down a phrase that we could easily *speak* in less time — not to mention the fact that Quick Command already addresses

Quick Command gives power to your gestures.

this capability, albeit in a separate app. This seems like a feature that Samsung threw in just because it could. Yet it's there if you want it, and we suppose there are a few folks that are gushing at the idea.

As you've no doubt come to understand, the Note II is fully loaded. The S Pen experience between the first- and second-generation devices is a night-and-day difference: the original Note seems like just a working concept in comparison. This is by far the best pen / stylus / whatchamacallit we've used on a smartphone. If you were a fan of the Note, you'll be pleasantly surprised with its successor.

Finally, Samsung has released version 2.2 of its S Pen SDK, which gives third-party developers the ability to beef up their apps with support for hovering, new brushes, special effects and context awareness. There's no guarantee your favorite app will magically have cool new S Pen features, but the option is there for devs to put in a little extra spice if they're interested.

CAMERA

Given what we already know of the Note II's similarities to the Galaxy S III, would it be much of a shocker to see the two sporting nearly identical cameras? Thanks to a little help from Supercurio, we did some digging and discovered that the two phones use the exact same rear camera modules (known in the code as the s5c73m3). Yes, both utilize maximum resolutions of eight megapixels (3,264 x 2,448 resolution), f/2.6 aperture and 3.7mm focal length in stills, while allowing for 1080p video capture. The front-facing cameras are the same as well: they max out at 1.9MP and are capable of 720p video recording. (Warning: they default to 1.3MP, which is 1,280 x 960. The 1.9MP setting offers 1,392 x 1,392 pixel resolution.)

But while the two devices may be hardware bosom buddies, there are likely to be a few minor differences in firmware — especially since the Note II has additional features not yet offered in the GS III. So before we dive into the performance, let's discuss what the device has to offer. First, it has a new "best face" mode, which is Samsung's version of Scalado Rewind: it takes five group photos and lets you choose the best faces. This is handy if Bob blinks in the first picture and Julie's making a weird face in the second — just take the best of each person and put them together in one magical finished product. There's also a new "low light" mode, which as the name implies, is meant to deliver an improved performance in that arena.

Aside from these newcomers, you'll find the same litany of settings present in the GS III, such as HDR (with strong and normal settings, a choice you're not given on the GS III), panorama, share shot, plenty of scene modes, burst shot, macro focus, white balance, ISO, metering and exposure adjustment.

We've always been impressed with Samsung's camera performance because the company seems more interested in quality than megapixel count. While both Notes perform admirably, the next-gen version gave us slightly better results than the original. The new Note produced more natural colors — its senior cranked out shots that were typically oversaturated and oftentimes washed out in the daylight. You'll see a smidge more detail in the sequel, as well. The Note II was also the winner in managing dynamic range, bringing out the best contrast and producing natural colors in the shadows. As for how our protagonist performs against the Galaxy S III, it appears to be more or less a wash; as expected, the images were incredibly similar and any differences resulting from firmware processing were minor.

The LED flash on the second Note is considerably better than the original, providing more light and color saturation. (When compared to the GS III, however, it's tough to see any difference between the two.) The Note II also does a great job of capturing low-light images, as the new low-light mode fares well at grabbing errant photons. Comparing it with the Note and GS III,

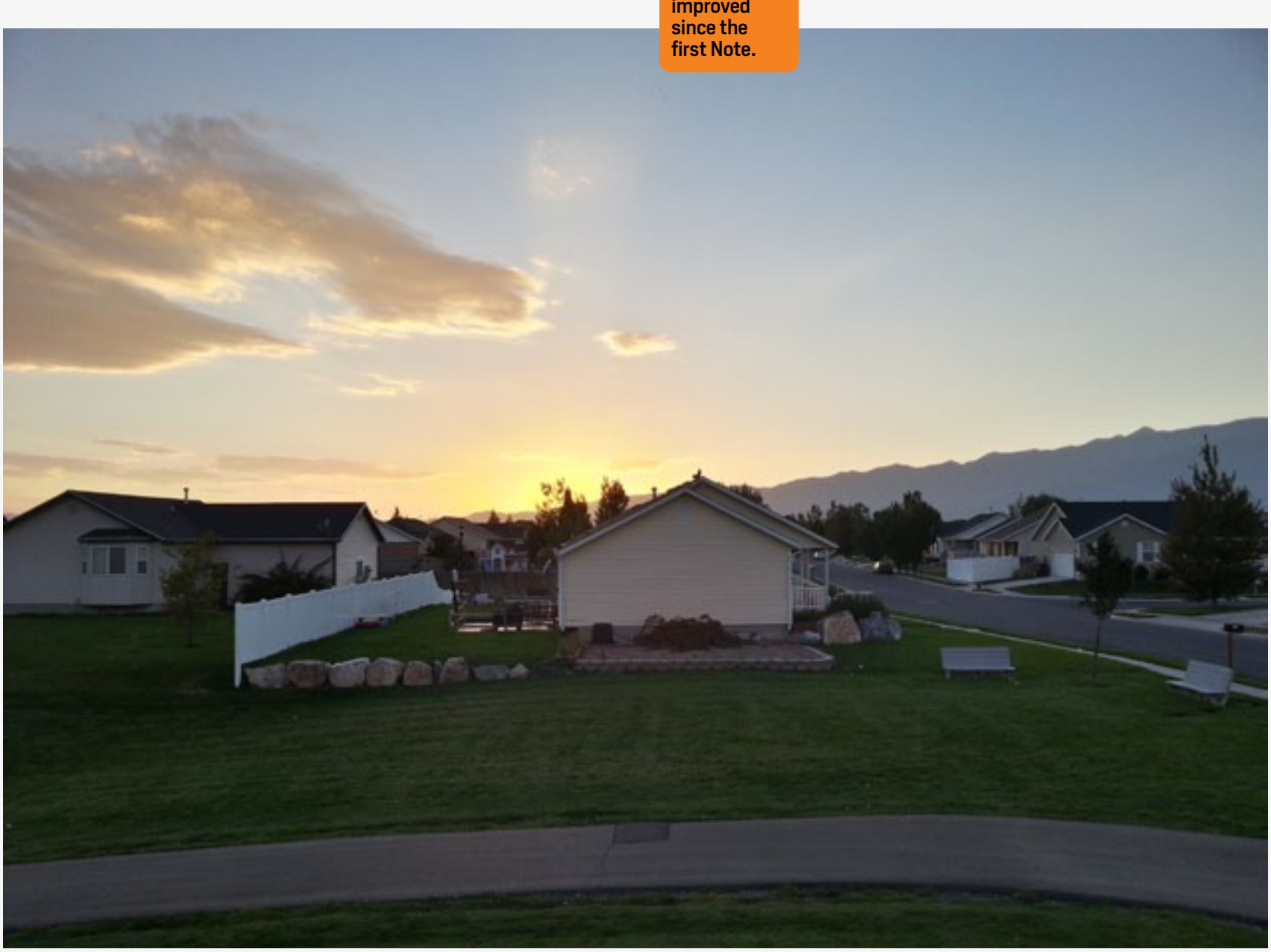


Image quality has been improved since the first Note.

however, ends up in a draw: after taking several types of low-light shots, each one had its own moment of glory in at least a few contests.

