CRITICAL COMMUNICATIONS: INTRODUCTION

chapter Critical Communications



Ildefonso de la Cruz Morales, principal analyst, government & manufacturing critical communications, OMDIA

A trajectory of growth and innovation

Africa, a continent of kaleidoscopic diversity, covers a very dynamic mix of countries with their unique geographical traits, political climates, and infrastructural disparities. This diversity intrinsically shapes the critical communications market, fostering a complex landscape. Across the region, nations with strong economies and highly developed urban hubs that have invested heavily in technologically advanced public safety solutions can be found alongside countries that are only beginning to lay the groundwork for basic critical networks to address emergency response infrastructure requirements for the protection of their increasing population.

The African market is still facing huge macroeconomic challenges fuelled by the aftermath of the COVID-19 pandemic, the impact of the global chipset shortages as well

as the recent political unrest in the Middle East. These hurdles for the regional market have consequently translated into high inflation and sharp depreciation of some local currencies, forcing many governments to reassess their technology investments. However, it should be noted that the focus on critical communications, especially for public protection and disaster relief, has remained resilient and continues to record growing volume of radio shipments and infrastructure rollouts for almost all digital technologies on the back of the increasing demand both in urban and rural regions.

In developing countries and rural areas that lack emergency response infrastructure, OMDIA has observed a trend for initial investment efforts to prioritize law enforcement agencies. Generally, Fire & Rescue and Emergency Medical Services (EMS) technical capabilities lag somewhat behind, and the focus is placed on bolstering the technical capabilities of law enforcement agencies and the establishment of basic emergency response provisions. For these developing regions in Africa, the replacement of worn-out equipment remains relatively slow due to conservative decisions from governments with limited budgets. As a result, a preference for offthe-shelf technology has been observed and high demand for cost-optimized digital technology (CODT) solutions and services.

High power analogue radio systems have traditionally provided reliable lifelines in these challenging landscapes, especially for rural areas. But even those agencies that once considered analogue radios, like VHF technology unchallenged, are being persuaded towards the digitalization of their critical communications equipment driven by the appealing cost of technologies like DMR and PDT, and in some cases a direct shift towards push-to-talk (PTT) over cellular solutions. This market represents a considerable opportunity for digital migration thanks to the availability of multi-tiered cost optimized digital devices. Omdia projects that, by the end of 2027, less than 4% of the active critical communications connections will be analogue, making this market one of the most digitized regions in the world.

On the other hand, higher-end customers have typically migrated to technologies such as TETRA and P25. Some examples of local governments enhancing their public safety and security agencies with these critical communications technologies are Kenya, Nigeria, and Angola. In this last one, the innovative decision to adopt a hybrid TETRA network enhanced with LTE capabilities has been made futureproofing the national public safety network with narrowband and broadband convergence.

Additionally, there are safe city projects in the works in South Africa, Mauritius, Congo, Kenya, Sudan, and Tanzania as well as plans for multiple programs in sub-Saharan Africa. Other nations, like Libya and Nigeria have already adopted TETRA technologies as a high-end digital critical communication solution for their public safety agencies. TETRA solutions are also particularly prominent in transportation critical infrastructure enhancements. The political unrest and security requirements in the regions are one of the main drivers spurring the decision of governments to secure their communications.

Similarly, some topologies in the region particularly suit the deployment of high-powered P25 equipment. North African countries are using P25 in desert areas benefiting from the P25 technology support of larger cell size coverage. Omdia has observed an uptake in the demand of countries including Algeria, Angola, Kenya, and Nigeria.

But, without a doubt, cost-optimized digital technologies dominate the African critical communications market, representing close to 60% of the entire installed base. Additionally, these technologies that offer sensibly priced digital communications remain the fastest growing technology group in the region. This growth will be seen in transportation, industrial and utility sectors for the next five years.

Omdia also forecasts that countries with limited budgets will opt for the adoption of CODT solutions even for their public safety and security user groups, rather than building expensive nationwide networks supported by high-end standards. Countries like Uganda, Ethiopia and Tanzania are the perfect example since they have chosen DMR technology solutions to provide critical communications to their police forces. Other countries like Kenya and Tanzania have also enabled other organizations like their port authorities with DMR solutions.

DMR tier-II is very well-suited to open geographic regions, resulting in many countries in Africa looking to adopt these solutions. It is also worth noting the potential for an increase in demand of DMR tier-III and dPMR model 3 networks in the region. Similarly, as a direct consequence of foreign investment, PDT technology is experiencing a growth surge. It is still being used sporadically across the region, but OMDIA expects its growth to continue.

