

Big Three Rift Exposed By Breakaway Europay

A schism has appeared in the apparent cosy co-operation between the three major card issuers Europay, Visa and MasterCard over the implementation of electronic purse operations.

In a dramatic move, Europay's International Board of Directors has advised its members that it would not be cost-effective to invest in a Smart Card terminal infrastructure based on the current EMV specifications within the next two years.

Instead it is urging a "drive" towards bringing forward work in progress on further releases on the specifications currently scheduled for June next year.

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Smart Card News

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Next Month

Smart Card Tutorial - Part 7

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The Europay move came with the publication of Release 2 of the IC Card Specifications for Payment Systems and Release 1 of the IC Card Terminal Specification for Payment Systems produced jointly by EMV. These have undergone "significant modifications" following contributions and suggestions from members and manufacturers.

Europay says the three payment associations are of the opinion that Release 2 is "sufficiently stable" to be used as a base for early implementation of chip cards and chip capable terminals. Europay says it is confident that the specifications would provide the ability to employ the card for the next several years but warns that the next release could require significant upgrades of terminal software when new features are introduced.

EMV had started work on preparing Release 3 of the card specifications and Release 2 of the terminal specifications with the two documents scheduled for delivery in June 1996.

Additional Requirements

Within this release EMV will focus on three additional business requirements of major importance:

- * Increase protection levels against counterfeiting by including support for Dynamic Asymmetric Card authentication
- * Include functions to assure compatibility of all terminals for the acceptance of emerging international electronic purse schemes
- * Establish a terminal architecture which finally addresses the long term concerns associated with the introduction of value added services, which could mean a secure and flexible terminal architecture

Europay reveals it has spent considerable time developing the Interpreter concept which will be considered by EMV for inclusion given that business, technical, cost and security issues can be resolved to everyone's satisfaction.

In a letter to members, Europay says that given the

Student Smart Card Programme

importance of these three business functions to the security and long term flexibility of the Europay Payment System, the Europay International Board of Directors decided that "it would not be cost effective for the Europay membership to invest in implementing a terminal infrastructure based on the (enclosed) EMV Card and Terminal Specifications."

"Instead, it has determined that the more appropriate decision would be to drive for an earlier release of the currently proposed June 1996 EMV Release, and use this as the foundation for the roll-out of cards and terminals supporting the Europay range of products during the second half of 1997."

Contact: Guido Heyns, Senior Manager, Europay, Tel: +32 2 352 5934.

Oki To Drop Its Own Cards?

Rumours in the industry say that Oki Electric Company of Japan is to stop selling its CMOS 8 bit microcontrollers on cards assembled by Dai Nippon.

Smart Card News sources believe that the success of the MSM range has prompted Oki worldwide to offer the chips and dies as on-board units to card manufacturers, while the company's Card Business Systems Division will continue to offer total card solutions, including terminals, to its customers.

However, rumours from usually reliable sources have been denied by the company. Roger Bailey of Oki Semiconductor (UK) says this is "unfortunately not correct."

BT Smart Phonecard Success

In the first six weeks since the launch of BT's new Smart phonecards and payphones in the Portsmouth area and the Isle of Wight, the UK telecommunications company reports card sales of more than £130,000. BT believes the cards will be a means of offering advanced services from its payphones, such as paying for calls from payphones in other countries, storing personal dialling codes, or collecting loyalty points to reward shoppers at selected retailers.

First of America Bank is to issue 60,000 Smart Cards in a multi-application system which includes

electronic purse, ID and banking functions for students at the University of Michigan.

The scheme will be launched next month and the card will be used by students, teachers and staff for a variety of functions including personal identification and dormitory security, banking and a wide range of "stored value" functions such as the purchase of goods and services, for example, food and books at off-campus restaurants and retail outlets, photocopying, snacks, beverages and laundry services on campus.

Schlumberger-Danyl will supply the Smart Cards and terminals. The contract includes the Payflex Smart Cards and terminals for point of sale, photocopiers, vending machines, laundry facilities, CashChip Stations and chip personalisation systems.

The First of America Bank card is the first bank-issued campus card programme to use Smart Card technology.

John Brecht, President of First of America Services, says: "We believe this provides the student with the most versatile campus card in the country and we are excited about installing the first major, all-encompassing chip card programme in the country.

"By using this technology, we provide the university with the capability of expanding in many other areas such as healthcare information, transportation, event ticketing and loyalty programmes."

Peter J Truscello, President of Schlumberger-Danyl, sees the installation as the first of many of its kind in the country. "The uniqueness of this application is that it combines a closed system at the universities with the outside world of merchants surrounding the campus."

Students will be able to load value onto their card at conveniently located CashChip Stations using cash or by transferring funds from a bank account. They also have the option to link a bank account to the card providing them with access to ATMs throughout the country.

Contact: Isabelle Ferdane-Couderc, Schlumberger,

Philips Takes Over Mikron

Netherlands-based Philips Semiconductors has

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ORGA/Kirk Plastic Agreement

A strategic partnership has been announced between ORGA Card Systems Inc., the US subsidiary of German-based ORGA Kartensysteme GmbH, and Kirk Plastic Company, North America's second largest manufacturer of financial transaction cards, to manufacture, market and distribute Smart Cards.

Kirk Plastic will continue to operate its magnetic stripe card manufacturing business while managing its new joint venture from existing facilities using current staff to produce Smart Cards. ORGA will provide its technological expertise in manufacturing, equipment for production, personalisation and quality assurance.

Both companies will distribute Smart Cards through their sales channels and are targeting the telecommunications, banking and Visa and MasterCard markets.

Kirk Hyde, President and CEO of Kirk Plastic, says the wide range of emerging applications for Smart Card technology worldwide has prompted their expansion in this direction.

Holger Mackenthun, President of ORGA Card Systems, Inc., headquartered in suburban Philadelphia, will spearhead the new initiative.

