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The information is still sketchy....

....but we recently turned up evidence that Jerome Lemelson and his alleged basic patents on bar code scanning technology have surfaced once again -- big time!

Some background: In mid-1987, we first learned of four patents that were issued to Lemelson between 1970 and 1975. They were: (1) "Light Projecting and Sensing Device and Target Practice Apparatus," which covers a method 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 symbol 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.

Exclusive licensing rights to those patents were assigned in 1987 to New York-based Refac Technology Development, which had a reputation for successfully enforcing patents by aggressively threatening to sue alleged offenders. Typically, they then offered to settle for modest royalty payments so that companies could avoid negative publicity and expensive legal fees. The *New York Times* reported on January 14, 1990: "Critics angrily charge that the company makes millions of dollars through 'patent blackmail' and the cheeky manipulation of weaknesses in the legal system." The article noted that in the past, Refac had filed patent infringement suits against 2,000 companies and had never won a single case in court.

These same tactics had limited success among bar code scanning manufacturers. In May 1987 Refac sued 16 manufacturers, distributors and users of bar code scanners, but only a few -- notably Welch-Allyn -- agreed to be licensed under these Lemelson patents. We closely tracked these developments at that time (SCAN Aug 87; Oct 87; Oct 89; June 89; April 90; July 90) -- including an unusual and unsuccessful effort by AIM/US to sponsor a coordinated legal defense by some of its members. Eventually the controversy died down.

This time around there are indications that Lemelson's lawyers -- Refac is no longer in the picture -- are using different tactics. They have chosen to directly attack the very large users of bar code scanning. SCAN has learned that their initial targets are the big three US automobile manufacturers. The



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presumed theory is that these major customers can be readily convinced that the easiest way to get rid of this annoying legal problem is to pressure the scanning equipment manufacturers to just take the license and pay the relatively small royalty. Once again, the leverage seems to be the threat of litigation rather than the merits of the patents.

We expect to hear more about this situation in the next few months and will be reporting as developments warrant.

Agreement was virtually unanimous....

...among the exhibitors we questioned, that the twelfth annual SCAN-TECH event was a significant success.

Compared to last year, seminar attendance (1,663) was up 71%; show-only attendance (7,560) increased 28%; and the 3,585 vendor personnel, manning 259 booths, also represented a SCAN-TECH record.

The enthusiasm of the exhibitors was based on more than just the larger numbers. "It was a high quality audience of people with specific projects," explained Bob Scaringe of LXE. Nick Toms of Peak Technology noted: "At the last couple of shows -- ID Expo in the spring and SCAN-TECH in southern California last fall -- our salesmen reported lots of people interested, but almost no one had any firm spending plans. This year we saw some help gleaming through the clouds in the economy in the form of people who came to the show with money to spend during the next 12 months."

This optimism has led to a rush for space for SCAN-TECH 1994 at Chicago's McCormick Place on November 1-3, 1994. According to Reed Exhibition Company, the new producer of the event: "Ninety-one percent of the available exhibit space for 1994 has already been reserved by more than 175 companies, including the return of Symbol Technologies and Intermec. Reserved exhibit space already exceeds the total '93 exhibit area by 10%."

Although the original plans called for AIM/US to manage SCAN-TECH 93, Reed decided to step into active management of the Philadelphia show almost immediately after finalizing the acquisition from AIM/US and only eight weeks before the scheduled opening (SCAN Aug 93). Even the AIM people we spoke with were impressed with the intense level of activity brought to bear by the Reed telemarketing staff to attract more visitors.

As for the day-to-day management of the show, some glitches were evident that could have been avoided. "It took an hour to get my badge on the very first day," griped one exhibitor, "what with the pre-registered salesmen and models and new registrants and badge pick-up all on the same line." And visitors didn't fare much better. That group's registration line snaked all the way out the front door of the exhibit hall on more than one occasion during the first two days. And to prove that you can't please everyone, another exhibitor was very unhappy with the management of the seminar he conducted. "I kept running into problems," he said, "and when I asked for help, the typical response was: 'It's not my fault -- the audio-visual was contracted out.' They just didn't have the personal touch that AIM had."

Our own feeling was that Reed made a gutsy and wise decision to take over this year's SCAN-TECH on such short notice. They could have allowed AIM/US to handle this one and then geared themselves up for 1994. But SCAN-TECH has had image and management problems these past two years and it needed the shot-in-the-arm that a large, well-oiled, professional organization such as Reed could provide. And it worked.

As is our usual practice....

