German Banks to Launch 25m EPs by End 1996

German banks are set to launch the biggest electronic purse scheme in the world to date and plan to have nearly 25 million Geld Kartes in circulation by the end of this year. This is the crushing response by the financial institutions to the emergence of two rival electronic purse schemes - the P-CARD, a bank independent system run by a commercial consortium lead by EBS Elektronic Banking Systems GmbH., and the PayCard, the payphone and bus and rail travel card backed by Deutsche Telekom, the federal railways (Deutsche Bahn) and the association of transport authorities (VDV).

Continued on page 123

Smart Card News

Managing Director: Patsy Everett

Editor: Jack Smith

Technical Advisor: Dr David B Everett

Editorial Consultants:

Dr Donald W Davies, CBE FRS
Independent Security Consultant

Peter Hawkes,
Principal Executive
Electronics & Information Technology Division
British Technology Group Ltd

Chris Jarman
Vice President, Chip Card Technology
MasterCard

Published monthly by:

Smart Card News Ltd
PO Box 1383, Rottingdean
Brighton, BN2 8WX, England
Tel: +44-(0)273-302503
Fax: +44-(0)273-300991

ISSN: 0967-196X

Next Month

Smart Card Tutorial - Part 3
From There to Here -
The Making of a Chip continued.

CONTENTS

MasterCard Pilot in South Africa 203

VISA Cash Pilot in UK in mid-1997 203

Mondex Goes International 204

Europay Announces OTA 205

PROTON Technology for Canada 206

Allsafe Orders Card Machinery 207

EMV Chip Specs Completed 208

Bull Electronic Commerce Offer 209

Italian Senate Votes by Card 210

Boots to Expand Loyalty Card 211

Israel to Produce Smart Cards 212

Barclays PurchaseOnline Pilot 213

Smart Card Diary 214

Payment Systems on the Internet 215

The Message is on the Cake 220

German Geld Karte Scheme

Continued from page 121

ZKA (Zentraler Kredit Ausschuss) representing the savings, public, co-operative and commercial banks says that starting in October, and until the end of the year, 15 million Eurocheque cards will be re-issued in a change from magnetic stripe to chip card technology. Four to five million co-operative bank cards and over four million Postbank cards will also be replaced with chip cards, giving a total of around 25 million cards. All will carry the Geld Karte electronic purse function.

The chip cards are being supplied by the three leading Smart Card manufacturers in Germany - Giesecke & Devrient, of Munich; ODS R. Oldenbourg, also headquartered in Munich, and ORGA Kartensysteme, based in Paderborn.

Currently the Geld Karte is being piloted in Ravensburg / Weingarten prior to national roll-out. The card can hold up to 400 DM for use in making payments on buses and trains, at retail outlets, and at public payphones. Thirty-six banks in the pilot are offering three types of electronic purse - a Eurocheque card with a chip, a proprietary card issued by individual banks and a non-accounted card for tourists.

The issue of 25 million Geld Kartes in such a short time is a major undertaking, comparable to the launch of chip technology into healthcare in Germany in 1994. Distribution of 79 million German Health Insurance Cards (Versichertenkarte) began in April 1993 and was completed by the end of 1994.

Contact: Manfred Krueger**, ZKA - **Tel: +49 228 204 365. Fax: +49 228 204 250.

MasterCard Pilot in South Africa

MasterCard, Amalgamated Banks of South Africa Ltd. and Standard Bank Investment Corporation are to carry out a six-month MasterCard Cash electronic purse pilot in the Gauteng provincial area, which includes Johannesburg.

Angelo Letimier, MasterCard's General Manager for the Middle East and Africa, said that the electronic purse card will hold up to 200 Rand and be tested with up to 40,000 customers with a network of around 500 retailers.

Noel Webb, Standard Bank's Managing Director of Retail Banking, said the introduction of Smart Card technology will cost the two banks US $10 million.

VISA Cash Pilot in UK in mid-1997

Visa has officially announced that it is to launch a VISA Cash pilot with a group of financial institutions in the UK starting in mid-1997. The announcement ends speculation of a challenge to the Mondex electronic cash system (*SCN March 1996*). Code-named EPUK (Electronic Purse UK), its existence was denied by the banks involved.

Taking part in the pilot will be Abbey National, Barclays Bank, Halifax Building Society, Lloyds TSB Group and the Royal Bank of Scotland with additional Visa UK members expected to join the group. Visa expects to issue 70,000 cards which can be used at between 2,000 and 2,500 terminals.

It is understood that pilots will take place in two cities - one in Scotland and the other in southern England.

This will be the first VISA Cash pilot to use public key cryptography for authentication and the card will complement the Association for Payment Clearing Services (APACS) programme to introduce chip technology for all payment cards in the UK. This means that VISA Cash can be put on a UK payment card with a debit or credit application on the chip.

Contact: Colin Baptie**, Visa International Press Office, UK - **Tel: +44 (0)171 937 8111. Fax: +44 (0)171 937 0877.

Consortium for Shell

Shell is looking for six partners to invest in a Smart Card consortium. Chris Fay, the chairman of Shell UK has invited 24 companies that are market leaders to join Shell in its multi-partner loyalty scheme. So far Shell UK's Smart Card has attracted 3.5 m users, about 20% of the petrol-buying public. As well as the consortium partners Shell is looking for up to 20 associate partners who will provide and redeem Smart Points.

Mondex Goes International

Mondex, the UK-developed electronic cash system, has formed Mondex International with the support of 17 leading financial institutions in four continents. The move, announced in London this month, substantially re-enforces its position in the global marketplace and strengthens its ability to compete with the established card issuers such as Europay, MasterCard and Visa now piloting their own brand of electronic purses or stored value cards with a common specification.

Mondex International Ltd is now owned by the 17 participants who are: NatWest and Midland Bank (UK); the Hongkong and Shanghai Banking Corporation (Hong Kong and 12 further Asia/Pacific territories); Canadian Imperial Bank of Commerce and Royal Bank of Canada (Canada); Australia and New Zealand Banking Group, Commonwealth Bank of Australia, National Australia Bank and Westpac Banking Corporation (Australia); ANZ Banking Group (New Zealand), Bank of New Zealand, Countrywide Banking Corporation, the National Bank of New Zealand Ltd., ASB Bank and Westpac Banking Corporation (New Zealand); Wells Fargo Bank and AT&T, through a wholly-owned subsidiary of AT&T Universal Card Services (USA).