Looking at the African public broadband mobile market. OMDIA has observed that LTE networks currently represent more than 20% of the mobile subscriptions. This a low number when compared with other regions in the world but major efforts from service providers and government have been put in place resulting in a major push of 4G technology. OMDIA expects 4G LTE technology to dominate public communications by 2027 with more than half of the total mobile subscription market. Some African countries have been early adopters of critical LTE technology. OMDIA has observed major efforts and relevant deployments in Nigeria, Kenva, and Ghana, As a consequence of these advances from 2G to 4G and 5G on the horizon, over-the-top PTT technologies leveraging broadband are becoming increasingly popular. Multiple industry sectors are attracted to the advantages of PTT offerings and the possibility of being connected by radio over long distances without additional dedicated infrastructure.

In Africa, the adoption of 5G technology has remained low to date. This is mainly due to the delays in spectrum allocation and the barrier of entry from high prices for end-users 5G devices. However, multiple governments have initiated active programs and Omdia projects 5G adoption to increase significantly over the next five years. One of the main drivers for this growth is the launch of 5G services by major service providers in Nigeria, Angola, Botswana, Kenya, and Tanzania in late 2022 and several North African markets are expected to launch their 5G offerings by the end of 2024.

Despite some of the ongoing challenges faced in the region, Africa's critical communications market continues to chart a trajectory of growth and innovation. The pursuit of resilient secure and efficient critical communications is propelling Africa towards high digitalization fuelled by the availability of cost-optimized digital communication solutions.



Ken Rehbehn, principal analyst, CritComm Insights

Public safety, wireless and the road to prosperity

Africa is massive, with its 30 million square kilometer landmass surpassed only by Asia. Technology progress in this diverse region varies widely, from urban centers humming with LTE airwaves to rural villages with limited connection to the outside world. Advancing progress in society and industry demands investment to broadly spread technology benefits across the

land. While the challenges remain complex, the elusive goal is a vital step toward boosting public safety and economic prosperity.

A diverse continent benefits from diverse wireless strategies

Africa is no stranger to advanced 4G LTE services. Mobile network operators have built out networks in urban centers and other major population areas. The resulting high-performance coverage has transformed banking and brought new educational resources to areas that lack wired communications access.

However, vast swaths of rural regions still need robust data communications that can enable security, education, health, and industrial

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growth. With little to no prospect for fibre expansion, these regions remain constrained. The need for more fibre resources leaves wireless support dependent upon capacity-constrained microwave transport.

This patchwork of connectivity options for public safety operations means that long-range analog or DMR networks must remain the foundation for rural coverage. Advanced LTE services, where available, offer powerful capabilities that can improve public safety responses. But with access to these networks limited, investment in costeffective narrowband radio technologies remains an essential communications necessity.

Leapfrog technologies

Establishing a dense grid of high-capacity cellular base stations operating LTE or 5G across the African landscape remains a tall order. Beyond the daunting geographic scope, basic infrastructure is a challenge. Power infrastructure is spotty and unreliable. Fibre access is rare. And vandals frequently target infrastructure for personal gain.

Against this backdrop, new satellite services offered by low Earth orbit (LEO) systems may provide modest relief. With 100-300Mbps speeds, LEO data services can quickly establish advanced communications technology in areas facing infrastructure challenges. These investments can light up remote regions and foster improvements in education and healthcare. Access to better data services can translate to economic growth for local businesses.

Expanding opportunities with direct-to-satellite mobile communications may benefit rural Africa, though the cost of these subscriptions will likely be beyond what individual users can afford. For public safety organizations, however, these new capabilities may deliver a big impact at an affordable price point.

5G drivers limited

Industrialized cities across Europe, Asia, and the Americas embraced 5G to contend with rapidly growing cellular data loads. The 5G New Radio (NR) air interface opens up new spectrum ranges unavailable with LTE. And the flexibility of the air interface sets the stage for precision wireless systems serving industrial use cases.

However, the African landscape and infrastructure constraints limit the requirement for 5G deployment in the region. Following years of LTE enhancements that added flexible combinations of spectrum bands, the 4G technology remains sufficient for most mobile network operators.

One thrust of 5G progress addresses improvements in non-terrestrial networks (NTN) or satellite-based services. As with early LTE-focused efforts for direct-to-satellite, 5G NTN progress coupled with LEO constellation expansion may set the stage for broader 5G impact across the region.

