Growth Through Engagement and Teamwork

Marina Ruggieri
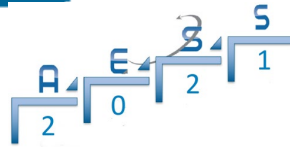**VP – Technical Operations**

October 7&8, 2021

**Fall BoG Meeting**

2021 Tech Ops Organization

- **Tech Ops Committee**: Steve Butler, Marina Ruggieri and George Schmidt
- **Panel Coordinator**: George Schmidt
- "Vision & Perspectives" **POC** from Panels
- **POC Committee** (*Chair:* Joe Dauncey)

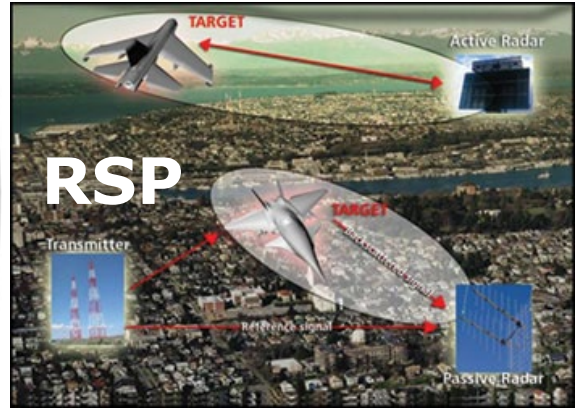# Tech Ops Presentation Outline

- **Introduction**: Marina

- **Report from Panel Coordinator**: George

- **Report from POC Committee Chair**: Joe

- **Perspectives**: Marina

2021 Tech Ops Panels

ASP

CYBER SECURITY

GlueTech

GAP

NSP

RSP
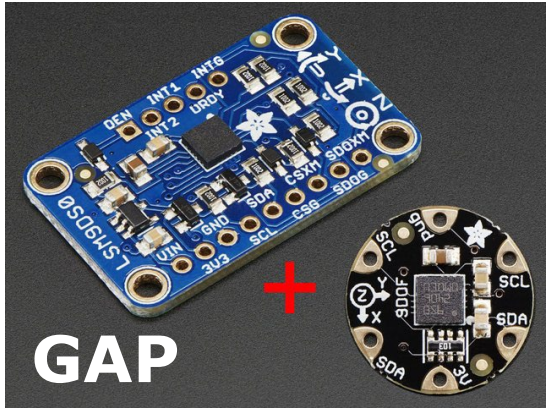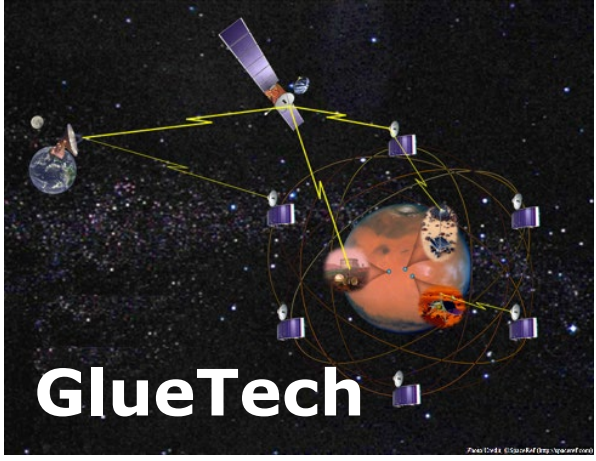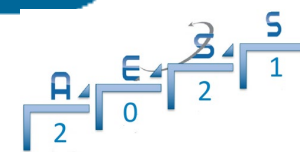
2021 Tech Ops Organization

PANEL	Chair
ASP	Roberto Sabatini
Cyber	Kathleen Kramer
GlueTech	Claudio Sacchi
GAP	Randall Curey
NSP	Michael Braasch
RSP	Nathan Goodman

5/9/2022

2021 Tech Ops Major Goal

- Alignment of Tech Ops activities with the dynamic impact of pandemic and post-pandemic.

