

APSCC Monthly e-Newsletter

October 2020

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.apscc.or.kr. To unsubscribe, send an email to info@apscc.or.kr with a title "Unsubscribe."

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

INSIDE APSCC

APSCC 2020 Conference Series Season 2 Starts from October 7: LIVE Every Wednesday 9AM HK 1 Singapore Time from October 7 to November 25

APSCC 2020 is the largest annual event of the Asia Pacific satellite community, which incorporates industry veterans, local players as well as new players into a single platform in order to reach out to a wide-ranging audience. Organized by the Asia Pacific Satellite Communications Council (APSCC), APSCC 2020 this year is even stretching further by going virtual and live. Every Wednesday mornings at 9 AM Hong Kong and Singapore time, new installments in APSCC 2020 will be presented live - in keynote speeches, panel discussions, and in presentations followed by Q&A format. Topics will range across a selection of issues the industry is currently grappling with globally, as well as in the Asia-Pacific region. Register now and get access to the complete APSCC 2020 Series with a single password. To register go to <https://apsccsat.com>.

SATELLITE BUSINESS

Nelco and Telesat Partner to Bring Advanced LEO Satellite Network to India

September 30, 2020 - Nelco has entered into a cooperation agreement with Telesat, a leading global satellite operator that has been addressing complex connectivity challenges for over 50 years. Nelco and Telesat will collaborate on terrestrial facilities, commercial distribution and regulatory frameworks to offer Telesat LEO satellite connectivity in India. Telesat LEO is a next generation satellite constellation that leverages Telesat's global, priority Ka-band spectrum rights and patent-pending architecture to fundamentally transform global communications. Telesat LEO will help close the digital divide in remote and challenging locations, accelerate 5G expansion, and set new levels of performance for enterprise, telecom, mobility and government broadband connectivity on land, air and sea. The Telesat LEO constellation will provide complete coverage of India and superior enterprise connectivity in the country, subject to the necessary regulatory clearances. The availability of the Telesat LEO Network in India has the potential to provide significant benefits in areas like 4G/5G backhaul, mobile hotspots, distance education, telemedicine, village connectivity, as well as maritime and inflight connectivity. The open architecture, compliant with the Metro Ethernet Forum standard, will simplify the integration of Telesat LEO services with enterprise networks, including Nelco infrastructure and service offerings. Acting as a virtual fibre network, Telesat LEO Layer 2 transport service can deliver hundreds of Mbps to a terminal.

STEP Electronics Chosen as Select Partner with Kymeta in Beta Trial Program for Revolutionary Mobile Connectivity Solution

September 30, 2020 - STEP Electronics has been chosen as a select global partner by Kymeta in the beta trial program for their next generation Kymeta™ u8 flat panel antenna across Australia, New Zealand and the Pacific allowing our customers the opportunity to explore and test the features of this remarkable communications on the move solution that combines satellite and cellular network technologies. The Kymeta u8 is the second generation electronically steered flat panel antenna, which has been redesigned for usability and improved performance. The u8 offers a low-profile form factor with native DC power input for easy integration into mobile platforms, and it supports global land mobility, covering the full Ku-band with improved efficiency. The u8 antenna platform provides options for configurations to meet any industry's communication needs. The u8 GEO terminal offers integrated satellite and cellular modems for a multi-WAN configuration for a unique seamless hybrid satellite/cellular connectivity, while the u8 Outdoor Unit (ODU) allows Av-Comm to design a comms-on-the-move connectivity solution that fits directly into your existing satellite networks. During prototype field trials, the Kymeta u8 GEO terminal

achieved 100% connectivity in vehicles on the move, with either satellite or cellular connection, further validating the offered hybrid solution for continuous and seamless connectivity.

Paradigm's SWARMGX VSAT Now Available in Japan via Jsat Mobile

September 29, 2020 - Paradigm, together with JSAT MOBILE and Inmarsat, is pleased to announce that the ultra-portable and compact SWARMGX VSAT is now available in Japan through JSAT MOBILE on the Inmarsat Global Xpress satellite network. Inmarsat, the world leader in global, mobile satellite communications provides fast and cost effective high throughput data services for GX Land based services such as G2X Land. JSAT MOBILE has a number of customer engagements and events scheduled already for the SWARM and is really excited about the opportunities the low SWaP terminal will create for their customers, particularly in the media and government sectors. The lightweight yet rugged SWARM supports the need for rapid transport and setup. It is IATA compliant and can be easily transported in a hand carry case or backpack. Powered by the PIM®, pointing is quick and simple and terminal performance is optimised; it can be setup in under 90 secs and operational in 240 secs.

Hitachi Begins Testing of 5G Powered Industrial IoT Solutions at its Silicon Valley Research Center

September 25, 2020 - Hitachi, Ltd. announced that a dedicated 5G network has been installed at its Silicon Valley Research Center, part of the Research & Development Division of Hitachi America, Ltd. in partnership with Ericsson. The network will leverage 5G and Hitachi's platform technology to accelerate the development and demonstrate the value of digital transformation across industries. Fifth generation wireless network technology, commonly referred to as "5G technology," is expected to drastically change the way society operates by providing ubiquitous connectivity with ultra-reliable low-latency communication. 5G has the power to accelerate the digital transformation of not just the telecom sector, but businesses across industries. Sectors that will benefit from the increased resiliency and efficiency that 5G technology affords include manufacturing, mobility, healthcare, energy, and IT, though the platform is also expected to support new business models.

Inmarsat Fleet LTE Service Coverage Extended to Gulf of Mexico

September 24, 2020 - Inmarsat will extend its unique 'three-in-one' Fleet LTE coverage for offshore service vessels to the Gulf of Mexico, following successful trials with V.Ships Offshore in the North Sea area. In conjunction with Inmarsat's service provider One Net, the North Sea trials were undertaken with ship management company V.Ships Offshore at the beginning of 2020, delivering hybrid connectivity via 4G cellular plus satellite coverage on VSAT Ka-band and L-band, without the complication of dual billing or the risk of disconnection. V.Ships Offshore, based in Aberdeen, covers ship management and technical services, as well as crew management and recruitment. The new Gulf of Mexico coverage extension adds to the existing agreement already in place with subsea fibre and offshore LTE network operator, Tampnet, following the Fleet LTE North Sea service launch in November 2019.

Eutelsat Awarded Service Contract by Ovzon for Operation of OVZON-3 Satellite

September 24, 2020 - Eutelsat Communications and Ovzon AB have entered into a long-term agreement for the provision of satellite control services following a competitive bidding process involving all major satellite operators. Under the agreement, Eutelsat will ensure the control of Ovzon-3, the first satellite procured by Ovzon, over its full operational life. The agreement reinforces a long-standing cooperation between Ovzon and Eutelsat, where Ovzon has operated capacity on a number of Eutelsat satellites since 2012. Ovzon-3 is a powerful geostationary satellite with multiple high-performance steerable beams and a revolutionary newly developed On Board Processor. To be launched in the fourth quarter of 2021, it will address the mobile connectivity segment.

Isotropic Systems Signs Contract with SES GS to Initiate Multi-Orbit Trials of Next-Gen Multi-beam Antenna Technologies for U.S. Military

September 24, 2020 - SES Government Solutions announced a two-phased antenna evaluation contract with the U.S. Air Force Research Laboratory, working in close collaboration with the U.S. Army Research Engineering Team, for tests of Isotropic Systems' multi-beam terminal over SES's O3b Medium Earth Orbit (MEO) constellation to ultimately unleash next-gen connectivity across the battlefield. It is the first customer contract between Isotropic Systems and SES Government Solutions and follows on from the significant developmental partnership currently ongoing between the two companies to produce scalable, cost-effective terminals capable of providing government, military, and commercial access to the existing O3b constellation and the groundbreaking O3b mPOWER system set to launch late next year.

ANYWAVES Selected by Thales Alenia Space for Omnispace's First Space and Ground 5G Network

September 24, 2020 - ANYWAVES, the only European pure player antenna equipment manufacturer for satellite constellations, has just been selected by Thales Alenia Space, the prime contractor developing OMNISPACE's satellite-based Internet of Things (IoT) infrastructure. ANYWAVES will deliver payload user antennas that will be embedded into the initial set of two satellites that Thales has been contracted to build. The satellites will serve to advance the development and implementation of the first global hybrid communications network, which Omnispace will operate in non-geostationary orbit (NGSO). Thales Alenia Space selected ANYWAVES antenna solution for the OMNISPACE project based upon its expertise in deploying commercially available antennas (S-band, X-band and GNSS allbands antennas), as well as its industrial expertise in payload antenna design. The Omnispace satellite constellation will support 3GPP-defined standards and operate in the S-band. The ANYWAVES payload antennas will be integrated into a NanoAvionics platform, and will be delivered by the second trimester of 2021. The small form factor of the payload antennas are optimized to support Omnispace's unique mission of delivering satellite-based IoT communications direct to the device.

SES Advances Digital Transformation with Cloud-first Strategy, Expanded Agreement

September 23, 2020 - SES announced plans to significantly advance its digital transformation across its enterprise, operations and development of new services for the cloud-scale era. As a cornerstone of the strategy, SES signed a multi-year agreement with Microsoft to be an Azure Orbital partner as well as to accelerate and expand the use of Microsoft Azure across its operations and jointly develop cloud-based video and data connectivity managed services. As an Azure Orbital partner, SES will be co-locating and managing O3b mPOWER gateways with Microsoft Azure locations so its customers are always only "one-hop" away from their Azure cloud services anywhere in the world. In addition, SES customers will enjoy improved network performance, speed-to-market, flexibility and scalability to route over Microsoft's global network and inject value-added, cloud-based managed services such as enhanced security, SD-WAN, and other network functions into the service chain. Additionally, to support customers migrating to the cloud, SES has established a corporate cloud cross-functional team responsible for driving cloud adoption within its own enterprise and operations, and defining, developing and launching seamless cloud, content and connectivity solutions across all of the company's key market segments. These cloud-based solutions will enable SES customers to enjoy the agility, flexibility and cost-optimisation they require in capitalising on new revenue opportunities. Under the corporate cloud initiative, SES is also moving its IT systems and operations to cloud-based automated services and applications.

Intelsat Cloud Connect Service Enables Enterprise Users to Securely and Reliably Access the Cloud Anywhere, Anytime

September 22, 2020 - Intelsat announced a new capability as part of its global managed networking service: Intelsat Cloud Connect, which helps enterprises realize the full value of their cloud investments by ensuring their end users can access their cloud applications anywhere, anytime – even where traditional terrestrial connectivity infrastructure is unavailable. Initially available to Intelsat FlexEnterprise customers, Cloud Connect currently supports Microsoft Azure ExpressRoute connectivity via the FlexEnterprise managed service, providing network service operators, and the businesses they serve, with a new level of flexibility in adopting a growth-oriented cloud strategy. Secure and reliable cloud access has become critically important as more enterprises turn to the cloud for mission-critical computing applications. Intelsat's Cloud Connect solves these access limitations for enterprises by providing a private gateway between a cloud service provider and cloud users, utilizing Intelsat's global integrated space-and-terrestrial network. This private gateway helps enterprises quickly extend cloud-based applications to virtually all of their locations, and to their remote workers – without having to build costly new terrestrial network facilities or rely on less secure, less reliable public internet connections.

Kratos Collaborates with Microsoft to Enable Cloud-based Satellite Ground Services for Azure Orbital

September 22, 2020 - Kratos Defense & Security Solutions announced today that it has joined with Microsoft to enable the launch of Microsoft Azure Orbital, a groundbreaking platform that provides Ground Station-as-a-Service (GSaaS) to the satellite industry. Azure Orbital is Microsoft's managed service designed to deal with the growing flood of data from Earth Observation (EO) and Internet of Things (IoT) applications. The managed service lets satellite operators communicate to, control their satellites, process data and scale operations directly in Azure without the need to build or manage their own costly ground stations. Azure Orbital is powered by Microsoft's Ground-Station-as-a-Service Platform (GSaAP) that includes virtualized infrastructure, orchestration and monitoring capabilities. Kratos' OpenSpace products

are built into the underlying cloud architecture of Azure Orbital beginning with Kratos' OpenSpace Digitizer that converts the RF signal from the antenna into network-ready IP packets that are transported in a digital stream reliably and accurately by an OpenSpace Virtual Network Function (VNF). Orbital customers can then choose additional OpenSpace VNFs available in the Azure Marketplace for receiving and recording their signals. The health and status of the physical gateway-based devices and cloud-based VNFs can be monitored in a unified view with Kratos' OpenSpace OpsCenter Network Management Application. Kratos OpenSpace products are available in the Azure Marketplace to expand the power and functionality of ground operations, including VNFs to process wideband signals and record data for EO missions.

