



www.semiconductors.philips.com/markets/identification/customer/download/

Philips Semiconductors

Given Philips' increased visibility in the Smart Card world their website was somewhat disappointing in the way it managed to hide their activities in this area. After a bit of persistence, the Smart Card products were located in the 'identification' area, which their search engine failed to point out. The coverage was somewhat superficial until you find the hidden 'downloads' page. And then, 'Eureka!', it was all there. Why do companies make their web sites so hard to navigate? In terms of appearance, tidy but bland.

Navigation
Content
Appearance



www.hitachi-eu.com/hel/ecg/products/smartcard/

Hitachi Europe

The mistake here was to start with 'www.hitachi.com', the reference to Smart Cards on the front page was misleading (don't bother to download the brochure) because all trails soon came to an end. However, a little inspiration and starting again with 'www.hitachi-eu.com' and things started to change. Clearly Hitachi Europe is in charge of Smart Cards, the search engine on their site quickly led to the right area and at this point a good overview of Hitachi's Smart Card chip products with outline specifications were available. I wasn't quite sure why the page was labelled 'Flat Panel Displays -Glossary' but otherwise everything looked OK. From an appearance point of view nothing to get excited about but quietly tidy.

Navigation
Content
Appearance

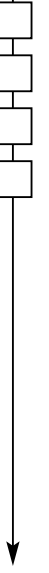


www.infineon.com/cgi/ecrm.dll/ecrm/scripts/prod_cat.jsp?oid=-8232

Infineon

Oh yes, this is a search engine that works once you spot the small button on the front page. Navigation here was a dream as well, everything appeared just as you might expect not as in the case of some other web sites where you hope, pray and get frustrated in that order. The content coverage was also high with overview specifications and application notes. I'm beginning to believe that semiconductor manufacturers have bare walls, from an appearance point of view there is no impact but from our point of view not vitally important so well done Infineon, this month's award winner.

Navigation
Content
Appearance





Macao Launches Smart Card ID Scheme

Siemens Consortium Awarded \$14m Contract

The former Portuguese territory of Macao is set to become the latest region to adopt a national Smart Card ID in a US\$14m (HK\$100m) deal to be managed by Siemens. Siemens has announced it will subcontract the work to a four-way consortium comprising Giesecke & Devrient (G&D), NEC, Bell ID and its local subsidiary, Siemens Ltda Macao.

A total of 540,000 inhabitants of the territory (which was returned to China in 1998) will eventually be issued with the card which is expected to comprise biometric identification, a digital signature function, a payment application and a driver's licence. The implementation is expected to last four years.

G&D has been contracted to supply the card body, the chip operating system and the basic applications such as the digital signature and biometrics features as well as the personalisation equipment and the data logistics functions. This will mean G&D will manage a package equivalent to 80% of the total solution worth around US\$11 million. According to the company, this is the first time anywhere that a genuinely multifunctional card is to be used as an ID.

Bell ID will contribute its ANDiS web-based Smart Card management system which features integrated PKI facilities, post issuance application downloading, authorisation control and key management. NEC will provide the Automated Fingerprint Inspection System (AFIS) functionality.

Bell Group Chief executive Pat Curran said: "This is a positive announcement to be able to make at the start of the new year. The Macao project is a world's first and we are pleased that our capabilities are gaining increased recognition by organisations of the calibre of those in the consortium."

The card, which will feature a Infineon chip with 32kb EEPROM and a 16 bit Crypto Controller, will initially be used for e-government purposes with driver's license, e-purse and other functionality expected to be phased in over time.



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Don't Forget!

Our Website containing daily News On-Line, and information about the full range of SCN services, can be found at the following address: www.smartcardgroup.com





Gemplus JavaCard Milestone

Gemplus has shipped its 10 millionth Java Card technology-based GemXpresso Smart Card to the financial services market.

The company has invested heavily in JavaCard technology research and development and is involved with a number of cross-industry organisations to support and develop the JavaCard platform, such as the Java Card Forum, Liberty Alliance Project, GlobalPlatform and Open Card Consortium.

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Intellect Order in Holland

Intellect has won an \$1.2 million order for mobile and built-in terminals from CCV in The Netherlands. The new order will see Intellect supply CCV with its Sapphire mobile terminals which can operate on a GSM network or a DECT system.

The Sapphire systems are being used by the Dutch police for immediate collection of traffic fines; by mobile merchants for payments in the home; as well as for goods and services in restaurants, markets, sporting arenas and in various other situations.

The Intellect built-in payment terminals are being integrated into systems such as transport and parking ticket machines and vending machines installed throughout The Netherlands.

Contact

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CVS Orders Hypercom Terminals

Pharmacy company CVS Corporation is to install 4,000 Smart Card-enabled Hypercom ICE 6000 multi-function card payment terminals at 450 of its new drug stores in the first quarter of 2002 after initial field tests are completed.

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OTI Opens New Facilities in Israel

OTI's new US\$3.5 million development center at Rosh Pina, Israel, was officially opened by Israel's Prime Minister Ariel Sharon last month. The new building will support research and development, testing, and manufacture of the company's contactless Smart Card products.

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Checking on School Attendance

Parents of pupils at an English school can now check over the Internet their child's attendance at school, whether he or she ate lunch and how much was spent on their Smart Card. This innovation is part of a new multi-application Smart Card system installed at Turnford School in Hertfordshire by Fortress GB.

The system integrates e-purse, access control and time attendance applications and can store information such as name, class and access rights. Each month parents are invited to transfer funds to their child's School Lunch Account to pay for school meals.

Contact

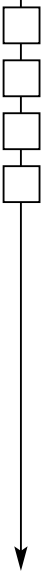
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Gemplus and STM Card Reader

Gemplus and STMicroelectronics have launched a single-chip USB Smart Card reader solution which will be integrated into the new version of Gemplus' GemCore Pro Solution for EMV-certified card readers. The chip, known as ST7SCR, has been designed and manufactured by STM, whilst Gemplus has developed the EMV firmware and software environment.

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CEPS Interoperability Success

Project Ducato - the first implementation of the Common Electronic Purse Specifications (CEPS) - has been declared a success. The project brought together Banksys, Groupement des Cartes Bancaires "CB", Europay International, Interpay Nederland, Proton World, Sermepa, Sistema 4B and Visa International to demonstrate international interoperability of different CEPS-based e-purse technologies.

CEPS standardises the underlying technology for an interoperable electronic purse system and therefore reduces infrastructure costs.

The two CEPS-compatible Smart Card technologies used in the project were Sermepa's Advantis (applied by Sermepa and Groupement des Cartes Bancaires) and Proton World's Proton Prisma (applied by Banksys and Interpay).

Banksys and Interpay used C-ZAM/Smash terminals from Banksys for CEPS load and payment transactions.

