Weekly *Wireless* Report

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This Week's Stories

'Dish Would Bring No Benefit To Sprint Whatsoever': MoffettNathanson

August 3, 2017

A rumored merger between Dish Network and Sprint might benefit the beleaguered satellite TV company, MoffettNathanson analysts wrote this morning. But it isn't likely to happen, and it wouldn't help Sprint at all.

Nikkei reported earlier this week that Sprint parent SoftBank was considering pursuing a merger between Dish, which has stated its intentions to leverage its spectrum holdings by building an NB-IoT network, and the U.S. carrier. That report is just the latest in a series of rumored deals that have Sprint tying up in some form with T-Mobile, Charter, Comcast or a combination of those three companies.

A marriage with Sprint makes some sense for Dish, which continues to see both its subscriber base and total service revenues wane. It does nothing to help Sprint, though, which controls an impressive portfolio of 2.5 GHz spectrum but faces serious financial challenges as it gradually deploys service on those airwaves.

"Perhaps reports that SoftBank is considering an acquisition of Dish Network are true ... but we sort of doubt it," Craig Moffett of MoffettNathanson wrote in a note to investors this morning. "To be sure, given Dish's rapidly deteriorating financial position, we can understand why Dish would be interested. And a deal with Sprint would actually have strategic merit for Dish, which would secure infrastructure that would help reduce the cost of deploying its spectrum.

"Unfortunately, Dish would bring no benefit to Sprint whatsoever —Sprint already has more spectrum than it knows what to do with, and Dish's rapidly declining EBITDA would hurt Sprint's liquidity position more than it would help."

That isn't to say that both companies don't need help in the wireless market, of course. Dish faces a significant challenge in building an IoT-focused network from the ground up, and the company has no experience in wireless. And Sprint needs a cash infusion to help it continue to narrow the network gap with its bigger rivals as U.S. carriers prepare to roll out 5G services.

But the economics of an arrangement between Dish and Sprint appear to be unworkable, Moffett said.

"And here's the bigger problem: both companies' stock prices discount a high probability of being acquired ... but not of being an acquirer," he wrote.

"Merging the two, with no meaningful synergies and no infusion of cash, would create a rapidly shrinking combined company with a warranted valuation far lower than the sum of their current market caps."

fiercewireless.com

Verizon Closes In On 1 Gbps In LAA Tests With Ericsson, Qualcomm

August 3, 2017

"By continuing to deploy the latest technologies on our 4G LTE Advanced network, we pave the way for better and faster performance for the things our customers do now, and provide the groundwork for our future advancements."

Verizon issued the latest salvo in the gigabit LTE wars this week, reporting speeds only a hair shy of the 1 Gbps mark in real-world tests with Ericsson and Qualcomm.

The carrier on Tuesday said it hit 953 Mbps in a joint commercial network deployment in Boca Raton, Fla., that utilized Licensed Assisted Access (LAA) technology. Alongside LAA, Verizon reported its use of four carrier aggregation, 4x4 MIMO, and 256-QAM to hit the near-gigabit mark. Verizon claimed the figure is the "fastest announced speed achieved in a real-world, dynamic network environment" using LAA technology.

"Today's milestone is a great example of our approach to new technology – we deploy the latest capabilities reliably and in real-world environments, not just in a lab," Verizon's Chief Wireless Network Officer Nicola Palmer commented. "By continuing to deploy the latest technologies on our 4G LTE Advanced network, we pave the way for better and faster performance for the things our customers do now, and provide the groundwork for our future advancements."

Verizon said the demonstration used all commercially available network components, spanning a cell site, hardware, software, and backhaul. Ericsson contributed its Radio 2205 for the LAA component of the test, while Qualcomm pitched in with a Snapdragon 835 mobile platform-based test device.

Verizon said it has been "aggressively" deploying new technologies on its network in the quest for gigabit speeds, and a spokeswoman noted engineers will be working in the fourth quarter and early 2018 to make peak speeds - via LAA with four carrier aggregation - more widely available. The carrier has already deployed 4x4 MIMO in 83 percent of markets, she added.

Last summer, Verizon launched two-channel carrier aggregation nationally, and noted it has now also completed deployments of three-channel carrier aggregation using its licensed spectrum. Several devices on the market can already support gigabit speeds, the carrier noted.

The news follows announcements of gigabit LTE work from all three of Verizon's major rivals.

Back in March, Sprint demonstrated speeds well above 600 Mbps at a New Orleans sports arena using 4x4 MIMO, 256-QWAM, and three-channel carrier aggregation on licensed spectrum. In an update last month, Sprint CTO John Saw indicated the carrier is headed for four carrier aggregation as well as massive MIMO deployments next year in its quest to hit the gigabit mark.

In June, both AT&T and T-Mobile surpassed 750 Mbps in their own gigabit tests utilizing four-channel carrier aggregation and LAA in California.

T-Mobile said it's already launched LTE-Unlicensed (LTE-U) technology in six cities across the country, but indicated it plans to further densify its network with small cells that include LAA functionality starting later this year.

