

1bit FORUM 2002

1bit Audio Transmission Over IEEE1394

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YAMAHA Corporation
Business Research and Development Division
mLAN Project

1bit FORUM 2002 – 1bit Audio Transmission over IEEE1394

Why IEEE1394?

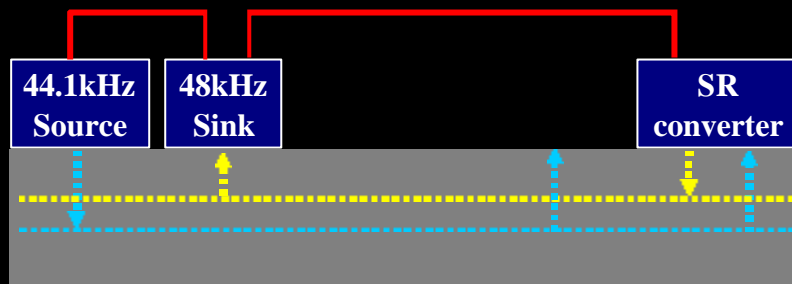
- ◆ High Bandwidth (400Mbps and more)
 - 44.1kHz x 64 1-bit requires 2.8224 Mbps/ch
- ◆ Standard I/O for Note Book Computer
 - But computer is not mandatory
- ◆ A/M Protocol supports
 - Multiple Sampling Frequency
 - Multiple Format



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Versatile Audio Bus - Multi-Sampling Frequency -

IEEE1394 physical connection (wiring)

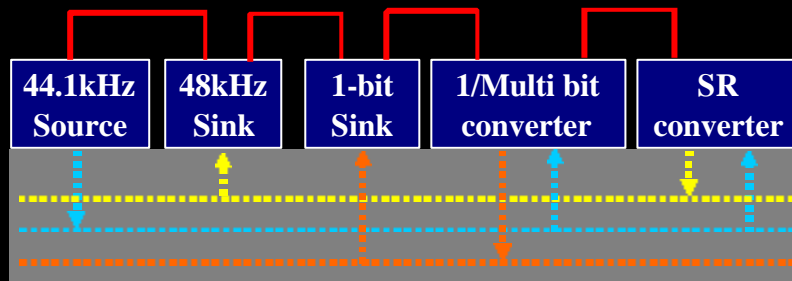


A/M Protocol logical connection (signal path)



Versatile Audio Bus - Multi-SR and Multi-Format -

IEEE1394 physical connection (wiring)



A/M Protocol logical connection (signal path)

