

Digital TV
Strong development on all fronts



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The PocketDISH™, a new line of portable media companions offered by DISH Network on which users can view their favorite programs. The content is secured by a solution provided by the Kudelski Group.



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With record revenues and profitability in 2005, the Digital TV division continued its strong growth. It confirmed its world leadership in digital content security solutions on all types of networks: satellite, cable, terrestrial, mobile or IP. 2005 was a very intense year both on the technological and commercial fronts.

Nagravision's solutions serve more than 100 operators worldwide representing more than 60 million active smart cards/devices at the end of 2005.

Television on IP

IPTV (Internet Protocol Television) is a new technology used by television operators and suppliers of mobile services.

The IPTV market can be broken down into the following main segments:

- The traditional telephone service operators who broaden their phone offer to include video and data transmission and propose triple-play bundles with the three services (phone, high-speed Internet and video).
- Satellite and terrestrial TV operators who expand their broadcast offering with on-demand movies and programming.
- Cable operators who also want to offer a triple-play bundle at a reasonable expense, thanks to IP-based technology.

Content protection on broadband networks remains a real concern for both content providers and programmers. Nagravision's Conditional Access (CA) and Digital Rights Management (DRM) systems go much beyond offering content protection during distribution and storage; they also offer rights management and user authentication functionalities.

Nagravision entered the IPTV market more than two years ago with the launch of the **NagraIP** solutions, now used by several operators.

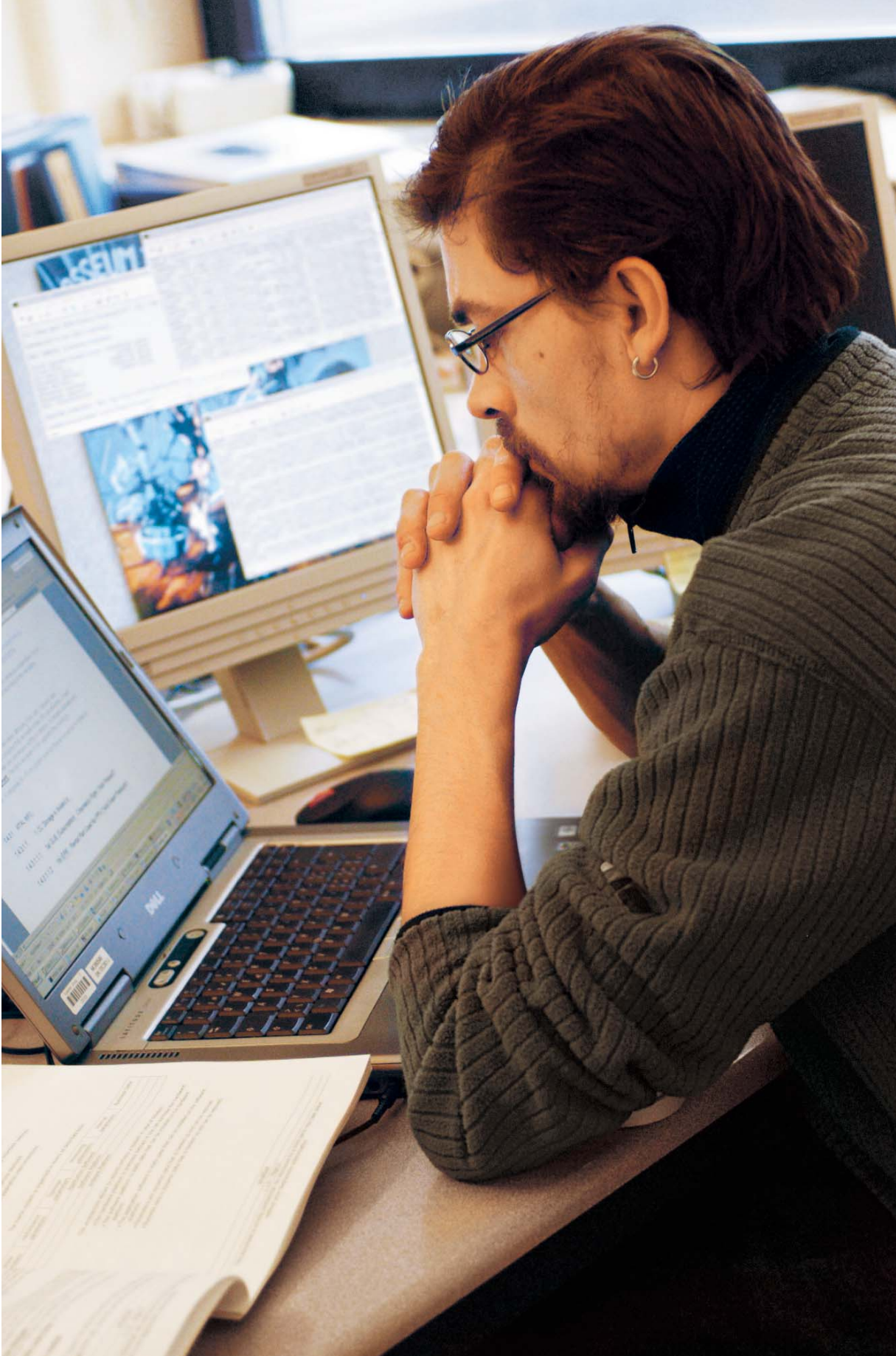
In 2005, a NagraIP solution was adopted by **neuf Telecom** in France to secure its TV service on DSL networks. neuf's acquisition of Cégétel significantly increased the target subscriber base. neuf's TV service plans to reach 200 000 subscribers in 2006.