NatWest has licensed its Mondex intellectual property rights and has sold the Mondex brand to Mondex International for £100 million. Additionally, NatWest will receive a fixed sum which will reimburse it for the Mondex development costs and it will also receive deferred payments based on the future successes of the product globally.

There are 23.5% shares still available and NatWest is in discussions with a number of other parties who are expected to acquire franchise rights for other markets and also to become shareholders in the company. The existing participants own, in aggregate, 76.5% of the fully-issued ordinary share capital of Mondex International.

Tim Jones, who with Graham Higgins invented Mondex, commented, "The realisation of a wide international ownership of Mondex by these leading organisations in four continents marks the most significant development for the introduction of electronic cash."

The first pilots of Mondex began in July 1995 in Swindon, UK where some 10,000 consumers and 700 retailers are taking part, and in San Francisco where over 500 employees of Wells Fargo are able to spend Mondex value at 22 merchant sites. Launches planned to start this year are in Canada (see below) and in Hong Kong.

Contact: Emma Simpson/Richard Campbell**, Mondex, UK - **Tel: +44 (0)171 726 1957.

Mondex Pilot in Canada

Mondex has announced the names of the first 123 merchants to sign-up for their electronic cash pilot in Guelph, Ontario, Canada. They include major super stores, fast food restaurants, video shops, petrol companies, the local poultry market and the Lottery Ticket Centre.

The scheme being launched by the Canadian Imperial Bank of Commerce (CIBC) and Royal Bank of Canada, along with Bell Canada as a marketing partner, will begin testing in September and October. Some Guelph consumers will start to participate in the pilot in November with the full pilot established in the first quarter of 1997. Mondex is scheduled to begin rolling out across Canada in 1998.

Watching the project closely will be The Hongkong and Shanghai Banking Corporation of Hong Kong which has pilots planned in six south-east Asia countries. John Ranaldi, Senior Vice President, Distribution Systems of Hongkong Bank of Canada said they would be actively involved behind the scenes in preparation for the national roll-out of Mondex. "Royal Bank and CIBC will be sharing their learning experience with us and we, in turn, will be able to offer information on our international activities," he said.

A J (Al) McGale, Vice President, Stored Value Cards at Royal Bank, described Mondex as an innovation that will potentially change everyday spending habits across the country. He added, "We have been very careful not to be unduly hasty with implementation and that we are cognizant of merchant expectations."

Contact: Joe Clark**, Mondex in Canada - **Tel: +1 416 440 0430.

Europay Announces OTA

Europay International launched its Open Terminal Architecture (OTA) at a meeting of 41 terminal and card vendors in Brussels last month. The OTA was successfully tested earlier at Europay's Members' Meeting in Seville, Spain, in June.

Among the companies represented at the meeting were Dassault and Ingenico which were instrumental in the development of Europay's multi-currency electronic purse product, Clip, also launched at the congress in Seville.

OTA is a specification for terminal management software developed to meet the needs of Europay members and retailers in the migration to the chip environment. It gives terminals the flexibility to support the many different functionalities of chip cards.

A particular advantage of OTA is that it can be installed in existing terminals thus reducing the time and cost of upgrading thousands of terminals from different suppliers.

Europay's OTA specification resides in the terminal and controls its operation by using a range of standard commands. OTA defines a standard "kernel" or core set of functions capable of supporting a range of transaction types. The flexibility comes from the fact that the kernel acts as a common base between different types of terminal, allowing new applications to be developed that will run without change on any terminal with an OTA-compliant kernel.

Europay says this ability to accept future chip technology is vital to banks and retailers if the cost of managing an installed terminal base is to be controlled. In addition, OTA is suitable for all kinds of terminals: POS terminals, integrated systems, ATMs and vending machines which accept cards.

After OTA is installed, the terminals can be programmed to accept new applications remotely by downloading software over the telephone line.

The Europay offer includes:
OTA kernel development kit
OTA application software development kit
Software development services
Training courses

OTA is based on the multi-tasking Forth programming language and, according to Europay, the development simplifies the certification process as only the application needs to be certified. It can then run on any previously certified OTA terminal.

Roger Swales, Senior Manager, Card Acceptance for Europay, says, "The obvious advantage of OTA is that it will save banks and retailers significant sums of money in the future, especially considering the pace of change where chips are concerned. However, it is also likely to bring about a positive change for the general public, who will see terminals in smaller retail outlets where previously such technology would not have been cost effective."

Contact: Roger Swales**, Senior Manager, Card Acceptance, Europay - **Tel: +32 2 352 5688. Fax: +32 2 352 5730.

Visa Certifies First Smart Terminal

Visa International has given its first certification to a Smart Card terminal, following the product's successful performance in the VISA Cash stored value card trial now underway on the Gold Coast in Australia.

The terminal is supplied by Australian Smart Card product developer Intellect Holdings and is currently installed in a range of retailers who are participating in the trial.

Bruce Mansfield, Head of Chip Cards for Visa International in Australia and New Zealand, says the certification of a Smart Card terminal by Visa is another important step forward in the introduction of Smart Cards.

"This trial is helping to test the equipment we need to introduce electronic cash on a much wider basis," he said.

Intellect has supplied most of the terminals for the VISA Cash trial and currently sells and installs its products in more than 20 countries throughout Europe, North America and Asia. It recently released a family of stored value card products into the European market.

Contact: Ross Leighton**, Chairman, Intellect - **Tel: +61 9 333 4333. Fax: +61 9 470 5002.

PROTON Technology for Canada

Two Canadian banks - the Bank of Montreal and the Toronto-Dominion Bank - are to launch an electronic purse scheme in Kingston, Ontario using technology developed by Banksys for the Belgian national electronic purse scheme, PROTON.

The system will be tested under the name "Exact" and the banks expect to install some 800 merchant terminals and issue 20,000 cards during the year-long pilot.

As in Belgium, the electronic purse is intended for use in neighbourhood shops and in vending machines, telephone booths, parking meters and other areas where payment is normally made with coins or small denomination bank notes.

Banksys is currently rolling out its electronic purse scheme in Belgium and has 75,000 cards issued and a terminal base of 2,500. The objectives for the end of 1996 are 600,000 cards and 10,000 terminals. National roll-out will continue in 1997 with the gradual combination of debit card and electronic purse functions.

