USER AND MARKET REQUIREMENTS FOR IN-HOME DIGITAL NETWORKS

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INTERACTIVE SERVICES COMMERCIAL MODULE
USER AND MARKET REQUIREMENTS FOR IN-HOME DIGITAL NETWORKS

1. INTRODUCTION

Existing in-home coaxial distribution systems will meet the initial needs of many users for carrying services from set top boxes to video recorder and TV sets. Over the next 5 years or so, however, it is likely that an increasing number of users will wish to have a more flexible means of interconnecting services within the home. DVB should therefore prepare the necessary specifications for an in-home digital network interface in a suitably early time-frame. The implementation of this interface shall be optional.

In-home digital networks will enable users to access the DVB broadcast and interactive services of their choice using digital audio/visual equipment distributed anywhere in their home. An in-home digital network should support services carried over one or more broadcast delivery networks to the home, and should support services carried on an interaction network that may be different to the broadcast delivery network. An in-home digital network may also allow a digital storage device to record from any delivery network.

However, the fundamental requirements of the broadcaster and service provider should be protected, including:-

- protection of content using conditional access

- enabling copy protection

- avoiding the services of other providers from being inhibited

The in-home digital network specification should provide different levels of capability. Users should be able to select the features, functionality and cost that meet their own evolving needs. For example, these levels include:-

- digital video cassette connection to TV receiver in the same room

- simple connection of more than one DVB receiver to a delivery network

- full broadcast and interactive services connectivity around the home.

2. SERVICE DELIVERY

DVB broadcast and interactive services may be carried to and from the home by:

- Satellite
- Cable
- SMATV
- Terrestrial including Multipoint Distribution Systems
- Telco (telephone connection for analogue/digital telephone, ADSL, VDSL and broadband fibre)
- Storage media (tape/disk/CD)

Services may use more than one of these means of delivery to provide interactive services. For example, the forward and return channels may use separate physical networks. Homes are also likely to receive broadcast services from more than one network.

3. SERVICE TYPES

The different services that a typical user will access can be classified according to the type of connection required.

Service Type	Service Description	Example of Services
a. Local interactivity	Broadcast including local interactivity with user terminal (no return channel)	Broadcast TV, Teletext, electronic programme guide, broadcast games channel
b. One-way interactivity	Broadcast with user response only	advertisement direct response, opinion polling, voting
c. Two-way interactivity	Broadcast with user response and content individually addressed to the user	e-mail messaging, telebanking, teleshopping, gambling

A set of example scenarios is listed in Annex 1. These outline a possible range of uses for an in-home digital network. They range from a basic connection to a complex set of interconnections. The user and market requirements below reflect the full range of these scenarios.

4. **REQUIREMENTS**

The in-home digital network must be able to support typical user requirements in the home without significant restriction, including being able to transmit a digital programme service (perhaps contained in an MPEG-2 Transport Stream) from one device to another.

It is believed that specifications are only necessary at this stage for an optional network-independent interface allowing connection to a future in-home digital network, and a first network specification.

4.1. A first level (simple) in-home digital network shall allow a single user to access any service connection in any point of the home.

4.2. A second level in-home digital network involves a more complex network and shall support at least 3 concurrent users accessing services, which may be from different multiplexes and/or networks, requiring connections to equipment in different rooms in the home. The upper limit for concurrent users will be dependent upon the technology adopted.

4.3. There shall be no noticeable service disruption during changes of connection (i.e. adding or moving cables or devices within the network) unless those connecting cables or devices are directly involved in the provision of that service.

4.4. The in-home digital network should still operate and maintain services while unused devices on the network are not in operation (e.g. in standby mode or un-powered).

4.5. A layered approach shall be taken to the specification of in-home network interfaces.

4.6. All in-home physical transport technology options (including 'wireless') shall be supported.

4.7. The in-home digital network shall be able to carry services or multiplexes at different data rates.

4.8. The in-home digital network shall carry command and control information as well as DVB Broadcast and interactive[1] services.

4.9. If the user is accessing interactive services on a DVB Receiver that is remote from the delivery system termination point, the interaction path shall also be carried over the in-home digital network. There may be a choice of interaction paths out of the home (e.g. a cable modem and a PSTN modem). It shall therefore be possible remotely to select between them.

[1] Within this document the term 'interactive services' is intended to mean, as a minimum, those specified in the ISCM 'narrowband' requirements.

4.10. It shall be easy for users to increase or reduce the number of devices connected, the reach, and level of functions of the in-home digital network, e.g. moving from a first level to second level of network.

4.11. The in-home digital network shall allow connection without repeaters between clusters of devices in a typical home (e.g. connection length up to 50m). The required connection length between devices may be longer but in this case the use of repeaters is acceptable.

4.12. It shall be possible for users easily to install the network themselves.

4.13. Connectors shall be small with a simple push to make connection. They shall be polarised and differentiated from other home connectors to ensure incorrect connections are not possible. They should tolerate a minimum of 500 insertions.

4.14. The in-home digital network shall not cause interference, within accepted industry practice, and shall not disturb the performance of the distribution or interactive networks to which it is connected.

