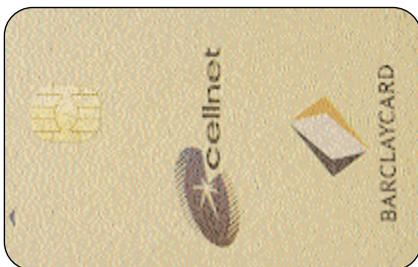
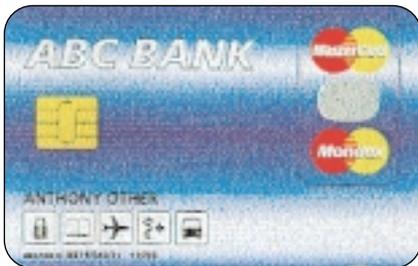


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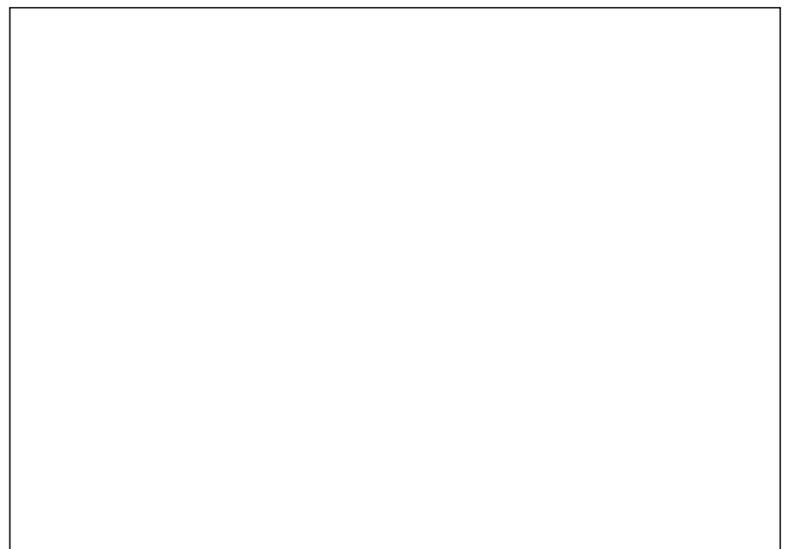
Privacy Guidelines Issued by Smart Card Forum

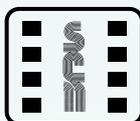
In a move to stave off possible mandatory government regulation the US Smart Card Forum, representing more than 200 businesses and organisations promoting Smart Card technology, has announced privacy guidelines for business and government issuers of Smart Cards. The guidelines are the first-ever code of practices covering the use of personal consumer data obtained through Smart Card applications.

The Forum is urging companies to restrict the use of personal information contained in the cards. The guidelines also give consumers a say in the use of the information, which could include sensitive financial, health and other personal data.

The guidelines were announced at a meeting in Washington early this month that included industry executives and officials from the White House, Federal Trade Commission and the Treasury Department.

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Important Announcement

Due to office reorganisation the SCN telephone numbers have been updated. You can now contact us on a new number:
+44 (0) 1273 236677, as well as **+44 (0) 1273 626677**.

Smart Card News is published monthly by Smart Card News Ltd PO BOX 1383 Rottingdean Brighton East Sussex BN2 8WX England
Telephone: + 44 (0) 1273 236677 / 626677 Facsimile: + 44 (0) 1273 624433 / 300991 e-mail: scn@pavilion.co.uk ISSN 0967 196X

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Printed by Design and Print (Sussex) Ltd. Telephone: +44 (0) 1273 430430.

Smart Card Privacy Guidelines

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Speaking at the Forum's Legal and Public Policy Symposium: "*Smart Cards - The Intersection of Regulation & Applications*," Jean McKenna, Forum President and Senior Vice President at Visa International, said: "The Smart Card industry must be quick to anticipate and allay any potential privacy concerns. Consumers need assurances that personal information will be handled responsibly.

"The Privacy Guidelines recommend to Forum members good business practices on how information may be stored and managed on these cards," continued McKenna. "This initiative, in keeping with the Forum's mission, proactively addresses the overwhelmingly positive attributes of products and services enabled by Smart Card technology."

The recommendations include:

- Identify, recognize and respect the privacy expectations of consumers and make applicable privacy guidelines available to them.
- Limit the use, collection and retention of information about consumers to what is necessary to complete a consumer transaction.
- Provide a means for consumers to remove their names from the company's telemarketing, on-line, mailing and other solicitation lists.
- Implement policies and procedures to limit employee access to personally identifiable consumer information to a "need-to-know" basis.
- Educate employees about privacy standards and employees' responsibilities to protect consumer privacy.
- Monitor employee compliance, and take appropriate disciplinary measures with employees who fail to adhere to such standards.

"Research shows that a large percentage of consumers want to do business with companies that are respectful of, and take steps to protect their personal data," said John Burke, Partner with D.C.-based Foley, Hoag & Eliot.

"These guidelines are intended to be responsive to these consumer preferences and to provide our members with a competitive advantage in designing their consumer applications and services."

But Alan F. Westin, Professor of Law and Government at Columbia University, said that some of the recommendations were "pretty bland" and that a study he led last year found considerable concern by the public about privacy threats. "Responding to these consumer concerns is important to your business case," he said.

In a keynote address, Ira Magaziner, Senior Advisor to President Clinton for Policy Development, said a framework for global electronic commerce was a necessary condition for it to thrive. He told the Forum that the industry should be allowed to police itself as too much regulation could stifle growth. But he warned that if the industry failed to respect the privacy of consumers it was likely that pressure would grow for government regulation.

Janet Koehler, chair of the Symposium and Senior Manager, Electronic Commerce at AT&T Universal Card Services, made the point that there were many benefits for the consumer.

"What makes this technology 'smart,' is the empowerment it provides to the consumer to access benefits, services or information in a highly personalised, efficient and secure environment," she said.

The two day symposium was designed to educate industry members about federal and state initiatives which may affect Smart Card applications and also educate governmental officials about the technology and its current and potential applications. The aim was also to foster a continuing dialogue among representatives of both communities.

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Reloadable Visa Card in HK

A reloadable Visa Cash card has now been launched in Hong Kong following success with a disposable Prime Visa Cash card launched in August 1996.

Bank of China Group, Standard Chartered Bank are now offering cardholders the addition of a reloadable stored value payment function on their existing ATM cards. Initially, cardholders will be able to load and unload their cards at 100 designated bank ATMs throughout the territory

In the next phase, cross-bank reloading through the JETCO Network will enable cardholders to load value onto their Visa Cash cards at either a Bank of China Group or Standard Chartered Bank ATM regardless of which bank they hold their accounts.

Visa says that as other banks in Hong Kong launch reloadable Visa Cash cards in the second half of this year, cardholders will be able to reload through these bank ATMs as well.

