

APSCC Monthly e-Newsletter

December 2021

The Asia-Pacific Satellite Communications Council (APSCC) e-Newsletter is produced on a monthly basis as part of APSCC's information services for members and professionals in the satellite industry. Subscribe to the APSCC monthly newsletter and be updated with the latest satellite industry news as well as APSCC activities! To renew your subscription, please visit www.apsc.or.kr. To unsubscribe, send an email to info@apsc.or.kr with a title "Unsubscribe."

News in this issue has been collected from November 1 to November 30.

INSIDE APSCC

APSCC 2021 Webinar Series Continues LIVE Every Tuesday 9AM HK I Singapore Time

The most frequent and largest ongoing virtual conference in the Asia Pacific satellite community – the APSCC 2021 Webinar Series incorporates industry veterans, local players, as well as new market entrants in a single event to reach a wide-ranging audience. The APSCC 2021 Webinar Series continues to play a vital role in supporting the industry in the Asia Pacific region and beyond with a brand-new format, a lengthened timeline, and a potentially unlimited reach. Register now and get access to the complete APSCC 2021 Webinar Series with a single password. To register go to <https://apscsat.com>.

SATELLITE BUSINESS

Kacific Makes Entry Cost for Satellite Broadband More Affordable for Underserved Markets

November 30, 2021 - Kacific Broadband Satellites has reduced the total price of satellite broadband for customers with the introduction of a new terminal kit consisting of a new, low power, high throughput ST Engineering iDirect MDM2010 IP Satellite modem, its paired iLNB 3210 transceiver, and the 1.2m VSAT antenna. The MDM2010 is a 2-way, high throughput modem supporting a wide range of IP services like Internet/intranet access, VoIP and multi-casting services. Its easy point and play -installation and high-performance modulation techniques allow Kacific to offer fast broadband services more cost-effectively over its Ka-band network. The compact, lightweight modem is more affordable, easier to set up than existing modems, and can be configured from a web browser. It has a small profile, low power consumption and is suitable for all weather conditions. It's introduction will reduce installation time and bring down the cost of the terminal kit by up to 50 percent, with entry prices starting from USD\$530 for all other markets. The new modem will easily connect 4 to 5 average users simultaneously, making it suitable for farms, households and small businesses. Lower costs will also give Kacific's partners flexibility to reduce the length of fixed term contracts where installation costs are included in monthly pricing. The new modems and terminals will roll out in all markets from 1 December 2021.

OneWeb and GDC Advanced Technology Sign a Joint Development Agreement for a Compact Terminal to Revolutionise In-Flight Connectivity

November 30, 2021 - OneWeb has signed a Joint Development Agreement (JDA) with GDC Advanced Technology. The agreement with the world-class aircraft modification and technology company sees the two industry leaders collaborate on the development of a new In-Flight Connectivity terminal that will enable airlines to connect their aircraft, passengers, and crew over OneWeb's low Earth orbit (LEO) satellite communication network. The new terminal based on the electronically steered antenna technology developed by Ball Aerospace, has already undergone early lab and ground testing at the GDC facilities in Fort Worth, Texas, and will deliver the much-anticipated benefits of OneWeb's LEO constellation including high throughput and low latency to airlines and their passengers from 2023. The GDC terminals for OneWeb are significantly lighter and smaller than existing aviation antennas. The attenuated aerodynamic profile produces virtually no drag, significantly reducing fuel burn compared with current fuselage mounted antenna types. The antenna is sealed and contains no moving parts, making it extremely reliable with no risk of fluid ingress. The system is designed for ease of maintainability, with four (4) simple Line Replacement Units (LRUs), any of which can be replaced in less than 30 minutes. The terminals have also been engineered to allow airlines to deploy a hybrid LEO/GEO connectivity solution. OneWeb expects this to be a key differentiator as airlines initially embrace and become confident in the benefits and performance of their new LEO technologies.

Inmarsat Celebrates Fifth Anniversary of GX Aviation

November 30, 2021 - Inmarsat celebrated the fifth anniversary of GX Aviation, its most successful passenger inflight broadband service to date. Since entering commercial service in 2016, the award-winning solution has been selected by more than 35 airlines worldwide, with a total order book of over 1,500 aircraft, approximately 550 of which are activated. Powered by Global Xpress (GX), the world's first and only globally available broadband network, GX Aviation has transformed the airline passenger experience, offering reliable, consistent and high-speed inflight connectivity on par with mobile Wi-Fi on the ground. It unlocks a host of new ancillary revenue streams for airlines and ensures they meet rising expectations from passengers to stay connected, browse the internet, stream video and audio, enjoy social media, shop online and more while on a flight. Millions of passengers have enjoyed access to GX Aviation over the years, with major airline customers including Lufthansa, Qatar Airways, AirAsia, Eurowings, Singapore Airlines, Air New Zealand, Philippine Airlines and Virgin Atlantic. This impressive list continues to grow, with installations underway or planned with existing and new customers, including SAUDIA, as announced at the Dubai Airshow last month.

iDirect Government Debuts Evolution Defense 4.4 Software with Enhanced Security

November 30, 2021 - iDirect Government (iDirectGov), a leading provider of satellite communications to the military and government, today announced its newest software release, Evolution® Defense 4.4, for enhanced military satellite communications (MILSATCOM) protection. Evolution Defense 4.4 technology advancements are targeted at the DLC-R line cards, enabling Communication Signal Interference Removal (CSIR™) on the DLC-R line cards, and other security improvements. CSIR represents a real-time streaming technology to mitigate interference, and the introduction of Evolution Defense 4.4 now applies to both iDirectGov's remote and line cards. This release complements the previous Evolution Defense 4.2.2.0 software release, which provided CSIR protection on the 9-Series, establishing a complete end-to-end interference mitigation solution. The DLC-R and 9-Series remote interference reporting work in the company's iMonitor network management software, which provides in-depth views into both real-time and historical network performance. This includes the health status of remotes, graphical displays, network probes and detailed bandwidth usage. The DLC-R-measured interference alerts and warnings thresholds are user configurable, as are the satellite remote alerts and warnings.

Seraphim Space Invests in Astroscale to Secure Future of Space Sustainability

November 25, 2021 - Seraphim Space Investment Trust plc, the world's first listed fund focused on SpaceTech, announces that it has made a new US\$12.5 million investment into Astroscale Holdings Inc., the market leader in satellite servicing and long-term orbital sustainability across all orbits. Astroscale closed a US\$109 million series F round which was led by THE FUND Limited Partnership in Japan and backed by a group of investors including Seraphim Space, Japan Growth Capital Investment Corporation and AXA Life Insurance Co. Ltd. Founded in 2013 and headquartered in Japan, Astroscale is a truly international business with operational subsidiaries in the UK, US, Israel and Singapore and a growing team of over 250 people. In addition to developing technology, Astroscale works closely with government and policymakers across the globe to ensure licensing and regulation is put in place that will foster a sustainable environment. Due to recent trends in the cost of access to space and miniaturised hardware, many well-funded businesses are expecting to launch more satellites into space in the next few years than have ever been launched before. This could lead to further proliferation of artificial debris that poses a threat on the sustainability of commercial operations in space and the future space economy.

FCC Validates SES Phase I Accelerated C-band Clearing and Relocation Certification

November 24, 2021 - SES announces the U.S. Federal Communications Commission (FCC) has validated the certification of SES's Phase I accelerated C-band clearing and relocation activities, a critical step to help meet the Commission's objectives to quickly roll out 5G services across the United States. With the help of trusted partners across the U.S., SES has completed all necessary Phase I clearing and relocation activities. These activities included relocating all of its existing services that are received by Incumbent Earth Stations out of the 3700-3820 MHz band exclusively in the contiguous United States and making necessary equipment changes on all associated Incumbent Earth Stations. SES also modified its telemetry, tracking and control (TT&C) operations to operate above 4000 MHz and consolidated gateway services below 3820 MHz to two earth stations located in Hawley, PA and Brewster, WA. In accordance with the FCC Report and Order published in the Federal Register on 23 April 2020, SES has satisfied the Phase I relocation requirements in advance of the first accelerated relocation deadline on 5 December 2021, making it eligible for the first accelerated relocation payment valued at close to \$1 billion. SES expects this payment to be made in Q1 2022. SES remains on track to clear 280 MHz of spectrum to speed deployment

of 5G services in the United States and is now focused on completing transition activities to meet the Phase II deadline of 5 December 2023. Successfully completing the Phase II activities by that deadline makes SES eligible for a further \$3 billion accelerated relocation payment.

Inmarsat Offers Remote Connectivity for Latest SEA-KIT Uncrewed Surface Vessel Trials

November 24, 2021 - Inmarsat has installed a new connectivity solution using virtualised networks that will establish higher standards for over-the-horizon uncrewed vessel control. The installation connects the SEA-KIT International uncrewed surface vessel (USV) Maxlimer to the best available network at all times by switching as necessary between Fleet LTE, Global Xpress (GX) and FleetBroadband satellite services when out of range. The combination will set new standards in continuous connectivity to serve a broader range of USV situations and support the next phase of SEA-KIT technology trials, which started in September off the coast of Plymouth, United Kingdom. The project requires installation of a GX antenna to join an existing FleetBroadband antenna that together will deliver full Fleet Xpress capabilities, plus Fleet LTE hardware for seamless switching between networks onboard the 12 metre long autonomous vessel.

Singapore Airlines Upgrades Fleet-Wide IFEC Experience with Panasonic Avionics

November 24, 2021 - Panasonic Avionics Corporation has today announced an agreement with Singapore Airlines that will provide a seamless and harmonized in-flight entertainment and connectivity (IFEC) experience across the airline's widebody and narrowbody fleets. Singapore Airlines has selected Panasonic Avionics' eX1 IFE solution for its new fleet of 37 Boeing 737-8 aircraft. The system features full-HD seatback monitors in both the Business Class and Economy Class, complete with capacitive touch screen displays and USB charging ports. Each Business Class seat's IFE comes with an additional handset and in-seat power outlets. Singapore Airlines has also selected global in-flight connectivity services from Panasonic Avionics which can deliver average speeds up to 100 megabits per second (Mbps) to the aircraft, with peak speeds reaching 200 Mbps and higher. The airline's in-flight connectivity experience, powered by Panasonic Avionics' global network of high-speed, high-bandwidth satellites will deliver a host of next-generation connectivity benefits, including fast internet and in-flight mobile phone services. This will enable the airline to meet the growing connectivity demand of travelers today and into the future.

Supernet and PAKSAT Reaffirm Strategic Partnership for Proliferation of Satellite Communications

November 24, 2021 - Supernet Limited ("Supernet"), Pakistan's largest satellite communications systems integrator and service provider and PAKSAT International ("PAKSAT"), Pakistan's national satellite operator today jointly announced the signing of a strategic partnership which expands the existing relationship between the two organizations. Through the partnership, Supernet will be able to provide national and international customers with seamless connectivity through Pakistan's current and future national satellites and PAKSAT will be able to expand its technical and support services in Pakistan and the broader region. The partnership also includes exploring areas of cooperation and investment in the emerging technologies related to space and satellite communications. Supernet has historically been a significant user of PAKSAT's satellites, starting with Paksat 1 up till 2011 when the switchover to Paksat 1R took place. Supernet is currently utilizing Paksat 1R to support the connectivity requirements of Independent Power Producers (IPPs) through a C-band network. This agreement reinforces Supernet's and PAKSAT's pledge to empower each other for national satellite bandwidth requirements, deployment of the existing services of PAKSAT, provision of equipment, technical expertise as well as to collaborate in the upcoming new national satellite and strategic projects.

