



# newsletter

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The management  
Newsletter for all  
industries involved  
with bar-code  
scanning and  
related  
technologies.

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## An international stir....

....was created in the auto ID industry and in the media by the Battelle Memorial Institute announcement that they have developed a new "invisible bar code technology." Battelle is an international contract research firm in Columbus, OH.

According to the company, the invisible bar code had been under development for five years. It was originally undertaken as a project for the US Postal Service to develop special inks and an ink jet printer to apply ZIP+4 information to parcels and packages. The USPS abandoned the program about a year ago, and Battelle moved ahead on its own to make invisible bar codes a commercial product.

The new technology is based upon printing the bar code using a specific type of dye in the ink. According to a technical paper issued by Battelle, this dye "fluoresces in the near-infrared when stimulated with 633nm light from a helium neon laser." The report continues: "A modified laser-scanned bar code reader is used to decode the information. The ink is sufficiently transparent so that it does not obscure the underlying printing." The Battelle development includes the technology for the inks and printing, as well as for the scanning equipment to read the printed bar code.

[Patent Number 4,983,817 ("Background Compensating Bar Code Reader") was issued to Battelle on January 8, 1991. The opening sentence of the Patent Abstract reads: "Methods and apparatus for reading a luminescent and substantially transparent bar code on a background surface whose reflectance may vary over the coded area." (The ink technology is covered by a separate patent application that is still pending.)]

Although Battelle has underplayed the significance of this development as it relates to UPC/EAN scanning, both the consumer and trade press latched on to that particular application as the major news story. Everyone became excited about the prospect of not having to print the ugly bar codes on their beautiful packages.

According to the *New York Times* (Jan. 6, 1991): "Bar codes have become ubiquitous on consumer products...but they can be unsightly on packages that emphasize glamor...and can add clutter to advertising messages...Because they are invisible...more information can be added and the codes can be printed on all sides of a packages."



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INCLUDING THE INTERNATIONAL EDITION

*Supermarket News* (Jan. 28, 1991) assumed it was just a matter of time before the bar code disappeared from consumer packages, when it reported: "Although the technology may take a number of years to find its way to supermarket applications, it could offer significant advantages over current methods."

*Post-News*, the London-based newsletter which covers retail automation, became almost ecstatic in discussing this new technology that is going to eliminate what it called the "unsightly" bar code on packaging: "At last," it reported in its January issue, "a means has been found of printing bar codes in invisible ink and reading them with a laser beam that can see things that a human eye cannot. If the system fulfills its promise, it could well eliminate one of the most vexatious issues in the bar coding industry."

No one seems to have taken note of the fact that there are about one million installed point-of-sale scanners (including almost 500,000 in the US alone) that cannot read this new ink -- and that trying to scan an invisible symbol would probably drive the cashiers bananas. The fact remains that there is absolutely no incentive for the retailers to spend any time or money to convert to this new system, no matter how attractive the idea may seem to a handful of manufacturers with fancy packaging.

Getting on with the more serious aspects of this new process, the first announced Battelle licensee is Accu-Sort Systems, which was granted an exclusive contract to develop the technology for use with fixed bar code scanning systems. Mike Hrabina, Accu-Sort's recently appointed VP Sales and Marketing, had this to say about the Battelle system: "We don't really see that infrared bar codes will have many retail or UPC applications. We do foresee, however, a wide variety of uses."

Hrabina told *SCAN* that he has received a "flood of inquiries" and that Accu-Sort is presently exploring a number of them. These include US currency marking (*SCAN* Oct 89), document security (passports, financial instruments), newspapers, product coupons and other items where forgery presents a potential problem. (The Battelle symbol cannot be photocopied and can only be printed with the special inks.)

Hrabina was particularly enthusiastic about a special publishing scheme that could be employed by magazines. Individual subscribers would be profiled (sex, income, age, etc.) and ads would be selectively bound into magazines destined for that reader. The ads would have invisible bar codes printed on them and could be automatically scanned, sorted and added based on predetermined criteria.