CEPS is supported by organisations from over 30 countries, representing more than 90% of the world's electronic purse cards.

Datakey Teams With CA

Datakey has announced that its cryptographic Smart Card and interface software package for enterprises has been certified ca smart with eTrust PKI and eTrust Single Sign-On (SSO) - two industry-leading security solutions from Computer Associates International.

The solution currently is being evaluated and piloted by a US state government agency, which is using eTrust SSO and Datakey Smart Card technology to enable primary user authentication to securely access a complete range of enterprise resources.

By storing CA digital credentials on a Datakey Smart Card, users can access the enterprise network or resources wherever they carry their Smart Card.

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G&D and Incard Partner on EMV

Giesecke & Devrient (G&D) and Italian Smart Card manufacturer Incard are partnering to support Italian banks and financial institutions in the EMV migration from magnetic stripe to Smart Cards.

Incard will be the exclusive production and selling channel in Italy for G&D's payment products and solutions such as Smart payment cards, public key infrastructure (PKI) technology and open platforms for the financial sector.

Keycorp Aus\$6m Smart Card Deal

Australian Smart Card manufacturer Keycorp has signed a contract to supply 1.1 million cards and electronic purse modules to a Korean consortium in a deal valued at Aus\$6 million.

Keycorp's Electronic Purse cards use the MULTOS operating system and an Infineon processor. They will be manufactured in New Zealand by Security Plastics. The Korean consortium of Kookmin Bank, Korean Telecom Freetel and Mondex Korea will use the cards in applications such as MasterCard's Mcard Select, the Mondex electronic purse and a Korean National ID card.

Intellect Opens Hong Kong Office

Intellect has opened new regional headquarters in Hong Kong. Intellect Asia will support Intellect's existing Asian customers and focus on new business opportunities throughout the region.

Roland Schmid has been appointed General Manager Asia. Previously he acted as General Manager for Europe and as Chief Operations Officer of the group.

Intellect successes in Asia include the supply of over 16,000 multi-function terminals and software for Bank Central Asia, Indonesia's largest retail bank. The company has also signed a multi-million dollar contract to supply hardware and software for Malaysia's Government MultiPurpose Card project.

Contact

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Cubic Contract in Chicago

Cubic Transportation Systems has been awarded a \$3.3 million contract to provide Smart Card-ready fare collection equipment for the Chicago Transit Authority (CTA)'s Blue Line Cermak Branch rehabilitation project.

The CTA introduced Smart Cards to its riders in August 2000 under a pilot program and is now planning a major roll-out involving 300,000 new cards from Cubic. CTA uses Cubic's GO Card, the same technology the Washington Metropolitan Area Transit Authority uses for its SmarTrip system.

Cubic's fare collection system is interoperable across the CTA's rail and bus system and the Chicago area's Pace suburban bus system.

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ORGA and PPP Alliance

ORGA Card Systems, headquartered in Germany, and US card manufacturer Perfect Plastic Printing (PPP) Corporation plan to create a US-based manufacturing solution for large-scale chip card production.

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Court Approves CardBASE Plan

CardBASE Technologies has announced that a scheme of arrangement has been approved by the High Court which has taken the company successfully out of examinership.

The troubled card manufacturer has managed to raise IR£4.3 million in funds following investment from ICC Software Partners and Eastbound which it claims will take the company through to positive cash flow and profitability for 2002.

Infineon/Toshiba Chip Talks Fail

Talks between Infineon Technologies and Toshiba Corporation to create a memory chip joint venture have collapsed after the companies were unable to settle a mutual agreement for co-operation.

"I regret that the mutual talks will not continue and that we could not achieve the results we were looking for," said Dr Ulrich Schumacher, President and CEO of Infineon.

Contact

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Card Readers and Terminals Growth

EMV (Europay/MasterCard/Visa) specifications for payment systems are set to unleash a new dynamism on the industry, which anticipates a big impact following EMV migration, according to a new study by international marketing consultancy Frost & Sullivan.

Frost & Sullivan expects to see the POS Smart Card-enabled market to grow at a compound annual growth rate (CAGR) of 36.5 per cent between 2000 and 2005.

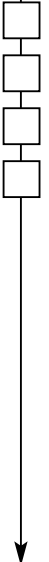
The market is witnessing greater use of Smart Cards, loyalty schemes and stored value cards. The report says Smart Cards will help 3G technology catapult e-commerce into the mobile age.

"The ratio between POS sales and Smart Card enabled POS terminal sales reveals that vendor confidence is still stifling the expansion of Smart Card technology," says Anoop Ubhey who singles out Ingenico as a good example with the launch of Smart Card-enabled POS terminals and leading the field with over 40 per cent market share. VeriFone and Hypercom account for a combined share of 25 per cent. By 2005, the reader market sector is forecast to rack up sales worth \$715.0 million. Gemplus and SCM Microsystems are identified as the clear heavyweights in the Smart Card reader industry.

The report was published in December 2001, priced US\$7,000 (Code: 6585-33).

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Log-on Security Weakness Solved

Smart Card systems developer Ecebs and IT security and networking specialist Barron McCann have developed a Smart Card authentication solution to counter the potential theft of passwords when users log-on and authenticate themselves to IT systems.

The solution combines Ecebs's Smart Card technology with Barron McCann's X-Kryptor network encryption device to provide end-to-end security. X-Kryptor uses AES (Rijndael 256) to encrypt communications between the user and X-Kryptor device positioned in front of an authentication server and other corporate servers.

David Braddock, Ecebs' Managing Director, said: "The X-Kryptor only accepts encrypted traffic. Second it encrypts all traffic the instant a connection is made; there is no gap between logging on and authenticating yourself."

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Biometrics Safeguard Residents

A contactless Smart Card-based voice recognition system backed by a face recognition system is safeguarding residents in a luxury complex called The Manor at Yorktown, Pennsylvania, USA.

The \$800,000 system uses VoicePass, Graphco Technologies (G-TEC) speaker recognition with proximity cards with a voiceprint for all entry points. A face recognition system from AcSys Biometrics Corp adds further security.

Cristian Ivanescu, G-TEC Chairman and CEO, said: "This cutting edge technology uses a human voiceprint to control access to all areas. You simply speak, and within seconds access is granted and the door unlocks."

The FaceTrac biometric interface provides surveillance and access control in busy areas and denies access to visitors who are not recognised while digitally recording and storing the event.

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Smart Cards for London Transport

SchlumbergerSema is to supply two million of its Easyflow contactless Smart Cards for use in London's underground and buses. The contract calls for the cards to be delivered over the next two years and will be supplied to Electronic Data Systems (EDS), a member of the TranSys consortium implementing the card-based ticketing and revenue collection system in the capital.

