The long-awaited preliminary report....

....on symbol reliability from AIM's <u>Technical Symbology Committee</u> (TSC) has met with mixed responses. When copies of the <u>Bar Code Performance Test</u> were given to the members of AIM (SCAN June 87), there was a tacit agreement among the panel members that the <u>actual figures</u> were not to be released to the press. Although we have obtained a copy of the report (marked "confidential"), we will respect that embargo.

Despite the TSC publishing restrictions, however, we feel it is appropriate to report some of the comments we have heard from AIM members regarding the results and methodology of the tests.

[Some background: The TSC-designed project was conducted at Stony Brook University from September, 1986 through April, 1987. Seven symbologies were tested in varying densities: Code 39, Interleaved 2 of 5, UPC A, UPC E, Codabar, Code 123, and Code 93. The objective was "to establish baseline scan performance and accuracy levels that can be achieved with commonly used bar code symbologies, technologies, and equipment." According to Ken Konechy (Printronix), the newly elected chairman of the TSC: "This test duplicated the real world of symbol procurement, inspection, and data entry. Consequently, the results will give us a good idea of how well these symbologies can be expected to perform in the workplace." Wands and hand-held laser scanners were used by "trained" college students who made over 2 million scans of bar codes which were recorded by many different printing methods.]

The following is a distillation of some of the comments that have been passed along to us:

- The preliminary presentation is so qualified by statistical references -- such as Poisson Distributions, confidence intervals, significant differences, probability factors -- that it is virtually impossible to reach usable conclusions.

- The lack of valid test controls makes the data suspect.

- Some of the reported figures run counter to previous tests and widely accepted parameters, which tends to place all of the results in doubt.

- Subjective criteria -- including readers that didn't perform properly or symbols that were scratched -- were used to eliminate some questionable errors. To some people, these omissions didn't sound like the "real world" that was supposed to be emulated.

- By cautioning that there is a "limit" to the conclusions that can be drawn, the report has prompted suggestions that these limited conclusions may be easily misinterpreted and misused.

It is certainly too soon to form any final opinions about the TSC study. The preliminary report does suggest, however, that the meager -- and sometimes confusing -- material will have to be fleshed out and presented in a more cogent manner to be useful to the industry.

The committee expects the final report to be ready for SCAN TECH 88 in October in Kansas City.

Interest has been piqued....

....across the country by four patents that have just surfaced which relate to bar code scanning. These patents were issued to Jerome Lemelson between 1970 and 1975, with the earliest filing date of July 10, 1959. Exclusive licensing rights were assigned to Refac Technology Development Corp. a few months ago.

In mid-July, Refac sent out letters to a number of companies in the bar code scanning industry, which began: "It has come to our attention that products you sell for bar code scanning systems infringe the claims of one or more of the above referenced U.S. patents." The letter continued by inviting each recipient to "consider the need for a license under our patent rights," and added, "We would like a reasonable royalty for the use of our patented technology."

The four patent titles and their coverages are: (1) "Light Projecting and Sensing Device and Target Practice Apparatus," which covers apparatus for bouncing light off of a reflective surface and detecting the reflected light in order to generate a signal, such as in a bar code scanner; (2) "Coding and Routing Apparatus and Method," which covers the use of a code such as a bar code in conjunction with a type of warehousing and distribution system; (3) "Code Scanning Apparatus" and (4) "Scanning System and Method," both of which cover the reading of bar code legends.

We called Philip Sperber, VP of Refac, to learn more about Lemelson, his patents, and the basis for these notices to this industry:

- Sperber told us that Lemelson is the third most prolific American inventor of all time (after Thomas Edison and Edwin Land of Polaroid). Lemelson operates out of his Licensing Management Corp. in New York.

- We asked Sperber why it took so many years (after these patents were issued) to pursue the so-called "infringers." He explained that "Lemelson has 600-700 patents and he isn't up to date on the particular market for each one." Sperber added: "He didn't realize until now that bar coding companies were violating his patents."

- Some of the bar code company executives we questioned about these patents thought that bar coding pre-dated 1959, the year of the earliest application filed by Lemelson. We therefore asked Sperber, "What about 'prior art'?" He replied: "Our claims cover particular apparatus and methods for bar code scanning. Our claims do not cover the idea of bar code scanning itself. If the 'prior art' can show that our claimed apparatus and methods were in the public domain prior to our filing dates, that's a different story and would invalidate our patent."

- And finally, we wanted to know the typical royalties that Refac negotiated under licensing agreements of this kind. We were told that the amount ranged from 3% to 8%, depending on the type of product and market.