Viasat's Mobility Network in China Now Operational

November 23, 2021 - In cooperation with China Satellite Communications, Co. Ltd. (China Satcom), Viasat Inc. announced the mobility network in China, which uses Viasat's innovative in-flight connectivity (IFC) equipment working over the Ka-band ChinaSat-16 satellite system, is now operational to meet the IFC needs of domestic and international airlines operating into and out of Chinese airspace. With the network deployment now complete, tested and operational, Viasat and China Satcom are well-positioned to meet the growing IFC demands in China – the second largest aviation market in the world, according to research from the International Air Transport Association. Successful network deployment means the network is ready to launch IFC services for Chinese airlines and can, very soon, enable Viasat's global airline customers to offer passengers a seamless roaming connectivity experience when flying into, over and out of China. The regional access in China to Viasat's IFC service means airline customers can choose to offer streaming videos or music, browsing the internet, access to social media, messaging and other apps – just as they do in many other regions of the world. In addition to optimizing passengers' connected experiences when in-flight, the Viasat network also enables airline customers to enhance passenger

loyalty, improve operating efficiencies and increase revenue generating opportunities through ancillary content and application programs. Viasat's agreement with partner China Satcom specifically covers commercial aviation IFC. In partnership, each company maintains its own intellectual property and will operate its equipment using a multi-layered approach to network services.

Kacific Launches the First Ka-band Mobile Backhaul Service for Mobile Operators

November 23, 2021 - Kacific Broadband Satellites has introduced the first Ka-band mobile backhaul service for Internet service providers (ISPs) and telecom operators in Southeast Asia and the Pacific. This will allow operators to extend their network's range in remote and difficult areas and provide them with an effective way of easing congestion in high-demand urban environments. Mobile backhaul is part of Kacific's FlexVNO solution set, which delivers dedicated wholesale Ka-band satellite bandwidth to telecom operators, who can then tailor it to meet their customers' needs. A customized offering, Mobile Backhaul is a transport network solution that connects the core network with cell sites – the radio access network (RAN) – on the mobile network. It delivers a rapidly deployable and cost-effective broadband solution with small, easy-to-install, and simple-to-maintain satellite dishes. That allows mobile operators to flexibly provide 3G and 4G coverage to end users, connecting them to any small cell or regular mobile tower. To mitigate the rain fade effect on the Ka-band technology Kacific has also deployed redundant and multiple gateways, adaptive power control, adaptive modulation and coding, a common tool that uses advanced signal processing algorithms. Kacific's Mobile Backhaul service was developed and tested in 2020 and has connected key operators in Asia and the Pacific. Now, Kacific has made it commercially available to all ISPs, telecom operators, and government agencies across all the countries it serves through Asia and the Pacific.

Comtech Awarded US\$1.3 Million Contract Renewal with a US Tier-One Carrier

November 23, 2021 - Comtech Telecommunications Corp., a leading global provider of next-generation 911 emergency systems and secure wireless communications technologies, has announced that during its first quarter of fiscal 2022, it was awarded a US\$1.3 million contract renewal with a US tier-one mobile network operator for precise location services. The contract was awarded to Comtech's Trusted Location group, a leading provider of precise device location, mapping and messaging solutions for public safety, mobile network operators, and enterprise solutions. Sold around the world to mobile network operators, government agencies, and Fortune 100 enterprises, our platforms locate, map, track and message.

SSC Rolls Out the World's First Global Ka-band Network

November 23, 2021 - Swedish Space Corporation (SSC) gears up to meet the growing capability need for Earth Observation missions. By upgrading its polar and equatorial locations to support Ka-band data reception, SSC rolls out a truly global Ka-band network mainly focused on EO missions. This important milestone will enable Earth Observation missions to use higher bandwidths and receive larger data volumes, allowing space companies to use their assets more effectively. The upgrade spans across SSC's strategic locations in Punta Arenas in Chile, Sri Racha in Thailand, Inuvik in Canada and Esrange in Sweden, as well as the SSC partner station in Weilheim in Germany. The network upgrade builds on the recent work where Ka-band capability was added to SSC's polar sites in Canada and Sweden. While the polar stations provide large data volumes at good latency, the equatorial stations allow increased volumes and enabling timeliness coverage for selected regions. And the expansion continues as the company plans for complementary Ka-band featured antennas, starting with two new radome antennas to be introduced in northern Sweden in 2021.

Intelsat's FlexMaritime Service Expands into Indian Territorial Waters

November 22, 2021 - Intelsat announces the expansion of its global FlexMaritime service, now enabling connectivity for vessels traveling in Indian territorial waters and immediately enhancing the service coverage for all of Intelsat's 8,000 existing FlexMaritime vessels. The landmark development also provides access for Indian-registered vessels to Intelsat's award-winning global high-throughput maritime network. Intelsat's expansion is made possible by a new in-country gateway that is operationally ready to provide service via Intelsat's HTS satellites under India-based partner Cloudcast's in-flight and maritime connectivity (IFMC) license. FlexMaritime provides high-speed, resilient connectivity service with 99.95 percent proven network uptime. The expansion of FlexMaritime into India will open new business opportunities and accelerate digital transformation for thousands of Indian-flagged vessels and ships trading in Indian territorial waters. According to the Ministry of Shipping, around 95 percent of India's trading by volume and 70 percent by value is done through maritime transport. The gateway will be located in Noida, India, serving as a critical link between Intelsat's terrestrial ground network and space

assets and extending Intelsat's existing global network to a vital trading port.

Telesat Becomes a Public Company, Marking a Significant Milestone in Support of its Growth Strategy

November 22, 2021 - Telesat Corporation announced today that it is now a public company and will begin trading on the Nasdaq Global Select Market and the Toronto Stock Exchange (TSX) under the ticker symbol TSAT. This follows the closing of Telesat's previously announced transaction with Loral Space & Communications Inc. and Public Sector Pension Investment Board (PSP Investments), in which Loral's stockholders and Telesat Canada's other equityholders have exchanged their interests for equity in Telesat's new public holding structure. Telesat did not issue new equity to raise additional cash financing as part of the Transaction. Telesat Canada and Loral have become subsidiaries of Telesat Corporation, the Canadian controlled and incorporated public holding company formed in connection with the Transaction. Telesat Corporation will continue to be led by Telesat's President and Chief Executive Officer Dan Goldberg.

Yahsat's Mobility Arm Estimates \$80 Million of Revenues from New Broadband Distribution Agreement with Cobham SATCOM

November 22, 2021 - Thuraya Telecommunications Company PJSC ("Thuraya") has entered into a long-term agreement with Cobham SATCOM ("Cobham"), for the distribution of next-generation broadband products for land, aeronautical and maritime users. This agreement further builds on Yahsat's existing partnership with Cobham and marks an important milestone in the roll out of the Thuraya 4-NGS enabled portfolio. As part of the agreement, Cobham will be appointed as the main distributor, on a non-exclusive basis, for Thuraya Next Generation Broadband Products (NGBP) for a minimum term of five years, starting from the commencement of commercial operations on Thuraya 4-NGS, following its expected launch in the second half of 2023. Through this partnership, Cobham will drive NGBP sales through its own extensive distribution channels but will also work closely with Thuraya's broad service partner network. The agreement is expected to generate more than US\$80 million of potential service revenue to Thuraya. Both partners and customers will significantly benefit from the combined distribution network as well as from Cobham's technical knowledge and after-sales capabilities and expertise. Thuraya recently announced a partnership with Cobham to drive significant enhancements to its future broadband portfolio. Under this partnership, Cobham will deliver a comprehensive mobile broadband system as part of the next-generation Thuraya 4-NGS satellite system, and multiple broadband terminals for land, sea and aeronautical applications to strengthen Thuraya's portfolio, capabilities and performance across a wide coverage area.

Supernet Awarded Multiple Equipment Supply Projects by a Strategic Organization

November 22, 2021 - Supernet Limited has been awarded three equipment supply projects consisting of equipment and services in the domains of satellite communications, telecommunications, and power with a combined equivalent value of PKR 100 million. The equipment and associated support and warranty services shall support the customer's large communications network in the country. Supernet also announced that the projects have been awarded by a strategic organization there by expanding the customer base of its Telecommunications and Defense Business Unit. Supernet has already successfully delivered one project in totality. The second project is on track to be completed by end of November 2021 with the third one expected to reach completion in the 1st quarter of 2022. Though it is an established fact now that there are lengthy delays due to the global shortage of semiconductor chips as well as disruptions in international shipping and logistics, Supernet through the strength of its partnerships in the supply chain and prudent project planning, has effectively addressed these delays to the satisfaction of the customer.

SES, MDDIAI RK, RCSC, and AsiaNetCom Test High-speed Remote Connectivity via O3b Constellation

November 19, 2021 - Residents of two remote Kazakhstan villages can now benefit from unprecedented Internet speeds via satellite-enabled Wi-Fi, through a network set up for 30 days by the leading global content connectivity solutions provider SES. The demo is implemented in cooperation with the Republican Center for Space Communications (RCSC), a subsidiary of the Ministry of Digital Development, Innovations and Aerospace Industry and AsiaNetCom, a Kazakhstan-based connectivity provider. During the demonstration, the companies have achieved 380Mbps downlink and 120Mbps uplink via SES's O3b satellite constellation, the highest speed ever recorded in Kazakhstan via satellite. The demo is done in the framework of the country's national project called 'Technological breakthrough via digitalisation, science

and innovation', that aims to bridge the digital divide and bring the benefits of high-performance communication networks for healthcare, businesses, local administrations, education and more. As part of the collaboration agreement between SES and RCSC signed earlier this year, the test demonstrates the benefits of SES's Medium Earth Orbit (MEO) networks and its upcoming second-generation O3b mPOWER communications system. The current demo network is leveraging SES's first-generation O3b satellites to connect an RCSC teleport located in Kokterek with the villages of Akterek and Beriktas for high-speed Internet access.

Comtech Awarded US\$1.7 Million Contract Renewal with US Tier-One Mobile Network Operator

November 18, 2021 - Comtech Telecommunications Corp., a leading global provider of next-generation 911 emergency systems and secure wireless communications technologies, announced today, that during its first quarter of fiscal 2022, it was awarded a US\$1.7 million renewal agreement with a US tier-one mobile network operator. This brings total bookings to-date with this Trusted Location customer to over US\$24.0 million. The service is a hosted turn-key system with diverse and redundant connections which interface with the carrier's network to provide data for location services platforms.

Intelsat FlexMaritime Now Powers More Than 8,000 Vessels Globally with Ubiquitous, High-Speed Connectivity

November 17, 2021 - Intelsat now has more than 8,000 vessels operating on its award-winning FlexMaritime service. The company, the world's leading provider of broadband connectivity to maritime passengers and crew, has added more than 2,600 terminals since the beginning of 2021 in key maritime markets including shipping, fishing, leisure and offshore energy, a growth of more than 45%. FlexMaritime is powered by a global, multi-layered, high-throughput satellite (HTS) network capable of delivering unrivaled density in bandwidth and extremely high levels of service flexibility and reliability. It is distributed by Intelsat's highly experienced and capable solutions partners who combine the scale and power of the network with their customized service plans and specialized value-added services. Vessel owners benefit by leveraging next-generation shipboard technologies, smart shipping and other in-demand maritime connectivity applications including remote monitoring and performance diagnostics, video streaming, real-time software upgrades and essential, always-available connectivity for crew members. As a customizable wholesale Mbps managed service, FlexMaritime makes high-speed connectivity simple. Complexity in network configuration, management and bandwidth availability is removed, and service levels are maintained at the highest standards.