According to TranSys, London will provide a reference for similar programs in other locations throughout Europe and the rest of the world.

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City Card in Switzerland

Switzerland's City Card Systems AG has ordered 10,000 Smart Card terminals from SCM Microsystems for use in merchant loyalty programs.

Based in Basel, CCS provides small and mid-size businesses with solutions to launch their own loyalty programs. The terminal from SCM was designed specifically for multi-application Smart Cards and can be connected through a modem to a telephone or through a serial port to the cash register or PC or used in stand-alone mode.

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🌐 www.citycardsystems.ch/sites.dienstleistungen.htm

CIBC / Amex Launch in Canadian

The Canadian Imperial Bank of Commerce (CIBC) is to issue American Express' Smart Card, making it the first credit card with a chip available nationally in Canada. The deal also establishes CIBC as the first bank in Canada to offer both American Express and VISA credit cards.

Initially the Smart Card will be used simply to enhance the security of purchases, with particular emphasis on Internet transactions, but CIBC hinted that the card may be used for managing loyalty programs and conducting electronic banking activities at some future date.





Indian Driving License Success

Gujarat was the first state in India to issue a Smart Card and biometric driver's license and the success of the project may lead to a national standard as more states are issuing tenders for Smart Card based driver's license solutions.

This would mean that individual state databases would be able to validate the identity of the individual based on biometric features such as a fingerprint or an iris scan during enrollment.

Frank Barbalace, Senior Business Development Manager for ORGA USA, said: "If a person with a valid Smart Card driver's license from one state travels to another and seeks to obtain a license in that state under a different name, the system will red flag them. This same system could work in the United States as well."

The Gujarat project began in early 1999 and was coordinated by ORGA in association with Smart Chip Limited in New Delhi. The license contains a chip, stores the cardholder's fingerprint, digital signature and personal information.

The issuance stations consist of Smart Card personalisation equipment including a PC, Smart Card printer, video camera, fingerprint capture device and a signature tablet as well as customised software.

To date, nearly two million people have received Smart Card driver's licenses with nearly 1,500 cards issued daily. At the end of the project, more than 25 million Smart Cards will have been issued.

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Datakey Card Order

Datakey is reported to have received an order for 6,400 cryptographic Smart Cards and associated software for an unnamed non-US government agency which will use the technology to secure electronic communications.

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Power Paper Board Appointments

PowerPaper, producer of ultra-thin and flexible micro-electronic power sources has announced three new board members. They are: Pol Bamelis, who will serve as Chairman, and was a board member of Bayer; Geoffrey C Nicholson recently retired as Vice President, Corporate Technical Planning and International Technical Operations at 3M Corporation; and Arthur L Rosenthal, Senior Vice President, Corporate Officer and Chief Scientific Officer of Boston Scientific.

The appointments follow Power Paper's completion of over \$9 million in Series C equity funding which, among other things, will support the company's entry in the Smart Card, Smart label and healthcare and medical device markets.

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Rewards and Cash Back Card

Akbank in Turkey has launched its Axess chip-based credit card combining real-time rewards based on Recency, Frequency and Monetary Value (RFM) and cash back giving cardholders back a percentage of all cumulative purchases available instantly as currency for upcoming purchases.

Astonishingly, the number of participating retail outlets is reported to have reached 2,500 just days after the launch.

Akbank is deploying Welcome Real-time's XLS software in the project.

Contact

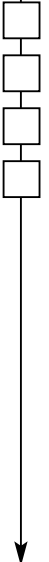
- **Debra Montner** for Welcome Real-time
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Amex and HP Join Mobey Forum

American Express and Hewlett Packard have joined the Mobey Forum - a consortium developing and promoting mobile financial services. Both have pledged their support for the dual chip mobile payment system recommended by the forum.

Website

- ✉ www.mobeyforum.org





Industry Review 2001

It was a year of further consolidation in the Smart Card industry with France's Schlumberger and Australia's ERG Group involved in major strategic takeovers and also marked by sweeping changes in the top management at French Smart Card manufacturer Gemplus (see page 12).

Acquisitions

Schlumberger acquired **Sema** for £3.6 billion accelerating its information technology strategy while enhancing its capabilities in systems integration. In another move, the company took over Bull's Smart Card activity (**Bull CP8**) for €350 million, plus an amount relating to royalties on associated patents.



The transaction included Bull CP8's operating subsidiaries in Mexico, The Netherlands, Sweden, UK and the US and its equity interest in several subsidiaries including Cardsoft, Cyber-COMM, SPOM, Trusted Logic and Xiring. Schlumberger also acquired **PCS Innovations**, a provider of platforms, tools and services for the mobile Internet.

ERG Group acquired outright Belgian-based **Proton World International** recognised for its Proton electronic purse technology, from former shareholders - American Express, Banksys, Interpay Nederland and Visa International.



Recognised as a leading player in Smart Card fare collection systems for public transport, acquiring the Proton technology gives ERG the ability to deliver multi-application Smart Card solutions for the financial and identity markets. There are over 35 million Proton-based Smart Cards in circulation worldwide.

OTI acquired the remaining 49% of European Smart Card system integrator **InterCard Kartensysteme** and electronic Smart Card hardware manufacturer **InterCard System Electronic** in Germany.

ActivCard acquired **Authentic8 International**, a developer of Internet Authentication Service technology in a deal valued at around \$42 million.

Oberthur Card Systems acquired **Logica Impressora**, ranked as number one in the manufacture and personalisation of banking cards in Spain for FRF 66 million. Oberthur also acquired the remaining 50% of **Rapsodia Software** from French customer relationship management specialist, Prosodie for EUR 3.6 million. Rapsodia provides software platforms for mobile value-added services.

Gemplus International sold **SkiData**, its electronic access control solutions business unit, to Swiss company **Kudelski**. Gemplus also sold its TAG subsidiary, a provider of electronic Smart labels based on RFID (Radio Frequency Identification) to **Axa Private Equity**.

Vishay Intertechnology acquired **Infineon Technologies'** infrared components business for US \$120 million.

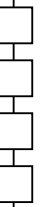
Welcome Real-time acquired Singapore-based **Axiomatique International** to form what it said would be the largest supplier of loyalty software for Smart Cards in the world.

UK-based **Dione** bought **Systek**, the terminal division of Sonera Solutions of Finland. The new company will be known as Dione Systek and continue to operate from offices in Helsinki.

Groupe Ingenico bought **IVI-Checkmate**, the American electronic payments systems supplier.

Management Buy Out

Thyron, UK supplier of terminal-based mobile pay





ment solutions, went into liquidation and was bought from its founders in a management buy out and trades as **Thyron Technologies**.