AT&T reported in June it has already activated 256-QAM and 4x4 MIMO in a "significant part" of its network, and is "actively testing" four-channel carrier aggregation now with plans to deploy the technology in the second half of the year. AT&T's VP of RAN and Device Design Gordon Mansfield told Wireless Week four carrier aggregation capabilities are on track to start showing up in handsets in the "near future."

wirelessweek.com

Products & Services

Microsoft Fine-Tunes Windows 10 And Debuts Beta Eye Control

August 3, 2017

As the date for the next big Windows 10 update approaches, Microsoft today released its latest developer preview, which includes a beta version of a new eye control system.

Borne out of a Microsoft hackathon challenge inspired by former NFL player Steve Gleason, who suffers from ALS (amyotrophic lateral sclerosis), Eye Control enables disabled users with compatible eye tracker devices to operate Windows 10 PCs through gaze alone.

The Windows 10 Fall Creators Update, expected to arrive next month, will bring several improvements to the Microsoft Edge browser and will also update the default colors in the Windows Console for the first time in more than 20 years. The color changes are aimed at making text easier to see and read on today's high-contrast screens.

'Liberating' Technology

Available in beta through the Windows 10 Insider Preview Build 16257 released today, Eye Control lets users with limited mobility type, control a mouse and convert text to speech with compatible eye tracker accessories. The first such device to support those capabilities is the Tobii Eye Tracker 4C, announced yesterday by Tobii, a Sweden-based company that specializes in assistive technology.

"This collaboration clearly shows the value of eye gaze input and is a big step forward on the long-term journey to drive high-volume adoption of eye tracking," Tobii CEO Henrik Eskilsson said yesterday in a statement.

Microsoft began working with partners in the ALS and motor neuron disease (MND) community during its first hackathon three years ago, following a challenge by Gleason. Gleason had sent an email to Microsoft asking the company to develop a technology that would make it easier for him and others like him to control a wheelchair and communicate.

That challenge led to the concept of an Eye Gaze Wheelchair, which won the 2014 hackathon grand prize. Since then, Microsoft has continued to further refine its eye-tracking technology for use with PCs.

"Having Eye Control in Windows 10 continues to bridge the gap between widely used technology and people with disabilities," Gleason said in a post published yesterday on the Microsoft Accessibility Blog. "It's simply liberating."

More Modern Console Colors

Another change coming with the Fall Creators Update is an overhaul of the default colors that appear in the Windows Console. The new palette aims to make it easier to read text, especially in darker colors, and to "give the Console a more modern look & feel," project manager Craig Loewen wrote yesterday on the Microsoft Developer Blog.

"During the past 20 years, screens & display technology, contrast ratio, and resolution have changed significantly, from CRT's through TFT LCDs to modern-day nano-scale 4K displays," Loewen said. "The legacy default scheme was not built for modern displays and does not render as well on newer high-contrast LCD displays. This is particularly apparent with deeply saturated darker colors like blue."

For now, the new colors will not appear in the Windows Console default option. Microsoft plans to release a tool soon that will let developers try out the new color scheme, he said.

Other changes arriving with today's Insider preview include a refreshed browser frame look for Microsoft Edge, several fixes to the anti-virus Windows Defender Application Guard, and the elimination of a number of other bugs in previous builds. In addition, Developer Insiders who are in the Office Insider program will see new support for using 3D images in Word, Excel and PowerPoint.

mobile-tech-today.com

What Fitbit Needs To Do To Make A Great Smartwatch In 2017

July 31, 2017

"There's hope for Fitbit's smartwatch if the company takes a different approach, focusing on its roots as a fitness company while also adopting the most useful aspects of the smartwatches we have today."

It's no secret that Fitbit is making a smartwatch. The company signaled its serious plans with the purchase of Pebble at 2016's end and the purchase of the lesser-known Vector shortly after. Fitbit was supposed to release a smartwatch this spring, but product issues delayed those plans. Rumors suggest we won't have to wait much longer, though, as the company may release an entirely new product this fall: a smartwatch that many want to rival the Apple Watch as well as Android Wear devices.

Fitbit has plenty of reasons why it would want to confront Apple in the wearable space: Apple overtook the company as the top wearable shipper, owning 14.6 percent of the wearable market (tied with Xiaomi) in Q1 2017. But Fitbit shouldn't make an Apple Watch clone—and one could argue that it can't do so anyway. There's hope for Fitbit's smartwatch if the company takes a different approach, focusing on its roots as a fitness company while also adopting the most useful aspects of the smartwatches we have today. Here's what we know about the device so far—and what we don't know—as well as some things Fitbit should consider including in the new device.

What We Know

Back in May, leaked images of the rumored Fitbit smartwatch popped up online and painted an all-too-familiar picture of what the new product could look like. The design of the wristband mimics the company's Blaze tracker (as well as the old-school Surge) with a square face accompanied by a couple buttons on the edges. It's not the sleekest-looking device, but neither the Blaze nor the Apple Watch were perceived as stylish when they first debuted. Since then, sales for both of those devices have proved users have either warmed up to the square-watch design or simply don't care enough to be deterred by it.

As far as hardware features go, reports state the forthcoming watch will have a heart-rate monitor, onboard GPS, and NFC for payments. Including both a heart-rate monitor and GPS places the forthcoming smartwatch as more of a upgraded Surge band, and that means it'll probably cost more than $200. Reports suggest Fitbit will price the smartwatch at around $300 or less.