2021 Tech Ops Objectives

- Identification of visionary topics for Future Directions and Society FoI

- Solicit panel articles for Systems and TAES as well as inputs to QEB

- Cross-panel activities and super-topic

Objective Description

S – Identification of visionary topics for Future Directions and Society FoI

M – Status Presentation at BoG meetings

A – Assigned to: TO Committee and Panel POC's)

R – Relevant to 2020 goal #2 and 2021 goal

T – Time period for performance: Feb-Dec 2021

Objective Description

S – Solicit panel articles for Systems and TAES as well as inputs to QEB

M – All Panels contributing

A – Assigned to George Schmidt and Panel Chairs

R – Relevant to 2020 goal #6 and 2021 goal

T – Time period for performance: Feb-Dec 2021

Objective Description

S – Cross-panel activities and super-topic

M – active POC's and super-topic identification

A – Assigned to Tech Ops Committee and Panels POC's

R – Relevant to 2021 goal

T – Time period for performance: Feb-Dec 2021

2021 Tech Ops Activities: V&P POC Committee

Panels have been asked to identify a POC for "Vision & Perspectives"

POC-V&P COMMITTEE KOM : March 18, 2021

The Committee then met independently on TechOps

Alignment meeting on October 1, 2021

- **Selection of a Chair** (during KOM) and be independent in the activity (meetings, chats, material exchange, etc)
  [DONE - Joe Dauncey, Cyber]

- **Identification of visionary topics** for Future Directions and Society FoI **[DONE]**

- Cross-panel exchanges and **super-topic** **[DONE]**

- **I/F with Tech Ops Committee** (LIGHT, AS REQUESTED)

Panel Activities

o **Panel at a glance**

o **Report from Panel Coordinator**

o **Reports from Panel Chairs attached**

ASP
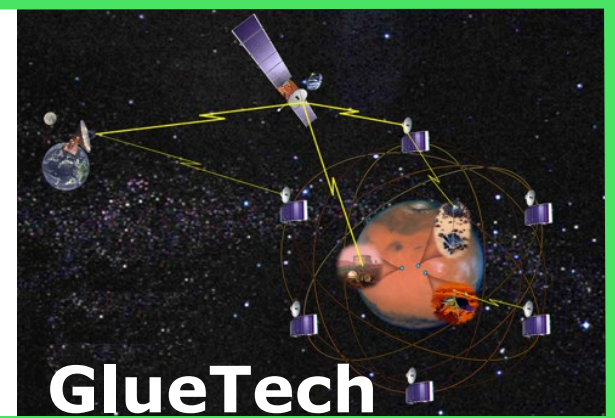
GlueTech

Most of AESS current FoI covered

GAP

NSP

RSP
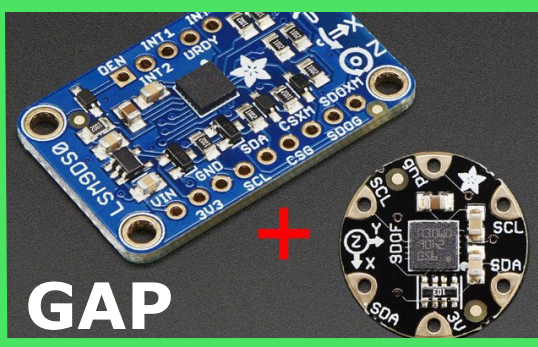
2021 Tech Ops Panels at a glance

PANEL	STATUS	ACTIVITIES REPORT	PERSPECTIVES REPORT
ASP	🟢	🟢	🟢
Cyber	🟢	🟠	🟢
GlueTech	🟢	🟢	🟢
GAP	🟢	🟢	🟢
NSP	🟢	🟢	🟢
RSP	🟢	🟢	🟢

AESS Panel Activities

October 2021 Board Meeting
Accomplishments & Activities

George Schmidt
Panel Coordinator

IEEE
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Panel Activities and Accomplishments

The are 6 Technical Panels involving about 100 AESS members. They are: Avionics Systems, Glue Technologies for Space Systems, Gyro and Accelerometer, Navigation Systems, Radar Systems, and Cyber Security.

- One way the Panels promote their technologies is through their member publications in their field of interest, including standards.

- This has been a banner year for publications(15+) as reported in the 31 Panel Charts that follow.

- Each year a Best Panel of the Year has been selected by the Technical Operations Committee. In 2021 this award will also allow up to $2000 in funding. The 2000 Best Panel Award went to Glue Technologies for Space Systems Panel and the 2019 Award was to the Avionics Systems Panel.

- Those Panels' charts follow and then the remaining 4 Panels charts are given.

Panel Detailed Reports
Accomplishments & Activities

From Panel Chairs

# Glue Technologies for Space Systems (GlueTech)

October 2021 Board Meeting
Accomplishments & Activities

Claudio Sacchi
GlueTech Chair

Goals of the GlueTech Panel

- Promote the coordination of the technical activities related to the technologies that constitute the necessary common platform for innovative Space Systems;

- Promote and support publications concerning the panel topics;

- Organize panels and special sessions in featured-topic conferences;

- Promote educational activities;

- Encourage the submission of nominations for IEEE Fellows and Senior Members in the fields of interest of the panel;

- Manage the nomination and selection of candidates for IEEE Awards in the fields of interest of the panel;

- Creation of communities and forums cooperating in the development of panel technical activities.