Mergers

The Smart Card Industry Association (SCIA) and the **Smart Card Forum (SCF)** combined to form a new organisation called the **Smart Card Alliance** to act as a single voice for the US Smart Card industry.

Cashless catering and vending specialist **GiroVend** and another UK company **Public Access Terminals** merged.

Cards

Oberthur Card Systems formed a joint venture with Guangbang PTD, Shenzhen Xinsi Industrial Co and Guangdong Nanfang Telecommunication Equipment to open a plant in Shenzhen, China, with an annual production capacity of 30 million cards.

German high-tech broker **ACG AG** won an order for over 150 million Smart Cards for Greek telecommunications company OTE (Hellenic Telecommunications Organisation). Manufacturing orders were contracted to partners Miotec in Finland and Hellenic Smart Card in Greece.

Britain remained the card fraud capital of Europe, with year 2000 losses of £293 million - up 55% on 1999.

Giesecke & Devrient expanded card production capacity at its North American headquarters in Dulles to over 15 million Smart Cards annually.

ORGA doubled its Smart Card production capacity to 200 million cards a year with a new £20 million production facility in Flintbek, Germany.

Gruppo PCU Italia announced the inauguration of its new card production plant, CardNet, with a capacity of over 150 million cards per year.

The Smart Card Security User Group (SCSUG) announced the Smart Card Protection Profile, a common model to evaluate the security of Smart Cards based on the Common Criteria for Information Technology Security Evaluation.

Visa International and **STMicroelectronics** launched an EMV compliant Smart Card costing less than one US dollar and supporting the Visa Smart Debit/Credit application. Later, Visa EU announced an EMV card with enhanced functionality and fraud protection to be available in 2002 at a cost of \$1.99.

Chips

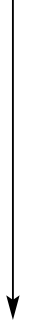
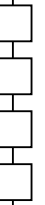
Philips Semiconductors set up a new chip card module assembly line at its Bangkok semiconductor assembly plant with a production capacity of 100 million modules per year to produce Smart Card microcontroller chips and modules for MIFARE dual interface Smart Cards. Philips also introduced Smart Card controller ICs called Smart MX with expanded memory configurations of more than 500K bytes.

The slow down in the mobile phone market caused **Motorola** to close its factory at Bathgate in West Lothian, Scotland, with the loss of 3,000 jobs; and **Gemplus** to shut its German factory in Seebach.

Hitachi announced the AE46C Smart Card controller with 68K bytes EEPROM and a 1024-bit coprocessor for fast modular multiplication. Hitachi also announced the AE-5 family of high end 32-bit Smart Card controllers that enhance the AE (Advanced Engine) series. Then the company unveiled the AE45C1 and AE46C 16-bit microcontrollers designed for next generation SIM card applications; and developed the smallest RFID (Radio-Frequency Identification) chip called the "meu-chip," which is thin enough to be embedded in paper.

Infineon Technologies introduced my-d, the first chips in the IdentSystem product family marking the company's entry into the Radio Frequency Identification (RFID) market.

STMicroelectronics unveiled three new multi-application microcontrollers - the ST19XR34 with 34K bytes EEPROM and featuring a 1,088-bit modular arithmetic processor for public key cryptography and an RF interface for contactless operation; the ST19XS08 with 8K bytes EEPROM, and the ST19XS04, with 4K bytes EEPROM.





Transit

There was a surge in transit applications. **ERG Motorola Alliance** began rolling out the Metrobus, a contactless Smart Card ticketing system in Rome, Italy, for ATAC's bus, rail and tram network in Rome and the surrounding region of Lazio. It was expected that more than one million Smart Cards would be issued by end 2001.

In the US, **Cubic Transportation Systems** won a \$20 million contract to provide the first interstate contactless mass transit ticketing system. The Washington Metropolitan Area Transit Authority (WMATA) is linking payment for travel on its buses serving Washington, DC and parts of Maryland and Virginia with the Metro's existing SmartTrip fare collection system.

Taipei City Government System awarded a US \$30 million contract to system integrator **MiTAC** and **Philips Semiconductors** for a contactless Smart Card ticketing project for mass transit. Philips was also contracted to provide the Smart Card and reader ICs for an automatic fare collection (AFC) project in China's capital, Beijing. Called the Beijing One Card it will be used initially on public transport, and later for electronic road tolling, utility metering and e-business. It is planned to roll-out five million MIFARE contactless Smart Cards.

Bucking the trend for contactless cards in transport ticketing, **e-Scotia**, the e-commerce subsidiary of Scotiabank, introduced a contact Smart Card electronic fare collection system in parts of Montreal in Canada. Called Scotia TranSmart, the system was developed by **Edgeware Technologies**.

Loyalty

Interest in loyalty schemes continued, particularly in the UK, which saw **Shell UK** replacing its Shell SMART programme in which some five million cards were issued since it began in October 1994. In the new scheme, called pluspoints, Shell moved to magnetic stripe cards while providing the infrastructure for payment by EMV (Europay/ MasterCard/Visa) chip cards.

Esso Ireland announced the launch of its Tiger-Miles programme at over 275 filling stations and took an initial delivery of 400,000 branded Smart Cards for the scheme.

Tesco, the UK's leading food retailer, relaunched its Club Card loyalty programme and awarded ID Data the exclusive contract to supply the new cards.

Multi-application card

The **Malaysian Government** took the credit for the first nationwide government-sponsored multi-application Smart Card roll-out in the world. The card will function primarily as a national ID card with other applications such as driving licence, passport, healthcare and non-government applications such as an electronic purse.

Health

Austria is to roll-out eight million health insurance Smart Cards by 2003. The £31 million contract from the Board of the Austrian Insurance Agencies went to **ORGA** and **EDS**.

GSM

The **GSM Association** and the **WAP Forum** formed an alliance to promote international standardisation in the wireless telecommunications industry.

The number of people using GSM phones globally was expected to exceed 630 million by end 2001 according to the **GSM Association**.

Biometrics

Chicago's O'Hare International Airport plans to upgrade its existing building access control system based on Smart Card-based fingerprint recognition technology from **SecuGen Corporation**.

Bell ID announced that the Schiphol Group had started piloting a biometric access control system based on iris recognition and Smart Cards at Amsterdam's Schiphol Airport.

Britain resurrected plans to issue national identity cards to UK citizens as part of a crackdown on terrorism following the 9/11 terrorist attacks in Washington and New York, but few people believe that the British government has the guts, or the support of opposition parties, to carry out the plan.

Jack Smith





Axe Swings at Gemplus



Marc
Lassus



Antonio
Perez



Ron
Mackintosh

A major shake up at Gemplus, the troubled French Smart Card manufacturer, last month resulted in the resignations of Antonio Perez as Chief Executive Officer and of Dr Marc Lassus as Chairman effective 10 January 2002.