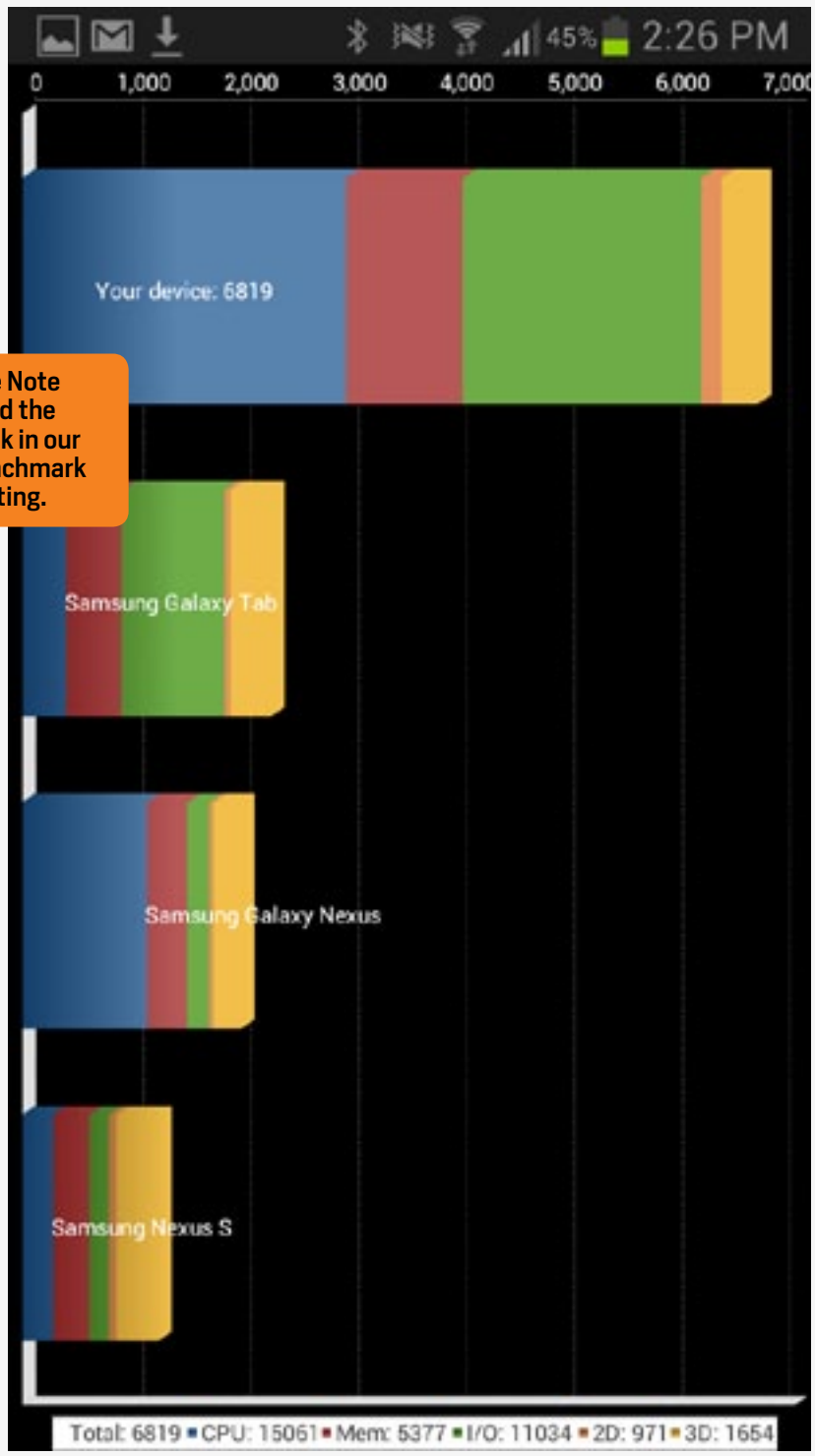
As mentioned, the Note II is capable of capturing 1080p video in MPEG-4 format. A quick perusal of the specs shows that it uses AVC profile 4.0, has a bitrate of 17 Mbps (the GS III is 17 Mbps, while the HTC One X is 10 Mbps and the ASUS Padfone is 20 Mbps) and offers a frame rate of 30fps. You're given the option of taking high-res (3,264 x 2,176) stills as you record your movies, but if you wait until playback to grab that precious shot, the pixel count will match that of the vid it was taken from.

In terms of features, the Note II introduces fast-motion (up to 8x) and slow-motion (down to one-eighth) recording modes for videos. You may not want to get too serious with these features, but it's a fun opportunity to be creative (example: fast motion vids are best accompanied by the Benny Hill theme song).

Overall, the video performance was pretty good: yours truly felt comfortable taking home movies with the family and leaving the fancy camcorder aside. It did well at capturing detailed motion without getting choppy, and picked up our voices loud and clear. We heard some gusts on a rather windy day, but it was able to filter most of the additional noise out. The only issue we had was with panning back and forth, where the imagery was choppy, almost to the point of inducing nausea. Frankly, we're chalking most of it up to trying to keep such a large device stable.

PERFORMANCE AND BATTERY LIFE

By stating that the Note II has a shiny 1.6GHz quad-core Exynos 4412 running the show with 2GB RAM and a Mali-400MP GPU to help things along, the performance section almost writes itself. We've always been fond of Exynos, but it's especially wonderful to see it pushed to new frontiers — in this case,



The Note II led the pack in our benchmark testing.

four cores on a smartphone. As per our usual practice, let's first see how it holds up in our benchmark tests.

We were expecting to see out-of-this-world results, but even then, we ended up pleasantly surprised: some of the Note II's scores shattered anything we've seen before, especially in tests that stress the capabilities of the CPU and GPU. Four of the benchmarks produced results that easily bested anything else currently available on the market, with the other two being among the highest we've recorded.

As for real-world use, we briefly touched on the silky smooth multitasking we enjoyed with Popup Video and Popup Note, and we're happy to report that this wasn't the only area where the processor excelled. Gaming was a joy, with the HD display and capable GPU teaming up together to produce solid and realistic play. With internet browsing, we weren't surprised to see that the Note II is faster and more efficient, since Jelly Bean offers enhancements in that area. Our site opened up quickly and didn't sputter as we navigated, used pinch-to-zoom and did various activities on the browser.

The Note II has incredible battery life, but with a 3,100mAh pack and a more efficient OS than the original Note (which initially launched with Gingerbread before upgrading to ICS), this is exactly what we were expecting to see. In our standard rundown test, which consists of looping a video at 50 percent brightness, WiFi turned on (but disconnected from any networks) and regular push notifications for social media and email, we were able to snag 10 hours and 45 minutes of life out of it — up just around an hour from the last Note. Granted, we may see a slight decline in the life of an LTE-enabled Note II, but this is still a highly respectable result. We were able to get

BENCHMARK	SAMSUNG GALAXY NOTE II N7100	SAMSUNG GALAXY NOTE N7000	SAMSUNG GALAXY S III (I9300)
QUADRANT	**6,819**	4,411	5,189
VELLAMO	**2,482**	1,243	1,751
ANTUTU	**13,539**	6,301	11,960
SUNSPIDER 0.9.1 (MS)	**1,023**	1,761	1,460
GLBENCHMARK EGYPT OFFSCREEN (FPS)	**114**	69	99
CF-BENCH	**15,267**	6,911	13,110

SUNSPIDER: LOWER SCORES ARE BETTER. GALAXY NOTE N7000 TESTS WERE CONDUCTED ON ICE CREAM SANDWICH.

almost two full days of normal usage from the device, so this should come as even more of a temptation for hungry power users everywhere.

For those asking, the Note II does in fact actually make calls, and it's above average in clarity. We didn't have any concerns with dropped calls, nor did our friends on the other end experience any static or other declines in quality. The loudspeaker earns its name, as it's on the top end of the sound spectrum — it's plenty loud, regardless of whether you use the earpiece or speakerphone. This resulted in a great audio experience for us when listening to music or watching movies as well.

Samsung's music player offers a full listing of various EQ settings, as well as a few other methods of enhancing your tunes (3D, reverb, bass boost, concert mode and plenty of others). Also, when plugging in a pair of headphones, the phone recognizes that you're ready to get serious about multimedia and shows you a specialized home page with various options that would most likely appeal to you. Overall, we were satisfied with how our music sounded — we could pick out all of the highs and lows without any shrill or overbearing areas. You shouldn't have any problem loading up most audio formats, including MP3 / WAV / eAAC+ / AC3 / FLAC. (For movies, you'll have success with MPEG-4, DivX / XVID, WMV, H.264 / 263, MKV, FLV and AVI.)

GPS on the Note II, which also includes support for GLONASS, was consistently accurate to within 15 meters; it swiftly locked our position and managed our navigation soundly. Bluetooth 4.0 low-energy support has been added (the device managed to

The GS III joins the Note I and II for a family photo.

receive file transfers at an average speed of 120 KB/s) as well as the same MHL capabilities as the Galaxy S III — this unfortunately means that you won't be able to use a standard MHL cable, and instead you'll need to shell out some extra money for a special Samsung-made MHL-to-HDMI converter for HD video output and home theatre-quality audio. USB file transfers were pretty fast, pulling down 16.44 MB/s received and 20 MB/s sent. We weren't able to test the LTE version, but HSPA+ yielded faster average data downlink speeds than what we've seen on the HTC One X and Samsung Galaxy Nexus.

WRAP-UP

To answer the question we posed at the beginning of this review, this thing is the real deal, and it's decisively better than the device that began the whole phablet craze. With SIM-free versions starting in the ballpark of £530, it's a bit on the pricey side, but for good reason: it offers best-in-market performance, an S Pen experience that blows its predecessor out of the water, a solid OS in Jelly Bean and plenty of other features that will make this a tempting offer to even the most petite-handed individual. To do so in a package that's actually thinner and narrower than the first Note is a tremendous accomplishment, and one that'll be hard to match. Get ready to have your cake *and* eat it too. D

James Trew contributed to this review.