Its success in exporting the PROTON technology must make many other developers and operators of similar schemes wonder where they have gone wrong. Canada is now the seventh country to adopt the Belgian technology after Belgium, The Netherlands, Switzerland, Brazil, Australia and Sweden, and Banksys hints that we should watch out for several other major deals this year.

Contact: Daniel Skala**, International Sales Manager, Banksys - **Tel: +32 2 727 6427. Fax: +32 2 727 6767.

Philips Opens Smart Centre in US

Philips Electronics has established a Smart Transaction Centre in Burlington, Massachusetts, to take advantage of the developing market for Smart Card-enabled systems in the US.

The system will develop new solutions for personal financial transactions and accessing networked information and will house a new business unit - Philips Smart Cards and Systems USA which will be a division of Philips Electronics North America Corporation.

The centre initially combines Smart Card capability with Philips Home Services (screen phones) and related semiconductor units. Customers will be provided with a wide range of options; including complete electronic commerce systems, custom chip sets, contact and contactless cards, card readers and back-end products.

Patrick J Greaney, Senior Vice President, Philips Electronics North America Corporation, says Philips is well-positioned to take advantage of the developing market for Smart Card-enabled systems, for example, the reloadable electronic purse card configuration "is well-suited to support the explosive growth of PC and screen phone commerce in the United States."

Contact: Paul Chapple**, Corporate Communications, Philips - **Tel: +1 617 238 3414.

National Microelectronics Institute

The new National Microelectronics Institute (NMI), led and funded by the industry, is to be based at the Heriot-Watt University in Edinburgh, Scotland. It will provide a focus for co-ordinating the training, supply and research infrastructure of the UK semiconductor manufacturing industry. An initial priority will be to focus on ensuring the availability of skilled technicians and engineers.

The NMI is collectively owned by the participating companies - Fujitsu, GEC-Plessey Semiconductors, NEC, National Semiconductor (UK), Newport Wafer Fab, Motorola, Philips Semiconductors, Seagate Microelectronics and Siemens Microelectronics.

It will be run from a central office with 10 people and managed by a Chief Executive Officer to be appointed shortly.

Chairman, Dr. George Bennett, Managing Director of Motorola in Scotland, said the Institute represented a watershed in the history of semiconductors in the UK. "We need to ensure that skills, technologies and processes will always be in place to fuel the future growth in semiconductor demand."

Contact: Sam McEwan**, NMI - **Tel: +44 (0)141 228 2299.

Allsafe Orders Card Machinery

US card manufacturer Allsafe Inc., which recently signed the first US License agreement with Mikron GmbH of Austria for its radio frequency technology (*SCN May 1996*), has ordered the manufacturing equipment to produce contactless Smart Cards from Meinen, Ziegel & Co. GmbH of Munich, Germany.

The Buffalo, New York-based company, has chosen a cold manufacturing process from the German company to produce ISO thickness cards suitable for quality photo imaging.

Meinen, Ziegel says that embedding assemblies in cards, while maintaining a quality smooth surface finish, has not been a simple task using the traditional technology which has included a hot lamination or moulding process. In a thermal process, it is difficult to achieve an absolutely smooth surface suitable for the low cost direct-to-PVC dye sublimation printers that are readily available today.

The machines can be configured for either semi-automatic or fully automatic card production lines, including chip module and coil implantation, for any volume of card production. An antenna coil winding and welding process to connect the chip module with the wire ends of the coil can be included.

Contacts: Michael L Davis**, Allsafe, USA - **Tel: +1 716 896 4515. Fax: 1 716 896 4241. Tomas Meinen**, Meinen, Ziegel & Co. GmbH, Germany - **Tel: +49 89 614481-0. Fax: +49 89 614481-22.

Gemplus Expands Card Centre

Gemplus has expanded its card personalisation centre in Sarcelles, near Paris, with a new extension which will double the site's production capacity to 20 million cards in 1996.

The card manufacturer personalises cards for more than 200 customers in a high security environment. The centre is approved by the major financial institutions including GIE Cartes Bancaires, Visa, MasterCard and Europay and is certified to ISO 9002 standard.

Contact: Jackie Shambrook**, Gemplus, UK - **Tel: +44 (0)1705 486444. Fax: +44 (0)1705 470628.

Continued Growth at DANMØNT

DANMØNT reports more than 1.5 million transactions in its electronic purse scheme in Denmark and says that continuing growth is due to the fact that the card can be used in a variety of different self-service outlets, including parking, mass transit automatic ticket machines, payphones, stamp postage machines, hot and cold drink dispensers, snack vending machines, launderettes, photocopying, fax and recharging stands for electrical cars.

To mark the installation of automatic ticket machines at more than 80 stations in the Copenhagen Mass Transit system, and the installation of 5,000 payphones all over the country, DANMØNT has issued a set of four cards designed by the artist Frederick Preston and based on the work of surrealist painter Salvador Dali.

The four cards, which depict the many services available, form a puzzle and are reported to be a success with collectors. The cards have been supplied by Giesecke & Devrient of Germany.

Contact: Henning N Jensen**, Managing Director, DANMØNT, Denmark - **Tel: +45 43 44 99 99. Fax: +45 43 44 90 30.

L&G Alliance with Conlog

Landis & Gyr (UK) has announced an alliance with South Africa's leading electricity meter manufacturer, Conlog, to market their products on a worldwide basis. Conlog's meters have been designed for third world countries undertaking rural electrifiction projects.

Martin Pollock, Landis & Gyr's Marketing Director, says, "Conlog's range of meters will enable us to offer a full range of payment solutions in those countries where the local utility is delivering electricity to rural communities for the first time and we will be pursuing markets in South America, the Far East and China through our worldwide network."

Durban-based Conlog plans to increase production from the current level of 1,000 units per day.

***Contact: Martin Pollock**, Landis & Gyr UK - **Tel: +44 (0)1952 677661. Fax: +44 (0)1952 677594**.*

EMV Chip Specs Completed

The EMV specifications for a global payments framework using chip or Smart Cards has been completed. Europay, MasterCard and Visa have announced the updated version of the joint specifications for Integrated Circuit Cards (ICC) for Payment Systems, EMV '96. The release marks the culmination of the two-and-a-half year joint effort by the three payment organisations.

