

TELEMETERING STANDARDS COORDINATION COMMITTEE



TSCC

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“TSCC Spring 2008 Meeting Minutes and Committee Reports”

March 4th/5th 2008
Cocopah Resort and Conference Center
Somerton, Arizona

Opening & Quorum Determination

■ Attendance and Determination of Quorum

- Meeting called to order
- Attendees were
 - James Yates
 - Scott Brierley
 - Loren Klein
 - Greg Kazz
 - Steve Nicolo
 - Bill Rymer
 - Tim Chalfant
 - Ron Pozmantier
- Sheila Horan is sick and is unable to attend, however she has submitted her report, which will be presented during this meeting.
- Dave Grebe could not make it.
- Dan Dawson submitted his resignation to the TSCC.
- Tim Chalfant and Ron Pozmantier will be here but not till after lunch
- Fil Macias is not here today.
- John Kolb could not make it.

Minutes #1

- Reviewed and approved agenda
- Reviewed the following reports:
 - Chairman
 - Secretary Treasurer
 - Committee Reports
 - RF, Networks, Data Multiplex, Transducers, Coding/Data Compression, Recorder/Reproduce
 - Nominating
- Had a briefing on CCSDS link security protocols by Gregg Kazz

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“Chairman's Report”

March 4, 2008

Significant Activity (2007)

- 2 meetings of the TSCC were held
 - (Spring) March 14th joint TSCC/RCC/TG meeting in Las Cruces, NM
 - (Fall) October 22nd in Las Vegas in conjunction with ITC

Significant Activity (2007)

- Revamp of TSCC web site with special focus on updates to subcommittee memberships and applicable standards
 - Updates complete
 - Networking & Protocols
 - Recorder Reproduce
 - Data Multiplex
 - Still in process
 - Coding & Data Compression
 - Radio Frequency
 - Transducers

Significant Activity (2007)

- Standards reviewed over the last 12 months include:
 - CCSCS – IP over CCSDS/best practices 702.1 red book (magenta)
 - CCSDS XTCE
 - New NASA/JPL LDPC Codes
 - IEEE1451
 - IRIG-106-Chapter 9 – DDML (data display mark up language), 6 & 10
 - IRIG-118 Instrumentation Handbook
 - USAF SGLS/USB spacecraft TT&C Stds
 - LDPC Code Review

Significant Activity (2007)

- Best telemetry standards paper award at ITC (TMoIP – Brian Eslinger)
- Added 3 new members
 - John Kolb
 - Steve Nicolo
 - Dr. Russ Jedlicka
- Loss of 6 members
 - Dan Dawson
 - Sid Jones
 - George Mantz
 - Danny Bonham
 - Eugene Law
 - Ed Snyder
- Attend 2008 ETTC meeting in Toulouse
- Agree to sponsor a special session at ITC 2008
- Develop template for reporting activities

Current TSCC Focus Areas

- New telemetry networking standards
- Membership recruiting
- Web improvements
- Best paper and special sessions for ITC

TELEMETERING STANDARDS COORDINATION COMMITTEE



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Coding and Data Compression

Status Report
March 4, 2008

Membership

- Sheila Horan, Chair - NMSU
 - Michael Marcellin, Alternate - Univ. of Arizona; marcellin@ece.arizona.edu
 - Chuck Creusere – NMSU; ccreuser@nmsu.edu
 - Stephen Horan – NMSU; sthoran@nmsu.edu
 - Aaron Kiely – JPL; aaron@shannon.jpl.nasa.gov
 - Matt Klimesh – JPL; matthew.a.klimesh@jpl.nasa.gov
 - M. MacMedan – Emeritus; macmedan@ieee.org

Membership - Continued

- George Nelson - Delta Information System;
gcnelson2@netzero.net
- Jimmie Perkins – Raytheon; jwperkins@raytheon.com
- Khalid Sayood - Univ. of Nebraska – Lincoln;
ksayood@sensin.unl.edu
- Pen-Shu Yeh - NASA – Goddard; pen-shu.yeh-
1@nasa.gov
- Gary Thom - Delta Information System;
gthom@delta-info.com
- Steve Nicolo - GDP Space Systems;
snicolo@gdpSPACE.com

Subcommittee Focus

- Data Compression and Coding
- Current Standards – Updates

Significant Activity

LDPC codes are scheduled to be used in the NASA Constellation project. Several encoder/decoder implementations exist at NASA and in industry.

