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ED'S NOTE

FEBUARY 2021

BACK TO GADGETS GALORE

AFTER A WHOLE year writing about Covid-19, I'm so done with it. Unfortunately, the coronavirus continues to have far-reaching consequences even in the tech world and we're not going to be rid of it anytime soon.

So, as we settle into the second month of 2021 and Singapore's Phase 3 of economic re-opening, our team investigated the various measures tech companies have prepared for the eventual return to the office. Is working from home (WFH) here to stay? Have productivity suffered over the past year? Is WFH burnout real? Can Singapore survive another lockdown? These are among the many questions we tried to get to the bottom of in this issue's feature story.

But, if you don't really want to read another Covid-related article anymore, I completely understand. That's why we've dedicated a major part of this month's magazine towards our core love of gadgets. Specifically, this month's theme of gaming gear. Maybe you missed the boat on ordering the Xbox Series X last Christmas. Well, good for you, because we've got a definitive answer this issue if it's worth the upgrade. PC gamers are also getting a treat for the ears. If you've been looking for a good pair of gaming headphones, we've not one, but three solid choices for your consideration. Even if you aren't into gaming, we've got the last word down on the latest big-ticket items that you probably want to consider carefully before dropping serious cash on such as the Apple AirPods Pro, and Samsung Galaxy S21 Series. Yes, all this, in one issue.

Huat ah!

Zachary Chan
Editor

ON THE COVER
PICTURE **123RF**
ART DIRECTION **JASON TAN**
All prices quoted in this tablet are in Singapore Dollars (SGD), unless otherwise specified.

CONTENTS

FEBUARY 2021

FOLLOW US

facebook.com/
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hardwaremag_sg

twitter.com/
hardwarezone

youtube.com/
hardwarezonecom

36
TEST:
Apple AirPods Max

58
TEST:
Microsoft
Xbox Series X

64
TEST:
Samsung
Galaxy S21,
S21+, S21 Ultra

10
THINK:
Solarwinds
Sunburst
Attack

72
TEST: Creative
Outlier Air V2

24
FEATURE:
Will you
return to
the office in
Phase 3

50
TEST:
RAZER
BLACKSHARK
V2 PRO

SINGAPORE HWM

SPHmagazines

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MORE INSIDE

MANAGING CYBERSECURITY: DevSecOps
Don't get overwhelmed with trivial defects.

RISE OF THE

CYBER PANDEMIC
There have been many warning signs of increasingly sophisticated cyber-threats that aren't just surging in volume, but impact, complexity, and speed. What can we learn from the latest SolarWinds Sunburst attack, and what is being done to improve protection against such threats?

SOLARWINDS SUNBURST ATTACK

What Do You Need to Know and How Can You Remain Protected

Contributed By

Check Point Software Technologies.

On the week of December 13th , US government offices exposed they were targeted by a series of mega cyber attacks, allegedly related to state-sponsored threat organisations. Those attacks targeted government, technology and enterprise organisations worldwide. This series of attacks was made possible when hackers were able to embed a backdoor into SolarWinds software updates. Over 18,000 companies and government offices downloaded what seemed to be a regular software update on their computers, but was actually a Trojan horse.

By leveraging a common IT practice of software updates, the attackers utilised the backdoor to compromise the organisation's network when they then went on to spy, impersonate employees and access data. This recent high profile attack represents additional evidence of the emergence of Generation V of sophisticated cyber-attacks.

Researchers, who have named the hack Sunburst, say it could take years to fully comprehend the severity of this large scale cyber-attack. It could

take months for security professionals in the affected organisations to discover which emails were read, what documents were stolen and which passwords are compromised because of the hack.

In the wake of this attack, the Monetary Authority of Singapore (MAS) has announced a new set of rules that all financial services and e-payment firms in Singapore must follow. These new guidelines are designed to improve the processes of testing and validating third-party vendors and technology used within the financial sector.

"The revised Technology Risk Management Guidelines are a step in the right direction and a necessity as we go into 2021, given that a lot has changed in 2020 with the pandemic. The pandemic brought about great flux with FSIs having to compress years' worth of IT changes into weeks. Based on customer feedback we believe cloud security and other emerging technologies will be a key priority for businesses in the next two years up to 2023, so it's great to see that the revised guidelines reflect this. Ultimately FSIs will benefit in the long run, with the board is accountable

for managing technology and cyber risks", remarked Robert Pizzari, VP Global and Strategic Customers at Check Point Software Technologies.

THE CYBER PANDEMIC IS HERE

The COVID-19 pandemic has had a dramatic effect on organisations globally. This presented cybercriminals the perfect opportunity to take advantage of global media interest to spread malicious activity. Coronavirus-themed domains are 50% more likely to be malicious and that there have been over 2,600 attacks daily relating to the pandemic. Furthermore, new phishing campaigns impersonated the WHO and popular conferencing platforms to steal sensitive information, peaking with a 192,000 coronavirus-related cyber-attacks per week.

THE 'NEW NORMAL' NOW MEANS GEN V CYBER-ATTACKS

Threat actors have become highly sophisticated. The latest generation of cyberattacks present a completely different ball game as sophisticated cyber-attacks are surging not only in volume but also in impact, complexity and speed. Hackers are constantly

evolving their technology and techniques to creatively deliver malware. We've previously projected that the pandemic will disappear, but it's cyber effect will not. This has now become a reality.

RANSOMWARE SPIKING

Organisations worldwide are experiencing a massive spike in ransomware attacks. In Q3 2020, there was a 50% increase in the daily average

> ❝ THE LATEST GENERATION OF CYBERATTACKS PRESENT A COMPLETELY DIFFERENT BALL GAME AS SOPHISTICATED CYBER-ATTACKS ARE SURGING NOT ONLY IN VOLUME BUT ALSO IN IMPACT, COMPLEXITY AND SPEED. HACKERS ARE CONSTANTLY EVOLVING THEIR TECHNOLOGY AND TECHNIQUES TO CREATIVELY DELIVER MALWARE. ❞

of ransomware attacks, compared to the first half of the year.

While some reported attacks were carried out by known ransomware strands such as REvil and Ryuk, several large corporations experienced full blown attacks using a previously unknown variant, Pay2Key.
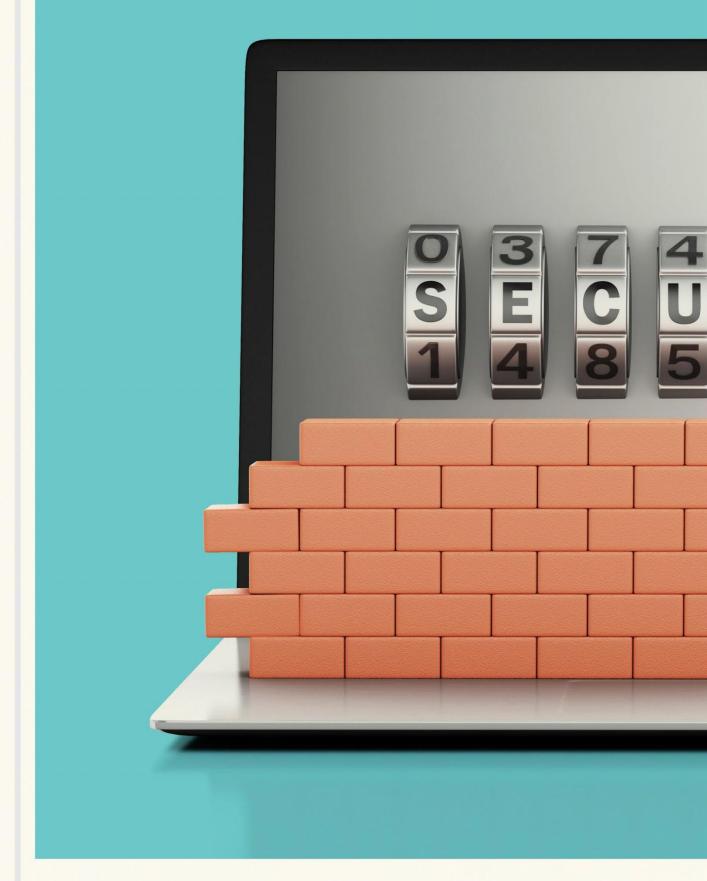
Pay2Key spreads rapidly across victims' networks, leaving significant parts of the network encrypted with a ransom note that threatens to leak stolen corporate data unless the ransom is paid.

Ryuk, the infamous ransomware, also targeted hospitals in what was seen as a wave of targeted attacks against the healthcare industry. The CISA, FBI, and HHS issued a warning against ransomware attacks on U.S. hospitals, saying they hold credible information of an increased and imminent cybercrime threat. October saw a 71% increase in ransomware attacks against the healthcare sector in the US. Ransomware attacks also increased by 33% in APAC and 36% in EMEA.

RECOMMENDATIONS TO PREVENT THE NEXT CYBER PANDEMIC

Real-time prevention: As we've learned, vaccination is far better than treatment. The same applies to your cyber security. Real time prevention places your organisation in a better position to defend against the next cyber pandemic. Organisations that stress the prevention of unknown, zero-day

processes, compliance of connected mobile, endpoint devices, and IoT. The increased use of the cloud means an increased level of security, especially in technologies that secure workloads, containers, and server-less applications on multi- and hybrid-cloud environments.

Consolidation and visibility: The highest level of visibility, reached through consolidation, will guarantee you the security effectiveness needed to prevent sophisticated cyber attacks. Unified management and risk visibility fill out your security architecture. This can be achieved by reducing your point product solutions and vendors, and your overall costs.

