July 12, 1996

RFID Market to Reach Record Revenues by Turn of Century

A new market study released by Venture Development Corporation predicts that the RFID market will achieve worldwide revenues of nearly $800 million by the year 2000. Growth is expected to be very strong across all major business segments, averaging 28.6% overall.

The RFID study sees a significant portion of that growth coming from new applications in smaller-to-medium-sized companies as well as in several lower-margin operations such as retail and related businesses. There will be major growth over the next few years in applications where readers from one supplier will be able to read tags from any other supplier.

Source: Venture Development Group
Natick, MA, PH (508) 653-9000, FX (508) 653-9836, E-mail vdc4u@aol.com

Acquisitions Solidify RVSI's Position As A Major Player In ADC Industry

Eleven years ago, when RVSI (Robotic Vision Systems, Inc.), Chairman, President & CEO, Pat V. Costa joined the company, annual revenues were $3 million. With the recent acquisition of Computer Identics, company revenues should exceed $100 million this year. Even major players like Symbol Technologies are realizing that RVSI is becoming a force to be reckoned with.

RVSI's background has been in the development of 3-D machine vision inspection, mostly lasers. When Costa came to RVSI, the company had pioneered the technology but was looking for a significant market. After a failed attempt to capture the automotive industry, RVSI scored big with its entry into electronics. Costa confirmed, "By the end of the '80s, we targeted the electronics industry and have been on a positive growth curve ever since. We are currently the dominant supplier of 3-D machine vision to the semiconductor industry."

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"Two years ago, good business prudence told us that we should diversify and protect our company's interests," Costa confided. "However, we wanted to diversify in a manner that would be very synergistic with what we were already doing."
In 1995, RVSI acquired Acuity Imaging, Inc., a company that was a result of the merger of two pioneers of 2-D machine vision, Automatix and Itran. So the combination of RVSI and Acuity is actually the joining of three leading, or pioneering, companies of machine vision from the '80s. "I believe we are now the world's largest, broad-based, machine vision company," Costa stated.

RVSI's interest in the bar code business was largely due to Itran's close working relationship with ID Matrix (another recent acquisition of RVSI). Two dimensional bar coding has many of the same characteristics as machine vision. For example, parts are often marked on the factory floor by using laser-mark, ink-jet, shot peening or etching. These methods rarely produce high-quality, high-contrast markings.

By using algorithms and techniques developed in machine vision over the last 15 years, poor-quality marking can be read as if it were crisp, clean and legible. A very high read-rate can be obtained on markings that otherwise would be very difficult to read. "When we saw the power of combining our expertise with the new 2-D products from ID Matrix, we became very excited about the combination of our technologies," said Costa. "And, we had grown to a size where capital wasn't going to be a problem. The merger with ID Matrix was a natural step for us in our business plans."

The synergy of this merger helped RVSI land a major contract with Motorola. The "PRISM" project required 2-D machine vision inspection, 3-D machine vision inspection and DataMatrix™ code reading. "We landed the contract because we were able to be a one-stop shop for them," said Costa. "Originally, Motorola anticipated using three separate vendors. When they found out they could get all three products from one company, the choice about where to place the contract was easy." With the acquisition of Computer Identics, the semiconductor industry now accounts for only 50% of RVSI's total business, down from 70% or more before the acquisition. Costa has accomplished his objective for diversifying, but he's done it by acquiring companies that "fit" well with RVSI's technology. And, he has allowed each company to maintain its identity while still being part of a bigger picture.

RVSI just entered into an agreement with Symbol to jointly pursue manufacturing markets. "We're natural allies," stated Costa. "We're strong on the factory floor and Symbol is strong in POS [point of sale], warehousing and distribution. Our weakness is their strength and vice versa."

"Together, Symbol and RVSI can cover an entire manufacturing system enterprise-wide," Costa continued. "If we align ourselves, do some joint sales calls and maybe even some joint product development, we're able to answer the needs of major manufacturers. I am fairly new to the business [bar code], but Symbol has been around for a very long time. I've found them [Symbol] very willing to discuss any business proposal. They just want to make smart business decisions."
We asked Costa where he'd like to see the company in five years. He laughed and said, "A lot bigger, obviously. Our mission is to satisfy customers' needs. If we do that, we will continue to grow."

