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Senior Vice President
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SONY

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December 22, 1998

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Ms. Magalie R. Salas, Esq.
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

Re: CS Docket No. 98-120

Dear Ms. Salas:

On Friday, December 17, 1998, the following representatives of Sony Electronics Inc:

James Bonan, Vice President, Business Development
Christina Tellalian, Manager, Government Affairs
Brent Mori, Copyright Section, Legal and Intellectual Property Division, Sony Corporation
Jeffrey P. Cunard, Esq., Debevoise & Plimpton

Met with the following members of the FCC staff:

Amy Nathan, Senior Counsel, Office of Plans and Policy
Jon S. Wilkins, Director, Strategic Analysis, Office of Plans and Policy
Bruce Franca, Deputy Chief, Office of Engineering and Technology
Jonathan D. Levy, Director, Strategic Analysis, Office of Plans & Policy

We reviewed and discussed the attached materials covering certain aspects of consumer digital television receivers, in connection with the Notice of Proposed Rulemaking on the Carriage of the Transmission of Digital Television Broadcast Stations.

Sincerely,

No. of Copies rec'd 1 Original
List A B C D E

Digital TV & In-home Networks

- Digital Television is a fundamental change that encompasses (and enables) virtually all others
  - New TV Displays
  - New Video Recording Formats
  - Digital Satellite
  - Digital Cable
  - Digital Terrestrial STBs
  - Interactive STBs
  - New Digital Service Applications
  - Closer "AV-IT" connection (e.g. PC-enabled devices)
- Digital in-home networks (i.LINK/1394) are the key to enabling these devices and services to interoperate.

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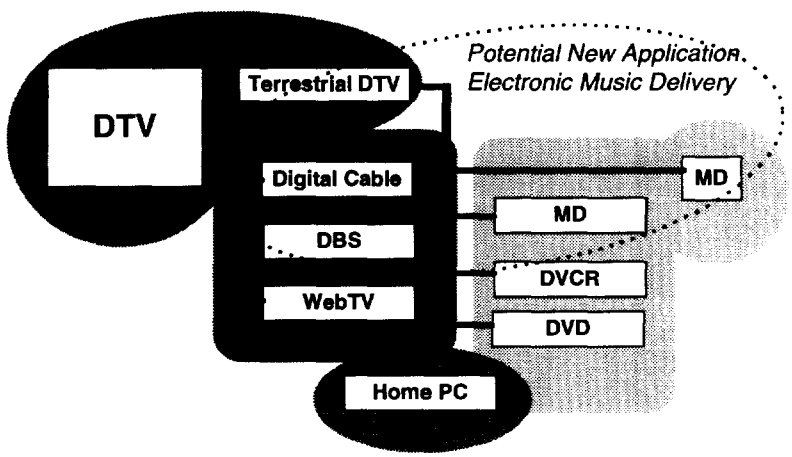
i.LINK Ties Together Digital AV Products



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What is "i.LINK"?

- IEEE1394 = Firewire™ = i.LINK™
- All are simply different names for the same thing.
- The "Formal" name is IEEE1394.
- Firewire is an Apple trademark.
- For consumer products, Sony wanted a name that was "friendlier" than IEEE1394, and didn't include the term "fire".
- Sony acquired rights to the name "i.LINK" and licenses it freely to any company. The license is free after a nominal filing fee.

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Why i.LINK?

- Single cable, and simple connector replace multiple video/audio/control connections
- High speed (100, 200, 400 Megabits/sec.) can carry multiple HD bitstreams (19.4 Mb/s) simultaneously.
  - Ethernet, USB 10-12 Mb/s
- "Hot Plug & Play" allows consumers to plug in and unplug devices without any need for setup.
  - Configuration and device recognition is automatic
- Topology free (hook up in any configuration)
  - Up to 63 devices
- No "master controller" is needed
- Low cost

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I.LINK will be pervasive

- Digital CE devices need to be digitally linked
  - Control
  - Resource sharing
- i.LINK/1394 is lowest cost solution with sufficient speed to handle multiple simultaneous video streams, especially HD.
- Already implemented in CE devices (digital camcorders)
- Data protection solution close at hand
- "It's going to be there anyway..."

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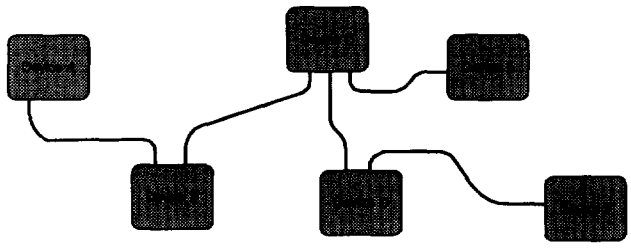
"Topology-free" Connection



- Any combination of daisy chain, tree/branch, star
  - Up to 4.5 m (14.8 ft.) between devices
  - Up to 16 "hops" between devices
- 1394 "Long" using plastic optical fiber up to 50-100m.