NFC payments is an important feature to include in the new smartwatch if it hopes to be an Apple Watch competitor. Apple Watch users can hold their device up to an NFC reader in a store to pay with a credit card they've saved to Apple Pay, so they can make purchases without an iPhone or wallet present. Fitbit is right to incorporate this into its new device, particularly if the watch is meant to be used for a morning run around the neighborhood without a wallet, with a possible drink at a coffee shop on the way home.

We know Fitbit has the technology to include NFC payments in the watch as well: in 2016, the company acquired assets from Coin, a startup that created a single card to replace your entire wallet. Fitbit had no plans to include Coin technology in its 2016 device lineup, but we're well past that threshold and will likely see it in the full-featured smartwatch.

Fitbit's new smartwatch will likely have onboard music storage as well. The company is supposedly working with Pandora to let users store music locally on the watch. The company originally planned to work with Spotify on the same project, but reports say the partnership "floundered" and Fitbit promptly turned to Pandora. Spotify made sense as Fitbit's first choice since it is the largest paid music streaming service in the world,

Another part of Fitbit's plans we know is that it's building a standalone app store that will hold third-party applications for the smartwatch. Late last week, a report from The Verge stated that the app store would be ready in time for the device's launch. An SDK, along with a few select apps, will be available when the device comes out, but we don't know which third-party apps will be the ones ready to go out the gate. (We'll discuss further uncertainties of Fitbit apps in the next section.)

Fitbit CEO James Park also stated that the apps will be available in an "app gallery" (so not really a "store") in the Fitbit mobile app. This sounds similar to the separate page in the Watch app on iOS where users can download Apple Watch apps and their mobile app companions.

One thing we likely won't see in the new Fitbit device is cellular service. CEO James Park has stated publicly that he doesn't see the use case for independent LTE connectivity on wearables yet. This is a wise choice because the hardware necessary for LTE connectivity adds bulk to any device; this makes sense considering the leaked images of Fitbit's watch already look clunky.

Many wearable enthusiasts have compared the rumored smartwatch to the Fitbit Blaze, but based on what we know, the device sounds more like a beefed-up Surge. Released nearly three years ago, the Surge was (and remains) the most advanced device in Fitbit's family, with a heart-rate monitor, onboard GPS, music controls, multi-sport tracking, and up to seven days of battery life. The leaked smartwatch images even present a device much more similar to the Surge than the Blaze, but the Blaze is fresh for comparison in everyone's minds since it is newer than the Surge and more flashy.

Where the Blaze prevails over the Surge is in modernity: it has a color touchscreen, on-screen workouts through FitStar integration (Fitbit owns FitStar), estimated VO2 max scores that Fitbit calls "cardio fitness levels," and guided breathing exercises. In light of the new devices Fitbit has come out with in recent years, the Surge has kind of been left on the back burner —and if everything we know comes to fruition, Fitbit could make a smartwatch that replaces the Surge entirely.

What We Don’t Know

The biggest question-mark of Fitbit's smartwatch is the app gallery. We now have confirmation from Park that the app gallery will be ready at the device's launch. Otherwise, we don't know much else. Fitbit leaned heavily on intelligence and technology it acquired from Pebble to make the app gallery, and we know the SDK will be Javascript-based. Fitbit is hoping Javascript will make it easier and more enticing for developers to make apps for the platform.

A possible (yet unreliable) detail about forthcoming apps is in the leaked image of the purported smartwatch (obtained by Yahoo Finance). A smiling icon of a sun marks the display, suggesting a weather app may be on the device at launch. There could also be a Pandora app featured on the watch if that's how Fitbit chooses to integrate onboard music.

Before we knew the state of the app gallery, one argument was that the new device would be DOA if Fitbit didn't have a full app store ready at launch. Apple has an app store for the Apple Watch and Google has a bunch of Android Wear-ready apps available in the Play Store, so Fitbit should be ready to step up to bat. The rollout of Android Wear 2.0 even put the Play Store on Android Wear devices, letting users download apps directly to the watch without using their smartphones at all.

The App Store revolutionized the iPhone in a plethora of immediate and long-term ways, but I'm unconvinced that app stores will do the same for wearables. This is mostly because these app stores aren't proving to be the best part of the smartwatch experience. There's a lot of skepticism on how useful onboard smartwatch apps are, and because of this developers either aren't creating apps for wearables, or they are discontinuing support for the apps they've already created. Google, Amazon, and eBay are some of the big companies that quietly pulled their Apple Watch apps from the device's app store back in May—no one really knows why, but it's believed that those apps simply weren't used enough to warrant continuous attention from developers.

So yes, we will get a Fitbit "app gallery," but I also expect to see smart app integration on the watch. Let's take eBay on Apple Watch for example: eBay's Apple Watch app let users track bid statuses, but is it necessary to have a dedicated app just for that feature? Browsing eBay, Amazon, or other online stores on your watch is awkward and inconvenient, so having a watch app mimic the mobile app isn't the best translation of features. A good watch app would have to supplement the mobile experience in ways that make sense for the device—currently, that seems to mean glanceable information that's easy to interact with from your wrist.

The eBay app for Apple Watch no longer exists, but the eBay experience on Apple Watch is still quite useful. With just the mobile app installed on your iPhone, you'll get any eBay alerts to your wrist that you normally would get on your smartphone. That includes alerts when auctions you're watching are almost over, if you won or lost an auction, and more.