Kirk Plastic Company was founded in 1919 and has its corporate headquarters and manufacturing facilities in Rancho Dominguez, California. It produced 116 million payment cards last year of which half were Visa or MasterCard branded.

Contacts: Kirk Hyde, President, Kirk Plastic Company - Tel: +1 310 884 7900. Holger Mackenthun, President, ORGA Card systems, Inc., - Tel: +1 610 993 9810. Simon Reed, Business Development Manager, ORGA UK - Tel: +44(0)1491 410997.

become a 100% shareholder of Mikron, the Austrian company which produces components for radio frequency identification and contactless Smart Cards.

Philips will gain access to Mikron's expertise in systems requiring "anti-collision" features and high bit rates. It intends to operate Mikron's activities parallel to its existing RF identification business and to continue with Mikron's current management.

Mikron, founded in 1987, produces contactless passive systems (no battery required) and chips which can be packed in tags as well as cards. Based in Gratkorn near Graz in Austria, it employs about 100 people.

Its MIFARE contactless Smart Card Automated Fare Collection (AFC) system is now in mass production with about one million cards and 4,000 readers manufactured by mid-1995.

MIFARE chip and readers are licensed to partners around the world such as Siemens AG in Germany, Monètel and Gemplus in France. Philips says it will support Mikron's commitments to existing customers and partnerships.

Its other RF products are HITAG, MIDAT, MIRO and MICARD.

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New Control System for Avant

Finland's Avant electronic purse is to have a new control system to manage the clearing, settlement and accounting of electronic money.

Avant Finland Ltd and Tietotehdas Oy have signed an agreement on the creation of the system, which will manage the rechargeable Avant cards for telephones and small payments.

"The system will be developed with a view to possible future link-ups to the clearing system and this facilitates clearing of foreign exchange transaction with electronic purse operators abroad as well as links with office, customer service and marketing systems," said Tietotehdas director Eva-Liisa Ala-Käkelä.

Armed Forces Smart Card

A Singapore Armed Forces (SAF) Smart Card has been developed by the Singapore Ministry of Defence (MINDEF) and Gemplus.

Tampere Telephone Co-operative TPO, the private telephone company of Finland's second largest city, introduced a rechargeable EP for public payphones in January this year. Other Avant card applications are for bus fares, parking, and vending machines.

Contact: Matti Erik Hakkarainen, Avant - Tel: +358 08941 4113.

Smart and Smarter Air Travel

Booking a flight the EDS way requires a painless telephone call - or calls, if you want to change the date and time of your flight, cancel it, claim refunds, and so on. Available through America West and Continental airlines in the USA, it is a computerised service which eliminates queues and tickets and is fast and efficient. Smart, in fact.

Smarter still is the solution provided by the IBM multi-function Smart Card which enables self-service flight selection and booking; check-in and ID; baggage identification; gate/passenger checks, verification and payment functions.

The Smart Card operates an easy to understand screen, with visuals of seats available and categories such as non-smoking and vegetarian menus; passport details with photo-ID, and so on.

The MFC is based on a tree structure, comprising a Master File, Dedicated File and Elementary File. It can have up to 8KBs of EEPROM for user applications, is compatible with magnetic stripe operations and has DES security. Further applications can be enabled without reissuing the card base.

Both systems were demonstrated at the International Air Transport Association (IATA) Electronic Ticketing conference at Gatwick Airport, UK.

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Over 300,000 cards will be issued to all personnel working in MINDEF as well as those in the reserve forces. Distribution of the cards has started and they will be introduced gradually until completed

around April 1998.

MINDEF is the first organisation in Singapore to use a single Smart Card to provide multiple applications on such a scale. The card will be used as a personal ID card and for physical security management, personnel administration/management and resource management, unit administration and financial management.

Personnel can use the SAF Card to do almost everything from opening office doors and logging onto computers to booking conference rooms and buying drinks from vending machines.

The card can also contain information such as drug allergies and leave entitlement and allows quicker processing for military mobilisations and in-camp training.

Collaboration with the Network of Electronic Transfers in Singapore (NETS) has enabled an electronic purse to be incorporated in the card for the introduction of financial applications such as the Individual Physical Proficiency Test (IPPT) Incentive Award Scheme so that personnel who qualify will be given their incentives immediately via an electronic cheque in the SAF card and can then cash it at any NETS terminal in Singapore.

The Gemplus MPCOS (Multi-application and Payment Chip Operating System) card with 8K bytes of EEPROM has been selected for the application.

Contact: Caecilia de St. Victor, Communication, Gemplus, France - Tel: +33 42 32 51 54. Fax: +33 42 32 51 17.

Proton Export Success

Banksys, operator of the Belgian national network for electronic payment - Bancontact/Mister Cash - has been successfully exporting the technology of Proton, the Belgian electronic purse.

In addition to selling its know-how to Interpay for the Dutch electronic purse scheme, it has had three

Six New Contracts for Innovatron

Innovatron Data Systems has signed a further six contracts in Eastern European countries to supply its Smart Card-based FUNCHIP Payment system.

other international successes with Proton.

In Switzerland, Telekurs has purchased the Proton technology. In Australia, ERG has bought the technology for the Quicklink consortium for application in Australia, Hong Kong and New Zealand. Banksys has also signed a contract with the Brazilian MITEL to enable it to launch an electronic purse with several local partners.

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

Two Million Phonocard Order

Solaic, the Smart Card manufacturing subsidiary of Groupe Sligos, is to supply 2.25 million phonecards to TELE 2000, a leading private sector provider of cable television and cellular phone services in Peru.

This is Solaic's first phonocard order from Peru and the company says the cards will be delivered during 1995.

Contact: Nathalie Six, Communication, Solaic, France - Tel: +33 1 49 00 92 08. Fax: +33 1 49 01 02 84.