Viasat Real-Time Earth Ground Service Available via Microsoft Azure Orbital

September 22, 2020 - Viasat announced Viasat Real-Time Earth (RTE) is available as a managed services option for Microsoft Azure customers. The Viasat has integrated Azure Orbital with its ground service solution to enable Azure Orbital customers, including those in the earth observation and remote sensing segments, easy access to Viasat's proven ground service solution – from initial commissioning and calibration to subsequent telemetry, tracking and command services and downlinking of critical payload data. Azure Orbital is a new service focused on providing satellite operators with direct access to Azure through owned and partner antennas. Viasat is recognized for providing global, trusted and secure antenna solutions, and is now part of the Azure Orbital ecosystem with its RTE solution. Viasat's RTE network provides Ground-Station-as-a-Service (GSaaS) to the commercial and government earth observation and remote sensing communities. The service offers affordability and reduced latency through automation and geographic diversity on a pay-per-use basis. Viasat's RTE service supports next-generation and legacy low earth orbit satellites using the S-, X-, and Ka-bands, which will enable operators to meet current and future data requirements. Specifically for its relationship with Microsoft, Viasat expects Azure Orbital customers to leverage Viasat's 5.4 meter S-/X-band antennas systems and its 7.3 meter S-/X-/Ka-band antenna systems utilizing the world-class Viasat high-rate receiver, the VHR-3200, which is capable of downlink speeds from 15 Megabits per second (Mbps) to 6400Mbps for computing at the edge.

KSAT Announcing Impactful Cross-industry Collaboration with Microsoft

September 22, 2020 - Kongsberg Satellite Services (KSAT) is announcing an impactful cross-industry collaboration with Microsoft at Microsoft Ignite 2020. By integrating their world-leading capabilities, KSAT will work with Microsoft to explore new ways to make satellite data more accessible through Microsoft Azure Orbital, which is a new ground station as a service from Microsoft enabling customers to directly ingest data from their satellites into Azure, for processing and storage. By combining industry experience, technology and cutting-edge expertise in their respective fields, the two companies will explore innovative methods for transporting, processing, and storing large amounts of space-based data in a new and integrated way through Azure Orbital Services. The space industry is a fast-growing industry. New satellites are launched almost weekly and the amount of information retrieved from space is increasing every day. Finding the most efficient and sustainable solution for managing these huge amounts of data and making it available for government and commercial users is increasingly important in the years to come. As one of the world's largest providers of ground communications services for satellites and launch vehicles, KSAT is dedicated to making sure the customer's data gets from space to where they need it on Earth in a fast and reliable manner.

ManSat Launches Free Preliminary Regulatory Reviews as 'One Stop Shop' Service for Space Entrepreneurs

September 22, 2020 - In an industry first, ManSat has launched a new confidential and free service to help support space entrepreneurs decipher the many necessary regulations needed to successfully and legally operate in space: Preliminary Regulatory Reviews (PRRs). Determining a viable regulatory path for a space venture is crucial. The hardest thing about getting into space can be gaining permission. Without proper licensing, there is no launch, so working to meet the necessary regulations can often prove to be the longest lead time element in a space project. ManSat's PRRs are confidential and free. They offer an unbiased perspective as a sounding board to ask questions about the necessary spectrum, its availability and the associated regulations and licensing procedures. An initial conversation can potentially reduce program cost, reduce program risk and offer peace of mind. Knowing and understanding the path ahead makes the regulatory journey transparent, understandable and navigable. ManSat advises and supports clients' commercial space activities and scientific missions from day-to-day market access issues to strategic orbital and spectrum resource acquisitions. Our clients range from large global organisations to

small businesses and start-ups.

SpaceBridge Rolls out Integrasys Satmotion Facilitating the Deployment of Customer Networks across Greece

September 21, 2020 - SpaceBridge, an established supplier, and global market leader in broadband satellite communications systems technology, has successfully rolled out an ASAT-II Redundant Hub and over 100 sites across Hellas SAT. To facilitate the deployment of the network and minimize staff time and efforts on-site, SpaceBridge selected Satmotion Pocket, Integrasys's industry-leading Auto Commissioning tool. Satmotion Pocket is a VSAT auto-commissioning system that minimizes deployment time and effort while ensuring the highest quality and interference-free installation for optimal performance. It is a software-based solution that simplifies and guides installers by providing feedback on important key performance indicators (KPI) such as Copol, Xpol and Adjacent Satellite Interference, verifying that the antenna and receive/transmit chain of the solutions are optimally installed and allowing sites to generate revenue earlier. Satmotion Pocket developed by Integrasys for ASAT System with its accurate performance enabled SpaceBridge customers to deploy the VSAT network rapidly, easily, and at low cost. Satmotion Pocket is supported on the smartphone, thanks to its user-friendly interface, it does not require VSAT experts to carry out the installation. The time and cost savings are remarkable, as the field technician does not need to call the NOC/Hub, carry a satellite phone, or spectrum analyzer, in a few minutes the VSAT is up and running providing revenue to Space Bridge customers.

Intelsat Finalizes Satellite and Launch Vehicle Contracts for U.S. C-band Spectrum Transition

September 17, 2020 - Intelsat has finalized all of its required contracts with satellite manufacturers and launch-vehicle providers to move forward and meet the accelerated C-band spectrum clearing timelines established by the Federal Communications Commission (FCC) earlier this year. The company has entered into a formal agreement with U.S.-based Maxar Technologies to build the final satellite required to support its C-band transition and maintain the FCC's post-transition, "same or better" quality-of-service standard. Earlier this summer, Intelsat announced manufacturing contracts with Maxar and U.S.-based Northrop Grumman for six satellites. Intelsat has contracted with SpaceX and Arianespace to launch these satellites on four separate launch vehicles, beginning in 2022. The diversity of manufacturers and launch-vehicle providers will lower transition program costs and help Intelsat mitigate potential launch-delay risks that could prevent the company from meeting the FCC's accelerated clearing deadlines. On August 14, Intelsat filed its final C-band spectrum transition plan with the FCC. The comprehensive plan details the steps required for Intelsat to reconfigure its satellite and terrestrial infrastructure to enable 5G deployment in C-band. Intelsat will relocate its existing customer services to the upper part of the C-band to make way for 5G services in the lower portion of the band.

Kratos Announces Space Domain Awareness Services to Assess Spacecraft Orbiting in Close Proximity to Each Other

September 15, 2020 - Kratos Defense & Security Solutions has announced it will begin offering data services to characterize spacecraft in Geosynchronous Orbit (GEO). This has great value for Space Domain Awareness (SDA) and will be offered to government and commercial organizations internationally. Services will provide highly accurate proximity operation data, real-time maneuver detection and accurate location data, referred to as ephemeris. Services offering high rate of refresh for closely tracked spacecraft will also be available. Kratos services will identify and accurately locate spacecraft in GEO using a powerful Space Domain Awareness (SDA) technique called Passive RF Ranging. Traditionally, the ephemeris of a unique spacecraft at GEO is derived from data obtained through ground-based radars and optical telescopes. Oftentimes, these resources cannot correctly differentiate between Closely Spaced Objects (CSOs) accurately enough to provide precise measurements, are unavailable during solar or weather exclusions, or are not geographically accessible. Kratos is not limited by these factors and can provide extremely accurate data related to the location of a spacecraft or multiple spacecraft at a specific moment in time, even when they are critically close (less than one kilometer away).

Hughes Pioneers Self-Healing Capability that Improves Enterprise Wide Area Network Performance Using Artificial Intelligence

September 15, 2020 - Hughes Network Systems, LLC announced the commercial availability of its artificial intelligence (AI) for IT operations (AIOps) solution for enterprise Wide Area Networks (WANs). Integrated into the company's HughesON Managed Network Services, the Hughes AIOps feature is already in use across more than 32,000 managed sites. The technology automatically predicts and preempts – or "self-heals" – undesirable network behavior, preventing service-disrupting symptoms in 70% of cases. Hughes

is the first managed services provider to deliver a self-healing WAN edge capability to enterprise customers. Driven by machine learning (ML) models that absorb and contextualize petabytes of proprietary network data, the Hughes AIOps capability detects deviations in key metrics against an evolving network baseline, gleaned from nearly a quarter million North American enterprise sites under the company's management. The AIOps then assesses the risk-reward of potential corrective actions, autonomously takes appropriate measures, and tracks performance to ensure a return to steady-state parameters. To deliver the network transformation desired by enterprises, Hughes continues to deploy cutting-edge AI and ML techniques throughout its service delivery. In addition to the self-healing application, outcomes of these innovations for the company's enterprise customers include shortened triage time for help-desk incidents, proactive detection of site, vendor, and geographic network anomalies, and prescriptive corrective recommendations.

Comtech Telecommunications Corp. Announces a Contract Renewal with Telefonica Digital

September 15, 2020 - Comtech Telecommunications Corp., a world leader in secure and highly reliable location, public safety, navigation, and communication technologies, announced today its Location Technologies group, a division of Comtech's Commercial Solutions segment, has finalized a contract renewal for location-based services (LBS) with Telefonica Digital, a Madrid-based research and development company. Telefonica Digital uses Comtech Location Technologies' global location services solution for their machine-to-machine communication requirements and customer use cases.

Viasat Expands its Premium Residential Internet Service in Brazil by 14 States

September 15, 2020 - Viasat announced today the expansion of its reliable, high-quality residential internet service to 14 additional states in Brazil. In July, Viasat launched its Brazil residential service in seven states and the Federal District. With its latest expansion, Viasat now offers service to more than 93% of the country's population across 21 states and the Federal District. The company expects to be the only satellite internet service provider (ISP) capable of making high-speed internet available across 100 percent of the country, upon completion of the residential launch rollout. Brazilian residents across all five regions of the country can now subscribe to Viasat's satellite internet service with speeds up to 20 Megabits per second (Mbps) and data-rich packages that offer up to 80 Gigabytes (GB) of data per month, enabling them to enjoy online access for daily activities including social media, video streaming content, video call services, work-from-home, online education, sending/receiving emails and unlimited chat and web browsing.

C-COM Partners with International Consortium to Develop Next Generation Phased Array Antennas

September 15, 2020 - C-COM Satellite Systems Inc. has joined an International consortium to develop next generation phased array antennas for both 5G cellular and satellite communications networks. Formed under the Intergovernmental Canadian/European EUREKA/PENTA program, the goal is to develop flexible and scalable antenna modules and technologies for operation in the upper 5G bands (Frequency Range 2) and in the high frequency satellite V-band. In addition to C-COM, the HEFPA (Highly Efficient and Flexible Phase Arrays) partners are: NXP Semiconductors Netherlands BV (project coordinator); Carleton University; Eindhoven University of Technology; Semiconductor Ideas to the Market (ItoM) BV; Skyworks Solutions Canada Inc.; and the University of Waterloo. The consortium combines broad expertise from industry and academia covering a wide range of technologies and all aspects of the project, which will span the next 3 years.

Paradigm's HORNET100GX Satellite Terminal Available for Inmarsat Global Xpress

September 14, 2020 - Paradigm Communications Systems has announced that the rugged, quick deploy HORNET100GX is available for operation on the Inmarsat Global Xpress satellite network as a highly efficient Land Terminal Efficiency Group 2 terminal. Inmarsat, the world leader in global, mobile satellite communications, has issued Type Approval of the HORNET100GX for use on all GX Land based services, such as G2X Land, providing cost effective high throughput data services around the world. The HORNET100GX is based on Paradigm's rugged and portable PIM-based HORNET VSAT terminal. The field-proven HORNET provides a single satcom solution for many different operational requirements, being environmentally rugged, yet lightweight; even the largest 100cm variant can be packed into a single airline-friendly case, as well as saving airtime service charges compared to other terminals.

