2006 NEWS FLASH

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A MONTHLY NEWSLETTER FROM 1394 TRADE ASSOCIATION

REPORT FROM THE EXECUTIVE DIRECTOR

During the First Quarterly meeting of 2006, Fred Speckeen, a new member of the Board of Directors from TC Group, told us that Pro-Audio is a rapidly growing market for 1394 products. Your Executive Director visited the recent professional audio show in Frankfurt (MusikMesse) and discovered the truth of Fred's words. According to one long time industry insider, there were over 100 FireWire products at the MusikMesse. I saw over 50 of them myself, everything from add-in cards, to mixer boards, to podcasting kits from most of the major players. One of the most exciting 1394 demonstrations was the XFN Media Network which was developed by D-Mexx, a consortium of small design houses in Europe - this was a proof of concept for a peer-to-peer pro-audio system. Among other things, the XFN Media Network simplifies cabling, distributes control through-out the network, while carrying 192 channels of professional audio (in a variety of formats) with 82 Mbps still available for command and control. The developers of the XFN Network stated that they tried to use Ethernet, but discovered that the cost was prohibitive and Ethernet could not match the low latency and low Bit Error Rate of 1394. D-Mexx will be addressing the first meeting of the Pro Audio WG at the Second Quarterly Meeting in Dresden.

On a different front, The Automotive Multimedia Interface Collaboration (AMI-C) announced the worldwide copyright assignment of its 1394 automotive technical specifications to the 1394 Trade Association. The following AMI-C documents are now the property of the 1394TA:

- AMI-C 3023 Power Management Specification
- AMI-C 3013 Power Management Architecture
- AMI-C 2002 1.0.2 Common Message Set Power Management
- AMI-C 3034 Power Management Test Documents
- AMI-C 4001 Revision Physical Specification

We also are off to a good start with Compliance and Interoperability following a packed house session during the first-ever 1394b Workshop April 10-12. More good news will follow as we focus on the compliance effort this year.

James Snider
Executive Director

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AMI-C Technical Documents Transferred to 1394 TA

The Automotive Multimedia Interface Collaboration (AMI-C) has completed the worldwide copyright assignment of its 1394 automotive technical specifications to the 1394 Trade Association.

As part of the assignment, the 1394 TA will maintain the complete collection of AMI-C 1394 automotive specifications and lead any future development and expansion activities designed to keep the specifications synchronized with evolving technologies and emerging market demands.

"AMI-C is proud to assign this valuable asset to the 1394 TA," said AMI-C Executive Director Scott McCormick. "Our members have high regard for the good work that the 1394 TA is doing and are confident in their ability to maintain and promote the adoption of these important documents throughout the automotive industry."

Since the AMI-C 1394 technical documents were published in 2003, they have played a significant role in introducing the global automotive industry to the 1394 network technology, also known as FireWire or iLink.

"These specifications offer a great opportunity for all vehicle manufacturers to work closely in a common environment that benefits customers with innovation, at the least possible cost and development timeframe," said Bob Fust, Chairman of the 1394 TA Automotive Working Group (AWG).

The AMI-C 1394 technical documents specify requirements for implementing a vehicle interface that enables devices (i.e. mini disk players, compact disc players, audio processors, DVD players, digital video camcorders, etc.) to access and communicate with an automaker's proprietary vehicle network. The AMI-C specifications allow for flexible application design and support expandability and upgradeability options.

"Our power management specifications include the software architecture and network messages required to execute the wake-up sequences and shutdown sequences in coordination with the ignition key position," said Ricardo Wong, AMI-C 1394 Technical Expert Group Leader. "These sequences are essential for the implementation of 1394 networks. They apply to both 1394 optical and copper networks."

Wong noted that the specifications have been validated using a prototype, based on network interfaces with electrical wake up capabilities. The next step, he said, is to use a prototype, based on network interfaces with optical wake-up capabilities.