Special thanks to Negri Electronics for providing us with a review unit!

Brad is a mobile editor at Engadget, an outdoorsy guy, and a lover of eccentric New Wave and electro. Singer and beatboxer.

BOTTOMLINE

SAMSUNG GALAXY NOTE II
STARTS AT £530 ($849)

PROS

- Much improved S Pen experience
- Quad-core Exynos offers mind-blowing performance
- Beautiful, vibrant display
- Thinner and easier to hold than original Note

CONS

- SIM-free version is a little pricey
- MHL only works using Samsung adapter

BOTTOMLINE

The Galaxy Note II is a huge improvement over its predecessor, and offers fantastic performance and innovative features.

PREVIEW

ACER ICONIA W510

Will Acer's Iconia W510 be able to hold its own against the upcoming rush of Windows 8 hybrids?
By Dana Wollman

Here it is, folks: our first Windows 8 device. No, not the first we've laid hands on, but the first built-for-Win-8 PC that we've been able to take home and spend some quality time with. If you don't remember today's specimen, you'd be forgiven: the Acer Iconia W510 is one of many, many tablet / laptop hybrids that have debuted over the past few months. Plus, this isn't even the highest-end Windows 8 PC Acer has to offer: unlike the W700, which has a 1080p screen and Ultrabook guts, the W510 runs off a Clover Trail-based Atom processor, and has a smaller 10.1-

inch (1,366 x 768) display.

Accordingly, the price is also lower: the W510 will start at $500 for the tablet only, though you'll also be able to purchase it with the detachable keyboard dock for $750. (And if the dock really does double the battery life to 18 hours, you might want to.) Though the W510 won't be available for a couple of weeks yet — it goes on sale October 26th — we've gotten a hold of an early unit. An important note: the model we tested was pre-production, so we'll hold off on the review card, performance scores and benchmarking until we have the chance to test a final unit. In the meantime, if you're looking for a deeper dive on the hardware, you've come to the right place.

LOOK AND FEEL

It was almost a year ago that Acer CEO J.T. Wang vowed the company would stop making "cheap and unprofitable products" and focus on more premium items — namely, Ultrabooks. And yet, the W510 feels like precisely the sort of low-end netbook that earned Acer its reputation for slipshod quality in the first place. Mostly, it's the keyboard dock that's the problem: the plastic buttons have a slightly scratchy feel, and look mismatched against the smooth, faux-metal keyboard deck. The hinge is also made of white, textured plastic that seems out of place next to the rest of the system. What's more, there's a large, unsightly gap between the hinge and the keyboard — again, netbook redux.

Not to go *there*, but we suspect it's because of products like this that Microsoft's management felt compelled to build the Surface. Even if you left the Surface out of this — and why not, since we don't know how much it will cost? — you can still do better than this. Just ask Samsung: the company's Series 5 Slate costs the same with a keyboard dock and has near-identical specs, but the design is considerably more elegant.

Visceral reactions aside, we have a small concern about the build quality. We found that the screen tends to wobble in its hinge — a potential inconvenience for folks who work on jostling buses, planes and Amtrak cars. Still, having manhandled our tester machine a bit, we'd say it's safe to pick up the tablet by the screen with the keyboard attached; you don't really have to worry about it falling out. On the plus side, too, the hinge

The design quality is reminiscent of the netbook era.

The W510 feels like precisely the sort of netbook that earned Acer its reputation for slipshod quality in the first place.

feels sturdy. You can even safely push the screen all the way back so that the keyboard is tucked behind the screen, with the keys face-down against your desk — not that there's much advantage to using the tablet that way instead of regular clamshell mode.

The tablet itself has the same gray plastic shell, with a white band ringing the edges. On its own, without the keyboard dock nearby, it's actually not a bad piece of kit: plain, yes, but unassuming. In fact, we like the two-tone effect of the white band against the black bezel. The only thing we could have done without is the "Acer" and "Iconia" branding, etched into the plastic on different sides of the devices. That niggle aside, the tablet feels unexpectedly light, at 1.27 pounds, and for that we have those plastics to thank. (Even with the keyboard, by the way, it weighs just 2.63 pounds) In practice, the 10.1-inch screen is just wide enough that you might have trouble typing in landscape orientation, if your hands aren't that big, but using the onscreen keyboard in portrait mode is easy; even when you're holding the tablet upright, the weight feels balanced enough that you don't have to strain to keep it from tilting backward.

Taking a tour around the device, you'll find the tablet portion is home to all the ports you'd expect to find on a mobile device. Up top, there's a headphone jack, power button and a switch for locking the screen orientation. On the bottom side are the various connectors that allow the tablet to latch into the keyboard dock, and the right landscape edge houses a volume rocker, microSD slot, micro-USB port and micro-HDMI output. The W510 has dual speakers, one on each side of the tablet when you're holding it in landscape mode. Unfortunately, though, they're located precisely where you're likely to grip the device, so it's easy to muffle the sound if you're watching a movie while holding the tablet in-hand. Finally, there's an 8-megapixel camera and LED flash around back, along with a 2-megapixel shooter up front.

The keyboard dock, meanwhile, is home to a full-size USB 2.0 port, along with a built-in nine-hour battery that promises to double the tablet's runtime. What you won't get is an SD card reader — something ASUS typically offers on its Transformer Pad docks. There's also a charging slot, allowing you to use the same AC adapter you would with the tablet. That power connector is oddly large, but since there are no USB ports nearby, it's not like we have to worry about it ob-

structing any openings.

Additionally, Acer will be offering some accessories that you can purchase alongside the W510. These include a micro-HDMI-to-VGA adapter and a pigeon-gray, faux-suede case. The sleeve has a super-soft lining on the inside, and we appreciate how discreet the branding is; just a small metal logo that fades in with the suede, and nothing more.

DISPLAY AND SOUND

Though we're not impressed by the W510's build quality, its Gorilla Glass display is actually quite nice. Yes, 1,366 x 768 resolution is middle-of-the-road as far as PCs go, but in terms of quality, this IPS panel offers some wide viewing angles. Working with the dock in your lap, you should have some leeway as far as dipping the screen forward or backward (a boon, too, for people who get work done on airplanes). You can even get by watching a movie from a side angle, but we're also aware that people aren't terribly likely to crowd around a machine this small anyway. We'd add, too, that the viewing angles improved as we increased the brightness. At 350 nits, it's quite bright, yet the battery life is robust enough that we never worried that cranking the brightness would have an adverse effect on runtime.

As on other tablets, the W510 doesn't deliver remarkably loud sound, and the audio quality is rather tinny with certain songs.

We enjoyed the Gorilla Glass–packing IPS display.

Depending on your musical leanings, though, it's actually pleasant to listen to at the mid-range. Eric Clapton's "Layla" on acoustic guitar is enjoyable, for instance; synthesized songs like MGMT's "Kids," not so much.

KEYBOARD AND TOUCHPAD

Something tells us we're going to have to grade these Windows 8 keyboard docks on a curve: it's clear that creating a comfortable typing experience for a machine this small is no simple feat. In fact, we already know that to be true: early netbooks offered terribly dense keyboards, and while PC makers like Toshiba eventually designed 10-inch laptops with more spacious layouts, we didn't really see progress until OEMs started putting out slightly larger 11-inch machines.