...we will try to provide some insight into developments that were not readily visible to those just visiting the exhibitor booths and attending the seminars.

RF/DC

In terms of new products and increased activity, radio frequency data communications (RF/DC) was the star of the show. In addition to the RF "specialists," such as LXE and Teklogix, every major manufacturer of portable data terminals is now featuring -- or will soon introduce -- new models with RF/DC capability. With some versions, the RF is built into the basic unit; with others, it is available as an add-on module. Although narrow-band is still generally available from the RF companies, almost all applications for the portables use spread spectrum.

Spread spectrum RF/DC is growing rapidly in the US, but has not penetrated the European or Far Eastern markets -- where it has not yet been approved for use (i.e., frequency allocations have not yet been made). Spread spectrum in the US -- where no license is required from the FCC or any other agency -- now operates in the 902-928 megahertz (MHz) band. Based on standards currently being developed for the European Community -- with participation by US vendors -- it is expected that spread spectrum RF/DC will move to the 2.4 gigahertz (GHz) range in the near future.

Since the 2.4 GHz range has already been approved by the FCC in the US, the expected result will be as follows: RF/DC spread spectrum in the US will be in both the 902-928 MHz and the 2.4 GHz ranges. Customers will make their choice based on the attributes of each and their specific needs. In Europe, only 2.4 GHz is expected to gain approval. Japan will definitely go with 2.4 GHz -- but may also include 902-928 MHz, which is currently under study. This will not affect any systems already operating since they will be "grandfathered" into any future changes.

POWER MANAGEMENT

Because of the growing importance of portable terminals, along with the increased power requirements of these units -- larger displays, 32-bit processors, RF/DC capability and laser scanning -- a surprising amount of development effort is being devoted to creating more efficient battery management systems. The users have sent a loud and clear message that they do not want to have to change battery packs every few hours and wait for 8-hour recharge cycles.

Hand Held Products has confronted this challenge with their Micro-Wand 32 ES (for Extended Service), which incorporates proprietary new power management

techniques (patents applied for). The company claims uninterrupted usage of up to one week on Nicad rechargeable or one month on alkaline batteries.

In a similar approach, the new Norand RT/DT 1700 -- a rugged radio terminal intended for harsh industrial environments -- also features a "unique battery management technology."

Other companies, SCAN has learned, are preparing to introduce portable terminals which will also emphasize improved power management.

The consensus among these manufacturers of portable devices is that there have been almost no significant advances in basic battery design for twenty years or more. The development of unique methods for managing the available power in these batteries -- including longer usage and shorter recharging time -- was the only avenue available to increase the capabilities of their devices to make them acceptable to the end users. These are important breakthroughs, developed by automatic data capture companies, in what would seem to be a technology that is peripheral to their primary focus.

RF/ID

Indications are strong that the already very significant usage of radio frequency identification (RF/ID) -- which has been quietly percolating for years -- is about to explode upon the scene. Much of this new activity is attributable to the energy of two larger companies, who are relative newcomers to this technology. Texas Instruments and Hughes Identification (division of General Motors) have been able to apply more substantial engineering and marketing resources than were previously available from the smaller companies which were the forerunners of RF/ID. Here are just three examples that demonstrate the broad-based potential of RF/ID, particularly as the price of transponders comes down:

- An RF/ID transponder -- carrying a unique, unalterable code embedded in the head of an automobile ignition key -- must communicate with an RF-reader located in the steering column in order to start the car. According to Texas Instruments, this system is being installed (starting last month) in 500,000 of Ford's 1994 Escort and Fiesta models in Europe and may be introduced in the US in 1995. TI says that this "vehicle immobilizing" security system called "SafeGuard" -- which was designed by Ford's Electronics Division, "cannot be overridden or hotwired by even the most expert car thief."

[Although Hughes ID revealed last year (SCAN July 92), that it was developing this same automotive application, that company has not yet gotten its version of this project off the ground and has not even sold it to its parent, General Motors. GM is reportedly looking at competitive systems proposed by Delco and Siemens. Meanwhile, the hotwireders have yet to be heard from.]

Hughes ID is actively promoting another system that uses RF/ID sensors attached to large truck tires to determine load pressure. According to a Hughes spokesman, this type of installation could significantly reduce tire wear and gas consumption.

- One of the earliest applications of RF/ID involved implanting transponders in cattle for identification purposes. That usage has become such a tired cliché, when discussing RF/ID potential, that industry vendors generally recoil at its mention.