Calling to Celebrate 250 million

Giesecke & Devrient's special edition 250 millionth German Telekom phonocard

New customers include four banks - the Gazprombank bank of Moscow (30,000 cards and 105 terminals), the SIB Contact bank of Nagian in Russia (10,000 cards and 51 terminals), the IMPAR

bank in Lithuania (5,000 cards and 100 terminals), and the Investbank bank of Kaliningrad in Russia (10,000 cards).

In addition, two companies, Manda Kharkoff of Kharkoff in Ukraine (10,000 cards and 31 terminals), and Galaxi of Simpheropol in the Crimea (10,000 cards and 103 terminals) - have also signed contracts.

This increases the total number of Smart Cards, (supplied to Innovatron by Solaic of France) in Eastern European countries from 539,000 to 614,000 and terminals from 6,935 to 7,325.

Correction

In our report on the success of Zolotaya Korona's inter-banking centre in Siberia (May SCN) it was stated that it had processed US\$ 5,670,000 in ten months of operations when this figure was for a single month - the month of March.

Contact Geneviève Bœuf, Communication Manager, Innovatron Data Systems, France - Tel: +33 1 40 13 39 42. Fax: +33 1 40 13 39 59.

Card Systems Sets up in Europe

Card Systems Inc., of Dallas, Texas - an independent consultancy specialising in plastic payment card processing systems - has set up a European operation in Amsterdam.

Called Card System Europe, the new operation is headed by Ken Maliga, Senior Industry Consultant and a Director of Card Systems, Inc., and Terry Newton, Senior Principal Consultant.

Maliga says: "Many card issuers, looking for a competitive edge, have ended up losing vast sums on such things as lost transactions, inefficient manual processes and phone bills. Fraud is the issue that usually hits the headlines but it actually costs the issuers less than mundane processing problems. Our benchmarking techniques can measure the performance of every aspect of any card processing system, and problems soon come to

Proximity Card AFC for Marburg

Buscom Oy, the Finnish specialist in electronic fare collection systems for public transport, is installing its contactless Proximity Card system in the city of

light."

The company has over 125 clients in 20 countries and employs over 60 card industry consultants worldwide. It has developed CardSMART, a repository of card processing data which includes models, templates, guidelines, business definitions and standards.

Card Systems Europe is at Karspeldreef 4, Postbus 22669, 1100 DD Amsterdam, The Netherlands - Tel: +31 20 6520 632/631.

Tampere 60,000 Card Order

An order for 60,000 contactless microprocessor cards has been placed with GPT Card Technology in the UK by Finnish company Intermarketing for the Tampere Automatic Fare Collection System (AFC). The order takes the number of cards to be supplied to around 80,000. The system uses Intermarketing's MTS 2010 AFC system which uses radio modems to transfer data from driver to depot computer, and protects data transfers against unauthorised access using the DES encryption algorithm.

GSM Fax Card from Mitsubishi

A new low power consumption PCMCIA GSM MelFax card has been announced by Mitsubishi Electric to provide fax and data modem facilities for portable computers and the fast-growing GSM digital mobile phone network.

Currently the card is available to Motorola 8200, 7500 and Flare GSM phone users, as well as other manufacturers phones with the necessary connection for the PCMCIA card's lead. The card operates at 5V and consumes just 50mA and can operate at up to 9600bps.

Contact: James Pemberton, Mitsubishi Electric UK - Tel: +44 (0)1707 276100. Fax: +44 (0)1707 278837.

Marburg in Germany.

The system, for the public transport co-ordinator for the greater Frankfurt area, Rein-Main-Verkehrsverbund (RMV), will be in operation by

the end of this year.

A feature of this particular application of the contactless card is the use of proximity technology for differential pricing according to the frequency of travel. The system incorporates a "bonus fare calculation" enabling favourable pricing for the most frequent travellers.

The Proximity Card can be programmed to carry a wide range of fare card functions as well as other electronic purse payment applications. It is intended to expand the system in the area covered by RMV and introduce other functions for the card such as paying for parking.

Among the cities where Buscom has supplied its Proximity Card-based systems are Uppsala and Österund in Sweden, Trondheim/Fosen in Norway, Nyborg in Denmark and Lahti and Oulu in Finland.

Contact: Kalevi Virta, Export Manager, Buscom Oy, Finland - Tel: +358 81 5514 366. Fax: +358 81 5514 766.

Secure Phone for Prisons

A secure phone system from Smart Move (NZ) is on trial in Australia in Parametta Gaol for the New South Wales Department of Corrective Services.

It consists of Smart Card driven encrypted phones which control and monitor inmate contact with outside parties, managed by proprietary software. The system can be extended to sector access control and vending machine applications for prisoners.

The system, designed and supplied by SmartMove, is a closed network interfacing with the Telecom Australia public network, and has been approved for tender to the Department of Corrective Services for installation in some 27 institutions in NSW.

Contactless Ticketing Pilots

Several contactless Smart Card ticketing pilot projects are about to start in the UK and mark a growing interest by local authorities and bus operators in Automatic Fare Collection systems using Smart Cards.

Parking System

Wellington and Auckland City Councils in New Zealand are introducing intelligent parking stations to operate in a pay and display environment.

The stations, from Auckland-based SmartMove (NZ) are able to give change, accept payment by Smart Card and reload cards.

Parking tariffs in the cities are time variable, and the meter downloads printed operational and audit reports by status and time sector.

Contact: David Bone, Director, SmartMove (NZ) - Tel: +64 9 309 2634. Fax: +64 9 309 2641.

Shell Smart for John Menzies

High Street retailer John Menzies has launched the Shell Smart customer loyalty scheme at 18 stores in Edinburgh and plans to extend the scheme to over 200 stores nationwide in the autumn.

It will issue and redeem Smart Points as well as issue Air Miles Points. Points can also be used as cash with £1 off for every 14 Smart Points redeemed.

Rick Hollway, Shell UK Promotions Manager says several other partners are expected to join.