Battelle has adapted a Model 70 Accu-Sort fixed position scanner as a demonstration unit. Hrabina says he expects to get the unit back in July, at which time they will set up for production. Accu-Sort hopes to introduce the product in Dallas at *SCAN-TECH 91* (November 5-7). Although final cost/price estimates are not yet available, Hrabina suggests that the hardware is neither complicated nor expensive.

[Battelle describes the actual scanning process as follows: "The scanned laser beam stimulates infrared fluorescence in the ink. No infrared fluorescence is stimulated in the 'uninked' space. An optical filter passes the fluorescence but rejects any reflected red light. A photodetector receives a low-to-high transition as the beam scans from a space to an ink bar. Note that the detector signal is high over the ink

and low over the space in this system. Since the printer writes the code in the proper bar-space format for black ink, the fluorescence signal must be inverted before conventional decode signal processing."]

Accu-Sort's President, Al Wurz, enthusiastically predicts: "By working with Battelle and commercializing their technology, we expect to revolutionize the bar code equipment business. We think applications for invisible bar codes in the industrial marketplace will soar." [Frankly, not everyone is so sure about "revolutionize," but it's certainly an interesting development for Accu-Sort to pursue for industrial applications.]

John Garvey, VP, Battelle, has told *SCAN* that his company is actively seeking additional licensees to develop the new technology for hand-held scanners and also for further development of the inks, which are still "very rudimentary." (The inks tend to fade when exposed to light and additional work with UV inhibitors will be required.) Garvey emphasizes that everything they have done so far has been in the laboratory and he believes that it will be "at least a year or more before a commercial product is available."

Battelle, 505 King Avenue, Columbus, OH 43201; 614/424-7507; FAX 614/424-3918.  
Accu-Sort, 511 Schoolhouse Road, Telford, PA 18969; 215/723-0981.

#### We made our annual pilgrimage....

....to the National Retail Industry Convention in New York in mid-January. This event is in its 80th year (it was previously called the NRMA Business and Equipment Exposition), and it is the major showcase for vendors of hardware, software and systems for non-food retailers.

[The sponsor of this annual exposition is now the National Retail Federation. The NRF was formed a little over a year ago as a result of the merger of the National Retail Merchants Association and the American Retail Federation. The NRMA had been the previous sponsor of this convention, which was also renamed after the merger.]

As expected, there was a heavy concentration of companies offering point-of-sale (POS) hardware, software and systems. We noted, however, the appearance of an increasing number of auto ID companies who are involved in other aspects of retail operations which are based on bar coding and RF systems. Among the products and functions offered by these companies were: labels and label printers; a broad range of systems for store security, employee management and information management; portable terminals for back room operations, store inventory and shelf label control; and a wide array of other software and systems services companies.

These non-POS vendors apparently recognize that the line of demarcation is fast disappearing between auto ID products which are offered to retailers and those that are offered for the so-called industrial applications. From another perspective, if we were to look beyond point-of-sale, retailers really have most of the same challenges as other manufacturing or service businesses: inventory, employee services, receiving, distribution and, in some cases, even a related form of manufacturing. (One exception is the shipping function which, in a retail store, is performed by the shopper who carries the goods out the door.)

There were many new products that reflected upgraded performance and more competitive pricing, but we found little that could be characterized as "breakthrough." This month, we will be covering the front-end POS scanning hardware. In subsequent issues, *SCAN* will explore the other significant products and companies aimed at the non-food retailers.

Now, let's examine some of the show's highlights....

#### The transformation that has taken place....

....in point-of-sale scanner hardware, during the past two years, is somewhat dramatic. The high-speed, below the counter slot scanners -- used primarily in the supermarkets -- are smaller, faster and can readily incorporate additional features such as automatic weighing scales and deactivation of security tags.

