

# Card Issuer Purse Trials in the US and Australia

Major developments have been announced which will finally establish the Smart Card electronic purse as the payment mechanism taking us into the 21st Century. Visa will launch the biggest Stored Value Card project to date in the United States in partnership with four banks and aims to issue one million cards and equip 5,000 outlets in Atlanta, Georgia by the start of the Summer Olympics in 1996. MasterCard is launching its SVC in Canberra, Australia with five of the world's largest banks and will test cross-border and multiple currency features.

In the UK, the Association for Payment Clearing Services (APACS) is heading a project to put chips on all bank cards by 1999 which will make Britain the second country after France to adopt Smart Cards throughout the card payment sector.

*Continued on page 63*

*The UK government goes on-line: a public multimedia Internet kiosk operated using a Smart Card (see page 74).*

## Smart Card News

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Published monthly by:

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ISSN: 0967-196X

### Next Month

Smart Card Tutorial - Part 4  
From There to Here -  
The Economics of Chips.

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## Card Issuer Purse Trials

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In the US, Visa's SVC partners are Bank of America, First Union Bank, NationsBank and Wachovia Bank. The stored value function is aimed at low-value payments and Jean-Jacques Desbons, President of Visa's Europe Middle East Africa region says: "We believe that by enabling customers to make small transactions under eight ECUs, banks can treble their card business."

Fred Winkler, Director of First Union's Card Products Division, comments: "Atlanta is where the future of banking will begin, and we plan to expand quickly to other cities."

"This is a bold, ground-breaking product introduction that will bring payment convenience to a new level, and revolutionise the way consumers and retailers transact business."

Both disposable and rechargeable Smart Cards will be supplied by French manufacturer Schlumberger. The disposable cards will be issued in denominations of \$25, \$50 and \$100 for the benefit of consumers who travel or do not have an established bank account. The rechargeable cards will allow bank account holders to reload the cards with value by inserting them into First Union ATMs which are being upgraded to accept Smart Cards by Diebold Inc.

In addition 5,000 screen phones are being distributed in conjunction with BellSouth Telecommunications Inc. for the Atlanta project for use in a home banking system which will also allow customers to load value onto the Smart Cards over the telephone.

Visa also plans SVC pilot schemes at their international headquarters (starting May), and in Argentina, Australia and Colombia (Q4 1995).

## Visa Buys DANMØNT Expertise

DANMØNT announced last month that Visa has licensed its Stored Value Card specification and will be incorporating part of it in its own SVC systems currently being launched.

Visa will utilise five areas of the specification dealing with clearing and administration, transaction collection, terminals, security and the cards themselves. Financial terms have not been disclosed.

The two companies will work together to develop the Visa reloadable SVC system which complies with the joint Visa, MasterCard and Europay (VME) specifications for ICC cards.

Henning N Jensen, Managing Director of DANMØNT, says: "We consider this agreement a breakthrough for the DANMØNT concept. It proved to be of vital importance that we in Denmark were the first to develop an open system that could make a major contribution to Visa's international system."

The current DANMØNT card is disposable with face values of 100-300 Danish Kroner but a reloadable card system will be available this summer. The cards are used in 39 cities in Denmark to replace cash in telephones, laundries, canteens, parking meters, stamp postage machines, fast food outlets, convenience stores and chargers for electronic cars.

## MasterCard Launch in Australia

MasterCard has announced that it will launch a nine-month Stored Value Card pilot scheme in the Australian capital of Canberra with five of the world's largest banks later this year.

Cardholders will be able to use their cards at gasoline stations, convenience stores and specialty retailers during the trial.

The banks are Australia New Zealand Bank (ANZ), Commonwealth Bank of Australia, National Australia Bank (NAB) and Westpac Banking Corporation (which represent more than 70% of the Australian credit and debit market) and the London-headquartered Standard Chartered Bank. As an international participant, Standard Chartered will issue MasterCard Smart Cards to their cardholders who live in or frequently travel to Canberra and allow cross-border and multiple currency features to be tested.

MasterCard will not issue disposable or throw-away cards. Its stored value feature will be linked to existing credit and debit card accounts, enhancing the value of the cards that consumers already carry and will help its member institutions "to use payment cards as a relationship-building tool to enhance cardholder loyalty."

Credit cards issued will bear the MasterCard logo, while debit cards will carry Maestro, the company's on-line point of sale debit brand. The cards will be issued by the banks and the cardholder will initiate the stored value feature at select merchant locations or automated teller machines later in the pilot, enter his or her PIN and load value onto the card. Additional value can be loaded onto the card at an ATM or during a transaction at select point of sale locations.

Diane Wetherington, Senior Vice President Chip Card Business/Marketing, says: "Our purpose is to conduct a live test of consumer and merchant acceptance of this new form of payment so that we are prepared to support our member banks in a commercial launch of this feature."

### Development partners

MasterCard's development partners for the pilot are ORGA Kartensysteme GmbH of Paderborn, Germany, and Solaic Smart Cards of Paris, France, who will provide both the Smart Cards and operating systems. MasterCard has modified each existing operating system with its own proprietary stored value application functionality.

Two operating systems have been selected for the pilot to demonstrate interoperability and compatibility with proven technology. Based on this pilot, MasterCard will develop its own operating system for use by members in subsequent commercial launches. Terminals will be provided by Victoria, Australia-based Fortronic Technology, Keycorp, based in Chatswood, Australia; and VeriFone, of Redwood City, California, USA.