Inmarsat Secures Installation Agreement with Maersk Supply Service for Fleet Xpress Portfolio

November 17, 2021 - Inmarsat, the world leader in global, mobile satellite communications, has extended its Fleet Xpress service agreement with Maersk Supply Service to include fleet wide IoT-based ship management connectivity on separate, dedicated bandwidths. The extension has also enabled Maersk Supply Service to evaluate new vessel performance tools for selection, available through Inmarsat's Certified Application Provider (CAP) programme. Operating off Europe, the Americas, West Africa, Southeast Asia and Australia, the 30-vessel Maersk offshore fleet includes some of the most modern anchor handlers and subsea support vessels in the industry. Under a long-term Fleet Xpress agreement, connectivity will now include dedicated Inmarsat Fleet Connect for key digital applications and a commitment to the Fleet Data IoT platform for data acquisition and uploading. The new agreement will accommodate rapid scaling up of new IoT-based vessel performance applications fleet wide. Fleet Data and Fleet Connect offer a single IoT-based architecture capable of working with every OEM-supplied or standalone analytics and management software in the market.

Comtech Awarded US\$1.8 Million Contract for High-Power Solid-State Amplifiers

November 17, 2021 - Comtech Telecommunications Corp., a leading global provider of next-generation 911 emergency systems and secure wireless communications technologies, announced, that during its first quarter of fiscal 2022, it was awarded an additional contract valued at US\$1.8 million for RF microwave solid-state amplifiers from a major domestic prime contractor. These very high-power solid-state amplifiers, which utilize the latest in GaN transistor technology, were developed in close cooperation with the prime contractor and are part of a complex RF microwave transmission system used by the US military. The contract was awarded to Comtech PST Corp. which is a leading independent supplier of high-power, high performance RF microwave amplifiers, transmitters and control components for use in a broad spectrum of applications including defense, medical, satellite communications systems and instrumentation.

SatADSL Unlocks New Southeast Asia Markets with ABS Partnership

November 16, 2021 - SatADSL has announced a new partnership with ABS, a global satellite operator. The partnership represents SatADSL's continued momentum as it provides satellite services to the four corners of the world. The new partnership is the latest to highlight the industry confidence in SatADSL's innovative global satellite solutions through its neXat platform. The technology disrupts the challenges previously associated with satellite connectivity, even in the most remote regions. The flagship platform, neXat, is a complete OSS/BSS in the cloud that acts as an intermediary platform between the teleport, hub operators and the marketplace. It offers its partners access to SatADSL's network of resellers across four continents. With the new service offerings from ABS' Southeast Asia satellite beams, SatADSL hopes to further expand into the region and deliver the connectivity solutions to more people and companies.

ST Engineering iDirect and Hellas Sat Successfully Validate Hybrid 5G Satellite Backhaul Use Cases

November 16, 2021 - ST Engineering iDirect and Hellas Sat have successfully validated hybrid 5G backhauling use cases over satellite. Showcasing a completely seamless transition between terrestrial and satellite-based networks, the demonstration not only confirms the critical role that satellite will play in the 5G ecosystem through its capability to broaden coverage to hard-to-reach areas, but further reinforces its cellular backhaul capabilities across Hellas Sat's satellite coverage. The demonstration was organized in partnership with Korean satellite operator KT-SAT, with Thales Alenia Space and Vodafone Greece which held the first 5G satellite backhauling demonstration in February 2021. It showcased how satellite can enable increased coverage in areas where traditional backhauling technologies are either unsuitable or not cost-effective. ST Engineering iDirect's Evolution® hub and modem equipment supported the transmission on the Hellas Sat 3 satellite and Vodafone Greece's 5G spectrum in the 2100 MHz and 3600 MHz frequency zones. KT-SAT also provided its world's-first hybrid router for satellite-terrestrial 5G transmission. 5G terminals were connected to the router to simultaneously transmit and receive various types of data, or utilized separate routes to and from a 5G network and a satellite. The terminals successfully maintained normal service operations with the Hellas Sat 3 satellite connectivity, even after the 5G network was intentionally disconnected.

Eutelsat and Gazprom Join to Reduce Emissions and Improve Energy Efficiency of Gas Pipelines

November 16, 2021 - Eutelsat Communications' Konnect Russia and Gazprom MKS, a company specializing in gas conservation using mobile compressor stations, have published the results of a major cooperation project aimed at reducing the CO2 emissions of Gazprom's gas transmission subsidiaries. The two-year program focused on reducing the volume of vented gas during repairs on gas pipelines at 13 companies, saw some 400 transfers undertaken using mobile compressor stations across a section of Russia spanning from the North-Western District to the Khanty-Mansiysk region. Over such a vast region, satellite communications was the optimal infrastructure to oversee complex operations including the centralized management of the network of mobile compressor stations, designing the logistics for the movement of complexes, enabling regular monitoring of the works, and assuring round-the-clock communication between dispatch centers and mobile station crews. The program yielded considerable benefits, saving circa one billion cubic meters of natural gas, and equating to a reduction in greenhouse gas emissions of 17 million tons of CO2-equivalent.

Viasat and Embraer Enter into Line-fit Agreement to Offer Viasat IFC on Embraer E2 Aircraft

November 16, 2021 - Viasat Inc. and Embraer announced they entered into a Buyer-Furnished Equipment (BFE) agreement to offer Viasat's advanced In-Flight Connectivity (IFC) system as a line-fit option on Embraer's family of E2 aircraft. Viasat is the first Ka-band IFC supplier to have a line-fit IFC solution available on the Embraer E2 family. By selecting Viasat's IFC system as a factory option on the Embraer E2 aircraft prior to delivery, airlines will be able to offer, from day one of aircraft service, an advanced IFC experience to each passenger and flight crew member, while avoiding costly down-time associated with taking aircraft out of service for post-production IFC retrofits. Today, multiple airlines, including Azul Airlines, have selected Embraer E2 aircraft equipped with Viasat's IFC system direct from the factory.

Intersputnik 50 Years of International Cooperation in Space

November 15, 2021 - 15 November 2021 marks the 50th anniversary of the founding of the Intersputnik International Organization of Space Communications. With its status of an intergovernmental organization, Intersputnik unites 26 member countries on various continents. At present, Intersputnik is a global satellite communications ecosystem that connects people around the world and offers opportunities of economic, social and cultural development using the latest space and infocommunication technologies. The basis of Intersputnik's activities is its unique status of an intergovernmental organization, which helps

implement satellite communications projects of any complexity in close cooperation with partners all over the world while leveraging the resources of international and domestic satellite operators, as well as teleports and terrestrial telecommunications infrastructure on all continents. Evolving towards a global virtual network operator (VNO) model, the ecosystem of Intersputnik includes resources of satellite constellations in different orbits, ground communications networks and teleports in various regions of the world, a wide range of technologies, as well as highly qualified engineering, legal and sales staff. This ecosystem gives Intersputnik's partners access to cutting-edge applications, services and high-tech solutions.

Saudi Arabian Airlines Selects Panasonic Avionics' 4K and Bluetooth IFE

November 15, 2021 - Panasonic Avionics Corporation has announced an agreement with Saudi Arabian Airlines (Saudia) to provide its latest 4K and Bluetooth audio in-flight entertainment (IFE) innovations on its 35 new Airbus A321neo family aircraft. Panasonic Avionics' NEXT IFE system will be installed on 20 new Airbus A321neo and 15 Airbus A321neoXLR aircraft. The company's NEXT system, which delivers one of the industry's most advanced cabin experiences, has been configured to evolve with the future business objectives of the airline. It leverages a large and evolving suite of digital services from Panasonic Avionics aimed at improving loyalty, revenue generation and passenger engagement. In addition to the full cabin advanced HD experience, Saudia will also feature Bluetooth audio streaming, allowing Saudi's guests to unlock a library of premium entertainment options safely, using their own Bluetooth-enabled headphones.

Comtech Joins the Digital IF Interoperability Consortium (DIFI)

November 15, 2021 - Comtech Telecommunications has joined the Digital Intermediate Frequency Interoperability (DIFI) Consortium, an independent space industry group formed to advance interoperability in satellite and ground system networks. Comtech joins a growing roster of leading organizations in the space industry coming together to form the DIFI Consortium. These organizations are contributing to the innovation of digital transformation of space, satellite and related technologies for the benefit of the space industry. Comtech is a leading innovator in satellite technology and the advancement of satellite connectivity and standards. The DIFI Consortium is committed to developing a new standard for a digital interface that will allow users to connect digital baseband equipment and RF or edge devices, located at the satellite antenna or uplink center, over a digital medium eliminating lossy IF cable runs and enabling users to remove the constraint that has always required digital and RF equipment to co-exist within close proximity. The new digital interface standard will allow lossless switching between antennas and geographically diverse systems as well as enable the use of low-cost COTS switches and interconnect devices. This will greatly reduce cost and complexity and will be highly desirable at complex hub or gateway locations.

Saudia to Enhance Passenger Experience with High-speed Inflight Broadband Provided by Inmarsat and GDC Advanced Technology

November 15, 2021 - SAUDIA, the national flag carrier of Saudi Arabia, has announced that its upcoming fleet of 35 Airbus A321neo and Airbus A321XLR aircraft will offer the award-winning GX Aviation high-speed inflight broadband solution by Inmarsat, the world leader in global, mobile satellite communications. The aircraft will connect to GX Aviation using an ultra-high performance terminal by GDC Advanced Technology, an industry leader in engineering and technical services, modifications and electronic systems. As the first major inflight connectivity agreement in the Middle East since the Covid-19 pandemic began, SAUDIA will be GX Aviation's launch customer in Saudi Arabia. In addition, it has become the first airline in the Middle East to select Inmarsat's revolutionary new OneFi customer experience platform and the first in the world to select GX Aviation's next-generation terminal, developed with GDC Advanced Technology. The terminal provides enhanced customer flexibility and is future proofed to meet the demands of planned and new constellations. The selection enables SAUDIA to provide a world-class digital experience for passengers onboard 20 Airbus A321neo and 15 Airbus A321XLR. The airline's first installation of GX Aviation is expected in late 2022 and once the service is live, passengers will be able to seamlessly browse the internet, stream videos, check social media, shop online and more during flights using their own personal devices.

Iraqi Airways Selects Panasonic Avionics for Narrowbody and Widebody IFE and Connectivity

November 14, 2021 - Panasonic Avionics has been selected by Iraqi Airways to provide in-flight entertainment and connectivity (IFEC) solutions for its new fleet of 21 narrowbody and 10 widebody aircraft. These aircraft, which includes five A220, 16 B737MAX and 10 B787 aircraft types, will be line-

fitted with Panasonic's X Series IFE solutions and are expected to enter service in October 2022. Panasonic Avionics' X Series offers elegant full HD seatback monitors, complete with capacitive touch displays and handsets, and an intuitive, personalized interface. Passengers will have access to USB and laptop charging power points at every seat as well. The X Series portfolio also includes eXW, which delivers a premium passenger experience to passengers' personal devices. Each of these systems are designed to help drive ancillary revenue, foster higher levels of passenger loyalty, and increase passenger engagement. The airline's Boeing 737 MAX fleet, which will feature the company's eX1 narrowbody IFE solution, also offers Panasonic Avionics' in-flight Wi-Fi service. Its next-generation connectivity enables a host of connectivity benefits, from fast internet to video streaming, all powered by its new satellite modem featuring bandwidth up to twenty times greater than previously available.

Rex Airlines Selects Intelsat for Mainline Fleet Inflight Connectivity

November 11, 2021 - Intelsat is installing its inflight connectivity systems on Rex Airlines' domestic Australian fleet of Boeing 737-800s. Passengers traveling on Rex Airline's domestic fleet can expect high-performance connectivity thanks to Intelsat's aviation network, leading Service Level Agreements (SLAs), and high-capacity service over the most trafficked commercial aviation routes. To celebrate the new service and passengers' return to the skies, passengers in economy will enjoy free Wi-Fi until the end of November, after which they can access the internet for a small fee. Rex business-class passengers will enjoy complimentary Wi-Fi throughout their journey whenever they fly. For passengers who want to binge on Netflix or Stan, Rex will also offer a streaming internet option on its Boeing 737-800s. And, beyond their online experience, Rex's passengers will also have access to stored content featuring movies and TV programs free of charge. Investing \$2 billion, initially, Intelsat is building a unified global 5G network that will support virtually any access technology, enabling the next generation of global mobility, the internet of things, and 5G services. Combining software-defined technology and a multi-orbit, multi-layer, multi-band network, we bring airlines the scale they depend upon and a single, more powerful way to connect easily.