In Spain, broadband operator **Jazztel** launched its DSL-based pay TV service Jazztelia TV, fully relying on NagraIP for content protection.

In Germany, **ish** is getting ready to deploy in early 2006 an IPTV-based video on demand solution over cable using a NagraIP system. Nagravision's solution will enable ish to offer the same VOD content on subscribers' television sets and on their computers.

In the United States, a contract was signed with **PanAmSat** for the delivery of an IPTV system including the NagraIP content protection solution and set top boxes for a high-definition MPEG4-based bouquet to be made available on a wholesale basis to cable and IPTV operators throughout the US. MPEG4 is a high-performance norm that enables new multimedia applications and HDTV.

In the Digital TV sector, the Kudelski Group runs three main Research & Development centers in Switzerland, France and the United States.



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Creation of a new entity

The experience acquired by the Kudelski Group in the IPTV sector confirmed that there was a real opportunity for the Group to extend its know-how to adjacent sectors beyond conditional access. A new subsidiary was established in the United Kingdom, **Quative Ltd**, specially dedicated to IPTV.

Quative offers a new generation service delivery platform for IPTV including content protection, content management and distribution, and service delivery. The company relies on a core team with an established track record in the rollout of IPTV services.

In addition to its experienced management and engineering team, Quative benefits from NagraVision's security know-how and Lysis' content management expertise. The gathering of these competencies confers to the company a unique position on the market.

In line with the Group's philosophy, Quative's platform architecture is open, scalable and service-independent. It supports IP-only and hybrid DVB/IP solutions and includes IP EPG (Electronic Program Guide), video-on-demand, purchase transaction applications as well as OSS/BSS gateway functions.

Quative will deploy its first turnkey solutions during 2006 as part of Kudelski Group's strategic projects.

Mobile TV

More and more, mobile phones are becoming multimedia terminals incorporating a wide range of functions such as SMS, MMS, photo, music and Internet access. Today the industry is becoming increasingly interested in offering high value-added, revenue-generating services such as pay television and premium video content on mobile devices. This represents the next logical step.

The Kudelski Group has succeeded in positioning itself strongly on this emerging market, offering specially designed solutions such as **Nagra-Lysis Mobile DRM**.

Based on NagraVision's experience in securing pay TV content on all types of networks, Nagra-Lysis Mobile DRM offers end-to-end security with Nagra Mobile, a set of client and server side content protection solutions, and Lysis Mobile DRM, which supplies content aggregation and rights management solutions.