MasterCard says that eventually cardholders will be able to:

- \* load value onto the card from public telephones or their homes
- \* store up to ten foreign currencies on the

### Schlumberger Acquires Danyl

card at one time

- \* convert previously loaded value from one currency to another
- \* use the card at a wider range of locations that traditionally do not accept cards.

The launch announcement was made during MasterCard's annual meeting of members in Sydney, Australia last month. Some 700 members had the opportunity to test Smart Cards in four applications for themselves. In addition to stored value there was a loyalty program which rewarded attendees for shopping in the MasterCard gift shop by automatically entering them in a prize draw. The card could also be used as an electronic ticket to speed admission to the event and to electronically register members to have meeting papers sent to them at home.

### MAC SVC Launch

Also expected to launch late this year in Delaware is the MAC Stored Value Card, supplied by Gemplus. MAC, the Money Access Service Network, owned by Electronic Payments Services Inc., is the largest processor of ATM transactions in the US.

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### BA Denies Smart Lift Off

British Airways, which admits to looking into ticketless travel, denies that any Smart Card trials are imminent or that possible chip or card fabricators are being seriously considered.

A reusable Smart Card, which would allow passengers to buy tickets and obtain boarding passes from card-reading machines at airports, has been reported as being ready for trial by September, but BA says this is untrue.

Contact: Gavin Halliday, BA. Tel: +44 (0) 171 821 4251.

In another strategic move into the US market, Schlumberger has acquired Danyl Corporation, the USA's largest manufacturer of self-service electronic transaction systems using stored value magnetic stripe and chip-based cards.

The take-over follows the acquisition last December of Malco, the largest US producer of secure credit and debit cards, and puts Schlumberger in a strong position in the US electronic payment market.

"This is an integral part of our strategy to become a dominant force in transaction automation systems as Visa, MasterCard and the banking community migrate to Smart Cards," says Clermont Matton, Executive Vice President of Schlumberger Measurement & Systems.

By acting as a single source of supply for all Smart Card components, including system hardware and software as well as the cards themselves, Schlumberger says it will speed market penetration and help customers improve the time-to-market and cost-effectiveness of their stored value and Smart Card applications.

Danyl, based in Moorestown, New Jersey, has an annual revenue of around \$14 million and specialises in vending and access control systems using stored value cards. It has an installed base of over 200,000 systems and is a major supplier of vending controllers to colleges, universities, libraries and public administration offices.

SingleCard, its electronic purse system (based on magnetic stripe cards) has already been adopted by some 200 university campuses and enables students to access pre-deposited funds and transfer value to their cards for use in paying for a variety of on-campus services such as the use of photocopiers, laser printers, fax machines, canteens etc., and for making cash withdrawals from ATMs.

Other Danyl products include the Vendamat line of vending machine payments systems and the Valet card-activated launderette controllers.

The company is also exclusive point of sale supplier of certain vending-related products to be used in the MAC Stored Value Card project. The Smart Card supplier for this project is Gemplus

## **IBM Floats Football Fan Card**

(SCN December 1993).

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## **Cherry Keyboard with Reader**

A new IBM compatible multi-function keyboard from Cherry, the G80-1500, has an integrated Smart Card interface and has been developed from a custom keyboard Cherry has supplied into the German healthcare market.

The keyboard can communicate with synchronous memory cards, including those with security logic, and supports chip specific security functions such as PINs.

Cherry says the keyboard is well-suited to applications which require personalised data to be written onto Smart Cards, for example healthcare cards holding medical data which require repeated updating or modification, and can also be employed in many other applications such as access control systems, point-of-sale and customer data registration.

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## **Solaic to Use Bull Patents**

Solaic, the Smart Card manufacturing subsidiary of Groupe Sligos, has acquired rights to use Bull CP8 microchip card patents to produce and market its on-card operating systems.

Bull CP8 patents are currently used under licence by 10 leading Smart Card manufacturers worldwide.

Contacts: Edith Eundevell, Bull CP8, France - Tel: +33 1 39 66 68 63. Nathalie Six, Solaic, France - Tel: +33 1 49 00 92 08.

UK football clubs are showing interest in a Smart photo-ID card devised by IBM UK to protect the dedicated fan and weed out the hooligans. On display at CCTA's Information Systems in Government Conference at Brighton, UK recently, it can function as a loyalty card as well as recording games attended and where, and if the owner is on a blacklist.

An adaption of the IBM MultiFunction Card (MFC), it will have either a Motorola SC28 chip with 8K bytes EEPROM, or Hitachi H8-310/1 with 8K bytes EEPROM.

Contact: John Noakes, IBM UK. Tel: +44 (0) 191 256 4350. Fax: +44 (0) 191 256 4004.

## Oki Value-Checker

Oki Advanced Products Division of Oki America, Inc. has announced the Value-Checker line of compact, low cost, Personal Smart Card Readers for consumers to verify the balance on electronic purse Smart Cards or pre-paid phone cards. It can also be used to display other information stored on cards such as healthcare information, ID numbers and electronic benefits transfer values.

The unit provides handy storage and protection for the card when not in use, is easy to carry in a wallet or pocket, and has a front label which can be used for custom graphics or advertising.

Gerry Vandenengel, Program Manager for Electronic Commerce, says: "We feel that consumers should be able to verify their card balance at any time, while the card protection feature and advertising potential of the Value-Checker appeals to the system providers. The unit's simple read-only operation also ensures that users cannot change or damage their cards."

Volume availability of the product will start in the second quarter of 1995.

Contact: Joel Johnson, Advanced Products Division, Oki America Inc. - Tel: +1 508 460 8602. Fax: +1 508 480 9635.