- There is a CCSDS experimental specification that is composed of two parts. The single rate $7/8$ code was designed and optimized for the characteristics and requirements typical of many Near-Earth missions, whereas a different set of codes was designed and optimized for the characteristics and requirements typical of many Deep-Space missions.
- <http://public.ccsds.org/publications/archive/131x1o2e1.pdf>

Significant Activity

JPEG committee has started a new project called JPEG DI (www.jpeg.org):

- JPEG XR is a proposed new part (Part 2) of the recently established new work item in JPEG known as JPEG Digital Imaging System Integration (ISO/IEC 29199 - JPEG DI). JPEG DI aims to provide harmonization and integration between a wide range of existing and new image coding schemes in order to enable the design and delivery of the widest range of imaging applications across many platforms and technologies.

Significant Activity - JPEG

- JPEG DI aims to leverage the rich array of tools developed in and around JPEG and JPEG 2000 to support new image compression methods such as JPEG XR.
- JPEG XR is designed explicitly for the next generation of digital cameras, which are based extensively on the technology introduced by Microsoft in its Windows Media Format proposals, at present known as HD Photo.
- At the Kobe meeting, the JPEG XR specification (Working Draft) was reviewed and will be balloted for promotion to Committee Draft (CD) status before the 44th WG1 San Francisco meeting, March 31 to April 4, 2008.
- In addition to JPEG XR itself, the creation of two other new parts of the standard on compliance testing and reference software was approved at the meeting.

Significant Activity - JPEG

- Digital Cinema Initiatives (www.dcinovies.com) organization has adopted JPEG 2000 for the distribution of digital movies to theatres. The successful rollout of this solution continues unabated with over 5000 theatres supporting digital cinema including 1000 stereoscopic theatres.

Significant Activity - JPEG

- JPEG 2000 Part 9, known as JPIP, allows powerful and efficient network access to JPEG 2000 images and their metadata in a way that exploits the best features of the JPEG 2000 standard.
- Interoperability testing among several JPIP implementations continued.
- Participation from additional organizations is solicited, and testing will continue over the Internet between meetings. For more information please contact jpip@jpeg.org.

Significant Activity - JPEG

- JPEG 2000 Part 10 Ad Hoc Group has been working on the extension of JPEG 2000 to three-dimensional images such as Computer Tomography (CT) scans and scientific simulations.
- JP3D is currently in balloting phase for International Standard (IS) status.
- Due to an increased interest in compression technologies for floating-point data, the JPEG Committee has issued a call for information on applications and compression technology for floating-point data.
- Responses will be reviewed at the 44th WG1 San Francisco Meeting, March 31 - April 4, 2008.

Significant Activity - JPEG

- JPEG 2000 Part 11 Wireless, also known as JPWL, has become an International Standard (ISO/IEC 15444-11). JPWL has standardized tools and methods to achieve the efficient transmission of JPEG 2000 imagery over an error-prone wireless system.
- JPEG 2000 Part 13, which standardizes an entry level JPEG 2000 encoder with widespread applications, was published as ISO/IEC 15444-13. (Intended to be implemented on a license and royalty fee free basis.)

Open Actions

- Complete information table for website.

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Recorder Subcommittee

Status Report
March 4, 2008

Membership

- Tim Chalfant (AFFTC, Edwards AFB, CA, USA),
Chairman
- Lorin Klien (AAC, Eglin AFB, FL, USA) Alt
 - Balázs Bagó (Heim Systems GmbH, Bergisch Gladbach, Germany)
 - Bob Baggerman (Georgia Tech Research Institute, Atlanta, GA, USA)
 - Mark Buckley (IDA Associates, Titusville, FL, USA)
 - Tim Gatton (Wyle Laboratories, California, Maryland, USA)
 - Mike Lockhard (EMC Corp, Irvine, California, USA)
 - Barbara Wood (QinetiQ Boscombe Down, Salisbury, Wiltshire, UK)
 - ??