For more information: **Computer Identics Corp.**, Canton, MA, PH (617) 821-0830, FX (508) 828-8942, **RVSI**, Hauppauge, NY, PH (516) 273-9700, FX (516) 273-1167, **Symbol Technologies**, Holtsville, NY, PH (516) 738-4191, FX (516) 738-4740, E-mail: tully@symbol.com.

**Computer Identics - The Early Years**

*as related by David Collins*

In a recent interview with SCAN/DCR, David Collins, who founded Computer Identics and currently heads The Data Capture Institute, said "I have always maintained that the bar code industry's penetration of the total potential market has been thin but this may change with the new alliance between Robotic Vision Systems, Inc. (RVSI) and Computer Identics. I think this latest acquisition is going to be good for Automatic ID technology as well as the various companies that have merged."

The commercial bar code industry got its start around 1959. Sylvania developed a system of tracking railroad cars with scotch-light sheeting that was color-coded. Many of the people who were instrumental in the development of commercialized bar code systems came from Sylvania.

In 1968, David Collins, who had worked for Sylvania, formed Computer Identics (CI), a pioneer of the automatic data capture industry and the first company to develop a commercialized bar code system based on the use of a laser. Building on the groundwork of the railroad car tracking system, the company accomplished three very important feats shortly after it opened. It got rid of the narrow strips of expensive scotch-light sheeting, did away with color and reduced the size of code area from one sq. ft. to one sq. inch. And this opened the door for many other applications.

At the time, there were only two companies that were making major strides in the commercialized bar code industry, CI and Identicon, founded by Roy Sallen and Hans Hug, also former employees of Sylvania. While CI was pioneering the laser scanner, Identicon was developing the first pen-scanner. Together, the two companies did all the major work in early bar code applications. CI survived; Identicon did not.

Another first for the bar code industry was CI's use of a micro-processor in a decoder. And, CI developed the Code 128 and 2-of-5. The choice of the number 128 is an interesting story. There are 128 characters in an ASCII character set and the road outside the window of the code's inventor was Rt. 128. At the time, Rt. 128 was the home of many of the country's leading technology providers.

In 1971, CI became the first company to offer a commercially viable bar code system. It was also significant because it marked the beginning of paper labels with bar codes. Two of the major applications were the grocery business and tracking axle assemblies for General Motors. And the railroads still accounted for a large portion of the company's sales.

By 1974, CI was earning $6 million per year in railroad car tracking and $1 million per year in commercial industrial laser applications. The company had taken 70% of Sylvania's market from them. Because of the CI's close relationship with the railroads, the Pullman company purchased a majority of CI's stock.

In 1976, the railroads stopped using bar codes for tracking and the bottom literally fell out of CI's market. The consequence was, CI was in a position where it could obtain no new financing for almost four years.

But even during these lean years, the company continued to pioneer new products. It became one of the world's foremost systems providers and introduced the StarNode wired network system a full four years before the current industry leader, Novelle, entered the picture.

For more information: **The Data Capture Institute**, Duxbury, MA; PH (617) 934-7585; FX (617) 934-6233; E-mail: 76526.1556@compuserve.com.

**First Meeting of ISO/IEC JTC 1/SC 31, Automatic Data Capture**

*by Stephen G. Halliday*

*Vice President, Technology - AIM USA*

The first meeting of ISO/IEC JTC 1/SC 31 was held in Brussels, Belgium, during the week of June 17, 1996. This committee, as previously reported in Scan/The Data Capture Report, is the new home for international standardization for all ADC technologies.

Twenty-one national bodies (including Australia, Austria, Belgium, Brazil, China,
Czech Republic, Finland, France, Germany, Hong Kong, Japan, New Zealand, Norway, Philippines, Romania, Slovakia, South Africa, Sweden, Switzerland, UK, and USA) and three liaison organizations (CEN TC 225, AIMI, and EAN International) attended the inaugural meeting. Mr. Alan Haberman was endorsed by the committee as the first chairman for a three-year term.