Shell Smart was launched nationally in October 1994 and the company has issued over 2.8 million cards to date. It has won several major marketing and forecourt industry awards including two Institute of Sales Promotion Gold Awards, an Award of Excellence from the Council of Sales Promotion Agencies and Best Oil Company Promotion awards from Forecourt News and Service Station magazines.

Contact: Andrew Vickers, Shell UK Media Relations - Tel: +44 (0)171 257 3894.

Kent Smart Move Programme

Kent County Council in south-east England is launching a pilot scheme using contactless Smart Cards on buses in the Folkestone area as part of its Smart Moves programme for public transport.

Some 36 Stagecoach East Kent and Town & Around buses will be equipped with the DF 4000

automatic ticketing system from AES ProData. The Smart Moves initiative is aimed at eventually enabling seamless through-ticketing on all modes of public transport in the county.

The Council says that contactless Smart Card technology was chosen because of the additional benefits it will bring such as:

- * Flexibility for operator owned incentive and loyalty schemes to encourage public transport use
- * Increased efficiency in administration of concessionary fares schemes thereby reducing costs
- * Ease of expansion into car parking and other local government service provision

It is planned to issue 2,500 Sony contactless cards during the one year trial to two groups of passengers - school children and senior citizens who are eligible for concessionary fares.

The system will be installed during September and issue of the Smart Cards will start about mid-November.

Surrey pilot

Surrey County Council is to launch a pilot automatic fare collection system using some 20 Epsom Buses which will be equipped with the AES ProData DF4000 system utilising contactless Smart Cards from Sony.

In the first phase, starting in late October/early November, cards will be issued to school children.

The second stage will start in April 1996 with the issue of cards to concessionary passengers and run until April 1997.

A further stage under consideration is the issue of a Stored Value Card for bus travel.

Merseytravel Trials

In the Liverpool area, two trials are being carried out. One involves Mersey Bus which operates 15 vehicles within Liverpool City Centre linking industrial and commercial developments.

Wayfarer electronic ticket machines have been installed in the buses since last December and the contactless ticketing technology has been evaluated by Merseytravel staff using cards from NEDAP in The Netherlands.

Another trial using Wayfarer ticket machines and Mikron of Austria contactless Smart Cards will be conducted on Southport and District and ABC Travel buses.

This trial will involve about 70 buses and the issue of some 10,000 cards over the trial period.

Contacts

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Mondex: A "Total Triumph"

A "total triumph" was how the launch of Mondex, the Smart Card global electronic payment system in Swindon, England on 3 July was described by spokesman David Morton. Well, he would, wouldn't he? But in this case, he backed up his claim by pointing out that over 120 Mondex cards had been issued to the Press (including Smart Card News), radio and television to use at the launch.

None of us were able to say we did not understand how to use the card or report that it did not work when we tried to use it in the town.

We tested our card paying for sweets in Woolworth's. It was certainly as quick as looking for cash and waiting for change. We simply inserted the card in the reader which displayed the balance and the amount to be paid and, with our agreement, the purchase price was deducted and the new balance shown.

We also tried out the portable balance reader, putting our card in and checking the funds still available.

It was all so easy and simple, but regretfully, it did not make us famous like 72-year-old newspaper seller Don Stanley, who entered the history books by becoming the first member of the general public in the UK to exchange goods

for electronic cash when he sold a 28p newspaper for "cash" stored in his customer's Mondex Card (see picture on page one).

Developed by the National Westminster Bank, Midland Bank and BT, Mondex is used in the same way as cash in your pocket or purse, but with money stored on the card.

Unlike credit and debit cards, Mondex transactions do not involve authorisations or signatures and there is no opportunity to incur debt as users only spend money available on their cards.

The Swindon pilot will last two years and is expected to involve up to 40,000 consumers and 1,000 retailers ranging from corner shops to supermarkets. This will gauge demand for the service, usage, quantify the costs and benefits to those involved and confirm that the technology works in a live environment.

In the first six months, Mondex will be free to customers. After that, a card linked to a bank account plus a balance reader will cost £1.50. A "family pack" (two extra cards with balance readers and a Mondex wallet) will also be available for £3.50 a month.

The wallet can be used to store money from the card and to accept payments from other Mondex users, for example, the window cleaner or milkman will accept payments from a Mondex card.

The card can also be used to transfer cash over the telephone.

After the pilot, the scheme will be extended throughout the UK with the Bank of Scotland already agreeing to participate.

Meanwhile the Hongkong and Shanghai Banking Corporation and the Royal Bank of Canada and Canadian Imperial Bank of Commerce have purchased rights to Mondex in the Far East and Canada respectively.

Further announcements are expected soon with major banks in the United States showing interest in the "less cash" concept and in Mondex as a global payment card.

Purse Roll-out in Portugal

Commercial roll-out of Portugal's electronic purse has started with 30 issuing banks planning to distribute 500,000 cards to their clients.

Early statistics indicate that over 100,000 payments were made and 30,000 electronic purses were loaded last month, while retailer contracts with the different banks are running at around 1,500 per week.

Known as the Multibanco Electronic Purse (MEP) during trials it is now called PMB for *Porta Moedas Multibanco*. The scheme has been developed and is managed by SIBS (Sociedade Interbancaria de Servicos SA), the Portuguese EFT operator, on behalf of its shareholding banks.

Rui Meneses, Director of SIBS reports that the system is drawing the enthusiasm of both merchants and consumers as the most convenient alternative to cash-based transactions.

"In a unique characteristic to other pre-paid schemes in Europe, the PMB scheme provides Portuguese banks with a competitive framework for both card issuing and merchant acquiring," he said.

Purse loading can be carried out at ATM's or bank branches from any bank account accessed by a bank card accepted in the Multibanco network (even foreign credit cards where the loading is processed as a normal cash advance).

Aimed at substituting cash at the point of sale, payment by card is simple and does not require cardholder identification, thereby providing full usage anonymity.

