



Institute of Electrical and Electronics Engineers (IEEE) Electromagnetic Compatibility (EMC) Society Technical Committee on Aeronautics & Space EMC (TC8) Meeting of August 2, 2022

Chair: James Lukash, Lockheed Martin Space Systems

Vice Chair: Jen Dimov, Jacobs Technology / Goddard Space Flight Center

Secretary Manny Soriano, Jet Propulsion Laboratory

Officers at Large;

Katherine Dang (JPL), Adrian Sun (Aerospace), Ed Gonzales(JPL), Melissa Schwager (Ford) Pablo Narvaez (JPL), Randy Jost (Ball-Retired), Ray Perez(JPL), Paul Edwards(KSC), Nika Amralah (AP Americas), Bob Scully (JPL) Paul Edwards (KFC)

IEEE EMC Society Virtual Symposium July 26 - August 20, 2021



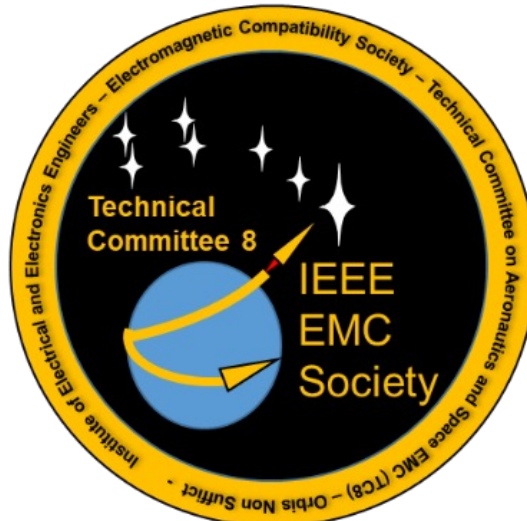
Agenda



- Welcome
- Introductions (Officers and Membership around the virtual room)
- Virtual Meeting mechanics (Virtual roster, chat window, how to ask for the floor (voice), how to ask questions, etc.)
- Officer Election
- Scope of TC8
 - Review of the Charter
 - Roles & Responsibilities of Technical Committee 8 (TC8)
- TC8 Activity & News for 2021-2022
- Long Range Planning – Future years
- Old Business– Proposed New Standard Lightning Test - Fred Heather
- New Business
- Closing Remarks
- Adjourn

Welcome

- “Around the table” introductions (Name & Organization)
 - Please sign in if you have not already done so
 - As is traditional, we will go around the table to introduce everyone (Room first, Online second)
 - Online participants Please E-mail Secretary Manny Soriano at manuel.martin.s.soriano@jpl.nasa.gov to sign our virtual roster





Membership and Officers



- James A. Lukash (Lockheed Martin)
 - Founding Chair: James.A.Lukash@lmco.com
- Jen Dimov (Jacobs Technology / NASA Goddard Space Flight Center)
 - Vice Chair: - jennifer.dimov@nasa.gov
- Manny Soriano (Jet Propulsion Laboratory)
 - Secretary manuel.martin.s.soriano@jpl.nasa.gov
- Officers At Large
 - Katherine Dang (JPL), Adrian Sun (Aerospace), Ed Gonzales(JPL), Melissa Schwager (Ford), Pablo Narvaez (JPL), Randy Jost (Ball-Retired), Ray Perez(JPL), Paul Edwards(KSC), Nika Amralah (AP Americas) , Bob Scully (JPL)
- Reminder: Please e-mail Manny Soriano for attendance