A number of new merchants, including Mobil Oil and Hagan Daz, have signed up to accept the Visa Cash, adding to the 1,000 merchants already participating.

Disposable Visa Cash cards will continue to be available for sale at 150 designated Bank of China Group branches and all Standard Chartered Bank branches.

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Bank at Home Project

Citibank and VeriFone are to jointly develop a Smart Card consumer banking service based on VeriFone's VeriSmart system.

The bank will distribute VeriFone Personal ATM devices to its customers to allow them to download electronic cash to Smart Cards, securely and conveniently, in the privacy of their home or office.

VeriFone's VeriSmart client/server system will link the Personal ATM device and Citibank's centralised customer computer service.

Henry Lichstein, Citibank Vice President responsible for Smart Card development, said if customers could get to a phone line, they could get cash.

The VeriFone Personal ATM device is a hand-held Smart Card reader allowing customers to connect, via any telephone line, directly to their bank account and download electronic cash onto their stored value Smart Card.

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New Card from Schlumberger

Schlumberger has announced the latest member of the Payflex microprocessor Smart Card range, the MicroPayflex, designed for loyalty and electronic purse applications.

The company claims that the cost of the card is attractive because it is based on a high volume Smart Card chip offering 320 bytes of re-programmable memory, instead of the usual 1K bytes or more. This memory is complemented by special functions built into the operating software, such as transaction logging.

As loyalty schemes evolve, users can upgrade cards to existing Payflex cards which offer up to 4K bytes of memory, allowing them to add major new applications to a system such as an electronic purse or ticketing.

MicroPayflex provides a simple and fast means of implementing loyalty functions such as discounting, electronic couponing or bonus points, combined with the security encryption techniques used in electronic purses. Applications can call on library functions, for example, to provide proof of transaction, PIN verification, authentication using the DES algorithm and control of file access.

Portions of memory can also be used or rented by third party companies to provide electronic couponing or co-branding functions.

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China Orders Chips from US

Silone MagCard, China's largest Smart Card manufacturer and supplier, has ordered one million Smart Card chips from YourNet, Inc., a Kansas City, USA-based company.

The chips contain YourNet's open architecture, multi-function operating system and are based on Siemen's SLE44C42S Smart Card controller, enabling existing technologies and currently used services to be combined and offered through a single card. The first chips will be delivered to MagCard's Shenzhen-based manufacturing facilities by early Autumn.

MagCard says the cards with the YourNet chip will be used for multiple government projects, the first focussing on automating paper procedures between Chinese companies and the government. Other projects will include driving licenses and health insurance information.

The two companies have formed an alliance under which MagCard will include the YourNet operating system on all the Smart Cards it manufactures and will also fabricate cards for YourNet.

Long Wang, MagCard's President, said: "We entered the alliance with YourNet because we believe that using the YourNet operating system will lead us to a very competitive position in the Chinese market."

Chris Goeltner, Director Smart Card ICs, North American for Siemens Components, said the YourNet operating system offered easy migration to the next generation of Siemens chips, allowing for further growth of the Smart Card market in China.

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New Card Readers from Philips

Philips has announced three Smart Card readers for PCs and workstations.

The PE 132 can be hosted on a PC or workstation either as a connected or integrated device. It needs

no external power supply, and accepts cards with T=0, T=1 (transparent) protocols for microprocessor cards, as well as I²C and S=10 for memory cards.

Target markets are any application in a PC environment - desktop or workstation - and more specifically: workstation security, access control to remote servers or EDP networks, secured electronic data interchange such as electronic payment, EDI and secured e-mail.

The PE 100 comes in PCMCIA type II card form and is aimed at developing mobile applications using Smart Cards on portable PCs. It accepts cards with T=0, T=1 protocols for microprocessor cards, as well as I²C for memory cards.

It addresses applications in portable and mobile environments, and more specifically: access control to EDP resources, e-mail, remote servers, and networks; secured EDI, electronic payment, reading of electronic purse content, loyalty programmes and games.

Another reader, the PE 135, designed for the French health card programme, hosts the health card application in its memory, allowing immediate completion of the health transaction on-site by doctors or practitioners. The PE 135 handles the French Health protocol for microprocessor cards, as well as for the host (PC) link, through the RS232 port on an RJ45 connector.

It also features a chaining capability for one other reader or additional device (such as a printer), through a second RS232C port on a DB9 connector. When using this chaining capability, up to three readers can be operated on a single PC - two external ones, and one integrated one - when the application requires multiple cards to be used for particular transactions.

It is targeting at the health professionals market (such as hospitals, clinics, laboratories and pharmacists). Additional uses of the card cover access control to hospital buildings, personnel identification, access control to workstations or PCs, authentication of secured access rights to data bases, secured files and confidential patient information.

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Schlumberger Plant in Mexico

Schlumberger Electronic Transactions has officially opened its Smart Card manufacturing plant in Mexico City to serve markets in Mexico and Latin America.

Last year, Schlumberger acquired an 80 per cent interest in its partner, Printer, Mexico's leading magnetic stripe card manufacturer and bank cheque personaliser, to form Schlumberger-Printer (*SCN November 1996*).

Schlumberger is investing US \$40 million in the 5,000m² facility which currently produced some 20 million plastic cards per year. Manufacturing is expected to grow to as much as 50 million cards in 1997, with Smart Cards accounting for most of the production.

Mexico telco, Telmex, has awarded Schlumberger Electronic Transactions a major contract to deliver 25,000 Smart Card-equipped public telephones - half of which will be assembled locally in Mexico. It is estimated that Telmex's annual card requirements may ultimately reach 200 million a year.

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PGP and Schlumberger Team

Pretty Good Privacy, Inc. (PGP), provider of digital-privacy software, and Schlumberger Electronic Transactions, supplier of Smart Cards and systems, have announced a strategic alliance for the development and marketing of integrated network security products.

The companies will develop and market products that integrate PGP's encryption technology with cryptographic Smart Cards from Schlumberger to provide communications security across corporate intranets and the Internet.

Schlumberger's Cryptoflex Smart Cards which support cryptographic functions such as key and digital certificate storage and digital signatures, will

be used in the product offering for secure e-mail and other communications.

PGP released its first commercial product, PGPmail 4.5, in February 1997 and has since released products for disk encryption, Internet phone encryption and a web-based privacy product.

"Schlumberger's products give users of PGP encryption the portability and convenience of Smart Card technology," said Tom Steding, President of Pretty Good Privacy. "Now you can carry your PGP keys as easily as you carry your credit cards."

James David, Vice President and General Manager of Schlumberger Smart Cards and Systems, North America, commented: "The combination of public key encryption and Smart Card technology provides the strongest and most convenient security and digital authentication available."