4.15. The network shall support applications and Conditional Access functions that enable the service provider to control the flow of encrypted services through the in-home network (e.g. number of recorded copies, number of viewings, number of independent viewers).

4.16. Users shall have a convenient means of accessing services in different rooms without compromising the security features of the services. Subject to the security requirements of the CA system, a user shall not be constrained by the in-home network to watch programs only on the TV directly connected to the STB or receiver with the CA system in it.

4.17. Where appropriate international standards are in existence or development these shall be used.

4.18. The in-home digital network interface specification shall take into account existing DVB interfaces and protocols.

4.19. The extra costs to the user for the inclusion of an in-home digital network interface on a user device shall be less that 10ECU at the end of 1997.

ANNEX 1 - SCENARIOS

Figure A1 shows a diagramatic representation of a DVB set top box including interfaces for connection to an in-home digital network and to local digital storage media such as DVCR, DVD, CD-i etc. The in-home digital network interface would carry a full multiplex or a programme service and control information for distribution to user terminals in other rooms in the home, via an in-home digital network.

Figures A2 to A4 show a number of example scenarios illustrating the ways in which an in-home digital network may be used. The abbreviations are explained in the key below. Note that although mainly set top boxes are shown, in all cases they could be PCs or games / other terminals instead.

Key to the figures

BC	Broadcast Channel (modulated)
BTU	Broadcast Termination Unit
DVCR	Digital Video Cassette Recorder
IC	Interaction Channel
IHDN	In-Home Digital Network
IHI	In-Home digital network Interface
NTU	Network Termination Unit
RC	Remote Control
RX	Receiver
SMI	Storage Media Interface
STB	Set Top Box

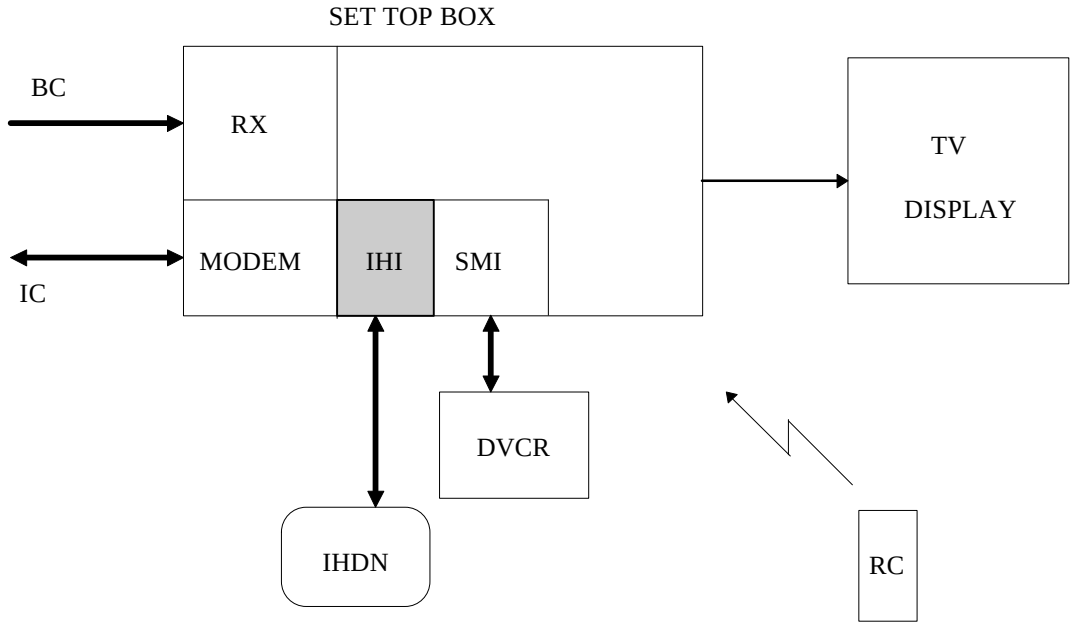

Figure A1 - Interfacing in-home digital network and storage media to DVB set top box

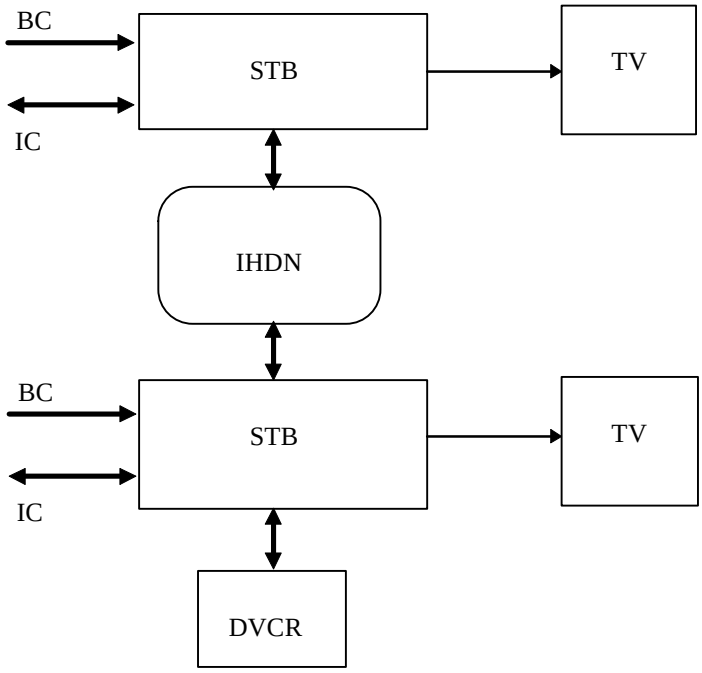

Figure A2 - Simple arrangement of two set top boxes (in different rooms)