NovelSat and Spacecom Exhibit World's Highest Spectral Efficiency over AMOS-17

September 14, 2020 - NovelSat and Spacecom, operator of the AMOS satellite fleet, announced today the successful demonstration of high capacity satellite transmission with spectral efficiency of 10.5 bit/Hz

over AMOS-17 high performance HTS utilizing NovelSat Duet CEC (carrier-echo-cancellation) band reuse technology. Operating over AMOS-17 Ka HTS and Ku beams, NovelSat modems established a symmetrical link, reaching 64APSK modulation with 9/10 FEC rate and 2% roll-off, achieving data rate of 854Mbps over of 81.6MHz bandwidth and 753Mbps over 72MHz bandwidth, demonstrating spectral efficiency of 10.5 bit/Hz. This extraordinary performance was achieved without any power backoff or additional satellite padding, and without requiring predistortion calibration. Connected to a 2.4m diameter antenna, the remote modem performed carrier-echo-cancellation, enabling simultaneous use of the same bandwidth for both uplink and downlink with implementation loss lower than 0.01dB.

Comtech Telecommunications Awarded Contract with Tier-One Mobile Network Operator

September 14, 2020 - Comtech Telecommunications Corporation's Location Technologies Group, a division of Comtech's Commercial Solutions segment, has finalized a 5-year contract worth over \$20.0 million for location-based services (LBS) with a tier-one carrier as part of their 5G implementation. The Location Technologies group of Comtech Telecommunications Corp. is 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. For more information, visit www.comtechlocation.com.

ASECNA, in Conjunction with NIGCOMSAT and Thales Alenia Space, Provides the First African Early SBAS Open Service

September 11, 2020 - The Agency for Air Navigation Safety in Africa and Madagascar, ASECNA, has started to broadcast a SBAS (Satellite-Based Augmentation System) signal over Africa & Indian Ocean (AFI) region, providing the first SBAS open service in this part of the world via NIGCOMSAT-1R Satellite managed and operated by Nigerian Communications Satellite Ltd under Federal Ministry of Communications and Digital Economy of Nigeria. This early open service is provided as part of the « SBAS for Africa & Indian Ocean » programme which pursues the autonomous provision over the continent of SBAS services, to augment the performances of the satellite navigation constellations GPS and Galileo. With improved accuracy to within a meter, and boosted integrity, availability and continuity of safety-related applications, these SBAS services will improve flight safety and efficiency in Africa, and also benefit to the economy in many areas as land, sea and rail transport, as well as mass market applications, supporting user safety, cost-effectiveness and sustainable development. The launched open service essentially aims to carry-out technical trials, and to undertake with partner airlines field demonstrations for aircraft and rotorcraft, to demonstrate the benefits of the future operational safety-of-life SBAS services, expected from 2024. It will also include early Precise Point Positioning (PPP) and emergency warning service to populations, which performance will be proven through other demonstrations.

Inmarsat's GX Aviation Inflight Broadband Now Available on 100 Qatar Airways Aircraft

September 9, 2020 - Inmarsat that its award-winning GX Aviation inflight broadband is now available on 100 aircraft with leading international airline Qatar Airways. The advanced connectivity service, which is being rolled out across Qatar Airways' fleet of Boeing 777 and Airbus A350 aircraft, has become a popular addition to the airline's premium five-star onboard experience, allowing passengers to seamlessly browse the internet, stream videos, check social media, and shop online during flights. Qatar Airways passengers receive one hour of free access to GX Aviation on equipped flights, with the ability to purchase full-flight access if more online time is needed. The service, marketed as 'Super Wi-Fi' by Qatar Airways, has been used by millions of the airline's passengers since 2018, when it became GX Aviation's launch customer in the Middle East and North Africa (MENA) region. The milestone of 100 aircraft has been achieved as Qatar Airways continues to play a leading role in the global aviation industry's recovery from the impact of COVID-19. It became the largest international carrier between April and June this year, according to the International Air Transport Association (IATA), and has now effectively rebuilt its network to over 85 destinations across six continents, with more than 650 weekly flights.

COMSAT Expands Hardware Footprint with New Orbit Communications Systems Agreement

September 9, 2020 - COMSAT, the global satellite connectivity solutions provider and member of the Satcom Direct family, is further expanding its international terminal, hardware and service footprint following the signing of a new distribution agreement with global provider of airborne and maritime satellite solutions, Orbit Communications Systems Inc. (Orbit). The addition of Orbit's Multi-Purpose Terminals (MPT) bolsters the extensive COMSAT portfolio, positioning COMSAT as a single source for both hardware and connectivity services for demanding government customers worldwide. The MPT WGX models deliver added value to COMSAT's connectivity offering as the reliable, modular, multi-role aviation

terminals are designed to be fully interoperable with the US Government's military Wideband Global Satcom (WGS) network and are optimized for use over Inmarsat's Global Xpress (GX) Ka band constellation. Built to fulfill "anytime, anywhere" connectivity needs, the MPT WGX terminals provide outstanding RF and tracking performance for customers operating in the harshest environmental conditions. The addition of Orbit's OceanTRx hardware to the COMSAT range delivers further flexibility in creating customized connectivity solutions tailored to individual vessel needs. The Ocean TRX hardware range supports naval, cruise and oceangoing platforms delivering multi band terminals – C/Ka and Ku/Ka – to support high-speed data transmission to combined networks of MEO, LEO, HEO, and GEO constellations.

Viasat, BCN Agreement: Enables Multi-Location Businesses to Have Reliable Connectivity using Viasat Satellite Internet

September 9, 2020 - Viasat Inc. announced it signed a reseller agreement with BCN, a technology solutions provider specializing in meeting the requirements of multi-location clients. This agreement will expand BCN's connectivity portfolio by providing multi-location businesses the option to purchase Viasat's proven business internet services as part of a total BCN solution. BCN serves thousands of business customers throughout North America with enterprise-wide communication technology solutions using the latest in voice, data, cloud, and wireless services and technologies. Viasat will be the first and only satellite internet partner in BCN's portfolio, helping BCN fill in coverage gaps for businesses that have locations lacking high-speed connectivity. BCN will also leverage Viasat business internet as a backup connection for multi-site customers who require high-availability networks and cannot afford downtime. The Viasat business internet service reaches 96% of the U.S. population, with download speeds up to 100 Mbps in select areas, and offers a variety of unlimited and metered data plans. Service installation typically takes place within three to five days of ordering, giving business customers the ability to quickly deploy and use Viasat's fast, reliable connectivity service.

Civil Aviation Department of Hong Kong to Deploy Aireon's Space-based ADS-B System

September 9, 2020 - Aireon has announced that The Civil Aviation Department (CAD) of the Government of the Hong Kong Special Administrative Region, Hong Kong's air navigation service provider (ANSP), has selected Aireon to provide space-based ADS-B for Air Traffic Service (ATS) surveillance services. CAD Hong Kong provides annual air traffic services for more than 400,000 aircraft landing and departing the Hong Kong International Airport, and manages overflights passing through the flight information region (FIR). Aireon will provide real-time space-based ADS-B air traffic position information to CAD Hong Kong, including 100 percent coverage of their FIR. The ANSP will also gain access to Aireon data in transition zones surrounding the CAD HKSAR airspace for enhanced cross-border safety and situational awareness of aircraft entering or flying near the HK boundary. Additionally, the Aireon-CAD Hong Kong agreement includes the provision of space-based ADS-B for air traffic flow management (ATFM) to support regional coordination for a significant portion of the Asia Pacific airspace.

R4 Integration Low-profile, High-performance Airborne Multi-Purpose Hatch System (MPHS) Secures Inmarsat Type Approval for Global Xpress

September 8, 2020 - R4 Integration and Inmarsat announced that Inmarsat has given type approval for the R4 C-130 Multi-Purpose Hatch System (MPHS) for use over the Inmarsat Global Xpress network. Global Xpress is the world's first and only, globally available, seamless mobile wideband service. In U.S. government operation since July 2014, Global Xpress has established itself as the gold standard for reliable communications across land, air and sea for assured mobile connectivity and interoperability with government satellite systems. The R4 MPHS is a low-profile Ka-band integrated system that can be configured with virtually any type antenna or sensor that meets the size constraints of the MPHS. The system is fully interoperable with military Ka-band systems and optimized for use over the Global Xpress constellation. Developed for mission-critical roll-on/roll-off requirements of the most demanding government special operations forces and other government customers, the MPHS accesses various Ka-band networks to provide enroute Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) support to airborne users on all C-130/L-100 aircraft variants.

GMV Announces Merger of its UK Company and NSL

September 7, 2020 - GMV Innovating Solutions Limited, the UK aerospace company belonging to the Spanish technology multinational GMV, has signed a merger agreement with Nottingham Scientific Limited (NSL). GMV trades in the aerospace, defense, ICT and intelligent-transportation-systems markets while NSL is UK leader in satellite navigation and critical applications. After the agreement GMV becomes sole

shareholder of NSL and sets up the company GMV NSL, to be integrated seamlessly into GMV's set of companies. Back in 2013, as part of its international expansion, GMV rolled out a business development strategy in the UK. This involved setting up a new company, which came on stream in late 2014 to join the suite of companies and offices in Spain, USA, Germany, France, Poland, Portugal, Romania, The Netherlands, Malaysia and Colombia. Working from its Harwell innovation center in Oxfordshire, GMV's main UK business is earth observation, space debris tracking, mission planning, flight dynamics, navigation, autonomy and robotics. Its principal clients include the European Space Agency (ESA) and the European Commission (EC), as well as UK's space agency (UKSA), the Defence Science and Technology Laboratory (DSTL), Innovate UK, ASUK, Satellite applications Catapult and the Science Technology Facility Council (STFC).

Kratos Introduces OpenSpace Wideband Software Receiver for EO and Remote Sensing Missions

September 3, 2020 - Kratos Defense & Security Solutions announced the launch of its OpenSpace Wideband Software Receiver supporting the high data rates, scalability and interoperability needs of today's Earth Observation (EO) and Remote Sensing missions. As more and more data is being beamed from satellites, the infrastructure on the ground must become highly flexible and more cost-effective to address the key challenge of EO applications – the need to rapidly download data on the fly during the short time periods when satellites are over the ground station. Kratos' OpenSpace Wideband Software Receiver is the only completely virtual receiver with no Field Programmable Gate Array (FPGA) or Graphics Processing Unit (GPU). The software receiver takes advantage of virtual and cloud-based architectures and runs on standard x86 servers. The OpenSpace Wideband Software Receiver offers 600 Mbps of throughput to support downlinks across several hundred MHz of instantaneous bandwidth, an unmatched level of signal processing in software. The performance of the OpenSpace Wideband Software Receiver is equivalent to hardware based EO and remote sensing receivers in the market. Unlike traditional EO and remote sensing hardware that is proprietary and purpose built, the software-only receiver easily scales based on demand and embraces open standards including VITA 49 and CCSDS.

Eutelsat and Paratus Sign Distribution Agreement for EUTELSAT KONNECT Capacity over South Africa

September 3, 2020 - Eutelsat Communications and Paratus have signed a multi-year distribution agreement to bring high quality network connectivity to South Africa. Paratus will leverage the unprecedented operational flexibility and power of EUTELSAT KONNECT, the new-generation high throughput satellite to bring connectivity to remote and rural locations across South Africa to businesses operating in farming, game farms and the SME segment and consumers, for home working, home schooling and general Internet use. Launched at the beginning of September 2020, Paratus' offers, based around packages of 10, 20 and 30 mbps, with 24/7 technical support, and operating with small, cost-efficient dishes are already seeing a high level of demand, highlighting the strong need for high-speed connectivity in remote areas.

ST Engineering iDirect Powers IP Access International's New FUSION Product Line

September 2, 2020 - ST Engineering iDirect, a company of ST Engineering North America, announced that its iDirect iQ Series Satellite Modems have been integrated into mobile and fixed satellite internet solutions provider IP Access International's FUSION product line, providing seamless, reliable and cost-effective connectivity that meets increasingly complex communications requirements. As demand for always-on connectivity from commercial, government and emergency services organizations continues to grow, solutions that enable seamless switching between different networks are becoming increasingly essential. FUSION utilizes the iQ LTE satellite modem, which features an integrated LTE cellular modem, to create a converged solution that automatically finds and connects to all available networks, including LTE, 4G/5G and multiple satellite networks, without user intervention. This delivers reliable data communication for several use cases where the physical path redundancy is critical. The iQ LTE is part of ST Engineering iDirect's DVB-S2/S2X modem series with a software-defined architecture for maximum flexibility and expansion. The integrated LTE modem offers fully automated VSAT/LTE failover and failback, WAN link affinity steering, advanced VPN connectivity, and an available SD-WAN option for robust enterprise-grade communications.