Contact: *Isabelle Ferdane-Couderc, Schlumberger - Tel: +33 (0)47 46 70 20 Fax: +33 (0)1 47 46 68 66. E-mail: ferdane@montrouge.et.slb.com*

Remote Home Banking Application

Gemplus Corporation in the US has announced that its GemXplore family of SIM cards is now compatible with GSM Phase 2+, the latest phase of the GSM (Global System for Mobile Communications) telecommunications standard that supports multi-application development.

It also announced that it has completed the development of the first GSM Phase 2+ application for home banking working with Cellnet, a UK GSM network operator, and Barclaycard (see cover).

The remote home banking application allows Barclaycard customers to use their Cellnet mobile phones to access account information through the phone's screen.

Gemplus supplies SIM cards to more than 180 GSM operators worldwide, and is the largest supplier of SIM cards to the US PCS market.

Contact: *Jackie Shambrook, Gemplus, UK - Tel: +44 (0)1705 488037. Fax: +44 (0)1705 472081. E-mail: jackie.shambrook@ccmail.edt.fr*

Mondex Success in Canada

The Mondex electronic cash system, launched in Guelph, Ontario, Canada, is setting a fast pace with the number of participants exceeding expectations.

Since it was introduced in the City of Guelph on 13 February, more than one in 20 residents are already carrying the Mondex card. In just over seven weeks, there were over 5,000 cardholders - more than half of the target of 8,000 to 10,000 within a year, and about \$500,000 has been issued in electronic value.

Canadian Imperial Bank of Commerce and Royal Bank of Canada, owners of Mondex in Canada, have over 90 per cent of merchants in the city now offering Mondex as a payment choice and 23 automated banking machines now dispense Mondex electronic cash.

Bell Canada has converted and installed 250 new Millennium payphones in Guelph and has deployed 2,500 Vista 360 personal screen phones throughout the community, all of which accept Mondex.

Credit Union Central of Canada is participating in the launch through two branches of the Guelph and Wellington Credit Union Limited.

Parking meters, pay and display parking and vending machines will be able to accept the card over the next few months and Hongkong Bank of Canada, a member of the Mondex Canadian alliance, will be participating in national roll-out.

Mondex Pilots in Ireland

National Irish Bank, through parent company National Australia Bank, and Ulster Bank have purchased the Irish franchise for Mondex and are forming a joint company to introduce the electronic cash Smart Card, starting with pilot schemes next year.

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Smart Terminals for Germany

Australia-based Intellect has announced that its subsidiary, Intellect Europe, has won a major order for 2,500 electronic payment terminals in the German petroleum market. The order, from Aral, is estimated to be worth more than A\$2 million.

The multi-function terminals will initially process credit, debit and Geld Kartes - the German banks' Smart Card electronic purse card - at Aral's 2,500 petrol stations throughout Germany. This will progress to acceptance of all cards.

Klaus Wollermann, of Aral, said: "With this solution, we will be able to provide all payment functions on one terminal, reducing space requirements and cost for individual petrol stations."

Contact: *Geoff Gander, Intellect - Tel: +61 9 333 4333. Fax: +61 9 470 5002. Mobile: 0417 914 137. E-mail: geoff.gander@intellect.com.au*

Baseball League Cards for Fans

Chicago White Sox will issue Major League baseball's first Smart Cards next month. Fans can buy any of the four card designs for US \$20 and use the stored value for purchases.

The application was developed by PreciSmart Card Systems, who teamed with Smart Card manufacturer Gemplus, transaction automation company VeriFone, and Tagent Associates, provider of arena and stadium point of sale systems.

Contacts: *Scott Reifert, Chicago White Sox - Tel: +1 312 674 5300. Jim Lout, PreciSmart - Tel: +1 405 752 5550. E-mail: jlout@precis-scs.com*

Fortronic Testing Terminals

De La Rue Fortronic has delivered EMV (Europay, MasterCard and Visa) - compatible terminals to key financial institutions for evaluation and co-development of their host systems.

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SET Transactions on the Internet

Electronic commerce developments have taken a giant leap forward with the completion of safe transactions over the Internet using SET, the Secure Electronic Transaction standard.

Last month, Europay International announced the successful completion of the world's first secure cross-border payments with three distinct transactions by Europay Norway and PBS Denmark all using Eurocard-MasterCard cards as the payment facility.

Europay Norway's CEO, Roar Steen, bought a novel from a Danish book store over the Internet, and Per Ladegaard, CEO of PBS Denmark, purchased a flight ticket from Norway's largest airline, Braathens SAFE. At the same time, Norway's first national SET-based transaction was also carried out to buy a ticket for a domestic flight directly via the Internet. The IBM Net Commerce technology served as the platform for all these transactions.

Roar Steen commented: "Openly giving out card numbers over the Internet is not safe: however, the use of SET-based certificates safeguards all parties to a transaction by fully securing payments between cardholders and merchants."

Per Ladegaard added; "Our project has been a huge success. As a result, trade and payment over the world wide web will be commercialised in Denmark over the next few months."

Technology by different manufacturers

Visa International also claimed a "first" last month for its end-to-end Internet transactions because the SET technology used was developed by two different manufacturers. IBM developed the payment gateway linking Citibank to the Internet, and Verisign produced the digital certificates which make it possible for sensitive financial information to be used safely on the Internet.

In Singapore, Stephen Yeo, Chief Executive of Singapore's National Computer Board, used an electronic version of a Citibank Visa card to purchase flowers and crockery from SET-certified merchants in Singapore.

A Citibank Visa card in Taiwan was used to make purchases at the same Singapore retailers.

Visa says the SET technology will undergo further trials and, from the middle of 1997, several thousand Visa cardholders from participating banks in Singapore will be able to make secure SET purchases from a wide range of local merchants.

Visa is involved in pilots in Korea, Singapore, Taiwan and Japan and plans to link all four projects in the region for cross-border transactions by the end of the year.

Compatibility testing

Visa and MasterCard have also announced results of SET compatibility testing being conducted by SAIC@Yourservice, a business unit of Science Applications International Corporation (SAIC).

The testing was carried out to ensure compatibility between software vendor's implementations of SET and to ensure that the basic specification was complete and unambiguous.

COST, GlobSet (formerly Interval Systems), RSA, VeriSign, GTE and IBM took part in the initial round of testing and each was able to demonstrate compatibility of their SET implementations against the SET Draft Reference Implementation.

The next step for vendors developing SET-compliant software will include interoperability testing and ultimately certification by the consortium.

Once a vendor's product has been certified, a SET mark will be issued to that product. The first of these vendor certifications are expected in August.

Steve Herz, Senior Vice President, Electronic Commerce at Visa, said: "The successful completion of this testing represents an important step towards building consumer trust and confidence in Internet commerce."

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Card Demo at CTST Show

The CardTech/SecurTech (CTST) conference being held in Orlando, Florida, this month, will emphasize its premier position as the world showcase for Smart Cards with a live multi-application contact and contactless conference card for the 7,000-plus attendees from some 60 countries.