Accomplishments & Activities
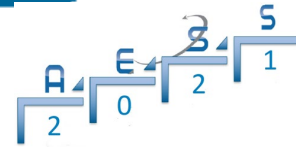
- Papers have been published with the acknowledgment to the GlueTech panel on IEEE international conferences, IEEE journals and other valued international journals. Here are the titles:

  - M. Centenaro, C. E. Costa, F. Granelli, C. Sacchi and L. Vangelista, "A Survey on Technologies, Standards and Open Challenges in Satellite IoT," in **IEEE Communications Surveys & Tutorials**, doi: 10.1109/COMST.2021.3078433, published in early access mode on May 26, 2021. Available on IEEE Xplore.

  - S. Bonafini, C. Sacchi, "Design of a 3D Ray Tracing Model Based on DEM for Comprehension of Large- and Small-Scale Propagation Phenomena over the Martian Surface," **International Journal of Satellite Communications and Networking**, paper accepted, in press.

  - S. Bonafini, C. Sacchi, "3D Ray-tracing Analysis of Radio Propagation on Mars Surface," **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.

  - S. Bonafini, C. Bianchi, F. Granelli, C. Sacchi, "A Reconfigurable Multi-Modal SDR Transceiver forCubeSats," **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.
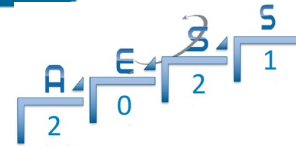
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Accomplishments & Activities
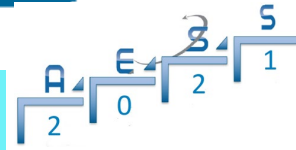
– K. Cheung, D. Morabito, M. Sanchez, "Design and Modeling of an Interleaved-Coding System in the Presence of Fading", **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.

– V. Vilnrotter, K. Cheung, "Near-Optimum Real-Time Range Estimation Algorithms for Proximity Link", **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.

– T. Ortega, M. Sanchez, D. Divsalar, K. Cheung, " Adaptive-Sweep Algorithm for Spacecraft Carrier Acquisition and Tracking: System Analysis and Implementation", **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.

– D. Divsalar, T. Ortega, M. Sanchez, K. Cheung, "Acquisition and tracking of high dynamics Doppler profiles for space applications", **IEEE Aerospace Conference 2021**, March 6-13, 2021 (remote conference). Available on IEEE Xplore now.

– **Interplanetary Network (IPN) Progress Report (42-224, Feb 2021)**. Jun, K. Cheung, G. Lightsey, C. Lee "Real-Time Position Determination on the Mars Surface Using Relative Joint Doppler and Ranging Measurements", https://ipnpr.jpl.nasa.gov/progress_report/42-224/42-224B.pdf
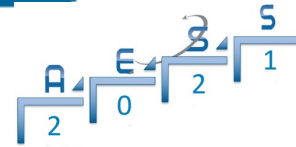
Accomplishments & Activities

- One paper has been submitted on June 22, 2021:
  - A. Guidotti, C. Sacchi, A. Vanelli-Coralli, "Feeder Link Precoding for Future Broadcasting Services: Architecture and Performance," submitted to **IEEE Transactions on Aerospace and Electronic Systems** (under review).

- Another paper is planned to be submitted in late Summer 2021:
  - C. Sacchi, F. Granelli, A. Gentili, L.S. Ronga, S. Morosi, Y. Le Moullec and C. Schlegel, "Software Radio for All: A Survey of Open-Source Software-Defined Radio Platforms", to be **submitted to: IEEE Communications Surveys and Tutorials** (a previous version was submitted on July 3, 2020: it was rejected leaving open to the authors the resubmission option).

- A special section of **IEEE Transactions on Aerospace and Electronic Systems** has been organized about the panel topics. Title*: Information and Communication Technologies (ICT) for a New Space Vision* (organizers: C. Sacchi, F. Granelli, M. Marchese, K-M. Cheung, M. Noble). Important dates:
  - Opening submission date: October 1, 2021
  - Manuscript submission due: October 29, 2021
  - First review round concluded on: January 17, 2022.
  - Revised manuscript submission due: March 24, 2022.
  - Second review round concluded on: May 3, 2022.
  - Final manuscript due: May 30, 2022.

