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A remarkable new technology....

....has surfaced in South Africa that holds great promise for <u>traditional</u> radio frequency identification (RF/ID) applications. The developers of this technological breakthrough, however, attracted worldwide attention in mid-January (with coverage by the major wire services, most TV networks and CNN), for an entirely different reason -- their unabashed claims that their new <u>SUPERTAG</u> will soon replace UPC/EAN and other bar codes.

The official release read, in part:

> "South Africa's <u>CSIR</u> and the <u>British</u> <u>Technology</u> <u>Group</u> (<u>BTG</u>) today announced initiation of a major project to commercialize the CSIR's SUPERTAG design for an electronic replacement for bar codes. SUPERTAG is effectively a single integrated circuit chip capable of broadcasting its identity number despite possible interference from other tags in the vicinity....The optical scanning of printed bar codes on all manner of goods is so well established in commerce and industry that people have become used to the limitations of bar coding. Imagine if one could accurately 'read' the entire contents of a supermarket trolley in a second without the need for unpacking past the scanner, and if stock taking could be a simple act of passing a scanner over the shelves to document the entire contents of a store within minutes."

The very dramatic demonstration, as seen on videotape, showed a supermarket wagon ("trolley"), piled high with goods, being wheeled into a tunnel-like structure and then completely read, decoded and checked out within seconds.

Two key claims by CSIR could make this new development especially significant: First, the ability to read multiple tags at one pass without interference. [Until now, if there were two tags in the field to be scanned, they jammed each other. Although several companies were rumored to be close to overcoming this restriction, the CSIR SUPERTAG is the first to be demonstrated.] Second, CSIR's prediction (thus far unsubstantiated) that the cost of the individual chips -- or transponders -- can be brought down to "$.02 or $.03 each" when produced in sufficient volume.

The SUPERTAG transponder is described as a "single integrated [electronic] circuit...attached to a small antenna." CSIR has developed a method for

programming these one millimeter square transponders with UPC/EAN numbers and gluing them to the inside of the product packaging at the time that the box, label or overwrap is being printed.

Mike Marsh, CSIR's Program Manager for the SUPERTAG project, told *SCAN* that the key element in bringing the unit cost down will be the ability to manufacture them in very large volumes. CSIR estimates that the ultimate need for these tiny transponders will exceed 10^{12} (1 trillion) SUPERTAGS per year for grocery applications alone. "Today's worldwide capability for manufacturing transponders represents only 4% of that volume," Marsh noted. "There will have to be a 25-fold expansion of production capacity to meet the estimated demand. We have applied for 82 patents on this technology -- and there will be 50 more -- and we will be giving licenses to just about anyone who requests one. We have already received express interest from companies in Japan and Korea."

Marsh disclosed that CSIR has received a quotation to manufacture one million transponders at $.30 each. "Within six months," he predicted, "we will be able to bring that cost down to $.10 each."

But not everyone has bought into these extravagant claims. One leading European RF consultant told *SCAN*: "I have seen research groups and newly established RF/ID companies make similar exaggerated claims which could not be delivered as realistic products."

Don Small, VP Marketing of Hughes Identification (Tustin, CA), one of the major US manufacturers of RF/ID readers and transponders, was quite impressed, though skeptical. Eighteen months ago, Small told *SCAN* that he could foresee the cost of RF/ID transponders coming down, with sufficient volume, from its current level of $.50 each to as low as $.25 (*SCAN* July 92). Commenting on the SUPERTAG, Small remarked: "If they could accomplish what they are saying, it would be compellingly attractive to both the store and the consumer. But the raw cost of silicon is higher than the two or three cents range they are quoting."

To which CSIR's Marsh replied: "Certain people say it can't be done and others believe it can be done quite easily. The lovely thing about this product is that the chip gets thrown away and they need another one. It doesn't live for 20 years on your disk and your telephone."

