



SEOUL: A man uses his smartphone to send messages via Kakao Talks, a South Korean mobile messaging app, in Seoul, South Korea. Kakao Talk and Line are two Asian mobile messengers that outgrew Facebook and Twitter in Japan and in South Korea in terms of user number. — AP

PITCH PERFECT: MOBILE MAKERS, TELCOS DRAWN TO HI-RES AUDIO

TECH IMPROVEMENTS, LIFESTYLE SHIFTS DRIVING DEMAND

SINGAPORE: Mostly young, male audiophiles through a Singapore hotel ballroom, intently assessing headphones, earbuds and in-ear monitors - priced from \$50 to as much as \$10,000. Alongside are banks of dedicated digital audio players (DAPs), with an entire wall of the expo showcasing the king of DAPs: iriver. Less than five years ago, the South Korean firm was staring at bankruptcy, its low-end MP3 players no match for Apple's iPod and the rise of the music-playing smartphone. But, after some missteps and a name change, Astell & Kern has created a small but lucrative market for those wanting to hear music as it sounds in the studio or concert hall.

This is the world of high resolution (hi-res) audio (HRA), a niche that smartphone makers, music companies and even telecoms carriers hope will, if not move to the mainstream, at least sprinkle some of its fat margins on their bottom lines. "Now, people are interested in \$3,000 players," says James Lee, Astell & Kern's vice president. "Before, they would think \$300 players were crazy. Now, \$1,000 is the average price." And that's a snip compared to the \$55,000 price tag on a pair of Sennheiser Orpheus HE 1 electrostatic headphones resting on a marble-mounted amplifier on show for selected guests in a room on the hotel's 34th floor.

Consumer demand for HRA is being fed in part by lifestyle shifts. We commute longer, live in smaller apartments and use smarter phones and streaming services, like Spotify. Americans spend 24 hours a week listening to music, says

market consultancy Nielsen. Also, there are fewer constraints on audio quality. A decade ago, a 'lossy' MP3 format - where file compression meant reduced quality - made sense when \$30 would buy enough space for only about 500 songs. Now, the same price would get you enough flash drive for 32,000 songs.

Audio add-ons

The growth in listening to music is having a knock-on impact on Bluetooth speakers, headphones and other audio accessories. Last year, Americans spent more on headphones for the first time than they did on physical music, such as CDs. This has stirred hardware makers. Apple's purchase of headphones and music streaming company Beats for \$3 billion in 2014 has overshadowed efforts by other manufacturers to offer audio accessories and features. A year earlier, Sony dusted off its Walkman brand as a high-end audio range, and has since added portable speakers and headphones. Samsung Electronics has its Level series of headphones and speakers, while LG Electronics last month launched its LG phone with an optional Hi-Fi module, made in partnership with Bang & Olufsen.

Others, too, hope clearer, richer audio will help them differentiate, adding separate audio processors to improve the playback of music on their phones. They are helped by specialist chip makers like ESS Technology Inc, whose digital audio converters are in phones made by Xiaomi, Lenovo, Meizu, LeTV and Vivo. Telecoms carriers

are also taking note, hoping to lock in users or boost revenues: Singapore Telecommunications launched a service in February offering four separate streaming apps, including Spotify. When iriver's owners decided to sell the company in 2014, it was South Korean carrier SK Telecom which offered the most compelling bid, said Lee, adding: "Telcos think this market will grow."

Asia leads

Much of the surge in interest in HRA is in Asia. Onkyo, a Japanese music download service, has offered hi-res music since 2004. The country accounted for more than a fifth of all spending on HRA, including home hi-fi, last year, according to GfK, a research company. China, too, is growing fast, and overtook Japan as iriver's main market last October. Tianjin-based Hifiman, a maker of headphones costing up to \$3,000, is seeing its margins squeezed by pretenders. "Customers and distributors tell me that users get a little bit confused," said Riccardo Yeh, Hifiman's international sales director.

The HRA market still has an early-stage, almost amateur feel. The dozens of companies making headphones, from Vietnam to Romania, are usually home-spun, crowd-funded or self-financed, and rarely employ more than a few staff, says Jude Mansilla, who runs a website and organized the Singapore expo. "The industry is very keen," says Peter Cooney, an analyst who follows the HRA space. "But for the mass market, the question is: is the demand there?" — Reuters

HTC'S NEW PHONE FOCUSES ON CAMERA QUALITY

NEW YORK: HTC is promising a better camera - along with refinements in audio and design - as it unveils its latest flagship phone, the HTC 10. The camera has long a weak point in HTC devices. At first, HTC sacrificed image resolution and made the size of individual pixels larger to capture more light. But the resulting 4 megapixel images were often fuzzy, especially when cropped or enlarged. HTC went with smaller individual pixels in a 20-megapixel camera last year, but it still underperformed in extreme situations, such as indoors and close-ups. The HTC 10 tries to strike a balance - larger individual pixels, but not as large as before. The camera is now 12 megapixels, the same as the latest iPhones and Samsung Galaxy phones.