The document structure has been re-organised to make it more user-friendly for manufacturers developing globally compatible chip cards and terminals.

Based on a common set of technical specifications derived from standards set by ISO, the International Standards Organisation, EMV '96 consists of three documents: the ICC Card Specification, the ICC Terminal Specification, and the ICC Application Specification.

New information includes:
Dynamic Data Authentication - a risk control mechanism that enhances security by performing off-line card authentication using public key cryptography in both the card and terminal;

Terminal Software Architecture - an additional section in the ICC Terminal Specification, containing different approaches that terminal manufacturers and member financial institutions may use when designing future terminal software;

Post-Issuance Commands - commands in a card that facilitate application management by the card-issuing financial institution;

Secure Messaging - a mechanism that ensures the confidentiality and integrity of the data that is originated by a card-issuing financial institution and sent to the card.

Further versions of the EMV will set regular maintenance releases and the partners say there are no further plans for a functionally-enhanced EMV specification.

Contacts: Gilliane Palmer**, Europay - **Tel: +32 2 352 5647. press@europay.com Leslie Lakis-Card,** MasterCard - **Tel: +1 914 249 5239. http://www.mastercard.com Gail Murayama**, **Visa - Tel: +1 416 432 3645. murayama@visa.com

Secure Internet Shopping Plan

A French consortium of Banque National de Paris, Société Générale, Visa International, France Télécom and Gemplus are to develop a secure way of buying goods and services over the Internet using the latest chip card technology.

Visa, which is represented in France by Groupement Carte Bleue, says the objective is to enable consumers to pay for goods safely on the Internet using a bank issued chip card and a personal computer equipped with a chip card reader.

When a cardholder wishes to buy something advertised on the Internet he will insert his card into the reader and key in a Personal Identification Number (PIN). This will enable him to access his digital Visa card, or "certificate," which is contained in software on the PC.

In the first phase of the project existing chip cards, issued by the French banks, will be used to test the system security which is provided by combining data held on the chip card with the international SET (Secure Electronic Transaction) specifications developed jointly by Visa and MasterCard. A method for processing small value transactions, such as purchasing on-line information services, will also be developed.

Visa says that after the specifications have been fully tested, the group will release them for the development of card reader software.

In the second phase a new French chip card conforming to the international EMV (Europay, MasterCard, Visa) standards will be developed. This card will contain SET-related functions, amongst others, and will provide a model for other countries implementing chip card technology.

The SET specifications were jointly developed by Visa and MasterCard and are available to everyone, so that the new standard can pave the way for the use of personal computer software incorporating payment security applications. The latest version was published in June, enabling developers to write new, or upgrade existing, software.

Contact: Colin Baptie**, Visa International Press Office, UK - **Tel: +44 (0)171 937 8111. Fax: +44 (0)171 937 0877.

Bull Electronic Commerce Offer

French Groupe Bull has announced it has developed an end-to-end electronic commerce offer bridging the gap between consumers and suppliers of the electronic marketplace.

Based on the information highway project Shopping 2000, initiated by the French Ministry of Industry in 1995, the project involves major European players such as the French retail group Conforama, Dutch retailer BECO, the French postal service La Poste and European broadcaster Canal +.

According to Bull, the key distinguishing feature of the electronic commerce offer is the end-to-end nature of the approach including:

* tools to retrieve catalogues and render them accessible to the broadcast services

* tools to enable the selective broadcast of these catalogues via satellite TV and/or the Internet

* EDI based mechanisms to enable the ordering and distribution logistics functions

* mechanisms to enable secure orders to be taken and payment made using Bull CP8 Smart Card based solutions.

Contact: Dominique Mercier Chevalier**, CP8 Transac - **Tel: +33 1 39 66 45 20. Fax: +33 1 39 66 44 02.

Schlumberger Shows Server

Schlumberger Electronic Transactions showed its Mercure server system at Americas Telecom in Rio de Janeiro last month. The server automatically manages payphone payments made by bank cards or electronic purses.

The system consists of a UNIX workstation with software to authorise and manage electronic payment transactions. Payments are consolidated and held in an Oracle database for subsequent download to banks or financial organisations.

Contact: Nicolas Poirier**, Schlumberger - **Tel: +33 1 47 46 59 34. Fax: +33 1 47 46 68 66.

Internet Project in Canada

Royal Bank of Canada and VeriFone Inc. say they are to work together to offer a secure end-to-end Internet commerce solution based on the SET protocol and expect to pilot it later this year. The planned solution aims to enable consumers to purchase products and services quickly and securely over the World Wide Web using their credit cards. It would also give Royal Bank merchant clients the opportunity to market their products on-line.

The solution uses technology by VeriFone, a leading provider of transaction automation solutions, and Netscape Communications Corporation, a premier provider of open software for linking people and information over networks.

The solution being developed is expected to pave the way for applications using credit cards, debit cards, stored value cards and other electronic payment methods.

Gemplus Claims Market Lead

Last year was a difficult one, not only for Gemplus, but for the entire Smart Card industry says Marc Lassus, President and CEO, in presenting the Group's annual report.

As competition for market share and volume escalated, prices of cards used for high-volume applications, like phonecards, fell by 15%, while worldwide Smart Card sales volume rose by only 11% - compared to the 30-35% growth figures of previous years - to reach an estimated worldwide volume of 465 million cards.

Gemplus remained the industry's clear leader, he said, increasing its share of the global market from about 34% to nearly 40%. Sales were up 37% to FF 1.5 billion (US $302 million), and profits were steady at FF 104 million (US $21 million).

More than 80% of the Group's sales were generated outside France. The highest levels of growth came from Asia Pacific which increased its net sales in 1995 by 72% over 1994. The second strongest area was the Americas with an increase of 54% over 1994. Europe, excluding France, generated net sales of FF 738 million, up 45% from 1994 net sales.

Italian Senate Votes by Card

Politicians in the Italian Senate have been trying out a new Smart Card system from Gemplus which records their attendance and enables them to vote by pressing a button.

The system enables the Senators to record their presence and availability to vote by inserting their card in a reader in front of their seat and to vote yes, no or abstain by pressing a button on the reader. The votes are automatically recorded and the result displayed on a large screen, says Giovanni Landi, Director of Gemplus Italia.

"It is an important application, particularly in terms of image," he said.

