

Commercial Liaison Report – March 7, 2023

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KEYSIGHT TECHNOLOGIES, INC.

Agenda

- Industry News & Updates
- Technology Trends

Ukraine War

Impact on Aerospace & Defense



The US has committed over \$27 billion in weapons aid to Ukraine since the start of the conflict a year ago. Military and defense industry representatives are now questioning whether this has depleted the US stockpile and how long it might take to replenish.

Military Spending Surges

Dec 18, 2022 - Congress is on track to give final approval to a national military budget for the current fiscal year that is expected to reach approximately \$858 billion — or \$45 billion above what President Biden had requested.

If approved, the Pentagon budget will have grown at 4.3 percent per year over the last two years — even after inflation — compared with an average of less than 1 percent a year in real dollars between 2015 and 2021. Spending on procurement would rise sharply next year, including a 55% jump in Army funding to buy new missiles and a 47% jump for the Navy's weapons purchases.

The latest defense budget also shows a 16% increase in the DoD's FY23 RDT&E budget — to ~\$144 billion.

Source: [NYTimes](https://www.nytimes.com)

Mergers & Acquisitions

Emerson Proposes to Acquire NI

- January 17, 2023 - Emerson announced a proposal to acquire National Instruments (NI) for \$53 per share in cash at an implied enterprise value of \$7.6 billion
- January 23, 2023 - Emerson today issued the following statement regarding its all-cash proposal to acquire National Instruments for \$53 per share

Emerson is committed to an acquisition of NI. We believe our premium all-cash proposal at \$53 a share, with no financing conditions or anticipated regulatory concerns, is compelling and in the best interest of Emerson and NI shareholders.



Source: [prnewswire](#)

Industry News

Test Solutions

November 9, 2022 – NI today announced its most versatile and capable Vector Signal Transceiver (VST), the 3rd generation PXIe-5842

- 50Mhz – 23Ghz frequency range
- 2Ghz instantaneous bandwidth
- Excellent phase noise + support of high bandwidth recording of RF signals
- PXI form-factor, up to four VSTs in one 18-slot PXIe chassis
- Applications include radar, SATCOM, and Electronic Warfare system test



Source: [NI](#)

February 7, 2023 – Anritsu Company introduces the Field Master™ MS2070A handheld spectrum analyzers for General-Purpose RF Testing Applications

- Economical solution for a variety of general-purpose field, lab, and manufacturing applications
- Battery-powered, ruggedized package measuring 11 ½" x 8 ½ x 4", 8.5 lbs [3.8kg]
- Frequencies up to 3Ghz
- Measurements include occupied bandwidth (OBW), channel power, & adjacent channel power (ACP)



Source: [Anritsu](#)

Significant capability in low-cost, small form-factor packages

Industry News

Collaborations

February 27th, 2023 – Keysight signs MoU with Analog Devices to advance 6G technology design and development

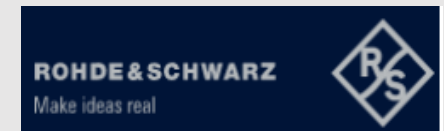
- The companies will build upon collaborations in 5G open radio access network (O-RAN) and phased array antenna technology to develop solutions in technology areas critical to future 6G networks
- Demonstrated massive multiple-input multiple-output (mMIMO) antenna design prototypes and associated test solutions at Mobile World Congress 2023



Source: [Keysight](#)

February 27th, 2023 – Rohde & Schwarz collaborates with Qualcomm and Iridium Communications to test Snapdragon Satellite

- R&S CMW100 communications manufacturing test set has been chosen by Qualcomm and Iridium to verify the Snapdragon Satellite solution
- Snapdragon will allow future smartphones to offer global connectivity via satellite, supporting two-way messaging applications in remote, rural and offshore locations



Source: [Rohde & Schwarz](#)