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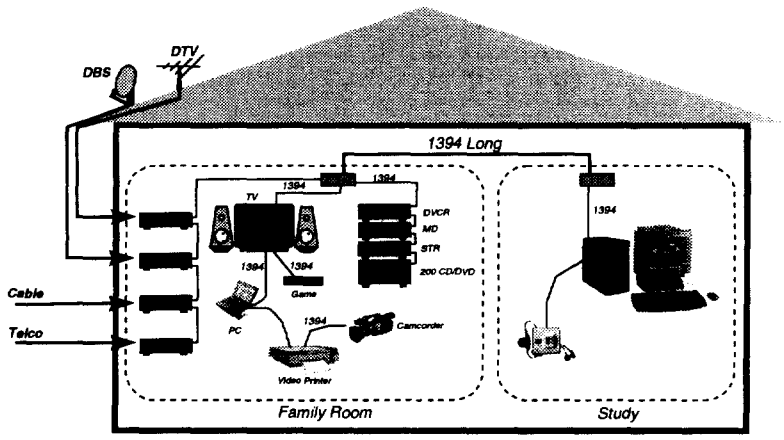
i.LINK™ Network



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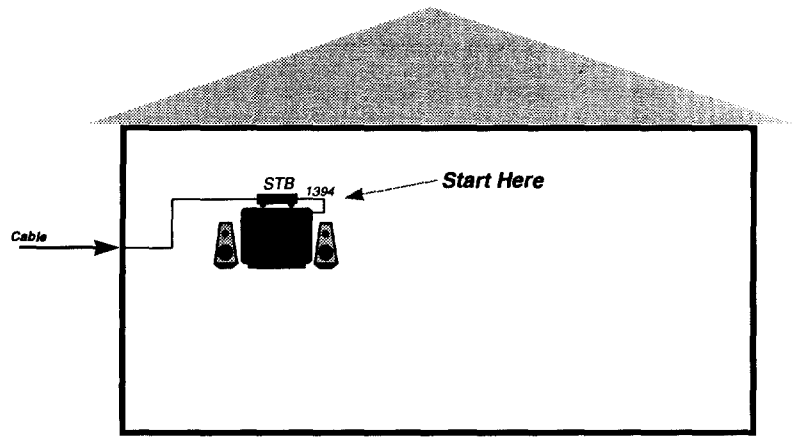
i.LINK™ Network



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Cable Interface Summary

- Most US consumers (~70%) watch TV over cable.
- To be successful, DTV must be available over cable.
- IEEE1394 (i.LINK) provides the best way to connect digital cable STBs to DTV sets, and enables copyrighted content to be digitally protected.
- Sony is strongly committed to making 1394, with digital content protection, a reality as quickly as possible. Other affected industries are showing unprecedented cooperation in resolving the remaining outstanding issues.
- In the interim other solutions may be necessary to ensure that initial DTV owners have access to off-air DTV programming that is provided over cable.

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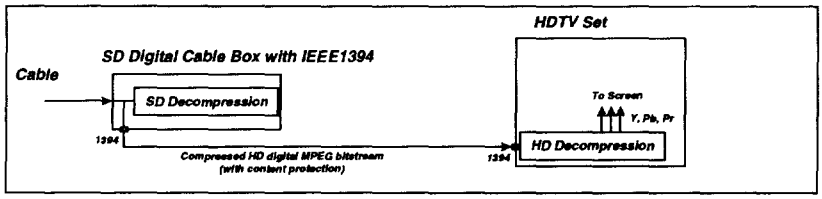
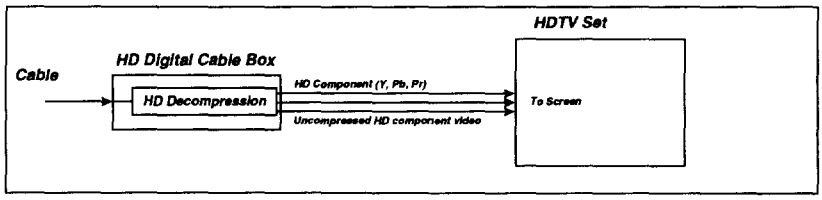
Need for a Digital Interface

A digital interface allows a low cost SD cable or DBS box to "pass through" an HD digital signal to an HDTV set.



Without a digital interface the cable or DBS box must decompress HD.



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CableLabs OpenCable Process

- OpenCable moving quickly to define architecture and interfaces by end of '98.
- For HD, CableLabs recommended a two step approach:
  1. Analog HD 1080i component (YPbPr) interface as interim solution.
  2. IEEE1394 with content protection.
- HDNI (IEEE1394) interface forwarded to SCTE standardization ballot (DVS-194/5).

