

TELEMETERING STANDARDS COORDINATION COMMITTEE



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TSCC Fall 2011 Chairman's Report

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Significant Activity (2011)

- TSCC web site was re-hosted and updated
- Best telemetry standards paper will be awarded at ITC 2011
 - Brad Fleury lead the selection effort.
 - Winner: "DESIGN CONSIDERATIONS FOR XML-BASED T&E STANDARDS". Authors: Tim Darr (Lead), John Hamilton & Ronald Fernandes (Knowledge Based Systems, Inc) and Charles H. Jones (EAFB)
- With the Resignation of James Yates there is open membership slot in the TSCC
- Sheila contacted Aerospace Industries Assn. (AIA) to the request of IFT <http://www.aia-aerospace.org/standards/>
- Two meetings of the TSCC in 2011
 - Spring 2011: March 2 in Santa Ynez Valley (Vandenberg) in conjunction with RCC meeting
 - Fall 2011: October 24th Bally's Las Vegas in conjunction with ITC
- S. Nicolo reported TSCC status at ETSC meeting at the ETTC Show in Toulouse France.

Significant Activity (2011)

- ITC2011: Special Session on Wednesday Oct 26: Session 8 C-Band Special Session set up for ITC2011 -Joint session with TSCC & C-band working group
 - 8:30 Intro/Agenda Review (TSCC) (Steve Nicolo)
 - 8:35 Opening Remarks - Test Resource Management Center (Gerald Christeson)
 - 8:45 C-Band Spectrum Regulatory Status- AFSMO (Fred Moorefield)
 - 8:55 C-Band Working Group (DoD) (Patrick Feeley)
 - 9:00 C-Band Channel Characteristics (Dr Michael Rice)
 -
 - 9:20 State of C-Band Standards (TSCC) (Scott Brierley)
 - 9:30 BREAK
 - 9:40 Open Floor Discussion (ALL)
 - 10:00 C-Band Hardware Overview (Vendors Presenting)
 - Transmitters: Antennas: Receivers:
 - 10:00 TCS:(Michel Roy)
 - 10:10 Quasonix:(Terry Hill)
 - 10:20 Semco(Doug O'Cull)
 - 10:30 ViaSat:(Ed Payne)
 - 10:40 L-3: (Mark Kukawski)
 - 10:50 TTC: (Paul Cook)
 - 11:00 Lumistar: (Kalyan Farrington)
 - 11:10 Orbit: (Yosi Avraham)
 - 11:20 Ktech (Chris Patscheck)
 - 11:20 Adjourn

Significant Activity (2010)

■ Review Requests:

- Draft document review of IRIG 118, *Test Methods for Telemetry Systems and Subsystems, Volume I* and focuses on Chapter 5 "Test Procedures for Telemetry transmitters." Comments are due to task lead NLT 11/10/11

link: <http://www.wsmr.army.mil/RCCsite/Pages/DraftDocumentReview.aspx>

- Red Book and agency review of CCSDS 123 "Lossless Multispectral & Hyperspectral Image Compression"

Current TSCC Focus Areas

- New Telemetry Standards – i-Net
- Review of draft document IRIG 118, Chapter 5 by Nov 10
- Decide on Spring Meeting (PAFB)-
Decide on Meeting Time

ACTIONS

- **Action:** Need to have an alternate and make sure they are on a subcommittee.
- **Action:** Brad F. to follow-up with James Yates to see if he has any recommendation for membership.
- **Action:** Steve N. to put email out to group to see what C-Band topics should be discussed as a potential Special Session. Need to contact ITC Tech Chair (Ray).
- **Action:** Steve N. to review Charter to see if we need to change in relation to US government members.

TELEMETERING STANDARDS COORDINATION COMMITTEE



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TSCC Fall 2011 Treasurer Report

October 24, 2011
Bally's Las Vegas
Las Vegas, Nevada, USA

Treasurer Report

for the Period 2/25/11 thru 10/24/11

■ INCOME		
• Funding Received, IFT	\$	0.00
■ EXPENDITURES		
• Award Plaques	\$	553.60
• Spring TSCC Committee Meeting Dinner	\$	473.79
• Web Hosting	\$	0.00
■ Net Increase (Decrease) in Cash	\$	(1,027.39)
■ Beginning Cash Balance	\$	1,445.52
■ Ending Cash Balance	\$	418.13

TELEMETERING STANDARDS COORDINATION COMMITTEE



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TSCC Fall 2011
*Nominating
Sub-Committee Report*

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- Sheila Horan – NMSU/ODU
- Scott Brierley - United Launch Alliance
- Chuck Weaver - Dynetics, Inc.

