KUDELSKI GROUP
ANNUAL REPORT

2000

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CONTENTS

THE KUDELSKI GROUP OFFERS ITS TECHNOLOGICAL SOLUTIONS ACROSS FIVE CONTINENTS, WHEREVER SECURITY REPRESENTS A KEY CHALLENGE IN THE FIELD OF INTERACTIVE DIGITAL TRANSACTIONS.

THE GROUP IS A LEADING PLAYER IN ACCESS CONTROL SYSTEMS AND IN SECURE MANAGEMENT SOLUTIONS FOR DIGITAL AND ANALOG TELEVISION AS WELL AS IN CONTENT SECURITY SYSTEMS FOR BROADBAND NETWORKS.

KUDELSKI ALSO DEVELOPS INTEGRATED SMART CARD-BASED SOLUTIONS WHICH CAN BE USED IN ALL TYPES OF IDENTIFICATION AND AUTHENTICATION SYSTEMS REQUIRING A HIGH DEGREE OF SECURITY.

RENOWNED FOR THEIR EXCELLENCE AMONG PROFESSIONALS AND AUDIOPHILES THROUGHOUT THE WORLD, THE PRODUCTS OF THE NAGRA AUDIO DIVISION DEMONSTRATE THE KUDELSKI GROUP'S COMMITMENT TO ITS LONGSTANDING CUSTOMERS.

MESSAGE FROM THE PRESIDENT

In the space of ten years, the Kudelski Group has increased its turnover by a factor of more than fifteen while profitability has shown continuous improvement. This strong growth represents proof of the fundamental transformation the business has been through.

Examined firstly from the perspective of the industry, having been a manufacturer of professional recorders operating in a niche market, Kudelski has become a leading player in the global field of the television of the future and broadband Internet. The same principle applies when it comes to financial structure: a family firm heading for increasing levels of debt has turned itself into a financially secure group that is quoted on the SMI, the blue chip index of the Swiss stock market.

In a manner that has sometimes been imperceptible to those outside the company, the Kudelski Group has taken up challenges as numerous as they have been varied. In the early 1990s, these primarily concerned internal and financial aspects of the business. For the past five years they have consistently come from outside, relating to markets that follow rules which are both global and local.

They are global, as there are no longer any major technological barriers between the different regions of the world. They are local, because by adopting the tactic of vertical integration, certain European operators have turned themselves into competitors where once they were potential customers of the Group: thus markets are becoming almost closed to free market competition.

Against this background, the Kudelski Group took a decision relating to strategic positioning by devoting its attention primarily to the North American market in order to be better placed to return to its natural homeland: Europe. In 1996, Nagravision was perceived to be active exclusively in the North American digital television sector. By 2000, it was Europe that clearly held pole position. When the obstacles are to be found outside the business, sometimes you need to have the courage to change tack, the better to make progress.

For the Kudelski Group, the financial year 2000 involved, to a certain extent, reaping the rewards of the strategy implemented over the preceding years. Not only did we record strong growth, and excellent profit levels into the bargain, but also, remaining faithful to our fundamental principles, we were able to negotiate the stock market turbulence of the year 2000 relatively unscathed.

In essence, our central belief remains the same: we must give priority to our long-term vision while putting the emphasis on customer satisfaction. In fact, it is vital that we continue to make progress that is based upon prosperity, the crucial element that guarantees the profitability of everyday business. It is in this manner that we will be able to maintain the required degree of detachment from the climate of the stock market and the volatility that is its trademark.

The fact that the Kudelski Group has successfully negotiated the stormy waters of the year 2000 does not in any way mean that the future is all mapped out. Growth can be very rapid, but this trend can switch into reverse just as rapidly. We must be particularly attentive to developments in our customers' needs: sudden changes can take place in their market or in their approach to that market. We must therefore take account of all the parameters that may affect the challenges they face, notably the demands of the financial sector.

Among the changes anticipated, we believe that we are heading for a thinning out process among new TV operators, particularly in the United States. As long as this means a simplification in the structure of the market, this trend will not place a brake on the growth in subscriber numbers and will not have any real consequences for us. Furthermore, we see Asian and European markets as offering many new opportunities for our systems; we can expect these to stimulate our future growth.

As regards our competitors, over the coming months it is probable that we will see a consolidation among digital television equipment suppliers. Thanks to its strategic position and excellent financial health, the Kudelski Group will probably come out of this process all the stronger, in the meantime formulating an aspiration: to generate 50% of our income from outside current areas of activity within five years, whether through the development of new projects or through acquisitions.

In the future, as in the past, we shall continue to strain every sinew to meet the needs of our customers, our investors and our people. This will certainly be no easier in 2001 than it has been in the past – but where there are new risks, there are also new opportunities.

André Kudelski

KEY
FIGURES

STRONG PROGRESS IN RESULTS
TOTAL INCOME + 67%, OPERATING INCOME + 87%
NET INCOME + 88%, CASH FLOW + 54%

	2000	1999	1998	1997	1996	1995
TOTAL INCOME	359 527	214 737	112 323	107 739	66 913	39 086
OPERATING INCOME	75 405	40 388	25 038	17 195	5 816	6 105
NET INCOME	66 618	35 427	16 468	10 109	2 759	2 201
CASH FLOW	80 450	52 160	32 901	22 270	9 988	9 015
EQUITY INCL. MINORITY INTERESTS	693 156	154 208	111 464	56 808	45 825	30 692
NET CASH	543 611	58 663	47 609	10 390	4 637	-14 149
NUMBER OF EMPLOYEES	425	239	170	141	109	98

(financial data in kCHF)

TOTAL INCOME
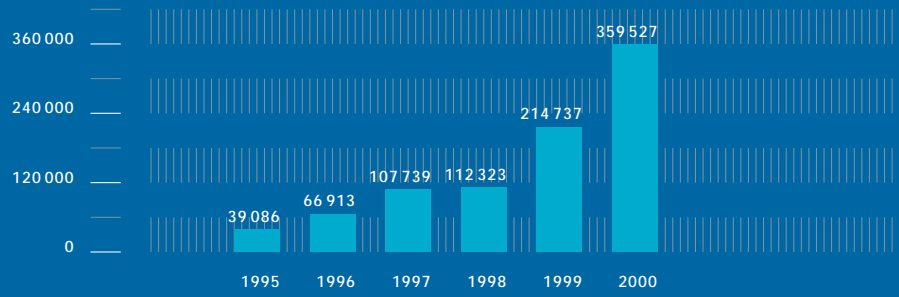
	1995	1996	1997	1998	1999	2000
	39 086	66 913	107 739	112 323	214 737	359 527

OPERATING INCOME

	1995	1996	1997	1998	1999	2000
	6 105	5 816	17 195	25 038	40 388	75 405

NET INCOME

	1995	1996	1997	1998	1999	2000
	2 201	2 579	10 109	16 468	35 427	66 618

CASH FLOW

	1995	1996	1997	1998	1999	2000
	9 015	9 988	22 270	32 901	52 160	80 450

EQUITY INCL. MINORITY INTERESTS

	1995	1996	1997	1998	1999	2000
	30 692	45 825	56 808	111 464	154 208	693 156

NET CASH

	1995	1996	1997	1998	1999	2000
	-14 149	4 637	10 390	47 609	58 663	543 611

7
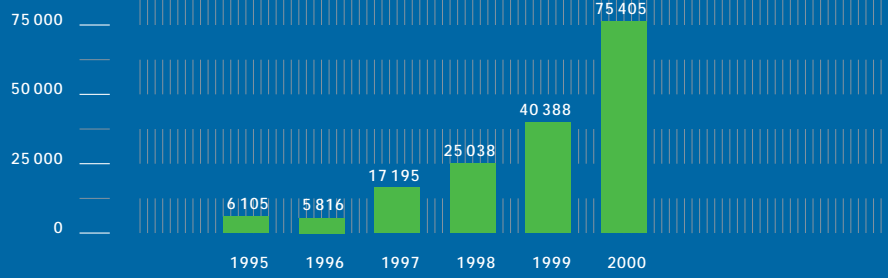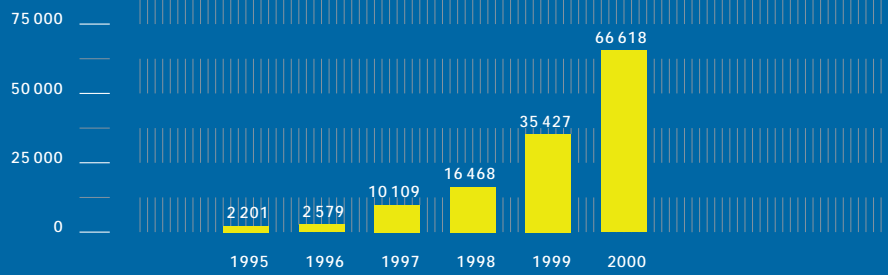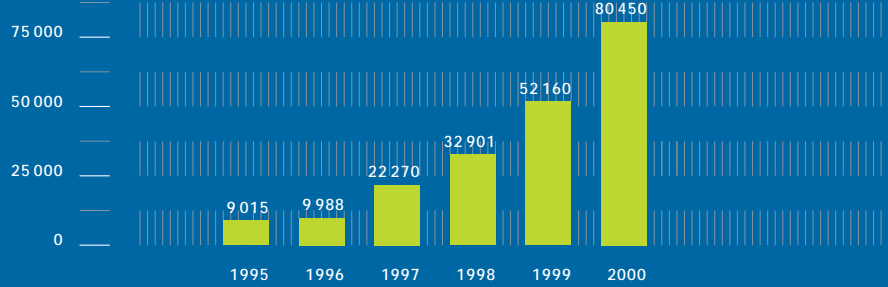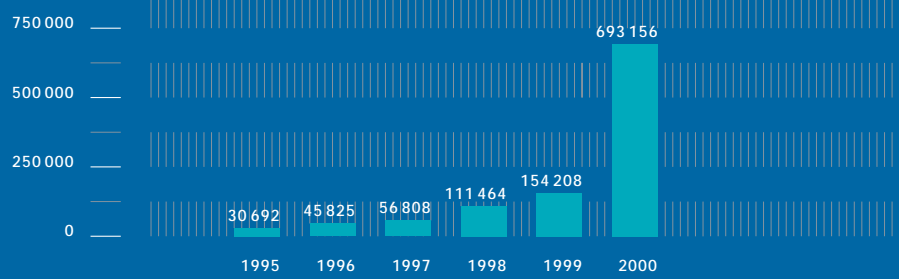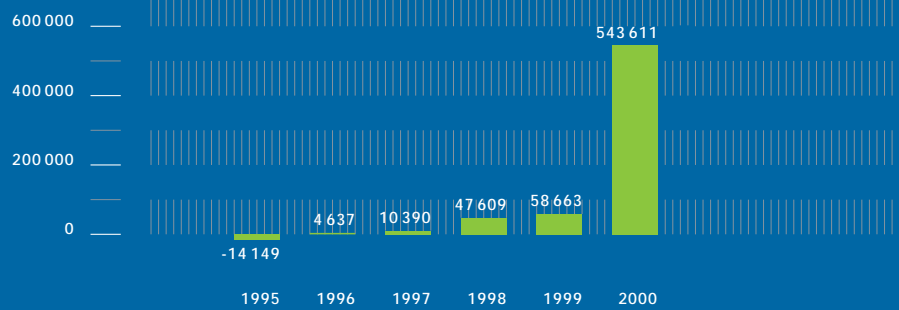
KUDELSKI GROUP COMPANIES

NAGRAVISION SA
Comprises two divisions carrying out different activities:
NAGRAVISION (DIGITAL)
Integrated conditional access systems, mixed secure solutions for the management of pay television and multimedia services. Security solutions for the distribution of digital content over broadband Internet.
NAGRA AUDIO
Portable analog and digital recorders for professionals; prestige Hi-Fi equipment.

NAGRACARD SA
Security technology using smart cards for digital television and, by extension, for applications such as physical access systems, e-commerce, cyber-administration, health cards etc.

PRÉCEL SA PRÉCISION ÉLECTRONIQUE
Assembly of electronic circuits and manufacture of mechanical parts, notably for the Kudelski Group's needs.

NAGRA+
Company equally-owned with Canal+ (France). Analog pay television systems.

NAGRASTAR LLC
Company equally-owned with EchoStar (USA). Conditional access and smart cards used by EchoStar's Dish Network American satellite television system and EchoStar's affiliated companies.

For the same partners: direct support, maintenance, security and development of new solutions to respond to the rapid development of the American satellite market.

NAGRA ID SA
Company equally-owned with Thermoplex F. Droz (CH). Development and production of modules and smart cards for contactless identification systems.

MEDIACRYPT AG
Company equally-owned with Ascom (CH). Fundamental encryption technology (based upon Ascom's IDEA™ algorithm) for secure digital television and broadband Internet transmissions as well as for copyright protection in the media industry.

SPORTACCESS KUDELSKI SA
"Hands-free" ticketing and access control systems using smart cards for installations such as ski-lifts, stadia, baths, amusement parks etc.

POLITICAL RIGHTS SA – POLIRIGHTS
Secure interactive communication solutions for the use of governments and public administrations (e-voting, cyber-administration).

E-PRICA SA
Company equally-owned with Galenica (CH). Personalized health card system for secure access to data from the "health" file of each patient.