Echoing the theme of the show, The Art of Implementation, the card will enable attendees to experience using advanced card technology in a variety of functions, including electronic purse, lunch tickets, proceedings pick up, seminar access, loyalty, lead tracking and message pick up.

Ben Miller, conference founder and chairman, said: "This is not a pilot system; it is a live application. We are doing useful things with the card to make the conference experience more productive and pleasant for registrants and exhibitors alike.

"At the same time, we are demonstrating to our thousands of visitors from banks, universities, government and other industries, that they too can make their envisioned card systems a reality."

Industry teamwork

The system was developed by a partnership headed by **Gemplus** which is providing its GemTwin Smart Card product which includes a magnetic stripe, a 1K byte EEPROM contact chip and a Mifare radio frequency chip supplied by **Philips Semiconductors**. Gemplus is also co-ordinating project management and developing the card personalisation system, proceedings distribution and lunch ticket applications.

Each card will carry \$4 of value in an electronic purse that can be redeemed at soda and snack machines located in the exhibit hall.

The SmartCity electronic purse program from **Product Technologies, Inc.**, is being used for the application. Vending machine interface modules are being supplied by **Debitex**.

The first 2,000 seminar registrants will receive a Value-Checker key chain fob from **Oki Advanced Products** which will enable them to see the balance on the electronic purse and the last five transactions.

Tickets for box lunches are stored on the contact chip. Registrants will insert their card into a point of sale reader provided by **Verifone** and a ticket will be deducted from the card.

Each seminar registrant is entitled to the 1,600-page conference proceedings. This information is encoded on the contact chip. Registrants picking up the Proceedings will have their card read at the Proceedings Distribution table to confirm their eligibility.

Contactless Chip

The contactless chip is encoded with seminar privileges for paying registrants, speakers and press. At meeting room entrances, the card is tapped on the reader and a pleasant tone and computer screen welcomes the individual.

Points are awarded for seminar attendance and can be redeemed at the conference Redemption Center when attendees turn in their Seminar Evaluation booklet. The seminar room access and loyalty applications were developed by systems integrator **3-G International**.

Points can be redeemed for collectable Smart Cards from US West, MasterCard, Western Wireless and other companies that have donated cards from real-world applications to the loyalty program.

Magnetic stripe functions

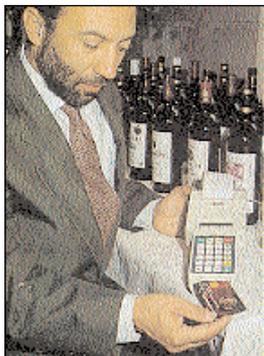
Many CTST exhibitors will be equipped with terminals to capture information from attendee cards via the magnetic stripe so they can follow up with additional information after the show. This function is part of the registration system supplied by **Galaxy Registration**, a contractor to CTST.

When a card is inserted into a reader in the conference message center, the cardholder is identified by information on the magnetic stripe and any messages for that individual will be displayed. This eliminates the possibility of anyone else seeing a person's messages.

The functions of the card are explained to attendees in a 16-page "Card Booklet" provided by **William Exline**. The booklet includes a pocket for storing the card when not in use.

Smarter Wine from Spain

Right:
The Smart Card system in use in Ribera del Duero [Photo courtesy of Wine and Spirit International]



The Denominacion de Origen (DO) in Ribera del Duero, Spain uses a smart system to regulate each year's harvest of grapes.

As far as SCN is aware it is the first application of its kind in the world.

Below Right:
The Absec 8500 system [Absec]

A pilot scheme was trialed in 1995 and the system became fully operational in the entire wine region during 1996.

Each vine grower is given a card which contains the holder's name, address, location of land, grape varieties, conduction system (goblet or trellis), number and age of vines. The card also holds a record of all the deliveries made by the holder during the past harvest.

When the grower delivers grapes to the producer they must present their card to an inspector of the Consejo Regulador. The inspector inserts the card into their computer and keys in the amount of grapes and variety delivered. The system records details of the delivery including the time and date.

The system is programmed with the amount of grapes allowed to be delivered according to the amount of land owned. For example, a grower who owns only one hectare is only allowed to deliver a maximum of 7000 kgs. If they attempt to deliver more the system will not allow it, beeping to signal the excess. Further checks are also in place. For example if a grower has only white grapes registered and tries to deliver black grapes the system will alert the inspector.

Javier Zaccagnini, President of the DO, told SCN that at present 6,500 vine growers, 80 producers and 80 inspectors have been issued with cards. In the coming months the DO expects to issue just under 1,000 cards.

The cards are manufactured by Philips and Siemens. The card reader terminals are supplied by Bull and Philips. They are called respectively, the TMF and PE112.

Zaccagnini says that since introducing the system the DO has gained increased control on possible fraud, can take instant action when an incident does occur and can clarify the cause. He points out that such incidents are not always due to an attempt to defraud the system.

Daily information is available on the harvest's progress and instant information can be obtained at the end of the harvest. Before the Smart Card system was installed all records were kept manually on paper and results were not known until three months after the harvest had finished.

The system has also updated the DO's database of vine growers and has speeded up delivery time which is beneficial for the quality of the wine and all involved.

Zaccagnini said the system will be developed within the wine region; and 1998 will see the introduction of new applications.

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More Smart Schools



In March this year, the Garibaldi School in Nottinghamshire got smart with the introduction of a Smart Card system designed and implemented by Absec (see SCN October 1996).

Approximately 1,000 cards were issued to pupils initially for use in the canteen. Cards will be issued each year to the latest intake of pupils. Further applications will include attendance registration and access control to improve security.

The school is also considering extending the scheme to the local bus company which would further reduce the pupil's need to carry cash.



The cards and terminals are designed and manufactured by Absec. The customer can choose from the standard EEPROM chip card with Absec data encryption or the advanced chip card which is also password encrypted. The advanced version offers additional storage capacity, useful if extra functions are to be added.

The Absec 8500 system is in use in Rhodesway School in Bradford and Holy Cross School in Kent. St Columb's College, Northern Ireland is due to install the system soon. Absec say they plan to continue installing the systems in both educational and commercial environments.

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Pints on a Smart Card

Since April 1996 a small London based pub chain have been using a Smart Card system in five pubs, including the Black Lion (*see front page*). Card holders can use their cards as a means of payment, for discount, loyalty, ID and access control in any of the pubs involved. The system allows the landlord to assess what is bought by customers and when. It can also be used to promote special offers and promotions.

The 2K memory cards SLE442 are manufactured by Gemplus, as are the GCR 400 and GCR 500 terminals. At present 3,000 cards have been issued.

HoneyCombe Leisure Plc in the North West are currently installing the same Smart Card system in their pubs and hotels. They have implemented 30 terminals and over 5,000 cards to date and plan to increase the number of sites using the system to 40 over the next 12 months.