Sub-Committee Focus

- **The nominating sub-committee shall propose TSCC members and officers for approval by the membership.**
- **Prospective TSCC members and officers can be nominated by the TSCC membership or by a nominating subcommittee.**
- **All nominations must be approved by a membership vote.**

TSCC Membership Rules

- Adequate representation shall always exist from the diverse groups constituting the telemetry community
- Representatives of government and commercial entities shall each constitute a minimum of one-third of the regular TSCC Membership
- The remaining one-third may include, but is not limited to those in commercial, governmental, and academic organizations
- Membership by representatives of non-US entities shall not exceed 25% of the total regular membership

TSCC Group Definitions

- Government entities are defined to include agencies of the United States Government, foreign governments, and not-for-profit organizations under contract to them
- Commercial entities are defined as manufacturers or vendors of equipment, software, or systems, for-profit companies that use telemetry equipment, and suppliers of telemetry-related services, such as consulting, on a for-profit basis.

TSCC Membership Terms

- TSCC Membership Terms are for five years
 - Terms are staggered so that the terms of 20% (rounded to the nearest integer) of the regular membership end each year
 - Members may be re-nominated for additional terms by the nominating sub-committee.
- This Fall 2011 Brierley, and Skelley will have reached the end of their terms.
 - Dan Skelly has agreed to continue to serve
 - Scott Brierley

TSCC Makeup

- The TSCC currently consists of
 - 2 academic organization members
 - 6 government entity members
 - 7 commercial entity members
- Members from commercial entities belong in two different groups:
 - Telemetry equipment suppliers
 - Telemetry equipment users

TSCC Membership

- Academia
 - Sheila Horan, PhD
 - Gerhard Mayer
- Government
 - Mark Bender
 - Greg J. Kazz
 - Lorin Klein
 - Filiberto Macias
 - Myron Moodie
 - Dan Skelley
- Industry
 - Scott Brierley
 - Diarmuid Corry
 - Lee Eccles
 - Brad Fleury
 - Wayne Klein
 - Steve Nicolo
 - Chuck Weaver
- Ex-Officios
 - Teresa Telles (TG chair)
 - Bill Rymer (IFT Rep)
- Members Emeritus
 - Merv MacMedan
 - Erwin (Terry) Straehley

TSCC Membership

- The Aerospace Corporation
- United Launch Alliance
- ACRA Control, Inc.
- Boeing Commercial Airplane Co.
- Edge Consulting
- Apogee Labs, Inc.
- New Mexico State University

TSCC Membership

- NASA- Jet Propulsion Laboratory
- USAF
- White Sands Missile Range
- GVM-Consulting/AIRBUS
- Southwest Research Institute
- GDP Space Systems
- NAVAIR
- Dynetics, Inc.

Two Open Membership Slots

- With the resignation of James Yates There is open membership slot in the TSCC
 - Recommendations for the position:
 - Mark Geoghegan

New Membership

- Voting on Alternates:
 - Alternate for Mark Bender
 - Alternate for Wayne Klein

TSCC Officers

- Officers shall serve for a two year term of office
 - The term of office shall begin at the start of the TSCC Year in even calendar years
 - Traditionally the Vice-Chair succeeds to the Chair's position to fulfill a two year term as Chair
 - The Secretary-Treasurer may be re-elected
- Current Officers:
 - Chair – Steve Nicolo
 - Vice-Chair seat is still open (Brad Fleury – unofficially)
 - Secretary-Treasurer – Wayne Klein
- Committee Chairs – all full

Open Actions

Nominating Committee Motions and Action Items:

- One open membership slot
- One Vice-Chair position open.
- Two alternate positions open – Mark Bender and Wayne Klein

Open Actions

Committee Memberships:

- TSCC members and alternates shall be appointed to sub-committees by the TSCC Chair.
- The Alternate shall be kept informed of the committee activities and will be expected to actively serve on a sub-committee
 - Most alternates are currently not on any subcommittees
 - Two members are not on a subcommittee
 - Review all memberships