## Dr Everett Advises AMTEC PROTON Pleases the Public

Dr David Everett has been appointed Chief Technical Advisor to the newly-formed Advanced Technology Unit of Surrey, UK, based AMTEC Consulting Ltd.

An expert in data security, Dr Everett is consultant to several major European and American financial organisations. He joined the National Westminster Bank development team to work on the Mondex Smart Card electronic cash project in 1990, is technical advisor to *Smart Card News* and is the author of the Smart Card Tutorial.

Over ten years, AMTEC Consulting Ltd has become established as an information systems consultancy with a client base in banking, retailing, computer services, pharmaceuticals, defence and central government.

Contact: Mike Wilson, Managing Director, AMTEC. Tel: +44 (0)1252 737866. Fax: +44 (0) 1252 737855.

## MasterCard Appointments

Christopher Thom, former executive with Midland Bank in the UK, has been appointed as executive vice president, franchise management at MasterCard International and Joseph Tripodi has been promoted to senior vice president and head of global marketing, products and services.

Thom was with the Midland Bank for 27 years, recently serving as general manager, strategic development. Previously, as general manager, retail, he was responsible for providing core banking services and products delivered through the bank's branch network and for running the central retail businesses including cards services and electronic banking. He was also a member of the Managing Committee and Council of The Association of Payment Clearing Services which is pioneering the introduction in the UK of an ICC card and authentication method.

Tripodi joined MasterCard in 1989 with over 12 years' of international experience in marketing and served as vice president, Europe.

Belgium's PROTON electronic purse, on trial in Leuven and Wavre since 18 February, is proving a

winner with cardholders. Service provider Banksys, operator of the Belgian national network Bancontact/Mistercash electronic payment system, report 30,000 cards issued so far, and expect to issue 50-60,000 by the end of June.

By the beginning of April, 140,000 payments had been made with the low-value amount card for car parking, ticketing machines, public transport, telephone calls and at newsagents and grocery shops. Some 10,000 transfers have been made by merchants to their bank accounts.

The PROTON card is a Bull CP8 CC60 card with an SGS-Thomson ST 16601 chip. Cardholders can check the balance at ATMs, on the terminals of service providers and on small personal pocket devices. Banksys is studying the possibility of loading the card by public or home telephones, but is not planning to introduce this service until the national launch in January 1996.

Contact: Youri Tolmatchov, Banksys - Tel: +32 2 727 6666. Fax: +32 2 727 6767.

## Fall in UK Plastic Card Fraud

Plastic Card fraud losses in the UK fell £33 million from £129.8 million to £96.8 million in 1994, a reduction of 25 per cent.

Announcing the figures last month, APACS (Association for Payment Clearing Services) said the main factor behind the success has been the increased level of transaction authorisations at the retail point of sale.

Contact: Richard Tyson-Davies, APACS, UK - Tel: +44 (0)171 711 6234.

## PSI Opens London Office

Tampa, Florida based PSI International has announced the opening of its London, UK, office and the appointment of Mark Sievwright as Managing Director, Europe.

A former senior executive of Europay International, his role is to expand the scope of PSI research and consulting services for individual countries and

## Mrs Walsh Cooked My Frog!

multi-national projects.

Each year in the United States, PSI carries out market research surveys involving more than 150,000 consumers, 1,700 corporations and the 300 largest financial institutions. In Europe, the PSI International Card Monitor surveys more than 8,000 consumers in 11 countries.

Contact: Mark Sievwright, PSI Europe, One Northumberland Avenue, Trafalgar Square, London, WC2N 5BW. Tel: +44 (0)171 872 5475. Fax: +44 (0)171 753 2802.

## Philips Delivered 500,000 SIMs

Philips TRT Smart Cards & Systems delivered over 500,000 SIM (Subscriber Identity Module) Smart Cards in 1994 to the French GSM operators - France Telecom, which provides the Itineris service, and Société Française du Radiotéléphone (SFR).

It also delivered centralised personalisation services in addition to SIM cards or plug-in modules and associated personalisation tools.

Contact: André-Jacques Selezneff, Philips TRT - Tel: +33 1 41 28 55 84. Fax: +33 1 41 28 79 68.

## Schlumberger Phase 2 SIM Cards

Schlumberger Smart Cards & Systems has released its next-generation of SIM (Subscriber Identity Module) Smart Cards for GSM Phase 2 with 3K bytes and 8K bytes of EEPROM for applications code.

GSM facilities which may be exploited using these cards are fax and e-mail data communications, broadcast messaging, conference calls and closed user groups, numbers storage, charge advice and preferred display language.

Contact: Isabelle Ferdane-Couderc, Schlumberger Smart Cards & Systems, France - Tel: +33 1 47 46 62 47. Fax: +33 1 47 46 68 66.

A frog heated slowly in a pan of cold water will be

cooked, because it does not realise the temperature is changing\* - a gruesome fact quoted by British Telecom Consumer Relations Manager Mrs Jan Walsh to close the proceedings of the COST 219 Seminar on Smart Cards and Disability. Her point was that the delegates must make it their mission to educate "corporate frogs" to the changing environment so that elderly and disabled customers can be treated with equality and respect.

COST (the European organisation for Co-Operation in the field of Scientific and Technical research), is concerned with the future telecommunication and teleinformatic facilities for the elderly and disabled. Participants in the seminar included representatives of the EC SATURN project (Smart Card And Terminal Usability Requirements and Needs); Mondex, the UK electronic cash scheme; AT&T, ICL, Gemplus, Norwegian Telecom Research, Telia AB of Sweden, Greater Manchester Transport Smart Card system, and universities, telecoms and banks from all over Europe.