Keep your threat intelligence up to date: Threat intelligence combines information from multiple sources, providing a more effective protection screen for your network. To maintain business operations, you need comprehensive intelligence proactively stop threats, management of security services to monitor your network, and incident response to quickly respond to and resolve attacks.

threats can win the cyber security battle.

Secure your everything: Every part in the chain

matters. Your new normal requires that you revisit and check the security level and relevance of your network's infrastructures,

MANAGING CYBERSECURITY:
DevSecOps

—

Don't get overwhelmed with trivial defects.

—

Contributed By

Taylor Armerding, Software Security Expert,

Synopsys Software Integrity Group

—

🔴 "If tools aren't used correctly, at the right time, and in the right way, they can flag an overwhelming number of potential vulnerabilities, many of them insignificant or irrelevant to a particular project. And that can frustrate development teams to the point that they could start ignoring the warnings or even disabling the tools, undermining the security those tools are meant to enhance."

That, according to Meera Rao, is one of the biggest challenges of embedding security into DevOps and yielding effective DevSecOps.

Rao, senior director for product management

(DevOps solutions) at Synopsys, notes the reality that "at every stage in the pipeline or even in your SDLC, you have many security activities to perform, and each and every one of them gives you vulnerabilities. That can lead to defect overload."

By now, that list of DevSecOps testing tools and other security tasks is fairly standard. At the start, security teams should conduct threat modeling and risk analysis based on what an application is expected to do and what kind of input, if any, it will handle. Obviously, a page on a website that accepts user input including personal and financial data needs more rigorous security than one that simply provides information, such as the locations of company offices.

During the coding and building phases, automated tools like static, dynamic, and interactive analysis can flag bugs and other defects that could be exploited. Fuzz testing can check how the software responds to random, malformed input. Software composition analysis (SCA) can help find open source components that may have security defects and/or licensing conflicts.

And at the end, penetration testing is designed to attack an application the way hackers might, to find any remaining critical weaknesses before that application goes into production.

CONFIGURE DEVSECOPS SECURITY TOOLS

All those tools and techniques are crucial to building security into an application during its development. But if those tools are aren't configured to flag only defects that are relevant and significant to a specific project, they can end up creating friction that slows development — which is the last thing a development team wants in a

> **STATIC ANALYSIS SECURITY TESTING (SAST) FINDS CERTAIN THINGS, DYNAMIC ANALYSIS SECURITY TESTING (DAST) FINDS DIFFERENT THINGS, AND SCA FINDS DIFFERENT THINGS.**

DevOps world where speed is a top priority.

The solution? Vulnerability management. But the frequently conflicting priorities of speed and security present multiple challenges to doing that effectively.

One is that while it's possible to configure a tool so it flags only defects considered critical, "if you have hundreds of projects, there's no way you can configure all the projects," Rao said. That's because each project will have different exposures and therefore have different things that are considered critical. "It takes skilled resources — it takes time to go to each and every project that you have onboarded and configure each one to only give critical vulnerabilities," she said.

KNOW WHAT YOUR DEVSECOPS SECURITY TOOLS DO

Another challenge is that, as noted earlier, there is no one tool that can find every kind of vulnerability. As Rao put it, "Static analysis security testing (SAST) finds certain things, dynamic analysis security testing (DAST) finds different things, and SCA finds different things." And it's not just SAST, DAST, and SCA tools — there are others

LOADING...

Keep Calm And Press Ok Button

OK

used at different stages in the SDLC as well.

Yet another challenge is that "each and every tool or activity in the pipeline requires different skill sets, different artifacts, and a different amount of time," she said. "If I have to do threat modelling, that's a completely manual effort and you need skilled resources to do it. Same thing with risk analysis. Whereas with static analysis you have a tool, you configure it, and then you can automate. But then again, static analysis isn't going to solve all the problems."

"To achieve 100% coverage of vulnerabilities in your source code, your open source, and all the infrastructure requires too many activities, skill sets, amounts of time and discovery methods."

So for development and security teams that need to work together in a DevSecOps environment, the obvious question is: How can we manage what sounds like the digital version of herding cats?

It takes effort and organisation.

UNDERSTAND THE RISK PROFILE OF AN APPLICATION

To start, it's crucial to know the "risk profile" of an application. As noted earlier, an application that accepts and processes user input needs more rigorous security than one that simply provides information.

Then it's important to understand what kinds of vulnerabilities different tools find. Unfortunately, many development teams don't know what individual tools do, so they simply run all the tools all the time, according to Rao.

Understanding what the tools do, and that all of them might not be necessary on a specific project, can help

> **TO ACHIEVE 100% COVERAGE OF VULNERABILITIES IN YOUR SOURCE CODE, YOUR OPEN SOURCE, AND ALL THE INFRASTRUCTURE REQUIRES TOO MANY ACTIVITIES, SKILL SETS, AMOUNTS OF TIME AND DISCOVERY METHODS.**

developers start to chip away at what she calls "defect overload." For example, if cross-site scripting (XSS) and SQL injection are considered critical vulnerabilities in a given application, the team can configure its SAST tool to look for those and ignore the rest.

If SAST does find one or both, "I take those as a payload to my DAST or interactive application security testing (IAST)," Rao said. "I configure those tools so they don't flag all the thousands of other issues they could find but just focus on these two. And if DAST and especially IAST finds them with very high confidence, I should be able to create a ticket in whatever defect-tracking the organisation uses — maybe Jira."

The process would be entirely different if threat modelling and risk analysis find a design flaw, such as an application being built in the wrong way.

"If I was supposed to use hashing for passwords in an API but used encryption, none of the testing techniques will be able to find that," she said. "So if I check in the code and say that I fixed the API, the pipeline should be smart

enough to say that I need to do a manual code review, or I'm going to let someone know that this critical API was changed and someone needs to take a look at it."

APPLY AUTOMATION

With the right combination of DevSecOps tools and other defect-discovery methods applied to the risk profile of an application, "you can get the ROI for automating certain activities and doing other activities that are out of band," Rao said.

She said an example of how not to do it was a development team that was building a back-end messaging API that used no database and didn't have a front end, yet the team was still testing on the Open Web Application Security Project (OWASP) Top 10 — a well-known and valuable list of crucial vulnerabilities, but not relevant to this specific project. "What's the point of that?" she said.

"It's important that whatever you do in the planning phase feeds into all the other testing activities that you do. If there's no database on the back end, there's no point in looking for an SQL injection."

ADD CONTROLS TO AVOID DEFECT OVERLOAD

> "IT'S IMPERATIVE TO AVOID DUPLICATION — IT WILL OVERWHELM DEVELOPERS IF MULTIPLE DISCOVERY METHODS LIKE SAST, DAST, AND PENETRATION TESTING ARE ALL REPORTING THE SAME DEFECTS AND CREATING DEFECT TICKETS FOR ALL OF THEM.

Finally, it's imperative to avoid duplication — it will overwhelm developers if multiple discovery methods like SAST, DAST, and penetration testing are all reporting the same defects and creating defect tickets for all of them.

One team was so frustrated that its members "went into the static analysis dashboard and marked everything as false positives, because for them it was finding way too many things for them to deal with," Rao said.
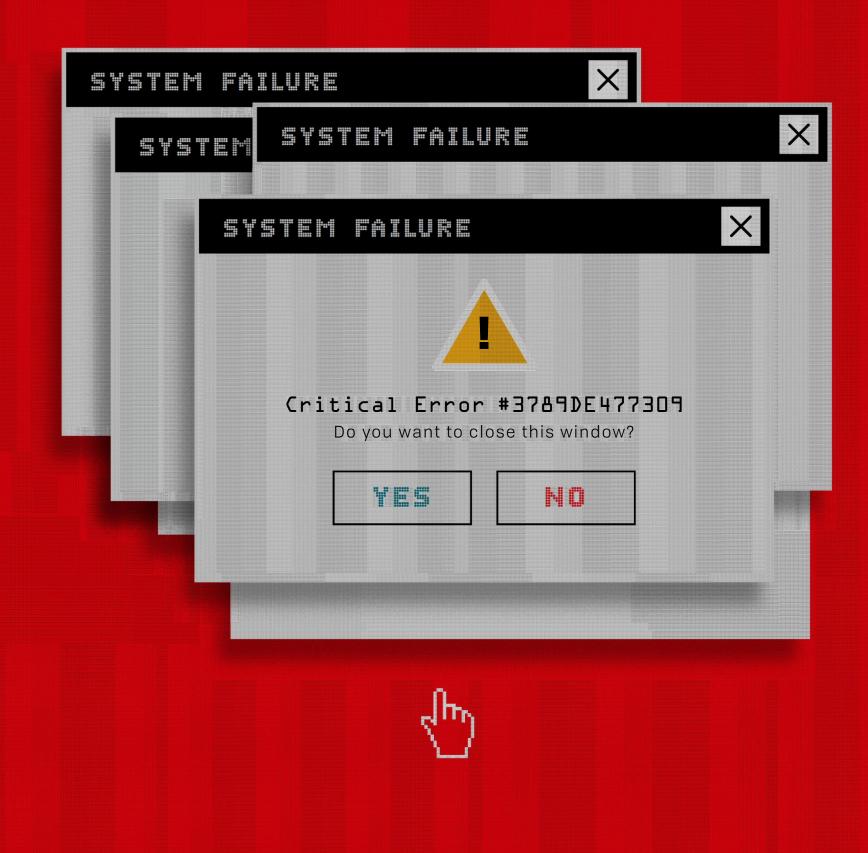
That "workaround" got exposed when, toward the end of the SDLC, a pen testing team found some critical XSS vulnerabilities — the kind of defect static analysis will find. The organisation's software security group came back and asked if the team wasn't running static analysis, because the tool is really very good at finding XSS vulnerabilities.