Kymeta, Intelsat and Fraunhofer IIS Demonstrate Satellite 5G Connectivity for Mobile Communications

November 10, 2021 - Kymeta, the communications company making mobile global, and Intelsat, operator of the world's largest and most advanced integrated satellite and terrestrial network, announced today the successful demonstration of satellite-enabled 5G services on Kymeta's electronically steered flat-panel u8 antenna using Intelsat's global integrated satellite and terrestrial network – the first test of its kind in a mobile environment. The demonstration, carried out by leading applied research organization Fraunhofer Institute for Integrated Circuits IIS, was held at Kymeta headquarters in partnership with Intelsat to help develop 5G satellite communication technology for mobility. This partnership between key industry leaders and successful demonstration further validates the ability to seamlessly leverage hybrid connectivity across satellite and ground cellular networks to develop solutions that satisfy the overwhelming demand for communications on the move.

Viasat Partners with Ghana Space Science and Technology Institute to Open its First Real-Time Earth Ground Station in Africa

November 10, 2021 - Viasat Inc. announced the launch of its first Real-Time Earth (RTE) facility in Africa, located in Accra, Ghana. Viasat worked in partnership with the Ghana Space Science and Technology Institute (GSSTI), a government-based institution under Ghana Atomic Energy Commission (GAEC), focused on coordinating all space, science, technology and related activities in Ghana, to bring new space opportunities and jobs to the region, while expanding Viasat's ability to deliver critical earth observation and remote sensing data on-demand around the world. With this new station, Viasat's RTE global network is now active in five continents. Viasat RTE provides Ground-Station-as-a-Service (GSaaS) capabilities in support of environmental, insurance, shipping, energy and government operations. It is a fully-managed, affordable ground network that supports next-generation and legacy geosynchronous equatorial orbit (GEO), medium earth orbit (MEO) and low earth orbit (LEO) satellites using the S-, X-, and Ka-bands, enabling operators to meet current and future data requirements.

InterSAT Partners with Kymeta and Azercosmos to Offer Complete Satellite Connectivity Solutions across Africa

November 10, 2021 - InterSAT announced a partnership with Kymeta and Azercosmos to deliver mobile satellite communication services with Kymeta™ U8 terminals and InterSAT's SkyMOVE services across Africa, on Azerspace-2 satellite. The partnership agreement enables InterSAT to deliver a complete

connectivity solution for on-the-go communications with the revolutionary Kymeta u8 terminal. The u8 terminal was designed with Kymeta's software-defined, electronic beam steering technology and is low profile and mounts easily on vehicles and vessels for seamless communications on the move. Kymeta's antenna technology is uniquely positioned to meet the demand for mobile broadband, providing internet access via satellite or hybrid satellite-cellular networks on a user-defined basis to enable connectivity while on the move or on the pause. When combined with InterSAT's SkyMOVE connectivity offerings on Azerspace-2 satellite and back-end support suite of services, customers will have unique access to an experience and product that no other ISP company in Africa offers today.

ABS Joins the Space Data Association

November 9, 2021 - ABS is the latest global satellite operator to join the Space Data Association (SDA), an international non-profit association of satellite operators. Formed in 2009, the SDA ensures a controlled, reliable and efficient space environment from global satellite operators. SDA's members, including the world's major satellite communications companies, work with all interested entities to define the next generation of STM systems and capabilities. ABS, founded in 2006, delivers cutting-edge satellite communication connectivity for video, data and telecommunication services to customers around the world. It currently operates 5 satellites, including ABS-2, ABS-2A, ABS-3A, ABS-4/Mobisat-1 and ABS-6, which all provide flexible, powerful and affordable satellite connectivity. The SDA operates the Space Data Center (SDC) platform which gathers flight dynamics information from the member companies and other available sources to allow conjunction assessments and warning services.

Viasat and Inmarsat to Combine, Creating a New Leading Global Communications Innovator

November 8, 2021 - Viasat Inc., announced they have entered into a definitive agreement under which Viasat will acquire Inmarsat in a transaction valued at \$7.3 billion, comprised of \$850.0 million in cash, approximately 46.36 million shares of Viasat common stock valued at \$3.1 billion based on the closing price on Friday November 5, 2021, and the assumption of \$3.4 billion of net debt. The combination will create a leading global communications innovator with enhanced scale and scope to affordably, securely and reliably connect the world. The complementary assets and resources of the new organization will enable the availability of advanced new services in mobile and fixed segments, driving greater customer choice in broadband communications and narrowband services (including the Internet of Things or "IoT"). The combined company intends to integrate the spectrum, satellite and terrestrial assets of both companies into a global high-capacity hybrid space and terrestrial network, capable of delivering superior services in fast-growing commercial and government sectors. This advanced architecture will create a framework incorporating the most favorable characteristics of multi-band, multi-orbit satellites and terrestrial air-to-ground systems that can deliver higher speeds, more bandwidth, greater density of bandwidth at high demand locations like airport and shipping hubs and lower latency at lower cost than either company could provide alone.

Intelsat and OneWeb Demo Global Multi-Orbit Satellite Service to U.S. DoD

November 3, 2021 - Intelsat, operator of the world's largest integrated satellite and terrestrial network, OneWeb (OWT), a global provider of innovative, secure satellite communications, and Linchpin Solutions, a leader in C5ISR systems and programs, successfully demonstrated a multi-orbit satellite communications solution for representatives of the U.S. Army and Department of Defense (DoD). This is a strategic demonstration to the U.S. DoD that shows transport diversification between the geostationary orbit (GEO) and low Earth orbit (LEO) constellations with seamless switching between them. Referred to as Automated Primary, Alternate, Contingency, and Emergency (APACE) communications, the solution enables soldiers to survive and excel in contested electronic warfare environments. The reliability of communications is significantly improved by simultaneously sending data over multiple paths and adjusting the traffic flow in real-time between GEO and LEO satellite constellations. Intelsat and OWT used both GEO and LEO services simultaneously, switching the data flow between orbits instantly at the packet level, using software to determine which connection will provide the best experience based on the technical requirements of the end service. The software solution can be hosted on existing fielded ruggedized virtual machine platforms allowing the system to run in the harshest environments. Two satellite links were established during the demo – one on the Intelsat 37 (IS-37) satellite and one on a OneWeb satellite. The links communicated through various end-user terminals, including a SatCube terminal, a Kymeta U7/8 terminal, a Litecom GEO terminal, and a OneWeb Intellian terminal, demonstrating applications such as two-way voice and data downloads and MP4 video.

FCC Authorizes Boeing Broadband Satellite Constellation

November 3, 2021 - The Federal Communications Commission today approved an application from The Boeing Company for a license to construct, deploy, and operate a satellite constellation. As detailed in its FCC application, Boeing plans to provide broadband and communications services for residential, commercial, institutional, governmental, and professional users in the United States and globally. Today's Order approves Boeing's application for non-geostationary orbit fixed-satellite service system using frequencies in portions of the V-band (the 37.5-40, 40-42, 47.2-50.2 and 50.4-51.4 GHz bands), and to operate inter-satellite links (ISLs) using frequencies in portions of the V-band (65-71 GHz band). It also dismisses Boeing's request to operate ISLs in certain frequency bands that are not allocated internationally for operations of the FSS in the space-to-space direction in the ITU Radio Regulations.

Lynk Signs Contract with Mongolia's Largest Mobile Network Operator

November 3, 2021 - Lynk Global, Inc. has signed a commercial partnership agreement with Unitel, Mongolia's largest mobile operator, enabling its subscribers to remain connected everywhere on the planet with ordinary cell phones. Unitel represents Lynk's third partnership agreement reached within the past month with a mobile network operator (MNO) as part of the American tech firm's Flagship Carrier Program. As a carrier program partner, Unitel will now have first-to-market rights to implement Lynk's service in Mongolia. Lynk's global commercial service providing direct satellite to cell phone service is on schedule to be deployed next year. Lynk will provide complete connectivity everywhere, whether land or sea, for the existing over 5.2 billion mobile subscribers through their existing MNO. Each year, more than 3 billion people, who own mobile phones, experience extended periods of disconnectivity. Another 1 billion people who can afford a mobile phone, don't buy one because there is no connectivity -- there is Zero G (0G) -- where they live and work. The mobile industry has nearly exhausted the ability to profitably expand coverage with ground-based cell towers world-wide, leaving geographic coverage effectively capped. Lynk's cell-tower-in-space service will complement existing terrestrial coverage and solves the 0G coverage problem. Lynk represents the largest growth opportunity in the mobile industry today -- a bigger growth opportunity than 5G.

Kacific Deploys ST Engineering iDirect's Mx-DMA® MRC Return Technology to Increase Digital Inclusion

November 2, 2021 - ST Engineering iDirect announced that Kacific, a leading satellite broadband operator in Asia Pacific, has successfully deployed its pioneering Mx-DMA® MRC (multi resolution coding) technology in conjunction with its first Ka-band satellite, Kacific1, to provide high-speed, low-cost, ultra-reliable broadband to rural and suburban areas of the Pacific and Southeast Asia. Mx-DMA MRC is a patented multi-access waveform that incorporates the scalability of MF-TDMA with the efficiency of single channel per carrier (SCPC) into a single return technology for unprecedented service agility. It enables service providers to cover a myriad of use cases in a single return link without making tradeoffs between speed, efficiency and scale lowering their total cost of ownership. Kacific operates over 8,000 terminals, including the new cost-effective MDM2010 modems in Mx-DMA MRC mode, spread across 56 beams. The technology will allow access to an abundance of use cases across multiple markets, including underserved communities, businesses, and public institutions as well as 3G and 4G cellular backhaul services across the Asia-Pacific region. This allows Kacific to use a single return technology for the majority of its customers' use cases, and quickly expand to more customers in underserved areas due to better efficiency, scale and operational simplicity.

Cydome Signs up as New Inmarsat Fleet Connect Application Provider

November 2, 2021 - Cydome, the ship-wide cybersecurity solution provider, and Inmarsat, the world leader in global, mobile satellite communications, have signed an agreement for Cydome to join the fast-growing group of over 40 Certified Application Providers, to offer a dedicated application for Inmarsat's Fleet Connect service. Fleet Connect is a dedicated bandwidth service that provides connectivity independent of the ship owner's primary bandwidth, allowing Application Providers to have an always-on, or on-demand, two-way communication channel to the vessel. Cydome will use Fleet Connect to offer its cybersecurity solution to ship owners and managers, enhancing cyber resilience in the maritime industry and extending vessel cyber coverage for critical IT and operating systems onboard.

Isotropic Systems and SES Redefine Global Satellite Services with First-ever Multi-orbit Field Tests

November 2, 2021 - Isotropic Systems, the leading developer of transformational multi-link satellite technology, and SES have announced the successful completion of the first-ever simultaneous multi-orbit antenna field tests, a game-changing development empowering a new age of connectivity on land, in the

air and at sea for both civil and defense communications. Isotropic Systems' UK-built multi-link antenna underwent a series of field tests at SES's Manassas, Virginia teleport. The terminal established multiple simultaneous, full-performance link connections with SES satellites – linking to a geostationary (GEO) satellite while simultaneously connected with an O3b satellite in medium earth orbit (MEO). Currently, users are reliant on legacy ground antennas which only connect to a single network at a time. This industry breakthrough enables satellite end-users to combine the best attributes of all available networks achieving superior network uptime and application performance. Isotropic's deep tech solution multiplies the performance of single antenna solutions to transform the global appeal of satellite connectivity, ensuring critical defense communications infrastructure and delivering multiple broadband connections that are highly reliable.