Accomplishments & Activities

- The Summer School for PhD students: **Frontier Technologies for Future Space 2.0 Communications**, organized by the panel members C. Sacchi, T. Rossi, M. Marchese and F. Granelli has taken place in remote (MS TEAMS platform) from **6 to 13 September 2021**. Lecture topics, speakers and schedule are available at the following link:

  https://webmagazine.unitn.it/evento/disi/96109/frontier-technologies-for-space-20-communications

- The School will be held under the patronage of IEEE AESS and Italian Space Agency (ASI).

- The registration deadline was fixed on August 20. **33 students**, coming from worldwide PhD courses, Master courses, Academia, Military and Industry, registered.

Accomplishments & Activities
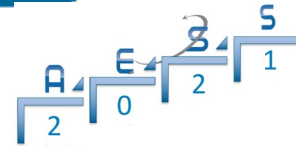
- A proposal for an edited book, dealing with panel topics, will be submitted in the Autumn 2021 to Springer.

- The tentative title of the book is: **"A Roadmap to Future Space Connectivity"**.

- The Book editors are Claudio Sacchi (panel chair), Fabrizio Granelli (panel founder member), Riccardo Bassoli (panel secretary), Frank Fitzek, Marina Ruggieri (panel founder member).

- A preliminary list of contributors, along with the titles of the planned contributions, has been already prepared.
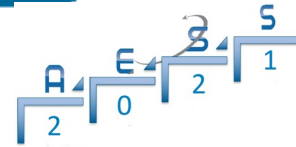
Avionics Systems Panel

Accomplishments & Upcoming Plans

October 2021

Rob Sabatini
**Chair, Avionics Systems Panel**

Avionics Systems Panel

The Panel is composed of IEEE Associate or higher-level members who are representatives of industry, government laboratories, educational institutions and professional societies, and who are active in the domain of Avionics. Its main objectives are:

- Promote and support collaborative research initiatives in the domain of Avionics.

- Develop and disseminate high-quality IEEE publications in the domain of Avionics.

- Promote and support educational activities in the domain of Avionics.

- Sustain and oversee the programs of the IEEE/AIAA Digital Avionics Systems Conference (DASC) and the Integrated CNS Conference; and contribute to other conferences and dissemination initiatives.

- To manage the nomination and selection of candidates for IEEE Awards in the domain of Avionics.

- To encourage the submission of nominations for IEEE Fellows and Senior Members in the domain of Avionics.

- To recommend and support new IEEE Standards or revisions of existing IEEE standards pertaining to the domain of Avionics.

Accomplishments & Activities
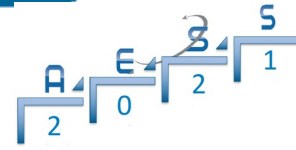
- The ASP continued its active engagements in the avionics research, innovation, education, standards, cyber-physical security and Unmanned Aircraft Systems (UAS) initiatives in 2021.

- Since the beginning of 2021, the ASP has led the development of two AESS Magazine papers:

  – R. Sabatini, A. Roy, E. Blasch, K. A. Kramer, G. Fasano, I. Majid, O. G. Crespillo, D. A. Brown and R. Ogan, **"Avionics Systems Panel Research and Innovation Perspectives."** IEEE Aerospace and Electronic Systems Magazine, Vol. 35, Issue 12, pp. 58-72, December 2020. DOI: 10.1109/MAES.2020.3033475

  – I. Majid, R. Sabatini, K. A. Kramer, E. Blasch, G. Fasano, G. Andrews, C. Camargo and A. Roy, **"Restructuring Avionics Engineering Curricula to Meet Contemporary Requirements and Future Challenges."** IEEE Aerospace and Electronic Systems Magazine, Vol. 36, No. 4, pp. 46-58, April 2021. DOI: 10.1109/MAES.2020.3043138

The first paper listed is a position paper portraying the ASP vision on avionics systems future evolutions, with an identification of key research challenges and industry-focused innovation opportunities.

The second paper provides guidelines for university curricular updates both at an undergraduate and post-graduate level. This is to mitigate the projected shortfall of qualified avionics engineers to sustain Research, Development, Test & Evaluation (RDT&E), Operations and Maintenance, Repair and Overhaul (MRO) activities in the field.

Accomplishments & Activities
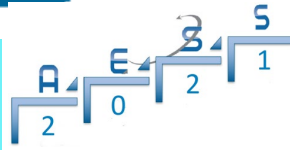
- The ASP led a Special Issue of the Magazine (*Avionics Systems: Future Challenges*), published in April 2021. Editorial paper:

    - R. Sabatini, K. A. Kramer, E. Blasch, A. Roy and G. Fasano**, "From the Editors of the Special Issue on Avionics Systems: Future Challenges."** IEEE Aerospace and Electronic Systems Magazine, Vol. 36, No. 4, pp. 5-6, April 2021, DOI: 10.1109/MAES.2021.3064616.