A role for policy makers and international efforts

Economic growth in the region depends on progress in education, healthcare, safety, security, energy, and other foundational elements of society. Ubiquitous access to highperformance data services remains a key enable in each element. Government policymakers must take steps to strip away barriers to fibre and wireless deployment.

The international community can assist, as well. Financial contributions and business expansion that bring wireless access into communities help expand markets. The vitality and success of the African continent are essential for a healthy and prosperous world.

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Robert Bell, executive director, World Teleport Association

Growing connectivity options boost the prospects of African mining

The abundant mineral resources of Africa have made it significant contributor to exports, revenue, and gross domestic product (GDP). Before the pandemic, minerals and fossil fuels accounted for over a third of exports from nearly two-thirds of African countries. In any discussion of Africa's economic future, mining must be on the table.

The modern mine has come to rely heavily on automation, from self-driving loaders and trucks to automated drills and Al-driven video surveillance. Those systems, in turn, rely on connectivity across the mining operation, to regional offices, headquarters locations and the worldwide web. The good news for mining companies and their investments is that connectivity has become less expensive, more powerful, and more flexible over the past few years than anyone could have anticipated.

Why connectivity matters

Robust, reliable, and widespread connectivity contributes to mining operations in many ways.

Health and safety. Mining has long been one of the most dangerous jobs in the world. With competition for qualified talent at an all-time high, automating work site surveillance with video analytics can produce sizable improvements in worker safety. Unlike supervisors, cameras and data processing systems never sleep or get distracted, and they can play a key role in making sure employees comply with rules designed to protect them. The health of people living near the mine is equally important to progressive operators. The same surveillance and analytic capabilities enable mines to monitor their environmental impact and take preemptive action to prevent harm.

Productivity of people and machines. The systems put in place to protect health and safety can be leveraged to significantly boost the productivity of resources and workers. As sensors on mining equipment and systems collect massive amounts of data, it creates an opportunity for sophisticated analysis that reveals bottlenecks and costinefficiencies in operations.

Autonomous haulage and drilling systems have an immediate impact. According to Nokia, haul trucks in an open pit mine are scheduled for an average of 5,500.6,000 engine hours per year. Autonomous trucks achieve significantly higher utilization, resulting in higher annual engine hours and more tons of material moved per day. Tire life is also significantly longer because trucks operate only on a programmed basis and avoid vehicle collisions and sidewall punctures.

Analytics can also generate predictive maintenance schedules based on operating data, so that equipment can be quickly taken offline and serviced before a major breakdown can bring operations to a halt. On a higher level, real-time analysis of data from operations, drilling reports and geological surveys can generate recommendations on exploration and improve metals processing methods to do less environmental damage.

Digital twins. For the most advanced operations, the 'digital twin' is transforming how companies manage complex systems and infrastructure in the field. Using data from construction and operation, analysts create a digital replica of the complete mine, which is maintained up to date from the data flowing in real time from the field. As additions and changes to the facility are proposed, they can be tested with great accuracy on the digital twin before fabrication and installation. Digital twin technology is being adopted at a record pace because, by eliminating errors, it can save millions of dollars on field implementation.

Robust and Proven Solutions for the Mining Industry

- Extend coverage
- Reduce operational costs
- Full accessory portfolio





New options in the sky

Despite the spread of optical fibre, satellite remains the core option for connectivity from the mine to the world, because most mining operations are located far from urban areas. For decades, all satellite services were provided from geostationary orbit or GEO, at an altitude of 36,000km. GEO satellites are powerful and offer highly reliable service, but the distance from satellites to the ground introduces transmission delay called latency. For most applications, this is not a problem – but enterprise resource planning systems and cloud services from Microsoft Office to mining applications such as EarthCache and Lightship are highly interactive and operate poorly over high latency connections.

Massive investment over a decade has created satellite constellations operating in medium Earth orbit or MEO and low Earth orbit or LEO. At these lower altitudes, latency ceases to be a barrier, and the new generations of spacecraft being launched are making available massive amounts of new bandwidth at much lower prices.

In Papua New Guinea, K92 Mining has contracted for a combination of GEO and MEO connectivity from SES O3b to improve cost and resilience. The O3b service is primary and GEO service backs it up, with a technology called SD-WAN used to automate seamless hand-offs from one platform to another. In Western Australia, Atlas Iron has contracted for a combination of GEO and Starlink LEO service, with the GEO VSAT supporting mission-critical operations and Starlink providing crew welfare connectivity. An advanced network management platform called SIGMA from the service provider Speedcast blends these paths into a single wide-area network and provides robust cybersecurity.