In addition to third-party apps, I hope Fitbit incorporates notifications like this on its forthcoming smartwatch with thoughtful interactions to go along with them. I want to get alerts on my wrist when someone tweets at me, and I want to be able to quickly like the tweet or reply with a short, pre-fab response (the same interaction could apply to text messages, too). I'd like to get headlines from my favorite news app as well, maybe with a photo like The Guardian's Apple Watch notifications have, but I don't need or want to read a full article on a tiny watch screen. At the end of the day, the quality of the app notifications and usefulness of the wrist interactions will make or break the "smartwatch" experience of Fitbit's new device.

Guided Workouts

Assuming Fitbit makes a smartwatch that focuses on fitness, the company could do a few things to make a stellar product. Guided workouts are largely overlooked and underutilized, but they are incredibly valuable for a fitness device and for device retention in general—if you're constantly using, creating, and updating customizable workouts, you're more likely to regularly use the device that holds them.

Rest in peace, Microsoft Band—the wearable that handled guided workouts arguably the best out of them all. Not only did it give you your choice of over 130 workout sessions to download, but you could also create your own circuits using the Band's Web portal. Following along with the workout sessions on the band was easy, and even Fitbit mimicked this on the Blaze with the incorporation of a few (free) FitStar workouts.

Making a personalized circuit may seem too complicated for the average user, but it's not that far off from streaming a workout video on YouTube created by a fitness personality. You follow along a few times, then take the individual exercises you've learned and apply them however and whenever you want.

Guided workouts are positive in two ways. The pre-fab sessions provided by the device's manufacturer, or third-parties like FitStar or Gold's Gym, make it easier for users to work out. You have no excuse not to work out when exercise plans are sitting in the cloud waiting for you to download them and load them up on your wristband. Guided workouts also make it easier for already active users to switch up their routines. Whether that means pre-fab sessions or customizable circuits, completing different workouts will challenge your body and prevent muscle memory from sabotaging your progress.

Battery Life

Ultimately, guided workouts will be more useful to some users than others, but a universally loved and necessary feature is a solid battery life. Most activity trackers have this down—you can get a super simple tracker with months of battery life, or a more advanced device will have up to a week of life. Smartwatches have not passed this hurdle yet. The Apple Watch Series 2 has come the closest of any true smartwatch, with up to two days of battery life (although it is highly dependent on how much you actually use the watch itself).

Smartwatches must get to the point where they can go at least five days without more juice, putting them in competition with "traditional" activity bands. The less you have to remove a wearable, the more you'll actually wear it. But since smartwatches generally do much more than track activity, more hardware and software features are constantly draining battery life. Screen quality, the inclusion of an onboard GPS or heart-rate monitor, and standalone LTE service are just a few things that can quickly send a smartwatch's battery life from 100 percent to 0. Fitbit will be miles ahead of the pack if it can find the right balance of hardware inclusions and software features that can last more than two days on a single charge.

Music Streaming

Clever music integration is also key for a wearable meant to be used independently from a smartphone, particularly a fitness device. Onboard music storage is a feature mostly isolated to niche athletic devices or expensive wearables made by companies like Garmin and TomTom. But it's a crucial feature for those who prefer to workout sans smartphone and want music at the same time.

Fitbit has an opportunity to make the wearable onboard music experience better by taking a different approach to the music interface. Before you can listen to music through wireless earbuds from a smartwatch you have to get those tracks onto the wearable, and most interfaces for doing that are ugly and clunky. Sometimes they aren't even in the wearable's companion mobile app. Instead, they live in an obscure Web app that you may never use for anything else other than syncing music.

Fitbit's mobile app is arguably the most user-friendly fitness wearable app available, and, if the company can intuitively integrate music organization into it, the new smartwatch will be unique among most competitors. The Apple Watch's music app (iTunes, really) has a pleasant interface on the watch that lets you control playback from music stored on your iPhone as well as music you've downloaded to the watch. Of course, the catch is that you can only play iTunes or Apple Music tracks. Limiting the music source isn't exclusive to Apple—and if rumors are true, Fitbit's device may only play music from Pandora.

There's a similar opportunity to renovate music controls on the device itself: a lot of wearables can control music from your smartphone with pause, play, and skip buttons on their touchscreen. Most wearables with onboard music have similar controls, but Fitbit could make that on-device experience better by adding album art or track lists so you can pick and choose the songs you want to hear (and not rely only on shuffle).

Diet Tracking

The final thing Fitbit could add to the smartwatch is an easier way to track daily food intake, and this is the wild card of the bunch. Fitbit doesn't emphasize its diet tracking features even though they've become robust over the past few years. You can track food and drink within the app and set weight and body-fat percentage goals, and the app will provide a calorie-based diet plan for you to reach that goal in a certain period of time. You can also connect third-party services like MyFitnessPal and Lose It!, making it easier to accurately log caloric intake and expenditure and see those values in one place in the Fitbit app.