Election of Officers



- It is a normal for the EMC society and our TC8 committee to have periodic elections for officers
 - Officers (Chair, Vice Chair, Secretary) serve for two years, and may stand for re-election
 - Elections were last held for officers the 2022 Symposium meeting(This year), so we will select officers for this technical committee again next year (2024)
- However if there is someone who wishes to nominate (Or self nominate) an individual for an officer at large slot, the chair will entertain such nominations
 - We presently have several individuals in the role of “Officer at Large”, and we remain open to additional persons for the position of “Officer in Training”/ “Officer at Large”
 - “Officers at large” participate in officers meetings in a non-voting capacity
 - Great opportunity to learn about the roles of the officer slots if you have interest without making a large commitment of time (Leadership Training)
 - Intended to allow people to learn about and “Test Drive” the functions of committee leadership with no actual responsibilities
 - Also excellent role for people to more fully participate w/o commitment
 - Officers at large speak and debate issues at officer meetings, but only the chair, vice chair, and secretary vote at those meetings

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- Our Charter
 - This committee is concerned with EMI/EMC issues in aircraft, spacecraft & space launch vehicles, robotic and crewed
 - The aerospace environment provides unique challenges in the design, development, test and operation of space systems to avoid EMI and achieve EMC
 - Aeronautics & Space EMC covers a wide range of topics on the part, board, box, system, multi-system, planetary and interplanetary levels
 - The harshness of the atmospheric, launch and space environments necessitates a broader view of EMC issues than traditional terrestrial projects, often leading to creative methods and solutions that can benefit our society's efforts elsewhere on Earth

Scope Of TC8

- This committee serves as a resource for the Board of Directors of the EMC society on all matters associated with Aeronautics and Space EMC
- This committee helps recruit authors for papers, poster papers at the annual symposium as well as articles for our society's journal and newsletter
- This committee initiates and/or contributes to standards activity in our technical area
- This committee helps to organize special sessions of invited papers and workshops for the annual symposium
- This committee provides subject matter experts to review papers submitted for publication at the annual symposium
- This committee provides subject matter experts for discussion panel sessions at the annual symposium
- Monitors and informs the larger membership of new developments in our technical area



TC8 Diversity & GOLD Commitment



- TC8 is committed to the participation and support of Graduates of the Last Decade (GOLD) and all other groups wishing to expand their participation
- Our committee would not function nearly as well without the many contributions of GOLD & various Diversity group participants
 - Most TC8 officers are diversity/GOLD (TC Vice Chair & Secretary)
 - Our GOLD “Officers at Large” participate in all TC 8 officer meetings
 - TC8 could not function without GOLD /Diversity members
- We actively encourage people from all backgrounds to participate in the activities of our committee and society
- TC8 and its officers remain committed to diversity and are happy to assist you in expressing your unique voice in the IEEE EMC Society and the committee on Aeronautics and Space – and have been since this committee was formed
- Need help or guidance? Just ask!

TC 8 remains committed to diversity and GOLD participation

- TC8 currently has no subcommittees
 - Aeronautics and Space EMC is sufficiently broad area of work to envision the creation of subcommittees
 - During the discussions of the SC6/SC7 merger and creation of TC8 the question of a subcommittee within TC8 on Drones was discussed
- TC8 officers are open to the formation of subcommittees if they meet some basic conditions;
 - Sufficient interest lies within the area of interest proposed for a subcommittee (Measured via papers published, sessions/workshops held, etc.)
 - Leadership is available & committed to leading a subcommittee
 - Subcommittee(s) will report to the TC8 officers
 - Subcommittee(s) will exist so long as they maintain leadership and interest, and will be phased out if they lose either
- The TC8 officers welcome any and all proposals to form a subcommittee
 - At TC8 meetings
 - Via communications outside the meeting (Phone, Email, etc.)
- We have one request to form a TC8 Subcommittee to evaluate at this time

- **Dr. Charles Jullien has proposed the formation of a subcommittee to work in the area of commercial Aircraft power systems**
 - **Concern area is the changes in voltages and frequencies**
 - *“In aeronautics, we have a big new challenge It’s a challenge because we change the level of voltage/current (passage from 230V to 1000V) and we will find higher frequency power network (passage from 400Hz to 20-150kHz). So we need to work with these new constraints to size and design the EWIS and its components. All equipment and aircraft manufacturers have these problems to answer”*
- **If interested in this area of work, or have a desire to help him form a subcommittee within TC8 you may contact Dr. Jullien at:**