Compared with the 'single thread' connectivity traditional for mining, these hybrid satellite solutions increase the reliability of service, expand the range of applications it can support and give crew members an internet connection that can support all their needs.

New options on the ground

WiFi has been the staple of onsite connectivity for years, but private LTE is rapidly emerging as a preferred technology for onsite connectivity at mines.

The technology leader in this space is Nokia, which offers a Digital Automation Cloud that delivers significant improvements in range, performance, and cost. Private LTE has 4-100 times the range of WiFi, depending on conditions, and offers more predictable performance for multiple users. While WiFi security is based on passwords, LTE uses military-grade security with SIM authentication and end-to-end encryption. It also provides simplicity of operation, because it integrates LPWAN technology for Internet of Things applications on the same radio network.

Mines are using private LTE for group communications, push-to-talk radios, and push-tovideo, which can speed collaboration and problem solving. More sophisticated applications include highaccuracy positioning of their automated vehicles to prevent accidents, control of drone networks and video analytics.

A partnership among Huawei, MTN and Mintec introduced a 5G private network at South African mines operated by Canyon Coal and Zijin Mining Group in 2022. The high bandwidth and low latency of 5G enabled real-time communications among mine workers, with planned applications including proximity detection, vehicle detection, asset tracking and wireless video surveillance.

For Africa to benefit fully from its mineral abundance, policy leaders need to understand the requirements of modern mining companies for productivity, connectivity, and process automation. According to McKinsey & Company, worldwide mining operations were as much as 28% less productive in 2015 than they were a decade before. In coming years, it will be the most productive mines, not the ones with the biggest deposits that will win the competitive battle to supply mineral wealth to the world.



Louis Lambert, chief revenue officer, 6Harmonics

e've sold products in Africa for years, but with less focus than in other regions. Our main challenge in Africa this year was the lack of product certification for some markets - but we are changing this for 2024 and in the future.

We have developed an upgraded product and are securing the FCC, ISED, and the required ETSI certifications. We expect the ETSI certifications in December 2023 and the first production shipment to be ready at the end of January 2024.

We're seeing an increased dependency on people and things to be constantly connected. Although there is an appetite for higher connectivity speed, the basic requirement is to be connected. More and more application developers assume that the devices are always connected, hence the need for real-time connectivity. On-prem computing alone is not enough; edge computing in edge devices needs to be married to edge computing.

From a technological viewpoint, we've seen new connectivity options in Africa that were unavailable just a few years ago. However, some of these, like LEO satellite connectivity, are still too expensive for many use cases. We also see tremendous energy and investment in edge computing to enable people and machines to process data locally and reduce reliance on highcapacity network connections. A high-capacity network connection is always desirable but often unrealistic due to location, coverage, and cost, Edge computing can function even when the communications path is marginal or interrupted, delivering more reliable OT operations and a safer work environment with reduced reliance on high-capacity network connection. With edge computing becoming available, containerized applications and micro-services are now possible. We are also seeing a push by OT to migrate from x86 to ARM-based. OT drives this push in the industrial markets, where footprint, resources, power consumption, reliability, and security are needed.

Africa is well poised to benefit from experiences and learnings from other markets and to adopt new applications and technologies fitting for digitization, as it does not have as much legacy infrastructure to deal with. Unlike most of the world, African mobile operators are not racing to build ubiquitous 5G coverage only to realize that users do not want to pay for it.

Looking ahead: Telecommunications is one of the most critical technology sectors to drive the African market in the future. The people of Africa need to reduce their dependency on commuting for education, work, health services and leverage communication. Moving from commuting to communicating is an essential milestone in Africa's growth.

The continent has diverse small markets with individual needs and requirements, from the regulatory, geo-political, economic, business processes and local customs. Doing business in Africa is not as easy as in North America, but the market entry barrier may discourage competitors.

We are still researching and working closely with the Canadian embassy to determine our best focus areas by considering mining output, security, financing, regulatory, and political landscapes. We are excited about Africa as a mining market and the significant opportunity to help with the digital divide. Africa is part of the focus from now on.

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Nimrod Kapon, founder and CEO, Oasis Networks

he dynamic within Africa has been characterised by both growth and instability. In the last year we have seen large scale projects mature within the region and we are witnessing significant developments within African communication networks.