At present only 35 per cent of the card is used. Future plans include adding product profiling to the cards.

Contact: Bob Cuthbertson, Managing Director, Smart Card International - Tel: +44 (0) 1482 650999. Fax: +44 (0) 1482 652271.

Left:
Smart Card used for snack food payments in schools [Absec]

Below Left:
Holidaymakers use Smart Card for drink payment [Europay International]

Holidaymakers Pack Their Cards



A survey carried out by Europay International has found that 37% of European holidaymakers will rely on plastic cards more than cash and cheques this summer. Europay commissioned the survey to assess how to make payment and access to cash easier for both European banks and their customers. Currently more than 150 million bank cards across Europe provide access to payment and cash through Europay/MasterCard brands such as Eurocard-MasterCard, eurocheque, edc/Maestro and Cirrus.

Louis-Noël Joly, Europay's Director and CEO commented, "We were not surprised to see travellers depending more on plastic cards."

Richard Tischler of Europay International told *SCN* that from July banks across Europe would begin to re-issue payment cards with a chip. He estimated it would take between five and seven years to convert the entire card base. The drive toward chip technology was motivated by a desire to cut costs and reduce fraud, he said, and described the purse function as an added bonus.

According to this prediction, in the near future the holidaymakers questioned will be packing their Smart Card along with their bucket and spade.

Contact: Richard Tischler, Europay International. Tel: +32 2 352 5304. Fax: +32 2 352 5732.

G&D Moves Into Russian Market

German Smart Card manufacturer, Giesecke & Devrient GmbH, has set up a joint venture with the Russian companies Znak/Perm and Znak/Moscow to provide services for Smart Card projects in Russia. The new enterprise, to be based in Perm, will be known as G&D-ZnakCard Z.A.O.

G&D will be contributing its expertise in turn-key SmartCard based solutions to the joint venture while the new company will benefit from the Znak companies' branch infrastructure covering the whole of Russia.

Employees of the new company will be trained at G&D's headquarters in Munich to familiarise themselves with G&D's broad range of products, encompassing Smart Cards of all types, card-based ID systems, terminals and portable card readers as well as GSM and pre-paid phone cards for the flourishing Russian Telecommunications market.

Contact: *Ulrike Gaissert, Giesecke & Devrient - Tel: +49 89 4119 1864.*

GemCore from Gemplus

Gemplus has launched GemCore, a kit of components designed for manufacturers of electronic devices.

With GemCore, a Smart Card interface can be integrated into any type of electronic equipment, rapidly and at a low cost: computer peripherals (keyboards, VDUs), public phone booths, automatic dispenser machines, portable computers, electronic personal assistants, telephones etc., as well as conventional stand-alone Smart Card readers.

GemCore consists of two modules - an Interface Chip: a component which handles all electronic signals interacting with the card; and a Controller: a microcontroller containing the operating system in charge of communications between the Smart Card and the integrator system. Gemplus says GemCore incorporates all the functionalities required to interface with any card.

Contact: *Ms Flavie Gil, Gemplus, France - Tel: +33 (0)4 42 36 56 83. Fax: +33 (0)4 42 36 51 17.*

Euro Card Plan May be Too Late

European Union plans to issue a "Euro Card" electronic purse with the stored value in Euros, the proposed new currency for the European Monetary Union, will be discussed later this year.

A draft report by an EU sub-committee has been prepared and will be commented on by Member states before it is considered by the European Parliament.

A key element in the proposals is that the planned European Central Bank will control the electronic purse. The report says the cost of the cards should not fall on consumers or business users, but should be financed by renting space on the chip to third parties such as credit card issuers, telecommunications companies and retail organisations offering loyalty cards.

It is also suggested that Member states might want to use the cards for additional purposes such as an ID card, a driving licence or social welfare benefit card.

However, the Euro Card project may be too late. There are a growing number of national electronic purse schemes in Europe - Austria (QUICK), Belgium (Proton), Denmark (DANMØNT), Finland (Avant), Germany (Geld Kart), Netherlands (Chip Knip), Portugal (PMB), Spain (Visa Cash) and Sweden (Cash).

Several Mondex applications are in use in the UK and will be followed later this year by Visa Cash. France is also planning a pilot scheme in mid-1998.

HP to Acquire VeriFone

Hewlett-Packard Company, the second largest computer supplier in the United States, is to acquire VeriFone, provider of electronic transaction systems, in a stock-for-stock merger valued at around US \$1.18 billion and plans to accelerate Internet-based commerce and Smart Card applications. VeriFone will operate independently as a wholly-owned subsidiary of HP.

Contact: *Mark McMurtrie, VeriFone - Tel: +44 (0)1895 824031. E-mail: Mark_ml@verifone.com*

Banks Join Visa Cash in Japan

Several more banks are to join in the Visa Cash pilot in Tokyo, Japan, bringing the total to nine major banks and six major card companies.

What began as a small test of stored value technology in the highly urbanised shopping environment of the Shibuya area of Tokyo, has now evolved into an industry-wide test of chip card technology in Japan, promising to pave the way for a change over from magnetic stripe to chip technology in the Japanese payments card market.

The banks plan to issue more than 100,000 disposable and stand-alone reloadable Visa Cash cards, as well as the Visa Cash stored value function incorporated as a reloadable feature onto ATM cards and chip-based, multi-function credit cards.

“The Japanese banking industry has embraced the concept of chip technology with an eye on both the immediate and future benefits it will bring to the payment card industry,” said Dennis Goggin, President, Visa International Asia-Pacific.

Visa members participating in the Shibuya project include Bank of Tokyo-Mitsubishi, Dai-ichi Kangyo Bank, Fuji Bank, Sumitomo Bank, Tokai Bank, Asahi Bank, Sakura Bank, Daiwa Bank, Yokohama Bank, DC Card Co., UC Card Co., Sumitomo Credit Service Co., Million Card Service Co., Credit Saison Co. and Nippon Shinpan Co.

Retail participants include more than 2,000 merchants that are part of the Tokyo and Seibu conglomerates, movie theatres, parking lots, the local railway and Coca-Cola (which will supply Visa Cash compatible vending machines).

Manufacturers taking part include Toppan Printing, Dai Nippon Printing, Kyodo Printing, Shoei Printing, Schlumberger, Gemplus, Omron Corporation, Matsushita Electric Industrial, Nihon VeriFone, Memorex Telex, NTT Data Communications Systems Corporation, Toshiba Corporation, TEC Corporation, Hitachi, Fujitsu, NEC Corporation, Oki Electric Industry, IBM Japan, NCR Japan, Sanyo Electric and Kubota Corporation.

Contact: Jeff Perlman, Visa International Asia-Pacific - Tel: +65 437 5513. Fax: +65 437 5567.