KUDELSKI GROUP
KUDELSKI SA

NAGRAVISION SA
100%

DIGITAL TV

NAGRA AUDIO

NAGRAVISION ASIA/PACIFIC (SINGAPORE)

NAGRAVISION CHINA (SHANGAI)

NAGRAVISION INDIA (GURGAON)

NAGRAVISION NORTH AMERICA (EL SEGUNDO,CA)

NAGRAVISION BRAZIL (SAO PAULO)

NAGRAVISION IBERICA (MADRID)

NAGRA FRANCE SÀRL (PARIS)

NAGRA ITALIA SRL (ROME)

NAGRA USA INC. (NASHVILLE, CT)

NAGRA KUDELSKI (GB) LTD. (ST. ALBANS)

NAGRA KUDELSKI GMBH GERMANY (MUNICH)

NAGRACARD SA
100%

PRÉCEL SA
100%

SPORTACCESS KUDELSKI SA
54%

POLIRIGHTS POLITICAL RIGHTS SA
66%

NAGRASTAR LLC
50%

NAGRA+
50%

E-PRICA SA
50%

MEDIACRYPT AG
50%

NAGRA ID SA
50%

MANAGEMENT AND BOARD OF DIRECTORS

BOARD OF DIRECTORS

André Kudelski
Chairman of the Board and Chief Executive Officer

Norbert Bucher
Board Member

Laurent Dassault
Board Member

Patrick Fœtisch
Board Member

Stefan Kudelski
Board Member

Gérard Limat
Board Member

Claude Smadja
Board Member

MANAGEMENT

André Kudelski
President and Chief Executive Officer (CEO)

Adrienne Corboud Fumagalli
Corporate Secretary

Charles Egli
Chief Operating Officer (COO)

Nicolas Gœtschmann
Chief Financial Officer (CFO)

John Markey
Chief Marketing Officer (CMO)

Jean-Jacques Duvoisin
Vice-President Finance and Administration

Philippe Stransky
Senior Vice-President R&D and Projects (CTO)

Michel Varonier
Vice-President Operations

Claude Werner
Vice-President Production & Logistics

André Kudelski

Adrienne Corboud Fumagalli

Charles Egli

Nicolas Gœtschmann

John Markey

Jean-Jacques Duvoisin

Philippe Stransky

Michel Varonier

Claude Werner

TRAINING – KNOWLEDGE TRANSFER, INTEGRATION OF NEW PARTNERS, ACQUISITION OF A COMMON VOCABULARY, LISTENING TO QUESTIONS, PROVIDING ANSWERS, INFORMING, GUIDING, PROVIDING CONTACTS, EXPLAINING, TALKING

PERSONALIZATION OF SMART CARDS – FORECASTING AND ANTICIPATING REQUIREMENTS, PLANNING, RAPID RESPONSE, CUSTOMER SATISFACTION, STOCK MANAGEMENT, REDUCING TURNAROUND TIMES, REDUCING COSTS, PERSONALIZATION, QUALITY CONTROL, DISPATCH

SWX

SWISS EXCHANGE

Market Quote

Market Quotes on the SWX

Segment: Select Security

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Symbol	Valor	Name
	073404	KUDELSKI I
K		
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The products traded on S...
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THE YEAR 2000
EVOLUTION OF THE KUDELSKI SHARE

1986
GOING PUBLIC
Kudelski Group floated on the secondary market of the Geneva stock exchange.

1995
ENTRY OF DASSAULT
The world-renowned French group Dassault takes a 25% stake in Kudelski SA share capital.

1996
INCREASE IN SHARE CAPITAL
AND PARTICIPATION CAPITAL
The share capital is increased from CHF 3 million to CHF 4 million and participation capital from CHF 1 661 600 to CHF 2 921 100.

At the same time, the public convertible loan of CHF 15 million issued in 1986 is fully converted into participation certificates.

1997
THE KUDELSKI PARTICIPATION CERTIFICATE,
A SHINING STAR OF THE STOCK LISTINGS
The stock closes the year at CHF 7 250, an increase of 264%, thus producing the second best performance on the Swiss stock market in 1997. The company's market capitalization is increased fifty-fold.

1998
THE NEW CAPITAL STRUCTURE
As announced two years earlier, on 29th July 1998 the 29 211 participation certificates are converted into bearer shares, bringing the number of bearer shares in circulation on the market to 62 961.

CAPITAL INCREASE AND FIRST INDIRECT SPLIT
In view of the very strong growth in the value of the stock, which attains new heights in 1998, a restructuring of the capital is proposed at the first public general meeting of Kudelski SA shareholders on 26th October 1998. The proposal is approved unanimously.

The share price is divided by six and quoted initially at CHF 3 100 on 10th November 1998. This operation, designed to promote the liquidity and accessibility of the share, meets with unqualified success against a background of stock market turbulence.

SHARE PRICE EVOLUTION (IN CHF)

3 000
2 500
2 000
1 500
1 000
500
0

01 02 03 04 05 06 07 08 09 10 11 12 01 02

1998   1999
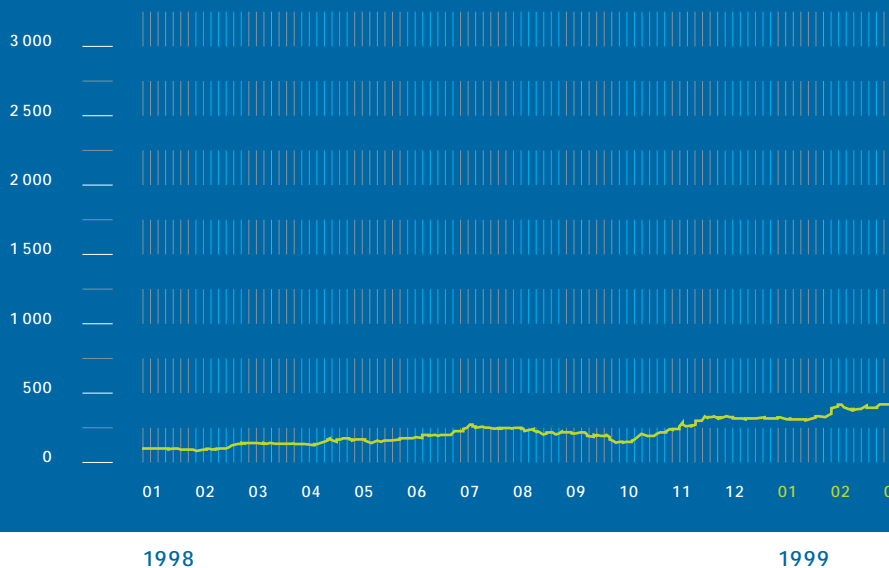
The new share capital totals CHF 41 526 600, divided into 377 766 bearer shares (nominal value CHF 100) and 375 000 registered shares (nominal value CHF 10).

This operation provides the company with more than CHF 34 million in fresh funds, thus allowing it to maintain its growth and to successfully implement a strategic investment policy.

FURTHER PLAUDITS FOR KUDELSKI STOCK
After the split carried out during the year, the stock closes the year at CHF 3 800, an increase of 210% making it the best performer on the Swiss stock market over this period. The company's market capitalization totals CHF 1 578 million at 31st December 1998.
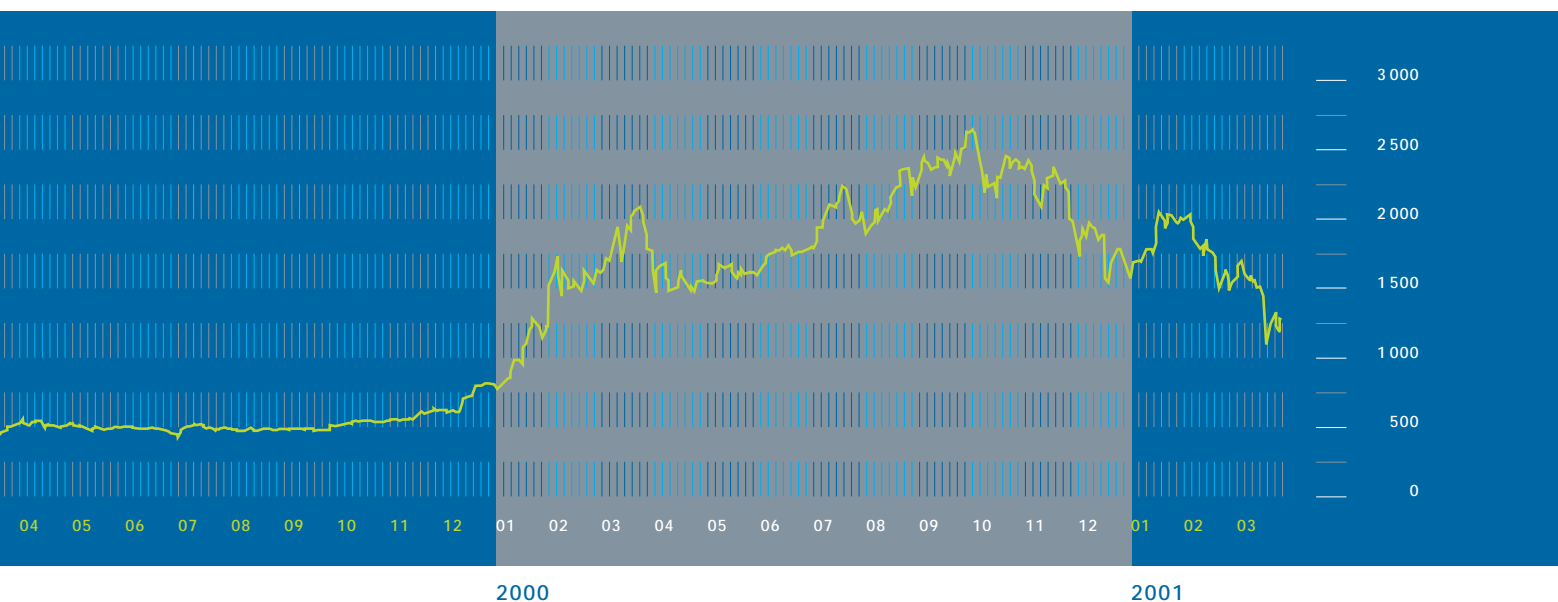
1999
KUDELSKI STOCK QUOTED ON THE MAIN SWX MARKET
In order to meet demand from numerous investors and to follow through on the Group's commitments, from 2nd August 1999 the Kudelski stock is quoted on the principal market of the SWX Swiss Exchange.

STRONG MARKET PERFORMANCE FOR KUDELSKI SHARE
In the wake of 2 exceptional years, Kudelski stock succeeds in remaining at the forefront of the listings in 1999, confirming the growing interest of numerous institutional and private investors.

The share closes the year at CHF 9 500, an increase of 150%, putting it 15th in terms of annual performance on the Swiss market, with shares in technology or with an Internet component blazing a trail. The company's market capitalization totals CHF 3 945 million at 31st December 1999.

	3 000
	2 500
	2 000
	1 500
	1 000
	500
	0

04   05   06   07   08   09   10   11   12   01   02   03   04   05   06   07   08   09   10   11   12   01   02   03

2000   2001

2000

CAPITAL INCREASE AND 2nd INDIRECT SPLIT

On 19th May 2000, at the Kudelski SA general share-holders' meeting, a capital restructuring proposal is put forward. This proposal meets with unanimous approval.

The stock price is divided by twelve, leaving it at CHF 2 371 on 24th August 2000. The operation carried is a great success.

The new share capital totals CHF 499 177 200, divided into 4 541 772 bearer shares (nominal value CHF 100) and 4 500 000 registered shares (nominal value CHF 10).

This operation brings the company CHF 475 million in liquidity assets, allowing it to continue to grow and to successfully pursue a policy of expansion through strategic acquisitions or investments.

1st OCTOBER 2000

QUOTATION ON THE SMI (SWISS MARKET INDEX)

On 1st October 2000 Kudelski stock is incorporated into the SMI together with that of four other companies (Julius Baer, Richemont, Serono and Unaxis). This share index brings together the 29 Swiss blue chip companies.

30th NOVEMBER 2000

INTRODUCTION ON THE MSCI (MORGAN STANLEY CAPITAL INTERNATIONAL)

On 30th November 2000 Kudelski stock is incorporated into the MSCI. The MSCI is an index produced by Morgan Stanley, comprising national indices to reflect a world share market index. The ratio for each country is calculated on the basis of their international economic importance. The MSCI index is a source of reference used greatly by foreign investors following different national markets.

The stock closes the year at CHF 1 800, an increase of 117%, representing the best performance among SMI stock and the 7th best performance overall.

The company's market capitalization at 31st December 2000 totals CHF 8 985 million.

The bearer share is listed on the principal market of the SWX Swiss Exchange.
Its reference number is P 073,404 (TK, DJT: KUD, R: KUD).

INTERNAL DEVELOPMENTS: CONTROLLED EXPANSION

In 2000, the Kudelski Group once again experienced a year of strong growth; it continued to make progress in adapting its organization to meet new challenges.

Increased staffing levels (almost 70 new colleagues, outside acquisitions), a reinforced market presence, services subject to constant improvement, new customers and technological diversification all indicate the growth achieved by the Group, whose structures have evolved to meet new requirements.

A STRENGTHENING OF OPERATIONAL STRUCTURES

The Operations Department has put new structures in place with a view to improving resource management, making better use of existing synergies between different departments and companies belonging to the Group, simplifying the information flow between them and optimizing the quality of customer service.

More particularly, the R&D, Project Management and Customer Care sections have been reorganized so as to offer even better service in terms of quality, product development times and delivery as well as site response times.

For example, training designed for Nagravision customers has been developed and formalized: thus, basic education about the Nagravision system is now complemented by modules covering specific products.

The structural changes also apply to the Quality Assurance division. This body, staffing for which doubled in 2000, has brought its attentions to bear upon the growing complexity of the projects and products supplied by the Kudelski Group. Armed with 20 man years of experience accumulated over time, it has continued to refine its methods and to put in place ever more effective validation procedures designed to guarantee that Group products meet the highest possible quality standards.