It doesn't help, then, that the W510 has a 10-, not 11-inch screen: that extra bit of real estate seems to be the difference between a cramped setup and something more usable. As you probably gathered by now, the W510 falls into that first category: in order to fit everything inside that 10.2-inch-wide keyboard deck, Acer had to shrink certain buttons like the Tab key and the four arrows. To Acer's credit, though, it at least used all the available space: the keys extend nearly to the edge of the chassis on either side. While typing, we also found

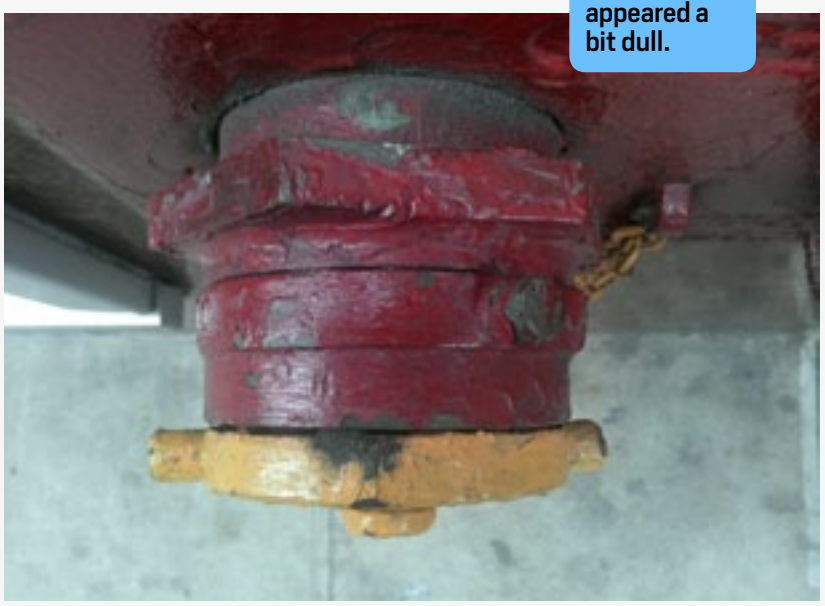
The small deck size results in a cramped keyboard.

that our fingers easily found the letter keys. If anything, we ran into more problems when our thumbs kept reaching past the space bar and hit the trackpad instead.

Speaking of the trackpad, it doesn't support gestures. That includes Windows 8-specific maneuvers, like swiping right to bring up the Charm Bar, but also two-finger scrolling and pinch-to-zoom. Basic stuff. Again, something to revisit when we review a final unit.

CAMERAS

The W510's 8-megapixel rear shooter performs capably in daylight and with macro shots, though we routinely had to hold the tablet still for a couple seconds after tapping the shutter in the Windows 8 camera app. The shutter, by the way, isn't an onscreen button; you can tap anywhere onscreen to capture. Though there's no tap-to-focus feature, we found that, with still photos at least, the camera homed in on exactly the parts of photos we would have expected it to. With 1080p video, though, our clips sometimes slipped in and out of focus, as if the lens wasn't sure what the highlight of the shot was. Across the board, colors appear fairly muted, but you should notice a good deal of detail in your full-res, 8MP shots. Lower-lit shots will look a bit duller, of course, but even then, the noise level was tolerable.



Low-light shots on the 8MP shooter appeared a bit dull.

PERFORMANCE

For the most part, when we compare the W510 to netbooks, we're making a dig at its cheap build quality. But there's something else the two have in common: internals. Like netbooks of yore, the W510 packs an Intel Atom processor — a 1.8GHz dual-core Z2760 CPU from the Clover Trail series, to be exact. Also like a netbook, it comes with 2GB of RAM. For storage, you'll get a 32GB SSD if you choose the lowest-end $500 model; every other configuration has 64GB of on-board storage. Either way, an SSD isn't something we would have taken for granted back in the netbook era; most minis at the time had spinning hard drives.

As you'd expect, the Atom's performance has improved since it debuted in 2008, with the latest-gen Clover Trail chips promising 10 hours of use and three weeks on standby. We'd wager, too, that consumer expectations might have changed: when PC makers were stuffing Atom processors inside netbooks — essentially, miniature laptops

The Iconia W510's faux-suede case with super-plush lining.

— they had a heck of a time explaining to consumers what they could and couldn't do with these machines. In the case of tablets, though, we suspect folks will pick up Atom-powered slates like the W510 and expect to use them as they would any other tablet.

And when it comes to things tablets are supposed to be good at — email, web browsing and video streaming — the W510 shines. That Z2760 chip is also more than sufficient for handling the overhead of Windows 8. Not only was the touchscreen responsive, but we didn't notice any lag when we launched programs, swiped right to expose the charm bar or swiped left to rotate through open apps.

When it comes to things tablets are supposed to be good at, the W510 shines.

Again, battery life is rated at up to nine hours on the tablet, and the keyboard dock promises to double that. Once we get a hold of a production-grade unit we'll run not one, but two battery rundown tests for our in-depth review.

WRAP-UP

Having met with Acer's product team in person (and having read its executives quoted in the press), it's obvious the company is eager to shed its reputation for cheap products and be taken more seriously as an OEM capa-

ACER ICONIA W510

The W510 is a decent performer and offers Windows 8.

ble of building premium PCs. You can even see glimmers of that in the Iconia W510, with its lovely IPS display and optional accessories. Ultimately, though, the W510 does a disservice to Acer: with a chintzy build and a cramped, netbook-like keyboard, it confirms whatever pre-conceived notions shoppers may have about the brand. And with so many Windows 8 hybrids on the way, including one from Microsoft itself, Acer can't afford to have its products get lost in the mix.

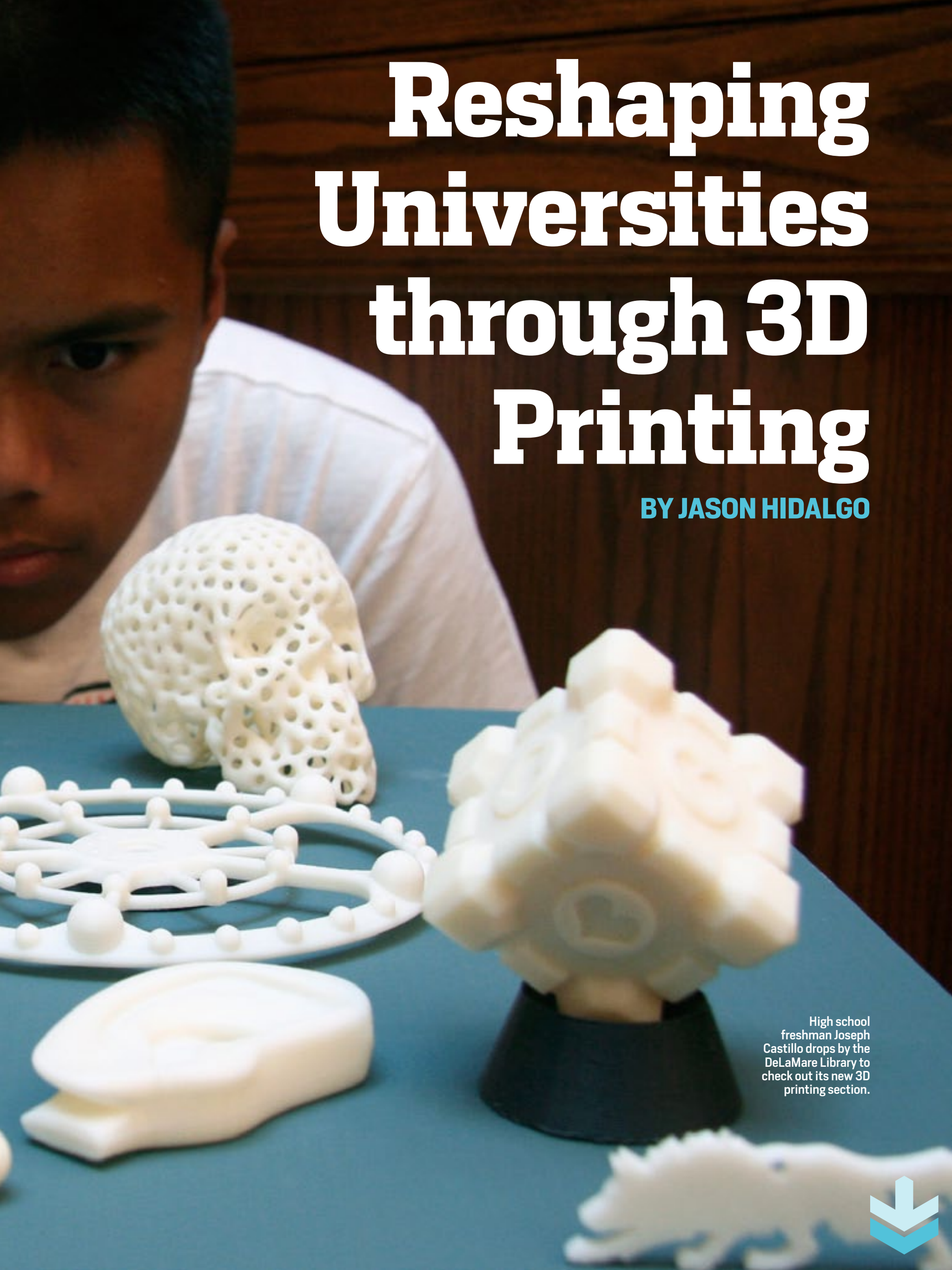
There is something to be excited about, though: the W510 performs well, and at $500, it's attractively priced for a tablet running full Windows 8. The Clover Trail-based Atom processor inside makes for some zippy performance in Windows 8, and that nine-hour battery is also promising. We'll be back with a full review in which we plan to put this guy through its paces, and we'll be curious to see how it fares against similarly priced hybrids offering comparable specs. For all we know, the W510 will end up being exceptionally fast and longevous for its class. But you'd have to get past its homely exterior to appreciate it. D