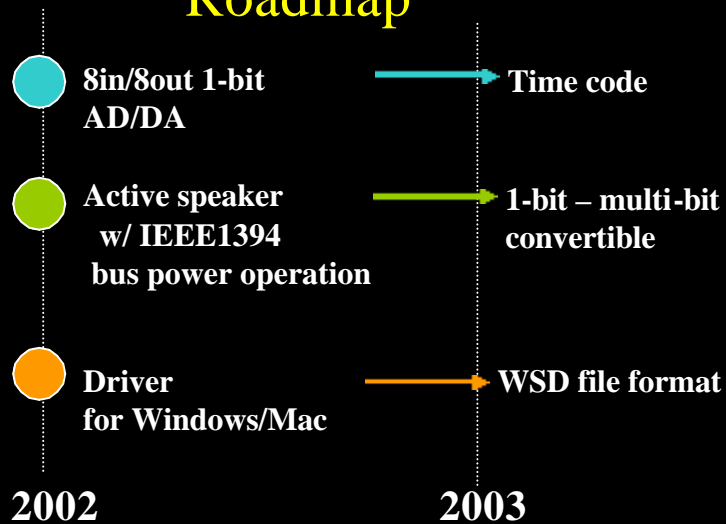


Waseda - Yamaha Joint Development

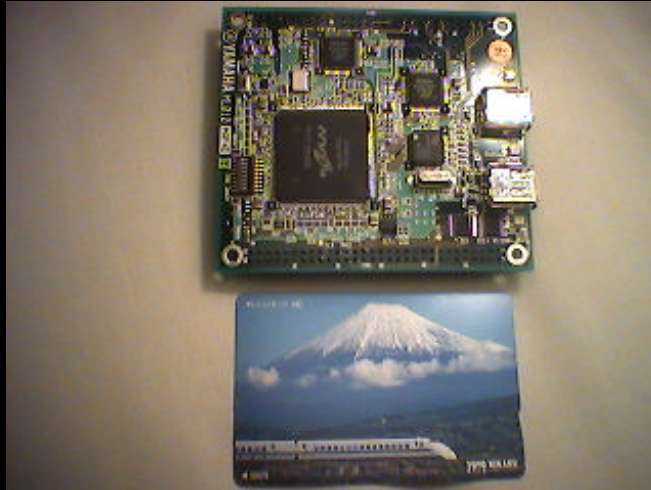
- ◆ Digital link for audio dominant archive
 - Multi-format transmission
 - Transmit 1-bit and multi-bit audio simultaneously
 - Ex. 1-bit for front and multi-bit for surround
 - Ancillary data such as date and place info
 - Embedded in 1-bit stream
 - Embedded in SMPTE time code
 - Audio and control data for speaker array
 - Synchronization with video



Roadmap



Low Cost mLAN(IEEE1394) Card



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Low cost implementation

- ◆ ROM 64kByte
 - IEEE1394 bus management
 - A/M protocol handler control
- ◆ SRAM 8kByte
- ◆ EEPROM 4kByte
 - Initialization parameters
 - Signal path information

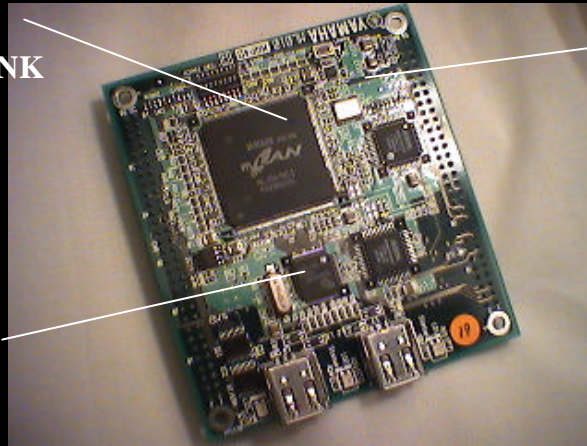


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Low Cost mLAN(IEEE1394) Card - 48kHz x 64 x 4CH Full Duplex Capable-

mLAN-NC1
- IEEE1394 LINK
- CPU
- 64KB FROM
- 8KB SRAM

IEEE1394 PHY
400Mbps



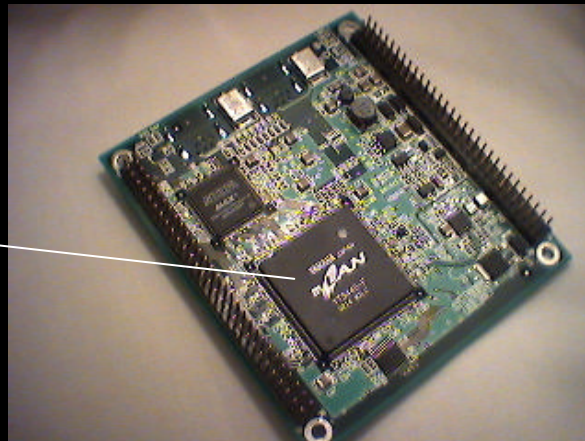
PLL



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Low Cost mLAN(IEEE1394) Card - 48kHz x 64 x 16CH Full Duplex Capable-