Gemplus to Manufacture in Asia

Gemplus has taken a 51% equity stake in Secur-Card Technology Pte Ltd., a leading manufacturer of high-end financial cards for the Asian market, and will extend output to Smart Cards for the Asia-Pacific region.

Secur-Card Technology, a Singapore-based company, valued at \$20 million (£11.5 million) is a certified manufacturer for both Visa and MasterCard credit cards and manufactures cards for most of the leading banks in Asia at its two plants - one in Singapore and the other in Zhuhai, China, which have a combined capacity to produce 100 million cards annually.

Contact: Ms Tarvinder Dhillon, Marketing Communications Manager, Gemplus Technologies Asia - Tel: +65 771 9140. E-mail: tarvinderdhillon@ccmail.edt.fr

Multi-application Platform

Eight leading silicon manufacturers and Smart Card companies, led by Mondex International, are joining together to introduce MULTOS - a new “open” high-security operating system for Smart Cards with plans for products to be commercially available from first Quarter 1998.

MULTOS will be available on a non-proprietary “open systems” basis to ensure that it becomes standard for Smart Card issuers in all sectors. Licenses to use the system will cost between £100 and £200.

Companies involved are Dai Nippon Printing, Gemplus, Hitachi, Keycorp, MasterCard International, Mondex International, Motorola and Siemens. They have agreed to form a consortium, called MAOSCO, to drive the adoption of MULTOS as an industry standard and to manage its on-going development.

Nick Hapgood of MAOSCO and Richard Phillimore of MasterCard refused to say how much each company had invested in the consortium. They did however, describe the amount as ‘modest’.

SACMan Fingerprint Biometric

SAC Technologies Inc., has announced a new fingerprint biometric security solution for positive identification which can be stored in a Smart Card or magnetic stripe card.

Called SACMan, the solution uses SAC's Vector Analysis technology and fingerprint imaging to produce a bio-key record by converting the unique aspects of a fingerprint into a "model" which is different from the traditional "minutia" approach used in most fingerprint biometrics. The bio-key can be stored in 3Kb or compressed to 1Kb of memory.

The system is claimed to positively identify an individual in less than three seconds, including the time to search a large database.

False rejection rate of .005%

SAC claims a false rejection rate (FRR) of .005% while maintaining a false acceptance rate (FAR) of 0.0%. This test was conducted in Bemidji, Minnesota, last year at the Paul Bunyan Mall. Full page advertisements were run in two local newspapers every weekend for two months to get participants who represented the population at large.

The company says that over 10,000 fingerprints were enrolled and verified during the test and all participants signed a form of authentication for each registration and look up.

OEM and licensing arrangements are available from SAC Technologies who are offering a developer's toolkit at US \$849.

Contact: Myron Norenberg, SAC Technologies - Tel: +1 612 835 7080. Fax: +1 612 835 6620.

Contactless ID Card Plan

A partnership to develop a contactless, chip-based identity card has been formed between Gemplus Corporation and IDMATICS, a subsidiary of Thomson-CSF. Under the agreement, IDMATICS will integrate Gemplus' contactless Smart Card technology into their high security document management and production systems.

The integration of contactless technology into IDMATICS' systems will facilitate the replacement of simple identity documents with highly secure portable records which might include official documents such as healthcare cards, passports or drivers licenses.

Gemplus says that documents developed with the combined technology will feature a large information storage capacity, protected read access, controlled updating by authorised entities and automatic card authentication.

IDMATICS has developed management and production systems for national identity cards and residents cards in many different countries.

Contacts: Ms Tarvinder Dhillon, Gemplus Singapore - Tel: +65 771 9140. Fax: +65 773 0648. Jean-Jacques Meuleman, IDMATICS, France - Tel: +33 (0)1 34 80 76 21. Fax: +33 (0)1 34 80 76 00.

Other News

Financial services company, GE Capital, a subsidiary of US-based General Electric, is to acquire "a significant equity interest" in Gemplus and form an alliance to work together to develop new products and services. GE Capital is a leading issuer of private label cards and is involved in almost all areas where Smart Card technology is being applied. **Contacts: Anthony Zhender, GE Capital - Tel: +1 203 357 4728. Ms Jackie Shambrook, Gemplus - Tel: +44 (0)1705 488037. Fax: +44 (0)1705 472081.**

The Smart Card Industry Association (SCIA) has formed two new committees - a Security Committee chaired by Gilles Lisimaque, Senior Vice President and Chief Technology Officer at Gemplus; and a Standards & Specifications Committee chaired by Jim Russell, President of Russell Technology. **Contact: Dan Cunningham, SCIA - Tel: +1 301 984 4210**

Smart Card Diary

Due to pressures of space this month we are unable to bring you the Smart Card Diary. Please see our website (the address is on page 82) for a detailed listing of conferences.

Integrated Circuit Card Standards and Specifications - Part 8 :

Inter - Industry Commands for Interchange.

So far we have looked at the base standards for Integrated Circuit Cards (ICCs). Remember the whole purpose of standards is to achieve interoperability between devices produced by different manufacturers. Clearly the physical dimension of the card are fundamental including of course the electrical connection plate. We have also described the electrical signals and the underlining communication protocols. In last months discussion we looked at the structure of the commands by which a terminal can interchange information with the integrated circuit card.

Now we have alluded many times to the difference between International standards and particular specifications. Standards typically allow options, sometimes many options. There are code words

buried in these standards that tell you what is mandatory and what is optional. SHALL or SHOULD are mandatory whilst MAY is an optional term. In this months discussion we are going to have a look at the Inter - Industry Commands for Interchange as defined in ISO 7816-4. These commands are in fact optional and an integrated circuit card may totally conform to ISO 7816-4 without issuing any of these commands as long as it obeys the basic syntax of the command structure.

Europay, MasterCard and Visa have produced what is generally referred to as the EMV specification. These specifications, which are based on the ISO 7816 standard define the particular commands which an EMV compliant device would need to perform. We shall look at the EMV commands next month and concentrate on the ISO 7816-4 commands this month.

Last month we referred to the command APDU (Application Protocol Data Unit) which is sent from the terminal to the integrated circuit card. The structure of this APDU is reproduced in *figure 1*:



Left:
Figure 1
Command APDU
Structure

The Class Byte (CLA)

The first byte in the header is the class byte. In the past this byte has been used by the various suppliers of IC cards operating systems as a way of identifying their particular commands.

The part 4 of the standard attempts to give more meaning to the class byte by using it to define conformance or otherwise with the structure and coding used in the standard. The following tables define the proposed use of the class byte.

If readers cannot quickly follow the logic of these tables they are excused. However, we have recorded them here in the event that they may serve some useful purpose in the future.

