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ANSI/CEA Standard

Versatile Home Network

ANSI/CEA-851-A

July 2006

Approved American National Standard

ANSI

CEA

Consumer Electronics Association

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(Formulated under the cognizance of the CEA's **R7 Home Network Committee**.)

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FOREWORD

This standard was developed under the auspices of the R7 Home Network Committee.

It should be noted that this current version, CEA-851-A, supersedes CEA-851.

The Video Electronics Standards Association (VESA) established the VESA Home Network (VHN) Committee in 1995 to create the architecture for a digital, broadband home network. The VHN standard was initially developed by the VESA Home Network Committee. However, it was never ratified as a VESA standard.

In June 1999, the Consumer Electronics Association (CEA) established the R7 Committee to help harmonize the several efforts being undertaken to develop home networking standards. In January 2000, the Board of Directors of VESA and the Board of Directors of the Consumer Electronics Association agreed to merge the VESA Home Network and the CEA R7 Committee, by establishing the CEA R7.4 Committee.

CEA-851 was completed and approved in 2000. Work started on CEA-851-A in 2003. Subsequently, CEA-851-A was transferred to R7 WG3 as the R7 standards committee was reorganized by the CEA and R7.4 was dissolved. In 2004 CEA asked the 1394 Trade Association (1394TA) to help develop CEA-851-A. The 1394TA presented a proposal for CEA-851-A to CEA in January 2005.

This standard is to be forwarded to JTC1 SC25 WG1 for international adoption.

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Introduction

This standard defines an IP-enabled network for connecting cluster networks to a whole-home broadband distribution backbone in order to facilitate integrated operation of appliances and networked components. The distribution network in this standard is based on IEEE 1394. This network will accommodate Ethernet as an attached network via a bridge, and directly with the introduction of IEEE 1394c. The network defined in this standard is called the Versatile Home Network (VHN Home Network). The VHN Home Network provides a flexible and open network architecture and communications protocol specification for digital devices in the home.

Function and use of a VHN Home Network:

- Allows the transfer of information among all connected digital devices in the home, either as directly connected end devices or as part of a cluster network.
- Allows interoperability between devices on different cluster networks in the home, including low bandwidth networks and high bandwidth networks.
- Provides a common interface to Residential Gateways that connect devices in the home to access networks.
- Provides user-to-device control.
- Provides device-to-device control.
- Provides home network management for devices and applications.

NOTE: CEA-851-A defines a home intranet as a collection of networks that provides complete connectivity between end devices. This intranet uses the facilities of the TCP/IP protocol suite for asynchronous (and some isochronous) communications. Almost all of the underlying technologies, from media to applications, are defined elsewhere, as standards that were developed by national standards bodies, by international standards bodies, or by industry consortia. CEA-851-A is different from most other standards in that it places unusual emphasis on incorporation of these other technologies and protocols. In many cases, the entire technology or protocol is included by reference in CEA-851-A. Thus, a single sentence in this standard may imply hundreds of pages of definitions and requirements from other documents. It is important for the reader and user of CEA-851-A to understand that the underlying specifications must be respected, and carefully followed, for the VHN to be an effective integrating tool for the home network.

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VHN (Versatile Home Network)

A Broadband Home Network

1 Scope and Purpose

1.1 Purpose

The VHN enables several important classes of applications for the home network:

- **Entertainment services** — which include the distribution of video, audio, and video games, and the control of audio/video (A/V) devices such as TVs, VCRs, and set-top boxes.

- **Communication services** — which include voice telephony (wired and wireless), video telephony, video conferencing, distance learning, and remote access to corporate networks.

- **Information services** — which include Internet access, on-line service access, PC file and printer sharing, news and information on demand, home shopping, and home banking.

- **Home automation services** — which include lighting, appliance control, energy management, comfort control, and premises security.

Figure 1 shows a VHN Home Network that supports these services.

