# Competitors Unite to Promote Java Card API

Two French Smart Card manufacturers, Schlumberger and Gemplus, who together claim 70% of the market, have announced compatible Java Card platforms and the formation of the Java Card Forum. The aim will be to promote the Java Card API (Application Programming Interface) as an industry standard platform for Smart Cards and allow the exchange of technical information between participants.

The companies say the decision clearly indicates the direction the industry is taking towards open standardised operating systems, language and APIs based upon the "write once, run everywhere" capabilities of Java developed by Sun Microsystems, Inc.

Whilst the Forum will invite applications for membership from Java Card API licensees and discussions are said to be taking place, for example, with UK and German card manufacturers, this strategic move by two major players will lead to a de facto standard and other manufacturers having to decide quickly if they are "in or out".
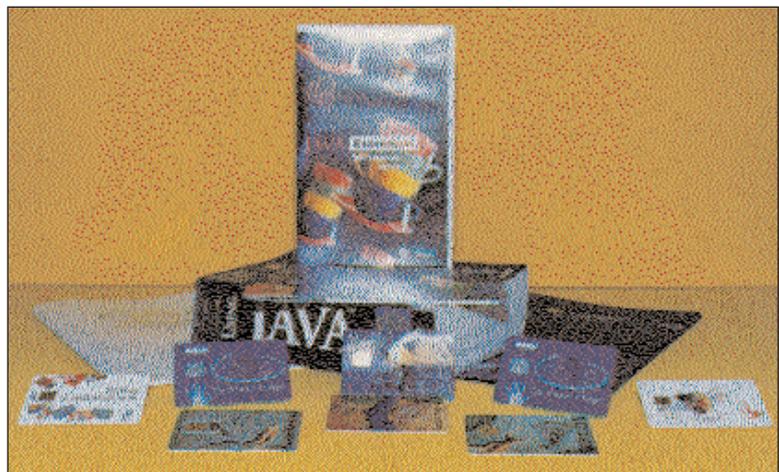
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## Smart Card Tutorial

### Next Month
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## Java Card API

*Continued from page 21*

The race to market was started by Schlumberger in the fourth quarter of last year when it announced Cyberflex, the first Java Card. This month Gemplus announced JCOS1, the name given to the first Java Card API 1.0 compatible product. Cyberflex and JCOS1 are being made available to other card manufacturers through licensing arrangements.

Both companies have said they will work in close co-operation to ensure full compatibility between their respective products. This means that Smart card applications developed for a Gemplus card will run on a Schlumberger card and vice versa.

Among those who have endorsed the Java Card Forum are IBM, Informix, Integrity Arts, Motorola, Oracle, Racom and Visa International.

Mike Inglis, Motorola's Worldwide Smart Card Operations Manager, commented: "The move away from proprietary, single application operating systems will revolutionise the Smart Card market. Offering a common API which utilises one of the most popular and dynamic programming languages, Java, will give developers the freedom to create a myriad of new Smart Card applications".

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## Visa Card Contacts

Motorola and Siemens have both won contacts from Visa International to supply fast crypto chips for the Visa Cash stored value card trial in the UK. The high-speed crypto chips enable the use of public key encryption and the flexibility to add other applications during the lifetime of the card.

The trial of 70,000 Visa Cash cards will start in the city of Leeds later this year and will involve Barclays, Lloyds/TSB, Royal Bank of Scotland, Halifax, Abbey National and the Co-operative Bank. Customers will be able to use the cards at a range of retail outlets including newsagents, vending machines, car parks and buses.

Visa is to use Motorola's new fast crypto chip, the M68HC05SC49A and software developed by Schlumberger Electronics Transactions.

Mike Inglis, Motorola's Worldwide Smart Card Operations Manager, said: "The Smart Card is designed to support other functions, such as credit/debit card applications in the future ."

The SC49A crypto chip has a 1024 bit flexible modular encryption co-processor, 20K bytes ROM, 4K bytes EEPROM and 896 bytes RAM, and an operating voltage of 3-5V. Siemens is supplying the SLE 44CR80S crypto-controller chip which offers 8Kbytes EEPROM and 17K bytes of ROM. Their partners in the project are Philips Smart Cards & Systems, who are developing the operating systems, and DelPhic Card Systems, who are responsible for card sales, technical support and personalisation to the UK banks.

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## Toppan Selects Motorola Chip

Nippon, Motorola's Semiconductors products Division, has announced that Toppan Printing Co. is to use it's 8-bit Smart Card chips in a new card it is developing. This is the first time that Motorola chips have been selected by a Japanese Smart Card supplier for a project in Japan.

*Contacts: Kathleen Reid, Motorola, UK - Tel: +44 (0) 1355 565447.montrouge.ts. slb.com*

## New 16K byte Chips

Chip manufacturers Siemens and Hitachi have both introduced chips with 16K bytes of EEPROM.

Seimems has unveiled the SLE 44C160S chip with 16K bytes EEPROM, 15K bytes of ROM and 256 bytes of RAM in a package less than 15mm².

The flagship of a new controller family, the chip provides extended security features including additional barriers against potential hackers, special protective functions for the EEPROM cells, encryption of the ROM addresses and measures to prevent simulation of the Smart Card IC.

The extension of the operating voltage range to between 3 and 5V is important when using the contollers in GSM mobile phones.

Hitachi has extended its H8/310 family of Smart Card microcontrollers with the H8/3103 for memory intensive applications. It has an 8/16 bit microcontroller with 16K bytes of EEPROM, 20K bytes of ROM and 512 bytes of RAM and a 20mm² die size.

The new chip is aimed at high security, high functionality applications such as GSM mobile communications and bank cards. Supply voltage is either 3 or 5V. Production orders will be accepted from March 1997.

*Contacts: Vince Pitt, Hitachi Europe:- Tel: +44 (0) 1628 585163. Fax: + 44 (0) 1628 585160. Graham Nott, Manager - Chip Card Ics, Siemems Semiconductors UK - Tel: +44(0) 1344 396579. Fax: +44 (0) 1344 396632.*

## AMMI Launches Smart Cards

American Microdevice Manufacturing, Inc. (AMMI) has launched into the Smart Card industry and claims a 1997 production capacity of 30 millon cards. It is currently manufacturing Smart Cards for US and overseas customers from its San Jose, California Plant.

President and Executive member of the Board is Alex Giakoumis, formerly Vice President of Strategic Marketing at Solaic.

AMMI produces memory cards, contact / contactless and microcontroller cards for banking, telecommunications, medical, transportation, retail and entertainment industries. Secure memory 1K bit EEPROM are available with 1, 2 and 3 security zones as well as 2K byte with 1 and 4 zones, the contact / contactless CombiCard, and microcontroller Smart Cards based on 8051 and 6805 architectures with 1, 3, 8 and 16K bytes of EEPROM.