Speedcast Extends Colombian Rural High-speed Internet with Hughes

September 2, 2020 - Speedcast International Limited, the world's most trusted satellite services and IT solutions provider, has been awarded a project to provide high-speed internet to 250 sites across rural Colombia. The government initiative will provide Colombians from Guajira to Amazonas with near-instant

internet access – even in regions where fiber, cable and LTE services are unavailable. Speedcast has been delivering critical VSAT services for more than twenty years and leverages the largest global satellite network in the world to provide coverage in even the most remote environments for its customers. The partnership with Hughes Network Systems, LLC (HUGHES), the largest consumer satellite internet provider in Colombia, will provide seamless and reliable coverage at each of the 250 sites, leveraging Hughes' Ka-band High Throughput Satellite (HTS) coverage to power 162 Community Wi-Fi hotspots, while the remaining 88 sites will leverage Ku-band connectivity. Following the contract award to local government organization, EMTTEL, by MinTIC and Communications Colombia, the project was awarded to Speedcast by its customer UT Wi-Fi Rural Colombia; a joint venture between SDT Ingenieria and Dinatel. The solution leverages, Speedcast's Ku-band network and Hughes' Ka-band JUPITER 2 and Hughes 63 West satellites, with both parties supporting UT Wi-Fi Rural Colombia in installing the hotspots.

L3Harris Technologies Selected to Build Space Antenna for Mobile Telecom Satellite

September 1, 2020 - L3Harris Technologies has been selected by Airbus Defence and Space to build a space reflector antenna for a next-generation satellite which will provide mobile telecommunication services throughout the Middle East, Africa, Europe and Central Asia. The geostationary satellite, owned and operated by Yahsat/Thuraya, will carry an L-band payload that will enable high-speed services for all customer segments, including defense, government and enterprise throughout multiple continents. The satellite, equipped with L3Harris technology, is scheduled for operation in 2024. Since the company began space reflector antenna operations nearly 50 years ago, L3Harris has designed and built large-aperture reflectors and deployable mesh reflector-feed antenna systems ranging from one meter to the world's largest commercially available 22-meter reflector. L3Harris has nearly 100 reflectors on orbit. The reflector antenna for the Thuraya 4-NGS satellite will be manufactured and tested at L3Harris facilities in Palm Bay, Fla.

BROADCAST

Azercosmos and ViewMedia Establish Partnership to Deliver Satellite Solutions

September 22, 2020 - Azercosmos has established a formal partnership with ViewMedia, which operates in the field of global broadcasting services and broadcasts television and radio channels over multiple platforms worldwide. ViewMedia will provide digital satellite services to its customers in the Middle East, Europe and Africa via Azerspace-1 satellite. The company broadcasts more than 150 TV and radio channels worldwide from many terrestrial platforms and ensures easy distribution of video content to carriers through its high-quality infrastructure.

Azam TV Migrates Services to EUTELSAT 7C with Multi-year Contract Extension and Additional capacity

September 21, 2020 - Azam TV has completed the migration of its video platform from the EUTELSAT 7B to EUTELSAT 7C satellite, with a multi-year extension of the existing contract and an incremental capacity commitment. One of Africa's leading pay-TV operators, Azam will leverage the enhanced performance of Eutelsat 7 C to distribute some 120 channels in a mix of standard and high definition across its footprint covering Tanzania, Uganda, Malawi, Kenya and Rwanda. Commenting on the deal, Patrice Paquot, Deputy Regional Vice President, Sub Saharan Africa of Eutelsat said: "We are honored to continue to partner with Azam, one of our anchor customers at the 7° East position as it successfully expands its broadcast offer. 7° East has become a new DTH hotspot for Sub-Saharan Africa and a key pay-TV neighbourhood for Eastern Africa with some of the fastest growth rates in the region." Jacob Joseph, Deputy Chief Executive Officer of Azam added: "Every Azam TV household will have the opportunity to enjoy a wide variety of local and international programmes with excellent signal quality. We are delighted to rely on Eutelsat to leverage the unparalleled reach of its 7° East position."

Euronews Partners with Globecast for the Launch of Euronews English HD in Asia and Oceania

September 17, 2020 - Globecast has announced that long-term customer Euronews has selected the company to provide distribution services for the launch of its new HD version of Euronews English HD, covering Asia and Oceania. Euronews has taken the decision to increase viewer value by launching this HD variant across Asia and Oceania, having already had a Globecast-delivered SD feed across the regions for several years. Globecast is acquiring the signal from Euronews' HQ in Lyon, France, in IP over fibre. It is then fed into the company's international Globecast BN fibre network to reach the Jordan Media Center in Amman. There it's uplinked at the teleport to Asiasat 5. During the course of the contract, Globecast will also add Viaccess PC6.0 encryption to the signal, at a time of Euronews' choosing, with cards also supplied.

Euronews is an international news corporation providing news with a European perspective to a worldwide audience since 1993, in 12 languages through linear channels as well as nonlinear, online, mobile and digital services in over 160 countries.

SES Simplifies Sports Production with Stockley Park Facility in London

September 17, 2020 - SES is providing broadcasters with a newly opened, full-service sports and events facility in Greater London. Apart from handling downlink, decoding, processing and recording, SES's Stockley Park facility offers sports broadcasters a range of services that help simplify sports production workflow. The video services offered at SES's Stockley Park facility range from content management services such as clipping and editing, subtitling, audio dubbing and titling, storing and archiving of content for easy retrieval to channel playout services to multiple broadcast or online platforms. In addition to addressing diverse customer needs, the facility in London will also provide playout services for European customers and provide redundancy to SES's Munich facility. The Stockley Park facility features a 2400 sq ft master control room and will act as a primary media centre for all sports originating in Europe. From Stockley Park, broadcasters and content owners can leverage SES's robust IP, fiber, terrestrial, and satellite hybrid network infrastructure capable of delivering and receiving multiple, simultaneous feeds. The facility is equipped with high-performance, broadcast-grade equipment to ensure superior quality delivery of all live signals, with the possibility of Ultra HD 4K transmission. Stockley Park is completely resilient, guaranteeing 100% continuity for live broadcasting, backed by a highly experienced team of on-site project managers and technical operational support staff.

Arabsat Launches Tele Maroc -Exclusively- on BADR-5/Maghreb

September 16, 2020 - Arabsat viewers in Maghreb can enjoy watching Tele Maroc - exclusively- on Arabsat BADR-5. Tele Maroc is a leading Moroccan satellite TV channel cast from the spinach capital, Madrid, showing fine entertainment, talk shows, documentaries, and sports. Rachid Niny, founder of Tele Maroc, said: "We are delighted at Tele Maroc to be available on Arabsat BADR-5 over Maghreb. We rely on the remarkable improved and growing Arabsat video neighborhood across North Africa and its powerful footprint over Maghreb to ensure significant reach to our massive audience." "In the course of developing our partnerships and cooperation ties across North Africa; particularly in Maghreb; we are thrilled to announce today another remarkable milestone in improving Arabsat video neighborhood over Maghreb." says Khalid Balkheyour, President and CEO, Arabsat. "We have now accomplished the distribution of Tele Maroc -exclusively- on Arabsat BADR-5, of which will join other leading channels from Maghreb active on the Arabsat BADR-5. This brings Arabsat audiences across Maghreb the best picture quality with an exclusive portfolio of top-ranked satellite TV channels."

SpacePath Wins Major Order for Direct-To-Home Digital Satellite Broadcast Services

September 16, 2020 - SpacePath Communications ('SpacePath') a dedicated, European-based, SATCOM amplifier manufacturer and equipment supplier, has won a major order for its small, lightweight travelling wave tube amplifiers (TWTA). SpacePath Communications has signed an agreement with a leading African connectivity solutions provider to supply its innovative, outdoor TWTAs. The small form-factor, high-power amplifiers will be used to provide DTH broadcast and data services to remote regions via a new digital satellite TV network. The STA5000 series uplink amplifiers incorporate a unique compressed carbon air-cooling structure that is half the weight of copper and which does not compromise thermal performance. Additionally, new end user features include removable/washable air-intake filters for cost-effective and simplified maintenance, quick-release connectors for ease-of-use and ethernet connectivity for convenient remote monitoring and control.

Sky Italia Renews Capacity Contract at Eutelsat's HOTBIRD Position

September 2, 2020 - Eutelsat Communications and Sky Italia have reached a strategic agreement for the renewal of Sky's capacity contract at Eutelsat's HOTBIRD position. The agreement represents the latest step in the long-standing partnership between Sky, the pre-eminent anchor customer on HOTBIRD, and Eutelsat which has supported since 2003 the development of Sky, the market leader in Italy, in broadcasting its premium content to some five million households. The multi-year contract represents a secured backlog of circa 450 million euros and guarantees broadly stable annual revenues for Eutelsat in the medium term. The contract also includes future extension options representing additional potential revenues. The HOTBIRD fleet forms one of the largest broadcasting systems over Europe. It will be upgraded with the entry into service of two HOTBIRD new generation satellites, to be launched in 2021, that will replace the current spacecraft at Eutelsat's premium 13 degrees East broadcasting position. The new satellites will deliver improved performances over the European footprint reinforced by a powerful

European super-beam.

Azercosmos and Globecast Extend Partnership to Deliver Satellite Services to Africa

September 1, 2020 - Azercosmos has signed an extended partnership agreement with Globecast to increase capacity and coverage across Africa. As a result of this expanded relationship with Azercosmos, Globecast is able to supply its customers across the continent with increased C-band capacity on the Azerspace-1 satellite. Globecast's platforms and their customers can now easily receive signals from the Azerspace-1 satellite and provide general entertainment, news, sports and special events coverage to viewers even in the most remote areas of the African region. As an example of the benefits of the relationship, the hugely popular Big Brother Naija Reality Shows will be aired exclusively on the Multichoice DSTV platforms across Africa utilizing Azerspace-1's contribution coverage capacity to ingest the feeds into Multichoice's Command Centre throughout the year. The feeds are being uplinked in Nigeria and downlinked by both Multichoice and Globecast, the latter for redundancy.

LAUNCH / SPACE

mu Space Uncovered the Plan of Pushing Thai Technology into Space Industry

September 30, 2020 - mu Space revealed the space technology development plan after the press conference of MoU signing between TOT and muSpace for advancement of research and development in space industry. mu Space, led by Mr. James Varayuth Yenbamroong, a space and satellite industry entrepreneur and engineer revealed another space technology development plan, confirming the project to create the HTS (High Throughput Satellite). More than 40% of the materials inside the satellites are manufactured by mu Space and by domestic manufacturers using Thai technology. This satellite is expected to launch by 2024, another ambitious goal of mu Space is to become Thailand's first foreign satellite service provider, when an Open Skies policy occurs. The arrival of the low-orbit earth satellite or LEO satellite will be extremely beneficial and important for future communications systems. And it is also regarded as upgrading Thailand's communication technology to be effective in order to compete with other countries. In order to support new technologies such as 5G, Cloud storage, Online transactions, as well as security in doing business to be more complete, which makes mu Space a new alternative for Thai people, which can develop a working model in new directions. Able to meet the needs of the group of customers thoroughly while helping to make signal transmission more efficient and accessible to various areas. And the highlight of this launch is the plan to establish a spaceship or the first small space vehicle in Thailand. Behind this plan, there are various important goals to reach.

mu Space, TOT Sign MoU for Advancement in Satellite and Space Industry.

September 30, 2020 - mu Space and Advanced Technology Co., Ltd have consented to sign the MoU agreement this year and it is music to the ears of the organization. This agreement aims to focus on the advancement of satellite and space industry, notably the main attention is on the LEO Low Earth Orbit Satellite, including MEO Earth Orbit Satellite and GEO Geosynchronous Satellite which these elements are a primary concern for future communications. Significantly, to enhance Thai communication technology to have the ability to compete with other nations. When the arrival of the LEO Satellite including MEO Satellite and GEO Satellite have emerged, disseminated communications will be distributed to all territories such as a remote area where the signals tower cannot arrive. It implies that all individuals have access to the internet, and making it accessible to both education, knowledge, occupation and including other opportunities equitably. The notable mission of mu Space and TOT, which is mu Space is the technology developer and a cooperation partner, Blue Origin to send an extra enormous Payload that TOT improved incorporates a wide scope of electronic devices, and sensors for watching and estimating closely in microgravity. Other than the Payload of TOT, mu Space also delivers its own experimental equipment, including partner's which still remain confidential. Be that as it may, this will report to surprise the public after the effective and successful delivery is over, however the official announcement of the upcoming Blue Origin New Shepard flight in order to test the Payload is not yet declared. This is expected to be released by the fourth quarter of this year, and this is considered to be the first time of delivering the Payload in 2020 and the fourth ideal opportunity for mu Space. For the mission of mu Space, it intends to launch its own satellite by 2024. Moreover, set a goal for being a provider of foreign satellites in Thailand, after the 'Open Skies Agreement' of satellites takes place for example LEO Satellite, MEO Satellite and GEO Satellite. This can enhance Thai communications to advocate new innovations to be more complete such as 5G, Cloud storage, IoT etc.