There was one other interesting aspect to this matter. In Sperber's notification letter to the industry, he specifically mentioned: "Businesses using exclusively IBM and Hewlett Packard equipment should notice that those suppliers already have agreements covering the above identified patents and may therefore already be covered by a license." Sperber would not reveal the nature or terms of the agreements with these two companies, which had been negotiated directly with Lemelson. So far, we have not been able to obtain any response from either IBM or H-P on this matter.

Refac Technology Development Corp., 122 E. 42 St, NY, NY, 10168; 212/687-4741.

The panic over possible terrorism....

....aimed at the airlines has increased interest in the upcoming meetings arranged by the International Air Transport Association (IATA) to address the problem of airport security (SCAN July 87). Passenger/Baggage Reconciliation Seminars are scheduled to be held in Rome, Miami, and Singapore during August and September. In response to terrorism in the air, a newly-issued security standard will take effect on December 19, 1987. The objective "is to prevent or deter the carriage of any explosive or incendiary device in checked baggage."

IATA is seeking solutions from the latest developments in automatic ID technology and has issued a more specific list of requirements that they hope vendors will be able to address at these meetings. These include:

- Sequentially numbered, bar coded baggage tags -- both pre-printed and printed on demand.

- Self-adhesive bar code label printers.

- All types of portable and fixed scanners capable of reading bar coded baggage tags and/or magnetic stripe boarding passes.

- Stand-alone passenger/baggage reconciliation systems (both manual and automated).

IATA has prepared a Specification Summary covering the size, color, and configuration of the baggage tags. A 10-digit, medium density, interleaved 2/5 bar code symbology has been proposed. Any companies with equipment or systems available to meet these requirements are encouraged to attend one or

more of the seminars. Those firms which have something to contribute, but cannot attend, should send for the Final Report of the Joint IATA/ATA Baggage Security Working Group, which will provide important background information. IATA, 2000 Peel Street, Montreal, Quebec, CANADA, H3A 2R4; 514/844-6311.

Scanning in the home may be imminent....

....with the integration of bar coding and <u>videocassette</u> <u>recorders</u> (VCR's). The first units appeared in the US earlier this year (SCAN March 87), when <u>Panasonic</u> introduced their special VCR with a scanning wand for program entry. At that time, the company was negotiating with TV Guide to place the bar codes next to each program listing.

When <u>Canon</u> introduced a comparable model to the US market last month, we decided to follow up on this story. According to Rich Meyer, Canon's National Technical Representative for Video: "The main purpose of this 'program reservation system' is to make the programming of VCR's easier." His new digital VCR comes with a remote control, bar code scanning wand and a pre-printed, bar-coded menu listing the channels, dates, times-on, and times-off. The VCR can now be programmed by scanning the menu with the hand-held light pen and then pointing the pen toward the VCR (at a range of up to 50 feet). At the push of a button, the information is zapped into the VCR.

Canon has also been in touch with TV Guide. Meyer said he didn't have authorization to release any specific information about these discussions, but he did explain that "there probably won't be bar codes printed in TV Guide for a while because they publish too many overlapping metro editions."

Daily newspapers are not expected to include bar codes in their listings either, since they currently have no incentive to incur the extra printing and editing expense. Several US cable guides, however, <u>are</u> interested in this system, especially for coding the listings for special events and late-night movies. According to Meyer, a small group of cable guide publications are expected to start test marketing "before the end of the year" -- one test on the West Coast and two tests on the East Coast.

The system has moved ahead much faster in Japan. Canon and Panasonic have been selling these special VCR's there for six months and several publications are already carrying the coded listings. (It should be noted that Japan can implement these listings much more easily because programming is mostly nationwide with few individual broadcast areas.) The Japanese TV listings include printed bar code symbols for selected programs -- such as movies, major sports events, and special events -- in their TV guides, newspapers, and the TV Book (their version of a comprehensive Cable Guide).

According to Meyer, Canon is currently selling "as many of these digital units as we can get our hands on, mainly because of the new digital effects." By 1990, he "conservatively" expects that "30-40% of all Canon VCR's will have bar code scanners attached." Other VCR manufacturers in Japan -- particularly JVC, Sharp, and Hitachi -- are currently looking into producing similar units. European countries, with their more homogeneous national broadcasting schedules, are considered to be even more viable markets than the US.

This application has the greatest potential that we know of for placing bar code scanners directly into the hands of the general public.

In an extraordinary year....

....(even for <u>Symbol</u> <u>Technologies</u>), the leading producer of hand-held laser scanners reported that sales for Fiscal Year 1987 almost doubled, and earnings more than tripled, compared to last year.

