IMAGE PRINTING DIGEST

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DoD Leads in Asset Tracking

The **US Department of Defense** (DoD) is under constant scrutiny to spend dollars wisely. Any example of DoD procurement that departs from common sense is jumped on as a reason to slash their military budget. A major reevaluation of logistic tracking took place after a report surfaced that $2.7 billion worth of unused material was found in the deserts of the Middle East after the Gulf War. The military success was tainted by the exposure of an antiquated and inefficient system for processing and delivering materiel. This outcry put pressure on the DoD to increase efficiency in the face of a mind boggling challenge to purchase millions of items to maintain personnel and to support a ready, reactive military force. This drive for efficiency pushes the DoD into cutting edge programs to track and inventory everything it uses.

The DoD has now deployed a system called **Joint Total Asset Visibility** (JTAV) which employs bar codes, RFID, GPS (global positioning system), optical memory, and virtually any identification and information source useful to the military, to create a reliable data base of information. This information is now available (visible) through a secure network. Military or DOD personnel authorized to use the JTAV system can locate items and human resources on a global basis, instantly and accurately.

Saving Private Ryan is now an historical anecdote unlikely to be repeated in the present US Army. Personnel as well as goods are now tracked in real time, globally. Today's military commanders can access timely, accurate information on the location, movement, status and identification of personnel, equipment and supplies.

The DoD has designed JTAV to take advantage of emerging technologies in item coding, marking and data transmission. The current JTAV system is PC based using a DOS operating system. Plans are underway to move to a **Windows CE** operating system and pen based wireless computers thus expanding the network to allow an infantry commander to search out the nearest source for a fresh supply of mortar shells.

According to an Executive Summary of the JTAV, challenges facing the DoD include maintaining and improving joint readiness, reducing costs and inventories, improving productivity, and maintaining accountability. Four

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Route to _____ & _____ & _____

PIEZO INK JET EXPANDING ON MANY FRONTS

Barcelona, Spain - Of the fifteen presentation at the **IMI Europe 7th Annual European Ink Jet Printing Conference**, four featured new applications of piezoelectric ink jet printing. Other presenters also voiced renewed interest in this specific technology for ink jet printing. While the total ink jet printer population is now dominated by thermal (bubble) ink jet technology led by **Hewlett-Packard Corporation**, San Diego, CA and **Canon Inc.**, Tokyo, Japan other manufacturers are exploiting the variety and flexibility of the piezoelectric system to gain a competitive advantage.

Mark Hanley, president of **IT Strategies**, Hanover, MA presented a market overview and future projection for ink jet printing. He predicted accelerating acceptance of color printing for business use leading to a sudden decline in black only printers in the near future. This trend may benefit **Seiko Epson Corp.**, Tokyo, Japan, the major manufacturer of color piezoelectric printers with a current estimated 35% of the world market. Epson's strategy aims at increasing world market penetration leaving the US for an end game strategy to unseat H P as the US business printer of choice.

Courtesy of Mark Hanley, IT Strategies

Other speakers at the IMI conference presented application specific information including **Xaar plc**, Cambridge, England, a manufacturer of high performance piezoelectric print heads, **Accent Color Sciences,** a specialist in phase change inks for piezoelectric printing, **Spectra, Inc.**, Hanover, NH a leader in phase change piezoelectric

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strategies address these challenges:

I. Continue to develop JTAV capability by taking advantage of emerging technologies including automated information systems.

II. Integrate JTAV into the overall **Global Combat Support System** (GCSS) and other DoD data-sharing initiatives.

III. Tailor JTAV support by building block design and adherence to DoD and commercial standards.

IV. Institute a continual quality improvement program to modernize by implementing change effectively that emphasizes data quality and technology insertion.

According to DoD, "JTAV (now) provides the tools to improve decision-making and enhance functional, operational, and business processes throughout DoD."

The advanced position of the DoD in Automatic Data Capture (ADC) has its admirers who understand that, once the government has done the beta testing of a new system and implemented it, chances are a workable, fundamentally sound system has been created that is worth cloning. Thus, independent system developers are beginning to offer similar asset tracking systems using the experience and methodology pioneered by the DoD.