*Contact: John Springett, Director of Marketing, AMMI - Tel: +1 408 986 1122. Fax: +1 408 986 1121. website: http//www.ammismartcards.com*

## Pay-TV Card Certification

The first Smart Card to gain ITSEC (Information Technology Security Evaluation Criteria) certification for pay-TV applications has been announced by SGS-Thomson Microelectronics and Bull.

Developed for France Telecom, the card uses the PC2.3 version 2 operating system masked onto an SGS-Thomson ST16SF48A chip.

Certification was to ITSEC Level E3 with Strength of Mechanisms "High", which means that the cards have been officially recognised as meeting the most demanding security targets normally required in commercial applications.

"This is an important achivement, not only for SGS-Thomson and Bull but for the whole Smart Card industry," said Michel Ugon, Vice President of Bull Smart Cards.

He added that the ITSEC certification allows Bull to offer pay-TV operators an access card backed by the best guarantee available today of security against pirating and other forms of fraud.

*Contact: Dominique Mercier-Chevalier, Bull Smart Cards - Tel: +33 (0) 1 3966 4520. Simon Loe, SGS Thomson - Tel: +33 (0) 4 5040 2558.*

## Visa Calls for Interoperability

Visa reports that to date it has issued over 3.7 million Visa Cash cards worldwide, only 20 months after the first in-house pilot began, and has called for greater interoperability between schemes.

Jon Prideaux, Senior Vice President, New Products, said it was becoming increasingly important for schemes to move forward together on interoperability. "This is especially the case in Europe where there are at least 18 different schemes currently underway," he said. "All use similar technologies, and all, except Mondex, are auditable and accountable - a concept fundamental to the Visa Cash system, and one which has become central to mainstream stored value card schemes.

"The foundations for interoperability are already in place, however they must be urgently built upon."

Visa's latest pilot scheme is in Italy where it has launched a pre-paid Visa Cash scheme with Cariplo, one of Italy's leading banks, in the Italian ski resort of Bormio. Cardholders will be able to use the new card for low value transactions at over 400 terminals in a variety of locations including news stands, shops, bars, taxis, car parks and ski lifts.

*Contact: Ian Gatherum, Visa International -* ***Tel: +44 (0)171 937 8111.***

## Kesefcard Experiment in Israel

Bezeq, the Israel Telecom Corporation, has been experimenting with an all-purpose, reloadable electronic wallet called the Kesefcard with nearly 10,000 students at the University of Bar-Ilan in Ramat Gan, near Tel Aviv.

Holders of the chip card can use it at around 100 facilities including public telephones and fax, photocopying machines, beverage vending machines, parking lots, cafes, automatic newspaper vending machines and launderettes. Further applications planned include use of the card as a student ID card on the campus, a library card and to access education grades.

The scheme is being conducted in a joint venture between Bezeq and Racom (Schlumberger's exclusive representative in Israel), and in co-operation with the University, Lipman, IBM, Comtek, Az-Ben and Getter.

The card can be reloaded up to a value of NIS 100 (approximately US $30) and usage reports show that most of the money spent by the students is on photocopying material relating to their studies. Only a small fraction is spent at vending machines and on telephone calls. The major potential is believed to lie in the acquisition of food at campus cafes and restaurants.

### Bank-imposed conditions

The experiment is one of the few in the world to be operated independently by a telecommunications company without the participation of a banking system. Bezeq admits that this impairs the quality of service to customers as they are unable to directly reload their Kesefcard from their bank accounts.

Conditions imposed by the Bank of Israel means that the cards cannot be loaded through a credit card or through telephone bills and have to be reloaded against cash only. Talks are continuing with the Bank of Israel to relax their rules and allow reloading through additional channels.

*Contact:* ***Eytan B Levy****, Vice President, Marketing and Customer Services, Bezeq -* ***Tel: +972 3 576 3351. Fax: +972 3 575 6143.***

## Card Production Starts in China

Card production started at the end of last month at the Tianjin Gemplus Smart Cards Company in Tianjin in China following the official opening by Francois Fillon, France's Minister of Tele-communications & Space at a ceremony attended by top officials from China's telecoms industry.

The plant, a partnership between Gemplus and Tianjin Telephone Equipment Factory, is producing Smart Cards for payphones to be followed later with microprocessor cards. Gemplus says the facility will produce over 10 million cards during the first year and over 100 million by the year 2000.

*Contact:* ***Francois Dupre****, General Manager, Gemplus Tianjin -* ***Tel: +8622 3515 239.***

## Bull 12.5m Dutch Bank Card Order

Bull CP8 has won major orders from the Dutch banks as they move towards adding the Chipknip electronic purse to their payment cards.

French-based Bull is supplying five million cards with the CC60 V2-chip which has some multi-functional possibilities. Anticipating a growth in requirements for multi-functionality, the Dutch banks have also placed an order for a further 7.5 million cards containing the CC1000 Smart Card technology from Bull, bringing the total order to 12.5 million cards.

Dutch Minister of Transport, Mrs A Jorritsma, said the Chipknip would also be used to pay for tickets in public transport and later would be used as a travel ticket.

*Contact: Dominique Mercier-Chevalier, Bull CP8, France - **Tel: +33 (0)1 39 66 45 20.***

## DataCard / Meinen, Ziegel Alliance

DataCard Corporation has announced a strategic alliance with Smart Card production systems company Meinen, Ziegel & Co. GmbH of Germany.

Under the agreement, DataCard acquires a majority equity in the Munich-based company and assumes responsibility for global marketing and product distribution.

Meinen, Ziegel & Co manufactures contact and contactless Smart Card production systems while US-based DataCard specialises in card personalisation systems.

Tim Riley, Senior Vice President of DataCard's central issuance business unit, said the Smart Card production systems of the German company would continue to be offered as stand-alone units or coupled with DataCard 9000 series central card issuance system for fully integrated card issuance.

*Contacts: Tomas Meinen, Meinen, Ziegel & Co. - **Tel: +49 89 614481-0. Fax: +49 89 614481-22.** Mark Iverson, DataCard Corporation - **Tel: +1 612 988 1736. E-mail: mark_iverson@datacard.com***

## IDS Partnership in the Philippines

IDS (Innovatron Data Systems) has signed a partnership contract with AMA Smart Card Technologies in the Philippines.

The deal gives AMA licences to use the IDS FUNCHIP payment system and its Totally Secure Chain standard developed to safeguard the integrity of a card transaction up to the server.

A subsidiary of the INGENICO Group, IDS has also signed a partnership contract with Sapura Card Technologies, Malaysia's first manufacturer of Smart Cards; and with Hyosung Computer, the first Korean supplier of automatic teller machines.