<u>Symbol Technologies</u>	<u>3 Months ended 6/30</u>		<u>12 Months ended 6/30</u>	
	<u>1987</u>	<u>1986</u>	<u>1987</u>	<u>1986</u>
Revenues ($000)	$15,296	$7,312	$45,443	$23,177
Net Income ($000)	2,570	557	5,671	1,286
Net Income/Share	.31	.10	.80	.23

(Note: All income figures are before extraordinary credits, which are tax benefits derived from operating loss carryforwards. During this past year, the company fully utilized all accumulated carryforwards, which can no longer be used to offset future tax obligations.)

As for next year, management "considers it feasible" that Symbol will meet the forecasts of the financial analysts who follow the company. These analysts project sales of $70-75 million and share earnings of $1.25-1.55 for FY 1988.

President Ray Martino feels that the three major segments of his business are all doing well and retain promise: <u>Retail</u> applications are still the driving force behind the major sales increases; <u>Military</u> contracts constitute great "over the transom" business, since all of the bidders have been specifying S/T equipment; <u>General</u> <u>Business</u>, including factory automation and other commercial/industrial installations, are growing at an increasing rate.

Within the last 30 days, the price of the company's stock has mirrored these positive reports with an increase of as much as 25%; as of August 5, the stock closed at 35 1/2.

Coming in right on target....

....with its first quarter results for fiscal year 1988, <u>Telxon</u> is matching the forecast of President Ray Meyo for continued growth this year (SCAN July 87). Sales and net income were up 22% and 28% respectively over last year's first three months.

Telxon	<u>3 Months ended 6/30</u>	
	<u>1987</u>	<u>1986</u>
Revenues ($000)	$23,255	$19,466
Net Income ($000)	3,363	2,635
Net Income/Share	.25	.20

A significant new product area for the Ohio-based manufacturer of portable tele-transaction computers involves radio frequency technology for on-line, real-time communications. The company's model PTC-750 features this type of built-in RF communication and a 16-line by 20-character display. During the first quarter, Telxon was awarded a contract by Avis Rent-A-Car to supply major airport locations with these PTC-750 devices to handle quick check in

auto rentals. According to Meyo: "We see this as a favorable trend in these markets as more business applications are requiring on-line interaction with host systems."

One last item: Telxon raised additional cash during its first quarter by selling $46 million in convertible subordinated debentures. The purpose for raising this new capital, according to Meyo, was to "enable the company to seek acquisitions as an option for strategic business expansion." Telxon has formed an internal task force to evaluate possible acquisitions, although we understand that no specific candidates have been identified as yet.

At the company's annual meeting....

....in Seattle on July 20, David Allais, Intermec's Chairman and CEO, told shareholders: "First quarter results were consistent with our plans and expectations. [Sales were up 23% and earnings rose 36% compared to last year.] We foresee a rapid growth in sales during the second half of our fiscal year that will enable us to meet our goal of increasing both sales and earnings by more than 25% in fiscal 1988."

Intermec	3 Months ended 6/30	
	1987	1986
Revenues ($000)	$17,814	$14,427
Net Income ($000)	895	657
Net Income/Share	.15	.11

There are four additional items to note about the company:

- During the first quarter of FY 88, Intermec acquired its New York City area distributor. (The sales and earnings shown above for the first quarters of both years were restated to reflect this acquisition.) The purchase continues Intermec's program to integrate all of its key US distributors into the company (SCAN Feb 87).

- Intermec is training 26 new salespeople as bar code data specialists -- a 30% increase in its direct sales force. The company anticipates that this program "may hold down second quarter earnings somewhat."

- While continuing to emphasize its Trakker portable reader/computer as its major new product (SCAN May 87), Intermec has also introduced two new printers. The model 8646 thermal transfer printer ($5,695) creates bar code labels unaffected by extended exposure to sunlight or high temperatures. The 8638 Direct Thermal Printer, to be introduced this summer, will be billed as "the world's fastest bar code label printer."

- In an interesting application, Intermec has worked in conjunction with the Australian Expo Authority to develop a new bar code system to monitor, control, and record entry by season pass holders and employees at Expo '88, the world's fair to be held in Brisbane next year. The new system is seen to have numerous applications at sporting events, trade shows, conventions, and cultural/entertainment gatherings of all kinds.

Intermec, 4405 Russell Road, Lynnwood, WA, 98046-9702; 206/348-2600.

The complexity of issues....

....relating to the measurement of bar/space widths and color contrast has led to a restructuring of the ANSI <u>Committee</u> <u>on</u> <u>Bar</u> <u>Code</u> <u>Print</u> <u>Quality</u>. We previously noted (SCAN Oct 86) the importance of that Committee's work and the reasons why time was of the essence. Specifically, we recommended that smaller groups should be assigned to meet more often to resolve the open questions.

