



21st Test Instrumentation Workshop (2017)
Telemetry Standards Coordinating Committee

RF Vendors Working Group

Location: Las Vegas, NV

Date: March 10



Who Are We?



Telemetry Standards Coordination Committee

Telemetering Standards Coordination Committee (TSCC), which is sponsored by the International Foundation for Telemetering, is chartered to serve as a focal point within the telemetering community for the review of standards documents affecting telemetry proposed for adoption by any of the various standards bodies throughout the World. It is chartered to receive, coordinate, and disseminate information and to review and coordinate standards, methods, and procedures to users, manufacturers, and supporting agencies.

RF Vendors Working Group is a Subcommittee under the Radio Frequency TSCC Sub Committee

TSCC

Chair- Steve Nicolo
Vice Chair- ?

Radio Frequency

Subcommittee
Chair-Scott Brierly

RF Vendors Working Group

Johnny Pappas- Lead

RF Vendors Group Members

Coding and Data Compression

Subcommittee
Chair- Steve Nicolo

Data Multiplexing

Subcommittee
Chair-Brad Fleury

Network and Protocols

Subcommittee
Chair-Diarmuid Corry

Recorder-Reproducer

Subcommittee
Chair-Mark Buckley

Transducers


Subcommittee
Chair-Lee Echols

Nominating Committee

Subcommittee
Chair-Brad Fleury



What is the RF Vendors Working Group (RFVWG)


- #1- NOT A Sales Forum
 - Leading **Experts** from RF Providers, First Tier Primes, and other organizations
 - Anybody encouraged to participate
 - Only qualification is you can add some type of technical value to the group
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What is our Objective

- By TSSC Charter
 - *Receive, coordinate, disseminate information, review and coordinate standards, methods, and procedures to users, manufacturers, and supporting agencies*
- example-*disseminate information*
 - Existing Technical and Operational issues
 - Future Technical Challenges
 - Early directives for long term needs



Composition of RFVWG

- We have a wide range of participants from every aspect of the RF Domain
 - RF Receiver Experts
 - Antenna Experts
 - Transmitter Experts
 - Simulator Experts
 - Looking for any other type of Experts
 - Such as Frequency Management and Interference Mitigation Experts
 - We can also serve the government by working together on the following:
 - Existing Technical and Operational issues
 - Future Technical Challenges
 - Early directives for long term needs
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Composition of RFVWG

- We feel as a *serving focal point within the telemetering community* we can also serve multiple entities in addition the government by working together on the following:
 - Existing Technical and Operational issues
 - Future Technical Challenges
 - Establish early directives for long term needs

RF Vendors Group History

- **ITC 2015-** Kicked around the idea with different vendors
 - Response was: lets establish RF Vendors Working Group
- **First Informal Meeting- March at Redstone RCC Meeting**
 - RF Systems Committee joint meeting with RF Vendors Working Group
 - Vendors met and established list of subjects for standardization, test procedures, and general items for discussion
 - RF Systems Committee
 - They voted and agreed the RF Vendors Group could provide value to the RF Systems Committee
 - Agreed to meet jointly in some capacity going forward

RF Vendors Group History

- First Formal Meeting- March at Pt. Mugu RCC Meeting
 - Met with:
 - TG RF Systems Committee
 - SRF Integration Working Group
 - Vendors refined and prioritized list of subjects for standardization, test procedures, and general items for discussion

What have we been doing?

- As a group individuals presented items of interest that were believed they need work due to obsolescence, not existing or addressed, or needed improvements or enhancements
- Original Focus
 - Standards
 - Test Methods
 - General/Other Related subjects

Here were our Results

Test Methods

Subject	Item	Detail
Test Methods		
1	Test Adaptive Equalization	Need a Test Method that has IF recordings from Real Recordings, Can us Multipath Simulator,
2	Standard method to test LDPC and STC	Generate a standard for a test stimulus, needs to be incorporated into 118.
3	218 TMOIP is too open and there is no interoperability between vendors	Looking at the possibility for an Industry Day
4	Test Methods 118	Willing to provide expert assistant to bring 118 current as part of a working group.
5	Test Methods for DQM	Calibration Standard for DQM
6	Diversity Combiner Test Methods	Lacking, this is related to Item 4
7	DQM/DQE Industry Day Interoperability Testing	Recommend the government sponsor an industry day. We need an Industry day to , test interoperability between vendors. Recommend ITC.
8	Test Methods for DQE	Need a Verification to assist Format and Content Check
9	Standard library of waveforms to aid testing	Discuss at RF Systems Committee Rates, Bands, Sampling STC or LDPC with or without, LDPC, IRIG and CCSDS.

Here are the Results

Standards

Subject	Item	Detail
Test Methods		
1	Interoperable and Standardized formats for DQE And DQM	Agree on implementation vs what is defined in the standard. We need to separate DQE from DQM. We feel DQE is simplistic. The DQM is where the challenge is. The pink sheet is really DQE, it is incomplete with respect to the DQM.
2	Standard Digital Format and Protocol for Antenna, SCU, Antenna and Tracking Receiver Interface standardization	Define Digital format and protocol between Receiver and Antenna ACU, intent is to achieve Improved Autotrack Mode / Centralized Control
3	Common API for Receivers	Common Object Model is a candidate. Java Script Object Notation. JSON (STRCI)
4	Determine the Accuracy of DQM	Standard to determine the accuracy of DQM
5	New Waveforms for Standard considerations	COFDM, APSK
7	TMOIP Format 218 Supporting DQE Modification	Time Missing DQM. If there is no modification DQE and DQM may be supported.
8	Common API for Antenna	ACU, interface standard
9	RF over IP	Digitizing RF over IP VITA 49 adoption?

Here are the Results

General

Subject	Item	Detail
Test Methods		
1	Joint Gov. and Vendor effort to establish Industry wide IA, Cyber Implementation	Define Security NIST 800 -53r4 RMF Controls
2	Interference	Big Issue, due to the different interferences at different locations. Nothing defined to identify and measure severity. How important is this, how can it be addressed, how can we help. Transportable Systems performance is at risk.
3	JF12 and 1494	Can't buy hardware that do not have frequency certification in place. Process is broken.
4	XDT -Extended Time Diversity	Solution for porcupine effect, increases multipath immunity, compatible with all modulation scheme, , Can be a very easy modification to existing transmitters. There is no modification in the receiver(need equalizer). Need real flight test data to qualify.



Summary

- There are a number of items that need attention that RFVWB can be involved:
 - Test Procedures
 - Bring them up to date
 - Test New Technologies
 - Standards
 - New Standards Required (Antennas)
 - New Candidates for Improved RF Transmission
 - Modulation, Coding, Time Shifting
 - Investigation of New Technologies
 - Overcome Challenges
 - Migration to C Band

Summary

- The TSCC has a wide range of experts
 - Looking for increased participation
- Looking for areas we can expand our reach and benefit the RF field and community
- A number of the subjects go beyond the RCC RF Systems Group
- If you know of anyone interested, point them to **Johnny Pappas**