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

The Future of Higher Education:

Reshaping Universities through 3D Printing

BY JASON HIDALGO

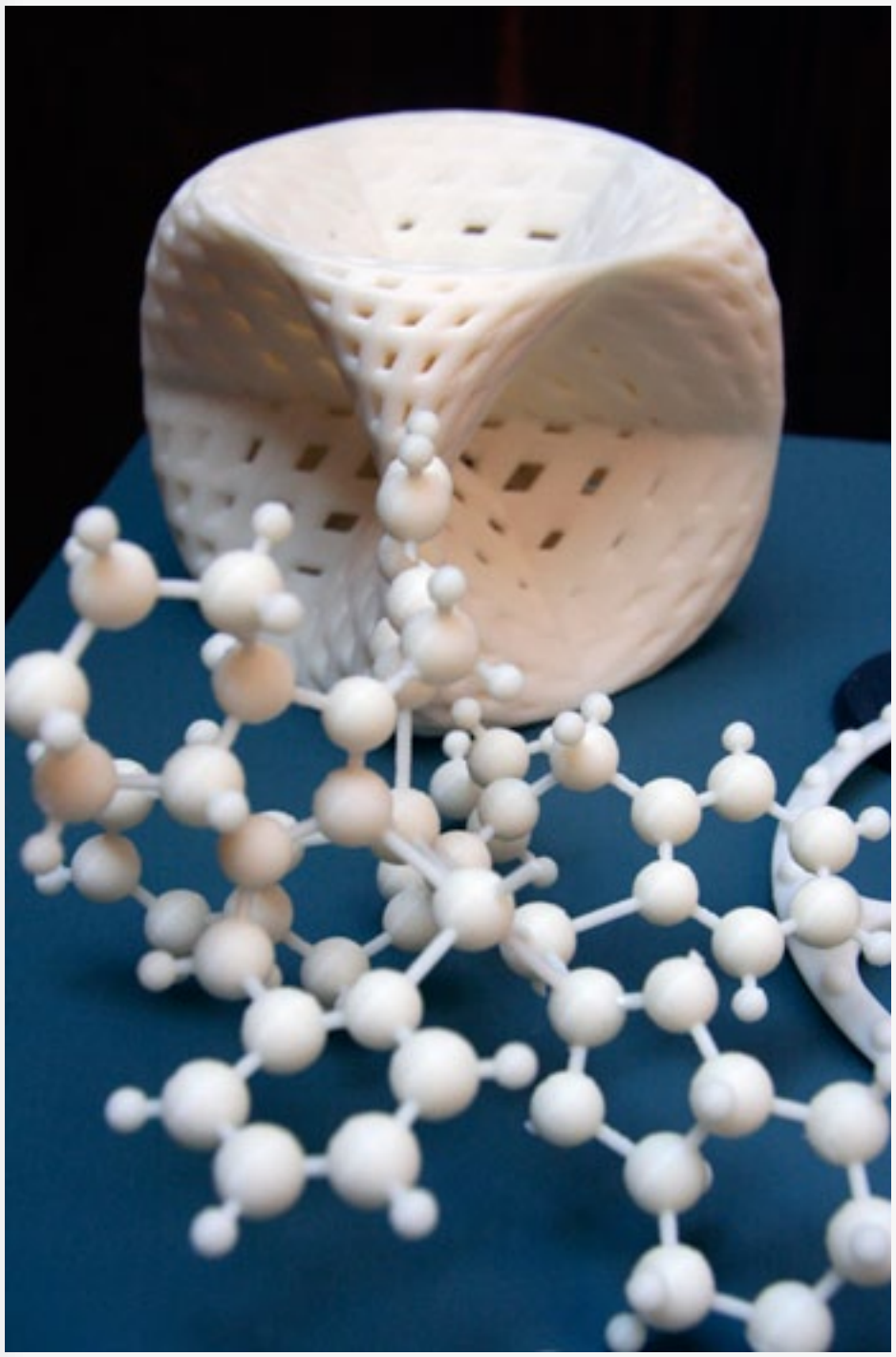


High school freshman Joseph Castillo drops by the DeLaMare Library to check out its new 3D printing section.

FEATURING FOUR TOWERING limestone columns and classic Flemish-bond brickwork, the century-old Mackay School of Mines Building at the University of Nevada, Reno, has long served as a bastion of Silver State history. Named after Irish immigrant and "Comstock Lode King" John Mackay, notable touches such as a cast bronze statue designed by Mount Rushmore sculptor Gutzon Borglum just outside the building helped it earn a spot in the National Register of Historic Places. Within its oak doors, however, are the makings of an intriguing experiment that's decidedly more new-school. Like a mini museum, a collection of 3D-printed models are displayed within the building's sunlit, three-story atrium — attracting a mix of students and teachers. Even more popular than the displays of plastic gears and molecule models, however, are the two 3D printers that made them: a professional-grade Stratasys uPrint SE Plus and a hobbyist 3DTouch machine.

Ben King, an associate professor of chemistry, holds a 3D-printed model of a molecule.

Earlier this year, the building's DeLaMare Science and Engineering Library became the first academic library in the United States to provide 3D scanning and printing to all students and faculty, as well as the public. The move is part of a plan by director Tod Colegrove to transform the facility from a typical library that promotes knowledge through books to one that also encourages creative thought and discussion via hands-on technology. With 3D printers jumping from the realm of geek fantasy to something more accessible, Colegrove thought the devices would serve as the perfect vehicle for promoting education



A higher resolution allows the Stratasys uPrint SE Plus printer to create more detailed 3D models.

and pushing DeLaMare's evolution.

"If you look back at libraries over 2,000 years — including the Library of Alexandria — you'll see that they were involved in buying technology that many people cannot afford and making them more accessible," Colegrove said. "Along the way, it became all about having the biggest and best book collection so you ended up having identical libraries. We lost our way."

PAPER OR PLASTIC?

For Colegrove, part of libraries losing their way involves the quiet, sanitized atmosphere that pervades many such facilities today. Early libraries were largely about the conversation — a fundamental part of learning and human nature, he said. As a result, one section of DeLaMare Library's walls is covered in whiteboard paint, making it easier for students to write out their ideas or map out calculations in groups.

"The biggest mistake we made is when we let books crowd out the users and libraries became a quiet place where there's no talking and no food and drinks," Colegrove said. "We need to adjust from having conversations in users' heads to a collaborative environment."

In order to take DeLaMare to the next level, Colegrove felt that it needed an anchor to draw in the diverse set of people needed to make creative collaboration possible. That's when he started thinking about 3D printers. Al-

"Along the way, it became all about having the biggest and best book collection so you ended up having identical libraries. We lost our way."

Director Tod Colegrove of the DeLaMare Library believes 3D printers can turn libraries into more collaborative and creative environments.

though the devices have been around since the ’80s, 3D printers are still a relatively new concept to most people and just recently became more accessible to average consumers. The novelty of using layer after layer of melted plastic to “print” actual three-dimensional objects also gave 3D printers a “cool factor.” Add the ability to turn people’s ideas into something that’s physically tangible and you have technology that could serve an educational purpose as well, he thought.

As great as 3D printers sounded, however, the library still faced one challenge: cost. Although it was possible to get a printer like the MakerBot Replicator for around $2,000, Colegrove wanted a higher-end machine that could print faster at a high resolution while also being able to handle a heavy demand reliably. He decided to pick two devices — the $20,000 Stratasys uPrint SE Plus professional-grade printer and a $4,000 3DTouch hobbyist machine. Throw in the cost of a 3D scanner and about a year’s worth of plastic material and the library was look-

ing at an expense between $30,000 and $40,000.

With the university system facing steep budget cuts after the Great Recession razed the state budget, Colegrove was apprehensive about pitching his plan to his superiors. After much thought, he decided to take the chance.

"When I first thought about getting funding from the school for the 3D printers, I was worried about the cost," Colegrove said. "But one of the people I talked to said, 'Oh, that's nothing, it's just the price of one microscope.' After that, I was like, 'OK, I don't feel so bad.'"