The system was developed by Rome-based systems integrator and Gemplus partner in this application, Eurel Informatica. Marketing Manager, Francesco Costa, described it as a system for the fast management of the voting procedure.

He added that the system has already been installed at local and regional government level in several major cities such as Rome and Milan and they now wanted to export it to other countries.

Contact: Giovanni Landi**, Director, Gemplus Italia - **Tel: +39 39 609 1361. Fax: +39 39 609 1368.

ICMA Technical Helpline

A technical helpline has been set up by the International Card Manufacturers Association (ICMA), based in the US, to answer members' questions on all aspects of card manufacturing and the plastic card industry.

Jeffry E Barnhart, Executive Director for ICMA, explained: "When the ICMA was formed six years ago, one of the primary complaints was that industry participants rarely talked to one another. The creation of the helpline represents another step in establishing a greater exchange of information within the industry."

The helpline will act as an expert referral system. Members who call the helpline will be given the names and contact information for one or more experts who can answer their questions.

Contact: Mike Pincus**, ICMA, USA - **Tel: +1 609 799 4900. Fax: +1 609 799 7032.

Smallest IC Card Reader/writer

Claimed to be the world's smallest IC Card reader/writer, offering full latching connections to any ISO 7816 card, the MP1 from Densitron Perdix in the UK, measures 91.4mm x 64mm x 5mm.

The unit is said to have an operational lifetime of 200,000 passes and weighs only 30g. It is aimed at applications such as handheld terminals, telephone installations, personal game players, notebook PC peripheral devices, electronic wallets and wireless IC card reader/writer modules.

Other products in a new range of reader/writers included an IC card reader produced to meet military specifications, a PCMCIA/JEIDA Type II ultra-thin Smart Card reader/writer, and a hybrid magnetic stripe and IC card reader housed in a single package.

An automatic reader/writer with an internal motor and dust-proof shutter is available for more demanding applications such as ticket readers and vending machines.

Contact: Alistair Duthie**, Densitron - **Tel: +44 (0)1959 700100. Fax: +44 (0)1959 700300.

Boots to Expand Loyalty Card

Boots the Chemist is planning to extend its Smart Card loyalty scheme currently being tested in 13 stores in the Norwich area of the UK.

Called the Advantage Card, the loyalty scheme enables customers to obtain one point for every 10p spent in Boots. Each point is worth 1p and can be redeemed against a choice of over 1,500 of the store's best selling lines or used to claim a day package or special treatments at a health spa.

The expansion of the loyalty scheme was announced by Managing Director Steve Russell in revealing plans to invest over £300 million in the development of its chemists chain over the next four years and expand store opening times, but he gave no further details.

It is understood that Boots will launch a second pilot scheme in another part of the country later this year before deciding on a national roll-out.

Contact: Francis Thomas**, Media Relations Manager, The Boots Company - **Tel: +44 (0)115 968 7029.

Smart Taxi Cab Meter

Orpak Industries, a subsidiary of Rapac Electronics of Israel, has developed the Metrolink 2000 series of taxicab meters that include a credit card/Smart Card meter, a receipt printing meter and a miniature taximeter as well as software to manage fleet operations.

The new taxi meters equipped with a combined credit card and Smart Card reader can be interfaced with an electronic purse and other Smart Card schemes, says the company.

In Israel a large taxi fleet is using the Smart Card meters and several thousand cards have been issued to customers.

The Rapac group is developing a range of Smart Card applications such as a Smart Park system, a Smart Card based bus fare collection system, a variety of Smart Card interfaces for automatic machines such as soft drinks, newspapers, photocopy machines, washing machines, etc., and combined card readers for magnetic stripe and Smart Cards for various uses such as medical cards.

Contact: Avivit Kochavi**, Marketing Communications Manager, Rapac Electronics, Israel - **Tel: +972 3 64 50365. Fax: +972 3 64 91007.

VISA Cash Cards at the Olympics

German Smart Card manufacturer, Giesecke & Devrient of Munich, will have shipped nearly one million VISA Cash cards to Atlanta, USA, for Visa International's test launch of its stored value product with First Union, NationsBank and Wachovia Bank.

The Smart Card is available from banks and can be recharged at special terminals or automatic teller machines. Prepaid, non-rechargeable cards can be purchased from designated dispensers using cash or a credit card. French card manufacturer Schlumberger, is also supplying disposable and rechargeable cards for the pilot.

Israel to Produce Smart Cards

Ordacard Hitech Industries of Israel has purchased new card manufacturing equipment from Oakwood in the UK to increase its plastic card production capacity to 80 million cards a year, 25% of which will be Smart Cards.

The new equipment, with an investment of US $3 million, is currently being installed in the company's new plant which was established at Caesarea with an investment of US $5 million.

Ordacard says the new equipment enables them to produce comparatively small series of cards for defined groups, as well as handling all the other types of cards produced by the company, such as Smart Cards, telephone cards, bank cards, etc.

The company is owned by Eli Garger (37%), Amir Galil (18%), Lilian Silver of Toronto (18%), Paul Kittay of New York (2%) and American Banknotes Corporation of New York (25%).

Contact: *Card Services Division, Ordacard, Israel* - ***Tel: +972 3 579 9021. Fax: +972 3 579 8461.***

G&D Targets UK Purse Market

German Smart Card manufacturer Giesecke & Devrient is to target the UK electronic purse market and has signed an exclusive marketing agreement for the UK with ID Data Systems.

The agreement covers the direct marketing of G&D's Smart Card products by ID Data Systems with a specific focus on the VISA Cash stored value card being launched in the UK in 1997.

Peter J Cox, Chairman of the ID Data Group, said that this co-operation represents the first stage of a multi-facetted approach by the two companies. The aim is to target the UK banking sector with a full range of business solutions. This is done by utilising the large production capabilities and chip card technology of Giesecke & Devrient in conjunction with Europe's largest credit card personalisation based at ID Data Systems in Corby, England.

Contacts: Verena Munz*, Giesecke & Devrient, Germany* - ***Tel: +49 89 4119 668. Fax: +49 89 4119 536. Anne Pihl****, ID Data Systems, UK* - ***Tel: +44 (0)1596 201868. Fax: +44 (0)1536 203434.***

Asia-Pacific Show for Singapore

Asia Card Technology '97 (ACT '97), to be held in Singapore next year, has been described by organisers, Reed Exhibition Companies, as the first international exhibition and conference for business applications and technological developments for the Smart Card and associated industries in Asia.

