A DIGITAL MIRACLE

The work of the DVB Project since its beginnings in Europe in 1993 has produced the most important technological and commercial miracle worldwide since the Internet. Never before have so many players from an industry been co-operating so closely and competing so fiercely at the same time.

It is a miracle that in only a few years this intense "co-opetition" has resulted in a worldwide standard for digital satellite broadcasting, nation-wide digital terrestrial broadcasting networks launching across the UK and Sweden in 1998 and a state of the art where World Wide Web pages are now being delivered to PC users across Europe via satellite dishes and DVB-S receiver PC plug-in cards.

In DVB meetings in Geneva, competitors continue to gather in specialist working groups of the DVB Technical Module to thrash out open, interoperable answers to tough technical questions covering every conceivable aspect of digital broadcasting.

The primary cause of the DVB miracle has been its industry-led approach. Before any of these specialist technical groups get together, commercial delegates from DVB Members have collaborated on producing common-sense Commercial Requirements, based closely on the needs of the market.

DVB-S - The de facto digital satellite standard

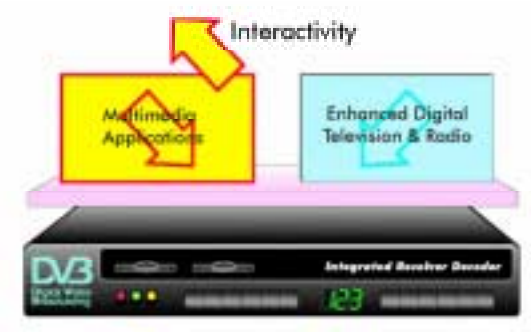
The result has been that DVB-S is has emerged as the *de facto* global standard for digital satellite transmission. DVB Satellite services may be received on all five continents.

Nationwide free-to-air DVB-T terrestrial digital broadcasts are launching across Europe this year. DVB-C cable networks are operational in most European countries, and in many other countries around the world.

PC users throughout Europe have a choice of different satellite based DVB Internet over the air services, which bring them WWW pages at speeds in excess of their hard drives.

The next wave

So now, in 1998, with the success of the DVB standards a part of history, why do they still gather every other week in Geneva?

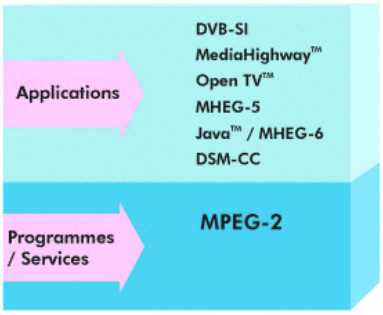


The digital receiver of the future will be able to run Interactive TV applications

The reason is there remains much work to do. DVB's comprehensive set of standards for how to deliver digital television to the home along all delivery media is only the start. In addition, the first wave of digital adoption is now a fact for the history books. The whole game has changed and new applications are answering new needs.

The rapid adoption of digital television technology in the age of the World Wide Web has finally woken the Convergence beast, and before we know it, we may not be able to tell the difference between a TV and a PC.

Beyond the brave new buzzword infested world of convergence, the terrifically complex issue of having an open standard for encrypted Pay-TV services remains largely unresolved, even with the extensive support DVB standards already offer Conditional Access providers and Pay-TV operators, work needs to be done to make the co-existence of different CA technologies user-friendly in the home.



An open API needs to take existing APIs into account

In DVB, the lion's share of the work assigned by the Commercial Module to the Technical Module in 1998 consists in the development of an open, common platform for interactive, multimedia applications across all future digital service receivers.

For DVB members, these could be any kind of appliance from computers to TV's and may even take surprising new forms. What needs to be put in place to bring interactivity into the broadcast domain, is a "software layer" topping off the delivery-medium based hardware layers and interfaces already specified in DVB.

This platform is known as the Multimedia Home Platform, or MHP. The challenge for DVB is to include the mostly proprietary work already done on interactive television by its founding members while at the same time to offer the emerging interactive TV solution-provider market an open standard.