Marsh has no doubt that these RF/ID transponders would be economically feasible when used in a supermarket environment -- especially if the costs were brought down to $.03 apiece. "The product manufacturers have always hated the UPC bar code," he says. "They cannot read them on their warehouse shelves and they believe that they were really put there just for the retailers. In addition, the consumers would welcome any system that would be an end to the supermarket queue. With a method such as encoding a passive transponder with its 'anti-clash' feature, manufacturers state that they can save considerable money in their handling of merchandise and that their costs would be reduced by an amount greater than the incremental costs of the transponders."

CSIR has been encouraged by both South Africa's grocery manufacturers and major supermarket chains, including Pick 'n Pay and Shoprite. They also have worked closely with both the South African and European EAN organizations.

Besides using the SUPERTAG as a replacement for bar codes, CSIR is also

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promoting the device as an inexpensive RF/ID system for other sectors of the auto ID industry. For example, electronic article surveillance (EAS) to prevent shoplifting. One of SUPERTAG's additional features is that it can be "turned off" at the time of checkout for a period of one-to-four hours, thus allowing the legitimate customers to exit the store but nailing the thief who avoids the checkout counter. As an added future benefit, CSIR visualizes consumers taking inventory of their pantry shelves by reading the reactivated SUPERTAGS.

CSIR -- an undefined acronym -- is based in Pretoria and is the largest industry and community-directed research and implementation organization in Africa. The company's literature states that CSIR currently performs approximately 10% of all research and development conducted on that continent. The organization employs 3,200 scientists, engineers, technologists and associated support staff at a number of regional offices and laboratories around the country. CSIR is not a manufacturing company; it is prohibited from using its research findings to enter into competition with commercial manufacturers. It took twenty specialists working three years to develop the SUPERTAG.

CSIR's partner in this development -- handling the business and licensing responsibilities -- is the British Technology Group. BTG, which claims to be the world's leading technology transfer organization, describes its business as the "profitable commercialization of technology." BTG searches for new technology and products in laboratories and companies worldwide; it then negotiates international licenses with these developers and shares the resulting revenues. The annual sales volume of the products currently licensed by BTG -- which has been in business for 50 years -- amounts to over $2 billion.

There are many unanswered technical questions about the SUPERTAG's claims and capabilities. We will be pursuing these answers during the coming months.

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In a significant policy change....

....<u>Norand</u> (Cedar Rapids, IA) is now taking a much more aggressive stance toward its strong portfolio of patents covering <u>hand-held</u> <u>CCD</u> <u>scanners</u>.

On January 27, President Bob Hammer told *SCAN*: "Norand holds many patents with hundreds of claims covering CCD scanning. The only company we have licensed under these patents is Nippondenso. Last month, we filed suit [in Iowa] against Opticon because they are violating our patents. We have also placed others on notice that they are infringing. We intend to protect our extensive intellectual property position in this technology."

Although Hammer would not elaborate any further, we obtained some clarification from Craig Harmon, an ex-employee of Norand and now President of his own consulting firm, QED (Cedar Rapids, IA). "Norand has a total of 28 patents that were issued between 1981 and 1993," Harmon explained. "I believe Norand's patent position in hand-held CCD scanners is as strong as Symbol's in hand-held laser scanners. Norand covers both linear and area-array CCDs. The company has notified both Welch Allyn and Panasonic that their CCD scanners are in violation of Norand's patents."

Harmon also elaborated on another of Norand's CCD-related efforts. "By this spring," he added, "Norand will be producing an area-array CCD scanner [for an as yet undisclosed company] capable of scanning 2-D symbologies. A similar product will be marketed by Norand in late 1994-early 1995."

In its first 10K Annual Report (August 31, 1993) filed with the SEC, Norand stated:

> "Norand holds certain patents relating to CCD technology....Norand does not presently manufacture CCD or laser bar code scanning devices, but purchases such devices for resale from unrelated third parties. Sales of CCD bar code scanning devices have not been material to Norand's operations."

Norand went public in February 1993. When it was privately-held, the company's owners chose not to aggressively pursue its patent position in hand-held CCD scanners. Now that it has settled into its public posture, that policy has changed. After all, the stockholders do have to be protected.

Bolstered by optimistic economic reports....