"We were shocked," Rao said. "But then when we looked at it, the tool had found it but the team had marked it as a false positive."

That was solved when the security team added a control that would flag any critical vulnerability that was marked as a false positive.

But that situation illustrates the defect overload point very well — if security tools aren't configured and managed properly, they will overload development teams to the point where they will ignore, or even block, warnings. That doesn't improve security. It undermines it.

"The bottom line is to help companies address defects that are critical without overwhelming them with defects that aren't critical to them," Rao said. "That way it doesn't slow development so much that everyone throws their hands up and says forget it."

By **Ken Wong**

Will You Return To The Office Now That Phase 3 Is Here?

As we began to Work- From- Home (WFH), we began to embrace tools like Zoom and Microsoft's Teams as webcams and stable Internet access became increasingly important and overseas travel became a fond memory.

Eric Goh, Vice President & Managing Director, Singapore, Dell Technologies said that Dell expects that 60% of their workforce will stay remote or have a hybrid schedule where they work from home most of the time. So collaboration tools will be critical in ensuring a smooth transition to the hybrid work culture.

As Goh put it, "Work today is no longer anchored to one place and time. Instead, it is focused on outcomes."

But we seem to have made it through what may be the worst of Covid-19 in Singapore, we've entered Phase 3 of re-opening where for some, the return to the office may be possible.
But after almost a year at home, are we really ready to go back? Are our offices ready for us to go back? What if Covid-19 returns?

PHOTOS **123RF** , DIGITAL IMAGING **HWM**

WERE WE READY FOR WFH CHALLENGES?

Dell Technologies recently carried out a survey in Asia with some 1,000 working professionals from Singapore and found out that 80% of them were ready for long-term remote work but were worried about productivity challenges.

We asked human resource firm Indeed about work trends during the last year and they said that many companies had seen little to no impact on productivity. And given the circumstances people are working in - the stress of the virus, many caring for young children and home-schooling - the fact we haven't seen a drop in productivity is remarkable and showed what a viable option working remotely was.

Communications solutions provider Poly's Managing Director for ASEAN & Korea, Samir Sayed, said that Poly had been working from a hybrid work model from Pre-Covid times and that he's been encouraged to see businesses and employees investing in collaboration tools. "Technology has a big role to play in creating the next normal, and if anything, COVID-19 has taught us to remain flexible and be quick to respond, redesign, reinvent, and adapt to the challenges head-on by embracing audio and video collaboration technology that

COVID-19 HAS TAUGHT US TO REMAIN FLEXIBLE AND BE QUICK TO RESPOND, REDESIGN, REINVENT, AND ADAPT TO THE CHALLENGES HEAD-ON BY EMBRACING AUDIO AND VIDEO COLLABORATION TECHNOLOGY THAT IS EASY-TO-INSTALL AND MANAGE, TO REDUCE DOWNTIME AND LOST PRODUCTIVITY.

WHAT IS AVAXHOME?

is easy-to-install and manage, to reduce downtime and lost productivity," Sayed said.

Fernando Serto, Akamai Head of Security Technology and Strategy, APJ said that working from home can be challenging and creates more opportunities for inadvertent data and privacy challenges. So, employees encouraged to follow good practices when dealing with data and across devices.

Serto added that with the pandemic, businesses had to adopt strategies to enable their workforce to work remotely, and those that traditionally did not have a BYOD or BCP strategy in place found themselves unprepared and without a security strategy to protect their remote teams. Akamai cautioned that the convenience that digitalisation brings and the increase in app usage indicate more traffic and a greater attack surface that needs to be managed effectively.

ADDRESSING EMPLOYEE CONCERNS

Ultimately it boils down to Government regulations and company policy as to whether employees return to the office, continue to work from home or a hybrid of both.

Beyond worrying about the health and safety of returning employees, businesses also need to understand the challenges employees

THE STUDY REVEALED THAT THE BLURRING BOUNDARY BETWEEN WORK AND PERSONAL LIVES WAS THE MOST SIGNIFICANT CONCERN FOR EMPLOYEES, WITH 35% CITING IT AS A TOP WORRY SHOULD REMOTE WORK ARRANGEMENTS CONTINUE LONG-TERM.

continue to face and to provide the necessary resources for successful long-term remote work.

Sayed said that he'd been impressed by businesses' and employees' ability to react and respond quickly to changes. But he was aware that employees working from home appreciated the need to carve out a more conducive space for their home office – of which includes comfortable furniture, good lighting, enterprise-grade technology and connectivity.

Dell's employee survey found that as workers began their WFH they faced not only technical challenges, but some felt lost, citing a lack of guidance or company engagement.

In Singapore, the lack of or insufficient learning and development sessions, which includes training for virtual tools, was especially felt by surveyed employees aged 55 and above (Baby Boomers), with 43 per cent viewing it as their top HR challenge.

The study revealed that the blurring boundary between work and personal lives was the most significant concern for employees, with 35% citing it as a top worry should remote work arrangements continue long-term.

GOING BACK IN NEEDS PREPARATION

Even as we enter Phase 3, what do businesses and employees need to do or have in place to ensure a smooth transition for returning staff?

Human resource firm Indeed says that the situation is evolving, but their most current data says that hiring in Singapore is slowly returning to form. But since employees are just as likely to be productive working at home, Indeed has adopted a hybrid approach for their workforce and staff have the opportunity to go completely remote, switch between working from home and the office, or be full-time in the office.

Dell's Goh said that prior to any return, businesses must have a system for employees to stay up-to-date on work policies, information about working from home, considerations for events and meetings and tips for keeping healthy. "We believe that technology readiness, leadership and a resilient culture are key to helping our teams do their best work," Goh said.

He added that Dell would be taking a conservative approach when allowing staff to return.

"Using data and science, we consider a country's infection and recovery trends, the availability of free movement, public transportation and the stability of the healthcare system supported by the respective country/ state," he explained, "Once the decision has been made for a return, extensive preventive measures are also in place to ensure site preparedness for the safety of returning team members including "masked when mobile," deep cleaning, and resource and capacity planning for social distancing."

According to Lee, at Lenovo's of-

fice, they have clearly demarcated the office in line with safe distancing measures. Along with a clean desk policy, there is also more frequent cleaning of shared surface areas. But Lee cautioned that while businesses have a responsibility to employees to ensure they have a safe environment to return to work to, employees too have to do their part to comply with safety measures.

Beyond safety measures, Sayed also added that businesses needed to create workspaces that are collaborative and technology-enabled across multiple locations as well as investing more in enterprise-grade tools like professional headsets and high-definition video conferencing as part of their long-term investments in technology.

Serto said that as the Asia Pacific region braces itself for a potential permanent remote reality, they also need to deal with more devices and interfaces are used to deal with data and information. "As a priority, businesses need to focus on what their design principle is for their cybersecurity architecture in order to stay secure from cyberthreats like ransomware and malware. Once that is identified, people, process and technology will follow," Serto added.

ALREADY BURNT OUT

There have been reports of employees on WFH suffering burnout as the lines between work and rest were becoming blurred as staff are in constant reach of work communications like emails and phone calls.

Plus, those with children have had the double whammy of work and family at the same time. A familiar complaint of, "Excuse me, my kids are calling," became a common comment during video conferences.

Sayed said that Poly had seen an increasing number of workers reporting "video fatigue". "Video conferencing solutions will need to add functionalities that helps people manage their mental health and improve the video experience for users," Sayed said, "This can include timers and alarms that alert the user to prolonged video meetings, reminders to schedule breaks, as well as insights for managers to better manage and prevent burnout within their teams."

Lee said that it is important for businesses to have continued employee engagement through regular virtual sessions during this WFH period. "Having in place Employee Assistance Programmes (EAPs) is also critical to provide confidential counselling to help employees to deal with any personal and relational challenges that may have an impact, physically, mentally and psychologically," he explained, "Lenovo for example, implemented DEAR Fridays, where employees are encouraged to end work at 3 pm on Fridays, so they can have adequate rest."
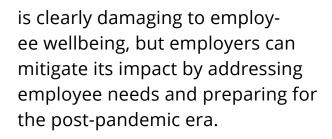
Serto said that the most important thing a business could do was to act with empathy. The pandemic

THERE HAVE BEEN REPORTS OF EMPLOYEES ON WFH SUFFERING BURNOUT AS THE LINES BETWEEN WORK AND REST WERE BECOMING BLURRED. THOSE WITH CHILDREN HAVE HAD THE DOUBLE WHAMMY OF WORK AND FAMILY AT THE SAME TIME.

BUT SHOULD THERE BE
A SECOND WAVE OF
COVID-19 INFECTIONS,
MUCH LIKE THAT
HAPPENING IN EUROPE
AND SOME PARTS OF
NORTH ASIA, BUSINESSES
AND STAFF HERE ARE
READY TO A WFH RETURN.

is clearly damaging to employee wellbeing, but employers can mitigate its impact by addressing employee needs and preparing for the post-pandemic era.

DEALING WITH ANOTHER SHUTDOWN

But should there be a second wave of covid-19 infections, much like that happening in Europe and some parts of North Asia, businesses and staff here are ready to a WFH return. All said that the experience gained from last year has helped shape plans and readiness should things go back to another Circuit Breaker situation.

Goh said that as a technology company themselves, Dell has deployed tools to collaborate online, attend virtual meetings, and serve customers while working remotely. "The collaboration and resilience of our team members are enabled by the robust technologies we have today."

All of the businesses we spoke to said that would be taking the lead from Government advisories and their headquarters.