"What we tried to do ... is to get the best of both worlds," said Nigel Newby-House, HTC's associate vice president for product planning in North America. In last year's HTC One M9 phone, "the imaging performance was not up to the kind of spec of what we really like to see in a flagship." HTC's flagship phones have drawn good reviews in the past, but it's had trouble translating those into sales. The company doesn't currently rank as one of the top five phone

manufacturers worldwide, according to the market-research firm Gartner.

In recent months, HTC has branched out to fitness and virtual-reality devices. But it isn't giving up on phones. Announced yesterday, the HTC 10 phone is expected to be available in late April. The company didn't immediately announce pricing. Other notable features in the HTC 10 include a powerful battery - promised at two days - and the ability to customize the home screen so that app icons don't all have to stay in a grid. There will be stickers of different sizes to move around and create a personalized design.

HTC is giving a slight boost to the selfie camera - to 5 megapixels, matching the Apple and Samsung phones. It also joins its rivals in letting the screen serve as a front-facing flash. An already-good metal design will now have sharper edges. The rounder finish in the previous model made the phone feel more like a bar of soap, with all the slipperiness you'd expect, Newby-House said. For audiophiles, the phone can now handle higher-quality sound files, and the two external speakers have been tweaked so that one focuses on high end notes, while the other emphasizes bass. — AP



This photo provided by HTC shows the HTC10. HTC is promising a better camera, along with refinements in audio and design, as it unveils its latest flagship phone, the HTC 10. — AP

TECH FIRMS VOW TO COUNTER ONLINE TERRORISM ACTIVITIES

BEIJING: Twenty-five Chinese technology companies have signed a pledge to counter images and information online that promote terrorism, the internet regulator said yesterday, months after China passed a controversial new anti-terrorism law. The Cyberspace Administration of China said the companies had promised to "handle in a timely way terror-related harmful, illegal information, create a clear internet space and maintain social stability".

The companies which have signed up include Baidu Inc, Tencent Holdings Ltd, Alibaba Group Holding Ltd, JD.com and Sina Corp, the regulator said. Tencent, Alibaba, JD.com and Sina did not immediately respond to request for comment. A Baidu spokesman declined to comment. The regulator said that more than 25,000 posts, 4,000 videos and 200 accounts had been removed from the internet so far this year that involve illegal, terror-related content.

China passed the anti-terrorism law in December. Among other things, it requires technology firms to help decrypt information and

cooperate with the government in fighting terrorism. Critics say China uses its counter-terror and national security regulations to quell free speech. Under President Xi Jinping, the government has implemented an unprecedented tightening of internet controls and sought to codify the policy within the law. China has rebuffed the criticism of the law, saying it is simply doing what other Western nations already do in asking technology firms to help fight terror.

The law has caused particular unease in Western capitals as it codifies sweeping powers for the government to combat perceived threats. China says it faces a serious threat from groups such as the East Turkestan Islamic Movement (ETIM), which operates in China's restive far western region of Xinjiang, home to the Muslim Uighur people, where hundreds have died in violence in recent years. Rights groups and many foreign experts though say China has never presented any convincing evidence to prove ETIM exists as a cohesive, well-organized group capable of the kinds of attacks China blames it for. — Reuters

NEW REPORT CALLS FOR BAN ON 'KILLER ROBOTS'

UNITED NATIONS: Technology allowing a pre-programmed robot to shoot to kill, or a tank to fire at a target with no human involvement, is only years away, experts say. A new report called Monday for a ban on such "killer robots." The report by Human Rights Watch and the Harvard

Law School International Human Rights Clinic was released as the United Nations kicked off a week-long meeting on such weapons in Geneva. The report calls for humans to remain in control over all weapons systems at a time of rapid technological advances. It says that requiring

humans to remain in control of critical functions during combat, including the selection of targets, saves lives and ensures that fighters comply with international law.