....and the results from a successful Christmas season, the nation's (non-grocery) retailers gathered in mid-January at the New York Hilton for the annual National Retail Federation Exposition to explore the latest available technology in store operations.

Among the auto ID companies that were exhibiting, these significant products were shown:

- Both Telxon and Symbol Technologies introduced their new portable, pen-based terminals. [Symbol had previewed its PPT 4100 unit for the press before the show and had already received extensive print coverage (*SCAN* Jan 94).] Although both devices are targeted at similar primary markets, there are significant differences in the design of the units and how they will be used.

  Symbol has focused almost exclusively on the "retail manager" who can use this on-line, real-time device to manage operations from the department store floor. Telxon has emphasized ruggedness and versatility so that they can expand their markets beyond just retail users into manufacturing, warehousing and route accounting. Because of its sturdy construction, the Telxon unit weighs over four pounds; Symbol's lighter, smaller version is less than one pound and fits comfortably in the hand.

  Another difference is in the "writing" device used. Telxon opted for an "electronic pen," rather than the "resistance pen" used by Symbol. Telxon maintains that the electronic pen's sensitivity produces improved accuracy and better visual results. Symbol counters that their writing implement is much less expensive and readily replaceable.

  [In a related development, Telxon announced, on January 28, that it had acquired the "PenRight and FieldNet products, technology, name and assets,

associated with PenRight Corporation, from AST Research [and] also
acquired the PenRight development and marketing organization based in
Fremont, CA." The PenRight character recognition and operating software
has been used by Telxon in its new pen-based portable computers.]

- Symbol Technologies also introduced a very small and versatile
  omnidirectional scanner -- the LS 9100 -- which they describe as "a
  compact, hands-free scanner, ideally suited for point-of-sale at
  convenience, drug and specialty stores and at select areas within full-
  line department stores." The company claims that the unit -- which
  measures 6.7" x 4.7" x 3.6" in its mounting stand and weighs 9.75 ounces
  -- is the smallest and lightest projection scanner available. The device
  can be disengaged from the stand and used in a hand-held mode for items
  that are too heavy or too bulky to present to the scanner. A company
  spokesman confirmed current production at about 400 units per day. The
  LS 9100 is list-priced at $1,395.

- Control Module showed their Computer-Aided Shopping List (CASL) system and
  CASLWAND device for the first time. The CASLWAND is a hand-held terminal
  with an LED bar code scanner at one end and a touch-memory receptacle at
  the other. The system works like this: Consumers use the CASLWAND at
  home to scan/record the UPC item numbers -- from packages, labels, coupons
  or a bar-coded catalog to be provided -- of all products to be purchased.
  The UPC data that is stored in memory is then downloaded to a touch-memory
  button. The shopper brings the memory button to the supermarket where it
  is read by a touch-memory receptacle on a special kiosk terminal at the
  front of the store. The terminal then prints a shopping list of the items
  and adds their locations in the store and any special coupons or pricing
  available that day.

  [Comment: Control Module has had some outstanding and unusual winners in
  the past -- such as the bar-coding system to control the tortilla
  allotment to welfare recipients in Mexico (SCAN Mar 91) -- but our
  expectations for the potential success of the CASLWAND are not too high.]

- Microsoft was a surprising first-time exhibitor at NRF, demonstrating
  Windows-like programs to be used in the retail environment. The company
  is looking for working partners to develop application software and
  hardware for retailers.

After struggling....

....during the first six months of this fiscal year (ending 3/31/94), Telxon
seems to have started back on the road to profitability. Third quarter results
-- compared to last year -- showed a 57% increase in sales to $77 million and a
significant reduction in its losses (down to $.04 from $.65 per share).

President and Chief Operating Officer Dan Wipff stated: "The increase in
Telxon's third quarter revenues can be attributed to...implementation of the
first phase of our Strategic Plan that occurred in the first and second
quarters. As a result, record sales from the North American and international
divisions were produced....Even more important...we reported income from
operations of $546,000, the first operating profit in five quarters."