In terms of new technology, we are taking an interest as to how LEO and the rollout of Ka-band small terminals will have an impact. The continuous penetration of Ka-band is an interesting advancement within the satcom industry in Africa. LEO, and especially Starlink, has become something that people are asking about. Additionally, the VSAT market is mature and proven within Africa and, without the same level of reliability, it will be interesting to see how LEO technology competes. There are operators which offer dedicated capacity however it remains to be seen as to how it will be received.

As the market matures and the demand for development within Africa continues to gain pace, we are seeing significant opportunities within connectivity. As the national infrastructure becomes more established, it can support

"People in Africa are more connected than ever and are well aware of what is going on worldwide. They own devices and their hunger to be connected affects the VSAT market." more initiatives. Oasis Networks is currently involved in two national projects, in two different countries, which can flourish due to this growth, paired with political stability.

The largest challenge within the region is related to political instability. It affects our customers' activities in the continent by delaying projects and developments. Unfortunately, we have seen political instability have a negative impact on the business environment within Mali, Niger, Burkina, Gabon, and Sudan.

We are seeing an increased need for better communication networks from our private sector customers. As their businesses grow alongside the African market, they require better connectivity, and therefore they need more support on the ground.

We're also seeing growth in terrestrial technologies across the region, including 5G and fibre. People in Africa are more connected than ever and are well aware of what is going on worldwide. They own devices and their hunger to be connected affects the VSAT market. It has increased both consumer and market demand. For example, the mining industry needs communication systems for operational reasons as well as welfare connectivity (providing video conferencing, emails, internet browsing, streaming for mining teams). The African market needs more of everything. Competition is growing significantly, especially within the VSAT sector.

Compared with the rest of the world, conditions in Africa are certainly different. Infrastructure can be poor in remote areas and the weather often poses problems. This must be factored in and respected by those doing business on the continent. There is a need to be familiar with what is going on at the ground, with it being very important to consider local populations. A flexible approach



THURAYA WE SOLUTIONS DEPENDABLE SATCOM LINK ACROSS AFRICA

CONNECTING TEAMS over mail and videoconferencing

IMPROVING WELFARE with access to messengers

EXPANDING OPERATIONS via remote maintenance kit

ENABLING CRITICAL MISSIONS through fast & affordable deployment



REDISCOVER THURAYA WE WITH IEC TELECOM

is essential. You may need to wait for equipment to be released and this can take time. You must consider weather conditions. Has this affected your planning? Are the roads you need to use blocked? Things can take longer and so you must be able to adapt. You must understand both the unique culture and conditions.

Working within the region requires us to balance both the opportunities from the market's continuous growth with the challenges presented by political instability. Our success derives from our open-minded approach in which we employ adaptable, flexible models of operation. Despite meticulous planning, there are instances when you will have to readjust your strategy in-field to ensure success in delivery. We know that adjusting operations to suit the situation in front of you leads to the best success.

Angola now has two of its own satellites, Angolasat-1 and 2 which can be utilised to boost local projects. Angolasat-2 is a high throughput satellite (HTS) that will deliver services to the entire African continent and some of Europe. On the other hand, there is a possibility that the 'instability belt' from Mali to Sudan, will lead to more governmental, military and security projects in the neighbouring countries. I think that east Africa is likely to receive more support from the West which will go towards easing instability.

The regulatory environment continues to be a complicated issue in Africa. Political

Looking ahead: I think that Africa will become more and more connected, and satellite will be one piece of this puzzle. The potential of this continues to be immense, with many sectors requiring good connectivity, including mining, lodging, construction, agriculture, offshore, NGOs and remote community connectivity.

Africa is so vast and there is no doubt that satellite has a lot to offer for the development

"Working within the region requires us to balance both the opportunities from the market's continuous growth with the challenges presented by political instability."

instabilities could result in governments paying more attention to communication markets and I am concerned that any changes in regulation could have negative effects. It has been reported that five people were arrested for selling Starlink service in Senegal. My fear is that it could lead to censorship of the internet as we saw in DRC a few years ago. There tends to be a heightening of regulations when political situations are unstable.

Border crossings can be dependent on infrastructure in some parts of the continent. For example, it is easier to access Gao in East Mali from Niamey, Niger, than from Bamako. Or it is easier to access some areas in North DRC from Bangui, CAR, than from DRC itself. However, instability in both Niger and CAR can affect cross-borders cooperation. It is hard to predict what will happen in 2024/2025, however it will align with political challenges. It is constantly evolving, and we monitor it closely.

of the continent, and satcom has a key role to play. I can't speculate now whether VSAT or LEO services will be most popular, as this is all still very much unfolding. There is still a huge demand for VSAT; look at the mature market of Europe where VSAT continues to be popular. Both people and industry are demanding more and more bandwidth, and I expect this trend to continue.