One bottom line positive for the printing industry is a building demand for hand held label printers that can output scannable data. The DoD is clearly interested in accurate input information, so when an item is purchased or identified in the field, accurate labeling is the surest way to keep that asset visible to the JTAV system. ◊

New approach - Self-crosslinking emulsions for fast drying ink jet inks

Barcelona, Spain - **Hugh Allen** of **Coates Electrographic,** Bath, England is adopting flexographic printing ink techniques to solve a nagging problem with ink jet inks. Increase dry-time or ink setup is necessary in fast moving production lines when continuous ink jet is employed as a marking, labeling or encoding system.

Current ink jet inks used in marking systems often contain organic solvents which may cause hazardous working conditions due to solvent exposure or flammability. The organic solvent allows fast print speeds in production printing systems. Allen has experimented with water based, alkali soluble resins which, when printed, give excellent adhesion to paper, corrugated, plastics, glass and metal. Dry and wet abrasion is satisfactory, and weather, heat and chemical resistance is also satisfactory.

According to Allen, water based inks for marking systems are important options to replace solvent inks which must be carefully handled and possibly are hazardous. The formulation of an emulsion inks needs to match the printing application which requires a partnership between the ink user and ink manufacturer.

As with other ink systems such as phase change or UV curable, the self-crosslinking emulsion is a development in ink jet chemistry that offers improvements to existing systems. ◊

Piezo *(Continued from page 1)*
print heads, and **Hitachi Kokl Imaging Solutions, Inc.**, Simi Valley, CA, a systems integrator that designs for special applications.

Renewed interest in piezoelectric printing systems is driven by a search for alternatives to thermal ink jet which is under a canopy of patents structured by H P and Canon. The piezoelectric print head furnishes a measureable pumping action whose physical properties offer a good working platform for new ink development. Phase change, UV curable and viscous inks are solutions now employed to increase throughput. Flexible ink choice helps piezo printers improve print quality and dry-time performance. Thermal ink jet systems tend to be more complex and are highly dependent upon ink formulation and liquid dynamics.

Hanley predicts that piezoelectric will eventually supplant thermal ink jet as a technology of choice for ink jet printing. Thus, the battle between these printing technologies rages as digital printing systems replace older mechanical printing systems. ◊

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drupa 2000 Coming soon - the print world looks to the future

Dusseldorf, Germany - *Druck und papier* translates to print and paper which further condenses in German to **drupa**, the enormous global trade show held every five years in Johann Gutenberg's backyard. One half million visitors will attend the May 18 - 31, 2000 exhibition with international visitors outnumbering locals. Every company that looks to printing, in whatever format and technology, will cast an eye on Dusseldorf for two weeks absorbing all that will be forthcoming.

According to **William C. Lamparter**, president of **PrintCom Consulting Group**, Charlotte, NC, four areas of intense interest will be addressed at drupa 2000:

• Computer integrating manufacturing systems; from prepress to finished binding,

• An avalanche of digital asset management (DAM) programs that are media neutral;

• Several new digital presses with both fixed and variable output;

• Announcements of mergers, acquisitions and strategic partnerships.

Working through 2.4 million square feet of exhibit space scattered over 18 separate buildings could easily consume a week. Some US exhibitors will join with **MAN Roland's** in their heavily promoted **PrintCity** building. US companies exhibiting in PrintCity include **Adobe Systems, Apple Computers, Polaroid** and **Sun Chemical**.

Additional trading partnerships between major printing press manufacturers and non-competing peripheral suppliers will emerge. Printing press builders need software, prepress systems and binding equipment for their digital equipment, so expect more cooperative ventures at drupa 2000. Among the forecast new products will be **NexPress**, a process color digital press created by the joint venture of **Heidelberg** and **Kodak**.

All companies interested in new printing technology will be drawn to drupa 2000. If not in person, then by trade hoopla, web site dynamics and promotion of new products and new technology which will be launched at this international trade show. Just five years ago at drupa 1995, digital color presses became a commercial reality. Now, the digital revolution impacts every printing process. By the end of May 2000 expectations are that new directions will drive the worldwide printing industry for the next five years. ◊

AIAG Spins Off ANX Network to SAIC

Southfield, MI - The **Automotive Industry Action Group** (AIAG) recently sold its network assets and operations, the **Automotive Network eXchange**®(ANX) Service, to **Science Applications International Corporation** (SAIC), San Diego, CA. According to **Gary Quick**, AIAG executive on loan, " With the transition of responsibilities to SAIC, AIAG can focus on setting the standards for evolving ANX-based applications and services as well as working with its counterpart organizations around the world to help globalize the network."