At a meeting in November, 1986, the ANSI Committee appointed a select Work Group, consisting of key members from the Committee. Several members of AIM's Technical Symbology Committee were also invited to participate. This lean and talented combined group of 10 individuals -- as contrasted with the 30+ members of the full ANSI Committee -- has been hard at work since then.

Each member of the Work Group has been contributing extensive time and the resources of his company to perform specific tasks relating to the standards. According to Allan Gilligan (Bell Labs), who is the leader of the Work Group, "the participating companies have dedicated significant effort to do test plots and measurements, multiple scan programs, and statistical evaluations. The quantitative experiments are related to the development of the new factors that are critical to the print quality specification."

Gilligan is very pleased with the cooperation of the group members. He is anticipating a Master Plan ready for release to the entire Committee in the fall.

There were two regional....

....automatic identification (AI) conferences and exhibitions held in Europe in June. In the UK, after last year's disappointing attendance (SCAN June 86), <u>AIM</u>-<u>UK</u> attempted to revamp and improve its show this year. In particular, there was earlier and more widespread promotion of the event, which was renamed <u>SCAN</u>-<u>TECH</u> <u>UK</u> <u>'87</u> and moved from London to Birmingham. In addition, an important "Basics" session was scheduled on three mornings parallel to the more advanced sessions.

The changes may have worked, because the attendance figures rose considerably: 352 delegates signed up for the Conference sessions (compared to only 80 last year) and 1,352 people visited the Exhibition only (compared to 680 in 1986). As an addition to the AIM-UK sessions, the Article Numbering Association (ANA) -- the UK EAN affiliate -- was invited to conduct a half-day Seminar on retail scanning. Andrew Osborne, Secretary General of the ANA, commented that the 100 delegates comprised the largest turnout ever at an ANA Seminar.

At the Basics sessions, which were essentially primers on AI, audience members were provided with response terminals for instant polling as speakers posed questions during their presentations. The audience was given 10 seconds to vote. Their answers were instantly displayed on a large video screen and retained within the computer system for further analysis by AIM-UK. Some of the more interesting questions and answers:

- When asked for the expected timetable for when systems could be installed in their companies, delegates responded: 30% within 6 months, 45% in 6-12 months, 25% over 1 year.

- When asked about their first choice in auto ID technology, bar coding was selected by well over 90% of the delegates on each of the days.

- When asked to choose a secondary technology, the top three answers were OCR (41%), vision (17%), and RF (16%).

The other regional show took place on June 3-4 in Paris, where AIM-France held its second National Conference on Automatic Identification, covering all AI technologies. This year, AIM-France retained professional organizers to manage the show. Their most significant improvement was to replace last year's small table-top displays with 40 display booths. In addition to the 283 seminar delegates, the 1987 vendor displays attracted 500 Show-only visitors. Commenting on the fact that only 15% of this year's delegates attended last year, Michel Grolee, President of AIM-France, concluded that the large proportion of first-time delegates indicates an expanding market.

Most of the exhibitors were French companies, with some representation from Italy, Switzerland, and the US. All of the technologies were covered, but bar coding predominated -- with an emphasis on industrial systems, rather than on retail. (This de-emphasis on retail scanning is fairly significant given AIM-France's previous close links to Gencod, the French EAN affiliate.) Next year's show will span three days; hopefully it will attract an even greater number of visitors.

A company which is better known....

....as a UK leader in the lapheld computer market, appears to have found an attractive niche market for scanning systems. Husky Computers Ltd. established its reputation by developing the hand-held "Husky Hunter" computer six years ago for rugged, industrial applications. Some of the company's memorable, original publicity material showed the Husky Hunter still usable after being driven over by the wheels of heavy trucks. For some time, Husky computers have been used for factory flow information systems and by mail order companies utilizing bar code data capture.

A more recent application package used for passenger transport surveys, and known as Databus, has been developed in association with Colin Buchanan and Partners of London. In a typical operation, a survey staff equipped with Husky Hunter units, boards a bus or train and asks passengers a series of standard questions about their journeys. All possible answers to these questions are pre-printed in bar code format on a card carried by the interviewers who enter the information into the Hunter using a bar code scanner.

The first installation of these computers was contracted for the Surrey County Council. The most recent installation, for 45 units, is to be used by the West Midland's Passenger Transport Executive. A pilot scheme is also being tested by British Rail. Although the market is not enormous, Husky Computers and its associates have treated this Databus system as a specific application and are marketing the package accordingly.

Husky Computers Ltd., Box 135, Coventry CV6 5RW, United Kingdom; telephone (0203) 668181. In the US: Husky Computers Inc., 1500 North Washington Boulevard, Sarasota, FL 33577; 813/366-8770.