



IEEE Macquarie University Student Branch/MTT-S Chapter IEEE NSW AP/MTT Joint Chapter

Lecture by IEEE APS Distinguished lecturer

Dr. Brian M Kent

Date : Thursday, 13 November 2014
Time : 5:00 pm to 6:00 pm
Location : Building E6B, Room 136
Macquarie University NSW 2109



Further Information:

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Electromagnetic Interference Attenuation Test of the Space Shuttle *Discovery* using the Air Force Research Laboratory Mobile Diagnostic Laboratory

As NASA prepared the Space Shuttle Orbiter "*Discovery*" for its first return to flight mission (STS-114) in July of 2005, a number of new visual and radar sensors were used during the critical ascent phase of the flight to assess if unintentional debris was liberated from the Shuttle as it raced into orbit. New high-resolution C-Band and X-Band radars were used to help ascertain the location and speed of released debris. We also used both radars to monitor debris generated by routine flight events such as Solid Rocket Booster (SRB) separation. To assure these new radars did not interfere with flight-critical engine subsystems, an Electromagnetic Interference (EMI) measurement was performed on the Shuttle Orbiter "*Discovery*" in January 2005, using the Air Force Research Laboratory's Mobile Diagnostic Laboratory (MDL). This portable EM Measurement system performed a large number of attenuation measurements the night of January 17-18, 2005. This paper describes how the attenuation data was acquired, and the methodology used to reduce the data to predict average attenuation of the radar energy from the outside world to the inside of the aft engine bay of the Orbiter. This data was combined with a separate NASA-performed avionics EMI analysis to demonstrate that the new C and X-Band Debris Radars could be operated without adversely interfering with the Orbiter aft bay Avionics systems. After a through description of the AFRL aft bay EMI experiment, the talk will close with a brief overview and presentation of results from the separate NIST/NASA EMI experiment performed on the Orbiter *Endeavour*.

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Dr. Brian M Kent's Biography

Dr. Brian received the B.S and MS degrees in electrical engineering in 1980 and 1981. He received his Ph.D. degree in electrical engineering in 1984, from Ohio State University, Columbus.

He is a Consultant in Aerospace, Science, and Technology, and an adjunct professor of Electrical Engineering with Michigan State University. He recently completed 37 years of Service to the United States Air Force. Dr. Kent also served the USAF as Senior Scientist for Low Observables and Electromagnetics, Air Force Research Laboratory, where he performed and directed research, and development activities at the Multi-Spectral Radar Signature Measurement Facility. His primary responsibilities include the development and transition of advanced low observable electromagnetic analysis and measurement techniques to the Department of Defense and their aerospace industrial partners, and profoundly impacted the development and deployment of the F-117, B-2, F-22, and F-35 for the USAF.

Dr. Kent has authored and co-authored more than 90 archival articles and technical reports and has written key sections of classified textbooks and design manuals. He has delivered more than 200 lectures, and developed a special DOD Low Observables Short Course that has been taught to more than 3,000 scientists and engineers since its inception in 1989.

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