INCREASED STAFFING LEVELS, A REINFORCED MARKET PRESENCE, SERVICES SUBJECT TO CONSTANT IMPROVEMENT, NEW CUSTOMERS AND TECHNOLOGICAL DIVERSIFICATION ALL INDICATE THE GROWTH ACHIEVED BY THE GROUP, WHOSE STRUCTURES HAVE EVOLVED TO MEET NEW REQUIREMENTS

HEADQUARTERS REFIT

A general refit of the Kudelski Group headquarters, located in Cheseaux-sur-Lausanne, Switzerland, took place, during which new work areas were created. This allowed the organization to be redistributed more rationally and new requirements to be met.

A new building, acquired in 1998 and located on an industrial estate not far from Group headquarters, is now home to production activities, including those of the Nagra Audio division, as well as to the sales and marketing team for this sector; it is also here that the assembly of Nagravision industrial product solutions and stock management takes place.

Moving into new premises has helped to improve resource management, facilitating the concentration of production, on the one hand, and keeping the rapidly expanding development teams grouped together, on the other.

DEVELOPMENT OF LOCAL NAGRAVISION BRANCHES

Over the course of the year 2000, Nagravision has continued to extend its market presence. In particular, a Nagravision office, Nagravision Iberica, was opened in Spain and currently has 7 engineers.

In Brazil, a branch was set up in Sao Paulo, with administrative support from a Brazilian company.

Lastly, the Kudelski Group has beefed up its staffing levels in Asia through the expansion of its Singapore office, which manages the development of activities in the Asia-Pacific region and to which the Nagravision agencies in India and China report.

REINFORCEMENT
OF NON-TV ACTIVITIES

TRANSFER OF ACTIVITIES TO NAGRACARD SA

At the beginning of the year 2000, the activities of Intelegis (a joint venture between Kudelski, Biwi and Trüb) were taken over by the company NagraCard SA. The goal of this activity transfer was to optimize the coordination of projects involving smart cards.

INTEGRATION OF PRÉCEL SA INTO THE GROUP

The company Précel SA Précision Electronique was integrated into the Kudelski Group. Précel SA responds to the Group's needs with regard to the manufacture of electronic and mechanical components.

THREE NEW STAKEHOLDINGS

Over the course of the year 2000 and in early 2001, the Kudelski Group took holdings in three new companies: SportAccess Kudelski SA (54%), Polirights – Political Rights SA (66%) and e-prica SA (50%).

Kudelski offers these new companies its technology and its experience with regard to access control and smart cards while the partners provide the additional staff. Thus, the Kudelski Group keeps its resources intact for its core business sector, digital television.

SPORTACCESS KUDELSKI SA

SportAccess is the Swiss market leader in physical access control as well as in ticketing for ski-lifts and sporting facilities.

After the Kudelski Group had acquired a capital holding, the business took control over the Austrian company Systems AG, which holds a very strong position in the market for physical access control in Austria, Germany, Switzerland, Scandinavia and the Czech Republic. In particular, this company is the market leader in sub-sectors covering amusement parks, thermal baths, swimming pools and stadia. More than 600 sites across Europe and throughout the world are equipped with its access systems.

The headquarters for the new SportAccess Kudelski SA Group is in Sion, Switzerland, and 75 staff are based there.

This center for expertise is destined to play a key role in developments where the contactless smart card becomes the universal medium: in practice it will, for example, allow access to leisure facilities, for which a package has been loaded onto the card in advance via the Internet by means of a digital decoder or using a mobile phone.

POLIRIGHTS – POLITICAL RIGHTS SA

At the beginning of the year 2001, the Kudelski Group took a 66% capital holding in the Swiss company Political Rights SA – Polirights, based in Geneva. This firm offers integrated solutions for secure home-based electronic voting and for interactive applications relating to cyber-administration. Polirights solutions are aimed at states and at national and regional public authorities.

The services that Polirights provides are based upon the concept of relational databases integrated into a smart card – technology developed by Kudelski since 1995 – combined with digital signature authentication and electronic certification techniques.

The system reconciles the need for reliability, security and protection of privacy in all situations involving a remote electronic relationship between government and citizens – for example when making a tax declaration, registering a child with a school or transmitting an electronic ballot paper.

Polirights is a typical example of the process through which digital convergence is opening up new fields into which the Kudelski Group can transfer its know-how.

E-PRICA SA

The creation of the company e-prica SA in February 2001 marked a new phase in the diversification of Kudelski technology towards fields located outside the digital television sector.

e-prica is an equal venture between the Kudelski Group and the Swiss pharmaceutical group Galenica Holding. Its mission is to develop and market data communications media such as smart cards designed to guarantee the protection of sensitive data in the field of health.

This partnership allows two highly complementary ranges of expertise to be pooled: on the one hand there is Galenica's experience in the management of health-related information and on the other, Kudelski's know-how in relation to smart card-based systems for the secure distribution of information.

The first product to be made available will be the "e-prica" card (electronic privacy card), a personal electronic medium providing its holder with exclusive control over data from their medical file. This file, kept in an "anonymized" and partial form in a relational database accessible via Internet, only attains its complete structure when accessed jointly with the relevant smart card.

DEVELOPMENT OF SMART CARDS – PROJECT MANAGEMENT, DEVELOPMENT OF NEW PRODUCT SOLUTIONS, GUARANTEEING QUALITY OF THE SYSTEM, MOTIVATING A TEAM, PROVIDING CUSTOMER SATISFACTION, PROVIDING SALES AND MARKETING SUPPORT

QUALITY ASSURANCE – CONTINUOUS IMPROVEMENT OF PRODUCT QUALITY, DRAWING UP PLANS, PROCESS MANAGEMENT, OPTIMIZATION OF TURNAROUND TIMES, INTEGRATION OF COMPLEX SYSTEMS, RESOURCE MANAGEMENT, VALIDATION OF CUSTOMER SOLUTIONS AND PLATFORMS, MIGRATION/DEPLOYMENT OF SYSTEMS, ADMINISTRATION OF DOCUMENTATION

AT THE HEART OF CONVERGENCE
THE ESTABLISHMENT OF A DIGITAL INFRASTRUCTURE

MEDIA CONVERGENCE

Personal computers and the Internet have brought a section of the population into the interactive era. The digital revolution is taking great strides towards democratization, gradually finding a place in every home. Today it includes such high-penetration communications media as television, the telephone, handheld computers (PDAs); there is a proliferation of multimedia terminals communicating with one another and, like the Internet, open to an enormous range of interactive services.

LANGUAGE CONVERGENCE

As they share a common communication standard – the Internet Protocol (IP) – these "domestic terminals" are in a position to process images, sound or I.T. data indiscriminately, all now brought together within a common waveband. In other words, these applications use a universal language that liberates them from the different media by which they travel. Watching television on your PC, accessing the Internet on your TV set, receiving a video message on your mobile phone, taking part in e-commerce over all these media: all this will soon form part of everyday life.

BROADBAND NETWORK CONVERGENCE

Broadband networks are gradually taking over as they allow for the interactive use of high-value digital content. Thanks to this type of network, you can use a single line to access the Internet, television and radio programs, e-commerce and the whole range of interactive services the extent of which we are only now starting to appreciate.

The speed of the network is a critical factor here: the applications package, which often contains a continuous flow of images, sound or data, requires a large capacity. The ongoing introduction of broadband networks is therefore an essential precondition for future progress.

The stakes are sufficiently high as to stimulate vigorous competition from every type of network operator, and they are providing ever more effective broadband products, whether in the field of cable, xDSL lines, fiber optics, power line communication networks or Hertzian channels.

KUDELSKI, CONVERGENCE ALREADY IN PROGRESS

PROVEN EXPERIENCE

Throughout the world, digital TV network operators are developing infrastructures allowing them to supply their subscribers with the first interactive services.

Suppliers of such infrastructures set up on their platforms the different systems allowing them to manage content and ensure the security of transactions. It is here that Kudelski's conditional access solutions come into play, as thanks to their open architecture they are easily integrated into all environments.

It is now 12 years since the Kudelski Group introduced its first security solutions. It has a proven track record in the secure distribution of content over networks that have millions of subscribers, a record few in the world can match.

NEW MARKETS

With convergence, the Kudelski Group's know-how is expanding through a natural evolution into other sectors where interactivity is being developed, notably broadband networks. Therefore, its technology may be used in new applications and with new partners operating outside the field of digital TV.

This is also true for smart cards, which have traditionally been used with the Kudelski conditional access systems and are now proving to offer the perfect security response in many new situations.

Kudelski is also a leading player in the field of encryption techniques, providing the safest systems now available. Here again, there is a continuous proliferation in the range of applications for which they can be used.

To conquer the convergence markets, in addition to the technological assets that the Group has, one can also add the fact that the company rests upon a structure that is independent from broadcasting or media groups which guarantees a great capacity for openness vis-à-vis customers in a sector that is fiercely competitive.

WHAT IS CONVERGENCE? A MULTIPLICITY OF DIGITAL CONTENT TRANSMITTED OVER A SINGLE NETWORK AND AVAILABLE FROM ALL TERMINALS: MOBILE PHONE, TV, PC, PDA

News network

Hello World

Cartoon

CNBC

CNN

NASDAQ Update

Stock Exchange News

Zoom in

Zoom out

Extended | Audio/Format | Ratings

Description

Title: NASDAQ Update

Access

00:00 +0100

CORE BUSINESS
DIGITAL TELEVISION
NAGRAVISION: OPEN ARCHITECTURE SYSTEMS

ONE OF THE WORLD LEADERS FOR CONDITIONAL ACCESS SYSTEMS

Nagravision is a market leader in the field of conditional access for digital TV and broadband Internet. Leading operators are equipped with its technology which ensures secure access to their services via more than 25 million decoders (analog and digital).

Today the range of Nagravision solutions includes systems for:
– information access security – for the operator (encryption and access rights) and the end-user (decryption through the decoder/smart card pair)
– content and subscriber management
– management and security for interactivity over IP networks

Nagravision also plays the much appreciated role of global integrator for operators wishing to entrust the implementation of a "turnkey system" to a single company.

TOWARDS UNIVERSAL INTEGRATION

Based on industry standards as regards the transmission of digital streams (DVB, ATSC, MPEG-2), Nagravision conditional access solutions are designed according to a completely open architecture: they can therefore easily be integrated into the platforms of TV operators and can meet the demands of businesses working over mixed systems such as satellite/cable, MMDS/cable, etc.

Nagravision solutions, which can easily interface with other technology, do not impose any constraint upon operators in their choice of other components in the transmission-reception chain. They are modular, which facilitates the upgrading required due to the constant evolution of technology and markets.

The market is also heading towards the implementation of the MHP (Multimedia Home Platform) norm, which covers decoder technology (software interfaces and applications) more specifically. This norm will facilitate the opening up of markets by defining the standards that will allow viable applications to be developed whatever the middleware selected.

Nagravision observes the market attentively so as to be in a position to respond to customers' demands for decoders that employ the MHP norm within as short a timescale as possible.

OPENNESS THAT IS FAVORABLE TO PARTNERSHIPS

Nagravision's strategy of technological integration with the platforms of leading players in the digital television industry has continued to take shape in 2000 through a whole series of cooperation agreements. Here is a brief overview of these:

SUPPLIERS OF MIDDLEWARE AND INTERACTIVE APPLICATIONS

Agreement with Microsoft for the integration of the Nagravision conditional access system with the Microsoft TV ® operating platform. The two companies plan to offer common, complete and secure solutions in the field of digital and interactive television operating systems for satellite, cable, MMDS and terrestrial transmissions.

Strategic alliance between Nagravision and Liberate Technologies. The two companies have developed an advanced interface encompassing the Nagravision conditional access system and Liberate's TV Platform™ software. The combination of these two products, presented in a pre-integrated form, allows the reduction of timescales for the commercial launches of products by operators supplying top-of-the-range interactive television services.

NAGRA+: ANALOG AS A PRELUDE TO DIGITAL

The strategic position that the Kudelski Group holds in the field of digital security systems is based upon its extensively proven track record in conditional access systems for analog television.

A joint venture between Kudelski and Canal+, the company Nagra+ enjoys a dominant position in the analog sector, especially in Europe.

In particular, Nagra+ analog solutions are used to equip companies belonging to the Canal+ group in France, in Spain and in Poland, as well as in Africa and the West Indies. Turkey, too, represents a significant market for Nagra+ and its customers there, TeleOn and Multicanal, have been recording good levels of growth.

While the analog sector remains relatively stable in Central Europe, there is still potential for progress in emerging markets.

ONE OF THE WORLD LEADERS FOR CONDITIONAL ACCESS SYSTEMS, **NAGRAVISION IS A MARKET LEADER IN THE FIELD OF CONDITIONAL ACCESS FOR DIGITAL TV AND BROADBAND INTERNET.** LEADING OPERATORS ARE EQUIPPED WITH ITS TECHNOLOGY

HEADEND

Global turnkey pay TV systems supplied by Nagravision and Scopus Network Technologies, a leading supplier of headend technology.

Integration of Nagravision and BarcoNet product lines. BarcoNet is a supplier of distribution systems (head-ends, high speed fiber optics systems, network manage-ment and digital television distribution) specializing in broadband applications.

DECODERS

Presentation by Nagravision and Pioneer of an integrated system including Nagravision conditional access tech-nology on digital decoders from the Pioneer Voyager™ range. These are designed for interactive broadband cable television.

This joint project reflects the Kudelski Group's willing-ness to provide customers with an ever greater choice over the security and interactivity of systems. To this end, Nagravision's systems thanks to their open architecture, can be integrated with the products of an ever-growing number of decoder suppliers – around thirty at present.

