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In a major coup....

....Intermec has been awarded the new US Department of Defense Automatic Identification Technology (AIT) contract, effective March 25, 1994.

Under the contract -- which has a maximum value of \$250 million -- Intermec will provide automated data collection hardware, software, maintenance, training and installation services. The contract runs for five years for the hardware and software and an additional five years for the maintenance. This is an open end agreement -- referred to as "Indefinite Delivery/Indefinite Quantity" (IDIQ) -- with no contractual requirement to purchase any minimums.

Intermec had been the prime contractor under the previous five-year agreement which expired last May (processing the new procurement has taken almost a year). Although specific numbers have never been made available, the total dollar value from 1988 to 1993 was estimated to have been well in excess of \$100 million.

This time around, the contract is expected to be even larger for three reasons:

First, the last award was for "non-tactical" (NT) purposes; the DOD's "tactical" requirements for AIT hardware had been covered under a separate contract. This award combines both NT and tactical.

Second, the range of products has been expanded to include RF (Data Communications and Identification), Smart Cards (and related readers) and additional hand-held terminals (including Intermec's Janus line).

Finally, all government agencies -- not just the DOD -- will be ordering their auto ID hardware and software from this contract.

Intermec was really sweating out this decision. DOD will not release the names of the other bidders, but SCAN has learned that there were three other competing companies. They are not from the auto ID industry, but are firms -- similar to systems integrators -- who cobble together all of the "partners" to supply the necessary parts to fulfill such government contracts.

[In the early 1980s, for example, the very first AIT contracts -- then known as LOGMARS -- went to Syscon and IBIS. They are typical of the companies who specialize in government business but manufacture very



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little themselves. They are almost all located in the Washington, DC area, and are sometimes referred to as the "Beltway Bandits."]

As is often the case in large contracts of this kind, the award can be challenged by the other bidders if they feel there has been any irregularity or that they did not receive a fair evaluation. No one seems to expect that to happen in this instance.

The negative impact....

...of patent lawsuits on the marketplace was clearly illustrated this past month when we were called by one of our subscribers. His company -- a large non-grocery retail chain -- was seriously considering the purchase of point-of-sale scanners and was holding back because of an announced infringement suit against the vendor they had selected.

The defendant in the lawsuit was Spectra-Physics; the plaintiff was AT&T Global Information Solutions Company (formerly NCR); the customer chooses to remain anonymous. The specific target of the legal action was the new Magellan 360-degree scanner that Spectra recently introduced (SCAN Mar 94).

AT&T maintains that the Magellan scanner infringes its patented bi-optic technology. Ironically, Spectra had positioned its new unit in direct competition with AT&T's devices, maintaining: "Bi-optic scanners have large blind spots...[which] the Magellan virtually eliminates."

We asked Spectra's President John O'Brien to comment. "NCR low-keyed this thing," he said. "We were advised just prior to the [FMI] Markettechnics show in Tampa that they intended to sue us and wanted us not to show the product. But we ignored that and went ahead anyway. There has been almost no public notice that we have seen of their legal action."

O'Brien also revealed that his company "has turned the guns back in their direction" and will set out to prove that the AT&T/NCR patent (issued in July 1993) is not valid. "Bi-optic technology," he explained, "is an optical configuration using a single light source and a single polygon and two apertures to read bar codes. This type of apparatus has been out in the market for years and there is lots of related intellectual property -- so how they can lay claim to bi-optic technology is a little bizarre."

As for what he thought about the real reason for the patent suit, O'Brien stated bluntly: "The NCR bi-optic scanner had hurt us a bit this past year-and-a-half, particularly with food retailers. NCR saw our Magellan as a really strong product that was going to hurt them in the marketplace. They reacted by suing us. If I were them, I would try to concentrate on developing a better product."

The perplexed customer still hasn't finalized his decision.

Watching nervously....

...from the sidelines has been an exercise in frustration for many auto ID companies concerned with the "Lemelson" patents.

Jerome Lemelson, reported to be the "most prolific living inventor" (*USA Today*, 1/11/94), has been flitting in and out of the automatic data capture industry since 1987. In his original foray into bar coding, his agent (Refac Technology) notified nearly all of the manufacturers and many users of scanners and printers that they were infringing one or more of four Lemelson patents issued in the early 1970s. Only a few companies succumbed at that time; they agreed to take out licenses for what were reported to be very modest fees (*SCAN* Aug 87; Oct 88; June 89).

During the past two years, Lemelson and his lawyers have changed tactics. No longer working through Refac, they decided to ignore the bar code scanner and printer manufacturers and to concentrate on a select group of very large users.

Bolstered by a licensing agreement -- reported to be worth \$100 million -- which was signed last year with eight Japanese automobile manufacturers, Lemelson took off after the Big Three US auto makers. In addition to GM, Ford and Chrysler, Motorola was recently drawn into the suit.