But at the very least, businesses and staff can draw strength from the fact that we went almost the entire 2020 in an unprecedented situation and we have seemingly made it through to the other side. What we've done once, we can carry on again, but this time with the knowledge of what we need to make things easier and the support of management to get it done.

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MORE INSIDE

APPLE AIRPODS MAX
The case of the big AirPods

SAMSUNG GALAXY S21 SERIES
The case of the three Galaxies

RAZER BLACKSHARK V2 PRO
The case of the all-black Razer

HOW WE RATE:
Products are rated on a scale of **1 to 10**; **1** being so abysmal, it should be a crime to sell it, and **10** being almost perfect. Come now, nothing is perfect. An Editor's Choice may also be awarded based on unique merits.

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BEST PERFORMANCE
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TEST
BEST VALUE
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SINGAPORE

TEST
EDITOR'S CHOICE
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SINGAPORE

PICTURES **MICROSOFT**

AT A GLANCE

DRIVERS
40mm custom-design dynamic drivers

BATTERY
20 hours with ANC

WEIGHT
384g

PRICE
$849

The Ultimate Expression Of AirPods

Apple AirPods Max

By **Kenny Yeo**

The AirPods Max is a collection of numbers: 4 years in the making, 40mm drivers, 9 microphones, 9 sensors of all sorts, and 2 H1 chips. But the biggest number of them all is the price – $849. I am well aware that wireless headphones with active noise cancellation and good sound don't come cheap, but even I did a double-take when I saw the price.

Interestingly, these are the first AirPods to come in different colours. The safe options are obviously space grey and silver, while more adventurous folks can opt for green, sky blue, and pink. The headband and earpads are colour-matched.

Build-wise, the earcups are anodised aluminium and they are connected to the headband by polished stainless steel telescoping arms. The headband structure is stainless steel and covered in soft-touch rubber.

To help with fit and comfort, the arms have spring-loaded hinges that let the earcups rock back and forth so that they clamp on your head with just the right amount of force. The headband has what Apple calls a "breathable mesh knit canopy" which is a clever design that mimics the effect of suspension-style headbands but with fewer components. The

earpads are memory foam covered with a cushy mesh fabric and are wonderfully soft. They attach via magnets and can be easily removed and replaced in future when they wear out.

The result of all this is that even though the AirPods Max are quite heavy at 384g, they are comfortable to wear.

For the price, the AirPods Max doesn't come with many accessories. You have a Lightning to USB-C cable for charging, a carrying case, and that's it.

The case is controversial. On its own, it looks faintly ridiculous, and if a case is judged by its ability to offer protection, then this case fails. It only wraps around the earcups and even then, not thoroughly; much of the headphone is still exposed. I suspect there is going to be a booming industry for third-party AirPods Max cases.

Unlike some of its rivals, Apple chose to

eschew fiddly touch controls in favour of a Digital Crown and a separate button. The hardware feels premium and works very well. The Digital Crown turns smoothly and allows for very precise and fine adjustments; the noise control button changes mode instantaneously.

There's no power button too. Sensors in the earcups know when you take them off and puts the headphones to sleep after a couple of minutes. Put them back on and they instantly connect to whatever device you are using.

Once paired, AirPods Max is ready to use not just on the iPhone or iPad but all devices associated with your iCloud account. Integration with iCloud also enables automatic switching that intelligently routes the AirPods Max to whatever device you are using without the need to pause and connect. When it works, it feels like magic. But unfortunately, there were also times where

The carrying case offers barely any protection.

it would be slow to switch or it didn't switch over at all.

One last feature worth mentioning is spatial audio with dynamic head tracking. This means even if you turn your head or move away, the sound will still appear to come from

The 40mm dynamic driver delivers outstanding clarity.

your source device. It's quite bizarre to experience for the first time, but it does make it feel as if you are listening to a surround sound setup. There are, however, some limitations. It only works on selected content encoded in 5.1, 7.1, and Dolby Atmos, and only on your iPhone and iPad.

The AirPods Max uses eight of its nine microphones for its active noise cancellation feature (the 9th mic is for voice calls). Noise data is analysed by the H1 chips which then tells the driver to produce noise of an opposite frequency to cancel it out. This happens 200 times every second.

The result is impressive. The amount of noise that the AirPods Max can cancel out is astounding. Transparency mode on the AirPods Max is also, hands down the best implementation of ambient sound I've heard on a wireless headphone; it sounds incredibly natural.

Adaptive EQ in the AirPods Max uses

the internal mic and H1 chips to analyse sound going to your ears and adjusts the driver's frequency response to match its target tuning. It does this to compensate for variances in fit and seal so that it can deliver a consistent sound regardless of your anatomy.

It should be no surprise that the AirPods Max sound fantastic. Tonally, it's balanced with slightly emphatic

CONCLUSION
THE AIRPODS MAX GETS A LOT OF THINGS RIGHT BUT ALSO MISSES THE MARK IN SOME PLACES.

bass, ever-present mids, and crystalline highs. The entire spectrum is well represented.

It is technically capable too. Apple promised ultra-low distortion and the AirPods Max exhibited outstanding clarity

at all volumes – as all high-end headphones should.

I should also point out that like the other AirPods, the AirPods Max maintain a strong connection to the source device with zero dropouts or loss in transmission.

You can also use the AirPods Max with a wired connection, but it doesn't alter the way it sounds because it has to be powered anyways which means the amplification stays constant. Plus, Adaptive EQ is always on.

Apple's advertised claim of 20 hours is mostly spot-on, but there's no running away from the fact that 20 hours is a good deal shorter

than some rivals like the Sony WH-1000XM4, which can last for 30 hours. Furthermore, the AirPods Max won't work passively. You are completely out of action if the AirPods Max run out of juice. If it's any consolation, when the headphones are flat, a five minutes charge is sufficient to get you 1.5 hours of listening time.

Overall, the AirPod Max gets a lot of things right but it also misses the

The AirPods Max rely on no less than eight microphones to enable its active noise cancellation feature.

mark in some areas. As it is, they feel like a flawed genius. Apple could have absolutely nailed it if had done a couple of things differently. The "smart case", in particular, needs a thorough rethink and Apple should also think about providing more accessories and the ability for users to use the AirPods Max passively.

TESTED & RATED

8.5/10

HWM
SINGAPORE

The AirPods Max come in five colours: space grey, silver, green, sky blue, and red.

A Speed And Precision Hybrid

Fnatic Dash XD mousepad

By **Hoots the Owl**

While there may be a seemingly endless selection of cloth pads to choose from today, the Fnatic Dash XD still manages to stand head and shoulders above the crowd. It is available in two sizes, the smaller Dash L, and the desk pad-sized Dash XD, which is what I have for review.

The Dash XD measures a whopping 950 x 500 x 3mm. You should definitely check that your desk has enough room for it. It's all enough that part of my monitor stand is now sitting on it.

Right from the moment you unbox it, the Dash XD delivers. It unfurls almost perfectly with no annoying lifting of the edges. What's interesting is that Fnatic says you should never roll the mousepad with the gliding

The Dash XD isn't just wide, it's very tall as well, so make sure to measure your desk space properly first.

like the Shidenkai, it utilises what Fnatic calls an F15 polyester blend surface that they claim to have designed on their own. This is a hybrid surface that combines the hyper-fast glide of hard, plastic pads with the control and stopping power of soft, cloth pads. It's supposed to give you the best of both worlds.

Another point to note is uniform X and Y tracking. This is important because many mousepads still have slightly different glides along the X and Y axes, where

surface on the inside, a similar caveat that Artisan attaches to their Shidenkai pad.

While the Dash XD doesn't seem to have a glass coating

one is faster than the other. Uniform tracking provides more consistent movement in both directions and is more conducive toward building muscle memory.

The surface is slightly liquid-resistant, but this doesn't mean it's liquid-proof. If you wait too long to clean up spills, everything will still soak through.

The polyester blend surface appears to resist dust accumulation quite well too, particularly important for an all-black pad. While I noticed that my Razer Gigan-

CONCLUSION

IF YOU WANT SOMETHING FASTER THAN AN AVERAGE CLOTH PAD WITHOUT SACRIFICING CONTROL.

tus V2 picked up dust and dirt quite quickly, the Dash XD stayed clean for far longer, perhaps because it doesn't trap dust as easily as the weave of a cloth pad.

Suffice to say, every inch of the Dash XD oozes quality, down to the tightly-woven stitched edges that protect against fraying. I like that the stitching is flat, so you don't feel it digging into your arm while gaming. The F15 surface is extremely smooth, which makes the mousepad really comfortable for long hours of use. In comparison, the Cordura surface on the Cooler Master MP510 is a lot rougher and may cause skin irritation for some folks.