SOLUTIONS

Strategic agreement between Nagravision and Diva, a major supplier of interactive video-on-demand (VOD) products and services.

The Nagravision pre-encryption technology chosen for this solution protects digital content at every stage of the transmission process and provides for a shorter launch period, thus meeting the needs of digital television operators.

Nagravision's secure VOD solution can be integrated with the interactive products and services of other part-ners, notably Compaq, and EMC2, market leaders in broadband multimedia solutions, as well as with those of Ncube and SeaChange.

SECURE ACCESS
TO INFORMATION

25 MILLION SECURE DECODERS THROUGHOUT THE WORLD

The Conditional Access System (CAS) lies at the heart of the solutions used by TV operators across five continents.

It manages transactions and interactivity and ensures that only subscribers who have paid for a service can gain access to it. This function is even more crucial now that digital television is bringing about a real explosion in the number of channels and the establishment of new interactive services such as video on demand.

DIGITAL TV: THE FUTURE FOR INTERACTIVE SERVICES

Digital television provides much more than an improvement in image and sound. Thanks to the new potential for interactivity that it offers, it brings multimedia services to the very heart of the home.

For the consumer, it is no longer a case of "going and searching for" interactive services on equipment whose functions they are sometimes unfamiliar with. On the contrary, these services are offered to them on the equipment with which they are most familiar: their television set.

In marketing terms then, this ensures the conditions are in place for the creation of a true mass market.

Continuous improvements are being made to the overall conditional access system and to the elements associated with it (management modules such as IMS and SMS, smart cards, interactive applications etc.). Over the year 2000, therefore, new functions were added to these products, substantially expanding Nagravision's offer, without this having any impact upon the profitability of the company's resources.

In general, the evolutions have principally involved the development of capabilities linked to interactivity and the optimisation of operational functions.

200 MILLION DIGITAL TV SETS BY 2005

Digital television is still in its infancy. Currently estimated to account for less than 5% of the market, this figure should rise to between 15% and 20% by 2005.

This means that, by 2005, there will be digital TV sets in more than 200 million homes, of which around 180 million will have interactive functions (source: Strategy Analytics).

DIGITAL TELEVISION PROVIDES MUCH MORE THAN AN IMPROVEMENT IN IMAGE AND SOUND. THANKS TO THE NEW POTENTIAL FOR INTERACTIVITY THAT IT OFFERS, IT BRINGS MULTIMEDIA SERVICES TO THE VERY HEART OF THE HOME

SMS – STREAMLINED SUBSCRIPTION MANAGEMENT

One of Nagravision's central activities in 2000 involved the development, by the SMS unit, of a Web server linked to the subscriber management module.

The SMS (Subscriber Management System) is in some ways the administrative engine of the conditional access system. It manages the subscriber database and the different operations carried out on subscriber accounts: purchases, invoicing, subscriptions etc. It also generates authorizations for access to programs.

Subscriber management requires the operator to put a telephone exchange in place, through which users make their purchases. However, in certain situations where there is a high level of demand for mass audience programmes – football matches, for example – the exchange can sometimes reach saturation point.

Thanks to the SMS Web server, subscribers order the broadcast of their choice independently and "on impulse", directly through their decoder/smart card or their personal computer. The orders are then sent to the operator's SMS through the conditional access system.

ENCRYPTION METHODS : PROVIDING EVER GREATER SECURITY

THE MOST SECURE SOLUTION ON THE MARKET

The performance levels of Kudelski encryption methods represent one of the company's greatest assets.

Through its joint-venture company MediaCrypt AG, Kudelski offers licences using the IDEA™ algorithm with a 128 bit key, reputed to be the most secure on the market and used in encryption modules and smart cards.

PRE-ENCRYPTION AND COPYRIGHT PROTECTION

Over the year 2000 Nagravision developed technology for the pre-encryption of digital content, thus ensuring security of data stored on the server of the content provider, namely right at the beginning of the transmission chain.

In particular this technique responds to concerns over copyright protection in the context of applications such as video on demand, distance learning, multimedia on demand over broadband networks etc.

Aside from the convenience that this brings for the customer, this system alleviates the burden of operators enormously, particularly at telephone exchanges.

Nagravision SMS solutions are used by Cablecom (Switzerland), Polsat (Poland), Quiero TV and RTVE (Spain), GVB and PMSI (Philippines), DVBH (9 systems in China) and Sentech (South Africa). In addition, Métrociné (Switzerland) uses a system derived from the SMS to administer transactions carried out using smart cards.

TSS – CONTENT PLANNING

The TSS (Traffic & Scheduling System) system is a tool providing the operators with the means to exercise better control over the planning of their platform's multimedia content and automated functions. Placed well upstream of broadcasting installations, it is used in particular to manage operations allowing a given procedure to be started up automatically at an appointed time: for example to insert an advertising message or a competition question relating to the film that is being shown.

The system thus ensures synchronization between the broadcasting of multimedia content, audiovisual content and conditional access.

Nagravision plans to adapt this platform to meet the needs of Internet operators in view of professional applications such as distance learning, business-to-business communications, etc.

A "TRUST CERTIFICATE"

Under PKI infrastructure, an operator grants "trust certificates" to subscribers whose record of payment for purchases meets pre-established criteria.

When carrying out an e-commerce transaction, the user provides the reference details from their certificate, the validity of which is verified on a centralized server. In addition, this verification serves the needs of the purchaser, as a valid certificate also indicates that the vendor is worthy of trust.

Under this type of infrastructure, the conditional access system handles the dispatch of PKI certificates to subscribers and their storage.

FOR THE CONSUMER, IT IS NO LONGER A CASE OF "GOING AND SEARCHING FOR" INTERACTIVE SERVICES ON EQUIPMENT WHOSE FUNCTIONS THEY ARE SOMETIMES UNFAMILIAR WITH. ON THE CONTRARY, THESE SERVICES ARE OFFERED TO THEM ON THE EQUIPMENT WITH WHICH THEY ARE MOST FAMILIAR: THEIR TELEVISION SET

PKI – ATTRIBUTION OF CERTIFICATES FOR E-COMMERCE APPLICATIONS

PKI (Public Key Infrastructure) has formed part of Kudelski systems since the early 1990s, ensuring the security of transactions in respect of access to information.

The PKI concept applied to e-commerce and t-commerce represents one of the major developments introduced by Nagravision over the course of the year 2000.

This infrastructure involves offering subscribers the option to purchase TV products (films, video on demand, sporting events etc.) via the Internet or potentially via an interactive decoder connected to the Internet, using a personal certificate issued in advance by the operator. This procedure avoids the need to place orders through a telephone exchange, adding to customer convenience and bringing about cost savings for the operator.

The PKI concept is even more attractive since, in a pay TV environment, there is often a large volume of subscribers (sometimes running into millions), representing a databank of customers who could potentially receive a certificate. This database is of real commercial interest. Certificates created in this way are also of significant interest to companies involved in e-commerce.

These features may generate additional revenue for television operators.

EPG – ELECTRONIC PROGRAM GUIDE

The distinctive feature of the Nagravision EPG (Electronic Program Guide) is the fact that it is linked to the conditional access system and therefore enables interaction between the user and the operator.
For example, it authorizes the "impulse purchase" of a broadcast directly from the program guide. This application is therefore more than a simple list of channels.

The EPG is also of value to the operator, who can easily provide subscribers with news about programs and new products that are available.

The EPG application operates via a decoder equipped with an open platform such as OpenTV. This type of solution is particularly relevant to the satellite market. For example, operators equipped with the Nagravision conditional access system, such as TeleOn in Turkey, Polsat in Poland and 022 Télégenève in Switzerland use this interface.

Additionally, Nagravision is working on the development of a more sophisticated version of EPG, a "VOD/NVOD Navigator", which will allow the subscriber to purchase a film and to view it immediately (in the case of VOD-Video On Demand) or almost immediately (in the case of NVOD- Near Video On Demand). This product should become available during the year 2001.

VIDEO ON DEMAND – ONE OF THE FIRST INTERACTIVE APPLICATIONS

Obtaining the movie of their choice at the time they have decided to is probably one of the first interactive features that digital TV subscribers wish for. Such a service is an advantageous substitute for the hiring or purchasing of physical media such as video cassettes or DVDs.

After several operators spent a trial period working with restricted groups of subscribers, Video On Demand (VOD) has entered its marketing phase.

The Nagravision VOD system allows flexible product management through a variety of sales options:
– by the session, so that viewers can watch a film or a particular program once and at a specified time
– by subscription, so that viewers can watch as many films as they wish over the period for which they subscribe
– by "window", that is to say for a specified period (a given number of hours) during which the viewer can watch several films
– by time slot, where a given film can be viewed several times

THE CONDITIONAL ACCESS SYSTEM AND THE SMART CARD: AN EVER MORE EFFECTIVE PAIR

The technological evolutions of the smart cards and of the conditional access system translate into a multiplicity of new functions that are available to the user:
– the management of complex subscription options. For example: differential rates based upon marketing criteria or purchases by time unit
– the management of several different user profiles on a single card: for example family cards with parental control, credit limits per user for impulse purchases etc.
– access to sample viewing windows (e.g. 10 minutes unscrambled coverage from a live match)
– security for on-line shopping transactions (e-commerce)

On a technical level, VOD operates according to three encryption techniques, each of which has its particular advantages:
– pre-encryption on the operator's server: the content is encrypted at the same time as it is digitized on the MPEG flow. This system forestalls hacking of the server and of the distribution of the content
– The storage of encrypted movies on the decoder, which must in this case have a hard disk. This solution is suited to satellite operators as no return path is required
– encryption "on the fly": a movie is encrypted at the same time as it is broadcast – a system that is particularly well-suited to live broadcasts

In September 2000, Nagravision reached agreement with Diva, a major supplier of VOD products and services, on the development and marketing of a secure platform based upon pre-encryption technology and designed for use with on-demand services.

The launch of the first Nagravision VOD management platforms is of particular strategic significance. In fact, the concept is fully transferable to the distribution of other types of on-demand content (games, MP3 music, software) on broadcast or broadband networks (fiber optics, DSL etc). Over the next few years, therefore, this infrastructure is destined to play a significant role in the rapid development of MOD (Multimedia On Demand) as well as in interactive applications.

NEW GENERATION SMART CARDS

Produced by another Kudelski Group subsidiary, NagraCard, the smart card plays an essential role in Nagravision's high-security digital TV solutions. Programmed to act as a barrier authorizing or prohibiting access to a given service, the smart card also acts as a security platform for interactive applications such as on-line shopping, games and banking transactions, and even as a means of payment.

A number of developments have been carried out by NagraCard over the last two years regarding both the smart card hardware (increase in memory capacity) and software (introduction of new functionality).

Aside from increased security, the new generation of smart cards offers additional functions to manage impulse product purchases: during the monthly billing procedure, for example, the card lists the purchases – which have been temporarily debited over that period on a "credit of trust" – and calculates the total amount due.

These products can now range from a simple film to complex subscriptions to several channels or to series of events (drama/film serials, sporting seasons etc.).

Operators whose offering includes e-commerce as well as the traditional television services particularly appreciate the flexibility that the card offers and the savings on administration costs that it allows them to make.

NAGRAVISION WORLDWIDE IN 2000

THREE FACTORS FOR SUCCESS

On a commercial level, the Kudelski Group's progress over the year 2000 was the result of three factors:
– the deployment of systems for new customers
– the development of relationships with longstanding customers who are expanding their services, and thus their technological platforms
– the expansion into security technology for digital content distribution over broadband networks.

The Group has been very active and has continued to increase its market share worldwide.

EUROPE

IBERIAN PENINSULA: DEVELOPMENTS IN THE DIGITAL CABLE SECTOR

Operators using Nagravision solutions continue to make good progress, whether in the satellite or in the terrestrial sector. In digital cable, two projects should be mentioned:

TV Cabo Portugal, one of the leading cable operators on the Iberian Peninsula in terms of its number of subscribers, chose Nagravision technology for its digital cable network, having already adopted a Nagravision system for its satellite services in 1998. This customer plans to introduce decoders that bring together Nagravision's conditional access system and the Microsoft TV ® platform over a fully interactive cable network.

In addition, the Spanish cable operator Ono has started to broadcast digital services. This represents the first stage in a wide-ranging operation that will include numerous channels as well as interactive services. Equipped with a Nagravision system, Ono is one of the first operators to launch digital services via cable in Spain.

In Spain again, but in the satellite sector, TSA (Telefonica de Sistemas Audiovisuales) has once again selected Nagravision for a new service designed specifically for Spanish-speaking regions of Latin America.

SWITZERLAND CONTINUES TO PLACE ITS TRUST IN NAGRAVISION

Adopted by Swisscable, the association of Swiss cable-operators, and supplied to Cablecom and 022 Télégenève in 1999, Nagravision solutions equip 95% of the Swiss market.

This vote of confidence was strengthened still further in 2000, when the operator Valaiscom installed a Nagravision digital terrestrial system.

THE GROUP HAS BEEN VERY ACTIVE AND HAS CONTINUED TO INCREASE ITS MARKET SHARE WORLDWIDE

NORTH AMERICA

ECHOSTAR: A SOLID PARTNERSHIP

After Europe, North America represents the most important market for the Kudelski Group. The United States in particular, where in 1995 Nagravision commenced its digital activities through the operator EchoStar, remain a priority market both in terms of present activities and future opportunities.

A strategic partnership has bound Kudelski and EchoStar together since the creation of a joint company, NagraStar, in 1998. Apart from the fact that it allows a close follow-up on EchoStar as a major customer, Nagrastar also represents a laboratory for new ideas in the field of digital satellite television.