Cellular & Satellite Communications

Electrified and Autonomous Platforms

Urban Air Mobility

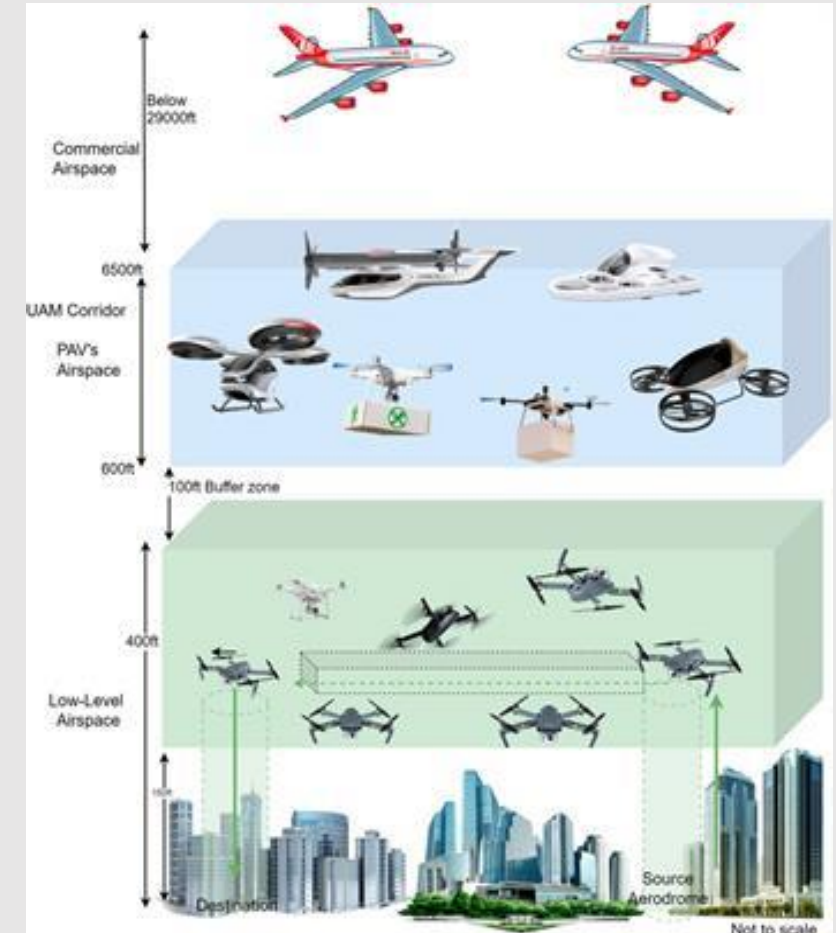
Airborne transportation system using small electric aircraft for air taxi and cargo transportation services

- Alternative to ground transportation in urban/suburban areas

Relies heavily on Electric Vertical Take-Off & Landing vehicles (eVTOLs)

- Ability of eVTOLs to take-off and land vertically offers advantages in urban environments
- Their electric propulsion allows for zero in-flight emissions and much quieter operations

In the US, NASA and FAA are leading efforts to define this new mode of transportation