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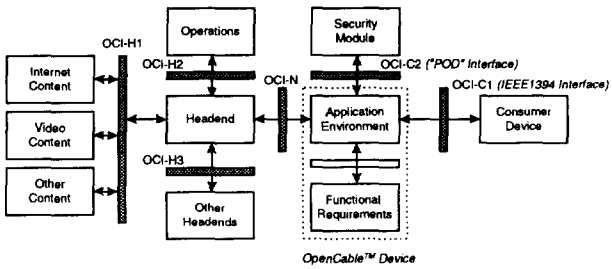
CableLabs OpenCable Project

- Broadbased project to standardize cable architecture

OpenCable Architecture



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Key i.LINK/1394 Developments

- *2/19/98 5C Content Protection* (Hitachi, Intel, Matsushita, Sony, Toshiba)
  - 5 CE & PC Companies propose Digital Transmission Content Protection to CPTWG
- *3/17/98 CableLabs*
  - CableLabs specifies 1394 as the link between OpenCable STBs and HDTV sets.
- *3/18/98 HAVi* (Grundig, Hitachi, Matsushita, Philips, Sharp, Sony, Thomson, Toshiba)
  - 8 CE companies announce open specifications for AV networking protocol (HAVi) to guarantee 2-way interconnectivity between AV devices from different manufacturers.
- *5/14/98 Eight CE Companies release draft HAVi specfication*
- *6/30/98 CableLabs*
  - CableLabs OpenCable Meeting confirms 1394, and issues draft specifications.
- *7/98 CEMA*
  - CEMA creates R4.8 to parallel CableLabs OpenCable work on 1394 interface.
- *8/98 Sony/TCI*
  - Sony licenses "Home Networking Module" (HAVi compliant software) for TCI STBs.
- *9/23/98 DTLA Licensing*
  - Digital Transmission Licensing Administrator begins licensing "5C" Digital Transmission Content Protection after receiving export approval from US and Japan.
  - Licensing fees: $14K/yr + $0.06/key or $18K/yr. + $0.05/key
- *11/2/98 CEMA & NCTA Agree on IEEE1394 Digital Cable Interface*
  - Joint press release indicating agreement on use of 1394 for digital interface.

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Key i.LINK/1394 Developments

- *11/16/98 28 Companies participate in Comdex 1394 Trade Association exhibit*
  - Demonstrate actual products & working AV/IT home network.
- *11/25/98 OpenCable HDNI Spec forwarded to SCTE DVS for approval*
  - IEEE1394 interface spec. finished & sent to SCTE DVS-194/5. Ballots due 12/30.
- *11/30/98 Sony Announces 1394 Interface IC with 5C DTCP*
  - 200Mbps link layer chip expected by Spring '99
- *12/1/98 Sony licenses HAVi-compliant software module to GI*
  - GI licenses Sony Home Networking Module for advanced digital set-tops
- *12/4/98 Matsushita Announces 1394 Interface IC with 5C DTCP*
  - 100/200Mbps combination link/phy chip, samples in March '99
- *12/4/98 Quantum & Sony Demonstrate 1394 AV Hard Disk Drive*
  - Quantum & Sony demonstrate 19GB AVHDD with 1394 interface
- *12/10/98 HAVi Licensing Consortium Established*
  - 8 CE companies announce licensing consortium for HAVi (www.havi.org)
  - (Grundig, Hitachi, Matsushita, Philips, Sharp, Sony, Thomson, Toshiba)
- *12/15/98 Western Digital Announces AV Hard Disk Drive Development*
  - Joint announcment with Sony to develop AVHDD for 1394 AV networks

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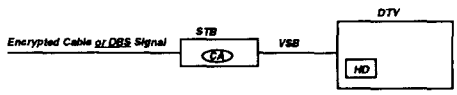
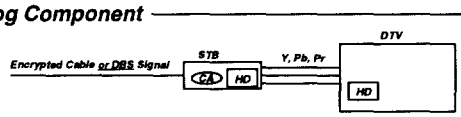
DTV Interface Options

VSB



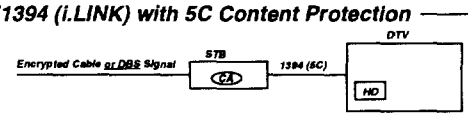
- No Content Protection
- If VSB is encrypted, won't work on legacy sets, sets must have decryption module
- Not 2 way, no authentication & key exchange
- How to handle DVCR?
- Not networkable

Analog Component



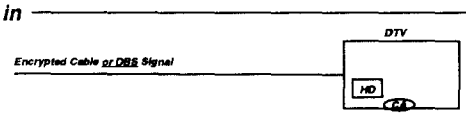
- No Content Protection
- STB requires expensive HD decoder
- HD Decoder in TV not used
- How to handle DVCR?
- Not networkable

IEEE1394 (i.LINK) with 5C Content Protection



- Content is protected
- Content encryption is not dependent on service provider (Cable, DBS)
- Set doesn't need separate decryption module
- 1394 network accomodates DVCRs

Built in



- Needs decryption/CA module to descramble premium services
- Decryption module different for DBS, Cable (Cable not avail until 7/2000)
- Still need 1394 with bus encryption for DVCR

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