Topics covered the relevance of Smart Cards to the elderly and disabled in the fields of banking, transport, telephones and shopping. Emphasis was placed on the need for standard icons for those with poor sight or reading difficulties; audible instructions, a sound tracker to the right ATM, large lettering in easily read colours on screen, contactless cards which need not be taken out of purse or wallet to overcome the "fumble factor".

Problems identified included the fact that on-screen colours for the partially sighted were not necessarily suitable for all groups, and ATMs sited for the convenience of wheelchair users presented problems for tall people with bending difficulties.

\* *Mrs Walsh was quoting Professor Charles Handy's observation on frogs.*

Contact: Dr Jan Ekberg, National Research and Development Centre for Welfare and Health, Finland. Tel: +358 0 3967 2091. Fax: +358 0 3967 2054.

## New Readers from AMC

A new family of multi-functional hybrid insert  
**Lisbon Parking System Trial**

Searching for a city parking space is not only

Smart Card/magnetic stripe insert readers has been launched by American Magnetics Corporation.

They are designed to fulfil the requirements of a wide range of terminal applications such as point of sale, public payphones, parking meters, vending machines etc.

TTL or RS232C interfaces can be integrated to give read/write capability for Smart Cards to ISO 7816, with protocol T = 0 or T = 1 and magnetic stripe cards up to three tracks.

An electromechanical latch mechanism is optional for card locking utilising only negligible power by motor rather than solenoid. Various mounting arrangements are available such as front brackets, side mount or standard bezel.

The product family is designed to operate to a minimum of 500,000 Smart Card operations and 1,000,000 magnetic stripe card passes.

Contact: Steve Poulston, American Magnetics Corporation, UK - Tel: +44 (0)1684 295475. Fax: +44 (0)1684 295100.

## Checkline FASTtran Terminal

Checkline has introduced an on-line APACS 40 EFTPOS terminal with integrated software called FASTtran for the retail, mail order, leisure and ticketing environments.

The company says it is a low-cost solution for fast authorisation of non-cash payments including cards and cheque processing with a combined cheque printers, a built-in Smart Card hardware interface option and a RAM card interface.

It will be formally launched at Retail Solutions 95 in May and is currently being piloted by a number of Checkline customers.

Contact: Christopher Ellis, Marketing Manager, Checkline Business Machines, UK - Tel: +44 (0)181 882 8088. Fax: +44 (0)181 882 8080.

frustrating for motorists but adds to congestion and air pollution. A trial in Lisbon, Portugal may change all that. Smart Card and microwave technology is enabling motorists to book a parking

space and then be directed to it.

"The results of the trial are eagerly awaited," says Phil Blythe of the Transport Operations Research Group at the University of Newcastle upon Tyne, UK which is directing the European Commission-funded project. "In many cities up to 10% of vehicles on the move may be doing nothing more useful than searching for a parking space."

Described as a "demonstration of the first real-time parking management system using Smart Cards Europe," the Lisbon trial is hosted by Lisbon City Council (Camara Municipal de Lisboa). It is the fifth and final test site to go live under the EC ADEPT (Automatic Debiting and Electronic Payment for Transport) research project which is concerned with automatic non-stop tolling, road pricing, charging for parking, and providing in-vehicle driver information.

The ADEPT system is based on a 5.8GHz microwave two-way communication link between the roadside and moving vehicles. The microwave link is used to perform an automatic debiting transaction whereby the vehicle's transponder deducts credit units from its Smart Card as it passes a roadside charging point. This has been achieved at highway speeds up to 160km/h.

In-vehicle equipment consists of a small box (transponder) attached to the windscreen which contains the microwave communications and a computer. This box can be interfaced to a Smart Card which carries the user's electronic credit, and to a keyboard/display panel on the dashboard.

At the roadside, communication beacons are either mounted on a post or on a gantry above the roadway. These beacons are controlled by a local or central computer which also controls the on-line video enforcement system and provides for connections to traffic control centres and an integrated payment network. The system can also monitor traffic on the road network and provide real-time guidance and traffic information directly to the driver as in the Lisbon trial.

Blythe says that dynamic information is required on the availability of parking spaces to reduce the

## **Smart Way up the Steppes**

number of "space-searchers" clogging the roads. Strategies to achieve this incorporate the use of dynamic information on vehicles actually parked, those wishing to park and those likely to have vacated parking spaces within a given period to be conveyed via the ADEPT transponder system.

Apart from payment for parking, drivers will use the system to book a space in a particular zone via the roadside beacons. A "booked" car then receives in-vehicle guidance.

The other ADEPT trials are: Göteborg (Sweden) - Multi-lane road use pricing and in-vehicle driver information (November 1992); Cambridge (UK) - urban congestion charging (October 1993); Thessaloniki (Greece) - mono-lane and multi-lane toll collection (February 1994); and Jönköping (Sweden) - multi-lane tolling with full enforcement (May 1994).

Contacts: Domingos Nunes, EID, Portugal - Tel: +351 1 350 7500. Fax: +351 1 295 0489.

Phil Blythe, Transport Operation Research Group, University of Newcastle upon Tyne, UK - Tel: +44(0)191 222 6547. Fax: +44(0)191 222 8352.

## **UK National ID Plan**

Prime Minister John Major has announced that a Government Green Paper is to be published on proposals for a national ID card scheme for the UK. He was speaking in the context of Conservative plans to combat crime. The Green Paper is expected in May.