EchoStar broadcasts DTH (Direct-To-Home) programs by satellite using a Nagravision system. The operator, which has achieved rapid growth since the beginning of its activities, has more than 5 million subscribers. In order to carry the number of channels that it broadcasts (currently more than 500), the operator has launched satellites at an impressive rate: from EchoStar I in 1995 to EchoStar VI in June 2000. Two further satellites are planned for 2001 and 2002.

On the technical level, a massive upgrading of the EchoStar system is planned for the year 2001. Namely, the improvements will include a more modular design, enhanced performance levels, extra management tools providing better maintenance capacity, new smart cards enabling e-commerce and greater interactivity.

Among the innovations that EchoStar introduced in 2000 is the "Starband" process, which is a two-way satellite link. The possibiliy of having a satellite return path is all the more interesting as it increases the opportunities for interactivity. In this way, EchoStar has introduced high-speed Internet Starband services in parallel with its Dish Network programs.

DIGITAL CABLE: A MARKET WITH POTENTIAL

For the Kudelski Group, the US digital cable market represents a development area that complements the satellite sector.

Currently, digital and analog cable represents approximately 70 million subscribers.

As digital TV becomes more widespread, cable technology possesses outstanding growth potential. Industry analysts forecast that US cable will grow as a pay TV digital market at about 15 million decoders per annum for the next 3-5 years.

In addition, the US Federal Communication Commission has launched initiatives aimed at opening the retail market for set top boxes and integrated digital TVs to the cable subscriber, who would therefore no longer have to rent these devices (without any choice over the brand) from their television service provider, as they do currently. This situation would benefit the consumer electronics producers with established brand equity.

The importance of the digital cable market and its expansion open a realm of opportunities that the Kudelski Group is already looking into. An end-to-end solution designed for this sector is currently under development.

CENTRAL AMERICA AND SOUTH AMERICA

Nagravision continues to make progress in the markets of Central and South America. The establishment of a Nagravision representative office in Sao Paulo, Brazil, is making contacts more convenient over the continent as a whole.

In Brazil, Nagravision has gained new customers who are currently in the process of setting up their operations. Acom, who has been equipped with a Nagravision system since 1999, is continuing to grow after obtaining new MMDS broadcasting concessions.

In Mexico, the Kudelski Group's second most important market of Latin America, PCTV (an association of cable operators) installed the first phase of a system equipped with a Nagravision solution.

PCTV's programs are sent via satellite to the operators throughout Latin America belonging to the association who then broadcast them through their cable networks.

PCTV's operations have a strong potential for development.

Overall the Mexican market offers great potential in the cable sector.

ASIA

The principal countries of Asia possess highly developed infrastructure in the field of analog cable TV. The switch to digital TV that is starting to take place, stimulated by new interactive applications, is opening up significant opportunities which should be explored actively.

Over the course of the year 2000, the Kudelski Group once again intensified its activities in this part of the world, notably by increasing its technical and commercial staffing in the region. Nagravision has now dedicated sales structures in China, in Singapore and in India.

THE PRINCIPAL COUNTRIES OF ASIA POSSESS HIGHLY DEVEL-OPED INFRASTRUCTURE IN THE FIELD OF ANALOG CABLE TV. THE SWITCH TO DIGITAL TV THAT IS STARTING TO TAKE PLACE, STIMULATED BY NEW INTERACTIVE APPLICATIONS, IS OPENING UP SIGNIFICANT OPPORTUNITIES

CONTINUOUS PROGRESS IN CHINA

With its 80 million cable subscribers, China represents a priority market in which Nagravision has recorded further success. The agreement reached in 1999 with the Chinese group DVN Holdings (formerly DVB Holdings) in Hong Kong to equip six cable networks with conditional access systems for digital TV was extended to cover new orders in 2000. It now encompasses eleven sites, including the Shanghai Cable TV network which has around 3 million subscribers.

Another important agreement was signed with NTC in Chengdu for the installation of Nagravision CAS, NVOD and SMS systems.

STRONG MARKET POSITION IN THE PHILIPPINES

Nagravision holds a very strong position across the archipelago, one strengthened in 2000 through the conclusion of contracts with two new customers: PMSI (CAS and SMS systems) and ABS-CBN (CAS system), which is also active in the Middle East.

The Philippines are mainly equipped with satellite networks.

NEW MARKET CONDITIONS IN INDIA

The liberalization of satellite licences, which until now had been reserved for the government, changes market conditions in this enormous country counting no fewer than 70 000 cable operators.

A strong sense of rivalry can be anticipated between the satellite and cable technologies, which both complement one another and are in competition. This situation will further the trend towards digital and its new interactive services which are perceived as genuine commercial assets.

Nagravision made its debut in this market thanks to agreements concluded with two suppliers of satellite programmes that are redistributed through cable, B4U and SaBe TV.

TAIWAN, A MARKET WITH GREAT POTENTIAL

Together with China and India, Taiwan is one of the Asian markets with most potential for Nagravision, which first became active there in 1998 when Mega Media Broadcasting Network purchased a system.

This operator was Nagravision's first major customer of the digital era in Asia. Interesting perspectives lie ahead for Nagravision in this country, particularly in the cable sector.

In addition, Nagravision has continued its technological integration activities with Taiwanese decoder manufacturers: Mentor and Eastern now add to Visionetics, a Nagravision partner of three years standing.

Similar integrations have taken place in Korea with Samsung and Humax.

ACCOUNTS – CONSOLIDATION, COST PLANNING, BALANCE SHEET PRODUCTION, PROFIT/LOSS CALCULATION, COVERING EXCHANGE-RATE RISKS, ASSET MANAGEMENT, OPTIMIZATION OF PERFORMANCE LEVELS, INVESTMENT

QUALITY TESTS – TESTING FUNCTIONS, VALIDATING CUSTOMER CONFIGURATIONS, GUARANTEEING TESTS CAN BE REPRODUCED, SPECIFICATION, TRANSFER, INTEGRATION, MIGRATION, ADDRESSING RESULTS, SOFTWARE INSTALLATION
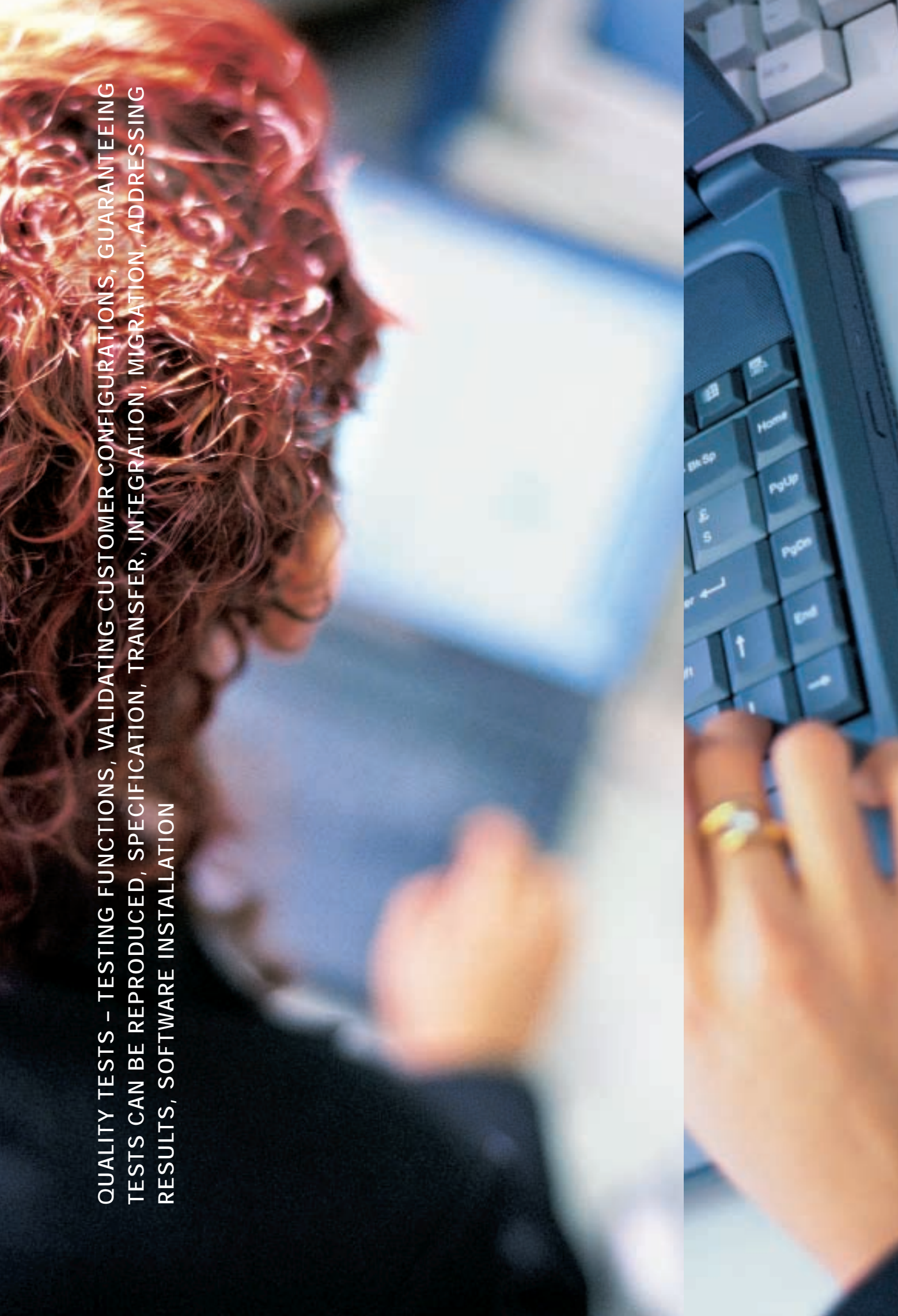
BROADBAND NETWORKS
NEW FIELDS
FOR DEVELOPMENT

With the convergence of television and the Internet, the technologies developed for pay TV interest other content suppliers and aggregators such as telecom network operators, communications groups, entertainment businesses etc.

Aside from the broadcasting of a greatly increased number of channels, this situation involves the development of a mass market for services such as video on demand, on-line music and games, Internet navigation, e-mail, e-commerce, e-banking, TV program guides etc.

Consumer demand is becoming more complex, requiring more speed, more content and more interactivity.

The problem of security on a large scale has been one to which Kudelski has dedicated its savoir-faire for more than a decade. Few companies can compare with the Kudelski Group for experience in the distribution of secure content to millions of subscribers.

Tried and tested over a number of years, security technology developed for conditional access television can easily be transposed into the world of broadband Internet.

This opens up a vast range of opportunities for the Kudelski Group as security requirements for the transmission of high value added digital content are on a par with the massive scale on which they are distributed over broadband networks.

MARKET TRENDS

– Greater speed of access to Internet networks: from 56k modems to xDSL, cable modems, fiber optics, FTTH (Fiber-To-The-Home), etc.
– Additional content: from audio-video content to multimedia content (TV, radio, MP3, games, software, HTML pages etc.)
– Increased interactivity: from TV and radio programs to multimedia on demand
– A single IP standard: convergence of video, audio and data streams over a single standard: IP (Internet Protocol)

KUDELSKI
AND DIGITAL SECURITY

APPLICATIONS

NETWORK OPERATOR

OPERATING PLATFORM

CONTINUOUS STREAMS
- Digital TV and radio channels
- HTML content
- Stock market listings
- Intranet, etc.

STREAMING ENCRYPTION

ON-DEMAND CONTENT
- Video (films, VOD)
- Audio
- Games
- Software
- HTML data or any MOD
  (Multimedia On Demand) application

PRE-ENCRYPTION

DISTRIBUTION

LOCAL SERVERS

LOCAL SERVERS

LOCAL SERVERS
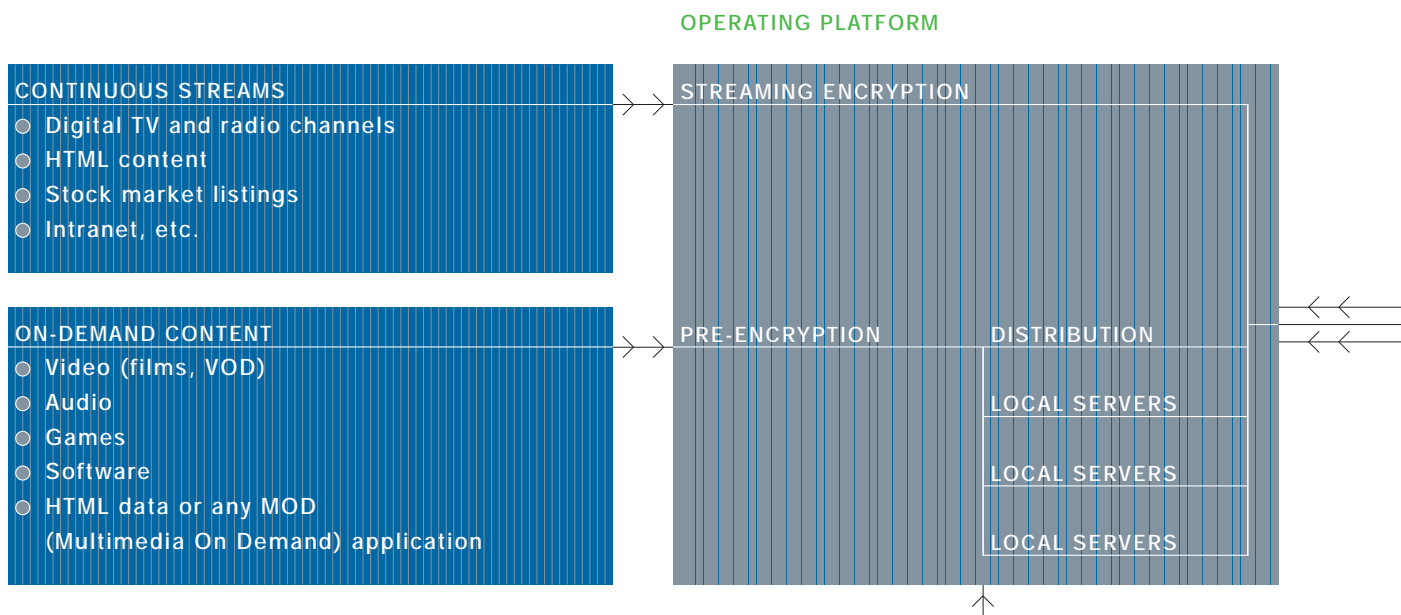
NAGRAVISION SOLUTIONS

SECURE ACCESS TO INFORMATION
- CAS (Conditional Access System)
- SMART CARDS

CONTENT/SUBSCRIBER MANAGEMENT
- IMS (Information Management System)
- SMS (Subscriber Management System)