Dr. Charles JULLIEN
EMC Engineer
Expert EMC electrical harness modelling
Department EWISe R&T

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Summary of Work Accomplished in the Past Year



- Symposia
 - 2022 IEEE Aerospace Conference, Big Sky, Montana
 - 2021 ~~Real~~ Virtual Symposium
- Standards Activity
 - MIL-STD-461 H is in review
 - AIAA-S-121A-2017 (Tailoring of MIL-STD-461 for Space Systems)
 - Will begin a Re-affirm/Revise/Revoke cycle in 2021-2022
 - ISO
 - Participated in the 57th ISO/TC20/SC14/WG1 Space Systems Design Engineering Working Group virtual meeting on June 17, 20 and 22, 2022.

This TC is actively working in the areas within its scope

- TC8 Organized and presented a track of papers at at the IEEE Aerospace Conference in 2021 (Also known as the Big Sky Conference, <https://www.aeroconf.org>)
 - The TC8 officers considered this outreach opportunity to be of great importance to the EMC profession
 - Instead of talking among EMC professionals, it is an opportunity to spread the importance of EMC to Avionics designers, systems engineers, mission planners, etc.
- Pablo Narvaez was the Session chair for 2020 -2022 and will be for 2023
- Pablo is Soliciting contributors for 2023

TRACKS, SESSIONS, AND ORGANIZERS

07.10 COTS Utilization for Reliable Space Applications, Douglas Carrow (Naval Research Laboratory), Eric Bradley (Naval Research Lab), Harald Schone (Jet

07.11 Designing Spacecraft Hardware for Electromagnetic Compatibility, Signal Integrity, and Power Integrity in Space Applications, James Lukash (Lockheed Martin Space), Pablo Narvaez (Jet Propulsion Lab), Jeffrey Boye (Johns Hopkins University/Applied Physics Laboratory), Paul Edwards (a.i solutions),

Robert Gershman (Jet Propulsion Laboratory), Bret Drake (The Aerospace Corporation),

08.01 Human Exploration Beyond Low Earth Orbit, Kevin



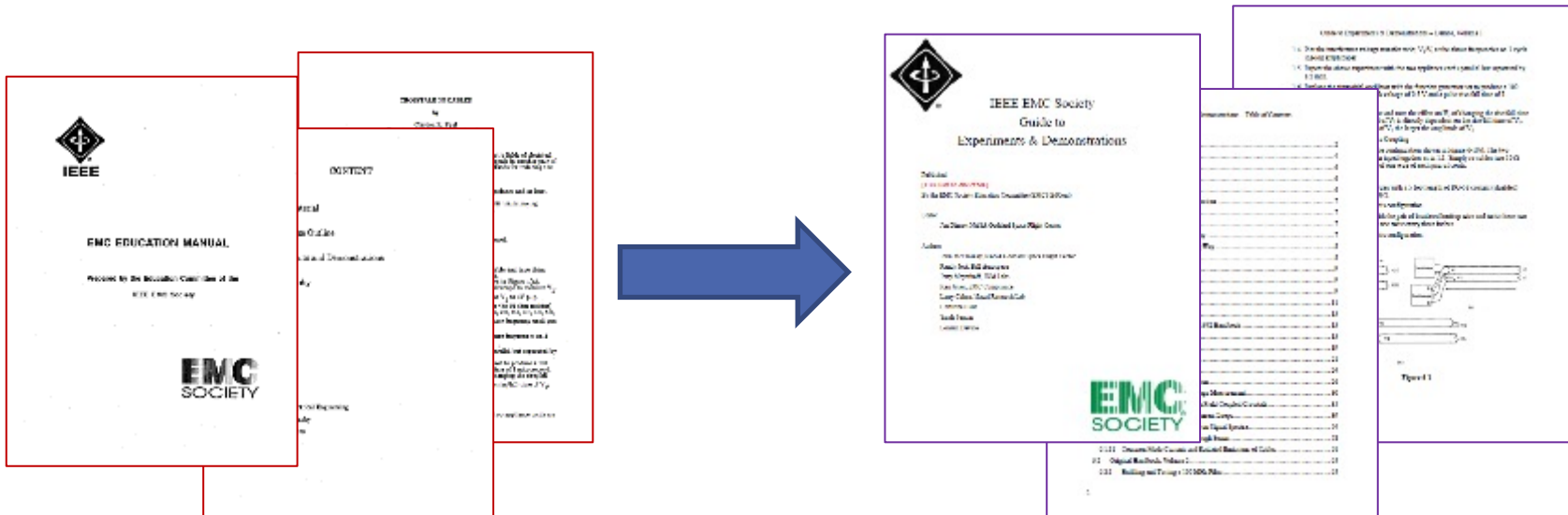
So successful that we have been invited back in 2023