Open Actions

Members				Alternate		
Last	First	Office	Committee	Last	First	Committee
Bender	Mark	member	radio Freq			
Brierley	Scott	Chair	radio Freq	McNatt	William	radio freq
		member	Transducers			
Eccles	Lee	Chair	Transducers	Grant	Robert	
Klein	Wayne	member	Network&Protocol			
Horan	Sheila	Chair	data comp	Marcellin	Michael	data comp
		Chair	nominating			
Kazz	Greg	member	data comp	Greenberg	Edward	
Klein	Lorin	Chair	Recorder/reproducer	Buckley	Mark	
Corry	Diarmuid	Chair	Network&Protocol	Yi	Hyong	
Macias	Filiberto			Braun	Chris	
Mayer	Gerhard	member	ETSC	Freaud	Gilles	
Niccolo	Steve	TSCC chair	Data multiplex	Carlson	John	
		member	data comp			
Moodie	Myron	member	Network&Protocol	Abbott	Ben	
Skelley	Dan	member		Malatesta	William	
Weaver	Charles	member	Data multiplex	Dison	Bob	
Fleury	Brad	Chair	Data multiplex & RF	Rob Tripa	Edge	

TELEMETERING STANDARDS COORDINATION COMMITTEE



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“TSCC Fall 2011 RF Subcommittee Reports”

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- Scott Brierley
 - Mark Bender
 - Mark Dapore
 - Brad Fleury
 - Lloyd Lautzenhiser
 - Eugene Law
 - Warren Martin
 - Bill McNatt
 - Rich Siegal

Subcommittee Focus

- RF Subcommittee reviews standards dealing with the Radio Frequency (RF) telemetry link
- Current standards
 - **RCC IRIG-106**
 - **RCC IRIG-118**
 - **RCC RF Handbook**
 - **CCSDS-401**
 - **CCSDS-411**
 - **SGLS**
 - **STDN**
 - **1451.5**

Significant Activity

- IRIG (RCC) 118 Chapter 5 Pink Sheets currently out for review
 - IRIG 118 Chapter 5 is Test Procedures for Telemetry Transmitters
 - Comments due 10 November 2011
 - Changes to the document are mainly editorial and cleanup
 - Example: The test method for the center frequency and frequency stability test gives options for the modulation input, but the next paragraph, test procedure states the input should be shorted to ground
 - The test methods are independent of the transmit frequency, however the examples are for S-Band, and no example exists for the new C-Band

TELEMETERING STANDARDS COORDINATION COMMITTEE



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“TSCC Fall 2011 Committee Reports”

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- Lee Eccles, Chair – Boeing Test & Evaluation

Subcommittee Focus

- Transducer Standards
- Current Standards
 - IEEE 1451 Family

Significant Activity

- IEEE 1451.2
- Point to Point Digital Transducer Standard
 - UART Interface Standard
 - SPI Interface Standard
- This revised standard has been balloted and changes are being incorporated

Significant Activity

- IEEE 1451.4
- TEDS associated with an analog Transducer
- This standard is being revised
- The balloting closed March 1
- The revised standard has not been released

Significant Activity

- IEEE 1451.7
- This standard is for a transducer that communicates using an RFID chip
- This standard was released in 2010

TELEMETERING STANDARDS COORDINATION COMMITTEE



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TSCC Fall 2011

Coding and Data Compression Sub-committee Report

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- Sheila Horan, Chair - NMSU
 - Michael Marcellin, Alternate - Univ. of Arizona
 - Chuck Creusere – NMSU;
 - Stephen Horan – NMSU;
 - Aaron Kiely – JPL;
 - Matt Klimesh – JPL;
 - M. MacMedan – emeritus;

Membership - Continued

- George Nelson - Delta Information System;
- Jimmie Perkins – Raytheon;
- Khalid Sayood - Univ. of Nebraska – Lincoln;
- Pen-Shu Yeh - NASA – Goddard;
- Gary Thom - Delta Information System;
- Steve Nicolo - GDP Space Systems

Sub-Committee Focus

- Data Compression and Coding
- Current standards – updates

Significant Activity

CCSDS - input

- Provided feedback on:
 - Red Book and agency review of CCSDS 123 "Lossless Multispectral & Hyperspectral Image Compression"
 - Most comments were cosmetic in nature and were sent to the Aaron Kiely (CCSDS)

Significant Activity

CCSDS Lossless Data Compression

CCSDS 121.0-P-1.1 - Updates

- *This Recommendation defines a source-coding data-compression algorithm and specifies how data compressed using the algorithm are inserted into source packets for retrieval and decoding.*

CCSDS Lossless Data Compression

CCSDS 121.0-P-1.1 Updates:

- increases the allowed values of block length J from $\{8, 16\}$ to $\{8, 16, 32, 64\}$;
 - increases the maximum allowed value of the reference sample interval r from 256 to 4096;
 - allows the use of a restricted set of code options;

CCSDS Lossless Data Compression

CCSDS 121.0-P-1.1 Updates:

- - defines a new subfield of the Source Configuration Field of the optional Compression Identification packet;
- adds guidance for selection of code option when two or more code options gave the same performance for a block;
- clarifies that the ID bits are to be included when selecting the coding option for a block;

CCSDS Lossless Data Compression

CCSDS 121.0-P-1.1 Updates:

- - updates nomenclature subsection;
- clarifies some text;
- adds a dedication to Warner Miller.