BT Secures Industry First Global Partnership with OneWeb

November 2, 2021 - BT and OneWeb have agreed terms for a new Distribution Partner Agreement, with OneWeb to provide Low Earth Orbit (LEO) satellite communication services across BT Group.* This builds on an initial Memorandum of Understanding signed in July and means BT is testing how LEO satellite technology integrates with its existing terrestrial capabilities to meet the communications needs of customers. On successful completion, BT will commence the first live trials with customers from early next year. The partnership will span a growing range of connectivity solutions around the world as well as specific opportunities for the UK market. This agreement marks a clear path towards the first LEO solutions being available for customers within a year. As the next step, BT will test capabilities in its Bristol lab to demonstrate how they integrate with existing services. Current capacity levels within OneWeb satellites mean initial trials will focus on its role as a supplementary, low latency backhaul solution to sites where additional capacity or a back-up solution is required, and to deliver improved resilience for business customers. On successful completion, BT will begin early adopter trials for UK and international customers, expected early next year. As OneWeb grows their capacity, the list of future use cases could also widen, opening up the opportunity to explore the use of satellite for IoT backhaul and Fixed Wireless Access in rural areas.

Next Generation METIS Data-Acquisition System Sets New Standards in Digital Shipping

November 2, 2021 - METIS Cyberspace Technology SA has launched the next generation of its automated data-acquisition system, Ship Connect, in a move which enhances data transfer and monitoring while also enabling the development of ship performance analytics based on standard protocols. Through a robust, flexible and unified data-transmission framework, the upgraded system enables the processing and visualisation of real-time and historical data both on board and ashore. Such is the efficiency of the data-transmission process that readings are transferred from vessel equipment to the METIS cloud platform in a second or less, making them immediately available for analysis. Backed by MQTT, the new standard messaging protocol for the IoT, and Google's Protocol Buffers (Protobuf) language- and platform-neutral mechanism for serialising structured data, the system's new framework is also scalable to accommodate the installation of millions of IoT devices.

Gogo Comments on Potential 5G Impact on Radio Frequency Interference

November 1, 2021 - Gogo Business Aviation commented on recent reports of federal regulatory bodies discussing the potential of certain radio frequencies planned to be used for 5G networks interfering with aeronautical services. Those discussions between the Federal Aviation Administration (FAA) and the Federal Communications Commission (FCC) center on potential interference with aircraft radio altimeters that operate in the 4.0 GHz - 4.2 GHz range caused by the terrestrial carriers' 5G use of C-Band spectrum in the 3.7 – 3.98 GHz range. For its 5G network Gogo plans to use 4 MHz of spectrum it owns in the 800 MHz band and additional unlicensed spectrum in the 2.423 GHz – 2.475 GHz range, which has sufficient spacing from the radio altimeter operating range to preclude any interference by the Gogo 5G system.

BROADCAST

Speedcast Unveils Network-Optimized Remote Video Streaming Solution

November 30, 201 - Speedcast, a leading communications and IT services provider, today announced the launch of Speedcast SmartView™, an innovative, network-optimized remote video and audio communications solution. Designed for energy, maritime, enterprise, telecommunications and government customers, industries with critical operations can accelerate their digital transformation for revolutionizing remote access and field collaboration. Powered by Speedcast partner Harvest Technology Group Limited and their ultra low bandwidth Network Optimised Livestreaming solution, Speedcast

SmartView allows secure, high-definition video and audio to be streamed in real-time via satellite at a fraction of the bandwidth previously required. As a result, organizations looking to transform their operations through digitalization can use Speedcast SmartView to conduct inspections and repairs for assets operating anywhere in the world, without requiring technicians to travel and work at remote sites. Available in multiple formats, Speedcast SmartView can be used on remotely operated vehicles (ROVs) for subsea inspections and research, at remote sites for monitoring, and on wearable devices.

NOVELSAT Powers Albavision Live Sports Broadcasting

November 24, 2021 - NOVELSAT, a global leader in content connectivity, announced today that Albavision, the largest Spanish-speaking media network in the world, has selected NOVELSAT's FUSION to power its broadcast service of a major sports events from across the world. NOVELSAT FUSION is a powerful end-to-end live linear platform for broadcast and broadband content connectivity and delivery. Expanding flexibility and scalability, NOVELSAT FUSION delivers optimal video processing, delivery and security solutions by technology innovation across the media network. Albavision deployed NOVELSAT's FUSION platform to receive, decode and decrypt the media content, utilizing the most bandwidth-efficient waveform, NOVELSAT NS4™, as well as HD and UHD video processing, and highest-level content security.

ATEME Leads NESTED 5G Consortium to Provide Energy-efficient Solution for Streaming over 5G

November 23, 2021 - ATEME, the leader in video delivery solutions for broadcast, cable TV, DTH, IPTV and OTT, today announced that it is leading NESTED (New vidEo STandards for Enhanced Delivery), a consortium aimed at developing a high quality-of-experience (QoE) and sustainable video-streaming solution over 5G. The innovative NESTED 5G project is headed by ATEME in collaboration with Orange, which tests the efficiency and sustainability of the NESTED streaming solution in real use cases over 5G. The project brings together leading French companies Viaccess-Orca, contributing its secure video player, QoE analytics enabler suite and targeted advertising solution, and ENENSYS Technologies with its MediaCast Mobile and its CubeAgent Mobile. Renowned French institution IETR (Institut d'Electronique et des Technologies du numéRique), the research unit at French engineering school INSA Rennes, also participates by providing a VVC decoder. In addition to leading the project, ATEME plays a vital role in bringing the new solution to life with its latest compression technology, its Just-in-time packager and its CDN.

HSE Renews Contract with SES on ASTRA 19.2 Degrees East

November 10, 2021 - HSE, leading provider in Europe in the field of live commerce, has extended its partnership with SES in a new multi-year contract that secures additional capacity for the organisation to broadcast its three TV channels including HSE SD, HSE HD and HSE Trend on SES's satellites in its prime TV neighbourhood at ASTRA 19.2 degrees East. Reaching up to 118 million viewers a year, HSE stands for the most entertaining form of shopping and offers a curated range of fashion, jewellery, beauty, wellness, household and home & living products – all delivered with high-quality picture and sound for an immersive consumer experience. With this multi-year contract, viewers in the region will continue to enjoy free-to-air live commerce via ASTRA 19.2 degrees East in SD and HD, giving HSE access to a wider audience across broadcast standards.

SES Launches New HD+ IP Streaming Service in Germany

November 9, 2021 - SES has announced HD+ IP, a new Internet-based streaming service in Germany that provides subscribers with access to 50 HD channels and libraries with more content without needing to have a satellite, cable or DVB-T2 TV connection. Launching in December, the new HD+ IP streaming service will expand SES's addressable market by additional 20 million households in Germany. The TV-app-based service will be downloadable or come pre-installed on a variety of smart TVs with Panasonic as an initial launch partner. Comparable with the current HD+ service for satellite TV-households, HD+ IP subscribers can watch both linear TV as well as on-demand programmes and content without additional or proprietary devices – everything is delivered through the HD+ IP app directly integrated in TVs. HD+ IP will offer over 50 HD channels, including public and private channels, with wide coverage as well as access to multiple media libraries with on-demand content. HD+ IP comes with popular features like an interactive TV guide, instant restart of live TV and more. HD+ IP will be available for owners of new Panasonic TVs through an automatic software update in December 2021. Panasonic was also the first launch partner to integrate HD+ into its TV sets in 2019.

Dish Mexico Turns to SES's One-Stop Shop for Linear and On-Demand Content

November 4, 2021 - SES announced its long-term customer Dish Mexico will be leveraging both its direct-

to-home (DTH) and over-the-top (OTT) offerings to deliver greater content choice and seamless functionality to their subscribers and new viewers nationwide. These new multi-year agreements will add over US\$85 million in secured backlog for SES's video business. Dish Mexico selected SES's Online Video Platform (OVP) solution for its ability to seamlessly integrate linear channels, third-party and on-demand content from multiple sources, eliminating the need to switch between applications and enhancing the viewing experience. Additionally, SES and Dish Mexico have extended their decade-long DTH partnership. Dish Mexico will continue leveraging its dedicated SES satellite capacity via the QuetzSat-1 satellite to further disrupt the local TV market with affordable pay-TV services throughout the region. SES's OVP platform allows for a diverse bouquet of linear channels and thousands of hours of on-demand content to be ingested and managed using the SES 360 unified media platform. Dish Mexico will leverage the highly scalable service to tailor its channel line-up and dynamic ad content as needed to meet viewer profiles and preferences on the fly.

Kenya Broadcast Corp.'s Signet DTT Connects to AMOS-17 HTS Satellite in Spacecom's Kenya Project

November 3, 2021 - Spacecom announced that Kenya Broadcast Corporation's Signet DTT (digital terrestrial TV) service is now being broadcast via the advanced AMOS-17 HTS (high throughput satellite) digital satellite. Spacecom's also provided an array of on-the-ground professional services that quickly and efficiently migrated Signet's DTT service to AMOS-17. KBC's Signet broadcasts over 70 TV stations and a host of radio channels throughout Kenya and into South Africa. Utilizing AMOS-17's HTS C-band beams, KBC optimizes OPEX (operational expenses) and realizes significant network performance improvements. In addition, Spacecom's satellite services division provided full turn-key service migration to 38 sites and a teleport, without loss or interruption of service, all in less than three weeks.

Newest HD Channel, Global Trekker Joins MEASAT's HD Video Neighbourhood

November 2, 2021 - MEASAT Satellite Systems Sdn. Bhd. (MEASAT) announced today an agreement with Rock Entertainment Holdings for the distribution of Global Trekker HD via MEASAT-3a satellite. The channel joins MEASAT's High Definition ("HD") video neighbourhood at 91.5°E for viewers across Asia Pacific. Global Trekker is a premium channel which features a broad range of content that broadens one's mind, heart, and soul. Here viewers get to explore the world, bringing them closer to nature, and giving them insights to business success and how technology improves everyday lives. The 91.5°E prime video hot slot is home to the MEASAT-3a and MEASAT-3b satellites, forming the region's strongest video neighbourhood. From 91.5°E, MEASAT supports broadcasters and DTH operators to distribute UHD, HD and SD channels to audiences across Asia, Australia, East Africa and Eastern Europe. The MEASAT fleet will be further strengthened with the addition of MEASAT-3d in 2022.

TAP Digital Media Ventures Corp. and ABS Sign Agreement on ABS-2 Capacity over the Philippines

November 2, 2021 - ABS, a global satellite operator and TAP Digital Media Ventures Corporation (TAPDMV) announced that they have signed a multi-channel, multi-year term contract on ABS-2. The distribution capacity agreement is on the ABS-2 East Hemi beam to deliver TAPDMV channels across the Philippines and other communities. Under this long-term contract, TAPDMV will leverage the ABS-2 premier video neighbourhood at 75°East to broadcast its four HD channels: TAP Action Flix, Tap Sports, Tap Movies, Premier Sports and two SD channels: Tap TV and Tap Edge. TAPDMV is a multi-platform media company offering TV and digital over the top media services. It owns a portfolio of eight TV channels and programming rights with many international broadcasters. "ABS operates one of Asia's most popular video neighborhoods at 75°E connecting broadcasters and media providers to grow their audience and extend to new markets. We are excited to broadcast TAPDMV's major channels to the Philippines enabling them to grow their business by providing viewers with high-quality programming and compelling entertainment services," said Jennifer Blasko, ABS EVP of Sales and Marketing. "TAPDMV expansion in the linear broadcast market shows the resiliency of satellite distribution in the Philippines where the majority of subscribers are still viewing their favorite channels through their DTH and cable subscriptions."