Lose It! has a feature on its Apple Watch app that lets users add a "snack" of a certain caloric value to the daily log without using your smartphone. Fitbit's device could benefit from a system like this for tracking food. It would be too cumbersome to track every food in every meal from a tiny wearable screen, but a list of your most-eaten foods easily accessible on your wrist would be convenient. Users could select a favorite food to add to the on-watch list from the mobile app, then choose that food on their device and adjust the amount consumed to instantly add it to their daily food log. Fitbit could partner with a third-party service for this, but since it has its own native food tracking system, I hope it would develop its own native feature.

It Won't Be Easy, But It's Not Impossible

I have many hopes for Fitbit's forthcoming smartwatch, but so much uncertainty surrounds it that I'm not getting my hopes up too much. Fitbit has an uphill battle entering the smartwatch market because we still don't know exactly what smartwatches should do for consumers. Apple and Google are both trying to figure this out.

But if Fitbit makes a device that has the sole purpose of taking on the Apple Watch—the current king of smartwatches—it will likely fail. If that's the case, it will be blatantly obvious that Fitbit went for the "attack Apple" approach rather than the "do something original" approach. The public still has a malleable opinion about smartwatches because their use hasn't been completely defined yet, so there's room for many types of smartwatches right now. Fitbit needs to stay true to its roots and make a smartwatch that's the best fitness device for the widest pool of people interested in exercise.

And we can't forget one big thing Fitbit has going for it: Fitbit devices work on both iOS and Android, so this smartwatch will likely also be available for both platforms without sacrificing any functionality. Neither Apple Watches nor Android Wear devices can boast that. If Fitbit's new device has the right balance of killer fitness features (even more killer than those on the Apple Watch), clever app integrations, an inoffensive design, and an affordable price, it will be able to compete in the messy and uncertain smartwatch world.

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Emerging Technology

Ice Wireless Deploys Parallel Wireless Gear To Connect Unconnected Canadians

August 3, 2017

"Ice Wireless, a provider of wireless and wireline IP services, said it successfully deployed a multitechnology macro solution based on Parallel Wireless' all-IP virtualized RAN (vRAN)."

An operator in Northern Canada is connecting the unconnected thanks to technology provided by Parallel Wireless, the same company that has supported public safety communications at high-profile events like the Super Bowl.

Ice Wireless, a provider of wireless and wireline IP services, said it successfully deployed a multitechnology macro solution based on Parallel Wireless' all-IP virtualized RAN (vRAN). That means residents in far-flung regions like north of the Arctic Circle have an opportunity to get connected.

And by remote, they're talking about a very harsh environment where this was done in the middle of winter—"We are talking -50," said Tore Stenbock, director of Wireless Core Networks for Ice Wireless.

The whole project took about two months, including travel, site acquisition, site preparation and delivery to some of very remote sites via Ski-Doo—that includes any other base station could not be delivered by snowmobile due to their size.

“Unheard of,” Stenbock said of the time it took. “Ice Wireless knows how to innovate in such tough environments.”

Specifically, the initial four locations (with multiple sites) are major Arctic locations for Ice: Whitehorse, Inuvik, Yellowknife and Iqaluit. Many of these markets have limited backhaul availability and limited access to power. Parallel Wireless’ Commercial Off the Shelf (COTS)-based network solution enabled Ice Wireless to deploy on an accelerated timeline.

Obviously, covering such a harsh region is difficult as operators typically don't want to spend a lot of money to serve a very small number of users (114,000 residents and 93,000 visitors per year).

However, Parallel says it is constantly updating its portfolio to help deliver internet to places that want the full experience and not just a sliver of it. Its products came preconfigured and all that needed to be done was to plug backhaul and power in at the four locations.

The self-configuring and self-optimizing technology combines Parallel Wireless HetNet Gateway with Parallel Wireless’ Converged Wireless System (CWS) base stations.

The sites use the software-defined radio (SDR) capability of the technology to incorporate both 3G and 4G LTE into a single integrated solution that delivers the smallest site footprint, according to Parallel. The whole thing is designed so that changes can be done remotely—no need to fire up the snowmobile to change configurations on site.

The deployment at 850 MHz typically, in ideal network conditions, yields throughput at 10 MHz, 115 Mbps uplink and 30-40 Mbps downlink.

Ice Wireless is a facilities-based operator that delivers 3G and 4G/LTE-A technology to rural and remote communities across the Yukon, Northwest Territories, Nunavut and Quebec.

fiercewireless.com

IBM And Sony Cram Up To 330 Terabytes Into Tiny Tape Cartridge

August 2, 2017

IBM and Sony have developed a new magnetic tape system capable of storing 201 gigabits of data per square inch, for a max theoretical capacity of 330 terabytes in a single palm-sized cartridge.

For comparison, the world's largest hard drives—which are about twice the physical size of a Sony tape cartridge—are the 60TB Seagate SSD or 12TB HGST helium-filled HDD. The largest commercially available tapes only store 15TB. So, 330TB is quite a lot.

To achieve such a dramatic increase in areal density, Sony and IBM tackled different parts of the problem: Sony developed a new type of tape that has a higher density of magnetic recording sites, and IBM Research worked on new heads and signal processing tech to actually read and extract data from those nanometre-long patches of magnetism.