## **Carry Mondex in a Sporan**

The Bank of Scotland has signed up for Mondex, the UK's cash on a card system due for a July trial in Swindon. Known as a technological pioneer, it is speculated that the Bank will issue Mondex cards to its customers. It joins the original Mondex members National Westminster and Midland Bank.

existed. The direct move to Smart is simpler and cheaper.

This was the theme of Innovatron Data Systems Chairman and Managing Director Philippe Rousselet, in a presentation at a recent conference in London.

Since 1992, the company formerly known as Innovatron Ingénierie has installed 25 systems with around 5,000 terminals and 300,000 Smart Cards delivered to CIS and Baltic Countries. The Funchip Payment system is the key to Innovatron's entry to these emerging markets, but others are also taking the risk, such as the British Interlink Computer & Software Co (see page 71).

## **Funchip Replaces Rouble**

There are two factors which make Eastern block countries obvious customers for Smart Card solutions: the poor quality of telecommunications networks which do not allow transactions to be processed on-line, and the high level of inflation which correspondingly means an outsize monthly wage bill for the many huge companies operating there.

A third factor is the custom of such companies to provide their employees with catering, housing and leisure services, including clothing for work or sports activities. As a result, a large portion of an employee's salary finds its way back to the company, which has quite possibly created its own bank.

For example, the Tcherkizovsky conglomerate in Moscow provides its 6,000 employees with a multi-service card for cash withdrawal, physical access control and electronic payment.

Cardholders working for the Promstroibank of Saint Petersburg can use their electronic purse to withdraw cash, pay for meals in company restaurants, use vending machines and so on.

Funchip payment can evolve from a closed area (single bank) towards open, interbanking and international systems without high upgrading investments.

Contact: Philippe Rousselet, Innovatron Data

Making the change from cheques and magnetic stripe to Smart Card technology implies huge investment costs for most countries - but in the former Soviet Union, such payment devices hardly exist. The Innovatron Data Systems Funchip is a complete payment system including cards, POS terminals, ATMs and software. Global security is ensured because Innovatron has total knowledge and control of all the component parts of the system. Local engineers trained to maintain it remain under Innovatron's control.

Systems. Tel: +33 1 40 13 39 50. Fax: +33 1 40 13 39 59.

## Interlink Scales the Urals

Credit FD, a Russian bank based in Perm on the border of the Ural mountains, is issuing 12,000 Smart Cards to customers in Berezniki. The system has been installed by London-based Interlink Computer and Software Co., using a Gemplus 1K Bytes EEPROM Smart Card with a magnetic stripe.

The cards run the PCOS operating system and have both an unprotected wallet for low value transactions and a PIN protected wallet.

Customers can add cash to their cards or transfer it from their current accounts at on-line terminals in bank branch offices, workplaces and post offices. It is impossible for customers to exceed their agreed overdraft limits.

Phase two of the project will include the installation of ATMs supplied by AT&T for 24 hour banking by the third quarter of 1995.

Many shops in Berezniki have off-line POS terminals where the Credit FD card can be used for purchase or purchase with cash back. At the end of the day, transactions are sent to the bank either by dedicated or dial-up line or by taking a merchant Smart Card to the bank.

## Pre-paid SIM Could Cut Fraud

A pre-paid Smart Card SIM (Subscriber Identity Module) for GSM/PCN mobile phones will help to cut fraud and open up the market to department stores and mail order companies who can now offer a mobile phone service.

Customers receive interest on all money held in their electronic wallets. In the case of loss or damage, the customers are refunded with all the money held in the card's PIN protected wallet.

Contact: John Lovell, Interlink. Tel: +44 (0) 171 251 1777. Fax: +44 (0)171 251 1533.

## UK Lift Off for Sandia

A new British subsidiary of Sandia Imaging Systems Corporation of Dallas, USA has opened offices in North Oxford, UK, and will market the Sandia range of ISO Standard PVC Smart Card Printers currently supplied to customers in business, industry and government in 15 countries.

SIS of Dallas is fully owned by Laser Technics of Albuquerque, New Mexico. Its European subsidiary, SIS - Europe, is based in Paris. SIS UK will offer sales, marketing and technical support.

Sandia has two new printers on offer, the Secumind 200/2R and 200/3R. The 2R has two print stations plus a reverse module (rectoverso) enabling the card to be printed on both sides in one pass, a 200 card feeder and 200 card stacker and reject tray. These features are common to the 3R, which also has a third print station for special effects such as holograms.

SIS printers range in price from £8,500 for the hand-fed desk top 200/1 running at 60 cards per hour to about £95,000 for the high volume automatic 200/4-6 multi station system printing at 300 cards per hour.

Contact: Terry Hart, SIS (UK), 20 North Oxford Business Centre, OX5 1LG. Tel: +44 (0)1865 370720. Fax: +44 (0)1865 842254.

The concept has been developed by ORGA Kartensysteme GmbH of Paderborn, Germany and is offered as an integrated package. As an example, customers on the German D1 network who purchase a mobile telephone for DM 649 as part of the overall package can start phoning the moment

they unpack the phone and insert the card which is supplied with installed credit.

### **No risk**

This means that retailers who have had to rely on the credit worthiness of customers when activating mobile phones now run no risk at all since the card in the package has already been paid for by the customer. Thus the service provider payment is guaranteed and the telephone service is provided immediately. Credit units to the value of DM 100 can be used by the card and are valid for 90 days.

ORGA and DeTeMobil have developed the system together. When the phone is used, units are deducted from the card from one of DeTeMobil's computer-based service centres equipped by ORGA. Each card sold has its own account from which units are deducted automatically. A fault-tolerant UNIX system, plus software from ORGA, ensures that DeTeMobil has no extra manpower costs.