*Contact: Geneviève Puig, IDS, France - **Tel: +33 (0)1 46 25 82 87. Fax: +33 (0)1 46 25 82 71.***

## Pisces Pilot in Slovenia

Landis & Gyr Payment Systems is to supply its Smart Card-based Pisces electricity prepayment metering system to Elektro Llubljana for a pilot in Slovenia.

Starting early this year and expected to last for several months, the pilot will use a combination of single and polyphase meters, point of sale equipment and software for the PC controllers.

Landis & Gyr say they are confident that the pilot scheme will lead to a significant order from Elektro Llubljana later this year.

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

## Taiwan GSM Contract for Gemplus

Gemplus Technologies Asia has won a tender for the supply of 550,000 GSM SIM (Subscriber Identity Module) Smart Cards and card personalisation equipment for Taiwan telephone operator Chungwa Telecom.

*Contact: Ms Tarvinder Dhillon, Marcom Manager, Gemplus Technologies Asia - **Tel: +65 771 9149.***

# New Low Cost Card from Toshiba

Toshiba Corporation has announced a low cost, Smart Card with an 8 bit CPU for applications such as pre-paid and communications, and in a wide variety of leisure activities.

According to the company, most cards with CPU offer a large memory capacity that pushes card costs up to 500 yen to 1000 yen (approximately US $4.50 to US $9.00) each. The new card was developed to meet increasing demand for secure Smart Cards in less memory intensive applications, including pre-paid cards for tickets, storing credits in loyalty cards, leisure and communications requiring both low-cost and forgery-resistant solutions.

The new card, CZ-3018, the latest addition to Toshiba's CZ-3000 series, is individually priced at less than 200 yen (less than US $1.80).

Toshiba says the CPU controls all data, read and write, rendering the security logic invisible, assuring card security and using Toshiba's new IC module based on an improved CMOS process that substantially shrinks chip size. The card conforms to both the ISO/IEC 7816 standards and EMV specifications.

Sample cards will be available from April with mass production scheduled to start in June.

**Technical details:**
- CPU            8 bit
- Protocol       T=1, (T=O under development)
- ROM            6K bytes
- RAM            128 bytes
- EEPROM         128 bytes
- Power supply   3V / 5V

*Contact: Toshiba Europe, Germany - **Tel: +49 21 31158-352. Fax: +49 21 31158-137.***

# China's Golden Card Project

China, as the most populated nation in the world, wears out its bank notes at more than double the speed of other countries, so chip cards will play a leading role in achieving its vision of a cashless society, according to Visa International President and CEO, Edmund P Jensen.

In a visit to Beijing, where Visa is working with the People's Bank of China on the Golden Card project, he said that all 12 pilot sites for regional interchange network centres will be established early this year allowing ATM and point-of-sale transactions in various parts of China. The next step is a national processing centre which will enable such transactions across the whole country and then an integrated chip card which could be supported by the Golden Card technology.

# BT 101 Dalmations PhoneCard

The BT card on this month's cover features actress Glenn Close as the evil Cruella De Ville from the Disney film 101 Dalmations.

The phone cards are available in denominations of £2, £5, £10, £20 and £35; all feature different images from the film. The £2 cards were manufactured by Gemplus and 1 million were issued. The other values were manufactured by GPT and a further 1 million were issued. A special collectors pack is also available.

*Contact: **Patricia Stewart,** Assistant BT Phonecard Product Manager - **Tel: +44 (0) 181 666 4554. Fax: +44 (0) 181 666 4630.***

# Security Module from Ascom

Ascom Monétel, of France, has developed the PROSAM security module which is the first to be evaluated to ITSEC level E3 for payphone systems.

In addition to Eurochip card authentication, PROSAM also offers facilities such as secured transactions and counters for cross-border use. The company says it enables the management of many payphones and also a solution for settlement in multiple payphone operators schemes.

PROSAM is the kernel of a new series of products in Ascom's Eurochip Concept for the management of keys, card data and card use whether pre-paid, credit or subscriber cards.

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## Plastic Card Fraud Down

Plastic card fraud losses in the UK have fallen from £165.6 million in 1991 to £83.3 million in 1995, an average of 15.8 per cent per year, says a new report from Datamonitor. The biggest losses came from lost and stolen cards with cards not received the second largest area of loss.

Initiatives to reduce fraud have included regular revision of floor limits, electronic authorisation, card fraud awareness campaigns, and making cards more difficult to counterfeit. Also a greater proportion of cards are collected from the branch by the customer or sent by courier or registered post.

The report says the introduction of Smart Cards looks set to make counterfeiting even harder.

*Fraud in UK Financial Services* is available from Datamonitor at a price of £1,995.

### Smart bank cards

Smart bank cards are, of course, on the way. APACS, the Association for Payment Clearing Services, is leading the switch from magnetic stripe to chip payment cards and banks and Building Societies in the cities of Edinburgh, Bristol and Northampton will start issuing chip cards in pilot schemes in October.

Overall, APACS says that 90 million cards will be replaced and some 20,000 ATMs will have to be upgraded. In addition retailers will be expected to convert 400,000 point-of-sale terminals to accept the new cards.

***Contacts: Sophie Smith***, *Datamonitor* - ***Tel: +44 (0)171 625 8548. Richard Tyson-Davies***, *Public Affairs Director, APACS* - ***Tel: +44 (0)171 711 6200. Fax: +44 (0)171 256 5527.***

### Intellect OEM Agreement with NCR

Intellect announced in Australia last month that it has signed a formal OEM agreement with NCR, enabling NCR to sell and support a range of Intellect electronic payment devices into the US markets.

Phil Kasper, NCR's Assistant Vice President, Consumer Delivery Systems, said the evolution of the payment and banking industries required them to provide a broader range of products than they currently developed and manufactured.

A number of Intellect products will appear with the NCR logo and will be integrated into other third party offerings, creating a total NCR banking and finance solution. The first Intellect product to be effected is the 7270 terminal which can read/write Smart Cards and read magnetic stripe cards. Intellect products range from Smart Card readers, payment systems, electronic wallets and mobile terminals to cryptographic processors.

The two companies co-operated recently in NCR's branch automation supply to Chase Manhattan using Intellect Smart Card capable terminals.

***Contact: Geoff Gander***, *Intellect* - ***Tel: +61 9 333 4333. Fax: +61 9 470 5002.***

## College Purse Extends to City

SNCF, the French national railway company, and merchants in the city of Muret are now accepting the Lycéoduc electronic purse.

What began as a campus card at the college Lycée Charles-de-Gaulle in Muret during 1992 has been further developed by French savings bank La Caisse d'Epargne and Innovatron Data Systems (IDS) a subsidiary of INGENICO.

All the college students have a personal Smart Card which includes the electronic purse allowing them to pay for services in the college such as the cafeteria, drinks vending machines and photo-copiers. Since the end of 1996, students can also use their cards outside the college at merchants selected by the city council - a cinema and a stationers - and at the ticket office of Muret SNCF station.