Steve Halliday, AIM's Technical Director, enthusiastically described a similar proposed system, only this one would be applied to household pets. Halliday reports that veterinarian groups and animal shelters are currently trying to establish standards -- to be certain that everyone would be reading a uniform algorithm of transponder signals. The next step would be to install a nationwide database. Tiny identification transponders (at a relatively low cost) would be installed by the veterinarians on dogs and cats. If lost, animals could readily be identified by the dog pounds or vets -- using simple RF readers -- and by accessing the database they would be quickly reunited with their owners. Sounds like a neat idea!

- For anyone who has waited for thirty minutes or more to pay a toll at New York's Lincoln Tunnel or Chicago's Tri-State Tollway, the RF readers that can charge the fee to a car speeding through at fifty miles per hour have got to have great mass appeal. Just such electronic tolls are now being tested on a California Highway in a program involving equipment from Texas Instruments (SCAN July 93).

As the transponders and readers are manufactured in larger quantities bringing unit prices down, we expect to report many new uses for RF/ID. Meanwhile, the more traditional applications -- such as security and access control, freight handling and distribution -- continue to increase.

ODDS AND ENDS

- Symbol Technologies chose not to exhibit at this year's SCAN-TECH, but that didn't mean they were ignoring the show. Some of their key marketing people were ensconced in nearby hotel suites, setting up meetings and exploring new initiatives. Management took advantage of the proximity of the venue to transport two busloads of personnel from Bohemia, NY to visit the exhibits for a day. Some competitors commented that Symbol may have made a mistake in bypassing this transition year -- in view of their show's record-breaking attendance and East Coast location. Be that as it may, the company has decided that it will be back in 1994 in Chicago with its largest booth ever.
- Although the introduction of two-dimensional symbologies is still a major topic, it lost its high visibility at SCAN-TECH since its major proponent -- Symbol Technologies with its PDF 417 -- was not exhibiting on the floor. But the foundation is being laid for future development of 2-D applications: AIM's Uniform Symbology Standards (USS) have already been issued for Codes 49 and 16K; the USS for Code 1 has been drafted and is out for review; the draft for PDF 417 is due in a few months; Datamatrix is expected to follow. Vericode, Codablock and Philips Dot Code are not being currently considered because they are proprietary and cannot be published as a USS until they have been placed in the public domain.
- As part of a US Army project, Ohio University's Center for Automatic

Identification -- under the direction of Professor Jim Fales -- conducted a test to evaluate the data integrity of two of the leading 2-D symbologies: Datamatrix (from ID Matrix) and PDF 417 (from Symbol Technologies). The statistical objective of the test was to determine if either symbology could be expected to exhibit one error or less in 2 million characters scanned and decoded.

More than 94 million characters were decoded during the test. An analysis of test results indicated no errors were attributable to either symbology (although 11 errors were recorded for Code 39, which was being used as a reference symbology). The test managers concluded that in "worst case" projections -- based on 95% confidence level -- both 2-D symbologies would experience only one error in over 10 million characters read. ("Best case" was one error in 613 million characters read.)

- DH Technology announced a unique package -- the Quick Start Kit -- to provide an inexpensive, integrated system for smaller companies that need an easy way to add printing capability to their PCs. The kit contains a printer (DHT's model DP2020 printer which runs at about 2 inches per second); the "Barney Express" bar code software (by Integrated Software Designs); "Bar Code 101" educational software (by Bar Code Systems and Solutions); plus additional educational material (by Quad II).

The participating sponsors envision that some companies will place these Quick Start Kits in multiple locations throughout a facility since they are so simple to operate and so inexpensive. The Quick Start Kit package sells for \$995; if priced separately, the total for all the components adds up to \$1,595.

* * * * *

All in all, the Philadelphia exposition represented a smooth, seamless transition of the SCAN-TECH ownership from AIM to Reed. We venture to guess that the overwhelming majority of the show visitors and seminar attendees were totally unaware that any change had taken place at all.

But, of course, to the automatic data collection professionals, this was a significant change. Next month we will complete our coverage of the show and further explore the plans of both the organizers and exhibitors of ID Expo and SCAN-TECH for 1994 and beyond. The burning question: Will the automatic data capture industry continue to support two horizontal shows each year?

In a quiet ceremony....

....in a small room at the Philadelphia Convention Center on October 19 during SCAN-TECH, the 21-month bitter struggle to achieve a unified, worldwide structure for an automatic data collection industry association came to a successful conclusion. At that meeting, the new AIM International -- "AIMI" -- was announced and the new officers and directors were introduced.