The rubber base does its job of keeping the mousepad in place, and I'm also happy that there isn't the strong smell of rubber that I've noticed on certain cloth pads, nor residue left behind on my desk surface.
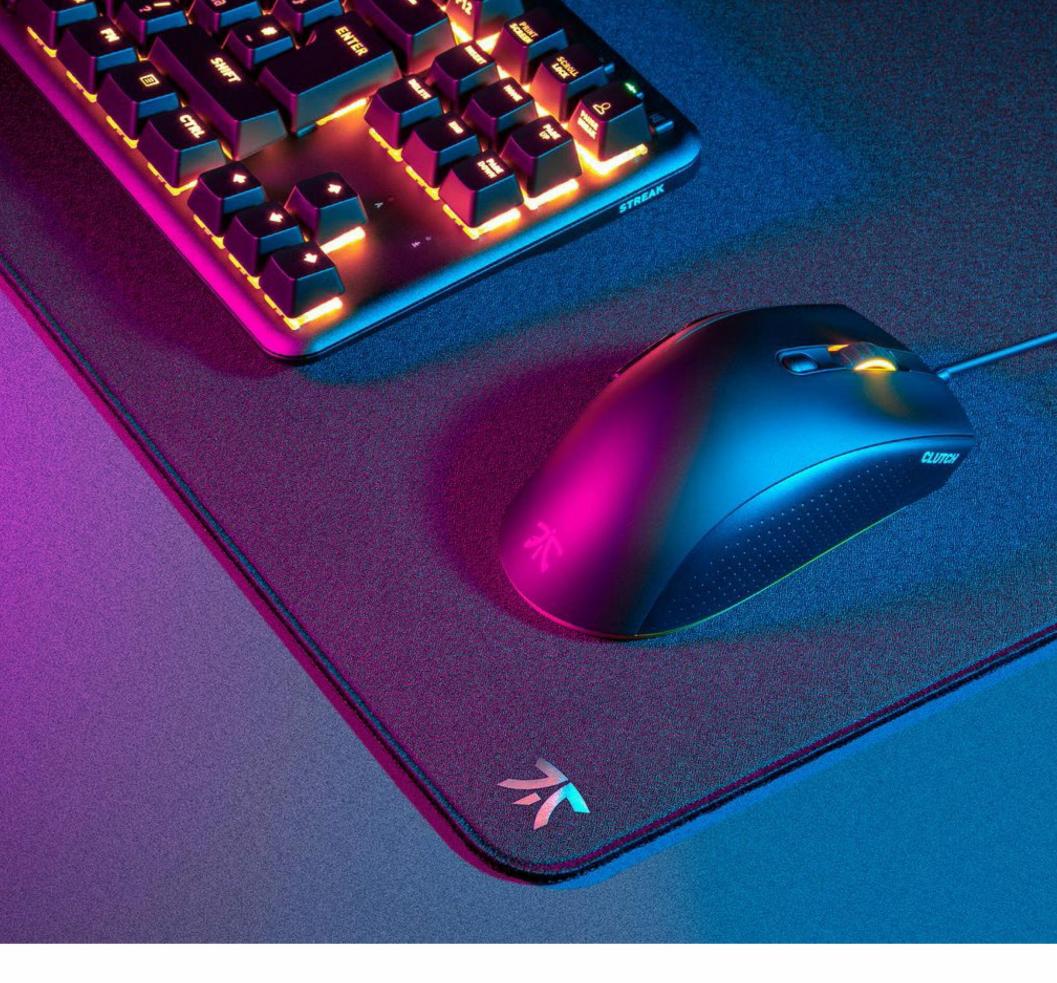
My one gripe would be the Fnatic logo in the bottom right corner, which looks as if it is stamped in silver foil and can be peeled off. Fortunately, it's small and unintrusive, and the mousepad still retains its overall minimalist look.

When it comes to performance in game, the Dash XD feels pretty fantastic. While I'm more used to a slower pad with more control such as the Razer Gigantus V2, the Dash XD offers sufficient stopping power, and my mouse never felt out of control. I'm still able to make micro-adjustments with ease, which many hard pads struggle with.

It is still markedly faster than most other cloth pads I've tried, and I'd say it's most similar in speed to something like the

The Fnatic logo looks like a cheap metallic emboss, but it has held up well so far.

Artisan Hayate Otsu. If you're used to slower pads like the SteelSeries QCK+, this may take some getting used to. Having said that, the Dash XD is probably best suited to games that require accurate tracking above all else, such as Apex Legends or Overwatch. That's not to say it cannot be used in games like Valorant; I was able to use the Dash XD without feeling like my aim was suffering.

As a company that people think of more as an esports team than a gaming peripherals manufacturer, Fnatic has done an absolutely stellar job with the Dash XD. This is one of the most premium mousepads I've used, and its quality construction is apparent right from the outset. It successfully combines the benefits of both hard and soft pads, all with a smooth, cloth-like surface that feels comfortable under the skin and allows you to roll it up for easier transport.

Good Looking Wireless Gaming

Logitech G Pro X Wireless

By **Hoots the Owl**

Logitech was the first to prove that wireless gaming peripherals could be a thing with its Lightspeed wireless tech and the Pro X Wireless is quite simply the wireless version of the popular Pro X.
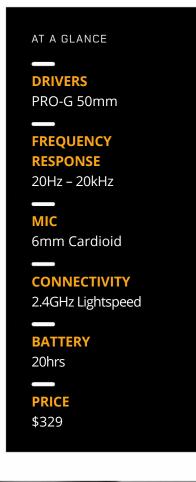
By standards of gaming headsets, these hew to a very minimalist aesthetic, and they remind me of aviator headsets, not unlike the Razer BlackShark V2. There's plenty of metal used here, from the spun-metal pieces on the exterior to the headband mechanism, which further contributes to the premium feel.

Everything is extremely sturdy and well-built, but this does mean that the Pro X Wireless is fairly heavy, weighing a good 370g.

The added weight, combined with a higher clamping force than I'm used to, means that the Pro X Wireless can start to feel a bit uncomfortable after long hours. I've yet to find a gaming headset that beats the Razer BlackShark V2 in terms of comfort for me, and the memory foam padding on the Pro X's steel headband is considerably less plush than that on Razer's headset.

The Pro X Wireless comes equipped with leatherette ear cups by default, but Logitech has also included replacement fabric ear cups that are more breathable. I preferred these over the leatherette, and it's nice having an option that you know won't peel over time.

All the headset controls are located on the left ear cup, including a microphone mute button, volume wheel, power switch, and thankfully, a

The Pro X Wireless has replaceable fabric earcups that are more breathable than the default leatherette ones.

AT A GLANCE

DRIVERS
PRO-G 50mm

FREQUENCY RESPONSE
20Hz – 20kHz

MIC
6mm Cardioid

CONNECTIVITY
2.4GHz Lightspeed

BATTERY
20hrs

PRICE
$329

USB-C port for charging. The microphone is detachable, so you can dispense with it if you've got a better external one. One thing to note – the Pro X Wireless does not support wired operation at all, so you'll still need to leave the 2.4GHz dongle plugged in even when the USB-C cable is connected.
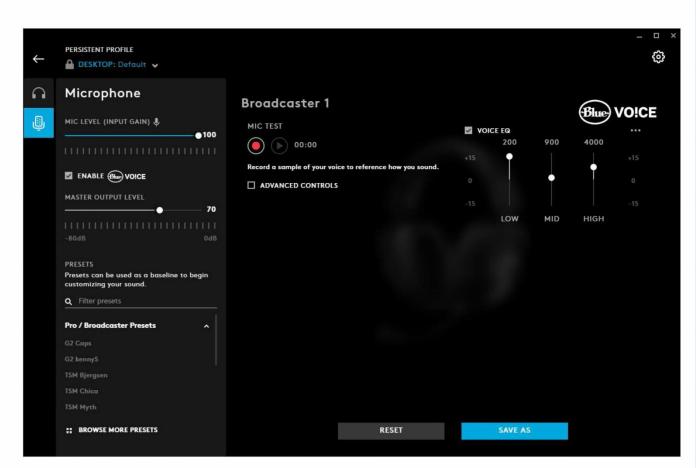
Logitech's Lightspeed tech is excellent as expected, and I experienced no noticeable delay or lag while gaming or listening to music. But while the Pro X Wireless does

come with the object-based DTS Headphone:X 2.0 surround sound technology, I generally preferred to play Valorant with it turned off as I found that turning the surround sound on affected clarity somewhat.

The soundstage isn't as wide or enveloping as with the JBL Quantum One or even the Razer BlackShark V2, but you can still

hear clearly the direction in which the enemy is coming from.

However, that's not to say that you should leave the surround sound tech off all the time, and it does add a nice bit of immersion and depth to the soundscape with games like Cyberpunk 2077.

The Pro X Wireless also comes with Blue Vo!ce functionality, which lets you apply

CONCLUSION

GOOD OVERALL, BUT NOT QUITE THE GAME-CHANGER ITS PRICE TAG SUGGESTS IT TO BE.

Blue Vo!ce lets you customise your voice to your heart's content, but nothing makes more impact than a better mic.

custom EQ profiles to your voice, in addition to various presets. The latter includes things like Broadcaster 1 and 2, FM Station, profiles for high and low voices, and even so-called pro player presets from names like kennyS and Bjergsen. I don't really see the point of these player presets, and if anything, I found they made the microphone output sound worse.

On its own, the microphone on the Pro X Wireless was a little lacklustre – while it picked up my voice clearly enough, audio sounded thin and reedy, with an unpleasant sharpness to it. Blue Vo!ce can help soften it somewhat, but I think the Pro X Wireless deserves a much better microphone for its price.

What about for console users? While the Pro X Wireless will work with your favourite game console, you'll have to forego surround sound and Blue Vo!ce functionality as these will require the use of the G Hub software.

As for battery life, it's pretty solid. Logitech is claiming over 20 hours of use on a single charge, and that's pretty much in line with what I got from the headset. After just over 10 hours I was down to roughly 48%.

At $329, the Logitech G Pro X Wireless is a hefty investment. Part of that price no doubt goes toward Blue Vo!ce licensing, and I can't say that it actually confers any significant benefit. Audio quality, while good, doesn't do much to differentiate itself from the pack, and there are more affordable headsets that offer better positional audio and comfort. While Logitech bills this as a headset for esports professionals, it's really just a decent headset that is priced above what it deserves.

Wireless Freedom, Incredible Comfort

Gorgeous blacked-out, aviator aesthetic eschews garishness for professionalism.