The SNCF and the banks are looking at the possible integration of a purse meeting interbanking requirements, into a transportation card.

***Contact: Marie Clérisse***, *IDS* - ***Tel: +33 (0)1 46 25 82 87. Fax: +33 (0)1 46 25 82 71.***

## Seven-day Card Delivery from GPT

GPT Card Technology, Britain's largest Smart Card manufacturer, has announced two new services - Premier, which offers an order-to-delivery package in a seven-day time frame, and Rapid Application Development for the development and delivery of customised cards with microprocessor capabilities.

According to GPT, the introduction of the Premier service follows successful trials with key customers, including BT.

Asif Chaudhry, Product Manager for BT Promotional Phonecards, said GPT have shown they can deliver their Premier promise while maintaining quality. "This in turn allows BT to provide specialised cards to meet all types of customer requirements and to take opportunities that previously were just not possible," he said.

The new Rapid Application Development service involves GPT staff working with the customer to define the functional needs of the card being developed. Paul Seward, GPT's General Manager, explained that this allows a series of bespoke options to be simulated and tested and for the best solution to be identified.

Once complete, the customer can then order quantities of the card with the application loaded. If sufficient volumes are required to justify full mask development then the optimum trial solution can be utilised for full mask and production.

GPT says the new service will cut costly and time consuming traditional development timescales as applications are being processed. Alternatively, the service meets the need for low volumes and for trial applications.

*Contact: **Brian Dolby**, GPT Press Office - **Tel: +44 (0)115 943 3661.***

## European Identity Card Plan

Plans to introduce a Europe-wide bank and identity card has re-triggered the angry reaction which caused the UK Government to shelve its plans for a compulsory ID card in Britain.

The European Commission is said to be debating the idea at a high level and the European Parliament's influential monetary affairs sub-committee, which is responsible for overseeing progress towards monetary union, will next month publish its plans for a single European Smart Card to be introduced along with the Euro.

European officials claim that if the launch of a single currency in 1999 is to be successful it will be necessary for all adults to carry an identity card which might also be used as a passport, a driving licence and for social security benefits.

The basic proposal is for the European Central Bank to issue a standard bank card which could be the platform for an ID card for all member states.

It is believed the plan has the backing of the French, German, and Dutch Governments, the Commission and the European Monetary Institute.

Civil rights group Liberty is against the issue of a compulsory ID card while Euro-sceptics claim it is another attempt by Brussels to control Britain's right to run its own affairs.

## Aspects to Supply EMV Test Tools

Aspects Software, based in Edinburgh, Scotland, has won a major contract working with Visa International in the US to supply its SmarTest, a Smart Card test and development tool, with the view of making it the standard test tool for all Visa EMV-based applications worldwide.

The tool will be available to any card issuing or acquiring institution who wishes not only to test Visa applications, but to develop their own as well. SmarTest has been supplied to four major banks - three in the UK and one in the US - and it is currently being used to test and simulate finance IC card and terminal applications based on EMV, Visa and Mondex specifications. Aspects says it is working on a prototype for a new "rapid development" Java-based system for SmarTest which will be available next month.

*Contact: **Helen Lodge**, Marketing Manager, Aspects Software - **Tel: +44 (0)131 225 9500. Fax: +44 (0)131 225 9555.***

# MEI Launches Payment System

Mars Electronic International (MEI) last month launched a new cashless payment system called MultiCard Smart. According to Andy Matko, MEI's Marketing Manager, "the quest for a truly Smart Card system is complete."

MEI acquired their Smart Card technology from DigiCash. MEI own the world-wide rights to DigiCash and have an on-going relationship with the company.

The 'smart' aspect of this new cashless payment system is its ability to span the two traditionally separate markets of open and closed sites. The new system is able to accept Mondex and Proton, is currently undergoing development. Future announcements can be expected.

The new product is developed from MEI's MultiCard, a magnetic stripe based product, which will continue to be marketed alongside the new MultiCard Smart. MEI's new Smart Card will feature a Motorola SC21 microprocessor chip.

MultiCard Smart is a flexible system and can be designed to suit individual customers needs. The system is a windows based PC package which allows functions such as pricing to be changed at the terminal making it possible to implement discounts or loyalty schemes. For example staff and contractors may be charged differently.

Andy Matko predicted that "in the future it [MultiCard Smart] will support multiple Electronic cash schemes, including the rapidly developing Mondex."

MEI estimated that approx 50 million cards would be in use by the end of 1997 and some 200 - 500 million in circulation by the year 2000.

# MultiCard Found in Holland

When a new product is launched it is often difficult to illustrate its benefits as there are little or no points of reference. However this is not the case for MEI who already have their MultiCard Smart system in operation. The system can be found in the Netherlands under the 'Facility Card' brand name which is sold by MEI's distributor EPS Transactie Systemen b.v. According to MEI over 150,000 users are already reaping the benefits of their new product.

## Education

One example of a successful application is the Dutch polytechnic Hogeschool's-Hertogenbosch. Cards have been issued to over 5,000 students and 500 staff.

The cards operate as proof of identity, as an electronic purse, a library card, allow access control, use of the photocopiers and even operates the lift. According to Koos Remmig, Special Projects Manager for the Polytechnic, the cards have also simplified and speeded up administrative tasks.

When asked whether further functions would be added to the card Koos revealed that the Internet was being investigated. The card would be a way of providing students and staff with the facility, yet also a means of limiting access to avoid excessive telephone bills. Koos explained this would mean "each computer linked to the Internet would then be equipped with a special card access".



*Contact: Andy Matko, MEI. Tel: +44 (0) 118 969 7700. Fax: +44 (0) 118 944 6412.*

## Dodger the Smart Dog

It is now possible to microchip your pet; be it a dog, cat, bird, pig or horse. It is also possible to chip inanimate objects such as your handbag or motorbike. To put animal micro-chipping to the test *SCN* nominated Dodger (see below). The procedure is quick, painless, inexpensive (about £23), safe and lasts a lifetime.

A microchip about the size of a grain of rice is injected into the skin on the animal's neck. If the pet is lost a scanner moved over the animal reads the chip's number. This unique number correlates with the owner's details held in a national database called PetLog. Owner and pet can then be easily reunited.