Dr Lassus, founder and one of the largest shareholders in Gemplus, will remain a Director. Antonio Perez leaves to pursue other interests.

Gemplus estimates that this part of the management restructuring will cost the company €25 million. The replacement of Dr Lassus as Chairman requires Gemplus to pay him US \$12 million in accordance with an agreement signed in year 2000.

Perez is to receive a US \$1 million severance payment, and return to an indirect subsidiary of Gemplus 12 million Gemplus shares that he received when he was recruited. Previously he had returned approximately 18 million shares to partially reimburse four loans that were made to him by the indirect subsidiary. As the value of the 12 million shares is not expected to be sufficient to pay off the loans in full, the outstanding portion will be cancelled resulting in a charge to the consolidated earning of Gemplus. The total charges associated with Peres is estimated to be around €12 million.

Board member Ronald Mackintosh takes over as CEO, resigning from the board to focus on his new responsibilities.

Dr Hasso Von Falkenhausen has been elected to the board and takes over as Chairman on 10 January, 2002. He was Chairman of Gemplus from 1997 until he retired in 1999.

An international search firm is to be hired to find a new, permanent CEO and a new permanent Chairman for Gemplus.

David Bonderman from the Texas Pacific Group has joined the board as Vice Chairman with Abel Halpern

leaving the post but remaining a director. Andrew Dechet and Dr Bertrand Cambou both resigned as directors.

In a statement, Dr Falkenhausen and Mr Mackintosh said they intended to focus on their key markets - telecommunications, financial services and e-business security., adding: "However, as we focus, we must rebuild the energy and entrepreneurial spirit that has made Gemplus the company it is today."

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More Jobs Go in Semiconductors

The struggling semiconductor market took another blow last month with both Motorola and NEC Semiconductors announcing major job losses.

Motorola is to cut another 9,400 jobs worldwide and will mean the struggling company will have slashed 48,400 of its workforce since its peak of 150,000 in August last year. The latest job cuts, which will be implemented during 2002, include 4,000 from its semiconductor operations, 1,300 from its equipment manufacturing businesses and another 4,100 distributed throughout the rest of the company.

NEC Corporation is to suspend operations of its semiconductor manufacturing facility, NEC Semiconductors (UK) in Livingstone, Scotland from April at the cost of 1,260 jobs.

Efforts were made to save the plant by halting DRAM production to focus on system LSI (Large Scale Integration), reducing wafer capacity and employee numbers. But demand continued to fall, and with no sign of recovery in the semiconductor market NEC announced its decision to suspend production. Reopening of NECSUK will depend on "market conditions and customer demand".

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Gemplus

2001 was a year Gemplus would rather forget. With over 60% of its business reliant on the telecoms market, the market slowdown last year caused by the sudden downturn in SIM card demand hit company profits hard. It was forced to issue no less than four profit warnings during the year which culminated in an operating loss of €55.3m (\$49.4m) for the third quarter. The off-loading of its TAG subsidiary to AXA and 700 redundancies did little to balance the books.

If this wasn't enough, the company was thrown into turmoil again with the resignations of Antonio Perez and Marc Lassus (see previous page). The tension between the two top executives was often plain to see during their time together. Perez' stewardship, in particular, was plagued by controversy - most notably due to a series of loans paid to him by a Gemplus subsidiary at his appointment which have still yet to be settled. Alongside the financial worries, Gemplus evidently required little persuasion to instigate a change at the top.

Director Ronald Macintosh emerged as the ubiquitous 'safe pair of hands' and took over as temporary CEO this month. Inevitably, the saga did little to reassure shareholders especially when it emerged that Gemplus had to pay Perez and Lassus a combined €25m in severance payments.

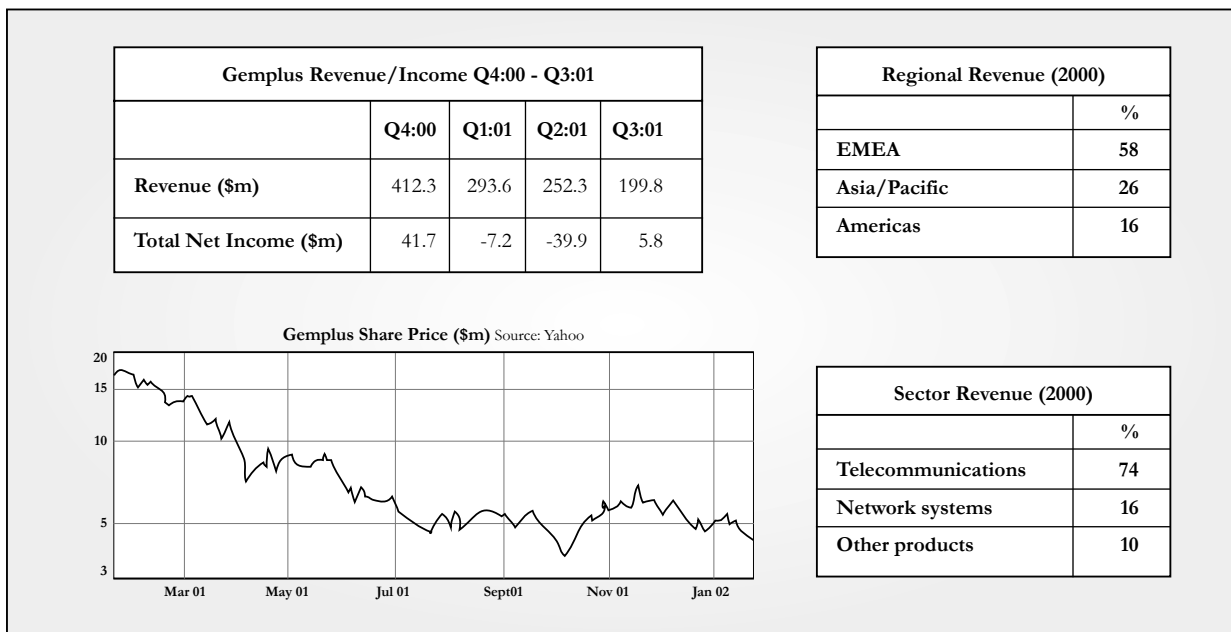
Despite all its problems Gemplus' position as the world's number one Smart Card supplier has remained largely unchallenged. Although often portrayed as the 'European Smart Card Giant', Gemplus has consistently focussed on expanding Smart Card usage outside of its core EMEA base. Europe still accounts for the lion's share of company sales (almost 60%), but Gemplus is beginning to make important progress in Asia and North America. This month, for example, saw the conclusion of a two year project with China Unicom to launch a Smart Card-based CDMA network. Gemplus' Philippe Vallee hailed the significance of the launch as "equalled only by the introduction of the SIM to GSM."