SpaceX to Launch First Commercial Crew Rotation Mission to International Space Station

September 29, 2020 - NASA and SpaceX are beginning a regular cadence of missions with astronauts launching on an American rocket from American soil to the International Space Station as part of NASA's Commercial Crew Program. NASA's SpaceX Crew-1 is the first crew rotation mission with four astronauts flying on a commercial spacecraft, and the first including an international partner. NASA astronauts Michael Hopkins, Victor Glover, Shannon Walker, and Soichi Noguchi of the Japan Aerospace Exploration Agency (JAXA) are set to launch to the space station on SpaceX's Crew Dragon spacecraft and Falcon 9 rocket. The Crew-1 astronauts named the spacecraft Resilience, highlighting the dedication the teams involved with the mission have displayed and to demonstrate that when we work together, there is no limit to what we can achieve. They named it in honor of their families, colleagues, and fellow citizens. Launch is targeted for Saturday, Oct. 31, from Launch Complex 39A at NASA's Kennedy Space Center in Florida. The crew is scheduled for a long duration stay aboard the orbiting laboratory, conducting science and maintenance. The four astronauts are set to return in spring 2021.

ProXopS Enters Launch Agreement with Momentus

September 29, 2020 - Momentus and ProXopS announced today the execution of a launch agreement for several slots in Vigoride rideshare missions from Q4 2021 to 2023. The agreement includes the deployment of multiple satellites for the VariSat constellation. ProXopS has partnered with Momentus to deploy up to 24 VariSat satellites in Sun Synchronous Orbit starting in Q4 2021. VariSat will enable new and extremely robust data communications protocols to worldwide users and provide a hybrid network capable of surviving nuclear attacks on current DoD satellite assets. VariSat takes advantage of the diffractive/reflective properties of some part of the radiofrequency (RF) spectrum (1.7 MHz to 30 MHz) in the ionosphere. The Earth's ionosphere provides an "umbrella-like" ionospheric reflector that gives each satellite unprecedented over the horizon ground coverage. ProXopS was founded in Houston, TX by Julie and Chad Brinkley. ProXopS has three main divisions that are comprised of Engineering Services, Products and Research & Development. The ProXopS team focuses on applying their systems engineering and technology development expertise in the Aerospace & Defense, Biotechnology and Oil & Gas markets.

NanoAvionics Launches Second Satellite for Lacuna Space's Growing IoT Satellite Constellation

September 29, 2020 - NanoAvionics has announced the successful launch of another Lacuna Space IoT satellite, and a third one being ready for launch at a later date. Operational communications with the nanosatellite in low Earth orbit (LEO) were established shortly after the launch. For this latest mission, NanoAvionics partnered with Germany-based Exolaunch, which provided the deployer and launch services onboard a Soyuz-2 rocket. Despite the ongoing pandemic, NanoAvionics and Lacuna Space, both based at the UK's Harwell space cluster, managed to complete all the steps prior to launch, from contract signing to testing and integrating the payload into NanoAvionics' M3P nanosatellite bus, within eight months. The payload, developed and built by Lacuna Space, consists of an IoT (internet of things) Space Gateway, able to receive and share data from small, battery powered sensors even in remote areas on the ground or at sea with little or no connectivity. The mission has been part-funded and supported by the UK Space Agency and ESA.

Exolaunch Delivers 15 Small Satellites into Orbit on a Soyuz Rideshare Mission

September 28, 2020 - Exolaunch announced a successful launch of 15 commercial, governmental and scientific satellites for its customers from Europe, Canada, the UAE and the U.S. The Mission dubbed "Wanderlust," Desire to Travel, lifted off on September 28 at 11:20 UTC on a Soyuz-2 rocket, marking over 100 satellites deployed by the company. On this mission, Exolaunch provided comprehensive launch, deployment, mission management and integration services to Kepler Communications, Spire Global, the UAE Space Agency, Technische Universität Berlin, Würzburg Center for Telematics and two unnamed commercial customers. The company confirmed successful separation of three microsatellites weighing within 100 kg and 12 nanosatellites into a sun-synchronous orbit of 575 km. These smallsats have various missions, including IoT, Earth observation, airplane and ship tracking, radio occultation measurements, greenhouse gas monitoring, scientific experiments and new technology demonstration. Wanderlust is Exolaunch's eleventh rideshare mission in total and seventh mission with Soyuz. Exolaunch successfully utilized its proprietary flight-proven separation systems - CarboNIX the next generation shock-free separation system for microsatellites, upgraded modifications of EXOpod cubesat deployers, as well as its EXObox sequencers to flawlessly deploy its customers' satellites into the target orbit. With this launch, Exolaunch has flown 110 smallsats on multiple launch vehicles.

ArianeGroup to Deliver Key Propulsion System Components for the Orion Spacecraft for the Artemis III Moon Mission

September 28, 2020 - ArianeGroup has just signed several agreements with Airbus Defence and Space for the adaptation and construction of the third European Service Module (ESM) flight model for the Orion spacecraft. ArianeGroup will therefore: provide integration and testing services for the propulsion sub-system, as well as for certain parts of the thermal sub-system and the corresponding electronic sub-systems; deliver several major components of the propulsion sub-system: notably 24 attitude control engines, two high-pressure regulators, various fuel valves, four fuel tanks, and two highpressure helium tanks for pressurizing the fuel tanks in zero-gravity conditions; provide technical support during system integration and acceptance of the Orion spacecraft's ESM in the United States. Airbus DS is prime contractor on behalf of the European Space Agency (ESA) for the ESM service module, Europe's contribution to NASA's Orion MPCV (Multi-Purpose Crew Vehicle) spacecraft. The contracts were signed in August 2020. They follow on from the decision taken by the ESA Council at ministerial level in November 2019 to continue European participation in the NASA project. ArianeGroup has been involved in the Orion program since its beginning and has already supplied propulsion sub-system components for the first two flight models. The first service module has been delivered to NASA and the second is currently being assembled and tested at the ArianeGroup site in Bremen, Germany. Integration of the third service module will be starting shortly in Bremen.

JAXA and ANA Launch Joint Research on Remote Sensing Observation

September 28, 2020 - Japan Aerospace Exploration Agency (JAXA) and ANA HOLDINGS INC. (ANAHD) are launching a joint research on utilizing passenger aircraft for remote sensing observation of atmospheric components in city areas. Since 2009, JAXA has been monitoring the increase of the greenhouse gas on a global scale by Greenhouse Gases Observing Satellite "IBUKI" (GOSAT)*1. The greenhouse gas emissions from city areas are estimated to account for approximately 70 - 80% of anthropogenic CO2 emissions. However, achieving both observations on the amount of greenhouse gas emissions associated with human activities in the city and on a global scale is difficult for satellites. In this joint research, the carry-on luggage sized the observation instrument developed by JAXA applying space technology will be placed in the cabin of passenger aircraft operated by ANA. This instrument observes the detailed concentration distribution of the atmospheric components such as carbon dioxide and nitrogen dioxide while flying over cities. The purpose of this research is to understand the emission distribution in city areas according to emission sources such as traffics and industries by combining the data obtained by aircraft and satellites such as "IBUKI". First, we start this observation experiment flight between Tokyo (Haneda) and Fukuoka.

Axelspace and Gazprom Space Systems to Collaborate on Earth Observation Projects for Energy Industry

September 24, 2020 - Axelspace Corporation announces the signing of a MoU with Gazprom Space Systems (GSS) towards the common goal of empowering anyone with actionable Earth observation data to make more informed decisions. With the strong support from Mitsui & Co. LTD, and Mitsui & Co. Moscow LLC, Axelspace and GSS have signed this MoU to explore opportunities to deliver competitive remote sensing solutions especially to the energy industry by combining the satellite imagery data from Axelspace's AxelGlobe platform, powered by its proprietary microsatellite constellation "GRUS", and from "SMOTR" Earth Remote Sensing Space System (the SMOTR System), powered by SMOTR-V satellites. AxelGlobe is Axelspace's next-generation Earth observation platform, consisting of dozens of microsatellites named "GRUS". The first GRUS satellite was launched in December 2018, and its data has been delivered to a wide range of clients since May 2019. Its applications vary from agriculture to disaster monitoring, urban planning and land management. Axelspace is ready to launch 4 additional GRUS satellites soon, allowing for much higher revisit rate.

Testing Super Foods for Space and More on Blue Origin Suborbital Flight

September 23, 2020 - It's no surprise to most of us that regularly eating fresh produce is a great way to support a healthy diet. Fresh fruits and vegetables benefit astronauts on the International Space Station, too - and soon the Moon and beyond. Scientists are investigating sustainable ways to grow highly nutritious foods in microgravity, to give space explorers a readily available supply of daily greens. On an upcoming flight facilitated by the Flight Opportunities program, part of NASA's Space Technology Mission Directorate, Space Lab Technologies will test their microgravity LilyPond, a hydroponic chamber for growing edible aquatic plants in space. Along with several other technologies selected for testing, LilyPond will launch on Blue Origin's next New Shepard mission. The payloads will fly to space and experience several minutes of microgravity before returning to Earth, giving researchers valuable data about how

their technologies perform.

Pixxel Enters Service Agreement with Momentus for Second Satellite Launch

September 22, 2020 - Momentus and Pixxel today announced the execution of a service agreement for delivering Pixxel's second smallsat to SSO orbit in December 2021 onboard a SpaceX Falcon-9 launch, as well as options to fly again in 2022. Pixxel is building a constellation of cutting-edge earth imaging small satellites that can provide real-time remote sensing data across the world. The Momentus Shuttle Service will provide a rideshare for multiple Pixxel spacecraft to predefined orbits. Founded in 2019 by then 21 year olds, Awais Ahmed and Kshitij Khandelwal, Pixxel satellites will help make the world a more sustainable place through highly accurate data-based insights in agriculture, climate change, forestry and other domains. Pixxel recently raised a funding of \$5M, which the company is using to rapidly build and launch the second satellite with Momentus' help.

Maxar to Deliver Portable Satellite Imagery Ground Systems to U.S. Army

September 21, 2020 - Maxar Technologies announced that it has been selected by the U.S. Army Geospatial Center to deliver multiple highly portable, direct-downlink tactical ground systems that provide critical geospatial intelligence to users in remote locations. Maxar was awarded a sole-source, indefinite-delivery/indefinite-quantity (IDIQ) contract valued at up to \$49 million over eight years and two initial task orders worth a combined value of \$8 million. The system, called the U.S. Army Remote Ground Terminal (RGT), is easily transported by two people and can be set-up in about an hour. The RGT enables troops in remote locations to rapidly downlink, analyze and disseminate data from commercial Earth observation satellites to support military, humanitarian and disaster relief missions. The RGT system is based on Maxar's Tactical Architecture for Near-real-time Global Operations (TANGO) platform, the most portable ground system of its kind. The RGT downlinks data from a variety of commercial sources, including Maxar's high-resolution WorldView constellation, and is designed to be continuously upgraded with additional commercial electro-optical and synthetic aperture radar sources. The RGT comes with robust training for unit operators to enable self-sustained operations, and 24/7 field service available from Maxar. The U.S. Army plans to continue developing the RGT system, ultimately transitioning it to become the commercial imagery receive node for the U.S. Army's future Tactical Intelligence Targeting Access Node (TITAN). TITAN is a scalable intelligence ground station that will leverage sensors across multiple domains to provide rapid and accurate targeting data directly to U.S. Army fires networks.