The system is being supplied by Avid who produce both the scanners and 96 bit memory chips. The RSPCA supports the tagging of animals and have made it policy that all re-housed pets must be micro chipped. Several other animal welfare organisations have also adopted this policy and the European Union's Balai Directive has ruled that all commercial breeding dogs must be micro chipped.
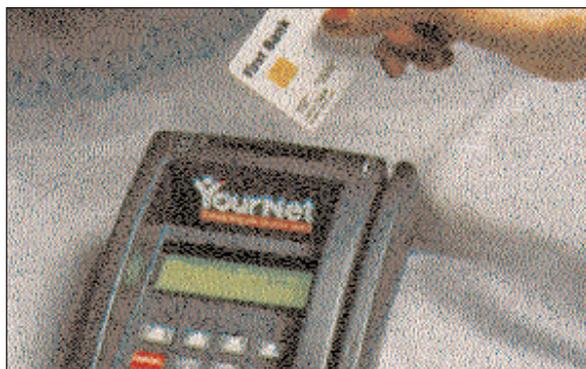
A further implication for micro chipping animals is its possible effect on Quarantine laws. Chips could aid the introduction of 'pet passports.' The animal's chip number would have to relate to official health documents.

Avid have recently signed an agreement with authorities in Poland to supply microchips for a compulsory dog registration programme. Poland is hoping to chip 90 - 95% of the country's seven million dogs.



**Contact:** *Richard H. Fry, Managing Director, Avid.* **Tel:** *+44 (0) 1825 791069.* **Fax:** *+44 (0) 1825 791006.*

## USA Community-Based Cards

YourNet, a Kansas City firm claims to have created America's first community-based Smart Card network. Consumers will be able to access a myriad of services and technologies using a single card. YourNet claim that whilst others merely talk about multiple functionality they will provide the reality.

The location of the initial pilot phase will be selected by Spring of this year and is expected to begin before the end of 1997. YourNet was able to tell *SCN* that the pilot would probably be located in a US city with a population of 50,000 - 200,000 and a large potential card issuer.

The cards, manufactured by YourNet, will feature Siemens CR8OS Crypto Controller chip and, according to YourNet, will have the largest currently available memory in the industry. The card reader terminals will be supplied by Intellect.

The YourNet card will function as a credit / debit card, as a drivers license, library card, provide voting registration, serve as ID, allow building and parking access, store insurance and health information, provide governmental services and act as an electronic purse. Biometrics can also be incorporated into the card.

A spokesperson for the company said: "Ultimately, the network will expand nationally through franchises and YourNet-owned communities." YourNet's operating system features a portable, open architecture design and has a secure 1024 bit public key security system.

**Contact: Susan Parker,** *Public Relations, YourNet.* **Tel: + 1 816 941 7800. Fax: + 1 816 941 3014. E-mail: SieraNight@aol.com**

## Smart Bonus Card in Thailand

A retail-driven frequent shopper loyalty programme is being launched in Bangkok with plans to later expand it to other parts of Thailand.

Called the Bonus Smart Card, the project is being operated by Smart Loyalty (Thailand) Ltd., a joint venture company owned by Shell Thailand, Bangkok Bank and the Central-Robinson Group.

The card is available to anyone residing in Thailand for a life-Member fee of Baht 100 (US $4). Members of the scheme making cash or credit payments with the Smart Bonus card at participating outlets will automatically collect bonus points which are added onto the card. These points can then be exchanged for an array of free offers available from the Smart Bonus Collection catalogue.

As the first loyalty programme in Thailand it has the support of leading retail and service brands, including Robinson Department Store, Shell, Bangkok Bank, AIS (Cellular 900/GSM), MAX Auto Express, Power Buy, Select convenience stores, Telewiz telecommunication shops, Bangkok Life Assurance and Budget Rent-a-Car.

Peter Buis, Smart Bonus Programme Manager, commented: "With a robust economy, competition in the retail sector has significantly intensified - Smart Bonus has the unique opportunity for increasing and retaining brand loyalty through the implementation of joint marketing programmes and we feel it will become the value-added feature of everyday shopping."

*Contact: Ms Tarvinder Dhillon, Marcom Manager, Gemplus Technologies Asia - **Tel: +65 771 9149.***

## Banking on the Internet

The European Commission has chosen C-SET technology in its preparations for the drawing up of Community norms for electronic commerce on the Internet.

Banksys, the Belgian interbank payment system organisation and Groupement des Cartes Bancaires representing the French bank card issuers, jointly submitted proposals for the use of C-SET (Chip-Secured Electronic Transaction) architecture and related security features.

C-SET uses the SET standard (software-based technology developed by Visa and MasterCard) but brings added value in terms of security, ease of use and interoperability. By storing sensitive data in the Smart Card instead of in the customer's PC, C-SET offers a high degree of security and at the same time provides guaranteed payment to merchants. Global interoperability is made possible by the use of a network server called "translator" that enables the C-SET and SET protocols to communicate with each other on a standardised, worldwide basis.

### Danish and French pilots

Denmark and France are involved in pilot schemes for secure payments over the Internet using Eurocard-MasterCard cards.

Europay last month revealed that PBS (Danish Payment Systems), IBM, Europay and MasterCard had joined forces to conduct the first live and secure credit card transaction on the Internet using a Danish Eurocard-MasterCard card and the new Secure Electronic Transaction (SET) protocol.

A pilot is now running involving three merchants and up to 1,000 PBS Eurocard-MasterCard cardholders with plans for similar projects in other parts of the world enabling Danish Internet users and merchants to participate in cross-border electronic commerce.

In France, Europay France announced plans to launch a pilot involving thousands of French Eurocard-MasterCard chip cards in April in co-operation with Crédit Agricole, Crédit Mutuel, Banques Populaires and La Poste.

Security will be provided by combining three key elements: existing chips already embedded in French bank cards (currently 25 million); secured chip card readers connected to Personal Computers which cardholders will receive from their banks; and the use of the C-SET security architecture/standards.

*Contacts: **Youri Tolmatachov**, Communication Manager, Banksys - **Tel: +32 2 727 6666. Fax: +32 2 727 2727. Gilliane Palmer**, Europay International - **Tel: +32 3 352 5647. Fax: +32 2352 5732.***

# New ICs from Texas Instruments

*An Interview with*
**Volker Schmidt**
*Worldwide Strategic*
*Microcontroller*
*Marketing Manager*
*Texas Instruments*
**by Anna Ronay**

At the end of last year Texas Instruments announced a new family of high security integrated circuits for Smart Cards which will offer from 1K to 16K of non-volatile data memory.

The new family is called the TMS310 and can be purchased with a complete package of development tools. Texas Instrument's 'C-compiler' is included which offers several levels of optimisation to enable customers to achieve the best executing speeds and program code sizes for their application. Customers can choose to optimise either code size or code execution speed depending on their individual needs.

Volker Schmidt told SCN that further family members are planned. According to Georges Maurel, Texas Instrument's Worldwide Smart Card Business Manager, these will "include products with more advanced submicron technology down to 0.5, resulting in even further levels of device integration and increased functionality". An announcement can be expected this month.

## Future plans

*SCN* asked Volker Schmidt about other future plans for Texas Instruments. He said Texas were already the leaders in GSM phones, as well as being major players in Pay TV, telephone and banking cards. He suggested that particular success was achieved in both 1995 and 1996 by focusing on one area of the market. An approach that Volker suggested is different to the rest of the industry. Dataquest awarded Texas Instruments 'Vendor of the Year' in 1995 and 1996 for the service they provide.

