



**THIC Inc.**

The Premier Advanced Recording Technology Forum

## **IRIG Recorder / Reproducer Standards Update**

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## Range Commanders Council - RCC

- Sixteen Groups representing test, training, and operational ranges. They ensure accurate and timely communications.

## Telemetry Group - TG

- Initiates the compatibility and the transfer of telemetry data between users and test ranges and between ranges with the goal of fostering improvements in overall telemetry systems performance and compatibility.

- Committees

- Data Multiplex
- Recorder / Reproducer
- RF Systems
- TM Networks
- Vehicular Instrumentation



## Recorder / Reproducer Committee

### •PURPOSE

–Addresses telemetry standards and test methods associated with data recorders, media, multiplexers, and reproducers

### •RESPONSIBILITY

–IRIG 118, VOL III

–IRIG 106, Part I

- Chapter 6, Magnetic Tape Recorder & Reproducer Standards
- Chapter 7, Magnetic Tape Standards
- Chapter 10, Airborne Solid-State Recorder Standard
- Appendix D, Magnetic Tape Recorder & Reproducer Information and Use Criteria
- Appendix G, ADARIO Data Block Field Definitions



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## Responsibility Continued

- Appendix L, Asynchronous Recorder Multiplexer Output  
Re-Constructor (ARMOR)
- IIRIG 107, Digital Data Acquisition and On-Board  
Recording Standard
- IIRIG 106, Part II, Chapter 5 (To be accomplished)
- Participate in STANAG and Motion Imagery Standards Profile  
(MISP) Committees



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## **Recorder/Reproducer Committee**

Joe Lloyd, Committee Chair

Air Combat Command (Eglin AFB)

Air Force Flight Test Center (Edwards AFB)

Naval Air Warfare Center (Weapons Div, Pt. Mugu)

Air Force Flight Test Center (Edwards AFB)

PMRF (Kauai)

NASA (Goddard Space Flight Center)



## **Current Standards and Tape Standards**

### **IRIG 106, Chapter 6**

- Longitudinal Analog Recorders
- ID-1 Digital Cassette Recorders
- VLDS Digital Cassette Recorders
- Solid State Recorders
- ADARIO Mux/Demux
- ARMOR Mux/Demux



## Recently Completed Tasks

- TG47: Command and Control Mnemonics
  - Any Type of Data Recorder
    - solid state
    - disk
    - tape
    - optical
  - Slanted to Benefit Range Operators
  - Common Command Set
  - Device Specific Commands
  - Updated IRIG 106 with a new section - Chapter 6, Section 18



## Recently Completed Tasks Continued

- TG 56: Airborne Solid State Recorder Standard
  - Fiber Channel as download means or mechanism
  - Followed STANAG 4575
  - Data File Structures
  - Index File
  - Packet Structure Definition
  - User Defined Message Types
  - Clock Rates
  - Video Compression and Transmission
  - TMATS - Developed R and V Group Fields for IRIG 106, Chapter 9
  - Updated IRIG 106 with a new chapter - Chapter 10





## Current Tasks

- TG 70: Valid Data Checker Standard for Chapter 10  
Solid State Recorders
  - Develop a Verification and Validation Flowchart
  - Goal: To guide the development of software that will verify compliance of data formats with the newly published IRIG 106-04 Chapter 10 Solid-State Recorder Standard.
  - To be published in IRIG 118 Vol. III, Chapter 10.



## Current Tasks

### Continued

- **TG73: Ground Recorder Standard Study**
  - Establish a standard for the upcoming wave of ground solid state instrumentation recorders.
  - Goal is to produce a standard that will assure interoperability in future telemetry ground stations and networks.
  - Format compatible with the airborne solid state recorder standard while allowing for enhancements that are necessary to support the laboratory environment
  - Status:
    - Working Group Formed
    - Completion in mid 2006



## **Current Tasks**

Continued

### **TG74: IRIG 118 Vol 3 Updates for Airborne Solid-State Recorders (SSR)**

- Goal is to update IRIG 118-99 Vol 3, Test Methods for Recorder/Reproducer Systems and Magnetic Tape, to provide test methods for airborne solid state recorders.
- Status
  - Completion in mid 2006



## **Current Tasks**

Continued

- **TG75: Move Analog Recorders sections (Chapters 6 & 7) of IRIG 106, Part I to Appendix D.**
  - Goal is to revise IRIG 106 Part 1, Chapters 6 and 7, Analog Recorders/Reproducers Sections to reflect current state-of-the-art recording technology by moving these sections to Appendix D.
  - Status
    - Pink sheets responses received 15 July.
    - Responses reviewed at TG-110.
    - Scheduled for publication in 2005.



## Current Tasks

### Continued

- **TG78: Additions to IRIG 106, Chapter 10**
  - New Packets
    - IEEE 1394b, Format 0 as an optional download means or mechanism
    - Computer Generated Data, Format 2 (Recording Events)
    - Computer Generated Data, Format 3 (Recording Index)
    - Parallel Data, Format 0
    - Added MISP reference, embedded time, RTC sync and intra-packet headers
    - Video Data Type 1
    - DCRsi Data Packets
    - KLV Metadata per MISP to Video Format 0 and Format 1
  - Revised Sections
    - Added 32 Bit Alignment Mode
    - Added Data Download Structure and Naming to Section 10.3
    - Added reserved formats



- TG78: Additions to IRIG 106, Chapter 10 (Continued)
  - Working Group formed to develop these new data packets
  - Appropriate TMATS written for new data packets to be placed in IRIG 106, Chapter 9
  - Status
    - Pink sheets sent out 16 June 2004 and their responses received 15 July 2004.
    - Responses reviewed at TG-110.
    - Scheduled for publication in 2005.



## Current Tasks

### Continued

- Deletion of IRIG 107

- Abnormalities originate with asynchronous vs. synchronous timing methods
- Undefined Word Mode
- Undefined Data File Structures
- Undefined user message types
- Does not contain a declassification standard
- One vendor supports the recording scheme of this document and they are calling it by their own proprietary format name
- Status
  - Pink sheets sent out in January 2004 and their responses received 1 March 2004.
  - Committee reviewed responses at TG-110.
  - Concurrence from Telemetry Standards Coordination Committee (TSCC)
  - Scheduled for deletion in 2005.



## **New Tasks Under Consideration**

- Disk Based Recorder Study
  - File Formats
    - FAT32
    - NTS
- Multiple Solid State Recorders in the same test article
- TMATS Registry Process
  - Vendor Specific Device Attributes





## Future Activities

- New Technologies
  - Airborne and Ground I-Net Solid State Recorders Capability
  - Higher capacities, transfer rates, smaller size
  - Higher frame rates for video
  - Implementation of XML based definitions for IRIG-106 CH 10
  - COTS Devices
  - Advanced Memory Technologies
    - Opticals, Crystals, Proteins
    - Molecular, Nano-Tubuals
- DoD Ranges must be able to interoperate



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## **FUTURE DIRECTION for Recorders and Reproducers**

- Ranges: studies, future scan, and committee work
- Industry: assistance, technology concepts, direction
- Comments, Ideas, Suggested Tasks

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