The collection of transaction details and the usage

Lufthansa ChipCard Project

of secure payment modules at terminals, provides a fully auditable system with security features at the highest level.

Card acceptance devices fall into three types - portable terminals used by taxis, kiosks and small shops; PINPADs attached to current on-line POS terminals or electronic cash registers; and self-service vending machines.

Every terminal must integrate a payment module, provided by the acquiring bank, which caters for card interface, security and transactions storage.

SIBS says that over 20 different models of self-service vending machines have been successfully submitted to certification process, ranging from snacks, cup drinks and can dispensing to ticketing, postal and petrol services.

Merchants may use either a merchant card (a chip card supplied by Solaic) to collect transactions from terminals (for later deposit at an ATM) or on-line communication facilities.

Meneses says: "Bank acquiring initiatives are increasing accepting points throughout the country and the number of transactions is increasing steadily.

"Exciting new developments such as combined cards (chip with purse on a magnetic stripe bank card) and purse cards with private applications (for example, loyalty or access control) will consolidate bank offer to both individual and corporate customers."

Gemplus is to supply over one million PCOS cards by third quarter 1995.

Contact: Rui Meneses, Director, SIBS - Tel: +351 1 847 3642. Fax: +351 1 848 7077.

Lufthansa German Airlines is testing ticketless travel on flights between Frankfurt and Berlin with more than 500 customers from major companies.

The ChipCard integrates for the first time contactless Smart Card technology into a traditional credit card which can be used as a check-in card, boarding pass, a Miles & More (customer loyalty) Card and a customer status card. In the case of AirPlus Cardholders, it can also be used as a credit card and a phone card.

To book a flight at a travel agency, for example, the flight details are entered on the card so there is no need to issue a ticket. At the airport, the cardholder can check-in by inserting the card in a terminal.

The new card is the first contactless Smart Card to be produced by Giesecke & Devrient and is called the RM8K (1K bytes EEPROM) MIFARE Card which uses remote coupling technology from Mikron of Austria and is designed specifically for applications in identification and ticketing systems.

Contact: Dr Anselm Eggert, Project Leader, Deutsche Lufthansa AG, Germany - Tel: +49 69 696 90211. Fax: +49 69 696 91089.

Multiflex Card Operating System

Schlumberger Smart Cards & Systems has released a new generation operating system for implementing Smart Card applications.

Called Multiflex, the software provides a ready-to-use library of functions common to all Smart Cards, together with a secure means of running code from EEPROM - allowing design ideas to be rapidly trialed, optimised and validated before committing to silicon.

Schlumberger says the new system could cut months off development timescales, cut Smart Card entry costs, and provide opportunities for individuals and small companies.

Multiflex's ISO 7816-4 compliant functions free designers to focus on specialised user-orientated aspects of their schemes. New transaction functions

Smart Card Diary

Plastic Cards Latin America, CasaPiedra Convention Centre, Santiago, Chile, 23-25 August.

can be created, typically by modifying or extending existing commands. The library of security processing functions includes both DES and RSA algorithms. RSA, implemented in software, can be utilised without resorting to expensive high-performance chips offering dedicated cryptographic hardware.

Using a "soft mask" concept developed by Schlumberger and known as SCOS, EEPROM resources can be utilised for development. Once validated, the software may then be masked in ROM to minimise volume production costs.

Multiflex is supported by a range of chips from 3 to 8K bytes EEPROM.

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

TV Licence Card National Pilot

A national pilot for a Television Licence Fee pre-payment scheme using Smart Cards to record over-the-counter payments on a weekly or fortnightly basis for those who find it hard to pay the fee in a lump sum, is being launched in Spring 1996.

Those who join the scheme will be issued with a personal payments plan and a Smart Card which they tender with the cash at a local outlet. People without a licence will be given six months grace to buy one in small cash instalments - i.e. paying for the first licence in arrears. Initial investment in the scheme by the Television Licensing Authority (TVL) will be up to £1 million.

An earlier TVL trial was carried out in conjunction with British Gas in the White City area of London using Smart Card terminals in the Quantum network for pre-payment of gas. Gemplus cards were used in this trial but the BBC says no decision has yet been taken on the card supplier for the national pilot.

Contact: Mark Thomas TVL, UK - Tel: +44 (0)117 921 9107.

This conference will cover procurement, debit, co-branded and credit cards (day one), Smart Cards: the future in cards (day two), with separately

bookable workshops on day three. Contact: AIC Conferences, SA, Chile - Tel: +56 2 246 8100. Fax: +56 2 246 8109.

Card Manufacturing in Transition: The Future is Now, Munich, Germany, 5-8 September.

ICMA (International Card Manufacturers Association) Conference and Exhibition. Contact: Jen Busch, ICMA, USA - Tel: +1 609 799 4900. Fax: +1 609 799 7032.

ESCAT '95 (European Smart Card Applications & Technology) Conference, Inter Continental Hotel, Helsinki, Finland, 6-8 September.

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: +358-0-752 0899.

The Retail Automation Conference '95, Mount Royal Hotel, London, England, 27/28 September.

An update on the key information systems issues affecting retailing today including sessions on Smart Cards and on remote shopping. Contact: RMDP Ltd, UK - Tel: +44 (0)1273 722687. Fax: +44 (0)1273 821463.

Smart Cards in Telecoms, Regus Conference Centre, London, England, 28/29 September.

Presents emerging market trends and opportunities in Smart Card technology and global telecommunications with a number of case studies. Contact: AIC Conferences +44 (0)171 242 2320. Fax: +44 (0)171 242 2324.

Smart Cards International '95, Regents Park Marriott Hotel, London, England, 12/13 October. Conference plans to focus on the operational aspects of Smart Card applications. Key areas will be: card population management, matching card designs to the operational environment, loyalty schemes and putting Smart Cards into operation from concept to monitoring results. Contact: ICM Marketing, UK - Tel: +44 (0)1483 37557. Fax: +44 (0)1483 33082.

