

MINUTES  
of  
TSCC MEETING  
Held  
October 24, 2005  
Las Vegas, NV  
Riviera Hotel

The meeting was called to order by Chairman Scott Brierley at 1300 hours.

Members and Alternates present:

Member	Danny Bonham	Mem Emeritus	Merv MacMedan
Chair	Scott Brierley	Member	George Manz
Alternate	John Cox	Member	Gerhard Mayer
Member	Dan Dawson	Alternate	Jean Yves Plasse
Member	Lee Eccles	IFT BD Rep	Bill Rymer
Guest	Jean-Claude Ghnassia	Member	Ed Snyder
Member	David Grebe	Member	Duane Wheaton
Member	Sheila Horan	<i>Data Mux Subcommittee</i>	
Member	Eugene Law	Vice Chair	James Yates

**ATTENDANCE AND DETERMINATION OF QUORUM**

David Grebe

There was a quorum.

**REVIEW AND APPROVE AGENDA**

Scott Brierley

**OFFICER REPORTS**

Chair

Scott Brierley

Vice Chair

James Yates

Secretary-Treasurer

David Grebe

The minutes of the spring meeting held May 3, 2005 Aberdeen Maryland, Four Points Sheraton Hotel were reviewed and approved without correction.

Financial Report

Showed expenses of only the spring meeting were incurred since that meeting.

Action Item Review

Scott Brierley

Ed Snyder was to supply a copy of the nominating committee membership list and any additional information about potential new members or activity that the committee had performed in the past to the chairman, Scott Brierley.

**COMMITTEE REPORTS**

**Nominating Committee**

Lee Eccles

There was no report made. Scott did point out that we still need two new additional members and we need officers' recommendations for the spring meeting.

**Radio Frequency**

Scott Brierley

There are no new reviews.

## **Data Multiplex**

Ed Snyder

IRIG118 Chapters 6 and 7 were reviewed. Data acquisition and test methods for CAIS. There was some discussion on commercial use of 118.

## **Network and Protocols**

Dan Dawson

Dan overviewed some papers on technology demonstration activities that Wyle is performing. The goal is how to fill in missing data during maneuvering or topology interruptions. He tried to find the issues upcoming with proposed architectures. They evaluated data drop out periods with Ethernet duplicate downlinks and request for retransmission used to fill in the errors. The big finding was that the test article needs to insert time vs. just appending ground receipt time to the data to allow all bit rate and frame structures to realign at the bit boundaries including encrypted data.

Bill Rymer reported that Kip Temple is also doing a technology demonstration on alternate hardware.

Lee Eccles reported the Boeing 737 Digital Acquisition Test Bed with Ethernet was based on standards and used to connect information to a recorder and also transmit. For example 15 megabits was transmitted over the RF downlink but the full 500 megabits of acquisition data was recorded. He also reported that IEEE1588 Time Distribution was used with 15 microsecond resolution. They have a target flight date of summer of 2006.

The INet challenge is how to work INet in existing applications, telemetry, safety of flight, these are already underway.

## **Transducers**

Lee Eccles

Lee Eccles reported on the 1451.3 work and mentions that at the physical layer there is no equipment available in the market. There's no support so therefore this may need a new approach. The .3 work concentrated on wireless smart sensor network based on 802.11 or Bluetooth and .0 was addressing higher levels. Both the .5 and .0 are scheduled to be out momentarily for balloting.

## **Coding / Data Compression**

Sheila Horan

There's no new reviews performed. Sheila suggests our web site contain a list of information as resources.

## **Recorder / Reproducer**

David Grebe

No new items to review.

## **Old Business**

TSCC Web Site

Ed Snyder had all the stuff from Terry Straehley to rehost it but Dan Dawson has volunteered to move it forward effective immediately.

Chair Scott requested all the TSCC members check the contact information on the current web site and provide update information to Dan.

Sheila's idea was to make the web site more educational and put information on the site to be used as a resource. For example, what's going on in data compression and data coding.

Merv MacMedan suggests that we use no ASCII content information for "spam-bot" protection.

The group consensus was that we should start the formatting the web site from scratch. That is, reorganize it, make it better and make it multi-browser compatible.