Thales Alenia Space to Provide the IRIS Altimeter for the Copernicus CRISTAL Mission

September 21, 2020 - Thales Alenia Space has today signed a close to €88 million contract with Airbus Defence and Space, prime contractor of the satellite, to develop the two IRIS flight models (Interferometric Radar Altimeter for Ice and Snow) of the Copernicus polar Ice and Snow Topography ALtimeter (CRISTAL) mission. The CRISTAL mission is part of the expansion of the Copernicus Space Component programme of the European Space Agency, ESA, in partnership with the European Commission. The European Copernicus flagship programme provides Earth observation and in situ data and a broad range of services for environmental monitoring and protection, climate monitoring, natural disaster assessment to improve the quality of life of European citizens. The CRISTAL satellite will carry, for the first-time, a dual-frequency Ku/Ka bands radar altimeter to measure and monitor sea-ice thickness and overlying snow depth. Measurements of sea-ice thickness will support maritime operations and they will help in the planning of activities in the polar regions. IRIS will also measure and monitor changes in the height of ice sheets and glaciers around the world, thanks to its interferometric radar mode. IRIS will significantly improve the measurement accuracy of its predecessor SIRAL-2 (a Ku band only altimeter on board ESA's CryoSat-2 Earth Explorer mission) thanks to the dual frequency operation and by adding the measurement of sea surface height as part of the mission objectives. The CRISTAL global mission is essential to better understand and monitor Earth climate in a context of the rapid climate change.

Arianespace Announces the Resumption of OneWeb Constellation's Deployment

September 21, 2020 - Arianespace and OneWeb will resume launch operations to continue the deployment of the OneWeb constellation. The next Soyuz launch is planned as soon as December 2020 from the Vostochny Cosmodrome. Pursuant to an amended launch contract with OneWeb, the London-based communications company, Arianespace will perform 16 more Soyuz launches from three spaceports (Kourou, Baikonur and Vostochny) beginning in late 2020 and continuing through 2022. These launches will enable OneWeb to complete the deployment of its full global constellation of Low Earth Orbit satellites by the end of 2022. The next Soyuz flight is scheduled for December 2020 from Vostochny with 36 satellites on board. Arianespace has launched 74 OneWeb satellites to date. The initial six were

successfully orbited by Soyuz Flight VS21 from French Guiana on February, 2019. In February and March, 2020, Arianespace and its Starsem affiliate successfully launched 68 OneWeb satellites from Baikonur on Soyuz Flights ST27 and ST28. OneWeb's goal is to deliver global connectivity from a network of 650 low Earth orbit (LEO) satellites that will provide high-bandwidth, low latency communication services to regions previously unconnected. In addition to the satellites, OneWeb's global network will include gateway stations located around the world, and a range of user terminals will provide connectivity services for fixed and mobile communications. These terminals will be compatible with the future needs of the Internet of Things (IoT) and 5G.

Rocket Lab to Launch Commercial Earth-imaging Rideshare Mission for Planet, Canon Electronics

September 21, 2020 - Rocket Lab has today announced its next Electron launch will be a rideshare mission to low Earth orbit for Planet and Spaceflight Inc.'s customer Canon Electronics. The mission – named 'In Focus' in a nod to the Earth-imaging satellites onboard – will lift-off in October from Rocket Lab's private orbital launch site, Launch Complex 1, in New Zealand. The mission will deploy a total of 10 satellites to precise and individual orbits. The mission will be Rocket Lab's 15th launch overall and fifth mission of 2020, making Electron the second most-frequently launched United States orbital rocket this year. Earth-imaging company Planet has nine of their latest generation SuperDove satellites booked on the mission for deployment to a 500km morning-crossing Sun Synchronous Orbit (SSO). Each of the nine SuperDoves will be integrated with and deployed from Rocket Lab's Maxwell dispensers, the industry's lightest CubeSat dispenser in its class. Planet's Flock 4e' of SuperDoves will join the company's constellation of Earth-observation satellites already on orbit providing medium-resolution global coverage and near-daily revisit. The 10th and final payload aboard this mission, Canon Electronics Inc.'s CE-SAT-IIB, was arranged by satellite rideshare and mission management provider Spaceflight Inc. CE-SAT-IIB is a technical demonstration microsatellite developed by Canon Electronics Inc. It has a middle-size telescope equipped with an ultra-high sensitivity camera to take night images of the Earth and small size telescopes which are suitable for CubeSat use.

Chinese Startup to Replace Chemical Rocket with Electromagnetic Power to Launch Satellites

September 20, 2020 - Guangzhou-based company Guoyao Tech announced a roadmap to complete a prototype launch of 10 kg by 2022 and short-range tonnage launch by electromagnetic by 2023. The company is developing a novel launch system – based on electromagnetic technology that would essentially bring satellite and human into space. The company was founded in 2017 and emerged into the public eye in 2018 after acquiring seed funding and hired Dr Yadong Zhang as the Chief Technology Officer. In October 2019, after the company successfully completed the prototype electromagnetic launcher, it secured \$1.5 million in Series A funding. Guoyao is attempting to cut the cost of manned, low Earth orbit (LEO) launch to \$2.6 million per launch by 2025. It will be the only electromagnetic launch system that will be capable of sending human into orbit without the traditional use of chemical rockets. The operation is flexible and can allow multiple payloads per day into Low Earth orbit, which can fully meet the launching demand of future commercial and military satellites. The use of electromagnetic launch technology could eventually replace the first stage of rocket propulsion. The electromagnetic launch can be done without the need for staged propulsion, and can throw satellite directly into near-Earth orbit.

Intelsat Entrusts Arianespace for the Launch of Three C-band Satellites on Ariane 5 and Ariane 6

September 17, 2020 - Arianespace and Intelsat signed an agreement for two launches of three satellites, Galaxy 35, Galaxy 36 and Galaxy 37, on Ariane 5 and Ariane 6 launch vehicles. Arianespace will launch the Galaxy 35 and Galaxy 36 satellites together as a stacked pair in 2022, and Galaxy 37 in 2023. Both launches will be performed from Europe's Spaceport in South America aboard an Ariane 5 and Ariane 64 launch vehicle, respectively. All three satellites will operate in the upper portion of the C-band spectrum, a range of wireless radio frequencies that is used for critical telecommunications and data connectivity around the world. With this mission, Intelsat will meet the accelerated C-band spectrum clearing timelines established by the U.S. Federal Communications Commission (FCC) earlier this year, in order to make the lower portion of the C-band spectrum available to mobile network operators to further the rollout of critical 5G services. Maxar Technologies will build the three satellites, all using Maxar's industry-leading 1300-class platform, in its manufacturing facility in Palo Alto, California.

Maxar to Build Sixth Geostationary Communications Satellite for Intelsat in 2020

September 17, 2020 - Maxar Technologies announced it will build the Galaxy 37 geostationary communications satellite for Intelsat, operator of the world's largest integrated satellite and terrestrial network. Galaxy 37 is the sixth Intelsat geostationary communications satellite awarded to Maxar in 2020.

Galaxy 37 will join four previously ordered satellites from Maxar in helping Intelsat transition its existing media distribution and contribution services—uninterrupted—from the 3.7 to 4.0 gigahertz portion of the C-band, to the 4.0 to 4.2 gigahertz portion of the band, freeing up spectrum for 5G terrestrial wireless services. Galaxy 37 will be based on Maxar’s proven 1300-class spacecraft platform, which offers the flexibility and power for a broad range of customer missions. The satellite is scheduled for delivery in 2023. In addition to the five C-band satellites Intelsat has ordered from Maxar in 2020 to support their C-band spectrum transition, the company also contracted Maxar to manufacture its next-generation Intelsat 40e geostationary communications satellite.

NanoAvionics Enters India’s Space Market through Partnership with Ananth Technologies

September 17, 2020 - NanoAvionics has signed a partnership agreement with Ananth Technologies Ltd (ATL) which marks NanoAvionics’ entry into India’s growing NewSpace industry. The agreement makes Ananth Technologies the official distributor of NanoAvionics’ products and services in India, giving companies one stop access to cost effective small, micro and nano satellites including subsystems. The local access will save them time and cost for assembly, integration and test of at Ananth’s facilities in Hyderabad and Bengaluru. Customers will also have access to low cost launch service, using ISRO’s Polar Satellite Launch Vehicle (PSLV), and post launch operation services. In addition, this partnership between NanoAvionics and Ananth Technologies is going to foster relationships with Indian research institutions and suppliers. NanoAvionics and Ananth Technology will work together to meet India’s demand for small satellites with the flight-proven NanoAvionics nanosatellite buses and their subsystems. NanoAvionics’ standardized nanosatellite buses satisfy the requirements for a wide range of small satellite applications thanks to their regular connectivity, powerful and reliable hardware, up to 14U of payload volume and integrated propulsion system. NanoAvionics’s designs provide functions for nanosatellites that once required much larger spacecraft.

Vulcain2.1 Engine for the First Ariane 6 Declared Ready for Flight

September 17, 2020 - On July 21 last, the Vulcain®2.1 engine for the first Ariane 6 flight passed its acceptance test at ArianeGroup’s Vernon (France) site. This test is the final step after manufacture, assembly, and the range of tests an engine undergoes before being integrated with the rocket stage – for Vulcain 2.1, the Ariane 6 core stage. This integration procedure will be carried out at the ArianeGroup site at Les Mureaux, near Paris. You can see the test in impressive action in the video (below). It was carried out on the PF50 testbench at the Vernon site, where the liquid propulsion engines for the entire Ariane launcher family are all assembled. For this test, the engine and the testbench were fitted with an array of sensors to take a range of specific environment characterization measurements, in order to predict levels that will be observed on the launch pad in Kourou (French Guiana), notably during the combined tests planned for 2021. The cryogenic Vulcain®2.1 engine delivers 135 metric tons of thrust in a vacuum. It will power Ariane 6 for the first eight minutes of flight, alongside the lateral boosters, which will operate for about 130 seconds – together these two propulsion systems provide a total lift-off thrust of 816 metric tons (in the two-booster A62 configuration).

Equatorial Space Signs MoU with Space Development Nexus

September 15, 2020 - Singapore’s launcher startup, Equatorial Space Systems, signs an memorandum of understanding with India’s Space Development Nexus-SDNx, for suborbital launch services using the company’s Dorado rocket. The MOU is the first foray of Equatorial Space into the Indian market, and involves extensive collaboration in providing responsive, suborbital launch operations to academic and research groups in the country. With its standardized payload module, the Dorado vehicle will provide cost-effective and frequent testing opportunities for a variety of users starting 2021. Space Development Nexus - SDNx is creating multiple Space Education and Research Centers in Educational Institutions across the globe to create an experiential learning ecosystem for the students in the Field of Aerospace, Aviation, and Automation. These Space Education and Research Centers will engage students in research and development of unique projects like Nano-Satellites, Sounding Rockets, Interplanetary Rover etc. to create skilled and eligible space ready workforce of tomorrow. Equatorial Space Systems aims to revolutionize space launch operations by devising a rocket which is safe, simple, and affordable using the company’s proprietary hybrid propulsion technology. The company’s inaugural suborbital launch of the Dorado sounding rocket is slated for the first half of 2021.

Thales Alenia Space to Provide Key Technology to HERA, ESA’s Planetary Defence Mission

September 15, 2020 - Thales Alenia Space has been selected by OHB, prime contractor, and the European Space Agency (ESA), to provide the Communications system as well as the Power Conditioning and

Distribution Unit (PCDU) for the HERA mission. Named after the Greek goddess of marriage, HERA, European contribution to AIDA international cooperation (Asteroid Impact & Deflection Assessment, HERA, the first planetary defence mission of humanity), aims to find out if we are capable of deflecting an asteroid and prevent it from hitting Earth. AIDA consists of two missions, NASA's Double Asteroid Redirection Test (DART), a kinetic impactor designed to deviate the orbit of the smaller of the two Didymos asteroids, and ESA's HERA inspector spacecraft, that will rendez-vous the Didymos target asteroid about 4 years after the DART impact. HERA, scheduled for launch in 2024, will travel for the first time in history to explore a binary asteroid system.

Exolaunch to Deliver the NetSat Constellation into Orbit for Würzburg Center for Telematics

September 15, 2020 - The Würzburg Center for Telematics, an independent research center in Germany, and Exolaunch, a rideshare launch and deployment solutions provider, announce a launch agreement for a NetSat nanosatellite formation. Under the launch agreement, Exolaunch will coordinate all launcher related activities, including satellite shipment to launch site, integration, and deployment services to the Würzburg Center for Telematics' satellites on a Soyuz-2 rideshare mission scheduled for launch on September 28th, 2020. NetSat is composed of four 3U cubesats that will pioneer research in formation control. It is set to demonstrate the self-organization of several satellites in three-dimensional space to jointly optimize the configuration for given tasks. This will then open up innovative perspectives for future sensor networks in space, including systems for three-dimensional imaging of the Earth's surface and computer tomography methods for looking inside clouds. All four satellites will be deployed into orbit with the 12U EXOpod, Exolaunch's cubesat deployer that has delivered 80 cubesats into orbit to date. The satellites have been successfully integrated into the EXOpod at Exolaunch facilities in Berlin, Germany, and made their way to the launch site for integration with the Fregat upper stage.