IBM's Tale of the Tape

More than 60 years of tape innovation

	2006	2010	2014	2015	2017
Aerial Density (bits per sq inch)	6.67 Billion	29.5 Billion	85.9 Billion	123 Billion	201 Billion
Cartridge Capacity (Terabytes)	8	35	154	220	330
# of Books Stored	8 Million	35 Million	154 Million	220 Million	330 Million
Track Width	1.5 µm	0.45 µm	0.177 µm	0.140 µm	103 nm
Linear Density (bits per inch)	400'000	518'000	600'000	680'000	818'000
Tape Material	Barium Ferrite	Barium Ferrite	Barium Ferrite	Barium Ferrite	Sputtered Media
Tape Thickness (micrometers)	6.1	5.9	4.3	4.3	4.7
Tape Length (meters)	890	917	1255	1255	1098

#5thtaperecord

Sony's new tape is underpinned by two novel technologies: an improved built-in lubricant layer, which keeps it running smoothly through the machine, and a new type of magnetic layer. Usually, a tape's magnetic layer is applied in liquid form, kind of like paint—which is one of the reasons that magnetic tape is so cheap and easy to produce in huge quantities. In this case, Sony has instead used sputter deposition, a mature technique that has been used by the semiconductor and hard drive industries for decades to lay down thin films.

The main upshot of sputtering—a cool process that you should probably read about—is that it produces magnetic tape with magnetic grains that are just a few nanometres across, rather than tens or hundreds of nanometres in the case of commercially available tape.

The new lubrication layer, which we don't know much about, makes sure that the tape streams out of the cartridge and through the machine extremely smoothly. Some of the biggest difficulties of tape recording and playback are managing friction and air resistance, which cause wear and tear and chaotic movements. When you're trying to read a magnetic site that is just 7nm across, with the tape whizzing by at almost 10 metres per second, even the smallest of movements can be massively problematic.

We know a little more about IBM's new read head, which appears to be a 48nm-wide tunnelling magneto-resistive head that would usually be found in a hard disk drive—which makes sense, given the tape's sputtered medium is very similar to the surface of a hard drive platter. This new head, combined with new servo tech that precisely controls the flow of tape through the system, allows for a positional accuracy of under 7nm. A new signal processing algorithm helps the system make sense of the tiny magnetic fields that are being read by the head.

The new cartridges, when they're eventually commercialised, will be significantly more expensive because of the tape's complex manufacturing process. Likewise, a new tape drive (costing several thousand pounds) would be required. Still, given the massive increase in per-cartridge capacity, the companies that still use tape storage for backups and cold storage will be quite excited.

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Mergers and Acquisitions

Google Reportedly Offered $30 Billion To Acquire Snapchat

August 3, 2017

"Together, they could align their Google Glass and Snap Spectacles hardware efforts to build a powerful but appealing AR device."

Nerdy Google has failed at social time and time again, so it considered buying teen sensation Snapchat. The search giant held informal talks with Snap and floated an offer of $30 billion in 2016 before Snap's last funding round, and just before its IPO this year, according to Business Insider's Alex Heath. That offer was apparently an open secret inside Snap, and was on the table after the IPO, too.

But Snap's notoriously independent CEO Evan Spiegel has apparently showed no interest in selling out to Google or anyone else. That's despite the startup's market cap slipping to around $15 billion after soaring as high as $30 billion when it IPO'd in May. News of Google's interest helped Snap's share price climb around 2.3 percent today. The uptick comes after weeks of decline due to lockup expiration finally allowing insiders to sell stock, and strong growth for Facebook's Instagram Stories and WhatsApp Status clones of Snapchat.

Google declined to comment to Business Insider and Snap told TechCrunch "these rumors are false." It's possible that Google's interest was very preliminary, and likely never rose to Snap's higher ranks. It's standard for startups to explore alternative paths before taking significant funding rounds or going public.Google's growth-stage investment fund CapitalG ended up investing in Snap after the 2016 talks went nowhere, contributing to the round valuing the "camera company" at $20 billion. The organizations have long been buddy-buddy. Google chairman Eric Schmidt was an adviser to Spiegel, Snap runs Google's office software suite and Snapchat has committed to spending $2 billion on Google Cloud hosting over the next five years.

At the time of the May 2016 choice to go with raising money instead of being acquired, Snap looked unchallenged in the full-screen Stories social media game. But in August, Instagram's soon to be wildly successful Stories clone launched, which has diverted growth, mind share and advertisers from Snap ever since.

Joining forces could be beneficial to both companies. Google would get a top social property to make up for its Google+, Buzz and Wave flops. It could also reap data about people's social graphs, where they spend time and what topics they care about, allowing it to improve its ad targeting and measurement.

Snap would gain a deep-pocketed parent that could provide extra capital to make acquisitions and build out its R&D-heavy augmented reality technology. Machine vision and image recognition algorithms from Google Search could unlock information about what's in everyone's Snaps. Google's advertising expertise and connections could boost Snap's ad revenue.

Together, they could align their Google Glass and Snap Spectacles hardware efforts to build a powerful but appealing AR device. However, Google's open, engineering-driven culture could clash with Snap's secretive, design-driven culture.

But Spiegel is the real stumbling block. He and his co-founder Bobby Murphy have configured Snap's voting rights to give them full control over the direction of the company, denying public backers any say. So even if investors would love to take the $30 billion offer that's double Snap's current market cap, they couldn't compel it to do so. Spiegel famously rebuked Mark Zuckerberg's offers to buy Snapchat, and is known for following his gut over outside advice.