CarteS '95, CNIT Trade Centre, 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.

Converging Technology Applications Conference and Intelcard Marketing Applications Cardexpo, Stouffer Resort, Orlando, Florida, USA, 29 October-1 November.

Contact: Rita Skehin, The Paradygm Forum/Panther Production Strategies, USA - Tel: +1 800 221 5334. Fax: +1 905 935 7478.

Electronic Purse Conference, Forte Crest Bloomsbury Hotel, London, 2/3 November.

Contact: Ashley Glover, Conference Director, Smi Technology Group, UK - Tel: +44 (0)171 417 7790. Fax: +44 (0)171 417 7791.

The 11th European Payments '95 (EFTPOS & Home Services) Conference, Sheraton Grand Hotel, Edinburgh, Scotland, 21/22 November.

Overview of the changing payments scene plus sessions on fraud and security, Smart Cards and the electronic purse, chip standards, cross border payments, etc. Contact: SETG, UK - Tel: +44 (0)141 553 1930. Fax: +44 (0)141 552 0511.

Card Fraud & Security Conference, Forte Crest Bloomsbury Hotel, London, 4/5 December.

Contact: Ashley Glover, Conference Director, Smi Technology Group, UK - Tel: +44 (0)171 417 7790. Fax: +44 (0)171 417 7791.

From there to here Part - 6

Physical characteristics of the Contact Card

Interoperability starts at the bottom. If the card won't fit the slot you have a basic problem and little else matters. This month we will look at the ISO standards surrounding the physical characteristics of the Smart Card (Integrated Circuit Card or ICC in ISO parlance) which will ensure the fundamental basis of interoperability.

Equally important is an understanding of the elements in the design and manufacturing process which effects the reliability of the final card product. There are still many observers in the industry who seem to believe that card failure rates up to 10% are the norm. While this may well have happened in the past, such a concept is a totally unacceptable engineering axiom. Today, under normal wear and tear, well designed ICCs are returning less than 0.1% in field use. But what are the best reliability figures and what are the tests that can be used to monitor and improve performance? This area is currently poorly covered by ISO but we can examine some of the industry techniques and look at some future possibilities.

The physical characteristics of an IC card are defined in ISO 7816 part 1. This standard applies to the ID - 1 identification card specified in ISO 7810 and includes cards which may have embossing or magnetic stripes. While we are all familiar with the use of imprinters to obtain a printed version of the embossed characters on some paper voucher, their viability on an IC card must be questionable. The IC module in a Smart Card is like any other electronic component and is not normally expected to be hit with a hammer at regular intervals. Even the embossing process itself is mechanically stressful and must raise serious doubts over the appropriate migration strategy.

The physical properties of the contact IC card are referenced against earlier card standards and we will look at each of them in turn.

ISO 7810 Identification cards - Physical characteristics (1985)

Part 5 Location of read - write magnetic track - track 3

This standard specifies the physical characteristics of identification cards including card material, construction, characteristics and nominal dimensions for three sizes of cards (ID -1, ID -2 and ID -3). It is the ID -1 card that forms the basis of ISO 7816 -1.

The principal parameters of ISO 7810 are the dimensions of the ID -1 card which are defined to be, 85.6mm x 53.98mm x 0.76mm

ISO 7811 Identification cards - recording techniques (1985)

This standard is in five parts and covers the specification of the magnetic stripe and the card embossing. It is not possible to entirely ignore these standards since devices such as ATMs use the magnetic stripe to open the vandal proof gate on the card slot.

Part 1 Embossing

This part specifies the requirements for embossed characters on identification cards for the transfer of data by imprinters or by visual or machine reading.

Part 2 Magnetic stripe

This part specifies characteristics for a magnetic stripe, the encoding technique and coded character sets which are intended for machine reading.

Part 3 Location of embossed characters on ID -1 cards.

As the title implies, this part of the standard specifies the location of embossed characters on an ID -1 card for which two areas are assigned. Area 1 is for the number identifying both the card issuer and the card holder. Area 2 is provided for the cardholder identification data such as his name and address.

Part 4 Location of magnetic read only tracks - tracks 1 and 2

This standard specifies the location of the magnetic material, the location of the encoded data tracks and the beginning and end of the encoding.

This standard has the same scope as part 4 except

that it defines the read - write track 3.

ISO 7812 Identification cards- numbering system and registration procedure for issuer identifiers (1987)

This standard relates to the card identification number or PAN (Primary Account Number) which consists of three parts, the issuer identifier number (IIN), the individual account identifier and the check digit.

ISO 7813 Identification cards - Financial transaction cards (1987)

This standard defines the requirements for cards to be used in financial transactions. It specifies the physical characteristics, layout, recording techniques, numbering system and registration procedures. It is defined by reference to ISO 7810, ISO 7811 and ISO 7812.

In particular the standard defines more precisely the physical dimensions of the card as follows,

Width	85.47mm - 85.72mm
Height	53.92mm - 54.03mm
Thickness	0.76mm \pm 0.08mm

The thickness of the card is particularly important for Smart Card readers because of the mechanical construction of the card connector mechanism.

This device often consists of a movable carriage that positions the card under the connector head while applying the necessary wiping and pressure action. Variation in thickness or even slight warping of the card can cause communication failures.

ISO 7816 Design and use of identification cards having integrated circuits with contacts (1987)

This standard in its many parts is probably the most important specification for the lower layers of the IC card. The first five parts in particular are well established and allow total physical and electrical interoperability as well as defining the communication protocol between the IC card and the CAD (Card Acceptor Device).

While this is certainly one way of comparing cards fabricated by different companies, whether it bears any relationship to the use of IC cards in the field seems debatable.

Part 4 defines the command structure for communicating with a Smart Card while part 5 describes the identification and registration of applications.