LAUNCH / SPACE

BlackSky Continues Business Expansion Adding Two Satellites with Upcoming SpaceX Launch

November 30, 2021 - BlackSky will soon add two additional satellites to its constellation through a scheduled Spaceflight Inc.-managed rideshare launch with SpaceX. Expanding the constellation to ten satellites will enhance the company's geospatial capacity for data while increasing revisit rates for customers. With the additional satellites, BlackSky's Spectra AI platform increases access to more timely analytics and insights for a range of customers including government agencies and industries such as

transportation, infrastructure, construction, and supply chain management. BlackSky expects to achieve a 12 small satellite constellation by the end of 2021 which will provide sufficient capacity to meet the expected demand for the foreseeable future and beyond.

Successful Rocket Lab Launch Strengthens BlackSky Constellation by Two Satellites

November 30, 2021 - BlackSky successfully added two satellites to its constellation following the Rocket Lab “Love at First Insight” launch from Rocket Lab Launch Complex 1 on November 18. The satellites were fully operational and commercially available within six days of launch. “This was the fastest BlackSky dual-satellite commissioning process in the company’s history,” said Nick Merski, BlackSky chief operations officer. “Within one work week customers were able to directly task the satellites from our Spectra AI platform and pull real-time geospatial analyses and insights to their desktops and devices in under 90 minutes.”. BlackSky is a leading provider of real-time geospatial intelligence. Leveraging its own satellite constellation and harnessing the world’s emerging sensor network, the Company monitors the activities and locations worldwide that matter most to its customers.

Thales Alenia Space Invests in Advanced Technology for Human Space Flight

November 25, 2021 - Thales Alenia Space has inaugurated a new Friction Stir Welding facility at one of its production sites in Turin, which will double production capacity of pressurized modules, for the production of the future orbiting and surface infrastructures. The only company in Europe to use this type of processing for pressurized habitation modules, Thales Alenia Space introduced friction welding technology in 2015, with a first operating facility used for the production of Cygnus, the pressurized cargo modules for the refueling of the International Space Station, an extremely complex type of structure, which enables exploration and human space flight. The new facility employs an innovative welding process that allows greater processing precision, an improvement in mechanical strength, energy savings and a reduction in costs and production times. Based on the simple physical friction between a welding tool, suitably shaped, and the pieces to be welded, this welding method eliminates or reduces the negative aspects of arc welding, maintaining the mechanical characteristics of the material, and improving the quality of the processing. The investment in the construction of this infrastructure is in line with international space policies and with the Lunar and Martian exploration objectives of the main Space Agencies, as well as the commercialization of space by public and private investors. Thales Alenia Space, thanks to this new investment, will improve the production of the pressurized modules, in particular the supply of the three key components of the Lunar Gateway: I-HAB, ESPRIT and HALO, the two modules of the first commercial space station designed by Axiom Space, and the Cygnus modules, crucial for the safe supply of the ISS since 2013, to name some of the programs in which the company plays a leading development role.

Voyager Space and Space Micro Inc. Announce Strategic Agreement

November 22, 2021 - Voyager Space Inc. announced its intent to acquire a majority stake in San Diego-based Space Micro. Space Micro is a highly innovative engineering-driven business focused on advancing high-performance satellite communications, digital, and electro-optical systems with over 2.7 million hours of space flight heritage. Space Micro developed the world’s highest data rate Laser Communications Terminal in orbit. As part of the agreement, Voyager intends to provide strategic operations support to help advance Space Micro’s technology throughput to civil, commercial, and defense customers. Founded in 2002, Space Micro delivers best-in-class satellite technology to the growing commercial market. Space Micro delivered its first computer and image-processing subsystem in space within the first four years as an organization, then went on to develop its first advanced Software Defined Radios for NASA’s Interface Region Imaging Spectrograph (IRIS), Lunar Atmosphere Dust and Environment Explorer (LADEE), and The Transiting Exoplanet Survey Satellite (TESS).

Nanoracks Announced as First Payload Services Provider for Maritime Launch

November 19, 2021 - Maritime Launch Services, one of Canada’s leading aerospace firms and the owner of the country’s first commercial spaceport, announced that Nanoracks, a Voyager Space company and the leading commercial payload provider to the International Space Station (ISS), will serve as the company’s first client when Spaceport Nova Scotia’s operations go live in 2023. For this first mission, Nanoracks will deploy customer SmallSats and host spacecraft technology demonstrations. Nanoracks is currently engaged with Canada’s small satellite efforts. The company provides satellite deployment services from the ISS for the Canadian Space Agency’s Canadian CubeSat Project (CCP). In addition to signing a contract with Nanoracks, Maritime Launch signed a Letter of Intent to launch with Nova Scotia based GALAXIA Mission Systems, an aerospace company that will deploy small satellites aboard Spaceport Nova Scotia’s

first flight. GALAXIA's founder, Arad Gharagozil, is former founder and president of Dalhousie University's Space Systems Lab, which is funded by the Canadian Space Agency.

SES Orders Two Satellites for its Prime TV Neighbourhood Serving 118 Million Homes

November 18, 2021 - SES has ordered two geostationary (GEO) Ku-band satellites for its prime orbital slot at 19.2 degrees East to maintain the premium services it provides to its European video customers and to capture new opportunities in the region. These two replacement satellites – ASTRA 1P and ASTRA 1Q – will be built by Thales Alenia Space and are expected to launch in 2024. ASTRA 1P, a classic wide-beam satellite, will support SES's prime TV neighbourhood and enable content owners, private and public broadcasters across Germany, France and Spain to continue broadcasting satellite TV channels in the highest-picture quality in the most cost-efficient manner. ASTRA 1Q, a next-generation digital satellite with both wide beams and high-throughput spot beams, will be able to support direct-to-home (DTH) operations like ASTRA 1P. In addition, the fully flexible ASTRA 1Q is customisable on orbit and can be deployed easily to other orbital positions, enabling SES to serve the dynamic needs of its video and data customers well into the future. The current satellites operating at SES's prime orbital neighbourhood of 19.2 degrees East serve an unparalleled 118 million households or over 43 percent of all European TV homes. Specifically the majority of satellite homes in Germany, France and Spain are being served by the ASTRA satellites. The number of TV homes receiving HD content from these satellites has increased almost 30 percent over the past five years.

NanoAvionics to Launch 5th Satellite Rideshare Mission with new MP42 Bus aboard SpaceX Transport-4

November 18, 2021 - Smallsat integrator NanoAvionics has announced its latest satellite rideshare mission 'MP42' to be launched aboard a SpaceX Falcon 9 with payloads from OQ Technology and Veoware. Using the prototype of its new MP42 microsatellite bus, it is the fifth shared satellite mission by NanoAvionics, which has been one of the firsts companies in the nanosatellite industry to successfully kickstart and continue such a commercial programme. The launch of NanoAvionics' satellite has been booked for the SpaceX Transporter-4 mission, planned for 2022. The MP42 is also the company's largest built satellite yet and the first commercially available modular microsat bus in the industry. It has the same modularity for hard- and software and mission operations infrastructure as NanoAvionics' nanosatellites. It will be deployed into low Earth orbit (LEO) via a launch agreement with NanoAvionics' launch partner Exolaunch, a German company providing launch, deployment and in-space transportation services. Exolaunch will also supply its CarboNIX separation ring to dock the MP42 to the SpaceX port aboard its Falcon 9 rocket.

Rocket Lab Launches 107th Satellite to Orbit, Successfully Tests Helicopter Recovery Operations

November 17, 2021 - Rocket Lab has successfully deployed two satellites to orbit for real-time geospatial monitoring company BlackSky. Rocket Lab also successfully introduced helicopter operations to a recovery mission for the first time, using a helicopter to observe and track the Electron rocket's first stage as it descended to Earth under parachute as part of the company's program to make Electron the world's first reusable, orbital-class commercial small rocket. The 'Love At First Insight' mission, arranged for BlackSky through launch services provider Spaceflight Inc., was Electron's 22nd lift-off from Rocket Lab Launch Complex 1 on New Zealand's Mahia Peninsula. Following lift-off at 01:38 UTC, 18 November 2021, Electron successfully delivered the two BlackSky Gen-2 Earth-imaging satellites to a circular 430km orbit, growing BlackSky's constellation of real-time geospatial monitoring spacecraft and bringing the total number of satellites deployed by Rocket Lab to 107. Today's mission also included a controlled ocean splashdown and recovery of Electron's first stage. For the first time, Rocket Lab stationed a helicopter in the recovery zone around 200 nautical miles offshore to track and observe the descending stage in preparation for future aerial capture attempts. The helicopter successfully tracked the returning rocket and completed communications tests in the recovery zone, bringing Rocket Lab a step closer to catching a rocket from the sky, bringing it back to the production complex for refurbishment, and then launching it to space again.

Arianespace to Launch Australian Satellite Optus-11 with Ariane 6

November 17, 2021 - Arianespace and Australian operator SingTel Optus signed the launch contract for the Optus-11 communications satellite. The launch, scheduled for the second half of 2023, will use the Ariane 64 version of the Ariane 6 launcher, with four solid boosters. Optus-11 is a Ku-band communications satellite with a coverage zone encompassing Australia and New Zealand. Optus-11 incorporates a number of advanced technologies, especially the latest developments in digital processing, plus active antennas enabling the creation of several thousand beams. Fully configurable in orbit, this

satellite will expand the capacity of the operator's current geostationary orbit constellation – making it the largest constellation ever deployed by an Australian company. The Ariane 64 configuration for this mission provides enhanced performance to inject the Optus-11 satellite into a high-energy geostationary transfer orbit, enabling it to start operation more quickly.

Sustainable Space Launches Get a Boost through Astroscale, Virgin Orbit Partnership

November 17, 2021 - Astroscale Holdings Inc. has signed a Memorandum of Understanding (MOU) with Virgin Orbit, the responsive launch and space solutions company that has announced a planned business combination with NextGen Acquisition Corp. II ("NextGen"). The MOU establishes a new partnership in which the two companies will seek opportunities to cooperate on a series of space initiatives that will drive the future of space sustainability and on-orbit servicing ecosystem. Astroscale is planning dozens of missions over the next decade and is in discussions with Virgin Orbit to launch as many as 10 of those on Virgin Orbit's LauncherOne. The two companies are also working toward a future joint mission concept focused on satellite servicing. Astroscale and Virgin Orbit share a vision of creating a sustainable space environment and will explore areas of cooperation on policy and regulatory efforts in the fields of space sustainability, space debris removal, government partnerships, launch and on-orbit servicing spectrum allocation. The MOU also includes a partnership to study the business potential of a joint Global Responsive Satellite Servicing capability, pre-encapsulating Astroscale payloads and storing them at LauncherOne spaceports, as well as promoting U.S.-Japan and U.S.-UK bilateral cooperation with a responsive launch capability from Virgin Orbit's launch sites in Oita, Japan, and Spaceport Cornwall, UK. The two companies are also discussing a future mission concept wherein Astroscale would utilize its robotic arms payload and/or docking plate on the LauncherOne system.

Arianespace' Vega Launcher Successfully Orbits Three Ceres Satellites

November 16, 2021 - Arianespace successfully launched three CERES military intelligence satellites from the Guiana Space Center, Europe's Spaceport in Kourou, French Guiana (South America). The three CERES (CapacitÉ de Renseignement Électromagnétique Spatiale) satellites are designed to collect signals intelligence (SIGINT) from areas inaccessible to surface sensors, excluding restrictions on airspace overflights and in all weather conditions. They will greatly enhance visual situational awareness to support the design and execution of military operations. A state-of-the-art system, CERES allows France to join the very select club of nations with these advanced capabilities. Airbus Defence and Space is the prime contractor for the space segment, and is co-prime with Thales Defence Mission Systems, in charge of the payload and user ground segment. In addition, Thales Alenia Space acts as a subcontractor to Airbus Defence and Space for the supply of the satellite platform. The Vega launcher, built by Avio (Colleferro, Italy) as prime contractor, is perfectly suited to the institutional market. Because of its performance and versatility, Arianespace offers customers the best possible solutions to orbit their small and medium payloads for a wide range of applications (Earth observation, science, education, defense, etc.).