- The R&I Committee and Publications Committee are currently working to two additional Special Issues for 2021 (both approved):

    - *UAS Traffic Management (U-Space) and Urban Air Mobility*, currently being finalized (CfP publication in April/May)

    - *Space Domain Systems*, focusing on Space Domain Awareness and Space Traffic Management (CfP already published)

- Several members of the ASP served as Distinguished Lecturers (DL) and also contributed to the DL Webinar Series. These DLs expanded the offerings of the IEEE lectures, webinars and potential tutorials at future conferences or Chapter meetings.

- The Avionics Conference Committee actively supported the organization and management of the DASC and ICNS Conferences. ASP members assisted with conference tutorials, local arrangements, and overall planning.

- DASC 2021 hosts a UAS students' competition organized by the ASP. Currently, two universities and three STEM High Schools have registered

Accomplishments & Activities
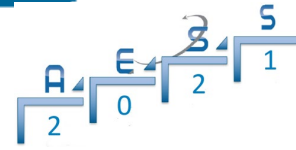
- The ASP will deliver a free-of-charge Tutorial during DASC editions. This tutorial will include two sessions:

  - *Avionics Research and Innovation Perspectives*: The Future of Avionics Systems

  - *Avionics Education Perspectives:* Undergraduate and postgraduate curricular reforms

- ASP members are collaborating with NASA and participating to AAM and UTM technical meetings and workshops.

- In June 2021, two members of the ASP have been nominated members of the **JARUS** (Joint Authorities for Rulemaking on Unmanned Systems) Working Group 7 (WG 7) on **Automation and Autonomy of UAS**. Significant contributions are being provided in the following areas:

  - *Trusted Autonomy / Human-Centric Automation* (Cyber-Physical-Human Systems)

  - *Control and Oversight of Multiple Simultaneous UAS Operations*

- One of the candidatures submitted by the ASP was selected for the IEEE AESS Early Career Award. This will be formally conferred at DASC 2021.

- The ASP is collaborating with ICAO, IFATCA, EASA, EUROCAE and SESAR initiatives to promote avionics education and the evolution of certification standards for UAS Traffic Management and Advanced Air Mobility.

◆ **IEEE**
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Accomplishments & Activities
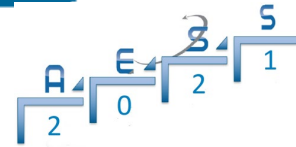
- The ASP Panel is contributing to the "AESS Vision and Perspectives Committee". This should drive the future strategy of the Society and refocus/strengthen the activities of all Technical Panels.

  – *The opportunity is to leverage some key themes, which are becoming well defined in the global society: **Ethics, Sustainability, Interaction with the planet/people/species, Diversity and inclusion, Internet everywhere***

- Current emphasis is on collaborative efforts involving multiple panels:

  – *Definition of a supertopic, based on the themes – To be defined, but could be **Autonomy for Sustainability***

  – *Define a **list of practical challenges to be fed into the Panels***

  – *Direction to **each Panel to explore the supertopic within their own programme of work, and jointly with other Panels***

  – *Definition of a **marketing strategy to reflect the initiatives externally***

  – *Consider a **joint conference based on the supertopic and the themes** – cross panel participation*
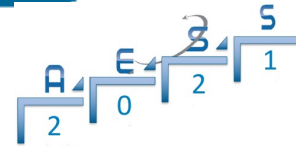
Gyro and Accelerometer Panel (GAP)

October 2021 Board Meeting Accomplishments & Activities

Randall Curey
GAP Chair

<IEEE logo>
Advancing Technology for Humanity

GAP Purpose

▣ Promulgate the understanding of components and systems for detection or measurement of linear or angular motion.

▣ Develop inertial standards with industry consensus.
  – Specification format guides
  – Test procedures
  – Terminology
  – Recommended practices

▣ Provide periodic revision of the standards developed by the GAP.
  – 14 published standards
  – one under development (in ballot now).

Accomplishments & Activities

- The GAP held 2 meetings since April 2021

Dates	Location	Host	Attendance
May 10/11	Virtual	Webex	11
July 12/13	Virtual	Webex	8

- Future GAP meetings

Dates	Location	Host
Sept 13/14	Virtual	Webex
Nov 15-16	Virtual	Webex
Jan 17-18	Virtual	Webex

Accomplishments & Activities

- The ballot for the revision of 1559, "Standard for Inertial Systems Terminology" is in progress.
    - Resolving comments received from first recirculation ballot.