In September 1998, after researching networking links among all sectors of the automobile industry, standards were set for a multi-provider Virtual Private Network dubbed ANX service. Since then, AIAG has documented an infrastructure consistent with its mission. The result is a robust, global network superior to Internet communication. The size and diversity of the automobile industry required flexibility for all types of business communication.

Basic ANX service provides:

- A communication service for the automotive industry;
- includes TCP/IP protocol;
- provides high network security for trading partners;
- is a facilitator for business re-engineering;
- can handle distributive printing;
- establishes a global communication network.

While AIAG never ran the network, it established certification standards through a contract with an ANX Overseer company, **Telcordia Technologies, Inc.**, Morristown, NJ (formerly Bellcore). Telcordia was acquired by SAIC in November 1997 and now plans to add advanced network features including videoconferencing, telephony and security, portal capabilities for communities of interest, and ASP-like (application service provider) services catering to engineering and back-office requirements.

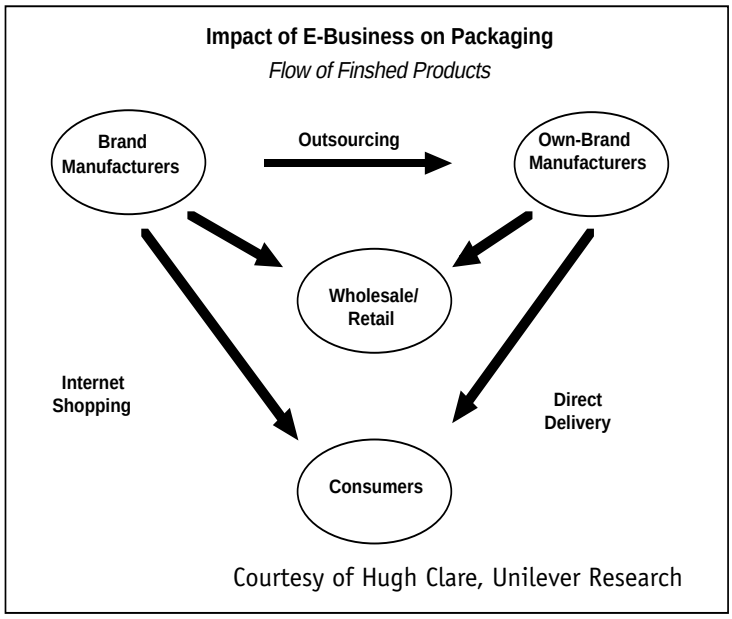
By controlling communication links, SAIC can upgrade the ANX service when new communication products appear thus staying at the leading edge of private networks. The solid business reason for the ANX service is thousands of dollars saved by an economical communication link. Corporate computer-to-computer secure links help businesses move at the speed of light while tapping the networks interwoven knowledge resource. ◊

Online Packaging *(Continued from page 6)*

- Opportunities for product and brand differentiation,
- Need for more information on packages,
- A different need for labeling (emphasis on customer, address, location).

The relationship between product manufacturer and an Internet seller is much different than current retail channel distribution. Many online vendors concern themselves with developing their web sites and designing selling messages that turn browsers into customers. The nuts and bolts of order fulfillment may be an afterthought. However, a backlash from a successful sales program may occur when orders are delayed and customers are turned off. Understanding the importance of economical and prompt order fulfillment logically leads vendors back to manufacturers where negotiations begin to reduce product costs or to add original features that will help satisfy customers. Online retailers, just like their brick-and-mortar cousins, become aware of the need for satisfied customers who will reorder and spread word-of-mouth positives about their products and company.