BROADCASTING MANAGEMENT
- TSS (Traffic & Scheduling System)

INTERACTIVITY MANAGEMENT
- interactive solutions
- E-t-m-commerce
- IP network security

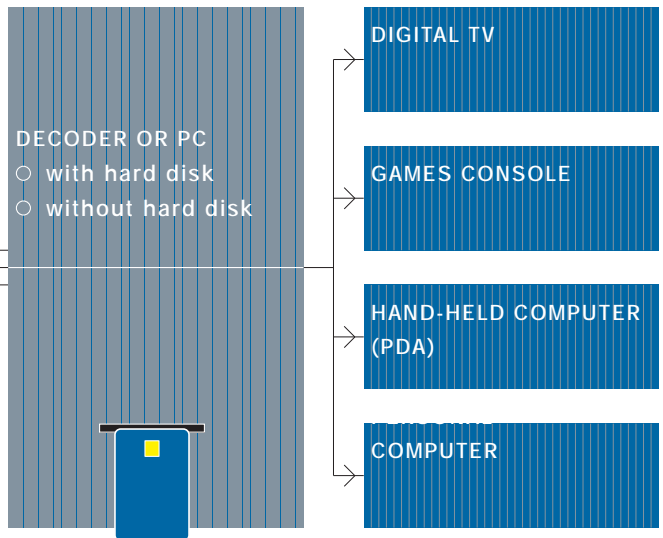GLOBAL "TURNKEY" SOLUTIONS
- integration of complete systems

END USER

BROADBAND IP NETWORKS

- cable
- xDSL line
- fiber optics
- satellite
- MMDS
- hertzian channels

HOME GATEWAY

DECODER OR PC
○ with hard disk
○ without hard disk

DIGITAL TV

GAMES CONSOLE

HAND-HELD COMPUTER
(PDA)

COMPUTER

WHICH TYPES OF
BROADBAND NETWORK?

Competitors are numerous in the field of broadband networks: cable network operators, telecommunications and mobile phone businesses and even electricity companies.

There is a similarly broad range of solutions, with ever faster data streams. Speeds exceeding 1 Mbps (megabyte per second) are required to achieve a smooth transmission of images (for the purposes of comparison: 0.056 Mbps for a standard telephone line with an analog modem versus 0.128 Mbps for an ISDN line).

FROM THE DECODER TO THE HOME GATEWAY

With the advent of "multimedia on demand", the decoder will need to provide a considerably wider range of functions. Taking on the form of a true home computer, it will become a digital pathway which, when linked to the broadband network, will simultaneously fulfill the functions of a modem, a decryption device, a tuner, a microprocessor, a payment terminal and a storage unit (it has a hard disk). All interactive terminals will be connected to it, forming a home network: TV set, telephone equipment, games consoles, home automation equipment and remote monitoring etc.

Like traditional decoders, the home gateway will be coupled with a smart card providing not just access control but security for interactive transactions: on-line shopping, e-banking operations etc. Moreover this card will offer a universal facility: it will be possible to use it on other terminals outside the home.

INTERACTIVE BROADBAND NETWORKS

NAME	TYPE OF CONNECTION	SPEED (*)	OUTWARD CHANNEL Mbps (*)	RETURN CHANNEL Mbps (*)
CABLE MODEM	A hybrid fiber/coax (HFC) or all-coax cable communications network – a solution well established in many markets	Very fast	100	10
FTTH – FTTB Fiber To The Home / To The Building	Solutions based on fiber optic lines, increasingly used in telephony	Very fast	100	100
SATELLITE	RF (Radio Frequency)	Very fast	45	0.4
XDSL (the "x" prefix refers to the different versions of DSL technology: ADSL, VDSL, etc.).	Solutions for copper telephone lines	Fast	from 0.256 to 2	0.256
UMTS Universal Mobile Telecommunications System	Solution linked to mobile access: hertzian channel	Fast	2	2
PLC Power Line Communication	Use of electricity lines onto which the digital signal is superimposed. This technology is still in its infancy but shows signs of promise	Fast	1	1
ISDN Integrated Services Digital Network	Solution for copper telephone lines	Slow	0.128	0.128
GPRS General Packet Radio Service	Solution linked to mobile access: hertzian channel	Slow	0.128	0.128
GSM Global System for Mobile communication	Solution linked to mobile access: hertzian channel	Very slow	0.096	0.096

NON INTERACTIVE BROADBAND NETWORKS

NAME	TYPE OF CONNECTION	SPEED (*)	OUTWARD CHANNEL Mbps (*)
MMDS Microwave Multipoint Distribution System	Solutions using very high frequency hertzian channel	Very fast	45
LMDS Local Multipoint Distribution System	Solutions using very high frequency hertzian channel	Very fast	45

(*) Indicative values

NEW SECURITY ISSUES

FROM BROADCAST TO BROADBAND

Traditional transmission networks (broadcasts) are well-suited to the distribution of continuous audio-visual streams, particularly in the context of television. However this means of distribution is less suited to operating interactive applications.

At present we are seeing the establishment of broadband networks, particularly those using the IP norm, which allow for the high-speed transmission of high value-added interactive multimedia content.

Numerous applications are covered by this technology: television on PC, video on demand or multimedia on demand over the Internet, distance learning, business TV, etc.

The increased opportunities offered by broadband brings with them a new form of behaviour among consumers: while before they sat passively in front of their TV sets, they are now taking on an active (and even "interactive") role. They are demanding access to a wider range of content and expect to benefit from a greater level of freedom: this in turn is stimulating a growing interest in on-demand services.

GUARANTEED SECURITY AT EVERY LINK IN THE CHAIN

The issue of security for multimedia transmissions is of a very specific nature when it comes to IP networks.

In the case of broadcast networks, the same content (television programs) is distributed in an identical fashion to everyone. The audio-visual content, traveling over an MPEG2 stream, is encrypted at the very moment when it is broadcast. The decoder and smart card ensure that the signal is unscrambled by subscribers only. In this context, the principal cause for concern on the part of operators relates to the prevention of illegal decryption.

For a broadband network in contrast – and especially where this relates to video on demand – content suppliers require a greater degree of protection so as to ensure that the data (films for VOD, multimedia content) is not received, copied and redistributed illegally. In this context, in addition to the concern over illegal decryption there is another relating to the prevention of illegal copying, so as to guarantee copyright protection.

NAGRAVISION: THE SOLUTIONS

PRE-ENCRYPTION TO GUARANTEE BETTER COPYRIGHT PROTECTION

In order to respond to the concerns of operators, over the year 2000 Nagravision developed digital pre-encryption technology to be located at the very top of the transport chain (e.g. with the film producer).

Thanks to this technology, content remains encrypted from the moment of its creation until it is used. Furthermore, the fact that it is stored in encrypted form on the hard disk of the user's decoder forestalls the distribution of illegal copies: only a subscriber who has paid to receive a film, for example, will be able to watch it using his decoder in tandem with a smart card containing the decoding keys.

In this way Nagravision is offering a response to the question of copyright protection.

Pre-encryption has been used in particular in connection with the Nagravision security solution developed for VOD. It can be used for all multimedia on demand content sold via an IP (broadband) or DVB (broadcast) network.

FINGERPRINTING AND WATERMARKING: ADDITIONAL PROTECTION

Additional measures can be taken for copyright protection purposes:
– fingerprinting, which involves placing a physical mark on the content (e.g. insertion of a number)
– watermarking, a digital watermark formed using lines of code that are undetectable to potential hackers, but that can be distinguished by the copyright owner.

These two techniques are at the research stage at Nagravision.

In parallel to these developments, Nagravision is continuing the efforts it has made over the last two years to refine its IP encryption technology.
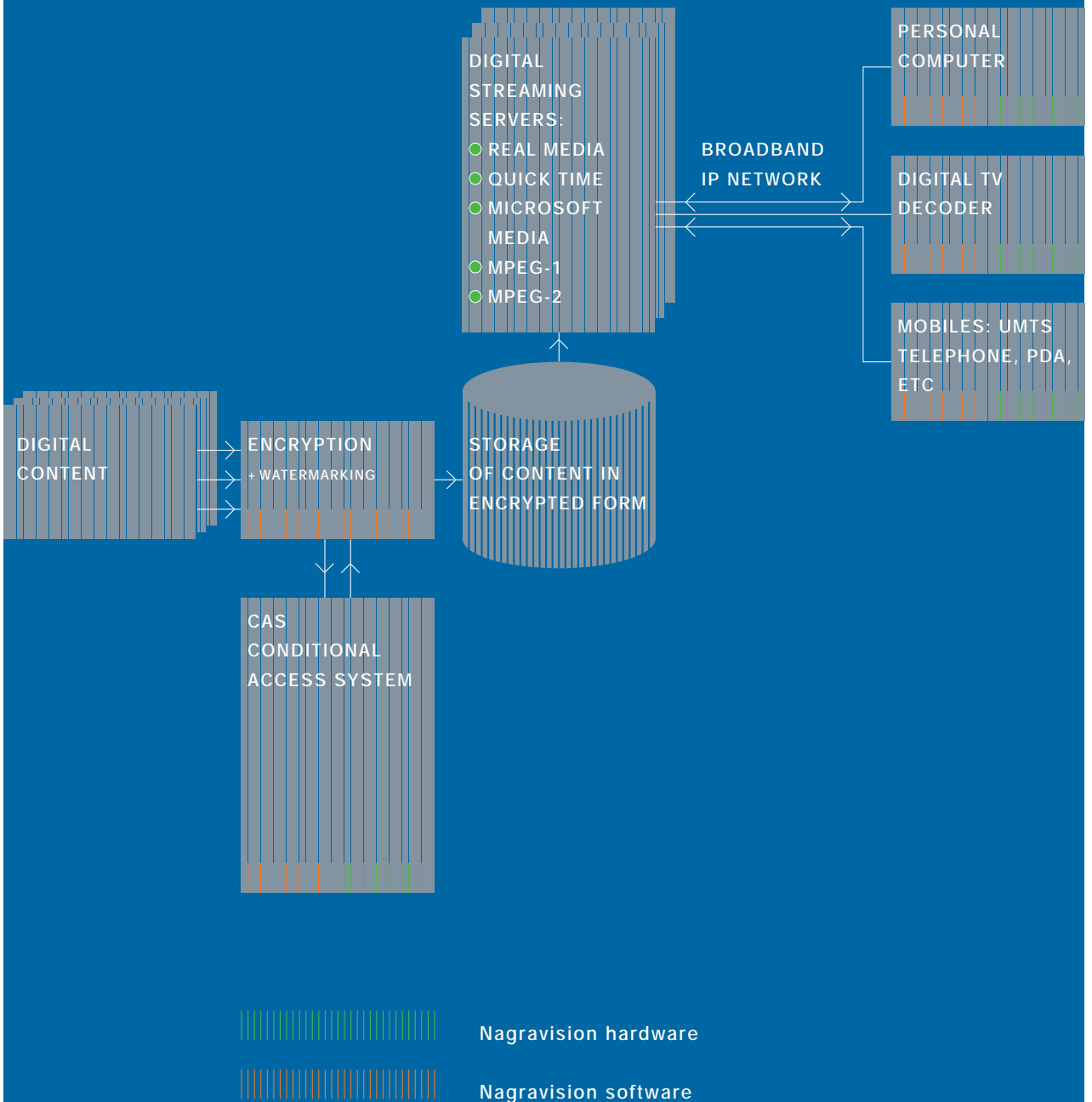
FROM CAS TO DRM – DIGITAL RIGHTS MANAGEMENT

DRM is an extension of the conditional access system (CAS) designed for broadband networks.

Just like the CAS, it allows the user the right of access to a given content by means of a very specific terminal (their decoder). In addition, however, DRM controls the distribution of this content over networks. Thus, by obtaining licences, the subscriber – who now becomes a distributor – could for example transmit data received to other users.

Nagravision is working to develop a DRM product based on the proven technology used in its CAS products.