Razer BlackShark V2 Pro

By **Hoots the Owl**

The wired BlackShark V2 was already one of the most comfortable gaming headsets I've tested, and now that the Pro version adds wireless freedom to the mix, Razer has quite the winner on its hands. The Pro model sports a classier, muted look. The bright green Razer logo and connecting cables have been replaced with black triple-headed snake and black cables. I really enjoy this new blacked-out aesthetic.

That aside, the design is nearly identical to that of its wired counterpart. The ear cups are still plastic, which plays a role in keeping the headset light. At 320g, the BlackShark V2 Pro doesn't weigh down on your head, while its construction is sturdy enough to not feel cheap.

The ear cups are covered by the same FlowKnit fabric, and I like the choice of this material over leatherette, which is especially important because the ear cups on the BlackShark V2 Pro are not replaceable. You don't want to be stuck with peeling headphones. The memory foam padding is ultra-plush and soft, making the BlackShark V2 Pro the most comfortable gaming headset I've tried.

Controls are on the left ear cup, including a micro-USB port for charging (I'd really have liked to see USB-C used here instead), a 3.5mm headphone jack, microphone jack, microphone mute button and volume wheel. The volume wheel has

AT A GLANCE

DRIVERS
TriForce
Titanium, 50mm

MIC
HyperClear
Supercardioid, 9.9mm

CONNECTIVITY
HyperSpeed Wireless
2.4GHz, wired 3.5mm

BATTERY
24hrs

PRICE
$269.90

a helpful notch at the halfway mark, so you immediately know when you're at 50% volume.

The same TriForce Titanium 50mm drivers are used here as well, where the driver is divided into three distinct parts that allow for individual tuning of highs, mids, and lows.

The one thing that's changed on the Black-Shark V2 Pro is the addition of a speaker chamber that supposedly improves balance between the left and right sides. According to Razer, it also allows for better fine-tuning of volume and bass.

Compared to the BlackShark V2, the Pro does indeed sound fuller. However, it requires some tweaking to the EQ settings in Synapse 3 to get the most out of it.
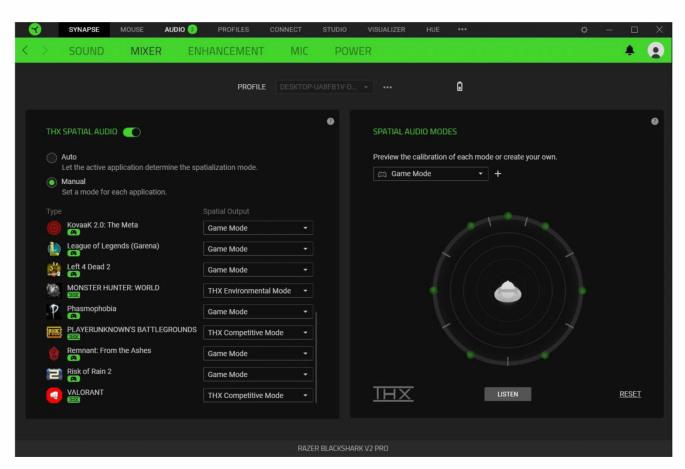
In-game, Razer's THX Spatial Audio really shines. Special THX Game Profiles deliver custom-tuned audio for specific games, but the list is still a bit limited at the moment, and even a popular title like Overwatch isn't supported yet. That

said, games like Apex Legends, Valorant, Call of Duty: Modern Warfare, Destiny 2 and even Monster Hunter: World are on the list.

Certain titles will offer you a choice between THX Competitive and Environment Mode. Environment Mode basically focuses on immersion and realistically projects the sound around you based on each game's unique environment, while Competitive

Mode is all about spatial awareness and accurate positional audio.

While I generally prefer stereo sound for positional audio in games, the custom-tuned THX Game Profiles serve up a delicious amount of detail and immersion, with a decent edge in terms of directional clarity. I'd recommend taking advantage of these profiles if your game is supported.

CONCLUSION

THIS MAY BE ONE OF THE BEST PC GAMING HEADSETS TO DATE.

Wireless performance is excellent, with no lag or stuttering whatsoever. The wireless dongle is fairly compact too. You can get around 24 hours of battery on a single charge, which is roughly in line with what Razer is claiming.

The HyperClear Supercardioid microphone has been upgraded from the one on the BlackShark V2, and it basically sports a tighter pickup pattern for less ambient noise. The mic still won't rival a standalone mic, but it works well enough for regular voice commu-

If your game is supported in the list of THX spatial audio profiles, we suggest you try it out.

nications. It picked up my voice clearly and reliably, and you can tweak the mic equaliser settings and pre- view your voice to get it to your liking.

THX Spatial Audio is only supported on PC though, as are the audio and microphone customisations. The BlackShark V2 Pro works as a basic headset with consoles if you use the 3.5mm cable.

At $269.90, the Razer BlackShark V2 Pro makes for a steep investment. However, it feels reasonable against Logitech G's Pro X Wireless and JBL's Quantum One, both of which cost over $300.

It is the most well-rounded headset I've tested, with no major performance hitches, is extreme- ly comfortable, and comes with excellent audio and a decent mic. Wireless per- formance is flawless too, and battery life should last you up to a week with moderate use. Top that off with a tasteful, all-black design, and Razer has made what may be one of the best PC gaming headsets of 2020.

Great Sound, Rich Features

JBL Quantum One

By **Hoots the Owl**

JBL is no stranger to the world of high-end audio, but it's a relative newcomer to the gaming headset space. With the Quantum One, it attempts to bring together JBL's audio pedigree with the things gamer's prize, such as Hi-Res audio certification and better positional audio

PICTURES **JBL**

in-game.

The Quantum One has something JBL refers to as QuantumSPHERE 360; integrated head-tracking that creates an independent virtual soundscape that sounds different according to how you position your head.

At 369g, this isn't the lightest headset around, but its plush, memory foam earcups and padded headband

Left earcup is pretty busy with all the controls and connectivity ports.

JBL Quantum Engine software is required to fully calibrate and experience the headset.

help with comfort over long hours. The Quantum One proved to be fairly comfortable, even with glasses on, but the headband doesn't feel as good as the cushier memory foam headband on the Razer Blackshark V2. The large leatherette earcups cup your ears, instead of sitting on them, although a fabric material would have been more breathable. It'd have been nice if JBL had included swappable fabric ear cups as Logitech did on the G Pro X Wireless.

This isn't a headset for someone who

CONCLUSION

BUY THE THIS ONLY IF YOU'RE A PC GAMER. CONSOLE PLAYERS GET A DIMINISHED FEATURE-SET.

wants a more minimalist look, and the Quantum One sports a rather elaborate design, from the winding circuit-style path the LED lights trace around the ear cups to the orange-and-black cable.

It's also quite complicated. The left earcup is dotted with a bunch of buttons, connectors, and a volume wheel, which can appear a little intimidating for a new

user. The detachable USB-C cord comes with a compact mixer dial, which lets you adjust the audio balance between chat and your game. A separate 3.5mm cable plugs into the audio jack adjacent to the USB-C port, so you can use it with consoles like the PlayStation and Xbox as well.

Unfortunately, you'll lose many core features over the 3.5mm audio

connection, including ANC, surround sound, and RGB lighting. The Quantum One is first and foremost a PC headset.

Much of its functionality is tied up in JBL's Quantum Engine software. When you first plug in the headset, you can calibrate it using the included calibration mic in your ear. The process is supposed to adjust the surround sound according to your ear structure. Then you'll also need to calibrate the head-tracking, and an onscreen gyroscope helps you ensure your head is in a neutral position before setting the central point of reference.

I took the headset for a spin in Valorant, where the Quantum One offered up a lush and detailed sound stage, although it did not feel quite as spacious as what Creative offers with the SXFI Gamer. Nevertheless, positional accuracy was pretty spot on.

Music sounds excellent on the Quantum One – mids

are smooth, rich, and clear. Bass is also deep and punchy, though treble can sound a tad bit harsh. I listened to music in both regular stereo mode and with the spatial sound turned on, and I'd say spatial sound creates a more fun, resonant, and enveloping sound, but stereo probably offers better clarity.

The ANC did a good job of cutting out the whir of my PC and dampening some of the background noise, but it won't entirely silence the TV if it's blaring in the same room as you. A helpful TalkThrough mode quickly lowers the volume of your music, so you can quickly speak to someone without having to fiddle with the volume wheel or taking off the headset.

The head-tracking feature was less impressive. I find that it doesn't add much in terms of immersion to your games. You'll be surprised how stationary your head usually is while gaming, and there is seldom if any turning involved.

What's more, the calibration appears to have a tendency to drift, leading to a somewhat distorted perception of the soundscape. JBL has included a helpful re-centring button on the headset itself, but it makes me think that the button was included precisely because the company was aware of the need for this.

The other big let-down is the microphone. Voice quality is mediocre at best, and my voice sounded distant and muffled. Static was also evident in the background, and there was an unpleasant amount of sibilance. I'd recommend using a standalone mic with the Quantum One, but you really shouldn't have to

TESTED & RATED
8.5/10
HWM
SINGAPORE

considering how much it costs.

And at $369, this is a steep investment. I think it would be a lot more attractive if the head-tracking feature had been removed to make way for a more palatable price tag or improving the microphone.

31 Days Later

Microsoft Xbox Series X

By **Aaron Yip**

Reviewing a gaming console isn't quite the same as, say, reviewing a graphics card or a smartphone. A new machine is traditionally launched every five years; the Xbox One X and PlayStation 4 Pro were mid-life upgrades, extending that generation's life cycle to eight years.