The complete set of AMI-C 1394 technical documents includes:

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"The Trade Association is definitely committed to enhancing all of the specifications, as needed," said Fust. "It will be an active program, once the IP is transferred."

He said the TA's initial plans for promoting the specifications will include

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issuing regular news updates, creating technical white papers to help the Tier 1-3 suppliers with implementation exercises, and reaching out to all of automakers' design / development teams to urge their support.

"Having all of the vehicle A/V specifications under one roof makes it easier to work with them," Fust said.

1394 Reaches into Space

FireWire to Deliver Data for Polar Orbiting Environmental Satellite

When the avionics team from Northrop-Grumman required a standards-based technology to deliver environmental images collected on polar orbiting satellites, they focused immediately on the electronics industry's optimal A/V delivery interface.

Their decision means IEEE 1394-enabled technology will be a significant contributor to the advanced National Polar-orbiting Operational Environmental Space Satellite (NPOESS) program. Earlier this year, a series of tests conducted by NPOESS prime contractor Northrop-Grumman and subcontractor Ball Aerospace proved that the team's implementation of fault-tolerant IEEE 1394 circuitry is doing the job.

According to Jim Nelson, avionics manager at Northrop-Grumman for the NPOESS project, the 1394 chipset is one of the program's key technology innovations. NPOESS is designed to help analyze ocean temperatures, wind speeds, and other environmental factors that weather forecasters, government leaders, and emergency personnel need to evaluate long-term changes and monitor real-time weather events, such as hurricanes.

NPOESS is an advanced, space-based environmental system designed to converge existing civilian and military systems into a single national program. NPOESS will be able to monitor the entire planet and provide data for both short term weather forecasts and long-range environmental and climate forecasts. The satellites making up the NPOESS system host multiple sensor payloads that collect key data across the electro-magnetic spectrum from RF toUV.

The satellites send their collected data to the ground via a network of globally distributed, receptor sites interconnected with optical fiber. This entire system from space to ground network incorporates a broad range of redundancies designed to prevent single points of failure and avoid loss of data during collection, transmission and processing. It is known as SafetyNet™. The unmanned ground receptors are interconnected and linked to central data processing centers in the United States by commercial fiber optic networks. Via SafetyNet raw data is delivered to four Weather Centrals – the National Environmental Satellite, Data and Information Service; Air Force Weather Agency; Fleet Numerical Meteorology and Oceanography Center; and Naval Oceanographic Office. Data gets to the user fast: 77 percent of the environmental data records will be delivered to the Weather Centrals in less than 15 minutes from the time phenomena are observed; some 95 percent will be delivered in less than 28 minutes. The high capacity and speed of SafetyNet are key to this rapid delivery of operational environmental satellite system data.

FireWire's Proven Record

The decision to use 1394 on NPOESS began when the NPOESS customer, a consortium including NOAA, the Department of Defense and NASA, known as the Integrated Program Office (IPO), decided a standardized data network was preferable for several reasons including lower total life-cycle cost, reduced risk of interface incompatibilities, ease of adding new payloads and compatibility with commercial 1394 test equipment.

"Sensors typically have custom, point-to-point interfaces which impose cost and complexity challenges, typically adding power and weight to the system when compared to networked solutions," said Nelson. "The IPO gets the credit for understanding the importance of using standards-based solutions, and recognized 1394 from the start of the program, because of its proven success in commercial applications. They had the foresight to see that FireWire is a potential key enabler for NPOESS and future space programs moving significant amounts of data reliably."

The Northrop-Grumman team uses FireWire to transfer data from several NPOESS high-rate sensors to the satellite command and data handling subsystem from which it is transmitted to SafetyNet locations, building on what Nelson termed '1394's proven record' in commercial applications spanning consumer electronics, industrial products and computers.