Eighteen Resolutions were developed and unanimously agreed upon by the full Sub Committee. These resolutions provide feedback to JTC 1 on the SC31 Title, Area of Work, Principles, Internal Liaisons, and Liaisons with other organizations. The Sub Committee agreed to recommend a change to its Title and Scope as follows:

**Title:** Automatic Identification and Data Capture Techniques

**Area of Work:** Standardization of data formats, data syntax, data structures, data encoding, and technologies for the process of automatic identification and data capture.

One of the resolutions proposes 21 new projects and establishes three Ad Hoc groups to manage the development of this work. The three Ad Hoc Groups, their conveners and their responsibilities are as follows:

A. **Ad Hoc on Data Carrier**

Convener - Mr. Dan Mullen (US)

**Proposed Work Projects Assigned**

1. Bar Coding - Symbology Specification - Code 39
2. Bar Coding - Symbology Specification Interleaved 2-of-5
3. Bar Coding - Symbology Specification Codabar
5. Bar Coding - Symbology Specification - Code 128
6. Bar Coding - Symbology Specification - PDF417
7. Bar Coding - Symbology Specification Maxicode
8. Bar Coding - Symbology Specification - Data Matrix
10. Bar Coding - Symbology Identifiers

B. **Ad Hoc on Data Structure**

**Proposed Work Projects Assigned**

1. Data & Application Identifiers
2. Data & Application Identifiers Maintenance
3. Data Syntax for Use Within High Capacity Data Carriers

C. **Ad Hoc on Conformance**

Convener - Mr. Chris Swindin (UK)

**Proposed Work Projects Assigned**

1. Bar Coding - Linear Bar Code Symbol Print Quality
2. Bar Coding - Two-dimensional Symbol Print Quality
3. Bar Coding - Bar Code Masters
4. Bar Coding - Electronic Bar Code Masters
5. Bar Coding - Test Specifications - Bar Code Printers
6. Bar Coding - Test Specifications - Bar Code Scanners and Decoders
7. Bar Coding - Test Specifications - Bar Code Verifiers
8. Bar Coding - Requirements for Bar Code Printing Software

In addition to these project items a resolution was passed to request immediate inclusion of RFID in the work program. Finally, resolutions were passed to explore the addition of Magnetic Stripe, Touch Memory and OCR to the work program. The full versions of the resolutions will be available from the TAG Administrator when they become available from the Secretariat.

**Future Meetings:**

The U.S. offered to host the Ad Hoc on Data Carrier and Ad Hoc on Conformance meeting in November 1996. The Netherlands have offered to host the Ad Hoc on Data Structure in Amsterdam in August 1996.

The U.S. TAG will schedule a meeting in late July to develop U.S. positions on the relevant topics and identify US experts to participate in the Ad Hoc meetings.

This milestone event in the history of the ADC/ID industry marks an advent for the marketplace. The SC 31 forum will provide, for the first time, one organization in which users and manufacturers can develop globally-recognized standards.

For more information on how your company can get involved in this important effort, contact: The TAG Administrator, AIM USA, Pittsburgh, PA, PH (412) 963-8588, FX (412) 963-8753, E-mail: aimadcl@aimusa.org.
New RFID Solution Aids In Mail Tracking

A comedian once said, "I think they should give the inflation problem to the Postal Service. They won't be able to solve it, but they sure as heck could slow it down!" A group within the US Postal Service (USPS) is using RFID tags to track mail and hopefully rid the organization of this source of ribbing.

Two years ago, Glenn McDonald, an operations specialist for the Service Analysis And Assessment group (SAA) of the USPS, proposed a test plan for tracking mail to identify and assess routing problems. McDonald chose the Northern Virginia; Maryland; and Washington, D.C. areas for the experiment. The plan was to send a number of letters through the postal system and record each letter's progress, looking for patterns of failure in the system.

To accomplish this, McDonald decided to use radio frequency (RF) tags and tag readers. But there were many problems to overcome before the system could be put into operation. A mailed letter must travel through a series of rollers [part of an automated letter sorting machine] that sort the mail by destination and cancel the postage stamp. So any RF tag must be flexible and thin enough to pass through a sorting machine.