Part 1 Physical characteristics

The physical dimensions of the IC card are defined as that specified in ISO 7813. It should be noted that the thickness dimension does not include any allowance for embossing. More particularly the slot for a card may include an extra indentation for the embossed area of the card. In effect it acts as a polarisation key and may be used to aid the correct insertion orientation of the card. This is an additional characteristic to the magnetic field sensor which operates off the magnetic stripe and is used to open a mechanical gate on ATM devices as mentioned previously.

The part 1 standard also defines additional characteristics that should be met in the manufacture of an IC card. These characteristics fall into the following categories,

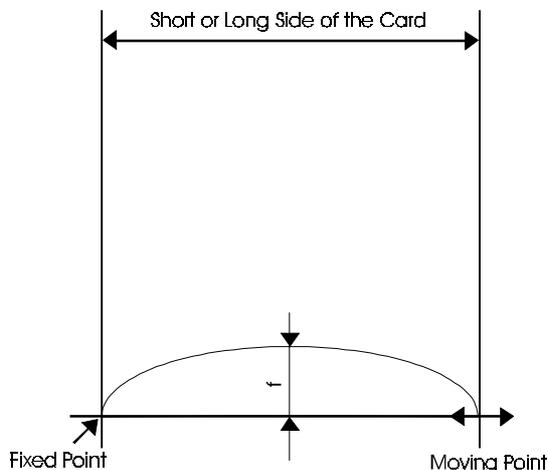
- Ultra violet light
- X - rays
- Surface profile of contacts
- Mechanical strength (of cards and contacts)
- Electrical resistance (of contacts)
- Electromagnetic interference (between magnetic stripe and integrated circuit)
- Electromagnetic field
- Static electricity
- Heat dissipation

It has to be said that this part of the standard could be improved and ISO 10373 (Identification Cards - Test methods) goes somewhat further in describing the test methodologies in some detail. The three most widely used tests applied by fabricators are specified in the annex to the standard,

- A1 Bending properties
- A2 Torsion properties
- A3 Static electricity

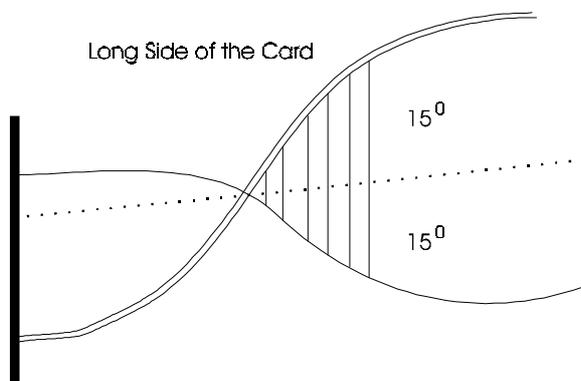
The bending properties are tested by deflecting the card on each axis as shown in fig1. With a periodicity of 30 bendings per minute the card is deflected to 2 cm at its centre from the long axis and 1 cm from the short axis. The recommended

test requires the card to withstand 250 bendings in each of the four possible orientations (i.e. 1000



bendings in total).

The torsion properties of the card are tested by displacing the card $\pm 15^\circ$ about the long axis at a periodicity of 30 torsions per minute (fig 2). The standard requires the card to withstand 1000 torsions without chip failure or visible cracking of

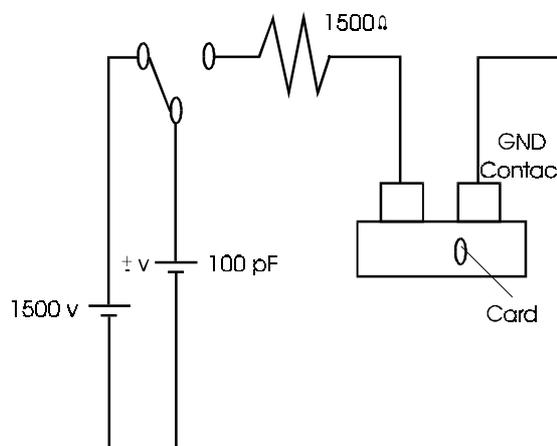


the card.

The resistance of the card to static electricity is This part of the standard has taken a lot of effort in order to reach agreement. Early applications of Smart Cards emanated in France where the Transac magnetic stripes were more central on the card than that eventually defined by ISO 7811. Unfortunately the French chip position overlaps the ISO magnetic stripe definition. As a result it was eventually agreed that after a transitional period (to the end of 1990) the position for the IC connector would be as shown in fig 4. This position is much closer to the longitudinal axis of the card. We might like to

defined by a test set up as shown in fig 3. The test voltage is defined to be 1.5KVolts. The specification requires this voltage to be discharged across each of the contacts in both normal and reverse polarity. The IC should still be operational at the end of the test.

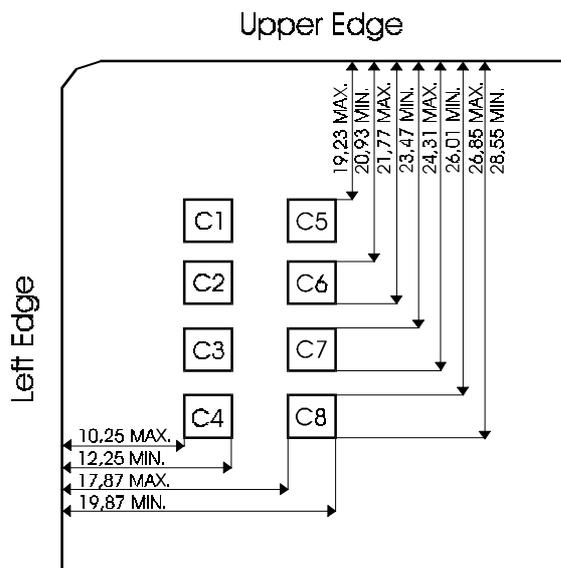
One of the issues surrounding the use of the IC card relates to the temperature range for operational use. ISO 7810 defines that the ID-1 card should be structurally reliable and usable between -35°C and $+50^\circ\text{C}$. The draft CEN standard on requirements for