Lemelson lives in Nevada, so that's where the court actions have been filed. According to one knowledgeable individual (who agreed to speak with *SCAN* only if not identified): "GM, Ford and Chrysler could not decide on one law firm, and each of them was actually represented by two. At one session in a Nevada courtroom, there were twenty-seven lawyers, each billing at the rate of \$300 per hour. This case is literally absorbing the entire time of the Federal District Court in the state of Nevada. There aren't a lot of judges out there."

This costly fiasco pretty much sums up the tactics of the very successful Lemelson legal team. Although few people familiar with automatic identification technology believe in the basic merits of the Lemelson patents, the hundreds of millions of dollars that the inventor has garnered through pre-trial, out-of-court settlements have given him the wherewithal and staying power to wear down the large companies. It is easier -- and often cheaper -- for the defendants to pay him off just to stop the clock on the legal fees, thereby not having to risk even the remote possibility of losing the case. "The records show," adds the anonymous source, disdainfully, "that Lemelson has lost eight out of nine cases that have gone to trial -- but few are willing to take it that far."

As of the end of March, only Ford and Motorola were active in the current lawsuit -- GM and Chrysler having been separated for legal reasons. Several interested observers predict that whatever the final settlement turns out to be, GM and Chrysler will follow along. (There was speculation that the judge was going to dismiss the case in mid-March -- because the Lemelson attorneys had not been sufficiently specific in their complaints -- but that never happened.)

As for the makers and sellers of bar code scanners and printers, their legal and monetary involvement may be just around the bend, according to this scenario:

If, in a hypothetical example, a company (e.g., Ford) agrees to pay royalties to Lemelson on the use of automatic data capture systems, it is almost certain that Ford would turn around and attempt to pass off those charges on the vendors of the hardware and software (e.g., Intermec or Symbol). Therefore, if the automobile companies decide to sign up as licensees, it is expected that they will exercise their options under the standard "Hold Harmless" clauses that are part of every purchase agreement and which protect the purchasers from just such patent disputes.

[Note: Bar code printing and scanning represent only a small part of the damages sought by Lemelson against the automobile companies. He actually claims infringement under the much broader category of "Machine Vision" -- a technology widely used in the automotive industry.]

According to Don Anderson, AIM's Executive Director, the trade association is closely monitoring the events in Nevada. "Although we are not playing an active role now," he recently told *SCAN*, "we want to be sure the interests of our members are protected. We will find ways to step in actively, if warranted." He would not elaborate on what AIM's actions might be.

"It's blackmail!" the anonymous source angrily insists, his voice exploding with disgust. "These phony patent infringement cases can drag on in the courts for years. Lemelson will probably not be alive when they are finally resolved."

Skepticism has been growing....

....about the claims made by the developers of the SUPERTAG, the new radio frequency identification (RF/ID) system. Two months ago (*SCAN* Feb 94), we reported that SUPERTAG was viewed as: "A remarkable new technology...that holds great promise for traditional radio frequency identification (RF/ID) applications" .

In that article, we noted that CSIR -- the large research organization based in Pretoria, South Africa -- has made two very significant claims about its invention that could impact bar code scanning; i.e., as many as fifty RF/ID different transponders (or tags) can be read in one pass; and the cost of the individual tags can be brought down to \$.02 or \$.03 each when produced in volume. CSIR had worked with consumer product manufacturers and retailers while developing the system; the implications were that replacement of UPC/EAN bar code scanning was imminent.

Since publishing that article, we have opened a dialog with a number of industry sources and have received additional information which brings the practicality of this new invention into question. These doubts apply particularly to SUPERTAG's future as a replacement for bar codes (although other applications have also been challenged). For example:

- With a promised error rate of one in ten thousand, are SUPERTAGS reliable enough to compete in the retail environment? Bar codes -- when printed correctly -- are generally acknowledged to have an error rate (misreads) of better than one in three million. Even with this very low error rate, and after twenty years of application experience, scanning non-reads -- from poorly printed symbols -- has been a major complaint of retailers. Imagine the chaos if, every time there is a SUPERTAG failure, an entire wagonload of products must be unloaded and scanned individually to locate the problem.
- The SUPERTAG promises -- as a result of its "anti-clash" feature -- to read as many as fifty different codes at one time. How will it read, distinguish and count the signals from four identical cans of peas?
- The CSIR reader reportedly cannot pick up a signal from any transponder

that is closer than one millimeter from a metal surface. What does that do to products packaged in metal cans or with a metal foil overwrap? Will the supermarket wagons/trolleys have to be redesigned using some materials other than steel?