Its key assets are as follows:

- It is the first comprehensive mobile TV solution worldwide.
- It is compatible with devices from all the main mobile phone manufacturers.
- It offers a flexible set of business models to purchase broadcast content on-line and off-line.
- It enables synergies between different types of networks: 2.5G/3G and DVB-H (Digital Video Broadcasting on Handheld devices).
- It is compliant with multi-DRM environments including OMA v1, v2 (Open Mobile Alliance) and Microsoft DRM as well as DVB-CBMS (Digital Video Broadcasting – Convergence Broadcast Mobile Systems).

At the end of 2005, Kudelski was selected by **T-Mobile**, the world's fourth largest mobile network operator, to launch a pilot project in the Czech Republic combining for the first time TV broadcasting on DVB-H technology with customized add-ons allowing interactive broadcasting.

The Nagra Mobile platform implemented for this project offers exceptional flexibility and allows the operator to develop new business models such as various combinations of subscription TV.

In Italy, the mobile phone operator **3 Italia**, which served more than 5.5 million customers at the end of 2005, selected the Nagra Mobile solution to secure its mobile TV service to be launched prior to the Football World Cup in June/July 2006. Football fans will be able to follow matches live on their mobile phones.

This will represent the world's first commercial deployment of a mobile TV service on DVB-H technology. Nagra Mobile, which will ensure the security of this platform, therefore positions itself as a pioneer in this market.

Abilis – reinforced Mobile TV competencies

In August 2005, the Kudelski Group acquired Geneva-based **Abilis Systems**. This company develops low-power, small surface (<90nm) integrated circuits that are particularly well adapted to mobile devices. The core of Abilis solutions is based on a multi-processor engine targeted at wireless broadband communication. Kudelski will combine Abilis' know-how with its security feature set to provide full-fledged solutions targeting the terrestrial and mobile TV markets.



MovieBeam – a catalog of movies in high definition accessed directly through the remote control.

Turnkey Push VOD and DVR solutions

In the still emerging market of Push VOD (video-on-demand) and DVR (digital video recorder) solutions, the Kudelski Group can already take pride in a few success stories, promising interesting business perspectives.

A partnership was concluded with **Walt Disney Television International** (WDTV-I) for the creation of a joint venture for the development and marketing of turnkey Push VOD and DVR services.

This solution is original in the sense that it includes the content as part of the offer: a catalog of movies, some of which in high definition, from Disney and other majors. The service will be deployed on satellite, cable, terrestrial and IP DVR decoders using standard hardware platforms.

MovieBeam, a venture financially backed by Disney, Cisco and Intel, re-launched in early 2006 its Nagravision-secured movies-on-demand service in 29 major metropolitan areas across the US reaching half of all US households. The MovieBeam movies-on-demand service provides instant access in high definition television to an ever-changing lineup of new releases and other popular favorites from virtually every major Hollywood studio. Disney will release its films through this service on the same day as they appear on DVD.

Nagra Push VOD

The Nagra Push VOD solution is designed for operators wishing to provide transaction-based content-on-demand on digital video recorders. Using the Nagra Push VOD system, content is encoded, encrypted, and transferred to the DVR hard-disk drive, and offered for rental or purchase to the subscriber. All rights associated to the stored content are managed by the Nagravision conditional access system. Content can be in various formats as file-based transfer is used to enable audio, video, data, games, etc. to be pushed by an operator to the subscribers' hard-disk drive.

The system delivered to Premiere is the only DVB solution using file-based content download rather than the streaming of videos. While such systems are typical in Internet Protocol networks, Nagravision provides the first implementation of a content-on-demand system using MPEG2 TS files that can be downloaded very quickly over DVB networks.

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In Germany, Nagravision launched a Push VOD service over DVB with one of its large customers, **Premiere**.

Nagravision's end-to-end DVR Push VOD solution secures Premiere's new VOD service Premiere Direkt+, the Premiere home video rental store, which enables subscribers to get up to 30 top movies per week downloaded on the Premiere Digital Recorder. After the order via phone, SMS or Internet, the movies are downloaded onto the hard drive via a push video-on-demand system that operates via satellite. Movies are available for the viewer during 24 hours.

In the United States, **DISH Network (EchoStar)**, a Kudelski Group long-standing customer, launched its new Push VOD service on the mobile devices PocketDISH manufactured by Archos.