Back in Europe, Gemplus has cautiously predicted a steady recovering from the problems it faced in 2001. In an interview with Reuters, COO Frederic Spagnou said that Gemplus "more or less follows the wireless industry so the worst is behind us", but was reluctant to reveal whether an upturn in fortunes would occur in the first or second half of the year.

The release of the Gemplus' 2001 fourth quarter figures (scheduled for release on February 6th) should give some indication of the company's financial health. According to Spagnou "seasonality is in favour of the fourth quarter in our industry," so the revival may just be round the corner.

Whatever the outcome Gemplus' rivals should heed the fact that the company's current crisis has been fuelled mainly by the weakened demand in the telecoms industry - which has effected everyone in the sector to varying degrees. Maybe Gemplus were guilty of over-focussing on wireless, but if the predicted upturn in the market materialises, Gemplus will be at the front of the pack.

Matt Ablott





The Past is the Key to the Future



by Simon Reed, ORGA / Editorial Consultant, Smart Card News

After over 10 years in the heady world of what we call the Smart Card industry I am delighted to see that many of the 'babies' have grown into teenagers. *Smart Card News* is one constant in an ever changing technical world. Not that it has remained stagnant, much the same as our technology, it has become colourful, it has taken on a whole digital presence and through the wonders of the web is no longer confined to the vagaries of the postal service or dusty company magazine racks, but can burst through to humanity in the strangest of places. It sings the song of Smart Cards even if, yet, not all the recipients understand the language!

As a former geologist I am extremely familiar with relating past events to the present and extrapolating them to the future. Looking back over the last 10 years I see some parallels:

1. Usually the smallest and simplest survive the longest.
2. If something works well others will evolve to use it.
3. There is always something unexpected which will completely turn the world upside down no matter how well you plan!

With around 3 billion Smart Cards in circulation worldwide nobody can deny they

have evolved as a success, and within the next 10 years I can confidently predict that they will far out number humans as a species. But what of the technology itself? No piece of writing from anybody who has seen it from fledgling tech-wizardry to commercial importance is complete without some crystal ball gazing... so here goes!

- Far from getting bigger Smart Cards will become smarter and sneakier.
- They will break away from ISO and become packaged in all sizes, mediums and devices. Smart Devices has been hijacked as a term by the PDA makers... it will be regained to its true domain.
- The first online space purchase will be made using a smart credit/debit card from the international space station - sadly the pizza will be cold when it arrives.
- The IT industry will fight to adopt the 'industry' as their own favorite son. A new raft of 'pocket servers' will spawn computer programmers desperate to boast how small their code is but how powerful the application.
- As children log-out of school chanting the mantra 'write once, run anywhere' day rates for computer programmers will plummet.

However, the moral of future predicting is like Dinosaurs: they thought they were bigger and better than everyone else... and we all know what happened to them! So *Smart Card News* stay clean and simple, feel small and intimate and keep evolving the best bits.... Happy Anniversary.

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Readers' Comments

We hope you like the revamped newsletter. We would appreciate any comments or opinions on the contents of *Smart Cards Now*, or the industry in general.

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United Kingdom
or
e-mail: info@smartcard.co.uk

Please state whether you would like your letter to be published or not. Thank you.

Please note: *Smart Cards Now* reserves the right to edit letters.

A Message for Subscribers

We would like to remind subscribers to *Smart Cards Now* that they are entitled to receive, free of charge, our Daily Smart Card News On Line service via e-mail. If you do not already do so and would like to receive the news please contact Amanda Pearce on +44(0)1273 515651 or e-mail: info@smartcard.co.uk



Readers' Comments

Events Diary

February

3-7 Saudi Communications 2002, Riyadh Kingdom of Saudi Arabia

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Website: www.recexpo.com

6-7 Central & Eastern European ATMs, Inter-Continental Hotel, Prague, Czech Republic

Gareth Walker
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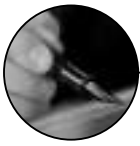
Tel: + 1 (800) 340-3010 or +1 (415) 544-9300
Website: www.rsaconference.com

March

4-5 The Institute of Economic Affairs' 3rd Annual Conference: Retail Banking in Europe, Hotel Lutetia, Paris, France

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Robin Townend, President and CEO Cardis



Firstly, may I congratulate you and the SCN team on your 10th anniversary and on the valuable contribution SCN has made to the industry over the years.

I thought this was an appropriate time to reflect on an issue that has occupied me over this period and share with you some of my thoughts. The issue is the continued, apparent blind faith acceptance that Electronic Cash (e.g. CEPS and Mondex) is the answer to the banks entrée into, and control of, the micropayments market.

For me there has never been an Electronic Cash business case for the banks to build and support a separate infrastructure to manage these low value transactions. I am not surprised that consumers and merchants find this approach unattractive - the need to continually load value onto the card, the fact that consumers may fail to make a transaction because of insufficient funds in the purse and the inherent processing costs (CEPS) or lack of an acceptable audit function (Mondex) - all aspects that won't go away over time.

Let's face it the continued success of the ubiquitous credit and debit card is the model to follow - both share a common infrastructure and the notion of extending their functionality to cost effectively handle micropayments is a much better value proposition.

My focus has been in this area, and the prospect of piggy backing on EMV migration for micropayments (and indeed offering added value to the EMV business case) through a software upgrade makes admirable sense and at the same time leveraging existing clearing and settlement infrastructure.

What is clear to me is that these Electronic Cash pioneers have developed some excellent technologies and this is something the payments industry can harness and use to full effect. Rising card fraud may be the driver and justification for EMV migration but this is only part of the answer. Much talk is made of multi-functional cards and the concept of adding functionality to the core payment application is one which is widely promoted, indeed, I fully support this notion. This, in time, will make the economics work.

I am pleased to say that later this year my theory will be tested with a program in Canada with Scotiabank, where the Bank will issue an EMV credit card with micropayment functionality and retailer loyalty applications juxtaposed to the EMV code. For cardholders it means their credit card can be presented for all payments - large and small and used in a transparent way. The purse will never run out of funds being 'reloaded' automatically when the need arises and the cardholder will qualify for loyalty rewards associated with those payments. We have been able to achieve this through unprecedented cooperation amongst key industry suppliers who have come together as The Solstice Alliance and who's goals are to deliver an end to end EMV multiple application solution that makes economic sense.

Through the columns of SCN you be able to follow and report on the success of the program and I expect the next 10 years will see widespread adoption of this approach.

I wish SCN the same success for your next ten years.