- Revision of 1431, "Standard for Specifying and Testing Coriolis Vibratory Gyros" is in progress.

- The ballot for 1780, "Standard for Specifying Inertial Measurement Units (IMUs)" is in progress.
    - Resolving comments received from initial ballot.

Radar Systems Panel (RSP)

2021 October Board Meeting Accomplishments & Activities

Nathan Goodman
RSP Chair (2021)

Radar Systems Panel

- ▣ Sustain and oversee the program of IEEE Radar Conference series
- ▣ Promote and support publications in the field of Radar
- ▣ Promote educational activities in the field of Radar
- ▣ Provide periodic revision of IEEE Standards pertaining to the domain of Radar
- ▣ Encourage the submission of nominations for IEEE Fellows and Senior Members in the field of Radar
- ▣ Manage the nomination and selection of candidates for IEEE Awards in the field of Radar
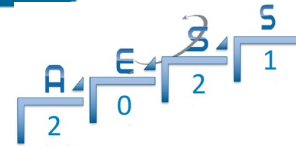
Accomplishments and Activities
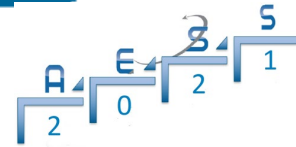
- Committee Chair/Vice Chair Updates:
  - Igal Bilik takes over as chair of Civilian Radar Committee and Graeme Smith will support as vice chair (essentially, Bilik and Smith are swapping roles), due to health-related limitations on Graeme Smiths time
  - Several vice chairs appointed

- Along with N&A Committee Chair and Vice Chair (Mike Picciolo and Ravi Adve) and RSP Vice Chair Alex Charlish, we have investigated online collaboration platforms for improving RSP operations and limiting email discussions with many "Reply All" responses
  - Tested IEEE Collabratec, but seemed to be more of a shared project tracker and lacked "channels" that could be used by different committees, etc.
  - Different platforms each had tradeoffs in features, "allowability" (organizational security limitations), and "another platform" (many other platforms in use by RSP members, such as MS Teams, etc.
  - We have now created a Slack channel, invited RSP members, and are testing it out
  - We hope this will make collaboration easier, provide a centralized location for storing files for the Panel and each committee (ToR, best practice documents, conference reports, etc.)
  - Still getting used to it overall, but eventually should be much better
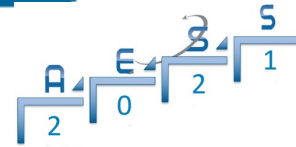
Accomplishments and Activities

- 2021 IEEE Radar Conference was held virtually over May 10-14
  - The "IEEE Radar Summer School" was successful, as were the virtual awards program, student paper competition, radar challenge, 17 tutorials, celebration of the life of Dr. Michael Wicks, and industry/government panel
  - Technical sessions were pre-recorded with presentations back-to-back, followed by an online zoom-based discussion moderated by session chairs, which worked reasonably well, but some sessions ended early due to short recordings, causing time of discussions to be a bit unreliable
  - A la carte registration allowed for tutorial and summer school attendance without full conference registration – seem especially useful/effective for the virtual format
  - Excellent surplus of > $100K expected

- 2025 IEEE International Radar Conference will be held in Atlanta as a concession to hotel originally planned for 2021

- Still looking for a venue/organizers for 2024 IEEE Radar Conference
  - Several calls for proposals, but no quality proposals received as of yet

Accomplishments and Activities

- 2022 IEEE Radar Conference is exploring a "light hybrid" approach of in-person and virtual
  - Complicated by a variety of factors, including…
  - Extreme expense of unionized A/V personnel that would be required for a fully virtual (i.e., real-time presentations, Q&A sessions, etc. in parallel with in-person sessions)
  - Concern that virtual options will incentivize attendees to skip the in-person option, resulting in hotel attrition, reduced registration fees, etc.
    - Registration for virtual is likely to be similar or equal to in-person registration to avoid major loss of revenue from virtual option
  - Unknown timeline for international travel to/from the United States
 - More restrictive policies in NYC

  - The NYC conference is in a difficult spot with its hotel contract, high local prices, need for high attendance, but uncertain Covid/travel outlook
  - Fortunately, many on the RSP have expressed that they are really looking forward to in-person conference if possible, so hopefully this reflects the radar community's perspective in general and a chance for good in-person attendance

Navigation Systems Panel (NSP)
2021 October Board Meeting Accomplishments & Activities