Exolaunch Signs Multi-launch Agreement with SpaceX

November 16, 2021 - Exolaunch, a global provider of launch services and in-space logistics, has signed a new multi-launch agreement with SpaceX. The agreement includes more launches, more slots and more capacity for Exolaunch to integrate customer satellites onboard SpaceX dedicated rideshare missions, called Transporter missions, during the next two years. Over 95 percent of that new capacity for next year, a payload mass of 3,000kg and the equivalent of more than 100 satellites to be launched across SpaceX Transporter missions in 2022, has already been booked by Exolaunch customers. Procuring more launch capacity, twice the amount from the previous agreement, also signifies further business growth for the German company, which opened two offices in the US last month. The next SpaceX rideshare mission with satellites integrated by Exolaunch, Transporter-3, is scheduled to launch no earlier than January 2022 from Cape Canaveral, Florida.

Northrop Grumman Announces Team for NASA's Next-generation Lunar Terrain Vehicle

November 16, 2021 - Northrop Grumman Corporation is teaming up with AVL, Intuitive Machines, Lunar Outpost, and Michelin to design a Lunar Terrain Vehicle (LTV) to transport NASA's Artemis astronauts around the lunar surface. This team provides multi-disciplinary expertise that is ready to deliver an innovative solution to NASA for lunar surface mobility. As prime, Northrop Grumman will lead systems integration, bridging its own flight-proven experience with spacecraft design to include cargo storage, energy management, avionics, navigation, sensors, controls, mission planning, operations and training.

Eutelsat Joins the 'Net Zero Space' Initiative to Combat Space Debris

November 12, 2021 - On the occasion of the Paris Peace Forum, Eutelsat Communications announces that it is joining the "Net Zero Space" initiative which has been launched with support from several leading players in the space industry. The ambition of this international alliance is to create a sustainable outer space environment in 2030 by initiating immediate action to contain and mitigate the generation of in-orbit debris. Taking this opportunity, Eutelsat reiterates its commitment to a safe and uncluttered orbital environment. This is notably reflected in the adoption of a Space Debris Mitigation Plan, a company-specific initiative that has been constantly updated since its launch in 2005. Under this plan, Eutelsat has achieved a success rate in excess of 95 percent for deorbiting its spacecraft, well ahead of the industry average. The plan also promotes full compliance with the requirements of the French Space Act, which ranks among the most stringent in the world when it comes to preventing the formation of space debris. The Group is also an active member of the Space Data Association and an ISO 9001 certified company for its satellite control operations. Since the advent of the outer space era in 1957, more than 12,000 satellites have been placed in orbit and have progressively turned into more than 1 million stagnant objects of at least one centimetre in size that are now considered to be orbital debris. In the face of this situation, there is a compelling need for international action to ensure continued monitoring of progress in addressing outer space congestion, so that all stakeholders can develop their activities in a sustainable Earth's orbital environment.

Arianespace Signs Net Zero Space Agreement, Reflecting its Proactive Commitment to Sustainable Space

November 12, 2021 - The aim of the Net Zero Space charter, signed during the Paris Peace Forum, is to unite the different members of the space sector in a global collaboration designed to protect the Earth's orbital environment. All signatories have decided to implement concrete measures to reduce the amount of space debris in space by 2030. Today's signature also reflects the major improvements delivered by the new Ariane 6 launcher to support the sustainable use of space. Scheduled to start operation in 2022, Ariane 6 will clearly express the company's commitment to reducing space debris, in line with the French law on space operations (FSOA). This new-generation launch vehicle will be capable of deorbiting its upper stage, for instance, facilitated by the stage's Vinci restartable engine. Features such as this place Arianespace at the forefront of the world's launch services operators who have pledged to reduce their orbital impact.

Astroscale and New Zealand to Cooperate on Space Safety and Sustainability

November 11, 2021 - Astroscale Holdings Inc. has signed a Memorandum of Understanding with New Zealand's Ministry of Business Innovation & Employment ("MBIE") to cooperate on areas of space safety and sustainability, including debris mitigation and remediation, and on-orbit servicing in general. The collaboration is focused on partnership in projects and activities that support long-term space sustainability, including joint technology development and research. To initiate these efforts, Astroscale and MBIE have identified an initial project in collaboration with Rocket Lab and Te Pūnaha Ātea–Auckland Space Institute, which will define the engineering requirements, policy challenges and associated costs for multi-active debris removal missions with clients that require direct re-entry due to survivability of components. The project will assess the mitigation strategy for up to three large debris objects with a single servicer in low Earth orbit and will aim to further demonstrate the viability of commercial debris removal while advancing the state of orbital sustainability.

Spire Global Included in NASA X-59 Quiet Supersonic Flight Community Testing Contract

November 8, 2021 - Spire Global, Inc., a leading provider of space-based data, analytics and space services, has announced that it has been included as a subcontractor in an award contract between Harris Miller Miller & Hanson Inc. (HMMH) and the National Aeronautics and Space Administration (NASA). The award supports a national campaign of community overflight tests using NASA's X-59 Quiet SuperSonic Technology research aircraft. With a maximum potential value of approximately US\$29 million and an eight-year period of performance, the award is a cost-plus-fixed-fee, indefinite-delivery/indefinite-quantity contract. The scope of work focuses on supporting NASA in phases two and three of its Low-Boom Flight Demonstration mission. Phase two will include the preparation and planning for phase three where NASA will fly the X-59 aircraft over communities and ask residents to share their response to the sound the aircraft generates during supersonic flight. Spire will assist in evaluating the loudness of the X-59 Quiet SuperSonic Technology research aircraft, ultimately helping one of the goals of the mission: reducing the loudness of a sonic boom to that of a gentle thump. (This is identified as about 70 decibels at ground level and on "Mach cutoff" where the boom does not reach the ground.) Spire will support the

contract by providing weather data and forecasting enhanced by data from its satellite constellation. Spire will collect and share data on winds, pressure, humidity and temperature; all factors that play a crucial role in sonic boom wave propagation and potential minimization of noise on the ground.

Seraphim Space Investment Trust PLC invests US\$25 Million in HawkEye 360

November 8, 2021 - Seraphim Space Investment Trust plc, the world's first listed fund focused on SpaceTech, has announced that it has made a new US\$25 million investment into HawkEye 360 Inc. the world's leading commercial provider of space-based radio frequency (RF) data and analytics. This takes Seraphim Space's portfolio of assets to a total of 20 SpaceTech companies. Since its IPO in July, Seraphim Space has made seven investments. The investment in HawkEye 360 represents the first new company to be added to the portfolio since IPO and is the first investment into a company that participated in the Amazon Web Services Space Accelerator which is delivered by Seraphim Space Camp. HawkEye 360 today announced it has closed US\$145 million in new funding, priming the company to achieve transformational growth in its data and analytical services product line. The round was led by Seraphim Space and New York-based global private equity and venture capital firm Insight Partners. Additional funding comes from new investors Jacobs and Gula Tech Adventures, as well as existing investors Advance, Razor's Edge, NightDragon, Silicon Valley Bank, Airbus, Shield Capital, and other company insiders. This brings the total amount of capital raised by HawkEye 360 to date to US\$302 million.

Amazon's Project Kuiper to Launch Two Satellites by Q4 2022 on ABL Space Systems' RS1 Rocket.

November 2, 2021 - Amazon continues to make progress on Project Kuiper, a low Earth orbit (LEO) satellite constellation that will provide fast, affordable broadband to unserved and underserved communities around the world. This is a major, long-term initiative, and today we're excited to share plans to launch and deploy our first satellites, KuiperSat-1 and 2. This morning, we filed an experimental license application with the Federal Communications Commission (FCC) to launch, deploy, and operate two prototype satellites for Project Kuiper. These satellites – KuiperSat-1 and KuiperSat-2 – are an important step in the development process. They allow us to test the communications and networking technology that will be used in our final satellite design, and help us validate launch operations and mission management procedures that will be used when deploying our full constellation. KuiperSat-1 and KuiperSat-2 will include much of the technology and sub-systems that power the production version of our satellite design, including phased array and parabolic antennas, power and propulsion systems, and custom-designed modems. The team will also conduct experimental tests using prototypes of our low-cost customer terminal, which has been designed to provide fast, reliable service at a more affordable price than legacy antennas.

Virgin Orbit and ANA HOLDINGS Sets the Stage for Twenty LauncherOne Flights from Japan

November 4, 2021 - Virgin Orbit has announced a planned business combination with NextGen Acquisition Corp. II and has entered into a MOU with ANA HOLDINGS INC., the owners of Japan's largest airline, to procure twenty flights of the LauncherOne rocket and to lead the effort to provide funds and support for those orbital missions to launch from Japan's Oita Prefecture. The terms of the MOU call for ANA HOLDINGS and several of its partners to fund the manufacturing of a new set of the mobile ground support equipment used to prepare Virgin Orbit's LauncherOne system for flight from a pre-existing runway, with a target of making Oita a LauncherOne-ready spaceport by as soon as the end of 2022, pending appropriate regulatory approvals in the United States and Japan. Japan's impressive aerospace industry has long been at the forefront of satellite technology innovation. However, the available launch services in Japan – and throughout all of Asia – have always been launched from fixed sites on the ground. Supported by ANA's premier logistics and transport services, Virgin Orbit is set to change that by bringing air-launch to the Eastern Hemisphere for the first time in history. By using a customized 747 as its flying launch pad, mobile mission control, and fully re-usable first stage, LauncherOne gains a substantial performance boost over a similarly sized ground-launched system. Additionally, the airplane's ability to cover large distances between taking off and releasing the rocket provides both weather resiliency and direct-inject orbital flexibility that until now, has never been available on the Asian market.

iRocket And Turion Space Ink Agreement For 10 Launches To Low Earth Orbit

November 4, 2021 - iRocket announced that the company signed an agreement with Turion Space Corp in Irvine, CA. iRocket is a New York startup building 100% fully reusable rockets since 2018 to cargo micro, nano, cube, and constellations to LEO orbit on its Shockwave launch vehicle. The company develops cost-effective launch vehicles that can support rapid launching within 24 hrs. for 400kg and 1500 kg payloads for satellite constellation providers for National security satellites, 5G internet constellations, the Internet

of Things (IoT), Biotech Research, and Space exploration. In addition, there reusable upper stage will target space junk removal in LEO orbit. iRocket is currently funded by the U.S. Space Force – Space Systems Command, The M&J Engineering Group, & Village Global a venture capital firm backed by Bill Gates, Eric Schmidt, Jeffrey Bezos, Mark Zuckerberg, and Abby Johnson. Turion Space is building spacecraft to remove orbital-debris and provide orbit-modification and domain-awareness services to existing space assets. Solving space debris is a crucial problem that must be solved to ensure a sustainable LEO economy and is the first technological step towards mining Asteroids. Turion Space plans to launch their D-1 satellite in October 2022. Solving this problem is crucial to ensure a sustainable space economy and is the first step towards our longer-term vision of mining Asteroids. Turion Space is funded by Y Combinator, Soma Capital, Forward VC, Pi Campus, FoundersX Ventures, Harvard Management Company, Imagination VC, among several others. The two companies also hinted at possible future collaborations on in-orbit servicing. Westerdahl suggested that Turion could work with iRocket to perform final in-orbit deliveries for a fraction of the launch company's payload, combined with space junk removal.