Users of pre-paid cards can dial the toll-free service number 2000 to contact a digital answering service to query their current account balance.

The mobile phone is initially linked to the credit card via a special code. The D1 package contains a simple order form addressed to DeTeMobil or to the D1 service provider which the user must send off to obtain a normal SIM card. The new telecard is sent with a special combination lock which, when entered, releases the line to the pre-paid card.

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## **COPILOT for Motorists Smart Card for Students**

Four hundred students at the Voltaire school will be the first in the city of La Garenne Colombes, France, to use a multi-service Smart Card system from Innovatron Data Systems (IDS) to gain access to school services - food services, study halls, day nurseries and leisure centres.

Motorists cocooned in their cars with only the radio for company will soon be able to obtain advance information about congested areas and road works ahead and be able to take avoiding action, thanks to a new Smart Card-based in-vehicle information system which has been developed in Germany.

Called COPILOT, the system is operated by COPILOT GmbH & Co. KG, with a Smart Card from Giesecke & Devrient to identify the user.

The motorist can purchase an access right to the service for a predetermined time. The system acquires traffic information and processes it in an interactive data exchange operation via infrared beacons at road intersections, a central control computer and the Smart Card in an on-board unit.

Traffic information is acquired by the roadside beacons and transmitted to the control computer which uses it, together with other available information on trouble spots, obstructions etc., to work out a recommended route. This information is then transmitted to the vehicle.

### **First service networks**

Following a successful field trial in Berlin, the first COPILOT service networks will come into operation this year in Stuttgart and Berlin.

Giesecke & Devrient is also developing a "mobile" card which drivers will be able to use both to operate local navigation systems in their vehicles and to pay fares on public transport. The company says implementation of the mobile card concept is already feasible using its STARCOS card operating system.

Contact: Dr Horst Bottge, Marketing Director, Giesecke & Devrient, Germany - Tel: +49 89 4119-0. Fax: +49 89 4119-780.

IDS franchisee ATMI is to set up the Smart Card-based system for the secure management of school services in the city. The scheme will be launched on 1 June at the Voltaire school with the AGIL Card and then extended to the other seven schools in the city. Initially some 2,000 Smart Cards will be distributed to the students.

Called the FUNCHIP City system, it has been in use in Meudon (5,000 cards) for two and a half

years, and in Issy-les-Moulineaux (6,000 cards) for two years.

IDS says that the management of school services is a major concern in France as it represents 30 to 50% of a city's operating budget.

Contacts: Jean-Christophe Coffin, Communication Manager, La Garenne Colombes, France - Tel: +33 1 42 42 69 08. Marc André, Innovatron Data Systems, France - Tel: +33 1 47 36 76 15.

## G&D Contactless Card

Deutsche Lufthansa AG and Lufthansa Airplus GmbH are to use the first contactless Smart Card to be produced by Giesecke & Devrient to shorten passenger check-in and boarding times, says Jürgen Nehls, Managing Director of G&D and Head of the Card and Card Systems Division.

He also reveals that transport services in the German towns of Lüneburg and Oldenburg are implementing the FAHRSMART project to convert their public transport networks to use contactless cards.

G&D, which has concentrated its Smart Card business on public payphone cards, SIM cards for the GSM networks, and cards for the German healthcare services, is now a contender in the contactless card market.

"The contactless Smart Card will find widespread use in all applications where fast, convenient and uncomplicated handling is decisive," says Nehls.

"The range of potential uses is wide: in public transport, as an electronic purse in car parking, as a company ID card, driver's licence, road toll ticket, club membership card, etc."

Called the RM8K (1K bytes EEPROM) MIFARE Contactless Smart Card, it uses remote coupling

## Government On-line

Log-on to [www.open.gov.uk](http://www.open.gov.uk) and you will be accessing the UK Government's pilot scheme to make information from government departments available electronically via the Internet, the worldwide computer network, using World Wide Web (WWW) hypertext information servers.

Launched by CCTA, the Government Centre for

technology from Mikron of Austria which has been designed specifically for applications in identification and ticketing systems.

Contact: Dr Horst Bottge, Marketing Director, Giesecke & Devrient, Germany - Tel: +49 89 4119-0. Fax: +49 89 4119-780.

## Datastripe Card Reader

Datastripe has announced the DS0520 motorised card reader which can read both magnetic stripe and IC cards. It has been designed for use in ATMs and other banking systems but can be incorporated into electronic point of sale, vending and security systems.

The company says that designers incorporating the reader into card-based systems for access control, clubs, schools and customer loyalty schemes can "future-proof" their products and take advantage of the added security features offered by the programmable chip cards.

Retailers can upgrade their existing point of sale equipment and avoid the need to rent Smart Card terminals from banks.

Multi-level systems can also be created with customers or members using cheaper magnetic stripe cards while staff use more secure Smart Cards to perform privileged functions.

Top end models with three track reading and IC card options are offered at less than £150, excluding VAT, in quantity.

Contact: Mike Hendry, Marketing Manager, Datastripe, UK - Tel: +44 (0)181 547 3418. Fax: +44 (0)181 547 3419.

Information Systems, the scheme - called Government Information Service - aims to fulfil the concept of open government and meet the objectives of the Citizen's Charter by providing a single point of entry to information from all UK government departments, e-mail address for all departments and pointers to other sources of useful information. Currently, information on most topics is limited and the rate of service growth will depend on the demand from the people using it.