As we wrote before the IPO, to bet on Snap is to bet on Spiegel — for better or worse. His sixth sense for product produced ephemeral messaging and Stories, while his eye for acquisitions gave Snap Bitmoji and AR face filters. But with Snap drowning under Facebook's competition, Spiegel's renegade style could see the company refuse life preservers even as it sinks.

techcrunch.com

Discovery Buys Scripps For $11.9 Billion To Form Cable Giant

July 31, 2017

"The combined companies could leverage their programming to ensure they're included in new online TV services that offers fewer channels at lower prices."

Discovery Communications Inc. agreed to buy Scripps Networks Interactive Inc. for $11.9 billion in a bet that uniting ownership of cable channels like Animal Planet and HGTV will help the company adapt to a fast-changing television landscape.

Discovery, one of billionaire John Malone's key holdings, is grappling with shrinking audiences at some U.S. channels -- including the Discovery Channel and Animal Planet -- as consumers drop cable subscriptions and get more entertainment online from Netflix and others. Discovery Chief Executive Officer David Zaslav said Monday he plans to use Scripps programming to strengthen the company's international reach and expand its distribution options, including creating more short-form video for social media.

The combined companies could leverage their programming to ensure they're included in new online TV services that offers fewer channels at lower prices, he said. Given their wide viewership, both Scripps and Discovery networks are relatively inexpensive for distributors to include in their channel lineups, he said. Hulu and Alphabet Inc.'s YouTube TV, for instance, didn't include Discovery networks in their new web-TV services, and YouTube didn't include programming from Scripps.

"It probably helps in those discussions," Zaslav said Monday of negotiating with new online-TV services. "We do think we are making ourselves a very compelling core of a skinny bundle." Discovery wants to package the Scripps networks with its own in an online service for as little as $3 to $4 a month, Bloomberg reported this month, citing a person familiar with the company's thinking. Discovery fell 5.6 percent to $25.30 at 10:13 a.m. New York time, while Scripps rose 0.8 percent to $87.60.

Discovery, based in Silver Spring, Maryland, will acquire Scripps for about $90 a share and assume long-term debt of $2.7 billion, bringing the total price of the equity value plus liabilities to $14.6 billion, according to a statement Monday. The price represents a 34 percent premium over Scripps' close of $67.02 on July 18, the day before news of the companies' talks became known. Discovery's offer forced Viacom Inc. to abandon its own efforts to acquire Scripps, people with direct knowledge of the matter said last week.

Discovery's cable channels are losing 3 percent of subscribers each year, and his smaller channels are losing subscribers at a faster rate, Zaslav said Monday. Scripps, meanwhile, said Monday that ratings declines have forced it to lower its revenue and profit outlook for the year.

The deal combines two companies that specialize in so-called unscripted programming, focused on real-life adventures, travel, wildlife and home. With Scripps, Discovery gets the home-improvement channel HGTV, where hits like "Property Brothers" and "Fixer Upper" have made it one of the more popular cable networks.

The combined company will have almost 20 percent of the ad-supported pay-TV viewership in the U.S., with a large female viewership. Buying Scripps could help Discovery boost its international sales, which currently account for half of its annual revenue. Knoxville, Tennessee-based Scripps owns an interest in Polish TV operator TVN and a stake in Britain's UKTV.As part of the deal, Scripps Chief Executive Officer Kenneth W. Lowe will join Discovery's board.

"This agreement with Discovery presents an unmatched opportunity for Scripps to grow its leading lifestyle brands across the world and on new and emerging channels including short-form, direct-to-consumer and streaming platforms," Lowe said in the statement.

However, analysts remains skeptical of the logic of combining two portfolios of cable networks as U.S. TV viewership declines and new online distributors offer "skinny" bundles with fewer channels, not more. Some noted that Discovery's content, like Animal Planet, is more applicable to an international audience than Scripps's food and home content.

"While we believe the two companies are likely better positioned together, rather than apart, the longer-term issues facing the industry still remain," said John Janedis, an analyst at Jefferies LLC.

The U.S. Justice Department is expected to give its assent, in part because the deal's unlikely to concentrate the advertising market, Paul Gallant, a Washington-based analyst for Cowen & Co., said in a note Monday.

The deal should face a "light review" before U.S. antitrust authorities because the companies are "relatively small" and their merger won't threaten competition, Roger Entner, founder of Recon Analytics LLC, said in an interview.

Though smaller, Scripps has an especially valuable asset in HGTV, which was the fourth-most watched U.S. network in prime time this year, with an average of 1.51 million viewers a night through July 16, according to Nielsen data. The descendants of Edward Willis Scripps, the newspaper mogul who founded the Penny Press in Cleveland in 1878, control 92 percent of the voting stock and had rebuffed earlier takeover attempts by Discovery.

Deal talk is picking up in the TV industry as network owners grapple with the decline in cable and satellite services amid online competition. Liberty Media's Malone also has discussed a deal to buy all or part of Spanish-language broadcaster Univision Holdings Inc., according to people familiar with the matter.

Pay-TV distributors like Charter Communications Inc. and AT&T Inc. have grown through acquisitions in recent years, giving them added leverage in fee negotiations with channel owners like Viacom, Discovery and Scripps. That's led some network owners to conclude they need to sell as well. Time Warner Inc., owner of TNT and HBO, agreed last year to be bought by AT&T for $85.4 billion.