- **2 paper sessions, 6 Papers**
 - **TP-TUE-4A • Sponsored by TC-8**
Space EMC
 - **TP-THU-8B • Sponsored by TC-8**
Aeronautics and Space EMC
 - **Best Paper Nominee**
 - **Statistical Field Model for Performance of Localized RF Absorption Blankets in a Payload Fairing by Paul Bremner, et al., Robust Physics**
- **Demonstrations**
 - **Common Mode Conducted Susceptibility Testing – A Simplified Method - John McCloskey – NASA Goddard Space Flight Center**
- **Workshop**
 - **Ray Perez and Irfan Majid are presented a tutorial sponsored by TC-8 in EMC+SIPI 2021. It is based on the book IEEE Handbook of Aerospace Electromagnetic Compatibility and titled "EMC Testing and EMI Mitigation for Safety Critical Aerospace Systems"**

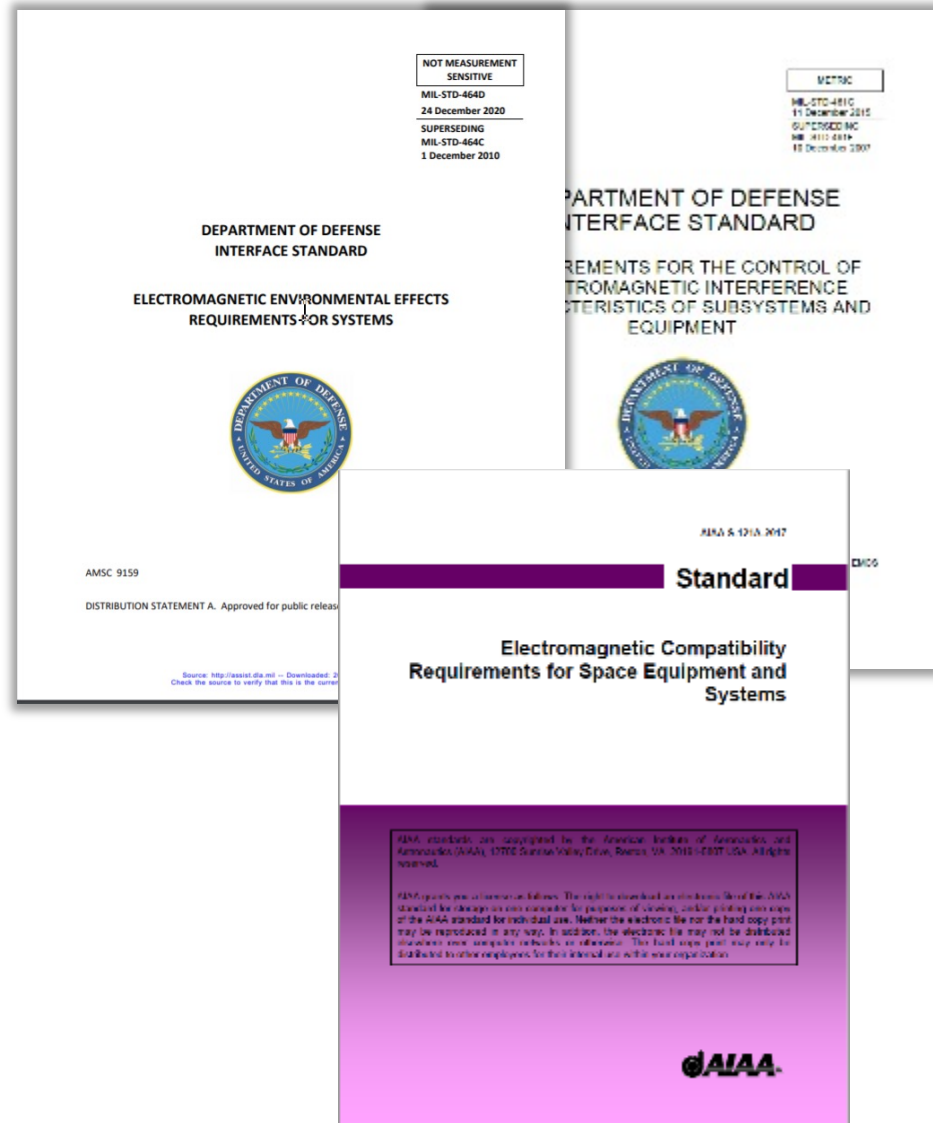
- **1 paper sessions, 4 Papers**
 - **Aeronautics and Space EMC (TP-WE-PM-TC8)**
- **Demonstrations**
 - **Common Mode Conducted Susceptibility Testing – A Simplified Method - John McCloskey – NASA Goddard Space Flight Center**
- **Workshops**
 - **Ray Perez is presenting a workshop on “Becoming a Successful Book Author for the IEEE EMC Society (WS-FR-PM-5)**
 - **Dr Charles Jullien is presenting a workshop entitled “EMC Test and Design for Cables and Connectors (WS-FR-AM-4)**
- **Tutorials**
 - **Two TC-8 Instructors at Tutorial Fundamentals of EMC (TU-MO-AM-1)**
 - **Pablo Narvaez and John McCloskey**

This TC is actively Supporting this symposium

- Several TC8 members have been closely involved in the Education Committee's project to revise and republish the old 1992 Experiments & Demonstrations Manual
- Aiming to complete this effort in 2021, but help always welcome