Equatorial Space Systems Partners with Commercial Space Technologies to Launch Volans

September 11, 2020 - Singapore's own rocket company, Equatorial Space Systems (ESS) announces a new partnership with UK-based Commercial Space Technologies Ltd (CST) for launch services to CST's clients using the company's Volans small launcher, slated for its first flight in late 2022. Commercial Space Technologies Ltd. has been supporting the space industry with consultancy, trade and launch brokerage services since 1983. To date CST has arranged and managed the launch of 82 satellites on 19 separate launches. This experience extends to 5 different vehicles, operated from 4 different launch sites. Equatorial Space Systems aims to revolutionise space launch operations with a launcher safer, simpler and more affordable than incumbents, by using the company's proprietary hybrid propulsion technology. The company's inaugural suborbital launch of the Dorado sounding rocket is slated for the first half of 2021.

Momentum Announces Service Agreement with LunaSonde's Gossamer

September 10, 2020 - Momentum and LunaSonde, a radar satellite remote sensing startup that provides subsurface imaging from space, today announced a launch service agreement to fly a demo Cubesat (Gossamer) to SSO orbit in Q1 2021, with further options to fly a constellation of 3U Cubesats to SSO in the future. LunaSonde's vision is to fundamentally change the way we see our planet and its resources. The company pioneered a technology that allows small satellites to essentially take an MRI scan of planet Earth. This technology combined with advanced algorithms enables direct imaging to identify valuable underground resources such as water, petroleum, and mineral deposits. Prior to founding LunaSonde, Pate worked on several research projects outside of the space sector, drawing international recognition for reversing Parkinson's Disease in a laboratory setting twice. He developed and patented AMELIA, a machine learning-based aircraft safety system, and led a team who successfully created a low-cost fusion reactor to generate medical isotopes. Asteroid 34104 Jeremiah Pate was named in honor of Pate's research.

Rocket Lab Granted FAA Launch Operator License for Missions from Launch Complex 2

September 10, 2020 - Rocket Lab, a space systems company and global leader in dedicated small satellite launch, has been granted a five-year Launch Operator License by the Federal Aviation Administration (FAA) for Electron missions from Rocket Lab Launch Complex 2. The Launch Operator License allows for multiple launches of the Electron launch vehicle from Rocket Lab Launch Complex 2, eliminating the need to obtain individual, launch-specific licenses for every mission and helping to streamline the path to orbit and enable responsive space access from U.S. soil. Located at the Mid-Atlantic Regional Spaceport within the NASA's Wallops Flight Facility on Wallops Island, Virginia, Launch Complex 2 has been designed to provide responsive launch capability to support for U.S. government missions. Between Launch Complex 2 in Virginia and Launch Complex 1 in New Zealand, Rocket Lab can support up to 130 launches each year across a range of orbital inclinations.

Gilmour Space to Launch Space Machines Company Spacecraft on First Eris Rocket

September 9, 2020 - Gilmour Space Technologies has secured the first Australian customer for its maiden Eris rocket launch in 2022. Space Machines Company has contracted to launch a 35-kilogram spacecraft to orbit, the largest payload announced to date by an Australian space company. Gilmour Space Technologies is a venture-funded Australian rocket company that is developing new hybrid propulsion rockets for more affordable and reliable small satellite launches into low earth orbits from 2022. Space Machines Company is an Australian startup developing space transportation capabilities to cost-effectively insert small satellites into desired LEO, GEO and Cis-Lunar orbits, and provide essential sovereign capabilities for Australia's future space requirements.

D-Orbit Launches its First ION Satellite Carrier

September 8, 2020 - D-Orbit has delivered its first ION Satellite Carrier and successfully tested the orbital transport system. The maiden flight of ION had to be scrapped in March because of the Covid-19 pandemic outbreak and again in August due to persistent adverse weather conditions. Finally, on September 3 at 3:51:10 a.m. (CEST), ION SVC LUCAS lifted off from the Vega Launch Complex in Kourou, French Guiana aboard an Arianespace Vega rocket on the VV16 Small Spacecraft Mission Service Proof of Concept Flight. The rocket placed ION in a Sun-Synchronous orbit at approximately 515 km with the satellite separating correctly from the dispenser at 4:43:45 a.m. In the coming weeks, ION will carry out its mission, named Origin, by deploying a flock of 12 Planet SuperDoves satellites, performing in-orbit demonstration/validation of dedicated payloads, and testing the onboard propulsion module. D-Orbit engineering and manufacturing teams are now performing a series of tests on the spacecraft and preparing for a second launch scheduled for late December 2020 atop a Falcon 9 rocket. The goal is to test advanced orbital maneuvers which will increase the satellite deployment precision of the ION Satellite Carrier.

Exolaunch to Deliver SALSAT into Orbit for the Technische Universität Berlin

September 8, 2020 - The Technische Universität Berlin, a leading German university specializing in space engineering, and Exolaunch have announced a launch agreement for the SALSAT nanosatellite. Under the launch agreement, Exolaunch is providing launch, mission management, and integration services for the Technische Universität Berlin on a Soyuz-2 rideshare mission later this month. SALSAT (Spectrum Analysis Satellite), aims to analyze the global spectrum use of S-band and VHF, UHF amateur radio bands. This analysis is required due to the increasing number of users and the intensification of radio communication, which is leading to an escalating probability of interference between radio signals. It will analyze the global spectrum usage with SALSAT, a spectrum analyzer payload based on a Software Defined Radio.

China Launches New Optical Remote-sensing Satellite

September 7, 2020 - China launched a new optical remote-sensing satellite from the Taiyuan Satellite Launch Center in northern Shanxi Province. The Gaofen-11 02 satellite was launched by a Long March-4B rocket at 1:57 p.m. (Beijing Time), according to the center. It was the 345th flight mission by a Long March carrier rocket. Gaofen-11 02 has a resolution up to the sub-meter level. It will be mainly used for land surveys, city planning, land rights confirmation, road network design, crop yield estimation and disaster prevention and mitigation. The newly launched satellite will also offer information support for the Belt and Road construction. Together with the Gaofen-11 01 satellite, which was launched in 2018, Gaofen-11 02 will form an in-orbit network to improve the country's satellite observation efficiency. The Long March-4B is a three-stage liquid-fueled rocket developed by the Shanghai Academy of Spaceflight Technology, affiliated to the China Aerospace Science and Technology Corporation. It has the ability to launch single and multiple satellites with different orbital requirements.

China Plans to Launch 12 IoT Satellites in 2021

September 7, 2020 - China will see intensive satellite launches for the country's space-based Internet-of-Things (IoT) network in 2021, sources with the China Aerospace Science and Industry Corporation (CASIC) said. The CASIC is scheduled to launch 12 satellites of the Xingyun project, China's first low-Earth-orbit narrowband constellation for IoT operated by its subsidiary Xingyun Satellite Co. The company plans to send a total of 80 satellites into space to complete the three-stage network around 2023. The first stage of the project was completed after two satellites Xingyun-2 01 and 02 entered their orbits in May this year. The satellites utilize inter-satellite laser links, which enable them to communicate over long distances and hence upgrade the real-time performance of communication services. The second stage will see 12 satellites launched next year, further improving the project's global service capability, said the CASIC. The

space-based IoT will have wide coverage and allow easy connection in all weathers and multiple fields. According to engineers, the Xingyun project is anticipated to solve IoT businesses' communication blind spots born from the deficient coverage of cellular wireless communication networks.

Vega Return to Flight Proves New Rideshare Service Qualified by ESA

September 4, 2020 - Vega's return to flight today proves new launch service capabilities on an ESA-developed launch vehicle while ensuring continuity of Europe's guaranteed and independent access to space. This flight marks the fast and efficient completion of corrective measures and actions carried out by industry with ESA in the lead as the Vega Launch System Qualification Authority, following recommendations made by the Independent Inquiry Commission which analysed the failure of Vega flight VV15 on 10 July 2019. This is a proof-of-concept flight operated by Arianespace as part of ESA's Light satellites, Low cost, Launch opportunities (LLL) initiative, decided by the ESA Council at Ministerial level in 2016, to prepare the way for routine services for light satellites using the European launch vehicles Vega/Vega-C and Ariane 6.

Thales Alenia Space to Start Work on Indonesia's SATTRIA Telecoms Satellite

September 3, 2020 - Satelit Nusantara Tiga (SNT) and Thales Alenia Space, Joint Venture between Thales (67%) and Leonardo (33%), announce the signature of a Preliminary Work Agreement to start the activities of the broadband telecommunication satellite SATTRIA. Thales Alenia Space, acting as prime contractor for this program, initially signed on July 2019 for a consortium led by the domestic satellite operator Pasifik Satelit Nusantara (PSN) on behalf of Indonesia's Ministry of Communication and Information Technology (Kominfo), will deliver the High Throughput Satellite (HTS) based on its Spacebus NEO full electric platform and fitted with a fifth-generation digital processor (5G). The company will also be in charge to provide two satellite control centers (main and backup), the telecommand and telemetry stations, and the ground mission segment linked to the fully processed payload. In addition, Thales Alenia Space will put in place a complete training program for PSN engineers, where part of them will join the project team as residents in Cannes and Toulouse during the duration of the program. The full Ka-band SATTRIA satellite, to be positioned at 146°E, will carry more than 150 gigabits per second over the full Indonesian territory. Dedicated to narrow the digital divide, SATTRIA has the ambition to connect around 145,000 areas including 90,000 schools, 40,000 hospitals and public buildings as well as regional government sites not linked by existing satellite or terrestrial infrastructure. The satellite will contribute to the digital infrastructure developments in Indonesia.

Satellogic launches 11th satellite to Low-Earth Orbit

September 3, 2020 - Satellogic today announced the launch of a new spacecraft from the Guiana Space Center via a launch procured by Spaceflight, Inc. The satellite, a NewSat Mark IV, was delivered to a sun-synchronous low-Earth orbit on a Vega rocket from Arianespace at 1:51am UTC on September 3, 2020. The spacecraft is named "Hypatia" after the philosopher, astronomer, and mathematician who lived in Alexandria and was a symbol of learning and science. She was renowned in her own lifetime as a great teacher and a wise counselor and became seen as an icon for women's rights and a precursor to the feminist movement. In line with Satellogic's NewSats already in orbit, Hypatia is equipped with sub-meter multispectral and 30-meter hyperspectral cameras. This NewSat Mark IV is also equipped with new technologies in service of Satellogic's research and development of Earth-observation capabilities. Upon successful commissioning, these new capabilities will be available to existing Satellogic customers. The launch demonstrates Satellogic's ability to adapt its satellites to different rockets and deployment systems. This mission will also allow Satellogic to test sub-meter imaging technology. Satellogic's current constellation remaps the planet at high resolution, which combined with Satellogic's low-cost offering, has opened up applications for its customers across industries. Through the refinement of sub-meter imaging, the company plans to further drive down the cost of high-frequency geospatial analytics.

Kepler Announces Successful Launch of Third Satellite

September 3, 2020 - Kepler's Low Earth Orbit constellation expanded earlier today with the successful launch of its third satellite. This satellite, internally referred to as TARS, was launched onboard the Arianespace Vega SSMS (Small Spacecraft Mission Service) from the Guiana Space Centre at approximately 01:51 UTC, with communication established shortly thereafter. Developed as part of the UK's Satellite Applications Catapult's In-Orbit Demonstration (IOD) programme, IOD-5 TARS is the final pathfinding satellite launched by Kepler ahead of the deployment of their GEN1 satellites set to launch in the coming months. The satellite bus and integration work was completed in partnership with AAC Clyde Space at their facility in Scotland, with launch services provided by Innovative Space Logistics B.V (ISL). The

satellite joins Kepler's two other satellites, both launched in 2018, and will bring additional capacity to Kepler's Global Data Services (GDS) data backhaul offering. This capacity will enable Kepler to increase the service level of GDS for existing users as well as add new users who have been awaiting the service.