It will take place at the Singapore International Convention and Exhibition Centre at Suntec City, from 23-25 April, 1997.

ACT '97 will focus on three key areas:

Enabling technologies - chip/stripe and embedding technology, card materials and connectors, security techniques, contactless and radio technology, software, programming, scanning options and support, component, memory, mounting technologies.

On-stream and future integration and applications - system integration tools and techniques, implementation methodologies, present development projects and future application areas.

Industry or business project showcase - live demonstrations of industry usage, infrastructure / backbone considerations, primary focus on projects in transportation, lifestyle (banking, entertainment, retail) and telecommunications.

In conjunction with the exhibition, ACT '97 will be complemented by a high-profile business-oriented conference and a series of technical workshops.

Contact: Ms Serina Tan - Tel: +65 434 3693. Fax: +65 338 2112.

VISA Cash on the Net

VISA Cash is being adapted for use on the internet. The "Smart Commerce Japan" scheme, undertaken with the Toshiba Corporation will develop a Java-based interface software between the chip card and the transaction system.

Netscape Communications Corporation will develop the back-end Internet system. Browser software, 30,000 chip cards and personal computer-compatible chip card read-writers will be distributed at the end of 1996. The twelve month trial will begin in the new year.

Barclays PurchaseOnline Pilot

Barclays has announced a pilot scheme to facilitate electronic commerce between British companies, called Barclays PurchaseOnline which will enable buyers to view, order and pay for industrial and office supplies on the Internet.

Developed in conjunction with BVR, an IT solution provider specialising in business-to-business software, the system lets corporate buyers view a range of business supplies from on-screen electronic catalogues. Payment for goods ordered will be made by a company Barclaycard Purchasing card, a specially-adapted corporate Visa card. However, *SCN* sources say that Barclays will use a Smart Card for this purpose within six months.

It will also be the first UK application of 128-bit key encryption - under licence from the US Government - for scrambling data being transmitted so even if someone hacked into the system they would not be able to read the information.

Roger Alexander, Managing Director of Barclays Emerging Markets Unit, said their research showed that 48% of the top 1,000 companies the UK would use the Internet to order and purchase supplies.

"Our survey did, however, indicate that security fears voiced by almost three-quarters (72%) are holding some companies back," he said. "We hope that the use of one of the most powerful encryption methods to protect payment details will reassure businesses that with our service they can trade effectively and securely."

A number of large corporate buyers and suppliers are taking part in the pilot phase which will run until the end of the year. The participants include Anglian Water, Farnell Components, XMA Computers, Fisher Scientific UK, Gilbert Ofrex and Imperial College.

Contact: Chris Tucker**, Barclays Bank, UK - **Tel: +44 (0)171 699 2669.

Great Wall Card in China

Bank of China's electronic purse, the Great Wall Card (see front page), is a multi-application banking card serving as an electronic pass book and purse and as a debit card.

The colourful card, showing China's famous landmark, is supplied by Gemplus Technologies Asia. Some 40,000 cards have been issued in field tests which began last year.

Contact: Michael Ng**, Gemplus China - **Tel: +86 10 6428 0882. Fax: +86 10 6428 0885.

Philips Ships New Phone Card IC

Philips Semiconductors Inc has announced that it is shipping a new Eurochip, a phone card IC called the PCF2033, which it says provides a larger non-volatile memory than competing devices. It contains improved security features which prevent security algorithms from being deciphered through analysis of the silicon or its electrical behaviour.

The PCF2033 is designed for Deutsche Telekom and enables phone cards to store a number of pre-paid call units that are deleted as the card is used to make calls. Philips says it plans to introduce Eurochip designs to meet the security requirements of other telecom companies.

Philips Semiconductors is a subsidiary of Philips Electronics North America Corporation and an affiliate of Philips Electronics NV, headquartered in Eindhoven, The Netherlands. Germany and The Netherlands have an agreement that makes it possible to use the same phone card in both countries.

Contact: Lawrence Fogel**, Philips Semiconductors, USA - **Tel: +1 800 447 1500.

CashCard EP in Singapore

Singapore's CashCard electronic purse (see front page), operated by the Network for Electronic Transfers Pte Ltd (NETS) comprising seven shareholder banks, is currently being rolled-out. NETS is targeting the issue of nine million cards by the year 2000.

It is planned that the 1K bytes EEPROM CashCard, supplied by Gemplus Technologies Asia, will be used for electronic road pricing and the mass rapid transit (trains and buses) system in 1997.

Contact: Sang Chu Yong**, NETS, Singapore - **Tel: +65 374 0557. Fax: +65 272 2334.

Smart Card Diary

Cards Australia '96 Conference & Exhibition, Sydney Convention & Exhibition Centre, Sydney, Australia, 20-22 August.

Three-day trade exhibition and a multi-streamed conference organised by the Asia Pacific Smart Card Forum and AIC Exhibitions to cover Smart Cards, Stored Value Cards and electronic purse, co-branded/loyalty cards and procurement cards. Erika Morton, AIC Exhibitions, Australia - Tel: +61 2 210 5704. Fax: +61 2 223 9216.

ESCAT 1996 (European Smart Card Application & Technology), Hotel Kalastajatorppa, Helsinki, Finland, 4-6 September.

Smart Card applications and user experiences from experts from seven countries. Congrex, Finland - Tel: +358 0 752 3611. Fax: +358 0 752 0899. Email: JohaniSaari@tbx.telebox.fi

Smart Cards for the Airline Industry: Practical Uses and Future Development, The Café Royal, London, 16/17 September.

The airline industry is looking at the potential for the use of Smart Card technology to complement the growing number of "ticketless travel" schemes, with possibilities for use in immigration, customs & excise, customer loyalty schemes and as an electronic purse. International Conference Group - Tel: +44 (0)181 743 8787. Fax: +44 (0)181 740 1717.

ICMA 6th Annual Card Manufacturing Expo, Bermuda, 21-25 October.

The annual gathering of the International Card Manufacturers Association which has taken "The Globalisation of the Plastic Card Industry" as this year's conference theme. Lynn McCullough, ICMA - Tel: +1 609 799 4900. Fax: +1 609 799 7032.

CarteS '96, CNIT, La Defense, Paris, France, 29-31 October.

