



newsletter

Ltd.

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

SCANNING, CODING & AUTOMATION NEWSLETTER • 11 Middle Neck Road • Great Neck, N.Y. 11021 • (516) 487-6370

Volume XI Number 9

May 1988

Our hats are off!....

....to Helmers Publishing, *ID Systems* magazine and Expocon Management Associates for keeping their cool in Boston at the annual ID Expo Convention.

Their calmness was maintained in the face of imminent disaster that seemed to lurk around every corner: The Hynes Auditorium was still under heavy construction and far from completed; a small fire broke out (no damage) at the height of the show causing the building to be evacuated; some of the meeting rooms were overheated, poorly lit and often not where the program said they were supposed to be; it seemed like a mile-and-a-half walk from the single remote building entrance to where the exhibit hall was located; and registration facilities were tucked away in a corner difficult to find.

Nevertheless, everyone seemed to take these irritations in stride and made the best of what could have been a disappointing experience. Most exhibitors we spoke with were pleased by the calibre of the visitors, while seminar attendees admired the quality of the presentations.

There was a broad representation of companies offering all types of auto ID products. Although none of the products we saw were of the bombshell variety, there were two important groups worth noting:

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LATE BREAKING NEWS ITEM

* MAY 4....Intermec is the winner of the LOGMARS Army Non-Tactical (N-T) Phase II contract. The government today notified Intermec that it is the "apparent awardee as prime contractor of a five-year contract in excess of \$100 million." Formal signing of the contract is expected in a few days.

* John Paxton, President of Intermec, told SCAN today that: "Intermec was the only bidder that has the breadth of products, system capability and worldwide support organization to handle this contract in-house." He expects the company's newly formed Federal Systems Group (see below) to manage the contract, and to solicit and coordinate the purchases of bar coding products throughout the DOD-user agencies.

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ISSN 0273-3080

INCLUDING THE INTERNATIONAL EDITION

- Hand-held visible laser diode (VLD) scanners were very much in evidence (SCAN April 88). Opticon, the first company to offer the VLD for shipment in production quantities, claims it can now take orders for up to 1,000 units per month and promises "immediate" delivery. Symbol Technologies demonstrated a working pre-production model of their entry into the VLD market and, according to company Chairman Jerry Swartz, these units "are just now emerging from the laboratory into production, are available in small quantities and should be in full production by year-end." Photographic Sciences did not demo their VLD, but promised deliveries will be timely and competitive with everyone else. At the moment, there is no way to tell whether any of these three manufacturers of hand-held laser scanners has a better supply position because all are presumably dependent on the same Japanese sources for the visible laser diodes, and all claim to have placed purchase orders for deliveries when available.

[Editor's Note: There is one added wrinkle to the restricted supply of the VLD components. Use of this light source for hand-held scanners represents a relatively small and limited market for the Japanese part manufacturers. We have been told, however, that the production potential for this type of laser is expected to expand significantly because VLDs will also be used as the light source in laser printers and, possibly, in compact disk (CD) players. This development could lead to expanded production capacity, improved lead time, and reduced costs from the current price of \$50 each.]

- A product group, that has been around for over 10 years but which has never created much of a stir, is drawing new attention. Bar code verifiers, first introduced in the mid-70's, have been experiencing a recent upsurge in sales. During the past two years, Photographic Sciences has dominated this market with heavy advertising and promotion of various models of their Quick Checks. At ID Expo, four new verification devices were introduced by three companies, with a promise of more to come. Photo Sciences privately demonstrated a prototype of the Quick Check V, their latest model, which includes added features and a more detailed analysis of each bar code that is scanned; RJS announced the Inspector II (\$1,495) and Codascan II (\$2,345 to \$3,295) which include enhanced features for scanning all symbologies, and the capacity to store data for later use; and Bar Code Systems (a major distributor for Photo Sciences) has now introduced their Analyzer 1000 (\$1,295), a basic verification tool which they plan to market in addition to the Quick Check line.