Commenting on Texas Instrument's success Volker mentioned the possibility that the company would expand to regions outside Europe, possibly Asia and the US.

*SCN* asked Volker about the future of the Smart Card industry. He suggested that the industry is striving toward multi-application cards, although he acknowledged there are many issues to be resolved before such a card becomes reality. Practical problems include resolving questions such as who would be the card issuer. Volker Schmidt concluded that despite these issues several services on one card were "the future".

When questioned about the public response to Smart Card technology Volker stated that the public had already accepted Smart Card technology. He referred to GSM phones saying the Smart Card gives functionality, whilst the phone itself is merely an application. Volker suggested that the public buy into the Smart Card concept without fully realising.

Volker foresees specialist technology as increasingly becoming an accepted part of everyday life. He mentioned the Internet as an under developed area with huge potential and identified electronic cash as the "next explosion". Volker also sees "portability of personal environment" as a concept that will generate more interest and use.

Volker predicted wide spread use of contactless Smart Cards in transport (SCN Nov '96), but said health and ID cards were more difficult to forecast as it involved Government decisions.

Finally he identified Java as an important factor in change (SCN Nov '96, and this issue's front page). Volker explained that it is now possible to develop new, low volume applications which, in the future may not need the high security of today and may be utilised in areas not yet considered.

Volker concluded that Smart Cards used to be known as a "twilight technology"; a follower rather than a leader. However he continued by saying "this is changing" as Smart Cards move closer and closer to leading edge technology. He suggested that within 5 - 10 years Smart Cards may become the driver behind technologies yet to be invented.

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## Gemplus Public Key Cards

Gemplus has announced the immediate availability in the US of GPK2000, the first in its GPK (Gemplus Public Key) line of Smart Cards for securing Internet and Intranet transactions.

The new card will be used in the first release of ImagineCard, developed in alliance between Gemplus, Hewlett-Packard and Informix to jointly develop a technology infrastructure for the secure delivery of transactions over the Internet and across corporate Intranets. In addition, Hewlett-Packard's International Cryptography Framework (ICF) technology will run on the GPK2000 card.

GPK2000 provides RSA-based digital signature authentication, 2K bytes of EEPROM and a multi-application operating system and comes with range of development tools and a set of developer algorithms.

Later in the year, other cards will be added to the GPK family including the GPK4000 with 4K bytes EEPROM and 1024 bit key length, and the GPK8000 with 8K Bytes EEPROM. The cards are compliant with ISO 7816-1, -2, -3, -4, and compatible with EMV (Europay/MasterCard/Visa specifications for chip cards.

*Contact: Jackie Shambrook, Gemplus, UK - **Tel: +44 (0)1705 486444. Fax: +44(0)1705 472081.***

## ICMA Board Members

US-based ICMA, the International Card Manufacturers Association, has announced its 1997 Board of Directors with representatives from 11 countries on four continents.

President - Alan J Scott, Wessex Interprint (UK), Past President - Michael Swiecicki (USA), Jeffrey Barnhart, Creative Marketing Alliance (USA); Al Vrancart, NBS Card Services, Inc (USA); Paul Patterson, Patterson Press, Inc (USA); Gordon Kramer, Continental Plastic Card Co (USA); David Stonely, McCorquodale Security Cards (USA); Mike Brussin, Kirk Plastic (USA); Sheri Mattice, Security Card Systems (Canada); Pietro Corsi, Cellograf-Simmp SPA (Italy); Francis Lavelle, Solaic (France); Markku Kemppi, ID Kort AB (Sweden); Tai Kyu Choi, KBC Corporation (Korea); Neri Fontoura, Menno Equipamentos (Brazil); Fernando Bautista, Thomas Greg & Associates (Columbia); Derek Chaplin, Shave & Gibson Africard (South Africa); Roy Simmons, Oakwood Design (UK); Richard Ryder, Klockner Pentaplast (USA); Luis Ferreira, Europay (Belgium).

*Contact: Mary Kay Metcalf, ICMA - **Tel: +1 609 799 4900. Fax: +1 609 799 7032.***

## Electronic Purse in a Kibbutz

An electronic purse project using a microprocessor-based contactless Smart tag instead of the usual Smart Card has been successfully implemented in an Israeli kibbutz (a communal settlement) and has been expanded to 35 other settlements with a total population of 20,000.

The Smart tag is used to purchase goods and services and as a means of access and attendance control. Each kibbutz resident has a monthly budget from which the value of purchases, goods and services is deducted. For example; meals, laundry service, drinks and snacks at a local pub, postal service, goods from local stores, newspaper stands and vending machines could all be obtained.

Other applications include selective authorisation of the use of communal vehicles. In this case, the personal tag provides identification and acts as an ignition enabling device. Driver and travel details such as date, time and distance are automatically registered, and several people can share travel expenses by each presenting his/her tag to the controller installed inside the vehicle. The tag is also used to control refuelling and to control access to the kibbutz's factories and other restricted areas such as the local swimming pool.

On Track Innovations (OTI) started the project three years ago to test their contactless technology. Ofer Tziperman, OTI's Vice President of Marketing, said the project has demonstrated the advantages of their technology in a controlled environment in which numerous applications are used simultaneously and to evaluate user satisfaction.

*Contact: Ofer Tziperman, On Track Innovations - **Tel: +972 6 938884. Fax: +972 6 938887.***

## People on the Move

MasterCard has attracted two key people from its partners in the EMV (Europay/MasterCard/Visa) group which formulated standard specifications for chip cards.

**Richard Phillimore** has joined the US card issuer as Senior Vice President for chip business with responsibility for the transition of all MasterCard's debit and credit products to chip cards. He joins from Europay where he was in charge of chip card business development.

Meanwhile, **Peter Hill** has moved to Mondex International - the organisation responsible for the management of the electronic cash payment system - as its first Chief Technology Officer with overall responsibility for technical development, system security, standards and Mondex supplier relationships. (MasterCard is taking a 51 per cent stake in Mondex giving it a controlling interest.)

Hill joins from Visa International where he was Executive Vice President, Payment Technology, and involved in the development of the Visa Cash system and the EMV chip card specifications. He was also responsible for developing Visa's multi-application chip card with debit, credit, electronic purse, Internet secure purchasing and loyalty functions.

**Dan A. Cunningham** has been appointed to the Board of Directors of Precis Smart Card Systems, the Oklahoma City-based company which developed the first healthcare Smart Card application linking patients, physicians, hospitals, pharmacies and mobile emergency units. The company is also involved in the development of stored value, retail, sports, entertainment and security access applications.