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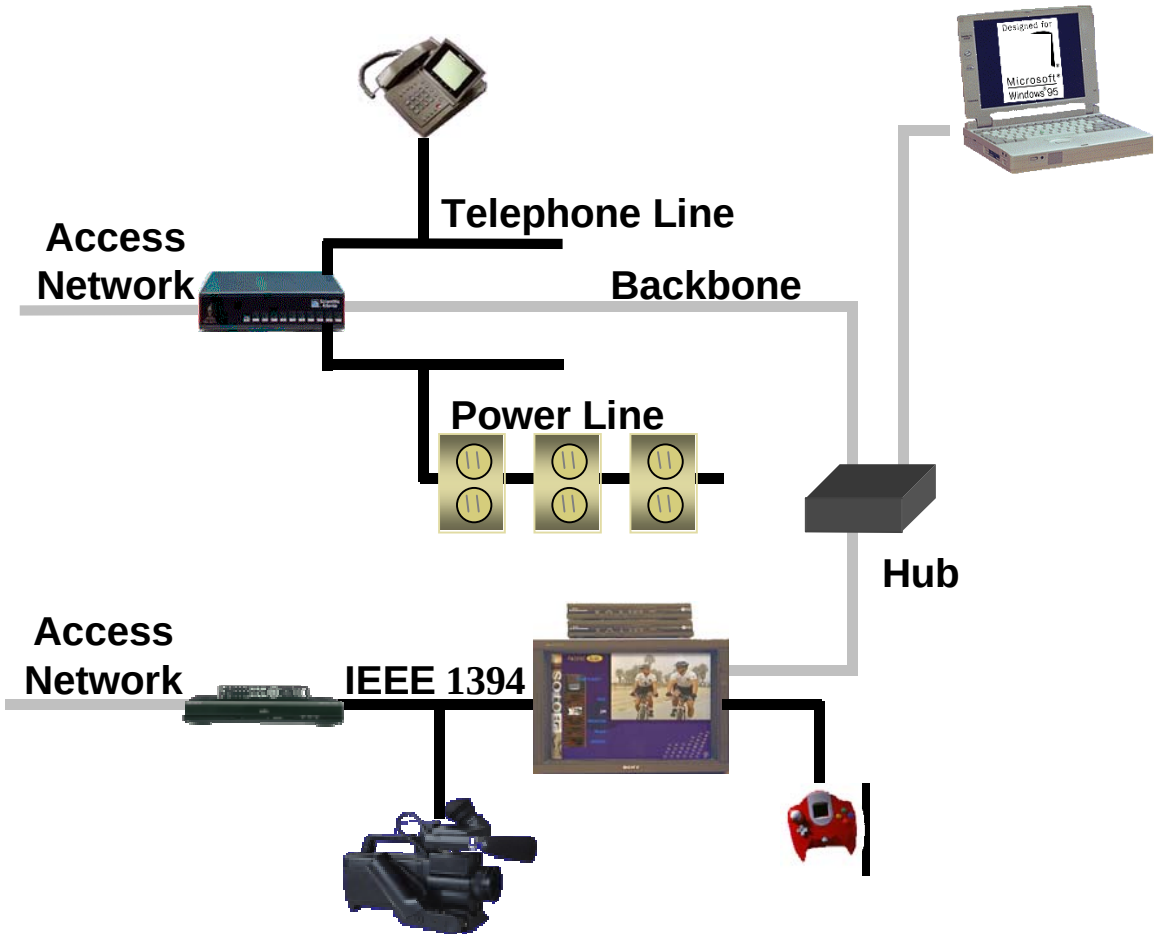

Figure 1 – A VHN Home Network

1.2 Scope

The VHN Home Network is defined by an abstract model (see Figure 2) that satisfies the needs of the classes of applications described in the Section 1.1. The model consists of:

- A backbone network.
- One or more component networks.
- A number of access devices that connect the home network to external access networks.
- A number of network devices that connect component networks to the home backbone network.
- End devices that provide various functional services to the home user.

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