StarHub Cable Vision, Singapore's cable operator, announced in February 2006 the upcoming launch of SmartTV, a new service that enables users to record their favorite TV programs conveniently with their remote control. This new feature will be offered to subscribers through the deployment of Digital Video Recorders using Nagravision technology. This will be the first deployment of a DVR project in Asia. Nagravision acts as global integrator. The system will support VOD and Push VOD services.

ADB/OpenTV – a reference platform

In 2005, the Kudelski Group announced a collaboration with **OpenTV**, the leading provider of enabling technology for advanced digital television services, and **ADB** (Advanced Digital Broadcasting), a leading supplier of digital TV systems and software solutions for interactive television, to develop and market global solutions for Push VOD/DVR services in high definition.

Nagravision, OpenTV and ADB intend to pre-integrate solutions to provide an accelerated time-to-market for set-top box manufacturers and pay TV operators wishing to deploy secure, interactive digital video recorders with minimized risk.

The first target platform is anticipated to be a high definition MPEG4 AVC-capable digital video recorder loaded with a complete set of interactive applications including an electronic program guide and file-based Push VOD ability particularly suited to DVR.

New business models

The Kudelski Group innovates constantly both by developing new technologies and by creating new business models.

Rental model

Launched in 2003, the rental model is increasingly appreciated by operators as it enables them to deploy a conditional access platform against payment of monthly subscriber fees.

This model is attractive to operators as it transfers operational risks and piracy risks to Nagravision.

For the Kudelski Group, the rental mode ensures recurring revenues and enables the Kudelski Group to capitalize on the proven resilience of its solutions.

Pre-paid cards

Pre-paid cards are becoming increasingly successful. **Mediaset**, the Italian operator, was the first to introduce this model in 2004.

Initially launched to secure Mediaset's pay-per-view soccer offer, the pre-paid smart cards now provide access to new content such as movies, motor sports and reality shows.

Nagravision is to deploy the third release of the rechargeable smart card solution suite in 2006 following a highly successful rollout of the first phases in 2005. The new release will enable Mediaset to expand its offering to include new features such as pay-per-time and subscription services. The cards can be recharged via mobile phone, Internet or at the point of sale.

The concept attracted another Kudelski Group customer, EchoStar Communications in the United States, who announced its plan to launch its prepaid satellite TV service DishNOW™ in 2006.

The Group's flexible organization encourages creativity and guarantees swift reaction times.



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New generation Nagravision conditional access system

Conditional access solutions are the Kudelski Group's core business. In parallel to the extension of its main product lines, the Group invests substantially in the enhancement of the security architecture of its conditional access system.

R&D teams are developing the next generation of advanced and customizable security architecture for securing content distribution.

This development integrates new distribution and security requirements related to the evolution of the digital television world: new broadcasting modes, business models and consumption habits. The new generation security architecture will also be particularly suited to the rental model.

In the course of 2005, a number of operators using the Nagravision conditional access solution have upgraded their system to new versions of the Nagravision system. Several operators have also swapped cards, generating important card delivery volumes.

Agreement with Microsoft

The Kudelski Group and Microsoft, the worldwide leader in software, services and solutions, announced in 2005 a joint commitment to enable technology solutions that help provide the secure reception of digital pay TV programs on personal computers and devices running Microsoft® Windows® operating systems.

The convergence of pay TV and personal computers brings new business opportunities for content owners, network operators, electronic device manufacturers, retailers and technology providers.

Digital cable

Europe

The Kudelski Group signed a cooperation agreement to provide conditional access and content protection systems to pan-European operator **UPC Broadband**, a subsidiary of the international cable operator UGC (UnitedGlobalCom, Inc.).

In the initial phase, Nagravision will support the rollout of digital television to UPC Broadband's analog cable subscribers in the Netherlands. Other developments are planned in Europe.

In Romania, **RCS & RDS**, the leading cable network and Internet service provider in the country, launched its digital DTH service in Romania and in Hungary. Similar deployments are planned in other countries in the near future. Additionally, this operator extended its analog cable platform to digital technology in Romania.

In Switzerland, **Naxoo** selected Nagravision to deliver and integrate an end-to-end solution including conditional access, smart cards, DVR, interactive applications and MHP middleware.