- One of the major advantages of the current UPC/EAN system to the grocery retailers is the ability to bar code the large number of high-ticket products packaged in the store -- meats, produce, deli items. How will these products be SUPERTAG-wrapped and encoded? And if this cannot be done, does this suggest that a dual system for checkout -- RF and bar code scanning -- will be necessary?
- Since it is planned that SUPERTAGS will be deactivated at checkout for a predetermined period of time -- typically a few hours -- and then reactivated for possible later use (for some, as yet unspecified, application), how does a shopper exit a scanning store with a pack of cigarettes, candy bar or lipstick bought elsewhere? (To avoid this problem, CSIR replies that everyone will be "deactivated" as they enter the store. This procedure implies that the contents of each shopper's handbag and coat pockets could be inventoried; we doubt that too many people would stand for that invasion of privacy.)
- And what about multi-packs? The total cost of six individual cans of beer may be more than the price of a six-pack. How will SUPERTAGS distinguish?

Admittedly, these objections were based on preliminary information released about the technology and on assumptions about the methods of implementation. We wondered whether these problems could be readily overcome by refinements and future developments?

So, we called on Ron Ames, one of the leading authorities on RF/ID, to evaluate the technology. "Reading multiple tags in a field is feasible," he explained, "and there are products on the market which do just that now, with more on the way. I expect to see prices of \$.20 to \$.30 in multi-million tag volumes, after their introduction at \$.50 or so. And I will be amazed at those low prices. But the cheapest CMOS, low-frequency silicon chip now available -- 50 mils thick on each side -- costs 5-6 cents for the silicon material alone. And that's before assembly, antenna, etc."

Ames thought of many other, much more technical, questions, so we asked if he would pose them directly to CSIR and report on their replies. On March 24, he faxed a message to Mike Marsh, Program Manager for the SUPERTAG project, that included a list of questions focussing on production costs and market opportunities:

- How do you address the challenge in developing RF/ID products for the global market due to the lack of harmonized regulation by the PTT or the FCC? What countries can your products be used in? What is your analysis with respect to certification?
- What are the frequencies, power levels, modulation schemes that you use? How flexible are they? Are they different for specific regions?
- What sort of antennas and sizes are used in the tags and readers to achieve a range of four meters?
- How directionally sensitive are the tags?
- Does your design require a semiconductor fab process that is common in the US foundries?
- How many transistors and how many bits are in your current design?
- Can you "write" to it via RF or how is it programmed?

The answer from CSIR's Marsh stated that 90+ companies were discussing licenses with them and that CSIR had filed more than 120 patents. "SUPERTAG is not a product that can be marketed to end users," Marsh continued, "but rather a technology which can be produced by a suitably equipped electronic manufacturer and then sold through a marketing partner."

Based on that brief reply, Ames responded to SCAN: "If I were a company [with interest in this development], I would want answers to the questions and issues I raised before I would share my business plan with them." Ames feels that the information provided by CSIR was much too sketchy to convince him that any company should make a substantial investment in the technology -- without further details.

The South Africa Article Numbering Association (SAANA), one of the organizations that had cooperated with CSIR in the development of the SUPERTAG, reported on this new technology in its January 1994 newsletter. The SUPERTAG is "literally the size of a pin head and the antenna is no more than a couple of centimetres from top to bottom," the newsletter informed its members. Recognizing the consternation expressed over the possible impact on suppliers who have already bar coded all their products and the misconceptions surrounding the SUPERTAG, the SAANA report concluded: "As far as the present system of barcoding is concerned, rest assured that it will be with us for many, many years to come, even if the SUPERTAG takes off overnight (which is highly unlikely)."

Comment

To illustrate the seriousness with which grocery retailers are viewing the CSIR claims, consider this remark by Eric Verhoeven, Director of Market Research at Bi-Lo Supermarket, in Supermarket News/Global Edition (3/28/94): "If this [SUPERTAG] system works, it turns the whole front-end upside down. This puts all self-scanning systems on the back burner."

And there the story lies for now. It is relatively easy to question a new invention or technology which does not yet have all of the answers -- or which the inventor is not yet prepared to share. Even so, the initial, overstated claims by CSIR have opened a can of worms which need sorting out.

A new series....

....of "Big Picture Workshops," consisting of two-day conferences on how to design, install and implement complete bar code data collection systems in manufacturing and distribution environments, has been announced by EduTec (St. Paul, MN). Ten such workshops, stretching from Boston to Anaheim, will be held from May 24 through November 10.

A prestigious group of specially invited faculty presenters will include: Dave Collins (Data Capture Institute); Craig Harmon (QED Systems); Dave Allais (Applied Tactical Systems); Scott Cardais (Quad II); Ted Williams (Laserlight Systems); Rick Bushnell (Bushnell Consulting Group); Dick Meyers (Delta Systems); Kevin Sharp (Accurate Information); Michael Southworth (Total Management Consultant); and Harry Burke (writer, lecturer). This entire group of individuals will not appear at all of the sessions. The workshops will

include about a dozen "non-competing vendors" with tabletop exhibits. Tuition for the two-day conference is \$495.