The ceremony consisted of the signing of documents by the officers of AIM/US and AIM/Europe. AIM/US formally transferred the "AIM" name and mark -- which it has

always owned and controlled -- to AIMI International. AIMI, in turn, designated AIM/Europe as a licensed AIM affiliate. These symbolic moves laid to rest the dispute that had raged between the US and Europe affiliates since January 1992 when the Americans attempted to withdraw the franchise from the Europeans (SCAN Feb 92; March 92).

Much of the credit for achieving this peaceful resolution belongs to Brian Wynne, the AIMI Executive Director appointed last May (SCAN April 93). Wynne undertook to set aside the personal animosity that had festered over the past year-and-a-half and to concentrate instead on the common objectives that everyone wanted to achieve; i.e., create a viable international organization that would, as the new AIMI by-laws state: "Foster, advance and promote the interests of the automatic identification industry."

At the end of the negotiations, however, Wynne knew just when to stand aside and allow the participants (all of the AIM affiliates worldwide) to recognize their common needs and for them to yield on some of their locked-in positions to achieve the greater objective.

The compromise solution, incorporated into the new by-laws, provides for both direct corporate membership (as originally proposed by AIM/US) and AIM affiliate participation. AIMI will be governed by a Board of Directors with both corporate and AIM affiliate representation; the Board will have built-in safeguards to ensure that no region of the world will have a dominant voting position (which had been a major sticking point for the AIM/Europe representatives).

The new charter Board of Directors includes four Americans (Mike Hone/PSC, Clive Hohberger/Zebra, Ivan Jeanblanc/Axiom, Tee Migliori/RJS); three Europeans (John Cribb/Telxon International UK, Matts Gunnarsen/UBI Sweden, Brian Marcel/Bar Code Systems UK); and three Asians (Ben Koikec/Nihon Denki Seiki Japan, Naoki Oku/Aucs International Japan, Dominic Tan/Monarch Marking Singapore). The first new President will be John Cribb, who has been a staunch supporter and very active member of AIM/UK, AIM/Europe and AIM/International.

Thus, the foundation has been laid for a multi-unit dwelling that will house the many disparate components of this organization. But the building is far from complete or furnished. Each of the AIM affiliates must now turn its full attention to strengthening its own organization:

- AIM/US has just gone through a major restructuring (including the shedding of SCAN-TECH) and the membership is awaiting a set of new objectives and programs to be presented at its upcoming meeting in Tucson on November 30-December 3.
- For the first time in many years, AIM Europe is not in debt. While it finds itself with some money in the bank (as a result of its sale of SCAN-TECH Europe), most of its subsidiary national affiliates are in disarray and struggling to survive.
- Down under, AIM/Australia and AIM/New Zealand are busy sorting things out to see whether they can combine forces to form a stronger regional group.

COMMENT

If the new AIMI organization can provide leadership, purpose and direction so that the national groups can have a set of common objectives and a blueprint of how to achieve them, then it will render a great service.

We realize that this challenge is not part of the AIMI charter, but the international organization and its worldwide affiliates must be able to create a synergistic relationship to feed off one another and grow from strength to strength. AIMI cannot survive unless the AIM affiliates prosper.

Following in the footsteps....

....of other founders/chief executives of auto ID companies, Jim Williams has decided to turn over the operating reigns of Imtec (Bellows Falls, VT) to a new CEO.

Founded in 1982, the company went public in 1984 with a modest offering of 225,000 shares, raising less than \$2 million. Imtec designs, manufactures and sells bar code printer accessories. These products include laminators, cutters and applicators, which it integrates with printers manufactured by others.

For the past four years, sales have been static, ranging from \$6.5 to \$7.5 million. Operating earnings have been modest -- except for fiscal year 1993 (6/30/93) when the company lost \$128,000. The stock is currently trading on NASDAQ at about \$3 per share.

"About a year-and-a-half ago," Williams told *SCAN* recently, "I came to the realization that my leadership had brought the company just so far and I was not succeeding in breaking out of that restricted level of sales and earnings." He concluded, therefore, that he might best devote his time and talents to marketing and product development while bringing in more professional management help.

Last month, Richard Kalich assumed the title and responsibility of President/CEO of Imtec. Kalich was previously VP and Division Manager of the Marking Products Division of Matthews International.

Williams will retain his position as Chairman and will be searching for new products, additional markets and expansion opportunities. "Down the road," Williams said, "we may hire a full-time Marketing Manager and then I will concentrate on research and development, acquisitions and public relations. I believe that shake-outs are inevitable in the auto ID business and that this is a good time to be looking at mergers and acquisitions."

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