

GSAW 2015 Tutorial J:

Introduction to Satellite Communications: Vehicle RF Communications

Length: Half day

Overview:

This session focuses on the parts of the tutorial dealing with RF communications and the space-to-ground link. This half-day session extends last year's tutorial with the following:

- Additional waveforms such as CCSDS, TDRS
- Ranging schemes
- Frequency Bands

This half-day course provides attendees an introduction to RF satellite communications with a focus on commonly used waveforms, modulation schemes and data encodings. Attendees will follow both the downlink and uplink paths by looking at both onboard processing and the link effects. Areas of complexity are discussed; criteria for architectural decisions are highlighted; and technology trends are presented.

Course Outline

- Introductions and Architectural Overview
- Downlink
 - Onboard the Spacecraft
 - Space Link
 - Antenna Site
- Command Path
 - Antenna Site
 - Space Link
- Industry Trends
- Closing Question / Answer Session

Instructors: Rod Morris, ViaSat, Inc.; Randy Culver and Dennis Connors, AMERGINT Technologies

Biographies:

Rod Morris is currently Director of Business Development at ViaSat, Inc., where he has been employed for over 25 years in the design and development of high performance ground stations for earth observation and specialized Government communications. Prior to that he was employed at Hughes Aircraft Company's Space and Communications Group where he designed spacecraft telemetry and command equipment. He holds a BSEE from Virginia Tech.

Randy Culver: I enjoy working with our customers to understand what they need to implement their systems. Systems Architect/Manager for 25+ years. MSEE – Purdue, BS – VA Tech ... Go Hokies! Prior Experience at IBM and RT Logic.

Fun Fact: Bike racing, travel, and outdoor activities keep me entertained.

Dennis Connors: I enjoy the theoretical side of modem design and algorithm design. Ph.D. E.E. – UCLA, MSEE – UCLA, BSEE – San Jose State University. Prior Experience at L3, NextWave Wireless, Trellisware Technologies, ViaSat, Texas Instruments, and Hughes Research.

Fun Fact: Raised just outside of Yosemite National Park, California; recent transplant to Colorado.

Description of Intended Students and Prerequisites:

Students should be familiar with the space domain and have a basic understanding of satellite operations.

What can Attendees Expect to Learn:

Upon taking the course, students will have an understanding and appreciation of RF communication links and the complexities involved.