Mike Braasch
NSP Chair (2021)

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Accomplishments and Activities
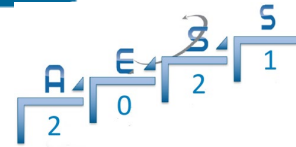
- Primary panel responsibility is support of the PLANS conference

- U.S. Institute of Navigation (financial sponsor of PLANS) moved the next offering from 2022 to 2023 due to issues related to the pandemic

- Panel met in March 2021 to start the organization of the next PLANS conference

- Panel met on 01 Sep2021 to finalize the application for the inaugural "IEEE Navigation Conference" to be held in conjunction with the International Global Navigation Satellite Systems (IGNSS) symposium in Australia in mid-Dec 2022.

Cyber Security Technical Panel October 2021 Board Meeting Activities and Accomplishments

Kathleen Kramer
Chair

NO UPDATE (eventual inputs after DASC and CARNAHAN events completion)

IEEE
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POC Visions and Perspectives Committee

Joe Dauncey **(Chair)**

Report - October 2021

IEEE

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Committee Scope

- Identification of visionary topics for Future Directions and Society Field of Interest
- Cross-panel exchanges and super-topics
- Interface with Technical Operations Committee

AESS Panel Representation

AESS Panel	Representative
Avionics Systems Panel (ASP)	Giancarmine Fasano
Cyber Security	Joe Dauncey (Chair)
Glue Technology for Space Systems Technical Panel	Ernestina Cianca
Gyro and Accelerometer Panel (GAP)	Matt Spencer
Navigation Systems Panel (NSP)	Zak Kassas
Radar Systems Panel (RSP)	Willie Nel

Supported by the Technical Operations Committee : Marina Ruggieri, Steve Butler, George Schmidt
Logistical Support : Amy Krutz, Conference Catalysts

Hypothesis

- The AESS is a contemporary and relevant Society solving Grand Problems but our mission is not obvious to those that are not already familiar with the Society
- There is the potential to be perceived as 'traditional', which could be associated with 'dated'
- Our Mission has been compromised by trying to be all things to all people
  - The opportunity exists for a stronger vision to clarify the relevance of the Society
- The nature of the Society is unique
  - Problems are addressed a 'top down' perspective
  - Multiple disciplines are applied, as necessary
  - The Society is broader than others
- We do what we need to solve the Grand Problems
  - We will bring in the people, skills, disciplines needed to solve the problem

Reframing the IEEE Aerospace and Electronic Systems Society

There is a need to reframe the Society : Maximising the capabilities, while putting a contemporary lense on activities

The opportunity is to leverage some key themes that are becoming core in global society:

- Ethics, Sustainability, Interaction with the planet/people/species, Diversity and inclusion, Internet everywhere, 4th industrial revolution

These themes enable us to refocus the Society, preserving the fundamental aims, while maximising our relevance to global society

- Which we believe will also result in more direct benefits to the Society itself

Combining these themes, we believe that we will need to clear about how the Society answers the question :

- How do we optimise the technology and its interaction with the occupants of the planet sustainably?

Testing and Driving the Necessary Change
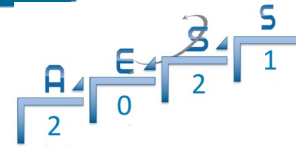
There is a need to test the proposed change, drive Member engagement with the themes and then review/revise the formal structures of the Society.

We believe that we can start to address this immediately through definition of a supertopic along with supporting engagement into the Panels :

- Direction to each Panel to explore the supertopic within their own programme of work, and with/between other Panels
- Consider a conference based on the supertopic and the themes – cross panel participation
- Define a list of practical challenges to be fed into the Panels
- Definition of a marketing strategy to reflect the initiatives externally

After 12-24 months, the change can be further embedded through interviewing the Panels and carrying out a more structured review of Name, Mission, Field of Scope, Panels and Panel of scope, Conferences, cross-panel discussions

In the longer term we should define a Global Benefits Framework to assess our work products against, which will provide continual challenge and reinforcement

This approach will support cultural adoption and an informed, engaged and sustainable refresh of the aims of the Society
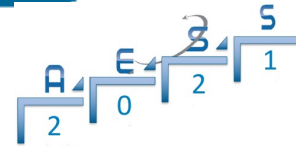
Proposed Supertopic:
Autonomy for Sustainability

Reflect current technological evolution while also giving a perspective aimed at global benefit (for humanity and Earth):

- Autonomy : Enables humanity to maximise their potential
- Sustainability : Ensures that what is done is in the interests of global society