So, with the Xbox Series X, I took a longer-term approach to reviewing it so as to have a better gauge on how it fares (I'm doing the same for the PlayStation 5 as well, so do stay tuned for that one).

Personally, I'm a big fan of the Xbox Series X's boxy monolithic design. The look and feel are clearly an evolution of the existing Xbox One X.

AT A GLANCE

CPU
Custom AMD Zen 2, 3.8GHz, 7nm

GPU
Custom AMD RDNA 2, 12 TFLOPS

MEMORY
16GB GDDR6

STORAGE
1TB NVME SSD

PRICE
$699

While you can place the Xbox Series X on its side, it looks a bit weird.

My only concern was that the 'proper' vertical placement of the console meant it might not fit in TV consoles or Hi-Fi racks.

The Xbox Series X is powered by an AMD custom Zen CPU with eight cores at 3.8GHz (3.6GHz with SMT) and a custom RDNA 2 Navi GPU with 12 teraflops, 52 CUs at 1.825GHz. It is an impressively powerful console, but the CPU

Yes, it's a running cost, but so is Netflix, and Spotify, and Disney+, and...you get the point.

CONCLUSION

UNTAPPED PERFORMANCE, BUT THERE'S A TREASURE TROVE IN THE XBOX GAME PASS.

Microsoft kept to a familiar controller design.

and GPU only tell half the story.

On the Wi-Fi front, the Xbox Series X is only equipped with Wi-Fi 5 (previously known as 802.11ac). Now Wi-Fi 5 isn't slow by any means, but I wish Microsoft had gone with Wi-Fi 6 (802.11ax) instead for a tad more future-proofing. It also misses out on Optical output, forcing you to route via HDMI, which kind of stings.

Your choice of storage expansion is also extremely limited, as the only option right now is the Seagate 1TB custom Xbox Series X|S expansion card, which retails for an eye-bursting $330 – nearly half the price of the Xbox Series X itself.

That said, the built-in 1TB SSD is still extremely fast. On the Xbox One X, I'd have time to browse Facebook or emails while waiting for a game to load. Not anymore with the Xbox Series X. Obviously, this varies from game to game, but I find on average, loading speed is now on par with high-end gaming PCs.

Then there's Quick Resume, a feature that allows me to

run five games at once; dropping in and out of sessions without needing to reboot and load up a save. It really is an excellent feature that enables quick bursts of gaming. The small little caveat here is that developers will have to build this feature into their games.

I have also always loved the Xbox controller since the Xbox 360 days, and the new Xbox Wireless Controller is a neat evolution of its predecessor. At first glance, you would be hard-pressed to spot major differences apart from the additional "Share" button. Unlike Sony's complete revolution of the PlayStation 5 controller, Microsoft opted for smaller refinements like textured triggers and a better D-pad. Yes, it's not exactly exciting, and the design is four generations old now. But it works.

The main problem right now with the Xbox Series X (and even the PlayStation

5) is the lack of key launch titles. Most third-party developers have instead been pushing out visual updates for existing titles such as Call of Duty: Black Ops Cold War. This has an unintended effect of extending the longevity of the older, but still powerful Xbox One X (and PlayStation 4 Pro).

The gaming proposition then for the Xbox Series X is the Xbox Game Pass Ultimate Games Subscription for PC and Xbox. It's value for money is ridiculous, especially now that Bethesda belongs to Microsoft as a first-party developer.

Big hitters such as Elders Scroll: Skyrim, Doom Eternal and Fallout 76 are already available for all subscribers, with other notable titles include Dragon Quest XI: Echoes of an Elusive Age, Final Fantasy XV, and Wasteland 3 onboard too.

Here's the thing: the Xbox Series X is a machine with a

TESTED & RATED

8.5/10

HWM
SINGAPORE

bright future, ripe for the proper next-gen games that can make full use of its horsepower. It's a powerful console that will run some of the best-looking console games, without a doubt. But so will the PlayStation 5.

Unlike previous generations, today's Xbox and PlayStation have almost identical specifications (cue AMD laughing away now) that non-platform exclusives will, in all likelihood, look and run similarly on either console.

The PlayStation 5 may have more of the exclusive games that you like, but the Xbox Series X is a simpler, more versatile proposition with amazing backward compatibility and an ace in the hole that is the Xbox Game Pass.

Distilled Excellence

—

Samsung Galaxy S21 Series

By **Liu Hongzuo**
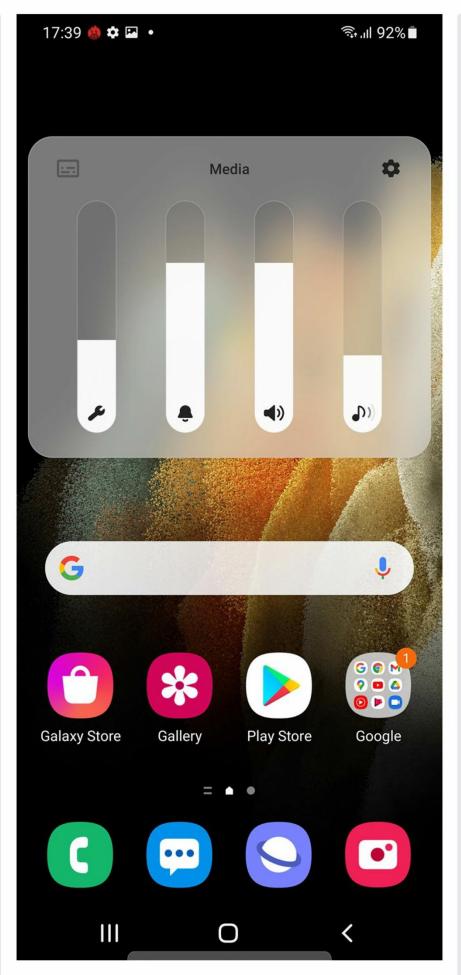
⬤ With Samsung eager to start a new year on the right foot, the Korean brand has taken the initiative to launch its Galaxy S21 series phones earlier than their usual Feb-Mar cycle. Together, the three models (Samsung Galaxy S21, Galaxy S21+, and Galaxy S21 Ultra) bring a combination of new flagship processors, pro-grade cameras, and incremental improvements alongside 5G-readiness.

New features and significant improvements were made to photography and videography despite having camera hardware similar to last year's Galaxy S20 series phones. There's Director's View with two more sub-features for more videography options, and then there's Cinematic 8K Snap for lifting still images out of 8k24fps videos. Single Take, Portrait Mode, and even Space Zoom got some upgrades. The Samsung Galaxy S21 Ultra receives a special mention here because it has S Pen support. It also has two telephoto rear lenses, making its 100x Space Zoom more powerful.

Samsung kept most of its original Galaxy S design language without changing too much. The Korean brand took great care in showcasing its Contour Cut Camera housing

design, adding a dimension of premium finish.

The S21 has Phantom Grey and Phantom White if you want a muted look, while the S21+ has Phantom Black and Phantom Silver, the two plainer-looking colourways that are also on the S21 Ultra. Phantom Violet, the flagship colour for the S21 series, is only available on the regular S21 and S21+. We think it's a lost opportunity for the S21 Ultra since you're limited to its monochrome palette there.

When in hand, the phones feel comfortable to hold and control. The S21 Ultra has an ideal grip and body even though it's 0.1mm thicker and 7g heavier than the S20 Ultra. If we had any handling issues, it's the positioning of the volume and power buttons on all three models. The phones don't have identical bodies, yet the buttons are identical in size and spacing across all three phones. The S21+ controls are most awkward of the lot, with the S21 Ultra being the

The volume indicators are a chunkier, iOS-like bar instead of a thin blue slider with a dot indicator.

most natural.

The Galaxy S21 and S21+ have the same display sizes and

panel quality as its predecessors. They sit at 6.2 inches and 6.7 inches respectively,

with Dynamic AMOLED 2X display and an Infinity-O camera cut-out at the top. The displays are HDR10+ certified, have 120Hz maximum refresh rate, and Dynamic Refresh Rate that adjusts between 48 to 120Hz, depending on the content viewed. What did change was the pixel fidelity from 1440p (QHD+ resolution) to the current FHD resolution at 2,400 x 1,080 pixels for both models.

The Samsung Galaxy S21 Ultra has a 6.8-inch, curved Dynamic AMOLED 2X rated at 3,200 x 1,440 pixels resolution (WQHD+). It has all the panel perks from the S21 and S21+, although its Dynamic Refresh Rate can be as low as 10Hz for better battery efficiency. Also unique to the S21 Ultra is a new maximum peak brightness of 1,500-nits, up from the predecessor's 1,200-nits.

A new (or rather, improved) display enhancement is Eye Comfort Shield. That's a snazzy name for automated blue-light reduction in the S21

TESTED & RATED
8.0/10

HWM
SINGAPORE

phones. Samsung said that it auto-adjusts blue light output based on your usage patterns, which isn't necessarily based on the day's hours. This is helpful if you don't have a typical day-night cycle because of work or personal commitments.

The Galaxy S21 series uses the Android 11 operating system, but it's cloaked under Samsung's One UI 3 interface. One UI 3 is very similar to past One UIs save for a few aesthetic changes. The lock screen is less cluttered. The pull-down notifications have a translucent background now. The volume indicators are a chunkier, iOS-like bar instead of a thin blue slider with a dot indicator. However, you'll still get Android 11 and One UI 3 on slightly older devices like Galaxy S20 and Note20 phones, so it's not solely reserved for folks who buy the Galaxy S21 phones.