The Internet is seen as one of many possible communications technologies which could evolve into an Information Superhighway. It is already available in over 100 countries and is estimated to provide connections to 20-30 million systems, with 100 million users worldwide.

## Internet kiosk

CCTA demonstrated its first public multimedia Internet kiosk at its Information Systems in Government Conference in Brighton last month. The kiosk is operated using a Smart Card (see front page) which provides user access to public information via a touch screen and in a combination of voice, pictures and text.

## Smart Card report

It also launched a new report: "*Smart Cards: Opportunities for Public Sector Applications.*" The report describes how organisations are using Smart Cards and their benefits and covers applications, the technology and issues to be addressed by those interested in "exploiting the opportunities presented by Smart Cards."

Contact: CCTA, UK - Tel: +44 (0)1603 704539.  
Fax: +44 (0)1603 704817. e-mail address:  
Info@mail.ccta.gov.uk. Web: www.open.gov.uk.

## Need for Contactless Standards

Lack of standards for contactless Smart Cards causes a major headache for suppliers and operators in selecting the card technology, says Peter Fogarty, Chief Executive of ERG, Australia.

Speaking at the Asian Smart Card Summit in Singapore last month, he points out that a number of card suppliers are offering cards, all of which operate at different frequencies, so the card and

## Smart Card Diary

**Retail Solutions '95**, NEC Birmingham, England, 2-4 May.

Conference includes half a day on Smart Cards in retailing involving a critical comparison of the design of different electronic purse systems and the role of Smart Cards in customer loyalty schemes. Contact: Pat Chard, RMDP, UK - Tel: +44 (0)1273 722687. Fax: +44 (0)1273 821463. Accompanying exhibition. Information from emap Business

readers from one supplier are not compatible with another - a clear disadvantage for adjoining cities, towns or countries.

The emerging trend in public transport is for a card with read/write capability and larger memory capacity for multi-function capability, particularly Stored Value Card applications. This requires a minimum capacity of 1K for the chip and a far greater level of security than is available in most contactless cards.

"It is critical for the industry to move towards a standard for card transmission frequency so that card readers can be standardised," says Fogarty. "If a standard does not emerge within the next 12-18 months then all card suppliers will suffer."

"Unfortunately, at present, each supplier seems hell bent on, or convinced, that it can win the world and become the *de facto* standard. We see that as highly unlikely. Attempts have and continue to be made to set a standard but not all suppliers are involved. It may be necessary for the users to force the issue as has been done by EMV (Europay/MasterCard/Visa) for the contact card standard."

Another issue is the ultimate development of a combined contact/contactless card which will require a single chip, probably of 8K capacity, which can satisfy the EMV standard for contact Smart Cards and have contactless capability. Suppliers are suggesting such a card will be available in 18 months.

Referring to the Greater Manchester Automatic Fare Collection project, he says it has been decided to move to a 1K byte card for full system implementation and the card will be identical to that used in the Hong Kong Mass Transit system.

Communications - Tel: +44 (0)181 688 7788. Fax: +44 (0)181 680 0306.

**Customer Loyalty Asia '95**, Sheraton Towers, Singapore, 17-18 May.

Presentations on how to keep customers happy and loyal, followed by a separately bookable workshop conducted by Brian Skirving, Principal, Loyalty Programmes International, Australia. Contact: AIC Conferences - Tel: +65 222 8550. Fax: +65 226 3264.

**Co-Branded, Loyalty & Affinity Cards**, Harrington Hall, London, 22/23 May.

Second annual conference giving an update on card-based loyalty schemes including loyalty Smart Cards. Contact: AIC Conferences - Tel: +44 (0)171 242 2324. Fax: +44 (0)171 242 2320.

**The 9th European Financial Self-Service '95**, Sheraton Hotel, Edinburgh, Scotland, 23/24 May.

Conference preceded on 22 May with a tutorial on Smart and Prepay Cards chaired by Bob Carter, Orchard International. Contact: SETG, Scotland - Tel:+44(0)141 553 1930. Fax:+44(0)141 552 0511.

**Ensuring Sustained Momentum in Affinity, Loyalty and Co-Branded Cards**, Euston Plaza Hotel, London, England, 25/26 May.

Latest market developments and case study presentations including Express Newspapers, Save & Prosper, Texaco and Meadowhall Shopping Centre. Interactive workshop on 24 May. Contact: SMi Conferences - Tel: +44 (0)171 417 7790. Fax: +44 (0)171 417 7791.

**Cyberbank '95**, La Maison de la Chimie, Paris, France, 30/31 May.

The first international forum on electronic banking in superhighways examines the role of credit cards in electronic commerce and digital money or Cybercash applications and the need for a coherent approach to controlling information flows. Contact: Christelle Moyon, Analyses & Synthèses, France - Tel:+33 1 46 28 82 10. Fax:+33 1 46 28 95 63.

**Stored Value Cards**, The Grand Hotel, Washington, DC, USA, 31 May/1 June.

An update from industry leaders with nine international case studies on electronic purse and other Smart Card applications. Contact: AIC Conferences, USA - Tel: +1 212 952 1899. Fax: +1 212 248 7374.

**European Smart Card Summit '95**, Waldorf Hotel, London, 26-27 June.

Includes case studies on Smart Card applications in transport, telecommunications, healthcare and the retail and utilities sections, with presentations on standards, security and technology. Contact: AIC

Conferences UK - Tel: +44 (0)171 242 2324. Fax +44 (0)171 242 2320.