Where autonomy is implemented by technology, sustainability gives it a moral/ethical context

Autonomous

Aerospace
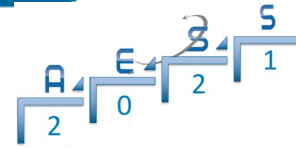
Technology
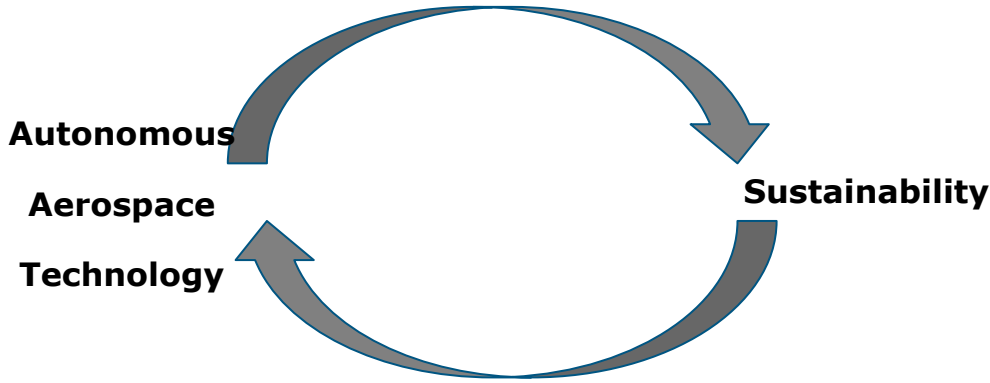
Sustainability

Autonomy for Sustainability

Autonomous systems are becoming mainstream in many walks of life:

- Unmanned Aerial Vehicles, Self-driving cars, Robotic surgery, Electronic Home-assistants, Manufacturing and warehouse systems, Space Systems and Surveillance
- Humanity faces the challenge of increased interaction with autonomous systems in everyday life
- AESS covers many of the areas where these impact will be felt
- Autonomous systems also has the potential to be used for very nefarious efforts
- establishes a role for the AESS in steering autonomous technology for the betterment of society and the planet
- Autonomy enables empowerment of the human in their society/context
- Aligns with IEEE Vision - Technology for Humanity

Autonomy for Sustainability

Sustainability ensures that all the great things we have created as human beings remain great for future generations:

- The immediate crisis of climate change is a threat to sustainability
- Further, technology itself poses some threat if used for the wrong purposes
- Sustainability is key to engagement with younger generations
    - Keen to apply their ethical/moral beliefs to the problems that they are trying to address
    - Averse to application of their professional/technical disciplines in isolation to the perceived challenges in global society
- Sustainability challenges are becoming more clearly understood, and it is essential for all innovation to make consideration
- Autonomous systems are expected to affect global productivity, equality and inclusion, environmental outcomes, both in the short and long term
- Demonstrates the AESS role in exploring the broader societal impacts of technology

IEEE
Advancing Technology
for Humanity

Supertopic Benefits

A topic on which all Panels can converge

Not only a technical topic:

- Tangible societal benefits
- Significant regulatory aspects that are needed to ensure trusted autonomy
- Regulatory and standards gaps
- Ethical aspects on the boundaries of autonomy and the role of humanity

Demonstrates AESS leadership by mapping societal problems to technological developments

Shows that technology/engineering does not exist in a silo

Challenges members on the application of their disciplines in their day-to-day working lives

Enables members (especially younger/emerging members?) to apply their disciplines in ways that support their beliefs (where those beliefs align to improved sustainability)

Ensures that panels and research agendas are scoped to consider the implications that are needed to make the work relevant to society

Enables opportunities for partnerships

Fundamentally, for the AESS, it keeps what has always been good and demonstrates why it is relevant today
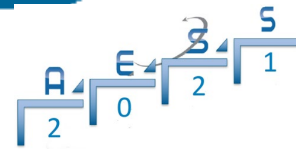
Summary of V&P POC Committee recommendations:

The Vision and Perspectives Committee recommend:

Adoption of a supertopic : Autonomy for Sustainability

- Across and within Panels
  - Develop concrete initiatives around the supertopic

After 12-24 months

- Further review of the formal structure of the Society, based on the outcomes of the supertopic and feedback from the Panels

PERSPECTIVES

- **AESS active Panels cover most of the FoI (+/-)**

- **Margin exists to improve cross-fertilization among current Panels**

- **Strong recommendation to continue over at least 2022 the V&P POC Committee activities and plan either under TechOps or under Strategic Activities.**

5/9/2022