MULTIMEDIA ON DEMAND
PRE-ENCRYPTION

DIGITAL
STREAMING
SERVERS:
○ REAL MEDIA
○ QUICK TIME
○ MICROSOFT
  MEDIA
○ MPEG-1
○ MPEG-2

BROADBAND
IP NETWORK

PERSONAL
COMPUTER

DIGITAL TV
DECODER

MOBILES: UMTS
TELEPHONE, PDA,
ETC

DIGITAL
CONTENT

ENCRYPTION
+ WATERMARKING

STORAGE
OF CONTENT IN
ENCRYPTED FORM

CAS
CONDITIONAL
ACCESS SYSTEM

Nagravision hardware

Nagravision software

MULTIMEDIA ON DEMAND
STREAMING ENCRYPTION

LIVE DIGITAL
CONTENT

DIGITAL
STREAMING
SERVERS :
○ REAL MEDIA
○ QUICK TIME
○ MICROSOFT
   MEDIA
○ MPEG-1
○ MPEG-2

STREAMING
ENCRYPTION

BROADBAND
IP NETWORK

PERSONAL
COMPUTER

DIGITAL TV
DECODER

MOBILES: UMTS
TELEPHONE, PDA,
ETC

CAS
CONDITIONAL
ACCESS SYSTEM
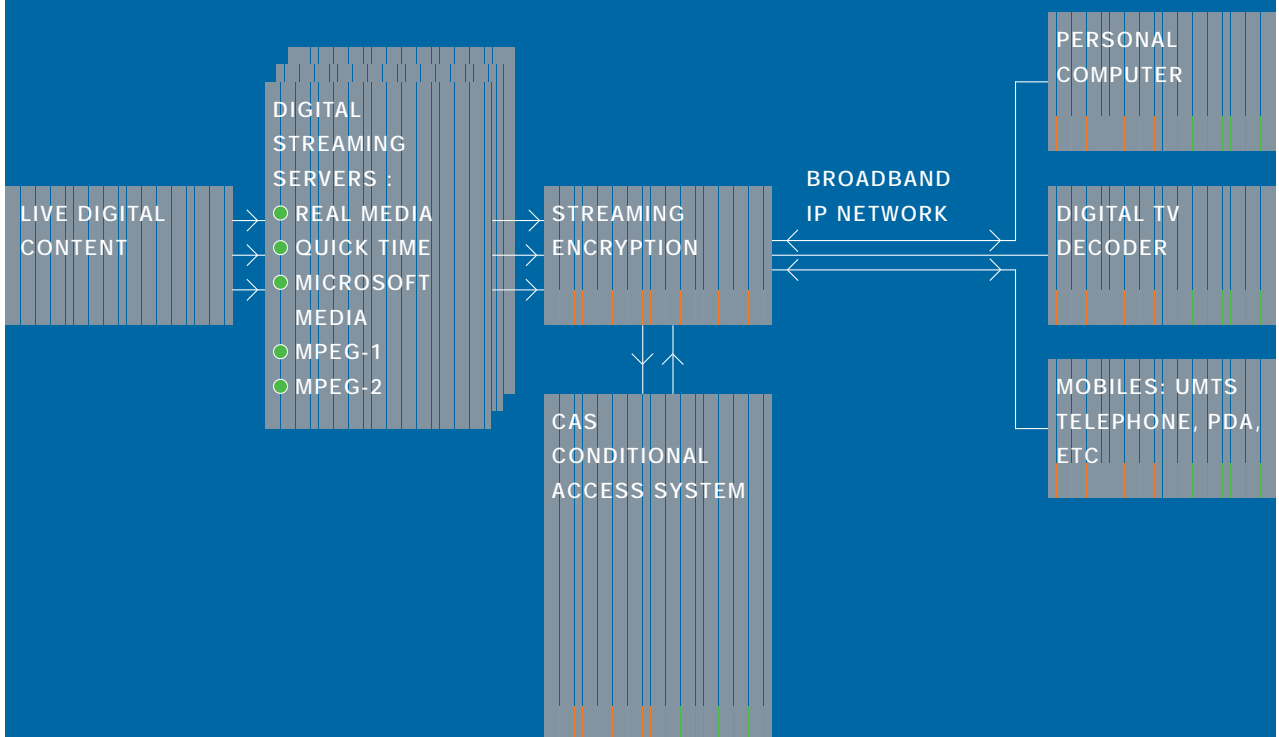
Nagravision hardware

Nagravision software

NEW SOLUTIONS – BEING WATCHFUL, ANALYZING THE MARKET, IDENTIFYING INNOVATIONS, APPRAISING ADDED VALUE, DEFINING THE PROCESS SEQUENCE CLEARLY, FOCUSING ON THE TARGET, CREATING INNOVATION AND SURPASSING ONESELF IN IMPLEMENTATION, PRESENTING AND IMPLEMENTING SOLUTIONS, OPTIMIZING THE RE-USE OF ACQUIRED KNOW-HOW

DECODERS – DEVELOPING MODULES, INTEGRATING CONDITIONAL ACCESS, TESTING THE DECODERS, MANAGING PROJECTS, ANALYZING PROBLEMS, DEVELOPING THE USER INTERFACES OF TOMORROW, IMPROVING THE TELEVISION EXPERIENCE OF TELEVISION VIEWERS, PERSONALIZING USER INTERFACES

SMART CARDS
DIVERSIFICATION OF
A PROVEN TECHNOLOGY

Within the field of pay TV itself, the smart card has developed extremely rapidly. From a simple access key opening and closing the lock of the decoder, it has become the central element in an intelligent communication system, responsible among other things for user identification and authentication, signal decryption, provision of security for transactions, and the exchanging and storing of data.

These functions, which enable interactivity of digital TV, are the same as those that have allowed the Kudelski Group to design innovative security solutions in new activity sectors.

Three major fields can be identified today: e-commerce, which is linked more and more to interactive TV, physical access control systems and systems based upon secure databases.

VIGOROUS EXPANSION IN THE SMART CARD MARKET
The explosion in interactive transactions of every sort is rendering more and more necessary the use of smart card-based security solutions.

Growth of 28% per annum in this market is forecast over the next four years, meaning that the number of units distributed worldwide will exceed 5,000 million.

PHYSICAL ACCESS CONTROL SYSTEMS

Kudelski smart cards are also revolutionising the approach to security where this involves controlling individual access to facilities ranging from official buildings to cinemas, and conference halls to ski-lift installations.

Representing so much more than simply a tool for controlling who comes in or goes out, the Kudelski smart card is at the heart of an access management system that interfaces with the intercommunicative functions that make the system so powerful.

Hands-free access control, decentralized processing of photos and identity checks thanks to computerized photos displayed at the control are just a few examples of the services that the Kudelski smart card can provide.

Other features include the high-powered calculation capability that the system offers for data processing and the evolutional nature of the product which can be continuously adapted to meet the needs of operators.

E-T-M-COMMERCE: A MAJOR PRIZE OF CONVERGENCE

Given the massive economic stakes involved, e-commerce is the field around which, in recent years, security issues have taken on the greatest importance. Fraud already takes place on an astonishing scale – estimated at more than 3 000 million dollars per annum.

Among the various approaches put forward, the Kudelski smart card is today considered to be one of the most convincing solutions due both to the high level of security it provides and to the other technical and marketing functions that it offers, functions that have already transformed the way in which interactive TV is perceived today.

With this card, Kudelski offers a universal approach to transactions, as the same card can be used on terminals as different as the TV decoder, the PC or even the mobile phone.

Here again convergence is breaking down frontiers: after e-commerce, we now have the era of t-commerce (TV receivers) and m-commerce (mobile phones).

In order to meet these new requirements, the technology contained within the Kudelski smart card can take different forms and be adapted to different media. It can, for example, be equipped with a USB connection and interface, bypassing the need to add card readers to PCs. The chip itself can also be integrated directly within systems and be subject to remote upgrading over the IP network.

THE FUNCTIONS WHICH ENABLE INTERACTIVITY OF DIGITAL TV ARE THE SAME AS THOSE THAT HAVE ALLOWED THE KUDELSKI GROUP TO DESIGN INNOVATIVE SECURITY SOLUTIONS IN NEW ACTIVITY SECTORS

TICKETING AND ACCESS CONTROL FOR LEISURE FACILITIES
MOVIE CARDS
This was the first application that the Kudelski Group developed outside the realm of pay TV. Introduced in 1997, it has allowed the Swiss cinema chain, Métrociné, to offer subscription access cards equipped with marketing functions aimed at winning customer loyalty: advance booking options to avoid queuing, awarding of bonus points etc. The system has millions of transactions to its credit.

SPORTACCESS KUDELSKI CARDS
Ski resorts are a good example of one area in which a contactless smart card access control system has been turned to excellent account.

The hands-free video-controlled SportAccess Kudelski system has brought the skier genuine convenience and has contributed to a smoother flow of individuals through control gateways. It has also demonstrated its reliability in particularly difficult conditions of use (cold, damp etc.)

Thanks to the wide range of functions that it may include and to the flexibility in subscription design that it offers, this technology has opened up new commercial opportunities. In particular it has stimulated the creation of products such as the multi-resort card or the "tourist passport" allowing access, within a region, to a whole spectrum of leisure facilities.

SportAccess Kudelski systems are used by than 650 customers in Europe and worldwide.

PHYSICAL SECURITY AT EVENTS
WORLD ECONOMIC FORUM

Major events represent another field within which
NagraCard physical access control technology has
staked a claim to be a product that both guarantees a
high level of security and promotes effective organization.

The World Economic Forum, which each year brings
together in Davos a whole range of world figures, has
entrusted the security of its physical access system to
NagraCard technology since 1999.

NagraCard badge cards function without physical con-
tact with the reader. They allow participants to be identi-
fied, contain various information about the cardholder
and their status (guest, press, staff etc.) and manage the
validity of the authorizations as well as the level of
access granted.

New functions were introduced for the January 2001
edition, including the storage on the badge of rights of
access to different sessions. This facilitates the move-
ments of participants (no more presentation of tickets)
and alleviates the burden upon the organizers.

REPRESENTING SO MUCH MORE THAN SIMPLY A TOOL FOR CON-
TROLLING WHO COMES IN OR GOES OUT, THE KUDELSKI SMART
CARD IS AT THE HEART OF AN ACCESS MANAGEMENT SYSTEM
THAT INTERFACES WITH THE INTERCOMMUNICATIVE FUNCTIONS
THAT MAKE THE SYSTEM SO POWERFUL

UNITED NATIONS – GENEVA 2000 CONFERENCE

NagraCard provided a security management service
(accreditations, badges, network etc.) for this interna-
tional conference dedicated to world social development.
14 000 people took part.

SALON INTERNATIONAL DE LA HAUTE HORLOGERIE 2001 (INTERNATIONAL FINE WATCHMAKING EXHIBITION 2001) IN GENEVA

This trade fair, an invitation-only event, brings together
firms that are the leading names in Haute Horlogerie. It
attracts some 10 000 individuals, buyers and profes-
sionals. Once again the performance levels and reliability
of NagraCard solutions have convinced the organizers.

INSTITUTIONS AND GOVERNMENT BODIES
UNIVERSITY CARD

At the end of the year 2000, Neuchâtel University in
Switzerland opted for a NagraCard system to replace its
traditional student identity cards.

Aside from its role as an identity card, the new smart
card has also been designed to operate as a recharge-
able electronic purse allowing payment to be made, for
example, for photocopies and printing carried out on
self-service machines distributed across the campus.

A barcode featured on the card also allows the bearer to
borrow items from any library forming part of the regional
network.

During phase two, the university plans to extend the use
of the card to cover the secure control of access to
buildings and I.T. equipment.

SYSTEMS USING RELATIONAL DATABASES

Given the proliferation in computerized administrative and commercial databases which are moreover universally accessible over networks, individuals are becoming ever more concerned to protect their private lives.

Every individual wishes to benefit from this development in order to simplify his or her life while also retaining complete control over personal data.

This is a field in which security issues relate not only to problems of identification upon access (who has the right to access a database) but also to problems of control over levels of access (who has the right to see what).

Complicating matters still further, it must be possible for certain databases to be held on an anonymous basis, as for instance is the case with distance voting systems (e-voting): where such a process applies, the authorities must be in a position to authenticate the identity of individual voters and calculate voting results, without however being able to make any connection between the individual voter and how they have voted.

Kudelski has developed a new concept in secure relational databases that ensures content protection at the level of the server on which it is stored. Thus, even if someone is capable of accessing the database, they will be unable to make use of the information it contains unless they possess the "open sesame", the Kudelski smart card.

WHAT IS A RELATIONAL DATABASE?

In a relational database, information is organized according to criteria that are laid down in advance and that are brought together when a search is made. This allows direct access to data as if you are dealing with items on the index of a vast library.

This deductive approach increases the intelligence of the system, in comparison with databases of the hierarchical or "network type", which simply lead you "passively" to one or other item of information via a series of links in a chain.

GIVEN THE PROLIFERATION IN COMPUTERIZED ADMINISTRATIVE AND COMMERCIAL DATABASES WHICH ARE MOREOVER UNIVERSALLY ACCESSIBLE OVER NETWORKS, **INDIVIDUALS ARE BECOMING EVER MORE CONCERNED TO PROTECT THEIR PRIVATE LIVES**

E-GOVERNMENT

By taking a holding, in late 2000, in the company Polirights, the Kudelski Group is creating the potential for its work in the field of security to serve the needs of the cyber-governments that are starting to be set up.

E-voting, as described above, is a service that is currently attracting a lot of attention at state level. However the demand also covers numerous other applications: administrative procedures (public records offices, tax declarations, driving licences, military service, school registrations etc.), transactions linked, for example, to the payment of taxes, censuses etc.

The Polirights solution comes within the scope of the media convergence process between Internet, television and mobile phone and thus allows official bodies to achieve greater proximity to the public and to offer them personalized, interactive services.

Over the coming years we can anticipate the advent of citizen cards that can be used on PCs, decoders and mobile phones.

HEALTH CARD

The latest development in Kudelski smart cards, the personalized health card gives the cardholders exclusive control over data from their file. It is the key that confirms a patient's identity and allows him or her to attain secure access to personal data remotely.