- Jen Dimov & Randy Jost are our liaison officers to this effort



- MIL and AIAA Standards are on a 5 year “Review, Revise & Republish, or Revoke” cycle (COVID may impact)
 - MIL-STD-464 D is published
 - Too early for renewal cycle
 - MIL-STD-461 H under review now
 - F is published
 - AIAA-S-121A-2017, Electromagnetic Compatibility Requirements for Space Equipment and Systems was
 - “A” Revision (AIAA-S-121A) released in 2017
 - Work has not yet begun on AIAA-S-121B
 - Reaffirm/Revise/Revoke meetings will start in 2022-2023
 - Work remains on coordinating this standard with IEEE





Standards Activity: ISO



- TC8's ISO representative is Pablo Narvaez, JPL Section Manager of 513 Reliability Engineering and Mission Environmental Assurance
- Participated in the 57th ISO/TC20/SC14/WG1 Space Systems Design Engineering Working Group virtual meeting on June 17, 20 and 22, 2022. Preliminary discussions were held on system requirements, design qualification and acceptance tests of small spacecraft and units. EMC requirements were approved.



TC 8 Student Outreach



- University Outreach:
 - University of Illinois – Illinois space society – Jim Lukash spoke to the assembled students about careers in EMC and Aerospace
 - Stanford University – Jim Lukash lectured to Professor Sigrid Close’s Class about careers in EMC and Aerospace
 - Like everything, the pandemic had an impact on outreach efforts

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5 Year Plan for TC 8

- We are in need volunteers to organize & run workshops, demonstrations, technical topic sessions, etc.