In Belgium, **Telenet** launched a digital cable TV service in October 2005 as part of its triple-play offer. The solution offers consumers interactive applications such as video-on-demand, electronic program guide and DVR. Nagravision acts as a global integrator.

In Spain, Nagravision was selected by the fiber optics telecommunications operator **R** for the deployment of a new digital television network. This contract is part of R's migration to digital technology. R is implementing a powerful fiber optics infrastructure involving over 300 000 km of cable and capable of transmitting video, voice and data signals simultaneously through a single cable line.

In the United Kingdom, Nagravision's long-standing customers **NTL** and **Telewest** announced in March 2006 the finalization of their merger. The merged platform totals more than 3.2 million subscribers; the global cable network reaches more than 12 million homes, representing approximately 50% of all UK homes.

Americas

Iowa Networks, a consortium of over 100 cable and telephone providers, continued to rollout its digital cable system using a Nagravision solution. In 2005, operators who adopted the Nagravision solution to upgrade their analog cable system to digital included Griswold Cable and Interstate Cablevision.

In Brazil, the two principal cable operators **Net Serviços** (Globo Group) and **TVA** (Abril Group), continued to grow using Nagravision technology: they expanded their digital TV services to new cities in Brazil and at the same time upgraded existing networks to all-digital.

In Peru, **Telefonica del Peru**, one of the largest telecom, Internet service and cable television providers in the country, selected Nagravision to supply a conditional access solution and Livewire OS software suite for its Cable Magico Digital TV network.

In Antigua and Barbuda in the Antilles Islands, **Communications Networks Systems (CNS)**, selected Nagravision to secure and enhance its new digital TV service. The upgrade of its analog terrestrial system provides subscribers with an all-digital solution.

Weststar Grand Cayman and **CBC Barbados**, who use the Nagravision conditional access system and Livewire OS suite, have adopted the digital technology across all their networks.

A solution specially designed for US cable
At the 2006 International Consumer Electronics Show (CES), Nagravision presented a conditional access solution in line with the new US cable DCAS (Downloadable Conditional Access System) concept. The demonstration was conducted with Comcast, leading cable operator in the US, on LG Electronics decoders.

Over the last two years, Nagravision has been a pioneer in collaborating with, namely, Comcast and STB vendors to develop a new generation of flexible and innovative interoperable client solutions specifically designed for the US cable, in which cable operators are free to manage CAS and Set-Top Box vendors in an independent way – an area where strong historical constraints prevail.

Asia

The Kudelski Group has a significant installed base in Asia, and in particular in the cable sector with, for example, **StarHub Cable Vision** in Singapore, **C&M** and **Qrix** in Korea and **Hong Kong Cable International** in Hong Kong.

In China specifically, one of the markets with the highest potential in the region, the Kudelski Group continued to enjoy strong progress.

The Beijing region cable operator **Beijing Gehua Cable TV**, a Kudelski Group customer, plans to have completed its digital migration before the Olympic Games.

The SARFT, the Chinese government's regulatory authority for television services, required all operators to migrate to digital.

Oriental Cable Network (previously Shanghai Cable Network), an important Kudelski Group customer, continues to develop well, using Nagravision systems.

The Kudelski Group benefits from a strong presence in China, supported by its strategic partnership with **CITIC Technologies** – a subsidiary of the leading CITIC Group – established in 2004. CITIC promotes the use of the Nagravision conditional access system for all digital programs distributed over its networks.

Nagravision and **SCM Microsystems**, leading manufacturer of electronic conditional access modules for digital television, concluded an agreement for the joint development of a smart card for the Korean cable market.

Nagravision and SCM developed and manufactured a secure module based on the OpenCable standard and worked together to integrate the Nagravision conditional access system into this module. The smart card resulting from this development is sold under the CableCard name.

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Direct-to-home satellite television

Europe

In March 2006, the Kudelski Group announced that its Nagravision end-to-end turnkey conditional access solution had been selected by **SES ASTRA**, a SES GLOBAL company and the market-leading satellite operator in Europe, for the launch of the company's new digital TV infrastructure for the German market.