Photographic Sciences, 770 Basket Road, Webster, NY 14580; 716/265-1600.
 RJS, 140 East Chestnut Avenue, Monrovia, CA 91016; 818/357-9781.
 Bar Code Systems, 345 Market Place, Roswell, GA 30075; 404/992-8326.
 Symbol Technologies, 116 Wilbur Place, Bohemia, NY 11716; 516/563-2400.
 Opticon, 36 Remland Rd., Orangeburg, NY 10962; 914/365-0090.

ID Expo, by the way, is going back to the West Coast next year (they were in San Francisco in '86 and Anaheim in '87) and is scheduled for the Los Angeles Convention Center May 9-11, 1989.

We continue to hear....

.... some serious criticisms of the AIM Technical Symbology Committee (TSC) Bar Code Performance Test: poor design, faulty execution and misguided reporting. The general position taken by most critics is that the Committee's focus was too narrow and its budget was too short to accomplish anything meaningful -- and the results seem to bear that out.

Until recently, *SCAN Newsletter* was the only publication that voiced any criticism of the study (*SCAN* Nov 87, Oct 87 and numerous other issues going back to Dec 85). It's been a little like hollering down a well -- the only response we heard was our echo. But now, in an important study commissioned by *Identification Journal*, which appeared in their January/February 1988 edition, the issue has been joined.

Written by Leon Cox, Associate Professor of Industrial Engineering at New Mexico State University, the article, titled "Review of the AIM Technical Symbology Test," opens with this statement: "There are a number of discrepancies and ambiguities in the AIM bar code system performance test. In particular, these faults are related to the basic design of the experiment and the way the resulting data was used."

In Cox's detailed analysis, he lists five questions which must be proposed and answered before testing begins on such a study. He then proceeds to carefully dissect the AIM study methodology and results as they relate to each of these questions -- and he finds glaring deficiencies in every instance:

1. *What are the objectives of the test?*
"The AIM test does not precisely state the objective and in fact confuses any possibility of determining the true objective."
2. *What factors influence analyzed characteristics?*
"The AIM test authors appear to have requested help to sort these effects [of factors that could influence the probability of any error] only after the testing was done."
3. *How will randomness be assured?*
"The AIM tests make no claim to random samples from a population."
4. *How many times should the experiment be performed?*
"There is no discussion of experimental error although it is basic to determine whether observed differences in the data are statistically significant."
5. *How will results be interpreted?*
"The design's inability to account for the interdependence of the various factors mentioned previously suggests that the experiment be conducted to minimize or eliminate the effects that can result."

After pointing out a number of other specific problems with the study, Cox concludes: "Common experimental design and implementation factors are not adequately answered by the AIM symbology test. It is hoped that the review will reveal the necessity to have a proper design in order to obtain a level of credible data on symbology performance upon which equally credible conclusions can be drawn."

The AIM Symbology Test was run at the State University of New York (SUNY) at Stony Brook, and was supervised by Sheldon Chang, Professor of Electrical Engineering. Chang replied to the Cox article in a letter to *Identification Journal*, published in the March/April 1988 issue.

In his letter, Chang defended his methodology, point by point, concluding: "The AIM test was designed to give a snapshot to the performance of a rapidly growing industry at a crucial time [and] no statistical test is perfect." To which Cox replied: "It is important to test the reliability of automatic identification equipment but to do so properly depends on a standard test procedure that meets rigors demanded by the scientific method."

Identification Journal Editor Tim Bitler, who was on the AIM test program staff, wrote in his magazine: "The AIM symbology test is the most controversial subject within the automatic identification industry." SCAN Newsletter enthusiastically endorses that statement and we commend Bitler's publication of the Cox review.

We have been drawn....

....into covering the current patent suit brought by Symbol Technologies against Opticon because of the importance of the litigation, and because of Opticon's vehement public defense of its position. Our most recent report (SCAN April 88) included very pointed remarks by Jackson Lum (VP Opticon) about the way in which he believes Symbol Tech has conducted itself with regard to the patent.