Subcommittee Focus

- Data Recorders, Ground and Airborne
- Standards in Place
 - IRIG 106-07
 - ANSI ID-1
 - MIL-STD-2179

Significant Activity

- RCC Released IRIG 106-07
 - Updates to Digital Recorders (Ch-10)
 - TMATS for Digital Recorders (CH-9)
- Europeans looking at Holographic Std

Open Actions

- RCC TG Addressing Ground TM Recorders
 - 106 Chapter 7
 - May be included in CH-10
- New task request for CH-10 updates
 - Target for a 2009 release of 106
- Anyone still using tape?
 - RCC TG considering moving ID-1 and VLDS to appendix (not recommend for new purchases)

Open Actions

- RMM Security
 - New RCC POC to STANAG
 - RCC Omnibus contract awarded
- Update to IRIG 118 on hold
- Digital Recorder Handbook

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Data Multiplex Subcommittee

Status Report
March 3, 2008

Membership

- Steve Nicolo
 - Howard Eckstien
 - Alain Hackstaff
 - M. Pizzuti
 - Bill Rymer
 - Dave Sniffin
 - Erwin Straehley
 - Duane Weaton

Subcommittee Focus

- Current Standards
 - IRIG-106
 - Part 1: Telemetry Standards
 - Chapter 3: FM Data Standards
 - Chapter 4: PCM Data Standards
 - Chapter 8: Bus Data Formatting Standards
 - Chapter 9: TMATS
 - Part 2: Telemetry Networks
 - Chapter 4: Packet Telemetry Standards
 - RCC IRIG-118: Test Methods
 - RCC IRIG-119: Telemetry App's Handbook

Significant Activity

- RCC completed and released the following in IRIG-106-07.
 - TG76 XML SCHEMA for TMATS
 - TG84 Standard for Data Display (XML SCHEMA)

Open Actions

- New Work Tasks
 - Ongoing effort to keep TMATS IRIG 106 Chapter 9 and XML Scheme Current
 - TMATS Handbook

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RF Subcommittee

Status Report
March 4, 2008

Membership

- Scott Brierley
 - Mark Bender
 - Mark Dapore
 - 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

- CCSDS 401.0-P-18.1 Radio Frequency and Modulation Systems – Part 1 Earth Stations and Spacecraft in review
 - Comments due 10 April 2008
 - Pink sheets provided for:
 - Command uplink (typically less than 4 kBps)
 - Suppressed Carrier downlink
 - High symbol rate (>2 Ms/s) space to earth transmissions

Significant Activity

- CCSDS 401.0-P-18.1 Pink sheets provide the following recommendations.
 - For Command Uplink:
 - Use NRZ-M, -L codes
 - Avoid long strings of "1" or "0"
 - For suppressed carrier PCM downlinks:
 - Use NRZ-M to avoid phase ambiguity, except
 - Use NRZ-L if synchronization markers are used to avoid losing a complete frame
 - For convolutionally coded systems, convert to NRZ-M before the convolutional coder

Significant Activity

- CCSDS 401.0-P-18.1 Pink sheets provide the following recommendations.
 - High data rate downlinks should use one of the following spectrally efficient modulation formats.
 - GMSK
 - Baseband Filtered OQPSK
 - GMSK and baseband filtered OQPSK can be demodulated using conventional OQPSK receiver.
 - There is a performance penalty using that type demodulator.
 - Some space agencies have no plans to modify their ground stations with the optimal demodulators.
 - GMSK and baseband filtered OQPSK with a matched demodulator have better interference immunity than BPSK.
 - FQPSK removed from the recommended formats.

Open Actions

- Need to update TSCC Website for RF Subcommittee members
 - Add Rich Siegal as new RF Subcommittee member
 - Have not heard from Alain Hackstaff or William Lennox for many years
- Need contact information for Gene Law
- CCSDS 401.0-P-18.1 comments due 10 April 2008

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Transducers

Status Report
March 2008

Membership

- Lee Eccles
 - Alex Karolys – VIP Sensors
 - Scott Brierley

Subcommittee Focus

- Transducer Standards and related topics
- IEEE 1451
 - The new standards in this family have been approved.
 - IEEE 1451.2 is still being revised.