SES ASTRA's new infrastructure for digital TV and additional interactive services will be made available to all broadcasters on an open and non-discriminatory technological basis, which will facilitate the introduction and development of digital services. The offer will include services such as the encryption of program signals and smart card distribution and registration for access. With this offer, TV households will enjoy a flexible digital TV solution providing technical access to free TV, pay TV and interactive services.

Nagravision's conditional access solution provides outstanding broadcast security and enables SES ASTRA to offer the technical services for programming diversity and flexible business models especially tailored to broadcasters and consumer needs.

This solution will be scaled to support up to 10 million registered customers with the capability to increase the capacity as per the requirements of SES ASTRA.

In Poland, the satellite operator **Cyfrowy Polsat** registered a strong increase in the number of its subscribers, now reaching more than 700 000. This operator successfully migrated to Nagravision's rental mode solution in 2005.

In Spain, terrestrial operator **CANAL+**, a Kudelski Group customer since 1989, completed the switch-off of its analog subscribers, migrating most of them to digital satellite technology using the Nagravision conditional access system.

Also in Spain, **Digital+** completed the migration of its satellite subscribers to the Nagravision's conditional access system.

In Portugal, **TV Cabo**, the country's leading digital TV operator, migrated its 300 000 satellite subscribers using Nagravision's conditional access system; the operator also migrated close to 350 000 subscribers to its premium analog service to Nagravision's digital system.

Americas

The year 2005 was marked by important milestones for **EchoStar**, **DISH Network**, its satellite operator, and **EchoStar Technologies Corporation**, its set-top box manufacturer.

DISH Network passed the 11 million subscribers milestone in January 2005, and reached 12 million subscribers (with in most cases several cards per subscriber) before year's end.

Bell ExpressVu, an EchoStar affiliate and Canada's largest satellite TV operator, reached close to 1.7 million subscribers in 2005.

DISH Network's impressive subscriber base growth can be attributed to different factors.

Quality programming and technology offers:

- The number of digital video recorders (DVR) sold reached more than 3 million units.
- The first MPEG4 HD DVR was introduced with DISH Network's HD package, the largest in the US, featuring more than 23 high definition channels, a lineup that will continue to expand in 2006, through EchoStar's agreement with Rainbow Media and VOOOM.
- The number one international channel offering in the US featuring more than 118 channels from 25 countries in 28 languages.
- A local channel offering in more than 163 local markets, (out of 212), representing between 4 and 10 channels in each city.

New product launches:

- **PocketDISH™**, a new line of portable media companions offered by DISH Network on which users can view their favorite programs. The content is secured by a solution provided by the Kudelski Group.
- **DishNOW™**, a prepaid card solution designed for viewers who prefer to access DISH Network's channels on a prepaid basis rather than through a standard subscription. The Kudelski Group also provided the encryption technology.

DISH Network – a continuously growing infrastructure

- In 2005, the number of uplink facilities increased from 2 to 8.
- Available services grew from 2 300 in January 2005 to 2 670 in December 2005, with HD services added daily.
- EchoStar launched its 10th satellite in February 2006.
- DISH Network finished first among all pay-TV providers in the American Customer Satisfaction Index (ACSI) for the second year straight.

Globecast, the American satellite DTH operator, selected and began its migration to NagraVision's new generation of conditional access system for its WorldTV platform broadcasting international programs in the US.

In Brazil, **Globo TV** selected NagraVision conditional access system and Livewire OS product to deploy a satellite-based pay TV platform into Europe.

Digital terrestrial television (DTT)

In France, the **CANAL+ Group** selected once more the Kudelski Group conditional access solution to secure four pay TV channels (CANAL+, CANAL+ CINEMA, SPORT and Planète) over France's digital terrestrial television network. The project was deployed successfully in October 2005.

Kudelski and CANAL+ have been partners since 1989 when CANAL+ chose the Kudelski technologies to secure its analog television service offering.

The new agreement extends the relationship between the two companies while providing an opportunity for the Kudelski Group to further strengthen its presence on the European digital terrestrial television market.

Following the successful rollouts in Italy (**Mediaset**) and the United Kingdom (**TopUp TV**), Kudelski positions itself as the reference supplier of conditional access solutions for DTT.