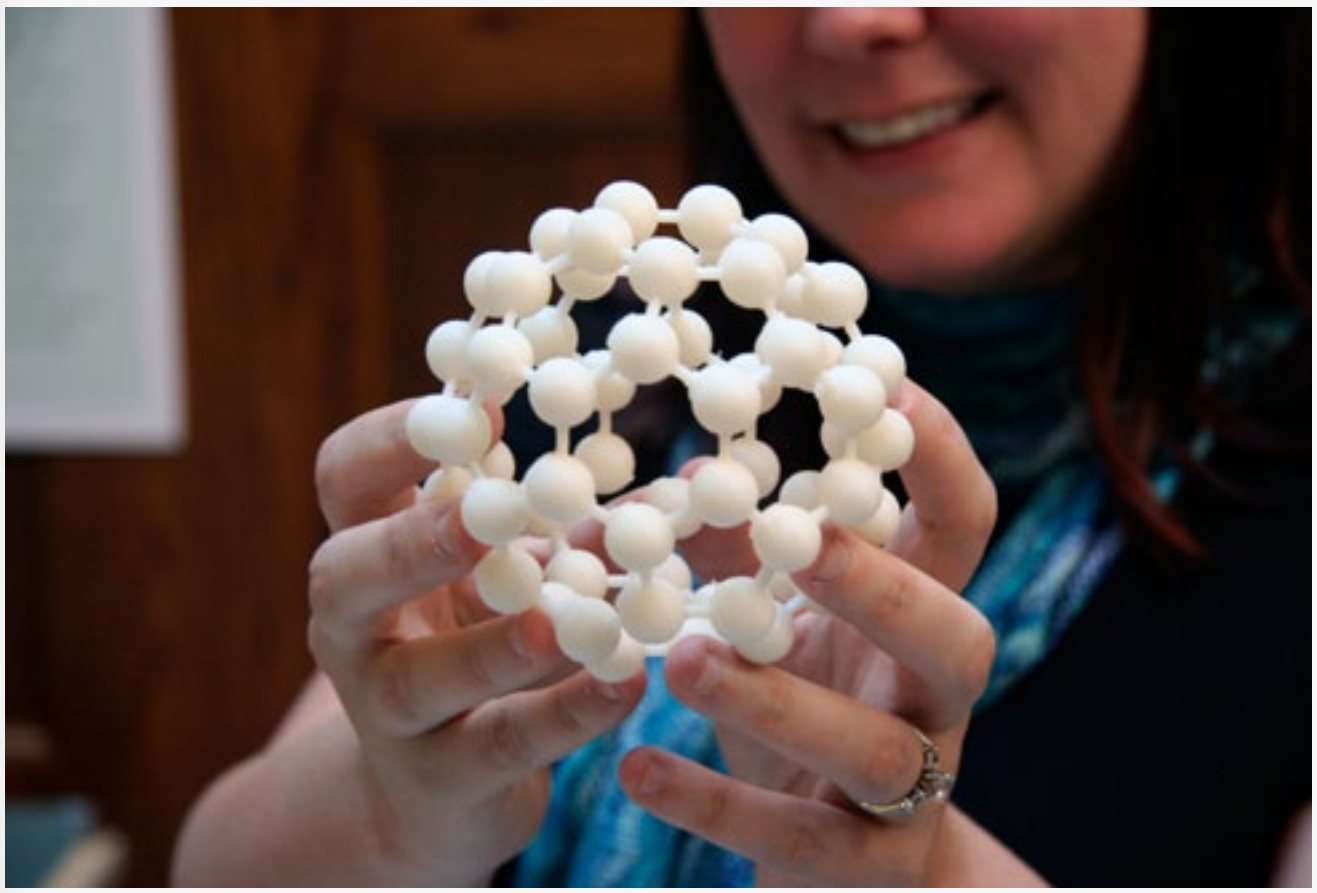
A MATTER OF PERSPECTIVE

Thanks to a combination of university gift funds and grants, the library soon acquired its two 3D printers. The 3DTouch arrived first on April 27th and was printing its first job — a rotor for an impeller pump prototype designed by a group of engineering students — just minutes later. The rotor would take three days to finish.

"The students just broke the box open and started printing

A 3DTouch hobbyist printer by Bits from Bytes.

“It’s really heartwarming to see just how backed up the machines are.”



DeLaMare’s Lisa Kurt says the library’s printers have been churning out models nonstop since their arrival.

right away,” said Lisa Kurt, DeLaMare’s engineering and emerging technologies librarian. “They just looked so excited and you could feel this tremendous energy.”

The library’s Stratasys uPrint SE Plus arrived two months later on June 27th. The Stratasys, which prints four times faster than the 3DTouch and is jokingly described by Colegrove as their “Mercedes-Benz,” has been running constantly since starting operation on July 3rd. Students have printed a range of devices that run the gamut from a bust of Master Yoda and RepRap 3D printer parts to intricate models of molecules and an engine block. Several of the creations churned out by the devices are now on display next to the printers, along with a “Box of Disappointment” that contains discarded pieces that didn’t quite turn out perfectly. For Colegrove, the strong demand for the printers validated his bet to bring the technology to the library.

“It’s really heartwarming to see just how backed up the machines are,” Colegrove said.

The waiting list got even longer in August, when the 3DTouch was taken offline due to a print head issue. The library also plans to replace the 3DTouch’s build platform with a heated version after some projects printed from the device exhibited signs of warping.

Meanwhile, the library’s “one-year supply” of 35 total PLA and ABS plastic spools is down to just a third of the original amount after only a couple of months. The supply

A Mario mushroom iPhone dock printed using a template from the Thingiverse website.

issue should rectify itself once the university starts charging for the material — 50 cents per cubic inch for 3DTouch jobs and $4.50 per cubic inch for the higher-resolution Stratasys. Kurt said strong demand will continue to be an issue now that students are back for the fall semester.

"Word has caught on around campus and we were already busy even during the summer months," Kurt said. "But it's a good problem to have. I'd rather have people coming in to the library to use the printers than have an empty room."