Significant Activity

- Looking into Measurement Uncertainty tools.

Open Actions

- None

TELEMETERING STANDARDS COORDINATION COMMITTEE



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Nominating Subcommittee

Status Report
March 4, 2008

Membership

- Scott Brierley
 - Lee Eccles

Subcommittee Focus

- The nominating subcommittee 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 not be 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 Makeup

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

Two Open Membership Slots

- There are two open membership slots in the TSCC
 - Previously there was one open slot
 - George Manz resigned and provided a second open slot
- A minimum of one additional government member is required
 - One-third minimum government representation required

TSSC Membership

- Academia
 - Sheila Horan, PhD
 - Russell P. Jedlicka, PhD
- Government
 - Tim Chalfant
 - Greg J. Kazz
 - Filiberto Macias
 - Dan Skelley
- Industry
 - Scott Brierley
 - Lee Eccles
 - David Grebe
 - John Kolb
 - Gerhard Mayer
 - Steve Nicolo
 - Michael Pizzutti
 - James A. Yates

New Membership

- Possible sources for new members:
 - SWRI (South West Research Institute)
 - SWRI would be a new category
 - Crosses the lines between academia, industry, and government
 - Aerospace Corporation
 - Aerospace corporation is defined in the bylaws as a government agency
 - Aerospace corporation employee Mark Bender has expressed interest in becoming a full time member

TSCC Chair

- TSCC Chair Term expires after the 2008 Fall meeting
 - 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

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 renominated for additional terms by the nominating subcommittee.
- Two membership slots expire this year
 - The TSCC year begins immediately following the TSCC Annual meeting, which is held in conjunction with the International Telemetry Conference.
- Not sure which membership slot belongs to Russell Jedlicka.

TSCC Membership Terms

Year Term Expires				
2008	2009	2010	2011	2012
Filiberto Macias	TBD	TBD	Scott Brierley	Tim Chalfant
Sheila Horan, PhD	Lee Eccles	Michael Pizzutti	James A. Yates	David Grebe
TBD	Gerhard Mayer	Steve Nicolo	Dan Skelley	John Kolb
		Greg J. Kazz		

Second Nominating Committee Member Required

- The Nominating subcommittee shall consist of three members of the TSCC of any category
- The membership shall consist of:
 - the immediate past Chair (or the most recent prior Chair if the immediate past Chair is unable to serve) who shall chair the subcommittee, and
 - Two Members-at-Large elected by the TSCC membership

Open Actions

- Two open membership slots
- New Vice Chair seat will be open in Fall 2008
- Need to verify membership terms are correct
- Need third nominating committee member
- Members that have terms expiring in 2008 should expect to be renominated at the fall TSCC meeting

TELEMETERING STANDARDS COORDINATION COMMITTEE



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**European Telemetry Standardization Committee
ETSC**

**Status Report
March 4, 2008**

Membership

- **Committee Chair**

Gerhard Mayer , Jean-Yves Plasse (A)

- **Subcommittee Chair**

- **SC-1: RF Spectrum & Frequ. M^{nt}**

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)

(A)...Alternate

Subcommittee Focus

- SC-1: Spectrum availability & efficient use, data integrity in the transmission channel
- SC-2: Ensure time tagging in high-rate data streams
- SC-3: Info collection & dissemination on recording system and techniques
- Current important standards
IEEE 1451, 1588, 802.xx; IRIG 106 Ch.10

Significant Activity

- ETSC meeting at the ETTC 2007 in Toulouse, addressing time tagging (IEEE 1588), IRIG 106 update, standards followed on Australian test ranges et al
- Harmonization issues for the additional spectrum now allocatable globally and in ITU region 1 (AI 1.5 of the WRC 2007)
- Review and comments on IRIG 106-Ch.10

Open Actions

- Investigate which existing standards may be applicable for sensor data collection; e.g., ZigBee
(IEEE 802.15.4)
- Investigate potential of existing standards for wireless RDAU-networking (IEEE 802.11n and UWB)
- Next ETSC- Meeting
Venue: Munich New Trade Fair, 17 April 1330 h,
ETC 2008, Meeting Room C