Contact

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6-8	Smart Card Technology India 2002, Pragati Maidan New Delhi, India (Rescheduled from 7 - 9 January due to political tensions in the region.) Tel: +91 11 463 8680 84 Website: www.exhibitionsindia.org	Olympia Conference Centre, London, UK Website: www.voice-world.com/Voice2002EU/	
		16	Cards Asia, Singapore
21-22	Smart Labels USA 2002, University Park Hotel @ MIT, Cambridge, Massachusetts, USA IDTechEx Ltd Tel: +44 1223 813703 Fax: +44 1223 812400 Email: info@idtechex.com Website: www.idtechex.com	16-18	Information Security World Asia 2002, Singapore International Convention & Exhibition Centre Stella Tan, Terrapinn Email: stella.tan@terrapinn.com Website: www.isec-worldwide.com/isec_asia2002
		22-25	CardTechSecurTech, New Orleans, USA
		23-25	The Advanced Card Awards, Olympia, London, UK Jane Callaghan Tel: +44 (0) 1733 245841 Email: awards@multimediaventures.com Website: www.advancedcardawards.com
April			
9-11	Voice World Europe Conference & Exhibition		





Memories Are Made Of This

The purpose of the Smart Card can be easily defined as:

“A portable secure store and optionally secure processor of data”

I have yet to see the business case for the use of a Smart Card where this is not a fundamental part of the requirements. What stands out immediately is that it is the properties of the memory that are fundamental to the way that a Smart Card is set up and used. If we look inside the Smart Card chip (figure 1) we can see an array of different memory types, ROM (Read Only memory), RAM (Random Access Memory), and EEPROM or E² (Electrically Erasable Programmable Read Only Memory) at least, with options on FLASH and FRAM (Ferroelectric Random Access Memory) as well.

Why are there so many types of memory? Well as we shall see there is no perfect memory for a single chip microcontroller, so we have to use different memories for different functional requirements. In a typical Smart Card chip the memory would be used as follows:

ROM	RAM	ROM
Operating System	Working Space	Operating System Extensions
Fixed Applications		Applications
Static Data		Data
Certification Public Keys		Cryptographic Keys

The EEPROM memory is the non-volatile that does not lose its contents when the power is removed from the chip. Its like the hard drive on the personal computer although very much smaller in both physical size and memory capacity.

Before we compare the different types of memory used in a Smart Card chip it is useful to define the ideal requirements for the memory in an abstract way:

Ask the Experts

Q: What does RFU stand for?

A: The expression RFU is often found in standards documents and other technical specifications and is an abbreviation for 'Reserved For Further Use'. To the designer using such specifications this is a warning that he should not use the item marked as RFU because the specification may be modified in the future to make use of this item.

Q: Can a PIN code on a chipcard be read by a criminal who has stolen the card and who has a card reader such as a UNIPROG or other reader?

A: As long as the Smart Card software is constructed cor-

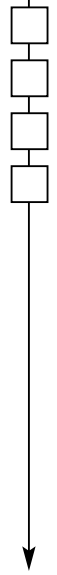
rectly it should not be possible to read the PIN from the card - there would not normally be any reason for the card to have any function that outputs the PIN in an unprotected fashion.

Q: I am writing from a school in Malaysia. We are have databases running on Filemaker Pro on Macintosh. Are there any Smart Card readers out there that have drivers for the Macintosh?

A: Yes, there are several. See for example: www.one-o-one.com/

Q: Do you know of any evidence that definitively demonstrates the cost benefits of the Smart Card over Magnetic cards?

A: The best example has to be EMV. Why would Visa, Mastercard, and Amex all move to Smart Cards (from mag-





- Data confidentiality should be assured
- Data integrity should be assured (even on power failure)
- Non-volatile alterable (mutable) data
- Fast memory access time
- Fast memory write time
- Long data retention time
- High endurance (number of read/write operations)
- Low cost

The properties of data confidentiality and integrity are fundamental to any security system and we have already defined the Smart Card to be a security component. The non-volatile property is the most important in terms of Smart Card chip memory, because of the need to preserve the state of the application data, otherwise we would always return to the initial data state every time the power is interrupted. The requirement for mutability is a fundamental part of the same requirement. The ROM memory is non-volatile but is not alterable and therefore cannot be used to store transaction data. In terms of performance we would of course like our chip to read and write data as fast as possible, and at least as fast as the memory cycle time of the CPU (Central Processing Unit). Some types of memory suffer from age, so that they no longer safely retain the data they are supposed to hold, equally this should be longer than the lifetime of the Smart Card (five years at least). Some memory types suffer from over work and are limited in the number of memory access times they can endure. In practice the work relates to the write/erase cycle, but you have to be careful because some memory types (e.g. FRAM) actually implement a destructive read where a write cycle is a necessary part of the read cycle.

Last and by no means least is the cost and clearly we would like that to be as low as possible. The cost of the Smart Card chip is directly proportional to the area of silicon it occupies and as a rule of thumb equates to about \$1 per 10 mm². So for our different types of memory the higher the number of transistors per memory cell the greater the area and the higher the cost.

RAM (Random Access Memory)

The workhorse of any computer be it a Smart Card or a personal computer is the RAM memory. This is fast (typically 70nS) read and write (mutable memory) that operates on single selectable words in memory at a time. That was the good news, RAM is volatile and loses its contents when the power is removed. The fact that you can invert this property by drastically cooling the chip raises a security problem since there could be sensitive data retained in RAM that the operating system software has not taken care of in an adequate fashion.

The big problem is cost. Each RAM cell takes 6 transistors, the most expensive memory on the chip. None the less a modern Smart Card chip can have up to 4Kbytes of RAM, a big improvement on the 256 bytes of just 10 years ago. The PC uses DRAM (Dynamic RAM) which needs to be continuously refreshed to maintain its contents.

netic stripe) without a good business case. The argument is complex which is the reason that Smart Cards have taken so long to penetrate the financial world. The security argument is the one that tends to attract the most attention but it should not be overlooked that a Smart Card is more reliable than a magnetic stripe. The cost of replacing a customer card in the field is probably at least \$5 which is far more than the value of the Smart Card.

Cartes Bancaire in France have produced some persuasive arguments in the past but you also have to take account of the introduction of PIN at the 'point of sale' which was a major factor in their fraud reduction.

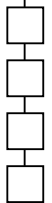
The real argument has to be considered over many years (in the case of EMV) and what would have happened if you stayed with the magnetic stripe. You also have to

look at the secondary products that you can promote on the back of the Smart Cards.

Q: I have a lot of Smart Cards that have been damaged by customers. I was wondering if I could reset them and return them to their original state?

A: This depends on the application and the operating system platform on which it runs. In many cases it may not be possible or worth the cost. You should also investigate why and how your customers have managed to damage the cards.

If you have a question you would like our panel to answer please complete the form at: www.smartcard.co.uk/ask-experts.html





This is a high overhead for the relatively small memory of the Smart Card chip which is actually using SRAM (Static RAM) which does not require any refresh circuitry. The RAM cell has unlimited endurance in that it can be read and written as often as you like.