Value	Meaning
'0X'	Structure and coding of command and response according to this part of ISO/IEC 7816 (for coding of 'X' see table 2)
'10' to '7F'	RFU
'8X', '9X'	Structure of command and response according to this part of ISO/IEC 7816. Except for 'X' (for coding see table 2) the coding and meaning of command and response are proprietary.
'AX'	Unless otherwise specified by the application context, structure and coding of command and response according to this part of ISO/IEC 7816 (for coding of 'X' see table 2).
'B0' to 'CF'	Structure of command and response according to this part of ISO/IEC 7816
'D0' to 'FE'	Proprietary structure and coding of command and response
'FF'	Reserved for PTS

Left:
Table 1
Coding and meaning
of CLA

Smart Card Tutorial

Right:
Table 2

Coding and meaning of nibble 'X' when CLA='0X', '8X', '9X' or 'AX'

b4	b3	b2	b1	Meaning
x	x	-	-	Secure messaging (SM) format
0	x	-	-	<ul style="list-style-type: none"> No SM or SM not according to standard No SM or no SM indication Proprietary SM format
0	0	-	-	
0	1	-	-	
1	x	-	-	<ul style="list-style-type: none"> Secure messaging according to standard Command header not authenticated Command header authenticated
1	0	-	-	
1	1	-	-	
-	-	x	x	Logical channel number (b2 b1 = 00 when logical channels are not used or when logical channel # 0 is selected)

Perhaps the most important thing to note is the use of CLA = FF_{hex} which is used for protocol type selection as discussed perviously.

Instruction BYTE (INS)

The standard defines 18 commands which have varied between all combinations of mandatory and optional. They are now all optional which allows considerable flexibility with a fair amount of confusion.

Right:
Table 3

INS codes defined in ISO/IEC 7816

Value	Command Name
'0E'	ERASE BINARY
'2.0'	VERIFY
'70'	MANAGE CHANNEL
'82'	EXTERNAL AUTHENTICATE
'84'	GET CHALLENGE
'88'	INTERNAL AUTHENTICATE
'A4'	SELECT FILE
'B0'	READ BINARY
'B2'	READ RECORD(S)
'CO'	GET RESPONSE
'C2'	ENVELOPE
'CA'	GET DATA
'D0'	WRITE BINARY
'D2'	WRITE RECORD
'D6'	UPDATE BINARY
'DA'	PUT DATA
'DC'	UPDATE RECORD
'E2'	APPEND RECORD

Erase Binary

This command is used to set part or all of an elementary file to its logically erased state. The

parameters P1 and P2 in the command header APDU are used to define the offset address of the first data unit to erase. The command assumes that the elementary file (EF) has previously been selected. The data field in the body of the APDU may be used to set the offset of the first data unit not to be erased.

Verify

The principle purpose of this command is to allow the verification of a password. The password is sent as part of the command data. Here the P2 parameter is used as a code to define the whereabouts of the relevant reference data in the card. We will have more to say about aspects of security later in this series.

Manage Channel

Logical channels allow one or more independent activities between the terminal and one or more DFs (Dedicated Files). It should be noted that commands and responses cannot be interleaved. Once a command to a particular channel is issued then the terminal must wait for a response before initiating a command to another channel. The manage channel command is used to open and close these logical channels.

External Authentication

This command is intended to authenticate an external identity (e.g the interface device (IF) or) to the IFC which then encrypts the number using its secret key. The resultant cipher is returned to the IC Card (using the external authentication command) which using the same key can check its correctness and hence the authenticity of IF. This proves that the IF and IC card are members of a set in that they share the same secret key. Another approach is to use a public key system which can achieve the same result without actually having to share the same secret key. Again the P1 and P2 parameter bytes are used to reference the algorithm and secret data in the card.

Get Challenge

The Get Challenge command is used in conjunction with the external authentication command to generate the challenge data which is normally a random number.

Internal Authentication

This command completes the bilateral authentication in that the IFD checks the authentication of the card. In this case the random data is sent to the IC card by the IFD. The card then replies with the enciphered version of the random data. The IFD can check this cipher to prove the authenticity of the card.

Select File

The inter industry commands defined in the standard are all effectively operations upon a file. It is the purpose of this command to select the relevant file prior to the necessary operation. The file remains selected until another invocation of the select file command. The file may be referenced either as a path description (discussed previously) or as a file name. Within the command header the P1 and P2 parameter bytes are used to select which addressing option is being used. The data body of the command then carries the information necessary to select the required file.

Read Binary

The Read Binary command is used to read data directly from the selected EF file. The P1 and P2 parameter bytes are used to choose the offset from the start of the file for the first byte to be read. The L_c byte in the data body of the command is used to define the number of bytes to be read. The main point to notice here relates to the data structure of a particular file. Quite clearly one cannot mix data stored in binary format with that recorded in a structured record format. A read binary command applied to a file stored in record structure would result in formatting information being mixed in with the data. Such an operation should be prohibited by the Card.

Read record

This command is used to read one or more records from an EF file. Normally the file would be selected with a select file command. However it is possible with this command to use a short EF identifier to select the particular file required. The P1 and P2 parameter bytes are used to establish the protocol of which record is accessed. It is also possible to read from a defined record until the end of the file. The L_c byte in the data body of the command is used to define the total number of bytes to be read. This command of course should be rejected if the selected file is not stored in a record format.

Get Response

The T = 0 communication protocol has a number of limitations compared with the newer T = 1 protocol. For instance the T=0 protocol does not allow data to be sent in both directions as part of one command. The Get response function allows you to obtain response data generated as part of a command which also contains data as part of the command, whilst using the T=0 protocol. This command is initiated by the IFD.

Envelope

The Envelope command may be used to overcome the lack of a chaining facility in the T=0 communication protocol. Accordingly it allows the IFD to assemble a command and data into a number of envelopes where the total data may exceed 255 bytes which is the normal limit of the T=0 communication protocol data transmission from the IFD to the ICC. Again this command is initialised by the IFD and is really only appropriate for the T=0 communication protocol. The concept of chaining using the T=1 communication protocol has been described previously.

Get Data

The Get Data command operates by retrieving primitive or constructed (containing more than one) data objects combined in a TLU format (Tag, Length, Value).

Write Binary

The Write Binary is the complimentary command to read binary. This command is used to write data into an EF file in an unstructured way (i.e not in a record format). The relevant file should previously have been selected by a select file command.

The actual physical writing of data to the memory of an ICC can be quite a complex operation. The process differs between EPROM and EEPROM memory. So far we have largely ignored the EPROM memory which requires the IFD to supply the memory programming voltage to the V_{pp} connector. This voltage varies (significantly) between the different chips which is why the necessary information must be contained within the answer to reset (ATR) interface bytes. The EEPROM devices generate the higher voltage required within the chip. It is also necessary for the correct timing sequence to be generated for the memory write operation. This operation typically takes 5mS. An erase operation also takes about 5mS. Some ICC devices have a page operation (typically 32 bytes) when the write and erase operation may be applied to a page at a time. Hence the writing of 32 bytes in this case will only take 5mS. Typically chips with EEPROM memory also allow an overwrite function. When the erase state of the memory is the '1' condition then this amounts to a logical 'AND' operation. If the erase state is a '0' condition the overwrite operation amounts to a logical 'OR' operation. Therefore a complete write operation may involve two steps, an erase followed by an overwrite. All of these processes should be transparent to the application programmer.