International forum for plastic card technologies and applications with a major conference and exhibition. CEP Exposium / Cartes - Tel: +33 1 49 68 52 87. Fax: +33 1 47 37 75 09.

New APACS Chief Executive

Christopher Pearson has been appointed Chief Executive of the Association for Payment Clearing Services (APACS) from 2 September to succeed Richard Allen who is retiring from the post he had held since 1988. Pearson is currently Director, Branch Banking Division, Royal Bank of Scotland and Chairman or Director of a number of Royal Bank of Scotland subsidiaries.

Standards Committee Chairman

The International Card Manufactures Association (ICMA) has announced that Joe Naujokas of Naujokas and Associates, its delegate to the ANSI X3B10 Committee for ID cards and Related Devices, has been appointed the committee's Chairman. He succeeds Chris Dybal of Drexler Technology Corporation and began his three-year term of office on 1 June. Naujokas is an exclusive consultant to ICMA on standards

Jeffrey E Barnhart, ICMA's Executive Director, said: "The interchangeability of machine readable cards has been a key to the growth of the plastic card manufacturing industry. Our continued support of standards through Mr Naujokas's efforts ensures that the card manufacturer's voice is heard in setting standards, while also ensuring that our members are kept up to date on this issue."

***Contact: Mike Pincus**, ICMA, USA - **Tel: +1 609 799 4900**.*

New Smart Card MD at Philips

Willem Haverkamp, a Dutchman, aged 49, has been appointed Managing Director of Philips Smart Cards & Systems. He has held the appointments of President and CEO with Philips Uruguay from 1987 to 1990, at Philips Morocco from 1990 to 1995, and latterly at Philips Cartes et Systems in Paris.

He succeeds Frangois Petit, who was involved in the first development contracts for Smart Cards with the French PTT and GIE Cartes Memoire as early as 1980. He became Managing Director of Philips' Smart Card activity in 1992 to develop its industrial and commercial capacities.

Electronic Commerce and Payment Mechanisms Part 5

Payment Systems on the Internet

The payment for services over the Internet falls into three categories shown below with some of the better known products in each category:

e-Cash	Credit/Debit Cards	Accounts
DigiCash	Cybercash Network Bank	Security First
Mondex	Visa/ MasterCard	Netbill

e-Cash

Products in this category are based on electronic cash models and have the particular characteristic of being able to cope with micro payments.

Mark Twain Bank / DigiCash

Mark Twain Bank in the USA is currently promoting a trail on the Internet using an electronic cash system developed by DigiCash, a Dutch company headed by Dr. David Chaum. Finland's Merita Bank is another licensee of ecash.

The system is based on the concept of digital coins. These coins are not of course visible but correspond to a string of digits which represent the relevant coin value. A portfolio of these coins is obtained from the bank and are subsequently used to make payments to the appropriate service provider. The service provider then submits these coins to the bank to obtain the corresponding credit to his account. A particular feature of the DigiCash scheme is that these payments are anonymous. The operation of the scheme can be followed by reference to *figure 11*.

The consumer provides blank coins to the bank for certification. When the bank applies its seal which is effectively a digital signature a certified coin is generated and the corresponding account is debited accordingly. These coins are made anonymous by using a blinding factor. This is achieved by constructing a special blank coin such that the certified coin can be subsequently modified to disguise the original owner. Clearly the consumer will purchase a set of coins of different denominations to allow any payment value to be constructed.

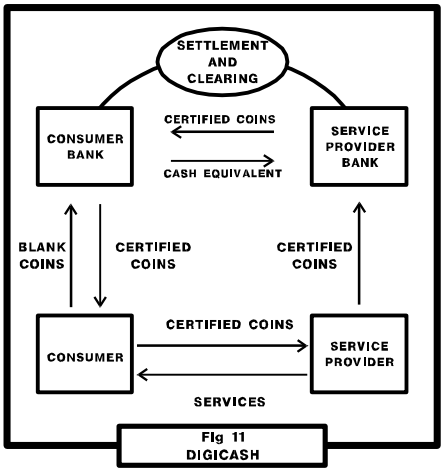


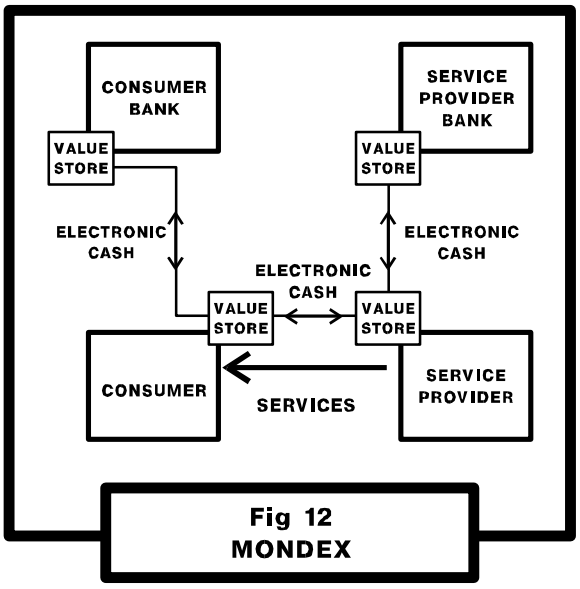
Fig 11
DIGICASH

The consumer makes payments to the service provider by transmitting the appropriate set of coins to make up the necessary payment value. The service provider then transmits these coins to the bank who can check their authenticity and can also check against duplicate spending. Clearly each coin must only be used once.

This scheme has a security advantage in that the digital signature that represents the coin values are generated only by the issuing bank. There is no need for a tamper resistant module to exist in the consumer's computer. The disadvantage is that the system must operate on-line to prohibit multiple spending of the same coin. Other concerns about this scheme have been raised in the area of its scalability. The University of Southern California has proposed an alternative scheme called Netcash to try and over come some of these problems. The DigiCash scheme uses RSA digital signatures to generate the certified coins.

Mondex

The Mondex business architecture is quite different to the DigiCash model. Whereas the DigiCash approach is similar to bank drafts, thereby requiring a clearing and settlement process, Mondex more closely models the use of cash. The operation of Mondex can be described by reference to *figure 12*. The concept is based on the use of all the



participants in the Mondex scheme being equipped with value stores. These are tamper resistant modules that contain the electronic cash. At long last the Smart Card appears because Mondex uses them to form the value stores for all participants.