But if you are a non-food retailer, you will be looking beyond the so-called "slots." For the department stores, the top-of-the-counter scanners -- sometimes referred to as projection scanners -- are drawing more and more attention. They all project an omni-directional scan pattern onto the counter where the label or tag can be placed in a so-called "hands-free" scanning operation. List prices for these countertop units range from \$1,000 to \$1,650, with sharp discounts for quantity.

The newer versions of the top-of-the-counter scanners -- some seen for the first time at the National Retail Industry Convention -- include:

- The very small, neat packaging of Fujitsu's Slimscan 1000, which owes its tiny size to the fact that it is a two-box system. The power module is packaged separately below the counter. This countertop unit, at \$1,100, is very unobtrusive and, from all reports, performs quite well.
- Metrologic's MS 700, mounted atop a flexible arm that can be bolted to the countertop, taking up an area of only a few square inches. The scanner can be tilted and aimed at any desired scanning area. List price is \$1,195.
- Spectra Physics' Freedom Plus, an upgraded version of the well-established Freedom Scanner -- offering higher scan performance at a list price of \$1,650. (Some observers speculated as to whether that high price might limit this unit's market appeal.) Spectra is probably the leader in the countertop type of scanner. Rick Baker, VP Marketing, Sales and Services, forecasts a sales increase of 50% in 1991 over 1990 for Spectra's Freedom line. IBM is one of its VARs.
- The Omniscan OS 510 from Microvideo, with a list price of \$1,295. This replaces the OS 712, which was one of the first, very compact, top-of-the-counter units when it was introduced in 1989 (*SCAN* March 89, Feb 90). The company's new OS 510 is billed as a very high performance model which is so small that, the manufacturer claims, it can also be used as a hand-held device with the attachment of a somewhat awkward handle screwed into the bottom. (Many companies -- including Microvideo and Metrologic -- claim to have the world's "smallest" top-of-the-counter scanner. We didn't take any measurements.)

Microvideo is a one-product company, that has attracted a substantial investment from Sensormatic, one of the leading producers of retail electronic surveillance (EAS) systems and also the owner of POSdata, a major VAR of POS systems. There have been other investors, including a Japanese company that had planned to distribute the OS 712 in Japan, but has since dropped out, presumably because laser scanners can't compete with CCDs in that country.

- Symbol Technologies, with the Scanlamp 9500, its first omni-directional scanner. The unit is attached to a small 3" x 3" base with an adjustable arm that enables the scan head to be positioned at different heights and angles. The unique scan beam is a rotating petal-designed pattern with an LED aiming point at its center. Including decoder and power supply, the list price is \$1,395.

All in all, this was an interesting array of countertop scanning devices. They are flexible, can be adjusted to each cashier's requirements and can be moved to different locations as demands require. Other, older models were also on display and this type of unit is expected to capture a significant portion of the non-food retail scanning market.

#### The other major category....

...of scanners, very much in evidence at the National Retail Industry Convention, was the hand-helds: wands, lasers and CCDs.

Although wands seem to be relegated to the status of poor cousins, they should not be dismissed as an important part of this -- or any other -- market. Pen scanners are inexpensive, they perform well and they don't break down too often.

[The continued attractiveness of these devices was brought home to us by one of the salesmen at the Welch Allyn booth who cited his company's major ongoing contract to supply wands to Dillard's department stores. He claims that the Dillard's chain has the largest number of department store check-out counters in the country, and decided to buy wands because they were much cheaper and "performed satisfactorily."]

But the real battle for hand-held scanners is being waged between the laser guns and the CCDs. In the US, so far, the retail market has gone overwhelmingly to lasers, although in Europe and Japan the reverse is true. But CCDs -- which are almost all made in the Orient (laser guns are manufactured in the US) -- are making their presence known in North America. This is being done through the direct sales efforts of manufacturers such as Bar Code Industries, Nippondenso, Opticon and Panasonic, along with their very aggressive VARs.