## **TSCC Session**

Worked fine in 2003, again in 2004 but with only one TSCC member presenting a paper. The rest was supplied by other folks. In 2005 we did not have a session. So we're back to looking at the 2006 possibility. Merv MacMedan reported that JPL member (Kaz) wanted to have the following information relayed to the TSCC committee and

perhaps use this as a TSCC session. Information about doing IP over CCSDS links is now being investigated especially for longer distance use. The CCSDS ARQ is to be able to support IP Robustness. There's a working group now addressing DOR (Delta Door) Delta Doppler Ranging at JPL is working. For the Man at Moon project, high rate uplinks in the order of 10 and 20 megabits to move fax, voice, computer loads, and imaging, etc. is required. But there's difficulty with this rate.

SLE Management: This is a protocol for space to ground data movement but still missing is the international control compatibility after the tracking station. So SLE (Space Link Extension) for control centers at high level were developed. Now they're developing a new standard to add the management layer on top to permit scheduling of international tracking resources. The Inner Agency Operational Advisory Group (IOAG) consists of ESA, CNES, NASA, and JASA says that there are too many mod. types and filters and asked to reduce the option to allow interoperability. Why should there be multiple SLEs for signal types?

But as Jim Yates points out, ITC is an Aircraft Centric Event and asked will there really be interest in space standards?

Merv MacMedan responded that the Air Force Control Center to NOAA Link is using SLE to talk to each other via AVTEK hardware. This is baseband data mixed in with protocol to control the tracking station. So here's the ground use of SLE to promote interoperability of two agencies and his point is: why would the military need to reinvent this wheel?

Lee suggests papers on how Mil-1588 might replace IRIGB and on vehicle net standards. Perhaps we could have a panel discussion of available standards for vehicle network support, suggesting the pros and cons of each. Many standards are available with various implementations, SCI, Ethernet Links, and AFDX.

Then Merv posed the question, why do we need standards? A) Because of the economy of scale B) cross support and interoperability, so maybe a paper on this, a paper on why do we need to have standards in the first place.

Dan thought that the idea of presenting a paper on "How to accurately and uniformly time stamp data" would be of general interest.

Jim suggested "TSCC provide a session with paper and panel discussion on timing standards": Identify best standards available, networking timing, IRIG standards. Scott to ask Ed Mondo, ITC Technical Chair for 2006. Perhaps we could have invited papers: 1588 from Lee, problems from Dan. Dan suggests especially vehicle time and air to ground time should be addressed. Lee volunteered to be session chairman. Jean-Claude asked why only time would be the subject. Network systems on board, architecture types like CCSDS and INET, etc. with new problems identified with those networks might be a good paper for 2007. Bill Rymer mentioned that the IRIG task group telecom and timing group is looking 1588 as useful and therefore is a germane topic.

Merv MacMedan brought up the honoring Larry Rausch issue. Merv continues to work on history of standards at JPL and his involvement. For example, the first TSCC meeting was held in London in 1963. Larry was also Professor Emeritus at Cal Tech in Michigan. In 1949 or 1950, he wrote the first radio telemetry book. Bill Rymer suggests we firm up the award process, and make it an IFT award with TSCC input as one suggestion. But the group also is aware that there'd be other deserving folks and money is only given to student papers and then the selection process is always a question. These are concerns from the IFT which Dave Grebe reiterated the IFT's response to our original request. Scott suggested that our web site perhaps have an honor/history session. Dan asked Merv for some content and we could also add other telemetry giants in the future. Merv to follow up with Norm Lance to see if there's any other way to honor Larry Rausch through the IFT but the consensus was at a minimum, putting information on the new TSCC web site would be a good thing to do.

Merv reported there are three draft documents for CCSDS review. One is the AOS Space Data Link which has to do with transfer frame header changes. The second is changes to the encapsulation services which add IP packet handling and three is RF and modulation schemes which revises three high rate standards. It was agreed that as an associate member that receives the notices to review CCSDS documents, Dave Grebe would distribute notices to the

chairman who can then have it directed to appropriate committees or to everyone for review. We also wanted to look into the question of whether CCSDS could send those announcements directly to the TSCC chair and then could we have our web site forward that information to the current Chair and/or individual members.

**New Business**

Scott Brierley

Planning our spring meeting. Plan A was to get to Albuquerque perhaps coincident with the RCC meeting in early March and that was something that the members who are also RCC members would look into and advise the chair.

The meeting was adjourned at 1430 hours.