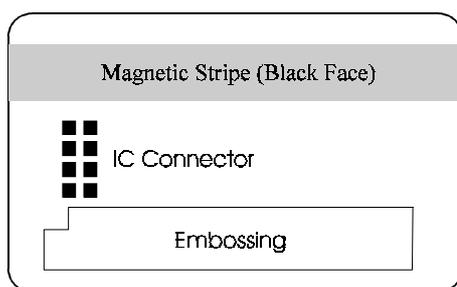
IC cards and terminals for telecommunications use, part 2 - application independent card requirements (EN 726-2) defines more stringent requirements for operational use as -25°C to $+65^\circ\text{C}$ with occasional peaks up to $+70^\circ\text{C}$. In addition the draft identifies multi-application cards for portable battery operated equipment to be used between -25°C and $+70^\circ\text{C}$ with occasional peaks of up to $+85^\circ\text{C}$. The word occasional is defined to mean not more than 4 hours each time and not over 100 times during the life of the card.

ISO 7816 Part 2 - Contact Locations and Minimum Size

conjecture on which is the better position for the chip in terms of mechanical stress but perhaps we should just settle for agreement.



Further problems arose in deciding on which face of the card the connector should be located. In order to avoid further delay in publishing the standard, two options were allowed to include both the front and back of the card. This anomaly has been a source of irritation and it is now widely agreed that the IC connector should be on the front of the card. For this purpose the back is defined to be the side with the magnetic stripe. The embossing is defined to be on the front of the card and therefore on the same side as the IC connector. The relative location of these components (when present) is shown in fig 5.



Reliability in the field

At the end of the day what we really want apart from interoperability is field reliability. It is generally accepted by experts in the subject that the

Support for Smart ID Card

Support for Smart ID cards has come from two sources following the UK Government's Green

tests referred to so far are somewhat inadequate. We are not suggesting that these tests are inappropriate only that we need a new view on the subject.

In practice with cards produced by the experienced fabricator we are unlikely to see plastic card failure due to bending or torsion in the way described in the tests. Yet the various postal authorities have designed automatic letter handling machines where the count path follows a bend that used to demolish the chip module with unfailing regularity. Many manufacturers have developed their own bending test where the card is forced around cylinders of various diameters to emulate the postal problem. Arguably this test is far more significant than those defined by ISO.

Failure due to electro static damage (ESD) these days is insignificant due to the improvement in chip and packaging design. Most ICCs are capable of a much higher performance than that defined in the ISO standard.

So where are all these card failures? In fact, they are largely due to excessive stress on the micromodule or the package that contains the chip. This module is sometimes referred to as the COB which stands for Chip On Board and relates to one form of packaging where the chip is stuck on a miniature printed circuit board and bond wires are used to connect the chip to the connector plate. This technique is still widely used.

We propose that the final reliability of the card is largely a function of the physical characteristics of the chip packaging. Accordingly the primary test methods for Smart Cards should be aimed at the micromodule. One of the major failure modes is due to pressure perpendicular to the plane of the module. Various test techniques to examine the properties of the module have been developed by the various card manufacturers, but they are all aimed at measuring resistance to a force either applied continuously or by an impact impulse. Just to bring in the practical relevance of such forces, just have a look at your own card wallet. Does it have one of those pop fasteners? Why does it always seem to line up with the centre of the chip? *David Everett (next month - part 7)*

paper on a national identity card scheme.

The government itself is keen to press ahead with electronic payment cards for welfare recipients as part of its strategy to eliminate benefit fraud

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Gemplus Dubai, Jafza Ali Free Zone, United Arab Emirates. Tel: mobile +971 50 641 7521.

Gemplus Technologies Australasia, 12 Tryon Road, Lindfield, N.S.W, 2070, Australia. Tel: +61 2 416 0604. Fax: +61 2 416 7718.

Orange, the UK Personal Communications Network operated by Hutchison Telecom, launched its new fax and data services last month making the mobile office a reality.

Customers with a Nokia phone, a portable computer and PC card can now send and receive faxes, e-mail, data and access the Internet.

A wire-free future becomes a possibility as out of office workers can send and receive faxes, or divert all incoming faxes to another machine before switching off their phones or PCs. With the same equipment, a mobile worker can access the Internet or CompuServe from his car or hotel room, access an office e-mail system and send or receive messages and data files. He can log onto an office computer system from a remote location, and with appropriate PC software, send a message to a whole group of people. Options include on-screen directories and message receipt functions where incoming messages can be viewed on-screen.

Orange Data Services operates at speeds of up to 9600 bits per second - four to eight times faster than analogue mobile data services - which helps to cut costs.

Contact: Orange Tel: +44 (0)171 734 2725/6030.

Three New Offices for Gemplus

Gemplus has opened three new overseas offices so far this year as follows:

Gemplus Caracas, c/o Systar Corporation, Edificio Seguros La Paz, Piso 8, oficina 082B, Avenida Francisco do Miranda, Caracas, Venezuela. Tel:

DANMØNT Card at Horse Fair

Three different DANMØNT cards were used at the famous Hjallerup Market in Denmark last month, and its success means that it will be used at other fairs and festivals there during the summer.

Dating back to 1744, the annual Hjallerup fair has always been connected with buying and selling horses in the northern part of Denmark, but the horse market has turned into a summer festival with several other activities.

The card could be used when buying a hamburger or drinks in the bar (as shown below) - but not for buying a horse!

Only small quantities of the card were produced for this event and were available in DKK 100, 200 and 300. The design featured the Hjallerup logo which includes a horse chewing a flower and will no doubt become collectors' items.

Contact: Jens Tastum, Vice President, Business Development, DANMØNT, Denmark - Tel: +45 43 44 99 99. Fax: +45 43 44 90 30.