EduTec, Box 64725, St. Paul, MN 55164-9507; 800/231-1748; FAX 800/257-5390.

The White House....

....last month, publicly recognized the achievements of an auto ID company that has successfully unlocked the door to expanded trade in Japan. On March 15, President Bill Clinton visited Markem Corporation in Keene, New Hampshire and spent two hours touring the facilities.

[Well, okay -- the President's visit was not prompted by just the recognition of the company's successes in international trade. A rally at Keene State College two years ago gave Clinton a boost during the 1992 primaries and provided his initial momentum to win the Democratic nomination. And Cheshire County -- where Keene is located -- is the only county in that entire rock-ribbed Republican state to have voted for Clinton over George Bush.]

Clinton travelled to Keene directly from a major G-7 economic conference in Detroit, where he had met with representatives from Canada, France, Germany, Great Britain, Italy, and Japan to discuss the difficulty of creating jobs in a tough global economy. He used that meeting's theme to point to the successes of the well-respected, hi-tech company in New Hampshire.

During the tour at Markem, the President was given a hands-on demonstration of the company's innovative four-color plateless printer. He sat at a computer keyboard and entered an order for pressure-sensitive labels. The resulting customized label included the Presidential Seal (which had already been programmed-in) plus his own signature (which he himself penned and scanned into the system).

Markem is a very unusual company and deserves all of the attention that it received on this occasion. Founded in 1911, with a line of machines for marking the insides of shoes, the company has grown to \$180 million in sales, with a staff of 1,630 people and manufacturing facilities in the US, Canada, Europe, Asia and Australia. It has operated successfully in Japan for more than 20 years through a joint venture company -- of which Markem owns 49%.

Still in the "marking" business (although no longer on shoes) Markem now provides a wide range of systems to solve identification problems on products that include: semiconductor devices; freshness date codes on food and packaged products; tablets and capsules for the pharmaceutical industry; pressure sensitive labels for durable goods manufacturers; and bar code labels. Although less than 10% of Markem's business is directed to automatic data capture applications -- mostly through its Scanmark Division -- the company has always been active in this industry.

We discussed the President's visit and the company's successful history with Ben Nelson, Markem's Industrial Market Relations specialist. For many years, Nelson has been a well-known participant in AIM activities and automatic data capture seminars and has written a regular column in *ID Systems Magazine*. "Our

company's primary commitments have always been to its employees and the community," Nelson proudly told SCAN, "even before our concern for customers or profits to the owners."

Family-owned for the past 83 years, the company has never laid off an employee. "Even during the Depression," Nelson explained, "when the company was forced to cut back some of its workers to a three-day week, it has held to this pledge. We continue to contract as much as 50% of our machining work outside the company so that in difficult times, when sales are weak, we are able to cut back on outside contracting while maintaining our commitment to staff."

The President's visit -- and the resulting publicity -- were a well-deserved honor to a fine company.

The growing concern....

...over the poor quality of an increasing number of printed UPC symbols was highlighted by *Supermarket News* (2/21/94) in an article headlined "Stores Crack Down on Faulty UPCs."

Although this problem is not a new one, it has become apparent that retailers are becoming much more aggressive in dealing with it. "At Kmart," the trade paper reported, "checkout registers now record which products don't scan on the first pass. Repeat offenders are subject to chargebacks in excess of \$100,000 per purchase order. As a result, brand marketers today are hustling to boost first-pass read rates from their 80% to 85% plateau to the 97% the grocery industry says it needs for optimum efficiency."

The reasons for these stricter standards are not new: i.e., reduced efficiency, additional costs, and the increased exposure of checkout personnel to repetitive-motion injuries. What is new is the growing body of evidence that is being brought to bear to make the point. For instance, Publix Super Markets (Lakeland, FL) reports that each 5% of checkout flow that fails on the first pass translates into "more than half a ton of product that have to be lifted, twisted, reoriented or passed per cashier per day."

In a move that promises to raise print standards, the Uniform Code Council's Board of Governors approved release of a new "UPC Quality Specification for the Printed Symbol" for public review and comment. (Assuming no major objections are raised, final approval is expected in April 1994.) This new specification requires the use of a verification device as a tool to evaluate quality.

Its passage will mark the first time that the UCC has endorsed the use of verifiers (*SCAN* Aug 93). The original UPC Symbol Specification -- which has remained basically unchanged from when it was first issued 21 years ago -- will continue in effect, the UCC explains, as "an alternate voluntary standard which allows evaluation of a printed UPC symbol at any point in its cycle."

Let's get more of those verifiers out there!

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