When the consumer wants to load electronic cash into his store a secure transaction protocol takes place between the Smart Card of the bank and the Smart Card of the consumer. The consumer's bank account is debited accordingly. Payment is made in the same way. In exchange for services the same secure transaction protocol is invoked between the consumer Smart Card and the service provider Smart Card. Similarly the service provider can pay-in his takings to the bank by using the same protocol, just like handing in cash but much easier.

The security of Mondex is based on the use of Smart Cards and the security of the value transfer protocol. The crytographic algorithms employed by Mondex are not published but are based on asymmetric cryptography for the generation of digital signatures.

Credit/Debit Cards

The payment mechanism employed here invokes the secure transmission of credit/debit card numbers across the Internet. The primary product is quite clearly the SET (Secure Electronic Transactions) protocol jointly developed by Visa and MasterCard. It should be noted that these payments on the Internet are not viable for micro payments because of the necessary cost overheads in processing the individual credit/debit card transactions.

Visa/MasterCard SET

On the 1st. February 1996 MasterCard and Visa joined together to announce a technical standard for

protecting payment card purchases made over an open network such as the Internet. Prior to this date MasterCard and Visa were pursuing separate specifications. The new specification SET (Secure Electronic Transaction) Is deemed to represent the convergence of these activities. The detailed specifications are available from the WEB site of both Visa and MasterCard.

The participants in this collaborative effort include: GTE, IBM, Microsoft, Netscape, SAIC, Terisa and Verisign. SET is based on specially developed cryptographic technology from RSA Data Security.

figure 13 and is designed to achieve the following key features,

- Confidentiality of information
- Integrity of data
- Card holder account authentication
- Merchant authentication
- Interoperability

The operation of SET is described by reference to The consumer passes the payment message through a hash function which is then signed by his secret

key. A random session key for symmetric encipherment is generated for enciphering the payment message along with the digital signature. The symmetric session key is enciphered with the public key of the receiver. These messages are then passed over the network.

The receiver initially recovers this secret symmetric session key by employing his asymmetric secret key. This key is then used for the symmetric decipherment of the transaction and signature message. The digital signature is checked using the public key of the sender to recover the original hash data. The deciphered transaction data is passed through the same hash function and the two hash values are compared.

The initial proposal for SET uses DES for the symmetric encipherment and RSA (1024 bits) for creating the digital signatures. RSA (768 bits) is used for transporting the DES sessions keys. The secure hash algorithm (SHA-1) is used to create the transaction message hash digest.

This is a strong security architecture that relies on the secure storage and management of the secret cryptographic keys. It is assumed that the computers employed in the system can be operated to provide the necessary security. As discussed previously there is no proof that the consumer was involved in the transaction. This security scheme would be considerable improved by the use of tamper resistant modules at the various key stores in the system. This could well be implemented by the use of Smart Cards.

CyberCash

CyberCash Inc. was founded in 1994 to enable electronic commerce by providing a safe, convenient and immediate payment system on the Internet. The system is described as shown in *figure 14*.

In *Figure 14* the consumer has been viewing goods from the merchants online server and "clicks" the decision to purchase. The CyberCash wallet window opens on PC screen.

1) The consumer has shopped at the merchants site and has decided what it is they wish to purchase, where they want it shipped etc. The merchant server returns a summary of the item, price, transaction ID etc. to the consumer.

2) The consumer clicks on the "Pay" button which launches the CyberCash, Checkfree or Compuserve Wallet and chooses which credit card from their "wallet" they wish to pay with and clicks OK to forward the order and encrypted payment information to the merchant.

3) The merchant receives the packet, strips off the order and forwards the encrypted payment information digitally signed and encrypted with his private key to the CyberCash server. The merchant cannot see the consumer's credit card information.

4) The CyberCash server receives the packet, takes the transaction behind its firewall and off the Internet, unwraps data within a hardware based crypto box (the same ones the bank use to handle PINs as they are shipped from an ATM network to ATM network, reformats the transaction and forwards it to the merchants bank over dedicated lines.

5) The merchant's bank then forwards the authorisation request to the issuing bank via the card associations or directly to American Express or Discover in those cases. The approval or denial code is then sent back to CyberCash.

6) CyberCash then returns the approval or denial code to the merchant who then passes it on to the consumer. From step 1 to step 6 takes approximately 15-20 seconds.

All encryption is at the message level and is therefore independent of the browser technology used.The cryptography is based on RSA (768 bits) for the digital signature and DES for the transaction encipherment. The MD5 algorithm is used to create the transaction hash digest. CyberCash have identified the new work being undertaken by Visa and MasterCard and have proposed to align themselves with the new SET specifications.

Dr David Everett
To be continued...

The Message is on the Cake

Did you forget your partner's or a very important person's birthday, or want to make a marketing impact with a difference? Well now you can solve the problem with a cake.

Bob Young, Managing Director of Cadex, a small company based in the south coast English town of Hastings in Sussex, has come up with a novel idea involving a Smart Card to protect image copyright.

An image is scanned into a computer and then recreated on sugar icing. The inks used in the printer are spirit based and have passed health and safety standards after a two-year development by Warner Jenkinson of Kings Lyn in Norfolk.

An image is scanned into a computer and then re-created on sugar icing. The printing takes about four minutes and a Smart Card, supplied by Delphic, is used to protect the copyright of the original design. As an example, copyright Disney and Hanna Barbara characters are loaded onto the Smart Card and encrypted. The baker decides how many characters he wants to purchase so each time a character is used it is registered on the card. It is not possible to change copyright protected designs.

Bob first had the idea of printed cakes 14 years ago, but because of concerns over infringing copyright, decided it was not a viable proposition. "Now, with a Smart Card," he said, "anything that can be printed on paper can be reproduced on sugar icing."

Cadex hope to launch their cake printing machine in September and say there is considerable interest from leading supermarkets.

Smart Card News went to the Cadex bakery to test the technology and became the first international publication to use it for promotional purposes. As the test of a world leading publication is in the reading, the quality of a cake is in the eating. The verdict of SCN staff was: "It's almost too good to eat." We can't let you taste it, but we can show the result (see below) of our first promotion on a cake!

Contact: Bob Young, Cadex, UK - Tel: +44 (0)1424 444788. Fax: +44 (0)1424 444772.