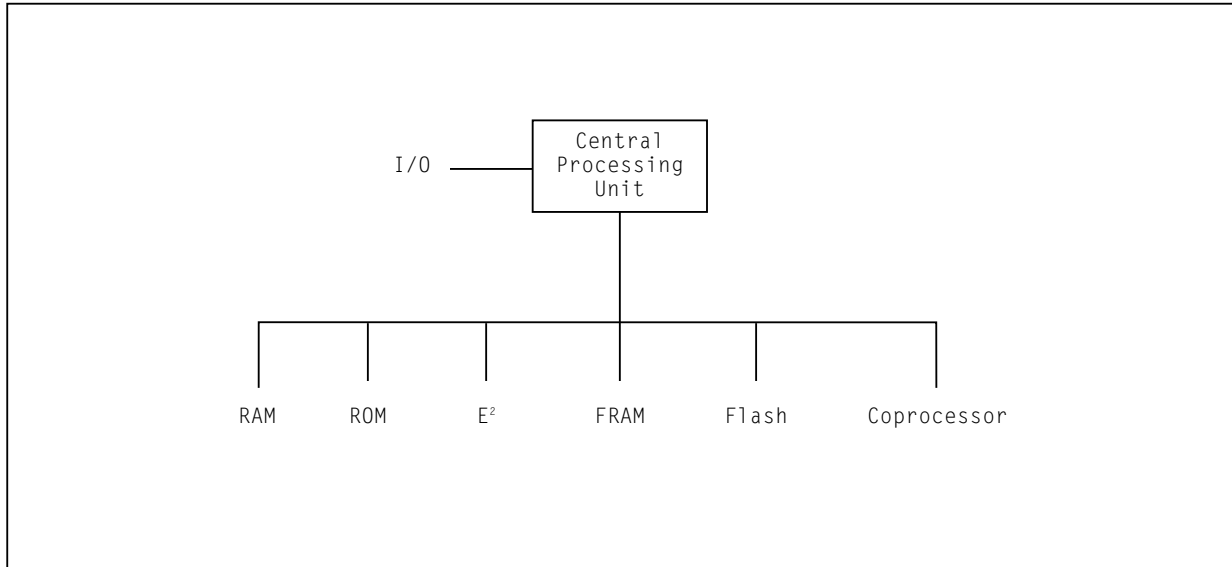


Figure 1: Smart Card Microcontroller

ROM (Read Only Memory)

A ROM cell really consists of the presence or otherwise of a transistor and is therefore the cheapest memory on the chip at only one transistor per memory cell. It has unlimited endurance and an unlimited data retention time. It also has a relatively fast read time. Because of the fact that it is read only the biggest problem with ROM is the write time of 3 months or more. This is because the cell state is actually set as part of the chip's mask fabrication process that either creates a transistor or not. Mistakes are expensive in terms of the development cycle.

EEPROM (Electrically Erasable Programmable Read Only Memory)

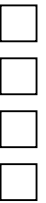
The most common form of non-volatile memory on a Smart Card chip is the E² which takes 2 transistors per memory cell and accordingly represents fairly expensive real estate on the chip. Today's top end chips have 32Kbytes of E² with 64 Kbytes not far away. The data retention time of 10 years is more than adequate for most applications and the endurance of 10⁵ write cycles is a manageable limitation. The big problem with E² is the write cycle time which is in the range of 2 B 10mS depending on the manufacturer and the memory version. E² is typically arranged in pages of say 32 bytes which means that you can write 32 bytes of memory in one operation but equally if you lose power when writing to just one cell the whole page is on risk of corruption. Preserving the integrity of E² memory is a major software overhead.

Flash memory

Flash memory differs from E² in that the write cycle is very slow and operates on a complete sector at a time. This sector could be the complete Flash memory. It typically takes 1 second to write to Flash memory. It also has a limited endurance of 10⁴ write cycles. But the cost is lower in that each memory cell only takes one transistor. In a development environment Flash memory is very attractive because it avoids the 3 month turn around time (and possible total batch error failure) of the masked ROM memory.

To be continued

Dr David B Everett





2001 - A Blip in the Market?

Was 2001 really such a bad year for the Smart Card market? Looking at all the rumblings in the industry and the warnings coming from Gemplus and others it was clear that the blip in the wireless market has had its effect. Why do we call it a blip? Well in the first place its all about relative time scales and looking over the last 10 years just one bad year is a blip. Of course, if this sorry position were to carry on for the next five years then it would be a different story. This however seems unlikely for a number of reasons. In the first place people are not going to give up using mobile phones and the GSM market is likely to penetrate countries like India and China in more depth because there is a very poor terrestrial communication system. Even in the UK which is somewhat better served than either China or India many people are giving up their land-line in favor of the mobile phone. In some cases you can show it's cheaper and more flexible. But in the more developed western world we also look upon the mobile phone as some sort of fashion accessory, subject to lots of irrational purchases maybe, but purchases there will be.

What really happened last year, or to be more precise in 2000, was a state of over-ordering that filled the pipelines with stock. Last year these pipelines gradually emptied and now the purchasing of chips and cards has started again.

It's interesting to compare the figures from Dataquest and Eurosmart shown below. The Eurosmart figures are about as close to the horses mouth as you can get and although subject to some mishearing are probably the nearest to the real truth. The figures for 2001 are estimates for the whole year based on the actual reported figures for the first half. When the end of year figures become available one suspects that there will be some downward movement in the wireless area which still seems a little optimistic. But all in all there is still a very impressive growth in the industry over the last ten years and the projections look fine. Yes, 2001 was a blip that will encompass maybe the first half of 2002, but the recovery is already showing signs of being underway.

Smart Card Forecasts (Millions)

Millions of cards	2000	2001	2002	2003	2004
Wireless	317.0	417.1	519.8	649.8	807.6
Financial	175.9	238.5	324.0	395.5	459.3
Network	4.6	15.6	48.4	102.2	169.4
ID	24.5	34.7	59.9	83.0	95.7
Health	29.4	26.8	33.5	65.6	82.6
PayTV	21.5	26.6	35.1	43.9	55.3
Transport	0.6	1.7	2.5	3.9	6.2
Other	24.2	30.3	35.9	53.5	82.3
Total	597.9	791.3	1,057.0	1,397.0	1,758.4

Source: Dataquest

Smart Card Shipments (Millions)

Millions of cards	2000	2001 (estimated)
Banking	120	140
Healthcare	30	30
Telecom	370	500
Transport	3	12
Pay TV	20	30
IT	5	15
Other	3	40
Total	551	767

Source: EuroSmart



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