The struggle for market share comes down to the three essential factors of performance, price and credibility:

- The performance of the CCDs is definitely improving. CCDs have a high positive scan rate, and claim to be more rugged than the lasers in field use. However, they require contact (or near contact) with the bar code and do not have the scanning flexibility of lasers, which is an attractive feature for many US buyers.

- CCDs have been able to maintain at least a \$200-\$300 price differential with lasers, even for the large quantity users. This has understandably influenced many of the retailers who opted to go with CCDs. Although the prices of the laser guns have come down during the past two years, the CCD price advantage is expected to continue.
- Credibility, the third leg of this stool, is much more difficult to define or isolate and goes beyond performance and price. The purchase decision between the laser and CCD product groups often hinges on other intangibles, which are related to the company behind the product: What has been its track record on other products? Will it be around to service this equipment? Is there any danger of patent infringement? How much system support will be available?

An additional credibility factor cropped up as we toured the retail convention and spoke to dozens of individuals from the auto ID industry. Many of the OEMs and VARs who sell hand-held scanners openly expressed their problems in dealing with Symbol Tech, which has gained such a dominant position in the laser gun market -- probably approaching 90%.

These resellers -- many of whom handle the Symbol line -- commented about the lack of field support, slow deliveries because Symbol was shipping to favored customers, and high-handed "take-it-or-leave-it" attitudes from sales and marketing personnel, all of which contributed to strained relationships. Some went so far as to say that this had led them, and some of their customers, to deliberately switch to alternative products such as the CCDs.

Unquestionably, much of this criticism of Symbol is the usual sour-grapes that is often evident against a successful industry leader. As yet, this has not resulted in any serious erosion of the dominant market share held by Symbol in the US. But there were enough complaints from responsible individuals to suggest that Symbol has some major fence-mending to do. It's all part of that elusive "credibility factor."

As for the actual product offerings in the hand-held group, the only new one we saw was a prototype by Metrologic. After being forced to withdraw its hand-held laser guns (following Symbol's successful suit against Opticon), Metrologic went back to the drawing board. The result is the MS 950, obviously designed with the Symbol patents in mind. Externally, the Metrologic unit looks almost exactly like a CCD scanner, although it has a visible laser diode light source. (What it doesn't have is a trigger, which is one of the major features protected by the Symbol patents.) The unit is self-activating and has a proximity switch which turns on the scanning beam when the target is 5" to 7" away. The MS 950 is list-priced at \$895, and is expected to be available later this year.

The non-food retailer has a wide choice of scanners when installing automated systems. Many are mixing products -- using countertop units and hand-helds in different locations within the same stores -- depending on tag and package configurations as well as volume throughput. Above all, there is almost total acceptance of front-end scanning as the way to go.

### The strange notion....

....of a "Fire Sale in Akron" (as reported in Doug Edgell's *Auto ID News* "Industry Perspective" column in December) doesn't seem to have turned out to be too hot an item. Edgell wrote: "Seems that Telxon has the itch to blow out its remaining inventory of Symbol goods...Is this on the eve of Telxon announcing a new alliance with another hand-held scanner vendor? Many feel so."

According to an informed source at Telxon, this report may be somewhat misleading. "As you know," *SCAN* was told, "we have a five year contract to purchase \$40 million worth of handheld laser scanners from Symbol, and Telxon intends to honor that commitment." (*SCAN* Nov 88). The erroneous report, we have learned, may have been based on two occurrences: first, Symbol thought that Telxon was selling certain hand-held laser scanner models to its VARs in violation of their agreement (Telxon is only supposed to sell these scanners along with its terminals and not as a separate product). An exchange of lawyers' letters ensued and, according to Telxon, the company demonstrated that they weren't in violation of the agreement and that problem seems to have gone away.

Second, as for Edgell's speculation that Telxon is seeking another hand-held scanner supplier, that may be based on a bit more substance. We have learned that Telxon, believing that Spectra Physics "has a good product," has begun "serious conversations" with regard to Telxon becoming a VAR for Spectra's hand-held laser scanners. With the lawsuit that exists between Symbol and Spectra, however, and in view of Symbol's high batting average on the legal front (*SCAN* Jan 90) Telxon is moving carefully and predicating its talks on complete protection ("product indemnification") from Spectra.