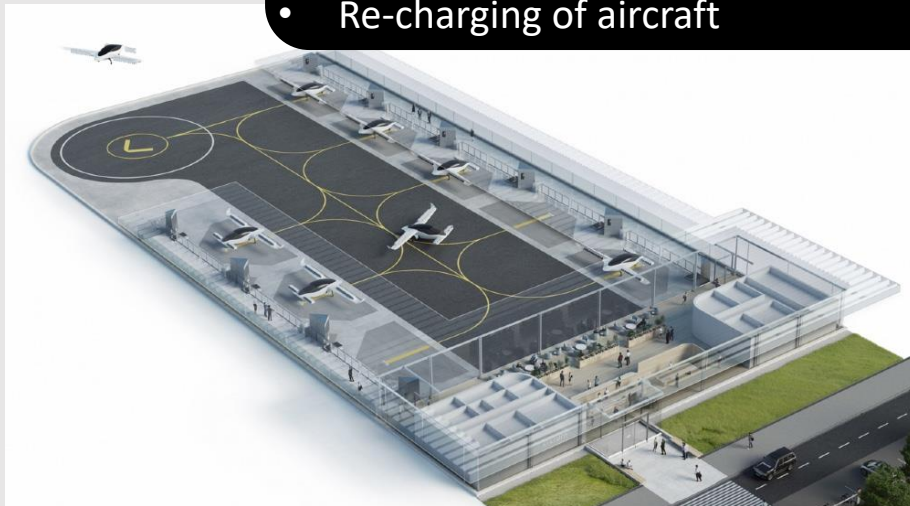


Electrified and Autonomous Platforms

Urban Air Mobility

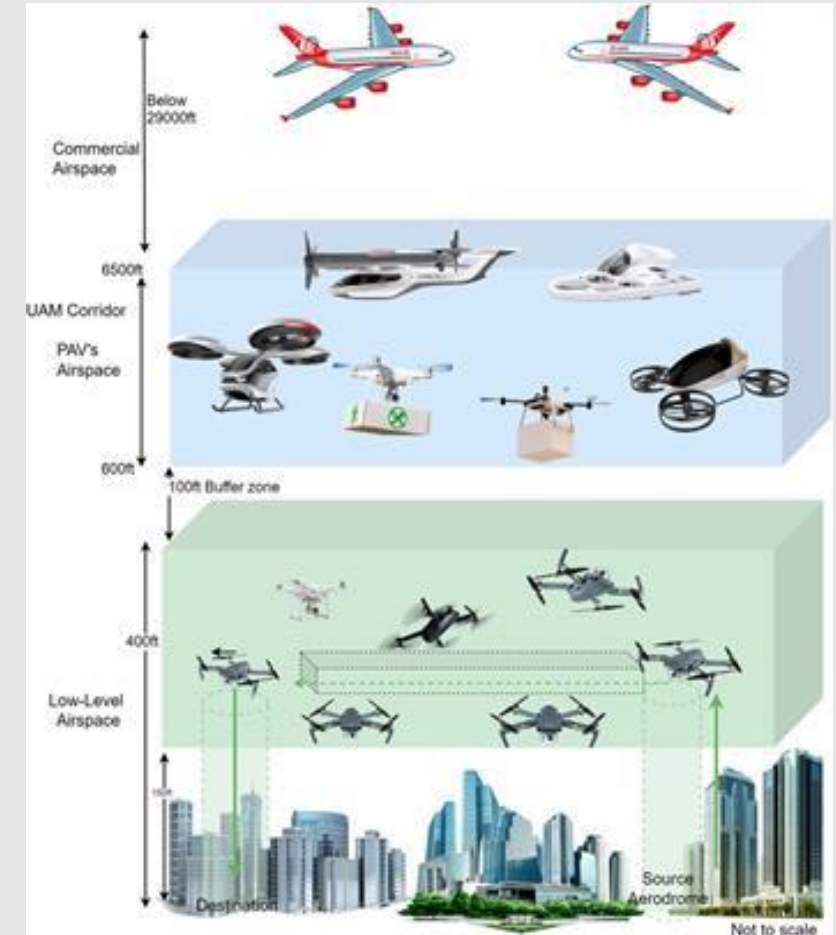
UAM services such as air-taxi will require a network of launch points – ‘Vertiports’

- Passenger loading & unloading
- Re-charging of aircraft



Challenges remain on the path to realizing UAM

- Aircraft certification, vertiport placements, public perceptions of safety



Electrified and Autonomous Platforms

USAF Agility Prime

- Lower technical risk by offering government expertise & test infrastructure
- Address regulatory risk by collaborating on commercial certification paths
- Lower financial risk by providing funding for test and use case exploration

AFWERX - Agility Prime

Accelerate the commercial eVTOL market
In the United States



- Millions of \$ in awards to eVTOL developers
 - Asking them to assess defense use-cases such as logistics support, medical evacuations & disaster response
- Established USAF “air worthiness” certification process

Electrified and Autonomous Platforms

US Navy Initiatives

Ship-borne energy storage & distribution capabilities



Naval Power & Energy Systems Roadmap

- Higher power radar systems
- Directed energy weapons
- Installing “Energy Magazines” and advanced power distribution systems to support

Hybrid-Electric Autonomous Submarines



Orca eXtra Large Unmanned Underwater Vehicle

- Boeing selected to develop and manufacture 5 copies
- Designed for mine countermeasures as well as anti-submarine, anti-surface vessel, and electronic warfare missions
- Fully autonomous, can operate independently at sea for months
- Hybrid propulsion system
 - Top speed of eight knots, range of 6500 nautical miles
- Surfaces, runs diesel generators to re-charge batteries

Commercial Liaison Report

What other technology trends are you interested in hearing more about?

- Artificial Intelligence
- Autonomy Systems / Autonomous Vehicles
- High-Energy Weapons
- Other