Write Record

This is the complimentary function to 'Read Record'. The command operates similarly to the read record, where the P1 and P2 parameter bytes are used to define the required record in the EF file. The command also allows the EF file to be identified by a short EF identifier which will override the currently selected file. The L_c byte in the data body of the command is used to set the length of the data block.

Update Binary

This Command is used to update some of the data already written in a binary (Elementary) file. The main reason for this command, in addition to the write binary command, is to allow different security characteristics to be set for each command.

Put Data

The Put Data command is the complimentary command to get data and is used for writing TLV encoded objects. This may be single primitive objects or a number of primitive objects combined in a single constructed data object.

Update Record

The Update Record allows a particular record in a file to be changed. Again the reason for the separate command from write record is to allow a more flexible security control.

Append Record

The Append Record command is used to either append a record at the end of a linear elementary file (EF) or for the writing of record number set in a cyclic elementary file. The use of a separate command allows a more flexible security structure.

Because these commands are defined on the integrated circuit card to terminal interface they should be considered either in the context of an application or as specific card generic commands.

The mixing of security between the operating system and an application is a dangerous process that we shall (must in standard terminology) examine in detail later. Of all these commands only a few relate to the basic application carrier device (manage channel, select file, get response and envelope). It is difficult to see how the more generic data storage and retrieval commands should operate independently of an application in the card. Whilst this may have been convenient with the early memory only chips its role in a modern multiapplication environment seems redundant.

Next month: The EMV Specifications
David Everett

In Brief

Japan Airlines Co. Is to run a Smart Card pilot in November and December of this year. A total of 1,000 participants will be able to make flight reservations using the Internet, complete procedures at the airport and shop in stores accepting the card. The pilot will run at Tokyo International Airport, Haneda. Smart Cards and readers compatible with a PC will be distributed to those chosen to participate. The system is being developed by Hitachi.

Loose Chippings

- A chain of health clubs, called Sally Gunnell Fit Stops after the 1992 Olympic Gold medalist, are to use Smart Cards to programme the fitness machines. The company involved in the venture is called Human Solutions.
- NTT is to invest in a company set up to guide Malaysia's information-infrastructure project. NTT is the only foreign shareholder. A high tech city called Cyberjaya will be developed which will have advanced laws and will trial the use of multi-functional Smart Cards.
- De La Rue has confirmed the acquisition of the Smart Card business of Philips for £54.2m. The company will trade under the name 'De La Rue Card Systems'.
- Philips Semiconductors has introduced a P83W858 Smart Card crypto controller offering higher levels of security and speed. Samples will be available from June of this year.
- The Hong Kong Monetary Authority (HKMA) may restrict moves by telecoms, retailers and parking companies wanting to link up with the soon to be launched Smart Card payment system to be used on public transport.
- Bank of Montreal and Canada Trust may be about to join the Mondex cash card consortium. Executives refused to confirm this but said they were considering all their options.
- The world's first pilot to test electronic purse transactions over the Internet has been announced by Visa International and Bank of America.



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News

Airport Security System

Face recognition technology will be used in a new biometric security system for airline passengers and baggage at the Langkawi International Airport in Malaysia, starting in July this year.

The face recognition technology, called Facit, has been developed by Visionics Corporation in the United States and will be licensed to TL Technology Research (TLTR), a Malaysian-based leader in airport security system development.

The system will use face recognition to authenticate passengers entering the departure lounge and subsequently boarding the aircraft. It will automatically match the traveller's face from a video camera to that encoded on a Smart chip on the boarding pass issued at check-in. Details of the scheme are expected to be announced later this month, including the use of other biometric techniques to ensure that luggage only from passengers who boarded the aircraft is loaded.

Contacts: Dr Joseph J Atick, CEO, Visionics - Tel: +1 212 327 7421. Fax: +1 212 327 7422.

E-Commerce Announcement

Microsoft, Hewlett-Packard and VeriFone have joined forces to announce plans to roll-out a Secure Electronic Transaction (SET) pilot and production solutions which will support the new Internet security standard. Merchants will be able to set up Internet storefronts, accept Internet payments and conduct SET transactions over the Web.

The solution includes Microsoft's Internet commerce software, combined with VeriFone's payment technology and Hewlett-Packard's security technology, hardware and software systems.

Hugo Lunardelli, E-commerce Industry Manager for Microsoft Europe told *SCN* that Smart Cards would have a role to play in the second phase of the project. He said that Microsoft was working to make Smart Cards easier to use with a PC and that this would be reflected in the next version of Windows. He predicted that Internet commerce with Smart Cards would come within two years.

Steve Johnson of VeriFone described electronic commerce as "an unstoppable force" with benefits for all who participate.

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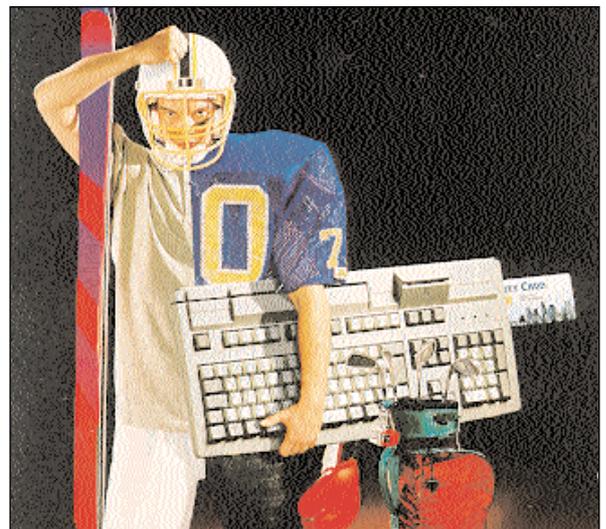
Smart Card Keyboard

Cherry Electrical Products has launched a new Smart Card keyboard with Windows '95 compatibility.

The new keyboard, Model 1500, has a "postbox" type Smart Card reader enabling communication between the card and the computer via a serial interface. The combination of computer data input facilities and Smart Card technology opens up a range of possibilities for chip based applications.

Data can be read off a card, for example, credit and ID cards, or written to the card in the case of a health insurance card which is regularly updated.

In case you think keyboards are unexciting, even if they are intelligent (Smart). Cherry's promotional material is aimed at attracting your attention as the photograph below demonstrates.



Contact: Toni Bowdery, Cherry Electrical Products, UK - Tel: +44 (0)1582 763100. Fax: +44 (0)1582 768883.

Right:
A new generation
keyboard
[Cherry Electrical Products]