"Machines have long served as instruments of war, but historically humans have directed how they are

used," said Bonnie Docherty, senior arms division researcher at Human Rights Watch, in a statement. "Now there is a real threat that humans would relinquish their control and delegate life-and-death decisions to machines." Some have argued in favor of robots on the battlefield, saying their use could save lives. But last year, more than 1,000 technology and robotics experts - including scientist Stephen Hawking, Tesla Motors CEO Elon Musk and Apple co-founder Steve Wozniak - warned that such weapons could be developed within years, not decades.

In an open letter, they argued that if any major military power pushes ahead with development of autonomous weapons, "a global arms race is virtually inevitable, and the endpoint of this technological trajectory is obvious: autonomous weapons will become the Kalashnikovs of tomorrow." According to the London-based organization Campaign to Stop Killer Robots, the United States, China, Israel, South Korea, Russia, and Britain are moving toward systems that would give machines greater combat autonomy. Human Rights Watch is a co-founder of the organization. The UN meeting of experts on the issue, chaired by Germany, continues talks that took place in April 2015 and May 2014. — AP



TEHRAN: A robot from Iran's Qazvin Islamic Azad University takes part in a football match against Germany's Nao-Team HTWK of Leipzig United University during the RoboCup Iran Open 2016, in Tehran. — AFP

RAMSOMWARE: EXTORTIONIST HACKERS BORROW CUSTOMER-SERVICE TACTICS

TEWKSBURY: When hackers set out to extort the town of Tewksbury, Massachusetts with "ransomware," they followed up with an FAQ explaining the attack and easy instructions for online payment. After balking for several days, Tewksbury officials decided that paying the modest ransom of about \$600 was better than struggling to unlock its own systems, said police chief Timothy Sheehan. That case and others show how cyber-criminals have professionalized ransomware schemes, borrowing tactics from customer service or marketing, law enforcement officials and security firms say. Some players in the booming underworld employ graphic artists, call centers and technical support to streamline payment and data recovery, according to security firms that advise businesses on hacking threats.

The advancements, along with modest

ransom demands, make it easier to pay than fight. "It's a perfect business model, as long as you overlook the fact that they are doing something awful," said James Trombly, president of Delphi Technology Solutions, a Lawrence, Massachusetts, computer services firm that helped three clients over the past year pay ransoms in bitcoin, the virtual currency. He declined to identify the clients. In the December 2014 attack on Tewksbury, the pressure to pay took on a special urgency because hackers disabled emergency systems. That same is true of additional attacks on police departments and hospitals since then. But all sectors of government and business are targeted, along with individuals, security firms said.

The total cost of ransomware attacks is hard to quantify. But the Cyber Threat Alliance, a group of leading cyber security

firms, last year estimated that global damages from CryptoWall 3 - among the most popular of dozens of ransomware variants - totaled \$325 million in the first nine months of 2015. Some operations hire underground call centers or email-response groups to walk victims through paying and restoring their data, said Lance James, chief scientist with the cyber-intelligence firm Flashpoint.

Graphic artists and translators craft clear ransom demands and instructions in multiple languages. They use geolocation to make sure that victims in Italy get the Italian version, said Alex Holden, chief information security officer with Hold Security. While ransomware attacks have been around longer than a decade, security experts say they've become far more threatening and prevalent in recent years because of state-of-the-art encryption, modules that infect backup sys-

tems, and the ability to infect large numbers of computers over a single network.

Law enforcement officials have long advised victims against paying ransoms. Paying ransoms is "supporting the business model," encouraging more criminals to become extortionists, said Will Bales, a supervisory special agent for the Federal Bureau of Investigation. But Bales, who helps run ransomware investigations nationwide from the Washington, DC office, acknowledged that the payoffs make economic sense for many victims. "It is a business decision for the victim to make," he said.

Run-of-the-mill ransomware attacks typically seek 1 bitcoin, now worth about \$420, which is about the same as the hourly rate that some security consultants charge to respond to such incidents, according to security firms who investigate ransomware

cases. Some attacks seek more, as when hackers forced Hollywood Presbyterian Hospital in Los Angeles to pay \$17,000 to end an outage in February. Such publicized incidents will breed more attacks, said California State Senator Robert Hertzberg, who in February introduced legislation to make a ransomware schemes punishable by up to four years in prison. The Senate's public safety committee was scheduled to review that bill on Tuesday. Some victims choose not to pay. The Pearland Independent School District near Houston refused to fork over about \$1,600 in ransom demanded in two attacks this year, losing about three days of work from teachers and students. Instead, the district invested tens of thousands of dollars on security software, said Jonathan Block, the district's desktop support services manager. — Reuters