Letters traveling through the mail system may be in a canvas cart or bundle with thousands of other letters. This means that the tag readers (which are usually mounted in a doorway and undetectable to workers) must be able to read a tag from any angle and at distances up to 15 ft.

The third problem that had to be solved was that the tag reader needed to read multiple co-located tags [in case multiple test letters ended up in the same bundle]. According to McDonald, he told vendors to allow for at least 10 tags in one bundle.

The company that solved all of these problems was ID Systems, Inc., founded by four young men from Stanford University. ID Systems developed a battery-powered tag equipped with 64K of memory and approximately .17" thick so it easily fits in an envelope. And, the tags were sturdy and flexible enough to withstand the rollers in the sorting machine.

The tag readers were very innovative as well. McDonald told his vendor he needed a minimum read distance of 15 ft. The tag readers designed by ID Systems will read tags up to 100 ft. with almost 100% accuracy. Another interesting design feature of the tag readers is that they communicate with each other and together form a wireless LAN system in distribution centers with multiple readers. The beauty of the system is that no access points or servers are needed. The readers are part of a standalone system.

In each installation, there is one master reader equipped with a built-in modem for relaying information gathered by the network of tag readers. McDonald and one assistant retrieve information by manual dialing or through the use of a round-robin dialing sequence. Once the information is gathered, it is transferred to a regional processing center in Wilkes Barre, PA.

The Postal Service has an elaborate "operating plan." The plan outlines to the minute when mail must leave and arrive at various points in the system. To understand the process, let's follow a letter from start to finish and outline what happens with the RF tracking system.

First, the tag is programmed with identification information and pertinent details about its route. In essence, when it passes through a tag reader it says, "Hi, I'm tag number 234. I left Falls Church, VA, on July 1, 1996 at 10:00 a.m. I am traveling to Washington, DC." From the mailbox the letter travels to a local post office. All mail from local collection points must be in the post office by a prescribed time. The mail is then bundled and forwarded to a regional process and distribution center (PDC) [keep in mind the mail must leave and arrive at the various stops precisely according to the operating plan].

These PDCs may handle mail from as many as 80 to 100 post offices. Even with thousands of letters in a cart or bundle, the tag readers are able to record incoming and outgoing information on the letters carrying tags. From this PDC, the mail travels to another PDC in Washington, D.C. There it is sorted and distributed to the local post office which will deliver the letter to its final destination.

As the letters arrive and leave each destination, the tag readers record the time of entry and departure, as well as the identification of the tag and its final destination. The tag is also updated so it is recording its own progress as it moves along the mail distribution path.
Multiple readers can be installed in PDCs and post offices to show a letter's progress within a building. The readers are unobtrusive and blend with the woodwork so that most employees don't even know they've been installed. This way, employees are not exercising unusual care [which would invalidate test results]. This allows the SAA to register information about the letters' travel from station to station. If it is in one area too long, they've identified a problem.

If there is a total failure, i.e. a piece of mail misses its destination completely, the radio frequency tags allow the analyst to backtrack along the route to see where the problem occurred. However, if a piece of mail went to a post office that was not a test site, the radio frequency system would be ineffective. For example, if test mail were to mistakenly go to Baltimore instead of Washington, D.C., the error would show up because Baltimore is a test site. If the mail were to go to Tulsa, Oklahoma, it would not be trackable with the radio frequency system because it is not in the test route.

ID Systems is a fledgling company that got its start in 1990 and incorporated in 1993. President of ID Systems, Ken Ehrman commented on the radio frequency solution his company provided: "Our challenge was to develop tags that were sturdy, well-protected from rough handling and small enough to fit in an envelope. The problem was that no specs for this kind of system had been developed because nobody had ever tried to run a radio frequency tag through an automated letter sorting machine." Jeff Jagid, a vice president of ID Systems, added, "The development of the package started in March 1995 and we began shipping product in December of 1995."

The first order was for 1,000 tags and 132 readers while the cost of the system to the USPS was $400,000. This was enough equipment to cover installations in 35 post offices. To handle the needs of projected expansion will require at least an additional 100,000 tags and an as yet undetermined number of readers.