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Danny Duan, GM for MEA, Baicells

2023 has been a successful year for Baicells, particularly within the African market. We have signed up several new customers across South Africa, Kenya, Somalia, Mauritania, Nigeria and Zambia – helping facilitate the rollout of 4G and 5G in the region. In addition, we have deployed a 2G radio solution to provide connectivity to those who still rely on this legacy generation.

Despite the hype around 5G, 2G devices remain widespread in Africa due to their broad availability and low cost. Recognising the need to support critical legacy connectivity services until the network is upgraded to the next generation, Baicells deployed a high-power outdoor radio solution in November 2023, which will now offer cellular connectivity to 2G user devices.

Global economic volatility has left no industry untouched, including telecoms. Committed to enhancing connectivity, we saw this as an opportunity to support our customers through financially tough times. Thanks to our financing plans with a 0% interest rate (with the option to defer payment over several years), our customers have been able to continue to grow their networks.

In line with previous years, we have observed an increased focus on digital transformation and progressing to the next generation "Global economic volatility has left no industry untouched, including telecoms. Committed to enhancing connectivity, we saw this as an opportunity to support our customers."

of mobile technology. As a consequence, urban areas have seen a huge uptick in highspeed network coverage. A lot of handsets have evolved towards 4G, sending 3G into diminution. In suburban and rural areas, while 4G and 5G are on the rise, 2G is still heavily relied on to stay connected. For example, MTN plans to keep 2G active in South Africa until at least mid-2024 and through 2025 in Nigeria.

There are also a couple of global telecom trends, that we have seen reflected in Africa. In response to economic challenges, MNOs and ISPs are prioritising reducing their CAPEX investments. Given the climate emergency, there has also been a focus on how to reduce power consumption in the network.

We are particularly proud of our 2G radio that was announced at AfricaCom this year. Baicells' compact, low-cost and easy-to-deploy Nebula246 radio supports 40W total power for an extended coverage range. It offers an attractive platform for African mobile operators to continue supporting their 2G customer base while offering them an attractive software upgrade path to 4G/LTE.

Looking ahead: Africa is rich with opportunity with a rising demand for digital.

Given the race for digital transformation, we expect to see the emergence of new telco players, as well as an

expansion and upgrading of existing customer networks.

While 3G will be phased out as 4G and 5G subscribers continue to grow, 2G will remain relevant – particularly in rural areas.

SUPPLIER PROFILES - CRITICAL COMMUNICATIONS

6Harmonics (6H) 6Harmonics, a Canadian Company, has its roots in developing long-range 21 Concourse Gate, Suite 2, broadband. In late 2021, the company assembled a new management team to Ottawa, ON, Canada K2E-7S4 develop a new product strategy. Tel: 1 (613) 366 1768 The New GWS 5500 Delivers more TVWS broadband capacity at greater distances. info@6harmonics.ca 6H has just announced its new GWS-5500, the industry's highest performance, furthest distance, PTP/PMP broadband wireless connectivity solution. The lowerpriced IP-67 industrial-grade product delivers lower TCO, both onshore and offshore. **6Harmonics** 6H is also developing an IP-67 Rugged Edge Compute and Communications (RECC), delivering real-time computing for people and things at the very edge of the network. The new 6H edge intelligent systems comprise H/W with edge S/W, either on-6H New GSW-5500 prem or cloud-based 6Harmonics controller S/W. Communication port options will include 4G/5G, WIFI6, TVWS, LORA, Etc. The new platform offers high value to digital divide solution providers and resource extraction operators such as: O&G, mining, forestry, fisheries, farming, and utility companies. **6H Rugged** Edge Compute & Communications **6HARMONICS 6H contact us**

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Sepura is a recognised global leader in the development and supply of radio terminals, accessories and applications for mission critical and business critical communications.

Based in the UK's Cambridge technology hub, Sepura provides local support through its global footprint, and is a trusted partner to public safety users and commercial customers in the Professional Mobile Radio (PMR) market.

Sepura's comprehensive solutions for critical communications enable customers to address the demanding operational challenges they face. The company celebrated its 20th anniversary in March 2022.