Telxon has always been a feisty competitor. Its position, in this instance, is that so long as it fulfills its contractual obligation to Symbol, it is free to handle any other product it pleases. The company has made a strong comeback this fiscal year, with 9-month revenues up 24% (\$133 million) and earnings at \$12.6 million, compared to last year's loss of \$5 million. Telxon shows every sign of having moved out of the doldrums caused by last year's poor financial results and the major turnover in its management staff.

### "Talking dictionaries"....

....based on bar codes scanned with a tiny reader attached to your index finger, were envisioned in a new patent recently issued to Matsushita Electric Works. (Matsushita is the same Japanese conglomerate that owns Panasonic and recently acquired the US entertainment giant, MCA, which included Universal Studios, Putnam-Berkley Publishers and the management of Yellowstone National Park).

In the new system, the phonetic elements of a word are stored as a bar code symbol. When the symbol is scanned, the information is relayed to a voice synthesizer and converted to a spoken word. A student learning the word "breakfast" for example, would scan the bar code next to the printed word and hear it pronounced a moment later by the voice synthesizer.

In addition to the dictionary concept, the inventors believe this technology could give blind people a means for obtaining important information from labels and other printed material that does not come in Braille. (There was no explanation offered as to how the blind were going to be able to find the bar code, but that may be the subject of another patent.)

The key to the invention, according to the patent, is the use of a simplified approach to reconstructing words from code. A Matsushita spokesman said the company was not marketing the product yet.

#### Last year's slogan....

....for SCAN-TECH 90 was silly and irrelevant, we thought, and soon forgotten (SCAN July 90).

The new motto for SCAN-TECH 91 is an improvement: "Get up to speed on auto ID." It may be somewhat prosaic, but it is much more to the point. AIM has sent out large promotional posters picturing a sweating, straining bike rider struggling up a hill. The copy reads: "The race is on -- the quicker you automate, the more productive you'll become -- get up to speed on auto ID."

This year's event returns to Dallas where it all started 10 years ago. Mark your calendars -- November 5-7.

AIM/US 1326 Freeport Rd, Pittsburgh, PA 15238; 412/963-8588; FAX 412/963-8753.

#### We made a few calls....

....to see if we could uncover any activities in the Persian Gulf which involved the Department of Defense LOGMARS program and bar code scanning. Not too surprisingly, the subject wasn't very high on anyone's list at the DOD and there is no definite information available (although we have been told, on good authority, that the Secretary of the Army himself is also interested in this same subject.)

The best speculation at the moment is that there may be some current scanning capability at the division and brigade levels. Since all materiel had been shipped directly to the field units on such a crash basis, however, there was little attention given to any automated systems to track the incoming movement of supplies and equipment.

There are plans underway, we understand, to establish more centralized depots, and it is at these installations that a more formal method of control may be instituted. It is expected, for example, that bar-coded labels will be generated and scanned at the depots for items being returned to the States.

Five years ago, the DOD awarded a \$100 million contract for the so-called "Tactical" LOGMARS system (SCAN Oct 86) and there is considerable interest in determining how well that system operates under "real" field conditions. It would be reassuring to find that auto ID is making a contribution to improving the timely supply of materiel to the men in the field.

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SCAN NEWSLETTER LTD. • 11 Middle Neck Road, Great Neck, N.Y. 11021 • Phone: 516/487-6370 • FAX: 516/487-6449  
PUBLISHER/EDITOR: George Goldberg • ASSOCIATE EDITOR: Jeff Goldberg • CIRCULATION DIRECTOR: Teddy Allen

INTERNATIONAL EDITOR: Paul Chartier • United Kingdom Office P.O. Box 7 • Cirencester GL7-1HY England  
Phone: 44-285-3011 • Telex: 437269 SHARET G • FAX: 44-285-68859

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