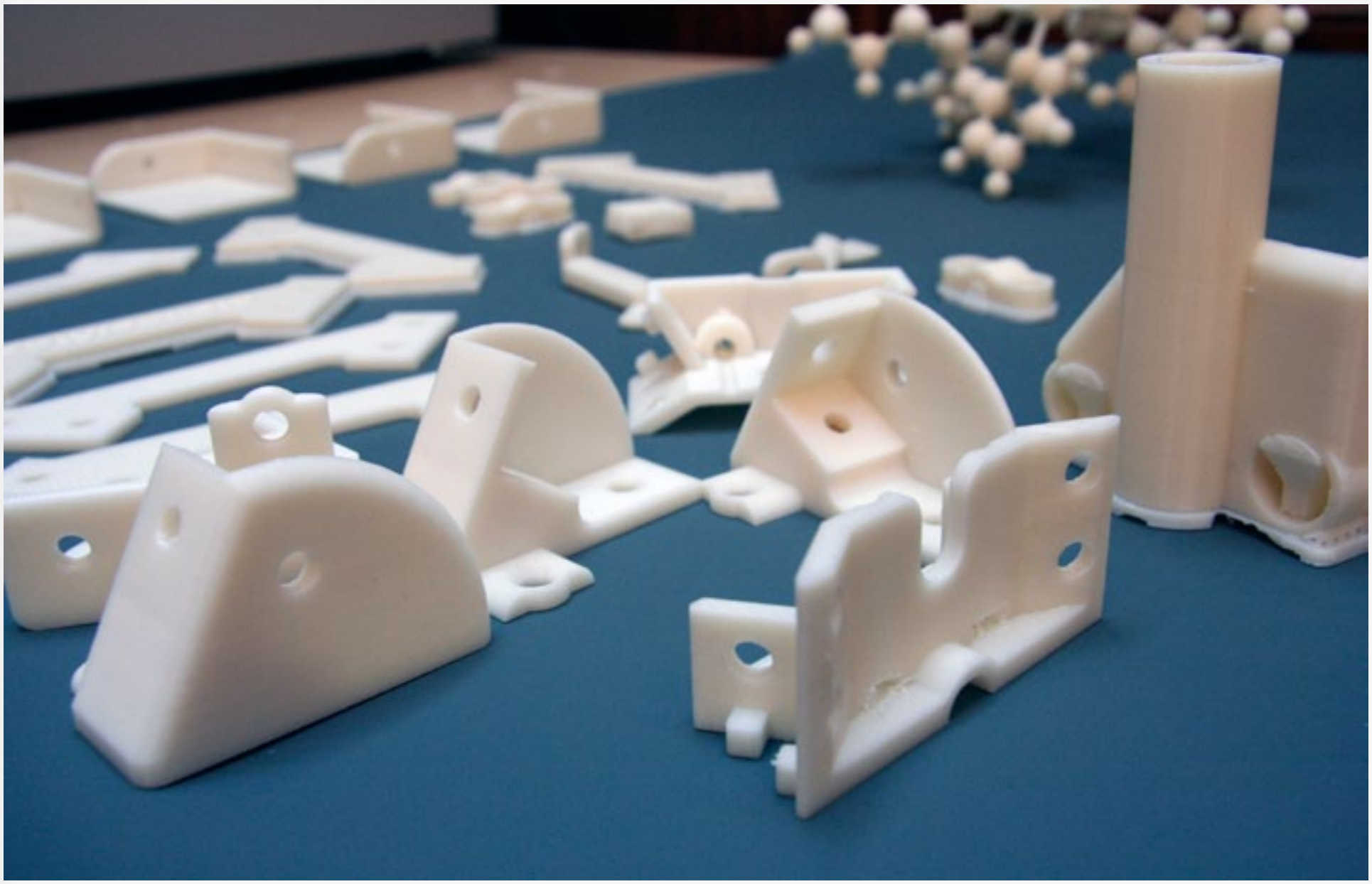
A NEW DIMENSION IN LEARNING

For many universities, 3D printers have become an indispensable tool for promoting learning and education. At Columbia University's Graduate School of Architecture, Planning and Preservation (GSAPP), the devices are considered a regular tool in students' everyday lives, said Carlito Bayne, manager of the GSAPP's Output Shop. He said the school has dabbled with 3D printers since 2000, including one that used wax. Their printers get so much use that the school is purchasing another machine. Other departments such as the fine arts, medical and engineering schools have their own 3D printers.

"During presentations most students have models as well as renderings to show the design process," Bayne said. "It shows the students and professors what works structurally and what just looks good. This is something that a 2D render or drawing can't do because you only have one view."

At the Massachusetts Institute of Technology, students such as Steven Keating are using 3D printers in cutting-edge ways that go beyond simple models. The mechanical engineering student described 3D printers as a valuable research tool because they can help accelerate projects that would normally take time using conventional modeling methods. The technology also helps democratize processes that may be too technical for the average person when done the traditional way.

"3D printing allows you to prototype rapidly and iterate quickly so it really levels the playing field in terms



These 3D-printed parts will be used to make a RepRap 3D printer.

of design," Keating said. "Anyone with a program like SketchUp can design something without needing access to a machine shop or knowing how to operate fabrication equipment. I think it's creating a Renaissance in manufacturing and the design world because even the average person can use it."

In Keating's case, he is currently part of a team that's studying new digital fabrication techniques, including large-scale 3D printing. Their ultimate goal? To be able to print entire buildings. Part of Keating's research is to come up with an alternative to the current layer-by-layer printing method used by machines such as the Makerbot, which is too slow for their purposes. One approach they are developing is to "print in place" — which allows for printing to be done on site. Their concept also uses "mobile swarm printing" via robotic agents that extrude a fast-curing material. The material acts as a concrete mold

for structural walls and also doubles as a thermal insulation layer. In addition to lower costs and the ability to print custom shapes, the unique approach gives the team the speed that they desire.

"We estimate that for a regular single-story residential house, we can print the entire exterior wall in under a day," Keating said. "So far, we've performed a lot of small-scale tests successfully so we're hoping to work on a larger scale within the next year."

THE NEXT LEVEL

Although printing models of molecules, gears and even hobbyist projects in plastic are a good first step, one of the things that excites researchers about 3D printing involves its potential for using other materials. One example is using the technology for biological projects, including the creation of human tissue, said Ali Khademhosseini, a Harvard Medical School associate professor who's also involved with the Harvard-MIT Division of Health Sciences and Technology. Khademhosseini and his fellow researchers are currently trying to engineer 3D structures that mimic cells and tissues that can be transplanted into humans. Unlike the more inanimate materials traditionally used, printing tissue material requires a different kind of medium that comes with its own set of unique challenges.

"We typically deal with gels and pregel liquids where you have cells encapsulated inside," Khademhosseini said. "Once printed, you can cross link them and make a gel-like structure, so the material is different … and very hydrated."

"I think it's creating a Renaissance in manufacturing and the design world because even the average person can use it."

In the past, researchers tried to repurpose traditional printers for the job but ran into issues such as clogging. These days, they use printers from companies like San Diego-based Organovo that specialize in printing biological material. The research could help speed up clinical trials by creating cells and tissues that can be used for test-

ing drugs, Khademhosseini said. Larger trials, which can cost upward of a billion dollars, may also benefit by seeing reduced costs. So far, researchers working on biological printing have already created viable material for treating burned skin. More complicated tissues, however, will still take some time.

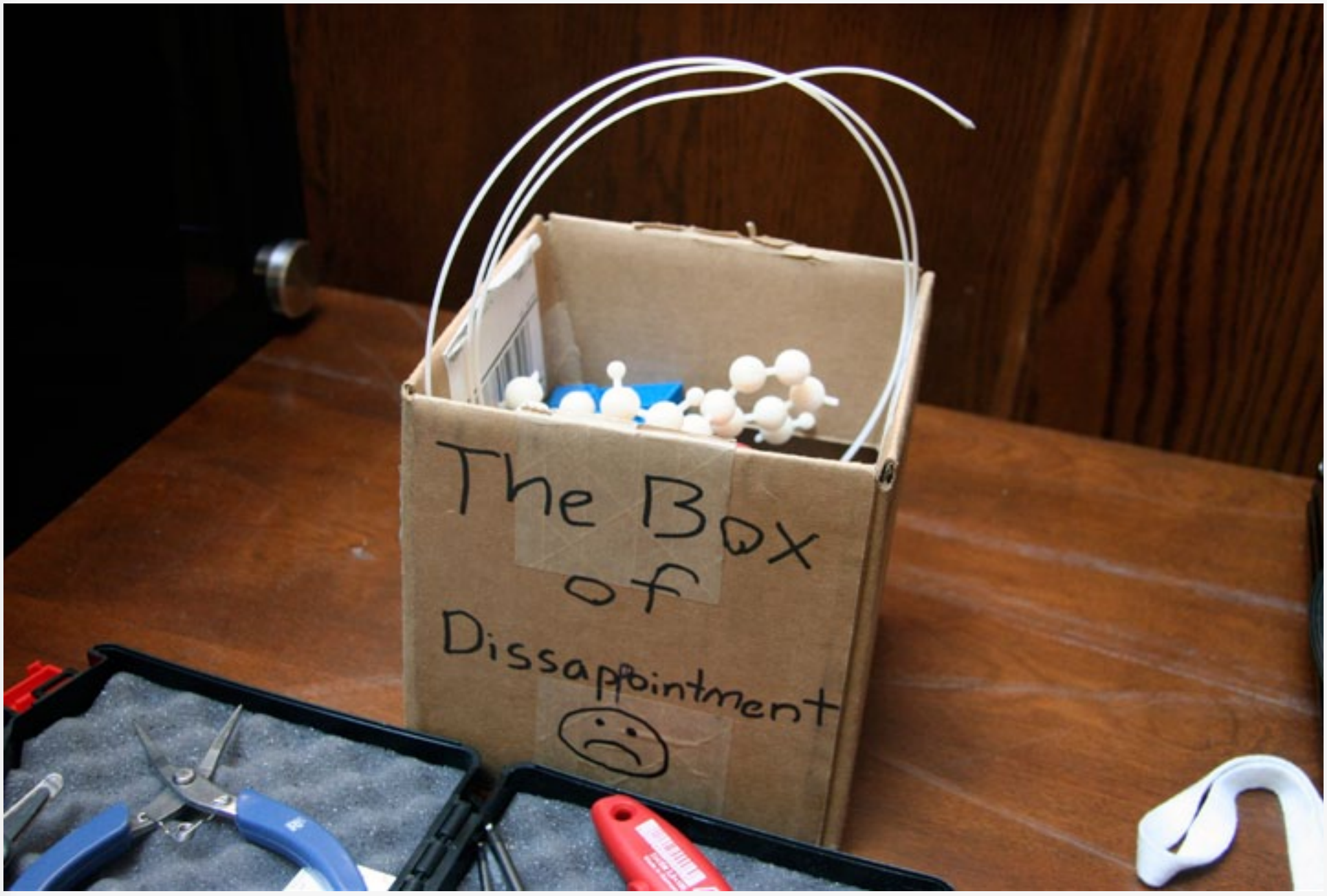
"The challenge now is making things like heart tissue, which is more vascularized and has all these blood vessels, or liver tissue, which has a metabolic function," Khademhosseini said. "There still are formidable challenges but we're making a lot of progress. Just being able to make tissues for drug discovery is already a big deal."