As expected, our report did not go unnoticed by the management at Symbol Technologies -- Chairman/CEO Jerry Swartz and President Ray Martino have now replied with a spirited amplification of their position. Although it is not *SCAN Newsletter's* policy to "try" legal cases on these pages, we feel compelled to print a few of the highlights of Symbol's response:

1. Swartz and Martino emphatically deny Lum's allegation that "Symbol Technologies intentionally withheld evidence from the patent examiner." They point out that Symbol initiated a voluntary re-examination of the patent in 1983. At the time of that re-examination, they note, all new and prior art documents were submitted by Metrologic and Spectra Physics. According to Symbol Tech: "The patent office reviewed the new references and decided that they did not raise any substantial new question of patentability." Swartz and Martino further maintain that: "Opticon has taken extensive oral depositions from Symbol executives, inventors and...patent counsel [and] has been granted access to thousands of pages of internal Symbol documentation."
2. Swartz and Martino take issue with Lum's statement that "Spectra Physics settled this case without even going through any discovery procedure." The Symbol executives point out that Spectra Physics did, in fact, engage in extensive discovery procedures. (Lum has since withdrawn this allegation based upon his "further investigation.")
3. There is still a very strong difference of opinion on the most critical aspect of the litigation: i.e. whether Lum actually has "definite evidence of public prior art that would invalidate the patent." Symbol Technologies maintains that, "During the 16 months that this action has been pending,

Mr. Lum hasn't presented to the patent office any such evidence." Meanwhile, Lum continues to privately disclose documents that he maintains will destroy Symbol's suit against him and invalidate their patents.

COMMENT

Based on these public pronouncements from the two companies, it would be foolhardy for any layman to attempt to judge the merits of the case, or to predict its outcome. It will have to be left to the Courts to render a final decision in this very arcane and complex area of patent law.

[In an unrelated action, Symbol has just announced that it has been awarded its eleventh US patent. This one covers the design of an optical scanner module which enables the laser to be quickly interchanged by the user.]

One way to measure the expansion....

....of front-end scanning in US supermarkets is to estimate the percentage of total retail sales actually scanned at the check-out counter. This has always been a seat-of-the-pants measurement based on a few random statistics. In early 1987, industry pundits estimated the figure had passed the 50% mark -- which was considered an important benchmark.

We undertook an independent analysis of these numbers based on the excellent annual Report of Operations published each year by the *Progressive Grocer Magazine*. Our results are as follows:

US SUPERMARKETS BY TOTAL ANNUAL SALES

| | \$2-4 Million | \$4-8 Million | \$8-12 Million | Over \$12 Million | Total |
|-----------------------------|------------------|------------------|-------------------|----------------------|-----------|
| Total number of stores | 8,920 | 11,210 | 5,310 | 4,960 | 30,400 |
| Number of stores scanning | 2,976 | 5,537 | 4,163 | 4,622 | 16,998 |
| * Total Sales Volume | \$26,400 | \$64,900 | \$52,600 | \$84,600 | \$228,500 |
| * Volume Scanned (Amount) | \$ 7,917 | \$32,059 | \$41,258 | \$78,833 | \$160,067 |
| Volume Scanned (%/Total \$) | 30.0% | 49.4% | 78.4% | 93.2% | 70.1% |

(* = \$ millions)

These figures indicate that 70.1% of all merchandise sold in US supermarkets, as of the end of 1987, was scanned at checkout. Supermarkets are defined as food stores (chains and independents) with more than \$2 million in annual sales.

The remaining market for scanning systems for food retailers lies with the smaller supermarkets, with the other food stores (there are 50,000 convenience stores and 69,600 so-called Mom-and-Pop stores, each with annual sales of under \$2 million) and in replacement systems. The current hottest product groups in POS scanning systems are PC-based and are well-suited for these markets. The potential remains strong for POS automated checkouts as retailers are learning to derive more and more benefits from scanning. The fact that almost three-quarters of all supermarket sales are scanned is testimony to the rapid penetration into this retail area.