Twinkle Satellite Set to Sparkle as Blue Skies Space Ltd. Releases Latest Renderings of Spacecraft

November 2, 2021 - Blue Skies Space Ltd., the space-science-as-a-service company, has released the latest renderings of its Twinkle spacecraft, an independent space science satellite which will increase the quality of, and access to, exoplanet and solar system research data to all scientists. The Twinkle satellite, the first in a series from Blue Skies Space, aims to revolutionise exoplanet and solar system science by accelerating the provision of scientific data to its members. Once launched into low-earth orbit, the golden-hued satellite will deliver visible and infrared spectroscopy of thousands of targets, enabling Twinkle members to produce transformative research on exoplanet atmospheres, solar system objects, stars, and stellar discs. The structured science surveys will operate at a large scale, providing more than 70,000 hours of data observations from 1000's of objects.

EXECUTIVE MOVES

Intelsat's Joe Chan Announced as SDA Executive Director

November 18, 2021 - The Space Data Association (SDA) has announced IntelSat's Joe Chan as Executive Director. Joe is Director of Flight Dynamics (FDS) at Intelsat, and is succeeding Jean-Luc Froeliger representing Intelsat within the SDA. The SDA has four Executive Directors from Eutelsat, Inmarsat, Intelsat, and SES. Chan has worked with Intelsat for 24 years. As Director of Flight Dynamics, he oversees the FDS operation and engineering of more than 70 geostationary satellites that Intelsat currently operates. Prior to joining Intelsat he worked at Goddard Space Flight Centre on the TOPEX/POSEIDON and Mars Observer projects. The Space Data Association is an international organization that brings together satellite operators to support the controlled, reliable, and efficient sharing of data critical to the safety and integrity of the space environment. Formed in 2009, the SDA aims to enhance safety of flight via sharing of operational data and promotion of best practices across the industry.

Rita Skjærvik Appointed Telenor EVP Group Strategy and External Relations

November 16, 2021 - Skjærvik has since 1 June 2020 headed the unit Group Strategy & External Relations in Telenor, being responsible for strategy, research, and external relations. From 1 December Group Compliance will be part of the unit and Skjærvik will in her new capacity as EVP be a member of Telenor Group's Executive Management team and report to the President and CEO Sigve Brekke in Telenor Group. After joining Telenor in 2014, Skjærvik has held different positions in the company, including being Head of CEO Office for several years. Prior to joining Telenor she was Deputy Chief of Staff for the Prime Minister, and she has solid experience from numerous political advisory positions in Norway.

Nanoracks Names Amela Wilson as CEO, Jeffrey Manber to Join Voyager Space

November 11, 2021 - Nanoracks, a Voyager Space Company, has announced the appointment of Dr Amela Wilson as Chief Executive Officer (CEO). Former CEO and Co-Founder Jeffrey Manber will join Voyager Space as President of International and Space Stations and will remain Chairman of the Board at Nanoracks. Nanoracks is the world's leading provider of commercial space services and continues to push this boundary, most recently announcing alongside Voyager Space and Lockheed Martin the intent to develop Starlab, the first-ever free flying commercial space station. Amela will oversee Nanoracks and its spinoffs in this pursuit, uniting decades of strategic planning, business development and project management experience. Amela most recently served as Senior Vice President and General Manager at Mercury Systems, where she oversaw five company sites and over 500 employees during her tenure. She

was also the Vice President and General Manager - Surveillance at FLIR Systems and the Vice President and General Manager - Sensors and Fire Control Systems Solutions at Elbit Systems of America.

Omnispace Expands Global Market Access and Regulatory Team

November 11, 2021 - Omnispace announced two new additions to its regulatory team. Lynne Dorward and Molly Gavin will be instrumental in further advancing the company's market access and regulatory efforts as it works toward building out its 'One Global Network.' Covering Africa, the Middle East, Asia and Latin America, Lynne Dorward, vice president of regulatory affairs, brings deep telecommunications expertise from both the mobile operator's and the regulator's perspective to Omnispace. A published author on various topics for the ITU and the GSMA, Lynne has 25-plus years of experience in regulatory policy development, compliance procedures and enforcement, along with telecommunications mergers and acquisitions in the mobile and fixed wireless fields. Molly Gavin, vice president of international regulatory and spectrum policy, is an experienced government affairs and business development executive with 20 years in international technology policy and sustainability efforts in the communications industry. She will cover the Asia-Pacific region and international multilateral organizations for Omnispace.

REPORTS

WTA Report: Inside the Top Operators

November 30, 2021 - This report differs from previous *Top Operator* reports published by WTA since 2004, because it covers a year of global pandemic affecting this industry as well as the many vertical markets it serves. The impact of the pandemic has been unpredictable, benefiting some companies and verticals while severely harming others. In general, like the rest of the communications business, teleports have fared well in a time when connectivity has had to stand in for so much human interaction. But outcomes have depended on the unique exposure of each company to the markets it serves.

Inmarsat Report: Industrial IoT in the Time of Covid-19

November 23, 2021 - Research by Inmarsat, the world leader in global, mobile satellite communications, reveals that, despite the accelerating speed of Internet of Things (IoT) adoption over the course of the Covid-19 pandemic, poor or unreliable connectivity is a key barrier limiting the success of IoT projects for most organisations in the transport and logistics sector. According to the research, '[Industrial IoT in the Time of Covid-19](#)', 76 per cent of all transport and logistics businesses don't feel that public terrestrial networks are completely suitable for their IoT needs and 59 per cent experience connectivity challenges when trialling IoT projects. For most transport and logistics businesses, the success of IoT projects hinges on connectivity being reliable, available, and responsive enough to deliver actionable data at the right time and at the right cost to deliver a strong return on investment.

NSR Report: Satellite Big Data Value Chain Sees Opportunity Driven by EO and M2M/IoT Applications

November 22, 2021 - NSR's newly released *Big Data Analytics via Satellite, 5th Edition (BDvS5)* report sees EO and M2M/IoT Satcom Big Data applications driving Big Data market revenues to over \$22.1B through next decade. As value chain evolution ramps up opportunity across the Big Data Market, nascent markets rapidly adapting to new standards propel Big Data adoption across multiple regions. Primarily driven by Earth Observation based Geospatial Analytics solutions, satellite Big Data Analytics annual revenue opportunity will reach \$3.7B by 2030.

NSR Report: 5G via Satellite, 2nd Edition

November 17, 2021 - The industry resource on 5G impact in the Satellite Communications sector, NSR's *5G via Satellite, 2nd Edition (5GvS2)* report finds the largest opportunity in Satcom's history generating \$35Billion in service revenues by 2030. Stimulating growth in numerous areas, 5G use cases set for a tremendous jump in the medium term. As Satellite integrates with the mainstream Telco ecosystem, Direct Satellite-to-Device trend reaching near 400Million average monthly subscribers by decade's end. From cellular backhaul to maritime to IoT, satellite is about to make its mark across the board. NSR's 5G via Satellite, 2nd Edition offers readers the strategic assessment and analysis necessary to capture and expand opportunities as they unlock throughout the Satcom ecosystem.

WTA Report: How to Profit from Customers' Digital Transformation"

November 11, 2021 - The World Teleport Association (WTA) has released *How to Profit from Customers'*

Digital Transformation, a new research report that explores the status of digital transformation in the industry and the benefits and challenges it presents. Slowly but surely, digital transformation is taking hold among satellite ground segment operators. Encouraged in some cases by customers and technology providers, but driven largely by the march of technology itself, the sector is adopting the digital tools that enable the efficiencies and process improvements necessary to stay competitive in an increasingly diverse and dynamic connectivity marketplace.

NSR Report: Government and Military SATCOM Demand Persists Despite Changing Operational Paradigm

November 10, 2021 - NSR's newly released *Government and Military Satellite Communications*, 18th Edition report finds that despite COVID-19, troop drawdowns in the Middle East and ongoing pricing compression, demand for connectivity will continue to grow in the long term. At over US\$6.6 billion in revenue in 2020 – the market was at the tail end of its growth phase and is now entering a short-medium term shaped by many factors. “2021 into 2024 will be a transitional period for Government and Military SATCOM,” states Brad Grady, Consultant at NSR and lead report author. “On the footsteps of ongoing supply-chain challenges, changing security objectives by major countries, and a slow re-architecture of space-based connectivity layers, the market is experiencing a dynamic set of drivers and restraints, all pushing towards a flatter revenue growth curve.

NSR Report: Spectrum Proceeds and Key Markets to Lead Satellite Operator Return to Growth

November 3, 2021 - NSR's *Satellite Industry Financial Analysis*, 11th Edition report, projects the global satcom industry contracted by 2.3% in FY2020 to USD \$13.4B. While continuing sector trends such as a weakening DTH sector and COVID-19 impacts on aeronautical and maritime markets drove declines, enhanced revenue from spectrum leases, consumer broadband, backhaul and government services point to growth potential on the horizon. EBITDA margins remain challenged as GEO operators move from capacity infrastructure business to more managed service offerings and retail service models. Weakening backlog and years of backlog to annual revenues reflect the shortfall in new contracts. Non-renewals in the typically long-term video market and the shortening of contract duration in growing connectivity markets also reflect the changing paradigm. Overall, pressure on Return on Capital Employed (ROCE) persists as EBIT continues to weaken. With competitive threats from heavily funded LEO mega-constellation operators on the horizon, change is inevitable. The pulse of the industry has shifted to redefining market strategies with the need to optimize upstream economies and locking in distribution at the center of executive discussions. Recent M&A activities and bankruptcies show that middlemen service providers are caught up in the drive to secure distribution.

UPCOMING EVENTS

APSCC 2021 Webinar Series, Virtual Event, <https://apscsat.com>
LIVE Every Tuesday 9AM HK | Singapore Time

IBC 2021, December 3-5, Amsterdam, The Netherlands, <https://www.ibc.org>

World Satellite Business Week, December 13-16, Paris & Online, <http://www.satellite-business.com>
Held between the 13th and 16th of December in Paris, Euroconsult's World Satellite Business Week will bring together an outstanding assembly of actors from the international community, emerging from all levels of the value chain on an international scale. Featuring a rich 40+ sessions program covering the entire space and satellite value chains, join the #WSBW in Paris for four days of immersive content, valuable networking opportunities and key market insights to stay on top of a rapidly changing business environment with the world's top sector executives. For the detailed program and registration visit www.satellite-business.com

APSCC members can use the code APSCC10 to obtain 10% for in-person format and APSCC25 for 25% for online only registrations discount.

PTC'22, January 16-19, Honolulu, Hawaii, USA, <https://www.ptc.org/ptc22/>

After an unprecedented year, Pacific Telecommunications Council (PTC) is excited to invite you back to Oahu, the gathering place, to reunite with your peers in the industry, rethink new ways of working and collaborating, and renew yourself and your organization, in a hybrid event that is offered both in person and online. Join us in Honolulu or online for *PTC'22: Reunite. Rethink. Renew*. PTC's Annual Conference is a



strategic springboard for the global communications industry, providing all attendees with a four-day platform to focus on planning, networking, and discovering what lies ahead for the industry at the Pacific Rim's premier telecommunications event.

Smallsat Symposium 2022, February 8-10, Silicon Valley, CA, USA, <https://2022.smallsatshow.com/>

Global Space and Technology Convention, February 8-10, Singapore, <https://www.space.org.sg/gstc/>

Satellite 2022, March 21-24, Washington DC, USA, <https://www.satshow.com>

Convergence India 2022, March 23-25, New Delhi, India, <http://www.convergenceindia.org>

Editorials and Inquiries

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About APSCC

APSCC is a non-profit, international organization representing all sectors of satellite and space-related industries. The aim of the organization is to exchange views and ideas on satellite technologies, systems, policies and outer space activities in general along with satellite communications including broadcasting for the betterment of the Asia-Pacific region. Conferences, forums, workshops, and exhibitions are organized through regional coordination with its members in order to promote new services and businesses via satellite as well as outer space activities. APSCC membership is open to any government body, public or private organization, association, or corporation that is involved in satellite services, risk management or associate fields such as data-casting, informatics, multi-media, telecommunications and other outer-space related activities with interests in the Asia-Pacific region. More information is available at www.apsc.or.kr.