"NPOESS took the 400 megabit/second standard and implemented the design at 100 Megabits/second, because that bandwidth proved to be sufficient and we did not need the higher rate. We also needed to ensure the chipset could operate in the harsh radiation environment of space with the robustness and reliability, which are critical for the mission. For potential future enhancements, 1394's support for higher speeds and strong technical roadmap provide very clear advantages."

The 1394 silicon was 'tailored' for the NPOESS application, meaning the design team developed the chipset and network topology suited to the demanding requirements of satellite data communication. One critical demand is that the system operate for seven full years in space, at a minimum, without the opportunity for human repair in case of failures. Northrop Grumman's satellites typically operate well beyond their specified lifetimes, and the 1394 enabled NPOESS is expected to further extend that heritage.

IEEE 1553, a successful avionics system bus developed in the late 1970s and used in many satellite applications including NPOESS, was evaluated for use with all the payloads; however, "it could not handle the date rates we required for many of the higher-rate sensors." "Based on the nature of the NPOESS applications and the requirements of those sensors, 1394 was the obvious choice for us."

1394 Forges Ahead in Pro Audio Markets

FireWire-Equipped Audio Products from Industry Leaders Introduced at MusikMesse

One of the fastest-growing markets for 1394-enabled equipment got even hotter in March at the MusikMesse in Frankfurt, as leaders of the professional audio equipment market introduced more than 30 new products and systems including 1394.

Yamaha Corporation, Mackie/Loud, Alesis, TC Electronic, Presonus, M-Audio and other suppliers announced amplifiers, audio/MIDI interfaces, speakers, recording systems and other products incorporating 1394 into recording and

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live sound products "Pro audio equipment makers are taking advantage of FireWire's proven quality of service, low latency, and high bandwidth to move multiple audio sources into a computer-based recording system, then back out to amplifiers and speakers," said Fred Speckeen of TC Group, a member of the TA's board.

"Early audio adopters of the 1394 technology are now selling mainstream products for the professional market and cross-over consumer applications, creating many new capabilities using 1394," said Executive Director James Snider, who visited the MusikMesse. "The pro-audio market is one of the leading sectors for growth of 1394 so far this year, and we are only at the beginning of a new cycle of product announcements."

to-peer mobile FireWire audio/MIDI interface, which can be powered via the 6-pin FireWire cable.

"FireWire is the top audio interface for computer recording, since it combines the best compatibility and performance with the lowest latency and CPU overhead," said Tony Rodrigues, director of business development for Mackie/Loud Corporation. "Mackie's products include dedicated desktop and studio FireWire recording products like the Onyx 400f and 1200f. Mackie's Onyx mixers have FireWire expansion capabilities using patent-pending technology that integrates an analog mixer with 1394."

"Our customers require portability, easy connectivity, and large channel



1394-equipped products from professional audio leaders Yamaha, Alesis, M-Audio and TC Electronic, among others, highlighted the Musik Messe in Frankfurt last month.

To support the growth, the Trade Association will establish a Professional Audio Working Group to develop and enhance 1394 specifications relevant to audio applications and new generations of audio systems.

The potential for 1394 also is expanding in the 'pro-sumer' sector, with technologies such as Apple's GarageBand enabling a new generation of entry-level musicians and recording artists to work with sophisticated systems that were previously too expensive to be found outside of a professional studio.

"This is a flourishing application for FireWire. Audio is an important element of A/V networking use case scenarios under development at the High-Definition Audio-Video Network Alliance," said Jalil Oraee, founder and Chief Technical Officer at Oxford Semiconductor, a leader in 1394 audio. "As well as guaranteed quality of services, all 1394 nodes synchronize their internal clocks to a nominated device within the A/V network, thus providing the facility to separate audio and video yet avoid lip sync issues. Users can buy their favorite 1394 audio devices and connect them to their HANA TVs. Audio also may be distributed to several rooms in a house and played simultaneously with no audible intra-room delays."