Cunningham is Senior Vice President of Business Development at Phoenix Planning and Evaluation, a consulting company based in Rockville, Maryland. Prior to joining Phoenix, he held positions as President and Chief Executive Officer of Gemplus Card International Corporation of Gaithersburg, Maryland, and as US Sales Manager for Micro Card Technologies of Dallas, Texas. Currently he is Chairman and President of the Smart Card Industry Association.

## Smart Card Diary

**Electronic Payment Systems in Transport,** The Churchill Intercontinental, London, 20-21 March 1997.

Forum for expert analysis of key issues technology, benefits and future trends in the transport area. Tel: +44 (0) 171 453 2700. Fax: +44 (0) 171 1976.

**Stored Value Cards 97,** Park Royal Hotel, Darling Harbour, Sydney, Australia 24-25 March 1997.

Issues to be addressed include the latest technologies, implementation and trading on the Internet amongst many others. Tel: +02 9210 5700. Fax: +02 9223 8216.

**Interfinances Expobanques,** CNIT, Paris, France, 26-28 March.

Showcase for new trends and development in banking and finance. Adeline Vancauwelaert, Tel: +33 1 4968 5261. Fax: +33 1 4737 7509.

**Smart Cards in Transport,** The Selfridge Hotel, London, 14-15 April 1997.

Aims to review current case studies, assess developing technology and operational procedures required to impliment new schemes. Tel: +44 (0) 181 734 8787. Fax: +44 (0) 181 740 1717.

## Fraud Hits BT's Smart Phones

Fraudsters in the UK have found a way of making free calls on BT's new Smart Card phones it was revealed last month.

It is understood that the fraudsters obtained the free calls by dialling a specific sequence of numbers and that as many as 5,000 phones have been used for this purpose.

While the British telecommunictions giant is working on a way to stop the fraudsters, a reliable source has told *SCN* that the problem is not related in any way to the Smart Cards or to the card readers in the payphones. It has nothing to do with the payment methods accepted by the payphones.

# Electronic Commerce and Payment Mechanisms - Part 5:

### The T = 1 Comms Protocol

The T = 1 communication is an asynchronous half duplex block transmission protocol. In terms of the ISO model this protocol operates at layer 2, the data link layer. The physical layer ( layer 1) operates in the same way as for the T = 0 protocol except for the error detection and correction. In essence this protocol puts an envelope around a block of characters which allows,

- flow control
- block chaining
- error correction

The choice of communication protocol for the ICC is still a debateable issue and one has to consider what advantages can be offered by the block protocol and then to examine the price that must be paid.

The most obvious advantage of the T = 1 protocol is the ability to manage data flow in both directions. In our discussion of the T = 0 protocol it was shown that for a particular command that the data is either sent to or received from the ICC. This limitation was really due to the use of a single byte for defining the length of the data related to the command.

The T = 1 protocol also removes the T = 0 restriction of the master slave relationship where the interface device (IFD) always initiates a command to which the ICC responds. For this block protocol a command may be initiated by either the IFD or the ICC albeit within the restrictions of the protocol.

A further advantage of the T = 1 protocol is the ability to chain the blocks of data such that an arbitrarily large block of data may be transferred as the result of a single command by the transmission of the appropriate number of frames chained in sequence.

The block protocol also has a more sophisticated error management system. This allows the use of a block error detection code (EDC) and the ability to re-transmit blocks that are subject to some error condition. By comparison the T = 0 protocol has a primitive character error detection and correction scheme as described previously in the tutorial.

Clearly there is a price to be paid for this higher layer protocol. Apart from the more complex software in both the ICC and the IFD the protocol is more demanding on the RAM memory of the ICC which needs to maintain the last sent block in case retransmission is required. In general the T = 1 protocol offers advantages where the application is managing large blocks of data, particularly when it is required to pass data in both directions as part of a particular command. The efficiency of the protocol is only really apparent for larger data transmissions since the underlying physical layer is still operating in character mode as for the T = 0 protocol. The reduction of the character frame to 11 etu ( elementary time units) compared with the 12 etu demanded by T = 0 has to be balanced against the administrative overhead of the frame structure which has both a prologue and epilogue.

There can be no doubt that the error control is significantly improved over the T = 0 protocol but at the lower speed of 9600 bit/second operated by many ICC's over very short transmission paths the probability of communication errors is much reduced. However it is clear that there is a move towards the use of the T = 1 protocol and it seems highly likely that this will become the predominant protocol of the future. We should not however dismiss the use of the T = 0 protocol which in some situations may well offer a more optimum technical solution. The T = 1 protocol is specified in the ISO standard revision of ISO 7816 - 3.

The block frame:

- The frame consists of three fields,
- prologue field
- information field (optional)
- epilogue field

as shown opposite:

| Prologue Field | | | Information Field | Epilogue Field |
|---|---|---|---|---|
| **Node Address**<br><br>**NAD** | **Protocol Control Byte**<br><br>**PCB** | **Length**<br><br>**LEN** | **Optional**<br><br>**INF** | **Error Detection LRC or CRC**<br><br>**EDC** |
| **1 Byte** | **1 Byte** | **1 Byte** | **0.254 Bytes** | **1/2 Bytes** |

The prologue field consists of three bytes:

- NAD the node address
- PCB protocol control byte
- LEN the data length

The NAD byte uses bits 3-1 to identify the source address and bits 7-5 to identify the destination address. The bits 4 and 8 are used for $V_{pp}$ control which will not be discussed further here. The node address byte allows the use of multiple logical channels where required otherwise both addresses should be set to zero.

The PCB byte allows the identification of three types of block frame:

- An information block (1 - block)
- A receive ready block (R - block)
- A supervisory block (S - block)

The information block is the frame which is used to transmit application commands and data between the ICC and the IFD. The receive - ready block is used as an acknowledgment when the protocol is sending data as a sequence of chained blocks. The supervising block is used to establish control parameters and to effect a resynchronisation or abort status as the result of some error condition. The information block also acts as an acknowledgement byte in the non chaining mode.

The LEN byte indicates the number of bytes (if any) in the information field of the frame. Its allowed range of values are from 00 - $FE_{hex}$. This allows a maximum information field of 254 bytes.

The information field is used to convey the application commands and data which we will discuss later.

The epilogue field contains the block error detection code which may be either an LRC (longitudinal redundancy check) or a CRC (cyclic redundancy check). The LRC is 1 byte whilst the CRC occupies 2 bytes. This option is defined by the specific interface characters.

**Specific Interface Characters**

In a previous part of the tutorial we discussed the specific interface characters given by the answer to reset (ATR). The T = 1 protocol uses three of these characters to establish the necessary options before communication can take place. These bytes are assigned as follows (where i > 2):

- $TA_i$ = IFSC (default = 32)

- $TB_i$
  (bit 4-1) = CWI (default = 13)
  (Bit 8-5) = BWI (default = 4)

- $TC_i$
  (bit 1=1) = CRC option
  (bit 1=0) = LRC option default

The IFSC is the maximum information field size for the card. There is also an IFSD which is the maximum information field size for the interface device. This has a default value of 32 bytes and can only be changed by means of an S - block request from the IFD to the ICC.