Rocket Lab Launches First In-House Designed & Built Photon Satellite

September 3, 2020 - Space systems company Rocket Lab has launched its first in-house designed and built operational satellite, cementing the company's evolution from a launch provider to an end-to-end space solutions company that offers turnkey satellites and spacecraft components, launch, and on-orbit operations. The satellite, named 'First Light', is the first spacecraft from Rocket Lab's family of configurable Photon satellites to be deployed to orbit. Launched as a technology demonstration, 'First Light' builds upon the existing capabilities of the Electron launch vehicle's Kick Stage with additional subsystems to enable long duration satellite operations. This pathfinding mission is an initial demonstration of the new power management, thermal control and attitude control subsystem capabilities. By testing these systems for an extended period on orbit, Rocket Lab is building up flight heritage for future Photon satellite missions planned to low Earth orbit, the Moon, and Venus.

Arianespace Successfully Performs the First European Mission to Launch Multiple Small Satellites

September 2, 2020 - Arianespace's light-lift Vega launcher performed its 15th successful mission, marking its return to flight. The satellites onboard VV16 are in two categories: seven primary micro-satellites with a mass of 25 to 145 kg.; and 46 nano-satellites with a mass of 250 g. to 7 kg. The first seven satellites were released between the mission's 40th and 52nd minute, while the remaining 46 were deployed during a sequence of less than three minutes, occurring 1 hour, 42 minutes after liftoff. Among these 53 satellites, certain spacecraft will be dedicated to Earth observation, with innovative projects such as GHGSAT-C1, a Canadian satellite at the service of air quality; or ION Satellite Carrier Lucas for the Planet company. OSM-1 CICERO is the first satellite from Orbital Solutions Monaco, a Monegasque start-up; while ESAIL is the first commercial microsatellite developed under the European Space Agency's SAT-AIS program for tracking ships. Several experimental satellites also were on board Vega, such as TARS from the Kepler company, which is dedicated to the Internet of Things; as well as the 14 satellites from Swarm Technology, an American start-up whose mission is the use of artificial intelligence in robots and computers. With the demonstration of its new SSMS service, Arianespace is strengthening its position in the growing market for small satellites. This service will soon be supplemented by the MLS (Multi Launch Service) – a similar offer available on Ariane 6, allowing Arianespace to increase the number of affordable launch opportunities for small satellites and constellations.

Lockheed Martin to Build 10 Small Satellite Mesh Network in Two Years

September 1, 2020 - The Space Development Agency (SDA) awarded a Tranche 0 contract of the Space Transport Layer to Lockheed Martin to demonstrate a mesh network of 10 small satellites that links terrestrial warfighting domains to space sensors – all launching in just two years. The \$187.5-million contract for Transport Layer's Tranche 0 is an initial test and demonstration phase, with two prime contractors building a total of 20 satellites. The first step toward building an interoperable, connected secure mesh network, it will help enable Joint All-Domain Operations, allowing warfighters to stay ahead of emerging threats. By linking nodes together, seamless connectivity is created between all domains, much like today's smartphones. The 10 satellites, operating in Low Earth Orbit, will provide secure high-bandwidth, low-latency data links. Additionally, new Link 16 network connectivity will be introduced to space. This capability will connect to systems that include fighter aircraft like F-16, F-22, and F-35, missile defense networks like PAC-3 and THAAD, weapons systems, and Integrated Air and Missile Defense (IAMD) networks, and will provide sensor-to-shooter targeting and situational awareness for tactical land and maritime warfighters.

EXECUTIVE MOVES

XTAR Appoints Michael A. Assid as Vice President of Sales and Marketing

September 30, 2020 - XTAR, LLC announced the appointment of Michael A. Assid as its new Vice President of Sales and Marketing. Prior to joining the XTAR team, Mike served in numerous leadership roles at Headquarters, Air Force Space Command (AFSPC) and Headquarters, U.S. Space Force. He continues to serve as a Colonel in the U.S. Air Force Reserve, currently assigned as the Senior Individual Mobilization Augmentee to the Commander, Space Training and Readiness Command (STARCOM) at Headquarters, U.S. Space Force. In his new role at XTAR, Mr. Assid will set strategy for all domestic and international sales, business development and marketing activities within the organization.

Momentum Appoints Jikun Kim as Chief Financial Officer

September 28, 2020 - Momentum Inc., a commercial space company offering in-space satellite transportation and infrastructure services, today announced the appointment of Jikun Kim as Chief Financial Officer, effective September 28, 2020. Mr. Kim's appointment comes as Momentum prepares for the first commercial launch of Vigoride, the Company's orbital transfer vehicle designed for last mile, in-space satellite transportation services. Vigoride is scheduled to launch on a SpaceX Falcon 9 rocket in December 2020. The launch marks the first time Momentum's vehicles will carry customers, following a successful in-space test of Momentum's groundbreaking water propulsion technology. Kim brings with him an extensive background in corporate finance, treasury, financial planning and analysis, tax, strategic planning and risk management along with experience in leading the finance function of businesses transforming and leading industries. Kim most recently served as Chief Financial Officer of Formlabs, a leading designer and manufacturer of 3D printing systems. Prior to that, he served as Chief Financial Officer of EMCORE Corporation (Nasdaq: EMKR), a publicly traded advanced fiber optic company focused on the aerospace and defense industries. Mr. Kim has held senior leadership roles at a variety of aerospace and defense companies, including as Chief Financial Officer of Merex Group, AeroVironment, and Raytheon Vision Systems.

Globecast Announces Antoine Guilbaud as CFO

September 23, 2020 - Globecast has announced Antoine Guilbaud as Chief Financial Officer, effective from September 1st. He replaces Nathalie Krick, who is taking up a new role in Globecast's sister company, Orange Cyberdefense. Guilbaud's duties include providing the CEO and management board with financial and management information to ensure proper driving of the business and to oversee the implementation of the company's financial goals and ambitions. He's also responsible for finance, budget and strategic planning, and global purchase activities. Guilbaud brings to his new position over 20 years of experience in the telecom industry. As former CFO and General Secretary at BuyIn - the joint venture between Orange and DT providing strategic procurement - Guilbaud was in charge of finance, IT, legal and compliance, as well as procurement engineering. Prior to this, he was the CFO/Deputy CEO at Orange Slovakia, where he was a member of the company's Executive Management and Board of Directors. He also worked as Finance Director at Orange Belgium.

Momentum Announces Appointment of Dr. Fred Kennedy as President

September 15, 2020 - Momentum Inc. announced the appointment of Dr. Fred Kennedy as President of the Company, effective September 14, 2020. Momentum has gained significant traction since its founding in 2017, attracting dozens of customers ranging from private commercial space companies to the likes of Lockheed Martin and NASA, and penning important industry partnerships, most notably with SpaceX. Dr. Kennedy's significant experience within the industry will help accelerate Momentum's goal of becoming the leading transportation and infrastructure services company of the new space economy. Dr. Kennedy most recently served as the inaugural Director of the Space Development Agency (SDA), a U.S. Department of Defense agency responsible for developing threat-driven space architectures to sustain the U.S.'s technological advantage in space. Prior to that, he led the Tactical Technology Office (TTO) of the Defense Advanced Research Projects Agency (DARPA). Before joining DARPA, Dr. Kennedy served as the senior policy advisor for the White House Office of Science and Technology Policy (OSTP), advising the President of the United States on space and aviation policy. Dr. Kennedy retired as a colonel from the U.S. Air Force after 23 years of service, filling multiple senior roles related to spacecraft technology demonstration and satellite system production.

KebNi Appoints Ronald van der Breggen

September 10, 2020 - Established and high-quality antenna manufacturer KebNi increases its focus on solutions for Low Earth Orbit (LEO) satellite constellations. KebNi AB focused on becoming a leading supplier of antenna solutions, servicing international government and commercial markets has announced the appointment of Ronald van der Breggen as special advisor to the CEO. In this role Ronald will help develop KebNi's winning strategy for the large opportunity that the future LEO satellite services represent. Ronald brings over 25 years of telecommunication and satellite experience, which includes working for several of the most prominent satellite operators, the last five years of which has been exclusively for LEO operators, most notably LeoSat, in the areas of strategic and commercial planning and sales management.

REPORTS

WTA Releases “New Antennas, New Opportunities” Report

September 24, 2020 - The World Teleport Association (WTA) released *New Antennas, New Opportunities*, a new research report that takes an in-depth look at the development of a new generation of flat panel antennas (FPAs) from the point of view of teleport operators who must determine where, if anywhere, it fits in their operations today or tomorrow.

NSR Report: \$68B Opportunity for Top 5 Non-GEO HTS Constellation Players

September 22, 2020 - NSR's latest *HTS Satellite Constellations: A Critical Assessment, 3rd Edition* report deep dives into satcom feasibility for MEO and LEO orbits within a competitive scope of 5 players who lead the race to launch and showcase business viability. The report is a must-have for any player evaluating the LEO/MEO constellations market: end users, service providers, financiers, suppliers, competitors and governments across all regions. The report bases the analysis on goal-based IRR's for each constellation to deduce necessary demand and revenue segments in order to close the business case. The report also depicts risk within each segment to objectively analyze each constellation on the basis of Architectural, CAPEX, and Competitive Strengths.

NSR Releases Flat Panel Satellite Antennas, 5th Edition

September 9, 2020 - NSR's *Flat Panel Satellite Antennas, 5th Edition (FPA5)*, is the ONLY resource detailing the market progress and opportunity for low-profile satcom antennas. This market includes mechanically- and electronically-steered, typically phased array antennas, which are seen as critical for NGSO constellations and supplementary for the development of next-generation terminals. This report provides an update on the business and technological development of FPA equipment, and of each manufacturer, as well as an assessment of current and forecasted opportunities for shipped equipment in all applicable verticals and regions. NSR's FPA5 report is segmented by two core applications, Broadband Mobility and Fixed Applications. Mobility is further categorized by three vertical markets: Aeronautical, Maritime, and Land-mobile, for both commercial and government players, while Fixed Applications includes Broadband (Consumer and Enterprise) and Backhaul.

COVID-19 Shakes Up In-Flight Connectivity Industry

September 9, 2020 - In its latest research, *Prospects for In-Flight Entertainment and Connectivity*, Euroconsult provides a strategic review of the market reset resulting from the COVID-19 pandemic and its significant impact on the aviation industry. In-Flight Connectivity (IFC) has been a key driver for the entire ecosystem and constituted a \$1.4 billion market in 2019. Current restrictions on travel and health concerns, however, are expected to decrease service revenues by 20-30 percent in 2020. The research found that roughly 9,200 aircraft were equipped to provide in-flight connectivity worldwide at the end of 2019. Despite the COVID-19 crisis, that number is projected to increase to between 15,000 and 18,000 aircraft by 2029. Almost 110 airlines provide connectivity with the largest market in North America where only a few remaining aircraft are yet to be connected. The European market is gaining maturity in terms of penetration with the biggest airlines currently committed to an IFC solution. India could be a growth market for IFC as its regulatory environment changes following the recent grant of licenses authorizing IFC. Euroconsult's findings are based on in-depth analysis with a focus on the strategic issues, technologies and services that are driving the industry. The research reviews prospects for both the commercial airline market as well as the business aviation market with facts and figures for year-end 2019 and projections for 2020 to 2029. It also includes an assessment of the Smart Plane concept and breaks down the value chain by network operators, service providers and equipment manufacturers.

UPCOMING EVENTS

APSCC 2020 Conference Series, August 18 - November 25, <https://apccsat.com>
LIVE Every Wednesday 9AM HKI Singapore Time from August 18 to November 17

CyberSatGov, October 6-9, Virtual Edition, www.CyberSatSummit.com

Future of Video India, October 10, Virtual Edition, https://avia.org/all_events/the-future-of-video-india-2020/

IAC 2020, October 12-14, Virtual Edition, <http://www.iafastro.org/events/iac/iac-2020/>

CABSAT 2020, November 9-10, Virtual Edition, www.cabsat.com

CABSAT now in its 26th edition presents SATEXPO, the only platform in the MEASA region bringing senior buyers in sat-comms, tech and business solutions together for 3 days under one roof. SATEXPO represents the entire ecosystem of satellite carriers, manufacturers, service providers and integrators serving government and military.

Asia Video Summit 2020, November 9-11, Singapore, <https://asiavideosummit.com/>

World Satellite Business Week, November 9-12, Paris, France, <http://www.satellite-business.com/en>

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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.