mLAN-PH2



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1-bit 8ch AD/DA Box

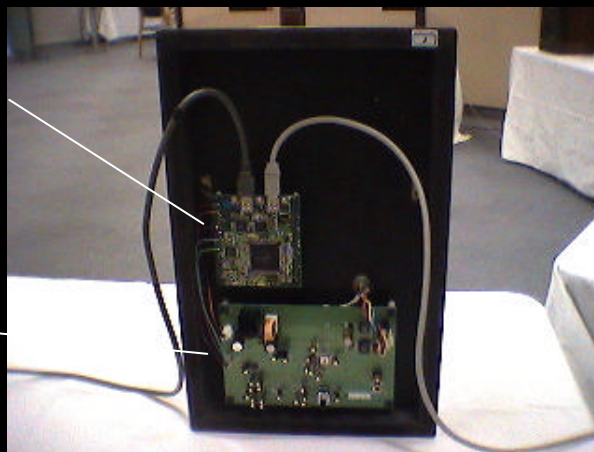


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Active Speaker

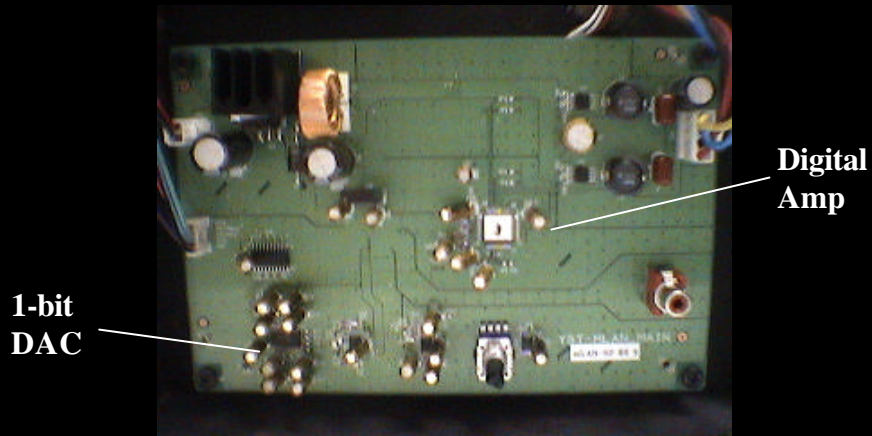
mLAN
(IEEE1394)

Power
Amp

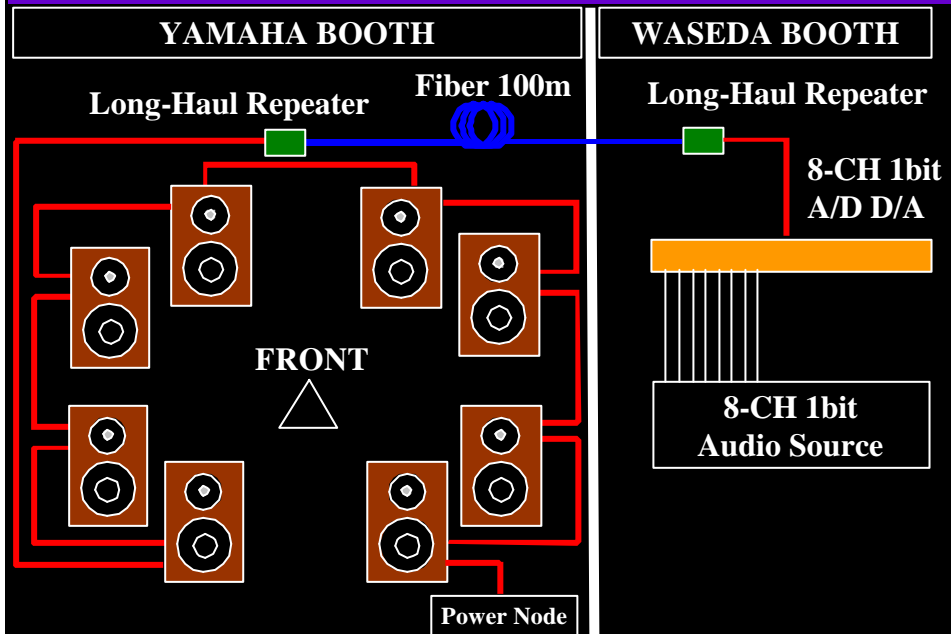


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Power Amp Unit



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