If the SAA decides to try a "real-time" system [which is currently being discussed], SAA manager Mike Cronin will have his work cut out for him selling the package to his superiors. There are 271 postal distribution facilities in the US. Real-time tracking would require the installation of readers throughout an entire plant rather than just at the shipping and receiving dock. There are also over 5,000 post offices in the US, so cost figures for a real-time solution could reach eight figures.

"Our objective is to invent concepts and figure out how to make them real," said McDonald. "The pilot program for this project started in 1995. We are planning a nationwide deployment of the tracking program which will cover 10 major "areas" [NE, Mid-Atlantic, Allegheny, Western, etc], and soon will begin the procurement process. We hope to be in full operation sometime between December '96 and February '97."

For more information: ID Systems, Inc., New York City, NY, PH (212) 677-3800, FX (212) 677-3802, E-mail: kehrman@id-systems.com, jjagid@id-systems.com, Service Analysis And Assessment (USPS), Washington, D.C., PH (202) 268-2300, FX (202) 268-2872, E-mail: gmcdonal@usps.gov.

Members Debate Over AIM USA Focus - New Markets Or Standards?
by Rick Morgan

Did a mutiny occur at the recent AIM USA meeting (June 4 - 7, Bloomingdale, IL)? It may have appeared so to a newcomer to the meeting as members set their own agenda during a brainstorming session chaired by Julie Andrews, the newly-hired director of membership and meetings.

Andrews' intent was to focus on new ideas and "value-added components" that would attract members to meetings. Although members at the session agreed that boosting attendance was important, they had their own ideas about how to approach the problem. [Editor's note: Attendance for the meeting, including walk-ins, was 92 of a total of 165 members. Although there have been meetings with fewer attendees, most members still considered this to be a poor showing.]

According to Don Chamblin [and others], sales & marketing manager, ID Card Printer Products for Eltron International, Inc., Andrews asked the wrong question. "When we started," said Chamblin, "the question was asked: 'Why did each of you come to the meeting?' We all knew why we came. We are the people who always show up. So that wasn't really the right question to address. We were more interested in why many members have stopped attending."

Members who had attended previous years' meetings did not wish to "waste" their time rehashing what they felt was obvious. They [the members] had spent a lot of time and money preparing various memos and reports for the meeting; therefore their agenda was quite different from that of the new manager. For the rest of the meeting, the members set the tone.
Some attendees mentioned that in the past, members had to attend two of the three yearly meetings or be blackballed. That rule was changed recently and now members must simply pay their dues to remain in good standing. "But it wasn't just the blackball rule that encouraged members to attend the meetings," said Chamblin. "The fear of missing something was always a big incentive. AIM was like a club that you had to belong to."

Members also voiced concern that AIM has lost its focus as a market-driven organization. Many attendees believe AIM's focus has shifted almost completely to the technical side of the industry, i.e., developing specs and universal standards. "This appeals greatly to engineers but does little to light the fires of upper management, who often lean more toward the marketing side of the industry," Chamblin stressed.

"Don't get me wrong," he continued, "the technical work is very important and necessary for the industry. And AIM does a fantastic job with these issues. But the scope of programs offered at these meetings needs to be broadened to attract more people. Specifically, AIM needs to focus more on being a market developer."

Some members felt that after the sale of the SCAN-TECH show, AIM lost a valuable rallying point for members. "SCAN-TECH really used to draw members," said Chamblin. "There would be as many members on the show committee as now attend the regular meeting.

"SCAN-TECH was nothing more than a means to develop new markets. Nobody likes working trade shows; we weren't there because we enjoy standing on our feet for three days. We viewed the show as a vital aspect in new market development. AIM needs to take back its position as the industry leader in the marketing arena."

In a statement prepared for SCAN, AIM stated, "The association has undergone some radical changes in the past few years, particularly in organizational structure and direction. The basis for this reorganization was to position AIM as a market-driven association rather than a trade show-driven group. One component that lead to this reorganization was the sale of SCAN-TECH - we found that since all of our efforts and energy were going toward trade show planning, we were not fully focused on growing new markets with targeted industries."

A number of the attendees felt that AIM USA has the image of being primarily a bar code association. Right or wrong, if this is a common impression, it is going to hurt attendance because the ADC industry is so broad based.