Meanwhile, printing speed remains a challenge for 3D printers overall, said Pedro Reis, an assistant professor of mechanical engineering and civil and environmental engineering at MIT. Although 3D printing certainly has advantages as a prototyping tool, it still lags behind more traditional manufacturing methods when it comes to mass-producing items, according to Reis. Nevertheless, its advantages as a tool for unlocking human creativity both individually and collaboratively can't be minimized.

"When you look at some of the crazy 3D objects that students come up with, you can't help but just go, 'Wow,'" Reis said. "It really empowers them and opens up their imagination. It opens up a completely new door for them to express their ideas."

MORE HEADS BETTER THAN ONE

Sunlight seeps into the bustling DeLaMare atrium on a sunny Tuesday afternoon as visitors arrive to hang out around the 3D printers and observe the progress of their projects. In one corner, a teacher checks out one of the molecule models printed by a colleague and starts chatting with a student who's fiddling with the 3D scanner nearby. For Ben King, an associate professor of chemistry at the school, one of the challenges in making the connection between science and technology is the gulf in communication between people. Using 3D printers, he said, not only encourages people to flesh out their ideas and potentially create the next cool widget; it



Failed pieces get a second life as teaching tools in "The Box of Disappointment."

also makes it easier to communicate one's results to people outside one's field of expertise.

"For example, one of the very hard things about teaching chemistry is explaining that molecules have shape," King said. "This basically removes that obstacle … so it will change how we teach chemistry and how we look at molecules on a daily basis. It's also just plain fun."

Guilherme Martins, a graduate student in the computer science and engineering program, agrees.

"In the field of robotics or mechanical engineering, the ability to create a moving part without any welding removes a lot of the barriers to prototyping," Martins said. "Using 3D printers also encourages you to learn something like a 3D modeling program so it pushes you to learn new skill sets."

On the other side of the room, one student can be seen

interacting with another student at a nearby table while holding a sandwich in one hand and a drink in the other. Instead of telling the visitors to keep quiet and to dispose of their food, Colegrove joins in on the conversations.

"When I first came in (a couple of years ago), I talked to the dean and said, 'You know, scientists and engineers are known for a lot of things but they're not really known to be quiet people,'" Colegrove said. "We need to get that community back in the library."

The biggest benefit Colegrove has seen so far is the increase in visits from people of varying backgrounds. As the library for one of the top mining schools in the country, DeLaMare has a strong history in the geosciences. With the addition of the 3D printers, the school's geological minds are now rubbing elbows with people from fields such as biology, computer science and even art.

Chris Bennett, a computer science engineering sophomore, said he especially enjoys the networking aspect of his visits to the 3D printing area. He briefly chatted with civil engineering senior Alicia Veach, who is planning to use the 3D printers to create miniature prototypes of the concrete canoes she and her team use in racing competitions around the country.

"You get your average engineering types but it's also nice to see the biologists and the artists coming in here," Bennett said. "It allows us to break out of the box and cross-pollinate in ways that we normally can't. It's basically tied to the Makerspace ethos — cool stuff happens when you get people together."

This diverse meeting of the minds is exactly what Colegrove hopes to continue seeing as more people become aware of the 3D printers. Colegrove alluded to the Gartner Hype Cycle, which explains the various phases that a technology goes through during adoption. The cycle starts with the creation of the technology followed by inflated expectations, disillusionment, enlightenment and the final phase of acceptance. Colegrove believes that 3D printers have passed the "disillusionment" phase that comes when a new technology fails to match the hype of inflated

expectations. Instead, 3D printers are now starting to work their way up the "slope of enlightenment" stage, where most progress is achieved. How fast that translates to printing organs and *Star Trek*-style replicators, however, depends on how many people start playing with the technology now, he said. The key is collaboration, which speeds up the learning process, he added.

"The old model — where you have individual silos and people went into their individual towers — I mean, what good is that?" Colegrove said. "Now you have engineers talking with artists and creating new forms of knowledge. Instead of the old teaching model where you have the sage on the stage, the new model is about learning from one another to create a spark that can be fanned into a flame. You end up connecting all these dots." D

A mix of models created with the Stratasys and 3DTouch printers are on display in DeLaMare's atrium.

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ELECTRIFIED: ONE MILLION VOLTS ALWAYS ON

PHOTOGRAPH: ASSOCIATED PRESS

MATT ROGERS

Following the release of its second Learning Thermostat, Nest's co-founder tells us how *DARK CASTLE* changed his life.

What gadget do you depend on most?
My electric car. I have one of the first Nissan Leafs delivered in the US and love it!

Which do you look back upon most fondly?
Mac Plus – my first computer and the one that started it all …

Which company does the most to push the industry?
Apple – they've changed the way that people look at consumer products and the way that companies approach products.

What is your operating system of choice?
I'm definitely a Mac guy, I have been using Macs since I was three years old.

What are your favorite gadget names?
Necomimi

What are your least favorite?
Chumby

Which app do you depend on most?
Mail and phone — I'm kind of old school. Twitter is for the "new" school.

What traits do you most deplore in a smartphone?
The same "trait" I deplore most in all products: feature creep (adding features for the sake of adding features).

Which do you most admire?
Simplicity.

"Playing *Dark Castle* on my Mac Plus in 1986. I probably spent 10 hours a week in front of that tiny black-and-white screen."

What is your idea of the perfect device?
A device that accomplishes an important task without exposing complexity to the user.

What is your earliest gadget memory?
Playing *Dark Castle* on my Mac Plus in 1986. I probably spent 10 hours a week in front of that tiny black-and-white screen with my dad. That early experience pulled me into technology and is what got me excited to become an engineer.

What technological advancement do you most admire?
In sensor technology, being able to size and cost them down — making them accessible to users. Some of the parts NASA used 30 years ago cost millions of dollars then, but are now available in the Nest Learning Thermostat.

“I love that I can arrive in Hong Kong, pull up a map to figure out where I'm going, translate directions, find a good restaurant, etc. That used to be so difficult …”

Which do you most despise?
The noise that comes along with being always connected.

What fault are you most tolerant of in a gadget?
Weight. Sometimes a heavy device can actually feel premium.

Which are you most intolerant of?
Slow speed and responsiveness.

When has your smartphone been of the most help?
When traveling internationally. I love that I can arrive in Hong Kong, pull up a map to figure out where I’m going, translate directions, find a good restaurant, etc. That used to be so difficult before the iPhone. Travel has become a pleasure!

What device do you covet most?
It’s a big device, but the Tesla Model S is on my list.

If you could change one thing about your phone what would it be?
No more dropped calls.

What does being connected mean to you?
As an entrepreneur, being connected means always being in touch with my team, the progress we are making as a company and what is going on around us.

When are you least likely to reply to an email?
When I’m in the shower.

When did you last disconnect?
October 2007. I went on vacation and turned off my phone and put it in the hotel safe. D

The week that was in 140 characters or less.

Accidental Acronyms, Big Minis, Germs, Gs and Space Dragons

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@mhamilton1509

So there's going to be a "5G"?!

@phonewisdom

i can believe the idea of naming the 5-inch HTC phone the Droid Incredible X. The only concern? It'll be called DIX for short.

@ronhoutman

Communal germ pad on a stick? Virginia Beach McDonald's adds free iPad use to its menu

@loghaD

"Dragon docks with International Space Station" has got to be the most sci-fi/fantasy:esque headlines of this decade.#SpaceX

@mattbuchanan

A 4-inch phone is now a "mini" device. The hell.

THE STRIP | BY BOX BROWN

ELECTROMAGNET

In 1825, William Sturgeon, an English electrical engineer, presented one of the world's first electromagnets. He discovered that wrapping an iron rod with an electrically charged wire would make the iron core magnetic — enough so that his 7-ounce magnet could hold nine pounds. Unlike permanent magnets, these could be turned on and off. Further developments have led to the electric telegraph and motor, and today's superconducting magnets, like those in use at CERN's Large Hadron Collider.

PHOTOGRAPH: SSPL VIA GETTY IMAGES

MODERN EQUIVALENT:
Superconducting Magnet

CERN

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