An MHP specification is expected in Summer 1998.

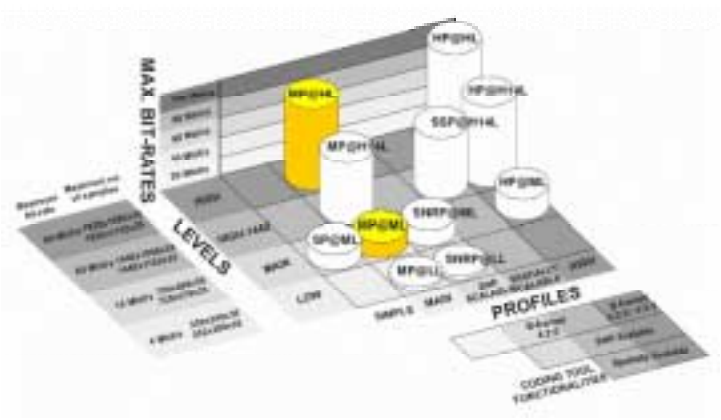
The great digital terrestrial debate

The technological success of the DVB standards is under competitive fire from the emergence of different proposed Digital Terrestrial Television Broadcasting (DTTB) approaches from two other highly important parts of the world, the United States and Japan.

Neither of these countries has offered a serious challenge to the dominance of DVB-S on the world market. The position of DVB-S here at this point seems unassailable, and this has happened without any regulatory support. The market needed digital satellite, and the only fully MPEG-2 compliant system ready on time was DVB-S.

All the proposed DTTB standards make use of MPEG-2 for video coding, good news for the world's large chip manufacturers, who will be able to deliver MPEG-2 chips worldwide whatever happens.

It is not the aim of this article to present a detailed technological comparison of the three approaches. That being said, it is noteworthy that Europe and Japan have opted for a multi-carrier RF modulation system, known as Coded Orthogonal Frequency Division Multiplexing (COFDM) and that the US has chosen a single carrier system, 8-Vestigial Side-band modulation, or 8-VSB.



There are other differences of course, chiefly in the MPEG-2 implementation, the US uses an audio system designed by Dolby, known as Dolby AC-3, where DVB uses the MPEG Layer II standard.

MPEG-2 Levels and Profiles supported by DVB

From the optional profile/level combinations offered by MPEG-2 the US system is focused on those which support High Definition Television (HDTV). Although there is a remarkable lack of consensus on exactly which scanning format to use in achieving HDTV images, the fact that MPEG-2 supports most of them is comforting for those who will soon be buying a new all-digital HDTV set.

As is well known, the DVB services being implemented in Europe and elsewhere around the world, have made use of the capacity of the MPEG-2 Transport bitstream to multiplex several standard definition or "Wide-screen" (16:9) services. DVB implementers by and large have planned a future upgrade to DVB HDTV formats, pending the arrival of consumer receivers with acceptable cost for the man in the street.

When that moment (estimated to be ten years away for the last twenty years) finally arrives, DVB standards are 100% ready for implementing HDTV. Essentially, this will mean a "swop-out" of the SDTV MPEG-2 decoder chips for HDTV ones.

A Tough Choice

With these different approaches the choice has become very complex for broadcasters and regulators not based in Europe, Japan or North America. A number of field tests and trial services are currently underway or being planned especially in Argentina, Australia, Brazil, China and Singapore.

These countries are all promising to officially adopt one of the available DTTB solutions before the end of the century. The first few decisions will also presumably tip the scales in what could be called the "spectator" countries, who are watching the decision making processes in these countries very closely.

Panasonic DVB-T consumer set top box

One thing is certain, each system requires a totally different accent on a complicated range of implementation issues, and the fundamental driver for the decisions will probably be market rather than technology-driven.

In the meantime demonstrations of DTV applications especially High definition TV can be expected around the world by the various DTV standards bodies. Expect showmanship, flair and highly persuasive arguments from proponents of one system or another, but one thing is for sure: In the end, the market will decide.