Combined with the new secure relational database concept, the card offers complete protection of confidentiality in respect of the cardholder's personal details. These are stored in the database in an anonymous manner and in a partial form and their complete structure is only obtained when accessed in combination with the smart card.

The patient exercizes control over the use of this card by means of "virtual locks" that are released according to the nature of the party to which the file is sent: doctor, health insurance service, chemist etc. In this way each party only accesses those aspects of the file that concern them.

Not only does the health card provide better protection of an individual's private details but it also offers greater reliability when transmitting information.

The company e-prica SA, created by Kudelski and the Swiss pharmaceutical group Galenica as equal partners in early 2001, is in charge of development work in this field.

MANAGEMENT OF ACCESS AUTHORIZATION – MANAGEMENT OF SUBSCRIBER ACCESS AUTHORIZATION, ENSURING COHERENCE OF RIGHTS GRANTED, COLLECTING IMPULSE PURCHASES, MAINTAINING A HISTORICAL RECORD OF TRANSACTIONS, DEVELOPMENT OF UPGRADEABLE SYSTEMS

CUSTOMER SUPPORT – INTEGRATING AND IMPLEMENTING ACCESS AUTHORIZATION SYSTEMS, FAST AND VERY FAST REACTION, ELABORATING SOLUTIONS FOR THE PREVENTION OF POTENTIAL PROBLEMS, OBSERVING BEHAVIOR AND DIAGNOSING FAULTS, TRAVELLING FIVE CONTINENTS IN LESS THAN 80 DAYS

NAGRA AUDIO
A STIMULATING ENVIRONMENT

DYNAMIC OF EXPANSION CONFIRMED

New markets, new applications, new products and new marketing activities; adding to that changes in internal organization and the transfer of the sales and marketing team to the new building acquired by the Group two years ago; the year 2000 has confirmed the vigor of Nagra Audio that was experienced in 1999.

Now working together in extremely well-equipped premises that offer an ideal degree of proximity to the production, after-sales and logistics sections, the Nagra Audio teams are perfectly placed to serve customers with maximum efficiency.

A RICH VEIN OF SUCCESS

Sales of the Nagra-DII recorder continued to thrive. This recorder has rapidly forged itself a reputation for excellence among users also within new application fields outside the traditional cinema market.

Towards the end of the year 2000, the scale of the success of the ARES range of recorders led to temporary stock shortages. The new handheld Nagra ARES-P and RCX220 versions, in particular, have been very much in demand.

As regards hi-fi products, the introduction of the new Nagra PL-L preamplifier, which now enjoys distribution extended to cover new geographical markets, won the admiration of specialists and audiophiles throughout the world. This equipment has won several prestigious awards.

Collaboration between Nagra Audio and the Montreux Jazz Festival in Switzerland started in 2000 with several high-quality recordings being made on the Nagra-DII, including of the Montreux Jazz Solo Piano competition. This partnership will be even more itensified in 2001 by Nagra entering as one of the official sponsors of the festival.

EXPANDING
THE PROFESSIONAL
PRODUCT RANGE

A CONCENTRATE OF HIGH TECHNOLOGY: NEW ARES HANDHELD RECORDERS

The year 2000 was marked by the launch of two new audio-digital pocket-sized recorders: the ARES-P and the RCX220.

This equipment, which weighs less than 500 grams and can be held in the palm of the hand, has been developed to meet the needs of radio reporters. These tapeless recorders store up to three hours recording time in a detachable flash memory, which can then be inserted into equipment used for editing, such as the Nagra ARES-C or Nagra ARES C-PP.

In contrast to the ARES P, the RCX220 version incorporates an additional USB port for the direct transfer of digital files to PC or laptop.

As with all other machines in the Nagra range, ARES-P recorders are designed to operate with absolute reliability even under the strictest environmental conditions. Their high-quality sound, simplicity of use and rugged construction are in line with the uncompromisingly high standards that the company has set itself in the field of professional audio equipment since the day it was created.

Still five years after its market introduction, sales of the ARES-C recorder once again increased substantially. This confirms the fact that the ARES-C is the reference recorder for journalists in many radio stations in Europe.

The recent launch of the ARES-P and RCX220 allowed the company to strengthen its overall product range in the radio applications segment, which had the effect of stimulating sales of all recorders in the ARES range.

THEIR HIGH QUALITY SOUND, SIMPLICITY OF USE AND RUGGED CONSTRUCTION ARE IN LINE WITH THE UNCOMPROMISINGLY HIGH STANDARDS THAT THE COMPANY HAS SET ITSELF IN THE FIELD OF PROFESSIONAL AUDIO EQUIPMENT SINCE THE DAY IT WAS CREATED

THE NAGRA-DII AUDIO-DIGITAL RECORDER: FAVORITE OF FILM MAKERS

Although it took place in 1999, it was over the course of the year 2000 that the launch of the Nagra-DII audio-digital recorder really had an impact in cinema and music circles. Sales are up 20% in comparison with the previous financial year.

The North American cinema industry was its leading market, accounting for more than half the annual sales. The traditional qualities of Nagra equipment – reliability, manufacturing quality and performance levels – explain the consistent success of the recorder in cinema applications.

In particular, the Nagra-DII has been used in many major productions, such as "The Patriot" with Mel Gibson and "Autumn in New York" starring Richard Gere.

An interesting new market for the Nagra-DII was also identified during 2000, that of instrumentation (measurement of noise and vibrations). Nagra Audio had not been active in this field since the famous Nagra SJ and TI machines back in the 1980s. A number of sales of the Nagra-DII have been achieved in this market. The automobile and aeronautical industries have also opted for a slightly modified Nagra-DII for measurement purposes. The multiple channel concept, the excellent extended frequency response and the portability were the principal reasons for choosing the machine.

The growing interest in high bit rate recording and the adoption of the 96kHz sampling frequency by the professional and consumer audio industries are two factors contributing to the continuing success of the Nagra-DII, despite the trend towards computer-based audio technologies.

NAGRA HI-FI:
FOR THE BEAUTY OF MUSIC

In the high-fidelity field, the notion of quality extends well beyond mere technical matters. Because the real challenge we face is emotional in nature: it involves reproducing music in its entirety and, above all, communicating all the life and emotion that it contains.

Nagra hi-fi equipment is designed much as an instrument maker creates a violin: through the use of the finest materials, complete mastery of craft and style, and the quest for perfect sound quality.

The Nagra range now comprises four of the models that are rated most highly by music lovers:
– the battery-powered PL-P preamplifier (version without phono stage launched in January 2001 under the name PL-L). Named as the "Best purist preamplifier" in the Best of the Best chart produced by the prestigious Robb Report
– the VPA amplifier, which combines the most sophisticated technology with the irreplaceable magic of vacuum tubes. Judged "Best all-tube medium power amplifier" by the Audio Art magazine
– the MPA modular-design transistor amplifier. Received the celebrated COTY (Component of the Year) Award in Japan
– the SNST-R miniature recorder, a true technological gem specially designed for high-quality musical recordings

The success achieved by this range of equipment encouraged Nagra Audio to continue expanding its international distribution network in 2000.

"FROM BEGINNING TO END, THE MUSIC IS ALL YOU HEAR; YOU ARE WITHIN IT AND IT IS WITHIN YOU. PERHAPS IT IS BECAUSE THE MUSIC FINDS THAT SPECIAL PLACE WHERE BODY MEETS SOUL"

Nagra PL-P
preamplifier

Nagra VPA
amplifier

Nagra-DII
recorder

Nagra ARES-P
recorder

NAGRA AUDIO – MARKET EXPLORATION, ADVISING CUSTOMERS, GENERATING ENTHUSIASM AND MOTIVATION OF SALES FORCE, SELLING, MAKING OFFERS, TAKING ORDERS, PRESENTING AND PROMOTING OUR PRODUCTS, PERSUASION, LISTENING TO THE CUSTOMER, TRAINING THEM, MARKET RESEARCH, DISCOVERING NEW APPLICATIONS, PROVIDING NEW IDEAS
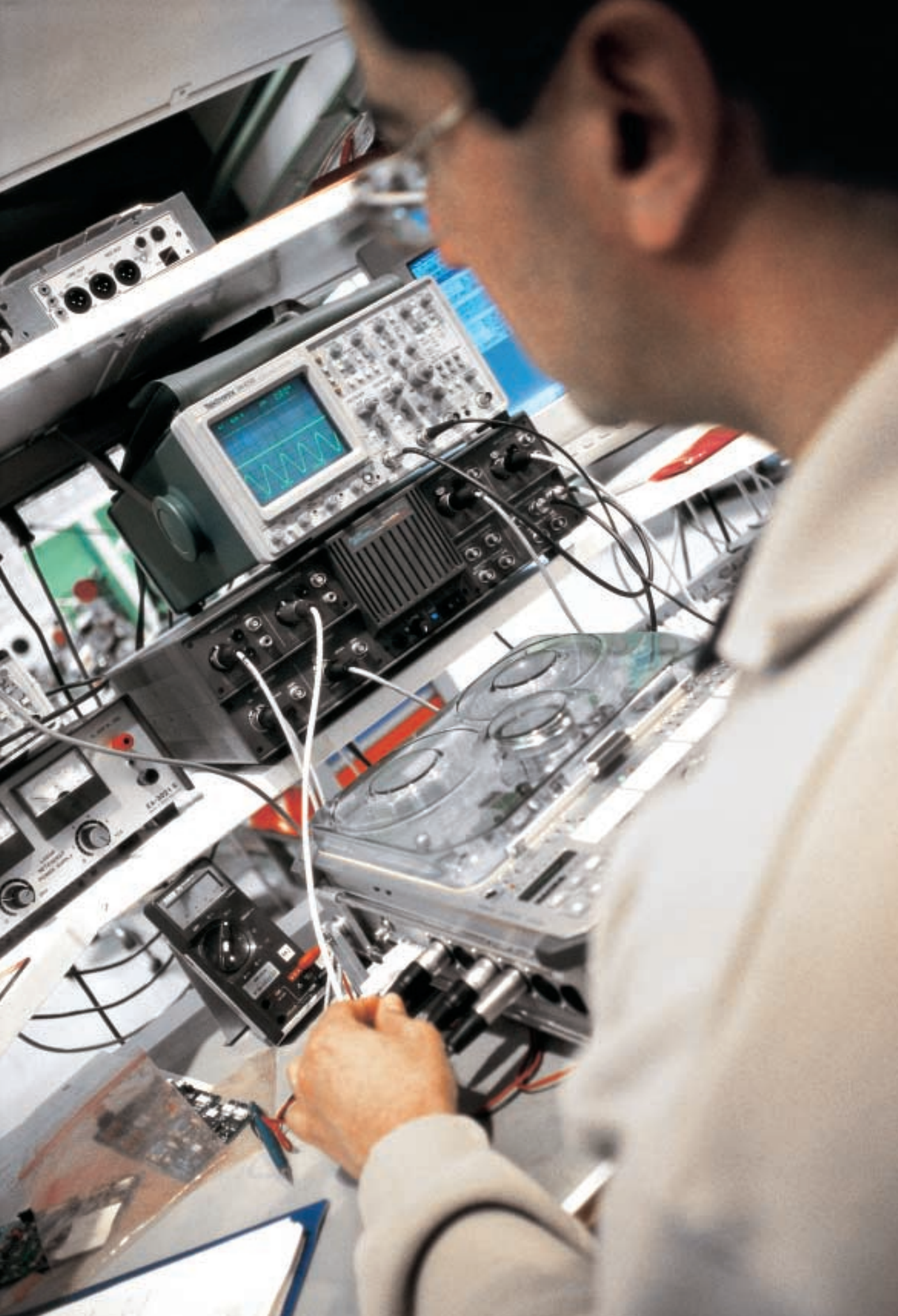
AUDIO R&D – ANTICIPATING THE PRODUCTS OF THE FUTURE, GIVING CONCRETE EXPRESSION TO IDEAS, DESIGNING PROTOTYPES, PREPARING FOR PRODUCTION, FUNCTIONAL OPTIMIZATION, ACOUSTIC ANALYSIS, CHECKING OF FEATURES, RADIATION MEASUREMENT

HISTORICAL BACKGROUND

1951 Birth of the first portable recorder, the Nagra I.

1959 Release of the Nagra III.

1965 First Nagra SN (Série Noire) miniature device.

1984 First Nagra VPR-5 video recorder.

1986 The company is listed on the stock market.

1989 Canal+ adopts Kudelski's access control system for pay television.

1991 André Kudelski succeeds Stefan Kudelski.
First million analog decoders sold.
The company concentrates its activities on conditional access television.

1992 Creation of Nagra+, a joint venture between Kudelski SA and Canal+.
Launch of the Nagra-D, the first portable digital recorder.

1995 First order (from EchoStar) for a Nagravision digital system, marking the arrival of Nagravision on the North American market.

1996 85% of sales are achieved in the pay TV sector.

1997 Nagravision (digital systems) breaks through in Europe.
Digital pay television becomes the company's core business sector.

1998 Nagravision conquers the British cable market.
Creation of NagraStar, a joint venture with EchoStar, and of NagraCard.
First systems offering mixed pay television/Internet solutions

1999 Against a background of convergence between television and other digital content, the Kudelski Group creates the first broadband network encryption systems.
Creation of MediaCrypt and investment in Nagra ID.
The company becomes a holding company.

2000 Kudelski stock listed on the SMI (Swiss Market Index) and on the MSCI (Morgan Stanley Capital International) Index.
Investment in SportAccess (ticketing) and in Polirights (electronic voting and cyber-administration).
The Group continues to expand in the field of secure distribution of digital content over broadband networks.

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