Many retail product manufacturers are tempted to develop their own online sales programs. Bypassing the wholesale/retail product distribution channel offers increased profit making possibilities. Manufacturers, who chose the direct selling route in the past, invested in an expensive outside sales organization with branch offices, salesmen and the maintenance costs. Online sales efforts can be centrally located and continuously monitored. As Internet use continues to explode, opportunities to set up a global presence on the web offers manufactures a source of additional sales which may be tolerated by traditional wholesalers (everybody is doing it). An alternative is an integrated program through traditional distribution channels (cutting regional retailers in on web sales in their geographical area) which placates existing middlemen while adding a new sales method. ◊



Courtesy of Hugh Clare, Unilever Research

Blue Roll out *(Continued from page 6)*

facto smart card industry standard. Some major US banks and **MasterCard** are also committed to Multos.

Blue is a multifunction card which contains a magnetic stripe for "brick and mortar" shopping as well as a smart chip. The magnetic stripe is used to access the huge US infrastructure for processing magnetic stripe cards. Microchips or optical patches offer a much higher memory capacity for the constricted environment of a wallet sized plastic card than does a magnetic stripe. But, to utilize this technology, multipurpose readers are required. American Express addresses the hardware issue by offering an on-line wallet and smart card reader at no charge to Blue customers. The smart card reader is ordered by connecting to the AXP web site (www/americanexpress.com/Igotblue). Card members then setup their on-line wallet at the web site. To do Internet shopping, the Blue customer inserts the smart card into the reader, keys in a PIN number to open the wallet and then places an on-line order. When the vendor queries for credit card information, the on-line wallet automatically fills in the order form eliminating manual entering of information. AXP also guarantees against fraud on-line. With the Blue program, American Express is making it easy and safe to purchase on the Internet to encourage card members to shop on-line.

In the future, American Express can add other functions to the Blue chip. AXP has experience with hotel reservations (proven in a pilot program with Hilton), airline travel (proven in pilots with American Airline and Continental Airlines) and electronic purse applications.

Business printing industry professionals should take note of smart card developments since widespread use of chip cards can require digital printers to interface with the smart card operating system. As more information is stored on the expanded memory card, it becomes feasible for printers to directly interface with the card without passing through a PC or other intermediate device. ◊

Coming soon . . Pepsi and Coke in a cardboard bottle

Barcelona, Spain - Among packaging innovations that make sense, the replacement of glass, plastics and metal cans with a paper substitute offers an economic and environmentally friendly improvement. **Dr. Richard Freeman** of **The Generics Group, Ltd.,** Cambridge, England, unveiled a laminated paper bottle with a 14 micron CO_2 resistant membrane. This "cardboard bottle" is inexpensive compared to existing soft drink containers and is easily disposed of by biodegrading or incinerating while offering a recycling option as well.

At the IMI Europe November 1999 **2nd Annual Advanced Packaging Technology Conference**, Dr. Freeman acknowledged that other paper containers, particularly small "bricks" that are commonly used for children's soft drinks had been accepted and widely distributed. Freeman estimates that 25% of all carbonated soft drinks are sold in plastic, glass or cans and 17% of beer sales are in glass or metal cans. This target market could be converted to paper containers that tolerate pressurized CO_2 (up to 90 psi) with a reasonable shelf life.

Because most beer and soft drinks marketers are large, global corporations, final commercial use will depend on major companies accepting the concept. The "environment friendly" argument can be compelling, but the convenience to the user of easy disposal may be most important. As for the bottlers, the opportunity to increase profits with a less costly package is the best reason to accept this new development. ◊

Zebra offers Printer/Encoder that combines RF and bar codes

Vernon Hills, IL - At the October 1999 **ScanTech 99** exhibition held in Rosemont, IL, **Zebra Technologies Corporation** again confirmed its printing leadership in the Automatic Data Collection industry (ADC). With award winning printers (two new ones were introduced at the show) and a career award bestowed on Vice President **Clive Hohberger**, Zebra was in the limelight at this major trade show.

Among recent developments is the convergence of radio frequency (RF) and bar code scanning as compatible technologies to automatically identify products. The new **Zebra R-140** thermal transfer printer/encoder is an industrial product that prints bar codes and human readable labels to standard industrial specifications while also encoding **Texas Instruments Tag-It®** or **Philips Semiconductor I-Code** RF transponders. In a single pass, continuous label stock, with transponder included, is fed through the R-140. Printed text and bar code is added while the transponder is encoded with identical information. Read/write verification ensures that bar code and RF code information is identical.