Yamaha, Mackie/Loud, Alesis, TC Electronic, Presonus, M-Audio Deliver 1394-Equipped Products

"Yamaha helped to develop and has supported 1394 audio and MIDI standards for more than 10 years. We believe FireWire is one of the best methods for transporting audio," said Athan Billias, marketing director for technology products at Yamaha Corporation of America. "We have seen the first wave of simple FireWire audio I/O products, but there is the potential for different devices targeted to specific market needs. For example, we see the need for simple peer-to-peer devices, network-capable devices such as Yamaha's mLAN products, and for devices that take advantage of aggregation in the OS." He added that at the Frankfurt Music Messe, Yamaha will introduce the GO46, the company's first peer-

counts of high-resolution, high-sample-rate audio," said Allen Goldstein, principal at Island Digital Media Group, which worked with Alesis Corporation and Wavefront Technology. "1394 delivers on these requirements, providing an excellent foundation for a variety of products tailored to the methods of recording engineers."

Wavefront and Alesis are using 1394 to transfer data to and from our industry-leading HD24 and HD24XR standalone hard disk recorders, he added.

M-Audio Corporation also has adopted FireWire for new products. "The 1394 protocol has enabled M-Audio to develop music creation products that are more powerful yet easier to use than ever," said John Bastienelli, director of product management. "For example, the new ProjectMix I/O facilitates professional multi-channel recording—18 x 14 audio I/O plus MIDI I/O—via a single FireWire cable for streamlined set-up. In addition to providing high fidelity and low latency, the FireWire protocol transmits enough electricity to power multi-channel audio interfaces, allowing us to support the mobile music community with our line of bus-powered peripherals."

Jim Odom, President of PreSonus Audio said, "FireWire has been the catalyst for PreSonus to provide professional-quality, affordable and easy-to-use computer recording systems to professional and hobbyist-musicians world wide. Stability and reliability is critical for music recording and FireWire gives our customers the performance and confidence that they need in the music creation and recording process."

Uffe Kjems Hansen, VP of Product Development at TC Electronic A/S said, "TC was an early FireWire adopter, and has implemented it in tens of thousands of our Powercore audio accelerator products. We chose FireWire because of its high channel count and true network structure that allows customers to grow their systems incrementally rather than having to retool completely every year or two."

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A MONTHLY NEWSLETTER FROM 1394 TRADE ASSOCIATION

First 1394b Workshop Draws Capacity Crowd

The 1394 Trade Association's first-ever 1394b Compliance and Interoperability Workshop drew 16 different companies with a total of 28 products equipped with the 1394b version of the popular audio-video standard.

The workshop was held April 10-12 at the Embassy Suites in Bellevue, Washington, near Microsoft Corporation headquarters. Participating companies included Agere Systems, AV Labs, Allied Vision Technologies GmbH, Apple, Dap Design, Fraunhofer IPMS, Hamamatsu Photonic Systems, Microsoft, Newnex, NTS, Oxford Semiconductor, Quantum Parametrics, Texas Instruments and Unibrain, among others.

"This initial 1394b compliance workshop was a significant event for the 1394 Trade Association," said James Snider, executive director. "We had a capacity crowd representing the complete spectrum of 1394b applications from consumer electronics to storage to industrial automation. I expect to see many of these organizations apply for the Compliance logo very soon."

The workshop was organized by the Trade Association's Compliance and Interoperability Working Group for member companies and guests to provide an environment for testing 1394 hardware and software products. It also provides the opportunity for developers to discuss interoperability issues.

Representatives from participating companies test the operation of their products with products from the other participants. Interoperability testing sessions are private and are conducted between two companies at a time. Three mandatory test suites will be provided for earning the Compliance Logo.

EVENTS OF INTEREST:

April 2006

- 1394 TA 2nd Quarterly Meeting
  April 24 — 27
  Hilton Dresden,
  Dresden, Germany

May 2006

- WinHEC
  May 23 -25
  Washington State Convention and Trade Center
  Seattle, Washington