With Wacom's partnership, the Samsung Galaxy S21 Ultra packs S Pen compatibility alongside support for some

Director's View has a feature called Live Thumbnails, where they act as shortcuts for switching camera lenses to get a variety of angles within a single clip.

third-party styluses. According to Samsung, it's compatible with any S Pen, including older models and the ones from Samsung's tablets.

However, not every S Pen feature is available on the Galaxy S21 Ultra. For instance, Air Gestures requires Bluetooth Low Energy (BLE), and neither can you tag the stylus button to launch a specific app without BLE. That is more of a limitation of passive styluses and S Pens.

Not only is the S Pen sold separately, but the Galaxy S21 Ultra also doesn't have a built-in S Pen slot. If you want to move from a previous

Galaxy Note device and retain your stylus mastery, you'll need a cover that can store the S Pen for you.

Photography and videography upgrades received the most attention in the Galaxy S21 series. Besides the features mentioned above, Space Zoom gets a new Zoom Lock feature that combines image stabilisation with focus-locking.

Specific to the Galaxy S21 Ultra is the ability to record in 4K resolution at 60 fps with any of its rear camera lenses - including the telephoto and ultra-wide-angle ones. After selecting

"UHD 60" in the Video tab, you can proceed to swap lenses using the shortcut keys at the bottom.

In essence, only one major camera change was made to the S21 Ultra, while the rest of the series is mostly on par with the previous generation's. The quad-rear camera S21 Ultra swapped out a 3D depth sensor for a second telephoto lens and Laser AutoFocus sensor. That gives the phone two optical zoom lens at 3x and 10x, the ability to go up to 100x for Space Zoom, as well as faster autofocusing capabilities.

As a whole, the Galaxy S21 series is wholly capable of taking pleasing pictures, with software optimisation that's not aggressive at first glance. The cameras are all equally responsive and fast. Some differences do crop up in quality and ease of use between each model. By far, the easiest for point-and-shoot would be the Galaxy S21 Ultra. That's not to say the other two can't perform - the Ultra variant was

CONCLUSION

ALL THREE GALAXY S21S ARE EQUALLY POWERFUL, BUT YOU'LL STILL WANT THE ULTRA FOR THE KITCHEN SINK EXPERIENCE.

AT A GLANCE
**SAMSUNG
GALAXY S21 ULTRA**

PROCESSOR
Samsung Exynos 2100
(5nm octa-core)

DISPLAY
6.8-inch, Dynamic
AMOLED 2X, 3,200 x
1,440 pixels, 120Hz
adaptive refresh rate

CAMERA
108MP, wide, f/1.8
12MP, ultra-wide, f/2.2
10MP, telephoto, f/2.4,
3x Optical Zoom
10MP, telephoto, f/4.9,
10x Optical Zoom
100x Space Zoom

STORAGE
256GB or 512GB
internal storage
No microSD slot

PRICE
From $1,798

TESTED & RATED
8.5/10

HWM
SINGAPORE

TEST
**EDITOR'S
CHOICE**
HWM
SINGAPORE
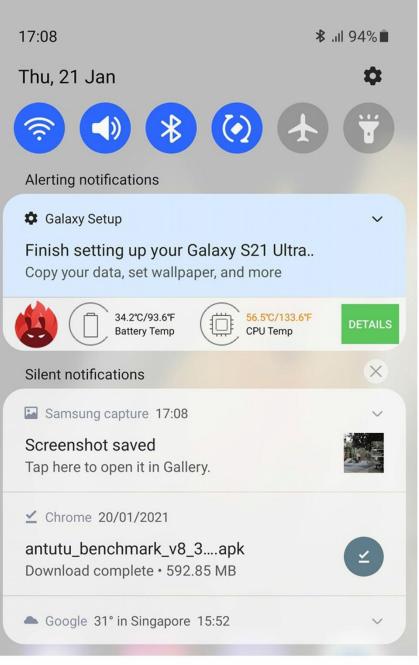
merely much easier to control.

At a glance, Samsung has made one of its better Galaxy S launches in recent years with the Samsung Galaxy S21 series. They put the phones out early, yet managed to deliver a powerful and beautiful trio.

The strongest draw would be the Galaxy S21 Ultra. It's not just the ease of use during photography, or the massive battery capacity, or the delicious 1440p display. The Galaxy S21 Ultra's S Pen support gives casual Galaxy Note users a reason to consider switching over to the Galaxy S series instead.

While the Galaxy S21 seems like the financially savvy alternative out of the three, it also had lower benchmark performance despite having the same components. If you don't need HDR10, you could consider the Samsung Galaxy S20 FE instead, with similar-enough performance scores, equally 1080p-quality panel, and more battery life.

One UI 3's lock screen is less cluttered, and the pull-down notifications have a translucent background.

The quad-rear camera S21 Ultra swapped out a 3D depth sensor for a second telephoto lens and Laser AutoFocus sensor.

If you simply need a new Galaxy S21 series device without S Pen functionalities, then there's the Galaxy S21+. It's just 0.1-inch smaller than the curved S21 Ultra's display. It has better battery uptime than the regular version, stunning performance that matches or betters the S21 Ultra, and it still comes in Phantom Violet if you don't like boring monotones.

While it sounds like a lot of praise, we're also not blind to the missteps that came with the Galaxy S21 series. If you ask us, the Koreans should've kept microSD compatibility, and bring back 1440p on to the S21 and S21+. The real shame is the removal of a charging adapter. Indeed, Samsung could've found it in them to at least give a universal fast-charging adapter, considering the sticker prices of these premium devices.

Trespasses aside, it's clear that Samsung managed to distil what was already excellent in their Galaxy S series, and started 2021 on the right foot.

The Value Torchbearer

Creative Outlier Air V2

By **Raymond Lau**

AT A GLANCE

DRIVERS
5.6mm
Graphene-coated

AUDIO CODEC
aptX, AAC, SBC

CONNECTIVITY
Bluetooth 5.0

BATTERY
12hrs (earbuds)
/ 34hrs (with case)

WATER RESISTANCE
IPX5

PRICE
$119

We gave Creative's previous true wireless earbuds, the Outlier Gold (an updated edition of the Outlier Air), decent marks for its fashionable looks, good sound quality, and comfortable fit. However, it was set back by some negatives like poor controls and connectivity. With the Outlier Air V2, Creative kept all of the good stuff while directly addressing some of our

complaints. At the same time, pricing is kept low.

At a glance, there's barely any difference between the Outlier Air V1 and V2, which is not quite a good thing.

For one, the case is very bulky, looking more like a mini power bank. Unless cargo pants are your style, there's no comfortable way of stuffing the Outlier Air V2 into jeans.

The saving grace of

that bulk is its battery life. The Outlier Air V2 is rated for 12 hours of listening per charge, and up to 34 hours total with the charging case. In all my daily normal use, I've never come close to depleting its juice.

The case has very clear LED indicators (simplified from earlier models) for the rough level of charge left in the case and each individual earbud. The latter will prove to be rather

important because the earbuds don't dock that well in the case. There were several times when I popped them into the case and one side ended up not charging because the pins weren't aligned.

The Outlier Air V2 has the same slide-to-open mechanism as its older sister, and while it's a novel distinction from your typical flip-to-open case, I must say I'm not a big fan of it. It doesn't slide very smoothly and needs a fair bit of force to get going.

Once you pluck the earbuds out of the case, they're light-weight and fits well in the ear. They're IPX5 rated too. I took them for a couple of work-outs at the gym and

they had no problems standing up to the task.

Unfortunately, there's no proper companion app for the Outlier Air V2. Sure, there's the Super X-Fi app, which is a great bit of software audio enhancement. However, it's no substitute for a proper companion app, which lets you maximise the use of your earbuds, from software customisation features like touch controls to basic things like apply firmware updates.

Without an app, you'll have to settle for Creative's built-in controls, which has a bit of a learning curve to them. Fortunately, they are better than Outlier Air and Outlier Gold because it's now touch-based. No more button mashing like on the old models.

Speaking of usability, the earbuds support smart assistants like Apple Siri or Google Assistant as well. So if you can't get around to mastering the touch controls, you have

some level of control via voice. Not a bad option.

The Outlier Air V2 is equipped with the same 5.6mm Graphene-coated driver found in the Outlier Gold and the Outlier Air. The earbuds support for aptX, AAC, and SBC codecs mean high-res audio is still available, which is great because aptX isn't something that is supported on a lot of Bluetooth headsets, so the Creative gets a nod here.

The Outlier Air V2 produces a suitably balanced rendition of John Mayer's New Light complete with clear highs and mids, with maybe just a tad too much bass for my personal preference. But I suppose that's just how today's pop songs are tuned.

On a lighter and airier tune like Ed

The earbuds boast the use of the less common graphene material, but does it make a difference?

CONCLUSION

SOLID-SOUNDING BUDGET BUDS WITH PREMIUM FRINGE FEATURES SUCH AS APTX SUPPORT AND HIGH BATTERY LIFE.

Sheeran's Afterglow, the earbuds performed admirably enough but started to show its limitations. You can hear Sheeran's voice struggling to stand on its own as the vocal harmony and guitar strumming gradually amped up their attack.

Using the right-sized tips definitely helps with the overall listening experience, as the earbuds could

completely block out all noise indoors even without active noise cancellation. Of course, being out-doors is a different story, but they do work well enough.

Nonetheless, the most attractive feature is its price. While originally set at $119, the Creative Outlier Air V2 have actually been going for just $99 at all of Creative's official retail touch-points. So, if you're in the market for a pair of good true wireless earbuds and only have the budget for one around $100, the Outlier Air V2 is easily the one to get.

By modern comparisons, the Outlier Air V2 has a power-brick of a case.