Courtesy of Zebra Technologies Corporation

The PC printer interface uses **Zebra ZPL II** printer language. A selected option adds Zebra's **BAR-ONE®** label design and supply chain integration with enhancements for RFID encoding. Other Windows based label software is an alternative choice. With a design package, various fonts and bar code formats can quickly be put into the label using a master template; an easily learned input job.

While cost of adding a transponder to a bar code is significant, the advantages of radio frequency that supplants line-of-sight reading by a bar code scanner allows more flexibility and quicker processing of packages and parts. As an example, a piled pallet of mixed, labeled boxes could be passed in the area of a radio frequency receiver and all items would be read as the RF receiver radio scans the pallet. This eliminates aligning boxes on conveyors for a visible scan which usually requires careful placement of the scanner and orientation of the package and label.

For bulky, heavy, expensive parts and materials, the new RF capable label should have a ready market. As transponder costs continue to fall, replacing bar code scanning with RF scanning could become commonplace. Zebra is positioning itself to take advantage of a technology advancement that is already being implemented by high volume warehousing operations including the **U.S. Department of Defense.** ◊

American Express Blue roll out may add 1 million US smart card users

New York, NY - **American Express Company (AXP)** rocketed into a top position in smart card distribution by a well planned promotion and new product offering that may well establish **Blue** as the billfold additive of choice in the US. AXP began exploring smart card use in 1995 when it distributed smart cards to employees for in-house cafeteria use. Since then, American Express has sponsored smart card test programs in Europe and the US while forming cooperative alliances and helping to develop and implement smart card trade specifications.

American Express' decision to invest heavily in the US roll out of Blue aims at adding new customers for its services. By issuing an advance technology card, AXP departs from the big business, Fortune 500, gray suit image of a typical green card owner.

The kickoff in September 1999 featured a concert in New York's Central Park featuring Eric Clapton, Chrissie Hynde, Sarah McLachlan, Stevie Nicks and Sheryl Crow. This benefit concert for AIDS was televised through the FOX network and is featured now on the AXP web site *http://blueconcerts.com*. Targets for this multimillion dollar ad campaign are tech savvy individuals and 21st century aficionados who may be attracted to this advanced, bank-style credit card. Other incentives include: no annual fee, no full balance payoff required, 0% interest on purchases for the first six months and below bank card interest rates on regular balances.

American Express Blue features a smart chip with the latest **Multos** operating system, a sophisticated encryption algorithm that provides users with a unique digital signature, and extra memory slots available for additional uses.

Outside sources indicate that the chip is manufactured by **Infineon Technologies AG**, Munich, Germany, a recent spin-off from **Siemens Semiconductor**. The card is produced by **Oberthur Card Systems**, Dijon, France who recently acquired the smart card division of **De La Rue**, the English bank note printing company.

Smart cards are moving towards a standard card operating system with memory space allocated for various functions. Among key participants in developing operating systems are **Sun Microsystems**, Mountain View, CA (Java card), **Microsoft Corporation**, Redmond, WA (a card with a Windows friendly OS) and **Mondex**, London, UK (Multos offered through a subsidiary, MAOSCO). AXP's choice of Multos helps make this operating system a de-

See **Blue roll out** on page 4

Online Shopping changes retail packaging needs

Barcelona, Spain - **Hugh Clare** of **Unilever Research**, Wirrel, UK presented new directions in e-commerce packaging at the **IMI Europe 2nd Annual Advanced Packaging Technology Conference.** As online shopping becomes more popular, the bypassing of the established manufacturer-to-wholesaler-to-retailer distribution channel is becoming real. When consumers shop online, information on the web site encourages browsers to become customers. Once an order is placed, the next steps are fulfillment and customer satisfaction. Order fulfillment requires shipping the item fast, accurately and in a protective, useful package. The need is different than current retail packages designed to attract buyers, be tamper resistant and be designed for an appropriate point-of-purchase display.

As retail items are increasingly sold online, the current practice of shipping retail packages designed for point-of-sale is expected to change. According to Clare, "Online shoppers have different expectations and needs."

Clare gives these parameters for e-commerce packaging:

- Smaller runs to targeted customers,
- More refills,
- Less total packaging (inner packs are unnecessary),

See **Online packaging** on page 4