**Waiting Times**

The T = 1 protocol uses two waiting time parameters to help flow control:

- Character Waiting Time (CWT)
- Block Waiting Time (BWT)

The character waiting time is the maximum time between successive characters in a block, whilst the block waiting time is the maximum time between the leading edge of the last character in a block sent to the IFD and the leading character of the block sent by the card.

The character waiting time may be used to detect an error in the length of a block whilst the block waiting time may be used to detect an unresponsive card. There is also a block guard time (BGT) which is defined as the minimum time between the leading edge of the last character of one block and the leading edge of the first character in the new block to be sent in the alternative direction. The CWT and BWT are calculated from the values of CWI and BWI coded as shown previously in the specific interface bytes by means of the following equations:

- $CWT = (2^{CWI} + 11)$ etu
- $BWT = (2^{BWI} \times 960 \times 372 / f)$ Sec + 11 etu

Where f is the clock frequency

The minimum value for the BWT is 100 mS + 11 etu when the card operates with the default frequency of 3.58 $MHX_3$. The block guard time has a value of 22 etu such that the delay between the start of the last character of a received block and the start of a transmitted block is greater than BGT but less than BWT. Accordingly the minium inter block time is 11 etu which is equal to one character time.

**Protocol Control Byte**

The protocol control byte identifies the different types of block and carries some control information including a single bit sequence number (N) and a block chaining bit (M). Other bits are used to identify transmission errors. The PCB is coded as follows.

| Type | PCB (bits 8-1) | | | | | | | | Function |
|------|---|---|---|---|---|---|---|---|----------|
| I | 0 | N | 0 | 0 | 0 | 0 | 0 | 0 | Standard I Block |
| I | 0 | N | 1 | 0 | 0 | 0 | 0 | 0 | Chain Bit Set |
| R | 1 | 0 | 0 | N | 0 | 0 | 0 | 0 | No Errors |
| R | 1 | 0 | 0 | N | 0 | 0 | 0 | 1 | EDC / Parity Error |
| R | 1 | 0 | 0 | N | 0 | 0 | 1 | 0 | Other Errors |
| S | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | Resynch Request |
| S | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | Resynch Response |
| S | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | IFS Request |
| S | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | IFS Response |
| S | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | Abort Request |
| S | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | Abort Response |
| S | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | WTX Request |
| S | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | WTX Response |

The I blocks can occur as independent blocks or as part of a chain. 'More' bit is set to indicate that further blocks are to follow. The sequence number of the sender alternates between '0' and '1' starting with '0'.

The R blocks are used to acknowledge the successful or otherwise receipt of transmitted blocks. The sequence number N carries the value of the next expected value of N where the transmitter alternates the value as mentioned above. Whilst blocks transmitted as part of a chain must be acknowledged by an R block the receipt of a successful stand alone I block may be acknowledged by an I block response. The two correspondents manage the sequence numbers of their I block independently alternating between '0' and '1'. The R block has three possible states as shown in the table.

The S blocks are used to invoke four control states as in shown the table. The resynch request is used by the IFD (only) to force a reset of the block transmission parameters to their initial values. A chain may be aborted by either the IFD or ICC perhaps due to some physical error such as memory corruption. The ICC may send an IFS request to revoke a change in the IFSC it can support. Similarly the IFD may send an IFS request to indicate a new IFSD it can support. The S block control also allows the ICC to request an extension to the block waiting time (BWT) that may be necessary to execute a command received in an I block. The INF field in this block contains a single byte integer value which is to be calculated as a multiple of the BWT value. In all cases the receiver of an S block should send the appropriate response block.

*David Everett*
*Next Month: Communication Protocols continued.*

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**Loose Chippings**

- Visa launches first electronic commerce pilot in Korea, the fourth in Asia.

- NatWest chooses Bull CP8 as card supplier for UK ICC chip project. The APACS pilot begins in October 1997.

- De La Rue Fortronic introduces new Eclipse TF41 terminal capable of handling debit, credit and EMV.

- Hyperion to provide strategic consultancy for IBM.

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## e-pass Next Generation Card

A new multi-function Smart Card concept, called e-pass, has been unveiled by London based Xanadu, a company which develops and promotes technology and sells licences.

A next generation card, e-pass comes into the Super Smart Card class. It is small enough to fit into a wallet, but powerful enough to provide a large number of personal information functions.

According to Xanadu, e-pass eliminates the need to carry numerous cards as in a single unit it can, for example, contain functions such as paying for goods and services, making cashless transactions, credit payments, membership schemes, access control, security management, health and personal records and could even act as a passport and driving licence.

E-pass can hold a range of pictures and illustrations, all viewable at the touch of a button and can contain one or more display areas to show relevant permutations of data - one area carrying a picture and another the holder's signature when required. The card is operated by buttons along the side and is powered by solar power and batteries which recharge when the card enters a transaction device such as a cash register. European scientist Hartmut Henninge, who developed the card, said: "Businesses are constantly demanding more powerful on-card facilities, combined with high security and the ability to enable customer transactions across multiple locations and networks. It makes economic sense, therefore, to combine functions in a permanent, rechargeable card".

*Contact: Ron Holland, Xanadu -* **Tel: +44 (0) 171 404 6050.**

## New Electronic Purse from Bull

Bull has launched a new electronic purse card, the CC 1000, which takes the electronic purse card from being solely a payment card to one that can also include loyalty programmes, health records and credit-debit functions.

The CC 1000 is the latest addition to Bull's cash card CC family of electronic purse cards. By combining the functionality of a multi-application card with an electronic purse, the CC 1000 provides numerous applications with user flexibility and a high level of security. It has 8K bytes of EEPROM and all applications are separated from each other.

The new card has already been ordered by the Dutch interbank organisation Interpay which has placed an order with Bull for 7.5 million cards to be delivered this year.

*Contact: Dominique Mercier-Chevalier, Bull CP8 France -* **Tel: +33 (0) 1 3966 4520.**

## IBM introduces NetWork Card

IBM claim to have been the first major computer company to introduce a Network computer with their announcement of the IBM Network Station in September 1996. A Network computer is a means of offering access to the internet, company intranets, multiple servers and Java.

According to John Noakes the aim is not to replace the Personal Computer, but to compliment it as a computing option. The Network computer is a low cost system because the user downloads the software they require from the network.

The IBM Smart Card is a means of proving identity and carrying out secure electronic commerce. The card pictured on the front of SCN is manufactured by ComCard and features either a Thompson or Motorola chip (both are used by IBM). John Noakes made his position clear by stating, "Network computing is our future".

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