**ESCAT '95 (European Smart Card Applications & Technology Conference)**, Inter Continental Hotel, Helsinki, Finland. One of the features of this well-established conference, now in its 8th year, is the presentation of the award for the most innovative Smart Card accomplishment of the year. Contact: Conference Secretariat, CONGREX, Finland - Tel: +358-0-752 3611. Fax: +385-0-752 0899.

**CarteS '95**, CNIT Trade Center, La Defense, Paris, France, October 25-27.

The 10th International Forum for Plastic Card Technologies & Applications includes conferences on Access to New Solutions and Cards and Security plus an international exhibition with over 100 exhibitors. Contacts: CEP Exposium, France - Tel:+33 1 49 68 52 64. Fax: +33 1 47 37 75 09. IMEX Management, Inc., North America - Tel: +1 301 460 9751. Fax: +1 301 460 0045.

### **From There to Here - Part 3. The making of a chip continued.**

The MOS transistor is the fundamental building block of the Smart Card chip. An understanding of the principles underlying its fabrication are necessary in order to fully appreciate the potential of the chip from both a performance, cost and security point of view. As an example the drawings show the major steps in the manufacture of an n-channel MOS transistor which is formed in a p-type substrate.

The source and drain regions are formed by selectively converting shallow regions at the surface to n-type material. The insulator, silicon dioxide is formed on the surface to create the gate insulator and also to separate one device from another. Aluminium metal is used to make the connections to the source and drain whilst conductive polysilicon is used to make the connection to the gate.

A number of processes are used during the course of the chip manufacture:



## **Oxidation**

Silicon dioxide can be formed on the surface of the silicon by heating the wafer to a high temperature (1000-1200°C) in the presence of oxygen.

## **Photolithography**

This is the basic mask process where the surface is covered in a photo resist which becomes soluble when exposed to ultra violet light. The mask that is interposed between the wafer and the source of light is made by depositing the relevant pattern in a light absorbent material on a glass plate.

## **Etching**

Etching with acids or a gas plasma is used to cut patterns in the masking material. Silicon dioxide is the principle masking material

but polysilicon and silicon nitride are amongst the materials that may be used to mask areas against ion implantation or diffusion.

## **Ion implantation**

This is a process where by the wafer is bombarded by high energy atoms generated in a high voltage particle accelerator. The atoms are donor type (in our example) to alter the characteristics of the bombarded area to form the shallow n-type layers of the source and drain.



**Diffusion**

This is an alternate process to Ion implantation for forming the shallow n or p type regions. The donor or acceptor impurities are diffused into the surface by raising the wafer to a high temperature (>1200°C).

**Evaporation**

Metal films that make up the conductive interconnections are deposited by evaporation when the metal is heated to its melting point in a vacuum.

**Chemical Vapour Deposition (CVD)**

Thin films of silicon dioxide and polysilicon

can be deposited out of a gaseous mixture onto the surface of the wafer. This process is typically applied at high temperatures and low pressure.

**Epitaxy**

CVD can be used to deposit silicon onto the surface of the wafer. A single crystal silicon layer may effectively be grown on the surface of the wafer by this process.

*David B Everett.*

Next month - More into the economics of chip manufacture.

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## NORWEB Smart Power Card

NORWEB, the regional electricity company covering the Greater Manchester area, has announced that it is rolling-out the Landis & Gyr Pisces Smart Card pre-payment electricity metering system under the name Power Card.

The decision comes after a pilot system study covering 100 homes. The first phase in the roll-out will cover homes in the Greater Manchester area where card recharging units will be installed in suitable NORWEB shops and card agencies.

NORWEB is the second regional electricity company to commit to full deployment of Pisces and follows the lead of Midlands Electricity (SCN January 1994). A number of other electricity regions are piloting the system, including Yorkshire Electricity (SCN October 1994).

Ian Simpson, Power Card Project Leader, says: "The system has advantages over the old paper card meters, not least the safeguard for customers that meters cannot disconnect between 9 pm and 9 am. The Power Card also reads information

from the meter and sends it back to us when being

recharged. This means that estimated bills will be a thing of the past. I think we have a real winner."

NORWEB plans to install 180,000 Smart Card meters over a three to four year period.

Contacts: Martin Pollock, Landis & Gyr - Tel: +44 (0)1952 677661. Fax: +44 (0)1952 677594. Frank Baker, NORWEB - Tel: +44 (0)161 236 9474. Fax: +44 (0)161 247 0634.

## Contactless Cards for HK Airport

Contactless FRAM (Ferroelectric Random Access Memory) Smart Cards from Racom Systems Inc. are to be used by all workers at Hong Kong's new airport as the only form of payment for goods and services, including those provided by the airport's cafeterias, bars and shops.

Riva Group, one of Europe's leading electronic point of sale systems integrators based in Bolton, England, has ordered 15,000 contactless cards and associated radio frequency communications controllers from Racom.

The controllers are currently being installed in the north zone of the airport. As construction progresses it is expected that the number of cards supplied by Racom will greatly increase.

The cards include two separate electronic purses to allow segregation of employer funded purchases from personal purchases. Workers will be able to have weekly/periodic subsidies loaded onto the card at reception centres to be charged directly to their employers, and at the same time add money to their own purse.

In addition to their use as electronic money, the cards may also be used for personal identification and electronic keys for workers, providing both access control and security for airport facilities.

Contacts: Oliver Gatchell, Racom Systems, USA - Tel: +1 303 771 2077. Fax: +1 303 771 4708. UK representative: Terence Warmbier, Cristel UK - Tel: +44 (0)1296 393134. Fax: +44 (0)1296 393136