IEEE EMCS TC8 Aeronautics and Astronautics 5 Year Plan						
Activity	2021	2022	2023	2024	2025	2026
	Virtual - Glasgow	Spokane, WA	Grand Rapids, MI	Phoenix, Az	Not yet Selected	Not yet Selected
TC Meeting at Symposium	X	X	X	X	X	X
Special Session						
Workshop Sponsored		X				
Demonstrations	X	X				
Technical Topic Session Sponsored	X	X	X	X	X	X
Recruit for Poster Session	Y	Y	Y	Y	Y	Y
Newsletter Article						
Student Activity Sponsored						
SC Charter Review	Y	Y	Y	Y	Y	Y
Leadership Succession		Y		Y		Y
Leadership Training	Open	Open	Open	Open	Open	Open

Many Opportunities to Participate – What can **YOU** Contribute to our Profession?

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Old Business



- ~~Our “New Orleans/Canadian student” success story~~
- ~~University Outreach~~
- ~~Linked In group~~
- Proposed New Standard Lightning Test - Fred Heather
- Any other old business?

- University Outreach?
 - Student papers recruitment?
 - Cubesat Efforts?
- Formation / Curation of a Linked In group?
 - First proposed years ago by Ken Lynch
 - Was Started by Jen Dimov
- Fred Heather Lightning Standard?
 - Any other old business?



New Business



- Drafting of new EMC Standards and/or aligning standards with the IEEE.
- Other?



The Future of TC8 & EMC Society – How to Best Serve our Members?



- In 2020 EMC Society VP Communications Chuck Bunting has asked each Technical Committee to include a “Brainstorming/discussion” during all TC meetings on the future of the society and the future of each technical committee.
- It is no secret that the world is ever changing, and like all organisms Professional Societies must evolve; adapt or die
 - This includes the EMC society
 - A disturbing trend exists looking at the membership and activity levels of the EMC Society in 1980, 1990, 2000, and 2020
 - The purpose of the EMC Society is to serve the EMC community, and TC8 exists to served the Aeronautics and Space EMC community
 - For better or worse, it is an all-Volunteer organization
 - It is what we make of it, for better or worse
- There is no reason that we need to do things the way they have always been done

TC 8 remains committed to serving the membership, but how?



The Future of TC8 and IEEE EMC Society – How do we Best Serve our Members?



- **Challenges we face, in no particular order, include;**
 - **New methods of communications (Linkedin, Websites, Facebook, Webex/zoom/telepresence)**
 - **New mindsets; Generational differences(20th Century thinking vs 21st Century thinking, experience differences, national-to-international business models, New ways to network, new ways to learn, virtual working, aging Membership/“brain drain” concerns, recruiting new members(what exactly do we offer that makes new members want to join?)**
 - **What does it mean to be a professional society in EMC today and in the future(Or is it EMI/EMC, or is it E3, or E3 – and what about SIPI?)**
 - **How do we best interact with members**
 - **More frequent virtual meetings? Fewer meetings?**
 - **Online discussion groups? (Via IEEE, Linked In, etc.)**
 - **Ways as yet unexplored?**

TC 8 remains committed to serving the membership, but how?

What are your thoughts?

- **Any subject, any time – there are no bad questions or comments**
- **TC8 leadership is wide open on any topic**
- **Chair is here to serve you, not the other way around**

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- Brainstorming Session: The Future of TC8 & The EMC Society
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Meeting Closure



- Reminder: Next TC8 general meeting will be at the 2023 Symposium in Grand Rapids, Michigan July 31st - August 4th, 2023
- Closing Remarks
- Adjournment

See you in person in Grand Rapids, Michigan, USA in 2023

- Thank You for participating today