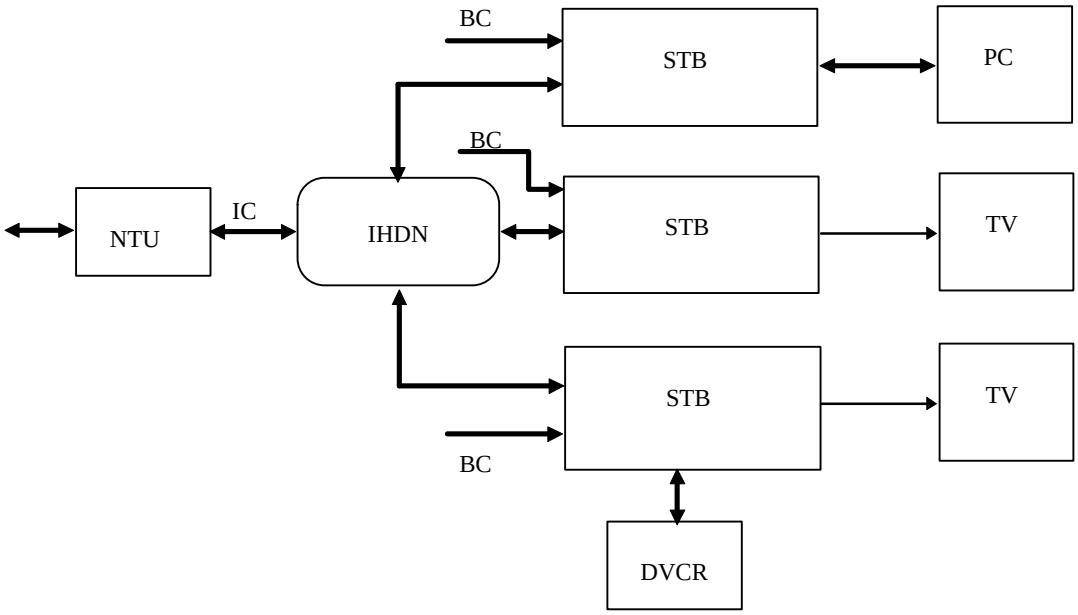

Figure A3 - Several set top boxes in different rooms with interaction channels transported by the in-home digital network

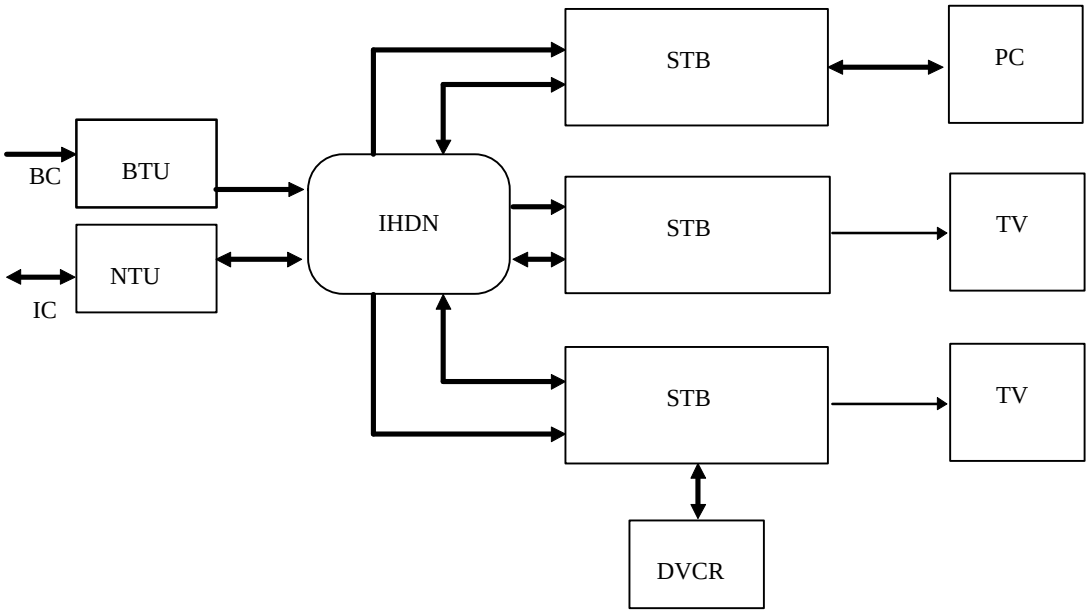

Figure A4 - Several set top boxes in different rooms with broadcast and interaction channels transported by the in-home digital network