A tendency has developed

. . . .during the last five years to stick with a handful of bar code symbologies, thereby avoiding the risk of "symbol proliferation." The industry locked into UPC/EAN on almost all retail applications; Codabar was retained for its established applications in blood banking and libraries; Interleaved 2/5 was chosen for all-numeric codes where space considerations were important; and Code 39 was the symbol of choice for just about everything else.

When Codes 93 and 128 were introduced a few years ago, they generated little interest, and almost no one picked up on the possible advantages of full alpha-numeric encoding that would take up less real estate. Code 93 came out of Intermec; Code 128 was developed by Computer Identics.

Now, there are signs that some applications may be better suited to the newer symbologies. The combination of long code numbers and limited space has encouraged the introduction of new bar code formats. For example, the Uniform Code Council is about to adopt Code 128 for the Serial Shipping Container Symbol (SCAN Feb 88); and the publishers of periodicals have also chosen Code 128 to represent their very long code number that identifies published material right down to the individual article and page. On the horizon is Code 49, which Intermec's Chief Scientist, David Allais, believes is the answer to the high-density requirements of unit-dose packaging in the health industry, and for the tiny space allowed on electronic components (SCAN Nov 87; April 88).

However, not everyone agrees that new symbols are the way to go. With the ultra-high density capabilities being introduced by printer and scanner manufacturers (down to 3 mil bars), some do not see the necessity for new symbologies. At those densities, the differences in space required become less significant.

The ultimate resolution of this problem may depend on the auto-discrimination capabilities of scanning equipment. Symbol proliferation was first denounced about 4 years ago as a system complication to be avoided (SCAN Oct 84, Nov 84). At that time, there was limited evidence and experience as to whether bar code readers could readily distinguish among symbologies and whether the requirement to do so might increase the misread rate (or reduce the first-read rate).

There are now strong indications that auto-discrimination has become a non-issue. Most bar code scanners on the market today readily and accurately discriminate among many symbologies (with no operator intervention). In addition, the introduction of unique coding systems (using data identifiers, for example) eliminates the concern over confusing one code with another.

We seem to be headed toward a bar code scanning environment in which the choice of a uniform symbology that conforms to other systems is no longer a critical decision. It makes the coding structure even more important, however, in order to be certain that decoded information cannot be misinterpreted.

[In reviewing the progress of higher and higher density bar code symbols, we were reminded of the early days of scanning (mid-1970's) when the proponents of OCR maintained, as one of their arguments in favor of using human-readable symbols, that it took more space to print the same information in bar code as it did in OCR-A. Not any more!]

Some corporate miscellany....

....covering financial and other significant reports from the industry:

- Symbol Technologies' 9-months' (3/31/88) earnings almost quadrupled on sales that were up 114% over last year. Profits were \$14.8 million (\$1.56 per share) with \$64.5 million in revenues. For the third quarter, sales were \$22.3 million (\$12.1 million last year) and earnings \$5.2 million (\$1.3 million last year). The company expects fourth quarter results to continue strong. Shareholders of record on May 16, 1988 will receive a 100% stock dividend (2-for-1 stock split). The stock of the company (NYSE) moved up sharply late in April, and at one point, was over \$50 a share. On May 3, it was announced that New York financier Saul Steinberg and his Reliance Financial Services Corp. had filed a disclosure with the Securities & Exchange Commission that they had sold 109,000 shares of Symbol's stock between April 27 and May 2, and may sell another 136,000 in the future. This would leave Steinberg with over 1,350,000 shares -- by far the company's largest stockholder with 15.1%. Most observers attached no particular significance to the move other than that Reliance may have chosen to realize some profits from their investment (they had purchased their shares, starting in early 1985, at prices ranging from \$7.50 to \$14). President/CEO Jerry Swartz hastened to comment that Steinberg has told him that he retains confidence in Symbol's future growth and that he will "remain a substantial investor [and] a valued member of the Board."
- The fourth quarter 1987 (12/31) results for Computer Identic's (Canton, MA) showed sales of \$3.3 million with operating profits (from continuing operations) of \$176,000. Comparable figures for 1986 were \$2.4 million sales and a loss of \$354,000. For the 12-month period, the company reported \$14.3 million in sales -- up 58% over 1986 -- and an operating loss of about \$2 million. (In addition, in 1987, C/I wrote off \$1.3 million in "restructuring charges.") According to President/CEO Frank Wezniak: "The company has begun the year with a well-positioned product line and a greatly improved balance sheet as we look forward to a successful 1988."
- For the first half of its fiscal year (ended 12/31/87), Imtec, the Bellows Falls, VT manufacturer of integrated printer/laminator/cutter/applicators reported flat sales (\$1.5 million vs. \$1.7 million last year) and a loss of \$97,000 (against last year's 6-month profit of \$187,000). President Jim Williams attributes these results to the disappointing rate of shipments released against the Government subcontract that was awarded to the company in January, 1987.
- Control Module (Enfield, CT) announced the receipt of a \$1 million Government subcontract to supply up to 900 bar code decoders and laser scanners to the US Defense Logistics Agency over the next 12 months (Federal Computer Corp. is the prime contractor).
- Shelf label manufacturer Graphic Technology Inc. (Olathe, KS) has achieved comparative earnings and sales gains for the ninth consecutive quarter. Net earnings for the third quarter (ended 3/31/88) were \$524,000 (\$.19 per share) an increase of 31% over last year; for the

same period sales increased 21% to \$6.3 million.

- Intermec has appointed Michael Ohanian as VP of the newly formed Federal Systems Group, with responsibility for the company's entry into prime government contract bidding. In its first attempt last year, Intermec bid directly for DOD business on the \$100 million Army Non-Tactical (N-T) contract (SCAN April 88). The company is now committed to pursuing additional Government business, on both a prime and subcontract basis. Ohanian, who has been a consultant to Intermec since January, 1987, was previously with Parks-Jaggers Aerospace Company, Martin Marietta, Litton Resources Systems, and Raytheon Missile Systems.

Much of the success....

....of the Automatic Identification Manufacturers (AIM)/Europe has been due to the leadership of Paul Berge (Symbol Technologies, Int'l) who has been the group's Chairman since it was founded in January, 1985. At the organization's annual meeting in Brussels on April 15, 1988, Berge stepped down as Chairman and was succeeded by Stefan Peters of Intermec Strichcode AG, Switzerland.

AIM/Europe has come a long way under Berge's guidance, growing to 66 corporate and organization members. During this same time, a number of European AIM national affiliates were formed: AIM/UK (55 members); AIM/France (20 members); and the two newly chartered groups, AIM/Spain (25 members) and AIM/Denmark (13 members). Germany has never opted for its own national organization; its 20 member companies are direct members in AIM/Europe.

If all of the above seems a bit confusing, it is! The time has come for a full re-examination of the AIM International Group. At the AIM/Europe annual meeting, a working party was appointed to look at these issues and propose a new structure. This working party, which is part of the Membership and Constitution Committee, will be headed by Paul Berge (who has remained on the AIM/Europe Council). A proposal for a unified European structure is to be presented to the full membership at a special meeting later this year -- probably in October, to coincide with SCAN-TECH Europe. These proposals would then be formally put to the next AIM International meeting to be held in November.

Another example of the need for a "master plan" is the continued proliferation of local and regional trade shows. SCAN-Italia was held in Milan in March; SCAN-Hungary, the first in the Eastern Bloc, took place in Budapest in April; SCAN-Moscow (believe it or not) will take place in September; SCAN-UK and SCAN-TECH/France are both scheduled for June; SCAN-TECH Europe will be in Dusseldorf in November; and we're sure that we have not exhausted the list.

Paul Berge, who shepherded AIM/Europe through its very important early years, deserves a solid vote of appreciation from the industry. His new undertaking, to develop a plan for future development, is no less important, and we wish him every success.

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