Significant Activity

CCSDS- 131.2-R-2: Flexible Advanced Coding and Modulation Scheme for High Rate Telemetry applications

- *This draft Recommended Standard defines a Serially Concatenated Convolutional turbo Coding (SCCC) scheme for telemetry applications. The current issue reflects comments resulting from review of the original issue.*
- To late to review

Significant Activity

iNet

- iNet Com Link Stnd section 4.5
 - Only comment would be on accuracy of technical write-up. No other input indicated. Will request review from committee. Using and Forward error correcting code, and goes through the requirements for that code.
- RF Network Element Standard – Section 11 on Encryption
 - Indicates radio encryption is being used. No specifics, so nothing to comment on.

Significant Activity

ETSI

- REN/JTC-DVB-301 Digital Video Broadcasting
- This document specifies a transmission system for hybrid satellite and terrestrial digital television broadcasting to mobile terminals
- The purpose of the DVB-SH standard is to provide an efficient transmission system using frequencies below 3 GHz suitable for Satellite Services to Handheld devices, in terms of reception threshold and resistance to mobile satellite channel impairments.
- Reviews due by 12/7/2011

Significant Activity

IRIG

- IRIG 106
- Contains CVSD coding (continuously Variable slope delta) no request for reviews

RCC

- Test Procedures for Telemetry Transmitters – Pink Sheet
- No work for this sub-committee

Open Actions

- Send out for Review:
 - Review iNet documents
 - CCSDS 121.0-P-1.1
 - REN/JTC-DVB-301 Digital Video Broadcasting
 - TSCC sub committee website

TELEMETERING STANDARDS COORDINATION COMMITTEE



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**“TSCC Fall 2011
Recorder / Reproducer
Committee Report”**

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- Lorin Klein, Chairman
- Mark Buckley (JDA Systems, Concord, CA, USA)
Alternate Chairman
 - Balázs Bagó (Heim Systems GmbH, Bergisch Gladbach, Germany)
 - Bob Baggerman (Georgia Tech Research Institute, Atlanta, GA, USA)
 - Tim Chalfant
 - Tim Gatton (Wyle Laboratories, California, Maryland, USA)
 - Mike Lockhard (EMC Corp, Irvine, California, USA)

Sub-Committee Focus

- Data Recorders, Ground and Airborne
- Standards in Place
 - IRIG 106-09 -- Range Commanders Council (RCC) Telemetry Standards
<http://www.irig106.org/docs/106-09/>
 - STANAG 4575 – North Atlantic Treaty Organization (NATO) Standard Agreement (STANAG) – NATO Advanced Data Storage Interface (NADSI) Allied Engineering Documentation Publication (AEDP)
<http://www.nato.int/STRUCTUR/AC/224/standard/4575/4575.htm>
 - ANSI INCITS 175-1999 (R2004) 19mm Type ID-1 Recorded Instrumentation Digital Cassette Tape Format (revision and redesignation of ANSI X3.175-1990 (R1995))
 - MIL-STD-2179 – Helical Digital Recording Format For 19-MM Magnetic Tape Cassette Recorders/Recorders

Significant Activity

- RCC Telemetry Group Recorder Reproducer Committee
 - IRIG 106-11 published 22 July 2011.
- STANAG 4575, Custodial Standards Team (CST)

Significant Activity

RCC Document 106-11 Ch 10

- Added new data type TSPI/CTS (Time-Space-Position Information and Combat Training System) data type (Section 10.6.16)
- Many administrative changes

Significant Activity

STANAG 4575

From 16 Sep 2010 Custodial Support Team Meeting Minutes

- Current Status – No change

- Proposed Changes Under Consideration
 - New physical interface - Ethernet w/ 1000BaseT- minimum
 - New Protocol – iSCSI and/or dynamic IP addressing for multiple memory systems
 - Revising cable/connector requirements, power – maintain Fibre Channel compatibility with ground stations
 - Shells for Ethernet should be MIL twist lock type
 - One power input is all that will be allowed
 - RMMs should allow for Ethernet or Fibre Channel – transition to Ethernet alone