Cable and satellite-TV providers pay fees to channel owners for the right to carry their channels, and the negotiations have grown more tense now that more pay-TV subscribers are cutting the cord.

Network owners are also beginning to offer their own online services to compete with YouTube and Netflix. CBS Corp. offers its flagship network and Showtime as standalone services online. Walt Disney Co., which owns ESPN, is developing an online service to reach sports fans who aren't using traditional cable.

bloomberg.com

Industry Reports

Amazon's Giant Jobs Fair Sends Troubling Signal About The Economy

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"This experience shows we have not had the labor market recovery that a lot of economists have suggested."

Federal Reserve officials say the US economy is at or very close to full employment. The thousands of Americans who lined up in the searing heat this week after Amazon said it was hiring 50,000 workers for fairly low-paying, physically demanding jobs in high-pressure warehouses, suggests otherwise.

Perhaps the Fed could have sent a staffer to observe the lines, and talk to some of the people on them for insight into the real economy.Here's what Washington Post reported about the Baltimore location, one of 12 around the nation conducting these cattle-call mass hires:

"Lisa Pendry has been laid off eight times since 2008, and each time it's been even harder to find a new job. This time, she's spent three months searching. But it's tricky to find companies that are hiring, she says, and even more difficult to get an in-person interview. ' I've got three kids to feed,' said Pendry, 44, who most recently worked as an administrative assistant for Allstate Insurance. 'It doesn't matter what it is anymore, I just need a job.'"

Which is why Pendry decided to stand in line for hours on a sweltering day, in the hopes of just getting a foot in the door. The jobs offer between $12-$15 an hour, well above the minimum wage. Crucially, they also offer healthcare benefits, absent in a lot of low-income jobs.

The day did not end as Pendry had hoped. After five hours of waiting, she gave up. " It would've been another three or four hours before we got anywhere. That line of thousands of people waiting around all day without food — that tells you everything you need to know about the job market," Pendry said.

It does indeed: Speed dating for jobs, and most people end up alone. US workers know all too well the labor market is a mere shadow of its pre-Great Recession self, but policymakers in Washington are bent on insisting otherwise. With the official unemployment rate at a historically low 4.4%, Fed officials seem bent on raising interest rates and shrinking its balance sheet despite inflation that continues to slip below their 2% target, indicating yet more room for the economy to grow more evenly. Underemployment is still rampant and wages have been stuck in a rut for a prolonged period.

"This experience shows we have not had the labor market recovery that a lot of economists have suggested," said Marshall Steinbaum, research director at the Roosevelt Institute, a liberal Washington think tank."Fed officials are talking about full employment but that is a misdiagnosis of the current state of the economy," he told Business Insider. "The wage data is what should rule here and the wage data do not suggest an economy at full employment."

msn.com

John Donovan Officially Named CEO Of AT&T Communications Ahead Of Time Warner Acquisition

July 31, 2017

"Donovan, who moved to AT&T from VeriSign in 2008, is largely credited with being a driving force behind the telecom's move to virtualize its network."

John Donovan was officially named CEO of AT&T Communications, confirming reports that the tech-industry executive would oversee the carrier's traditional phone businesses as well as DirecTV. Donovan, who moved to AT&T from VeriSign in 2008, is largely credited with being a driving force behind the telecom's move to virtualize its network. Donovan has also spearheaded AT&T's efforts to implement new business models for its carrier partners in an effort to reduce network costs.

AT&T announced Friday that Donovan's new purview will include its Business Solutions, Entertainment Group, and Technology & Operations Groups. The move is part of a broader strategy as the carrier restructures ahead of the closing of its acquisition of Time Warner. John Stankey, who has worked at AT&T for three decades, will lead the team integrating the two companies and "will work closely" with Time Warner CEO Jeff Bewkes "for a smooth leadership transition," AT&T said. Stankey, who previously headed AT&T's Entertainment Group, will become CEO of the media company once the merger is complete. Meanwhile, Global Marketing Officer Lori Lee will expand her responsibilities to oversee AT&T's international operations.

Donovan, Stankey and Lee will all continue to report to Randall Stephenson, who remains in place as AT&T's chairman and CEO. The changes take effect tomorrow. While the official announcement was made Friday, Bloomberg reported more than two weeks ago that "major organizational challenges" were in store as the company prepared to expand beyond telecom into digital media. Bloomberg described the restructuring as "one of the largest at AT&T since 'Ma Bell' was broken apart" by U.S. regulators 33 years ago, creating seven regional "Baby Bells."

Donovan faces some major challenges as AT&T strives to leverage the colliding worlds of telecom and media to become a cross-platform provider of content and advertising. AT&T's overall broadband revenues were down slightly in the second quarter, although IP broadband revenues grew by 3.2%. The company posted a net loss of 89,000 postpaid phone subscribers during the quarter, beating analysts' expectations but continuing a long streak of postpaid losses. And while DirecTV Now enjoyed 152,000 subscriber gains during the quarter, the DirecTV satellite service shed 156,000 users. "We look forward to completing the deal and delivering for customers the many benefits of this merger," Stephenson said in AT&T's brief statement.

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