Addressing this issue, the AIM correspondence continued, "Our reorganization included the development of six marketing-focused divisions differentiated by their technology focus: Optical Recognition; Card; Data Communications; Radio Frequency Identification; Consulting, Software, Systems Integration; and Consumables. These six divisions were established as forums for our members to voice their needs and provide direction on the activities they want the association to pursue. The division names were technology-focused for two reasons. Primarily to reinforce that AIM USA is representative of all automatic identification and data collection technologies. Secondly, to assure that we're meeting the needs of all constituencies involved in AIM. We understand that the areas of focus differ by the technologies and their applications.

"Additionally, AIM has developed a list of six key activities for the association in 1996. The activities include: the ANSI TAG to ISO, IQ 1996, Alliance Building, AIM USA and AIM International Cooperative Efforts, Public Relations and Membership Retention and Recruitment. According to AIM, almost all of these programs focus wholly, or in part, on developing new markets."

On a more positive note, most members said they like the AIM-sponsored seminars in addition to committee meetings. Chamblin calls these seminars "take-aways" because you take away valuable information when you leave.

Most attendees agreed there are four important questions that need to be answered:

- How do you grow new markets?
- What does AIM mean outside these meetings?
- What does AIM mean to check-signers?
- What can we do to make the organization more vital, not only to members but also to those who don't feel AIM fits their needs?

Don Chamblin told SCAN, "I have been very active in AIM and it is a fantastic organization. I was vice president for a number of years and was a member of the board of directors. You don't get to that level of involvement by following your own personal agenda. You have to take a broader view of things and I believe that's what this year's attendees did."

The situation reminds one of the line in the Paul Newman movie, Cool Hand Luke where the chain-gang boss says, "What we have here is a failure to
communicate!" It seems as though both the members and staff at AIM USA have common goals and ideas about what AIM ought to be.

Chamblin concluded, "AIM needs to concentrate on more than just standards. A true trade association must expand on this and take an active role in market growth and expansion." After talking to AIM staff members, we believe that they would agree whole-heartedly with those statements.

For more information: Eltron International, Inc., Elgin, IL, PH (847) 695-6422, FX (847) 695-6484, AIM USA, Pittsburgh, PA, PH (412) 963-8588, FX (412) 963-8753.

Rebuked for doing a good job?
by George Goldberg

Sometimes it's difficult to distinguish your friends from your enemies. When we first read the following headline on a letter from Second Harvest, we expected to run up against another cranky anti-establishment group:

"Help Us Conquer the Most Threatening Enemy We Have Ever Faced; The Grocery Store Scanner."

This message was really different, however. Second Harvest is a national, non-profit organization devoted to collecting unsold, excess inventories of packaged foods from supermarkets for redistribution to the needy. Some of these cans and boxes are dented or broken and unsuitable for sale, but are perfectly adequate for consumption. Second Harvest arranges with manufacturers, distributors and supermarkets to collect all of this surplus and damaged merchandise and tally the amounts — so that the retailers can receive proper credit from their suppliers — before sending the food to those who depend on this source for their sustenance.

So why has the UPC scanner become the enemy of this worthy effort? In a letter soliciting donor funds to help with its program, Second Harvest's President Christine Vladimiroff explains: "The grocery store price scanner...threatens to drastically reduce our most important source of food...When that little bar code is scanned into the computer, your purchase is instantly subtracted from the store's inventory ....Even worse: grocery stores also use their scanners to count 'damaged' products." In other words, the more efficient management of inventory and stock replenishment has reduced the stores' excess merchandise and identified the rejects for returns.

The solution proposed by Vladimiroff to replace this loss of donated food is to "convince food manufacturers and retailers to let our food banks sort, scan and count their 'damaged' goods, and, in return, they agreed to donate the products that can't be sold but can be safely consumed."

Second Harvest has run a successful pilot program with Kraft USA and is soliciting donations to expand that effort. This "enemy," it turns out, has been converted into a "friend."

For more information: Second Harvest, Chicago, IL, PH (312) 263-2303.

[Our thanks for spotting this story go to an anonymous, but alert, correspondent in Potomac, MD.]