Significant Activity

Next STANAG CST Meeting

- Next STANAG 4575 Custodial Support Team (CST) meeting is TBD



Open Actions

- RCC publication of RCC Document 118-10 and IRIG 106-11 Summer of 2011
- STANAG CST – TBD

TELEMETERING STANDARDS COORDINATION COMMITTEE



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“TSCC Fall 2011 ETSC Committee Report”

October 24, 2011
Bally's (ITC 2011)
Las Vegas, NV

Membership

- **Committee Chair**

Gerhard Mayer , Gilles Freaud (A)

- **Subcommittee Chair**

- **SC-1: RF Spectrum & Frequency Management**

Jean-Claude Ghnassia, Jean Isnard (A)

- **SC-2: Data Acquisition & Processing**

Werner Lange, Christian Herbepin (A)

- **SC-3: Data Recording & Storage**

Steve Lyons , Balasz Bagó (A)

- **SC-4: Network Telemetry**

Eckhard Schulze

(A)...Alternate



Subcommittee Focus 1

- SC-1: Spectrum availability & efficient techniques, data integrity in the transmission channel
- Current Standards
 - IRIG 106-09, Chapter 2+Annex A&M
 - IEEE 802.11n/15.3/15.4
 - DVB-T & OFDM derived industry standards (ETSI EN300 744 V1.6.1)



Subcommittee Focus 2

- SC-2: Ensure acquisition and time tagging in high-rate data streams
- Current Standards
 - IEEE 1451
 - IEEE 1588
 - IEEE 802.11.n/15.1/3/4
 - IRIG 106-09, Chapter 3
 - IRIG 218-07 (TMoIP)



Subcommittee Focus 3

- SC-3: Info collection & dissemination on recording system and techniques
- Current Standards
 - IRIG 106-09, Chapter 10
 - XidML 3.0



Subcommittee Focus 4

- SC-4: Info collection & dissemination on network telemetry systems
- Current standards:
 - IEEE803.3 (Ethernet 100-Tx), basis for long range WLAN functionality
 - IRIG 106-07 part 2
 - iNet Metadata standard

Significant Activity

- ETSC open meeting at the ETC 2011
- Review RF classical modulation standards, comparison with OFDM-based techniques
- Review and comments on IRIG 106-Ch.10
- Nomination SC-4 „Network Telemetry“ chair

Open Actions

- "WRC`07" C-band: upcoming RF standards
- IEEE 802.n and UWB as a basic standard for wireless intra-aircraft RDA-networking
- Track emerging standards of Cognitive Radio Systems, IEEE 801.15&22, IEEE1900.1/2/4
- ETSI TR102 802/803, ITU-R (WP 1B) AI 1.13 of the WRC-12
- New Subcommittee on Network Telemetry (SC.4), call for members, defining scope of work

ETSC Open Meeting, ETTC 2011 Toulouse, 16 June, 2011

1. Committee Reports:

ETSC *Gerhard Mayer, GVM-Consultants*

RCC TG *Michael Golackson, Edwards AFB*

TSCC *Steve Nicolo, GDP Space Systems*

CCSDS *Rob Ritter, RT Logic*

2. ETSC Round Table Discussion:

*"Standardization of future measurement systems,
configuration file format & interfaces"*

Gilles Freaud & Jean-Pascal Caturla, Airbus F

ETSC Round Table, ETTC 2011 (1)

- ***"TOWARDS A COMMON CONFIGURATION DATA
■ FORMAT for INSTRUMENTATION"***

Introduction

G. FREAUD

Vision of the users

Eurocopter

Dassault

Edwards US AF

Airbus

C. HERBEPIN

J. PONS

R. POZMANTIER

L.PELTIERS / JP.CATURLA

Vision of the suppliers

Acra

Zodiac

Teletronic

N. CRAWLEY

J. SAUVALE

E. PESCIOTTA

Open discussion

All attendees

ETSC Round Table, ETTC 2011 (2)

"TOWARDS A COMMON CONFIGURATION DATA FORMAT for INSTRUMENTATION"

Sum-up of discussions :

Two different visions have been highlighted

- MDL (based on iNet)
- XidML (based on Users group, leaded by Acra)

Conclusion of the Round table :

- No standard selection made
- Discussion in progress at EADS to select a format
- Suppliers are open to develop such standard whatever solution, if it is a customers requirement