There are also signs that Telxon is proceeding very aggressively to further implement its Strategic Plan (*SCAN* Jan 94). SCAN has learned that management has already designated two corporate divisions to be spun off as independent public companies in the near future.

There is little question....

....but that Advanstar Expositions -- with two trade journals (*Auto ID News* and the *International Edition of Auto ID News*), and three trade shows (ID Expo/US, SCAN-TECH Expo/Europe and ICAP/UK) -- is totally committed to its expanded worldwide presence in the automatic data capture industry.

In a recent interview, Advanstar's President Brian Nairn expressed pleasure at the results achieved at SCAN-TECH Expo/Europe (Cologne, Germany; November 30-December 2). That event was the first show held completely under the auspices of his company. "Next year," Nairn stated, "our focus will be on bringing the largest audience to Paris with the maximum buying influences available. We plan to further develop the conference program. We will be utilizing our European magazine and other resources to promote attendance."

"In the UK," Nairn continued, "with the strengthening of the British economy this past year, we anticipate a successful ICAP show in Birmingham next June. Since our surveys show that there is virtually no attendance overlap between the European and UK expositions -- the French and Germans do not travel to Birmingham and the English do not cross the channel to Cologne or Paris -- we plan to continue them as separate events. Our job is to bring specific audiences to the exhibitors and we have concluded that we must have two events to do that. We have no plans at the present time for other 'national' shows in the European market."

Regarding the current status of the largest automatic data capture event now handled by Advanstar, Nairn stated emphatically: "There have been no confirmed pull-outs of any exhibitors to ID Expo."

Nairn sees a continued need in the industry for two US events. Asked whether both ID Expo and SCAN-TECH will continue in Chicago, he replied: "It will depend on our ability to pull an audience. Historically, ID Expo has been held in the spring in Chicago. We are not the party that created this sudden concentration in that city and, ultimately, it will depend on who will produce the best results."

In an interesting new development, Advanstar is planning a series of regional conferences, some of which will be targeted at specific industries. According to Nairn: "Recent SCAN-TECH experiences -- notably in Philadelphia, Atlanta and Dallas -- demonstrate that there are potential audiences all over the country. We plan to use a seminar/educational format to tap regional markets and vertical applications."

We discussed these plans with Nancy Kelly, Conference Director of Advanstar's Cleveland Conference Group. "Our plans are to tie these conferences in with the 56 trade magazines that we publish," Kelly explained. "The first event will be ID INFO: Atlanta (Sept 20-21) which will be sponsored by ID Expo and *Auto ID*

News. This conference will include presentations on bar coding and RF/Data Communications plus table-top exhibits by vendors. Later this Fall we are planning conferences on Health-Tech (Boston), Mobile Data Communications (Dallas), and the Hotel Industry (venue not yet selected). All of these events will be co-sponsored by our magazines in those industries."

It is apparent that Advanstar is carving out a very special automatic data capture niche for itself in the publishing, exposition and conference areas.

One of the most stalwart....

....AIM affiliates in recent years has been the Australian group. Founded in 1986, the organization now includes 85 members and runs a successful exposition and seminar each year.

> [The operation Down Under has two minor hitches: First, the AIM acronym is registered in that country by the unrelated Australian Institute of Management and is thus not available to the automatic identification association; and, second, the SCAN-TECH name has already been usurped by both a furniture company and a computer company. The Australian AIM affiliate, therefore, which used to be known as AIMPAC (AIM Pacific), recently adopted a new name: "Australian Data Capture Association." Their annual show is called "Scanning Technology."]

The association's Secretariat functions have been handled since its inception by David Kyle and his company, The Practical Marketing Group. Kyle also publishes a number of magazines -- including a quarterly called *Rapid Response* which covers auto ID -- and manages the Scanning Technology trade show. "We are able to keep our annual dues at the low rate of less than (US)$300," Kyle explains, "because we provide many of the services through our established company."

The Australians have always been staunch supporters of AIM International and soon expect to become members of the new AIMI organization. Trevor Dean of Bar Code Data Systems (Peakhurst, Australia), has recently been appointed as Chairman of the Affiliates Committee, an important AIMI operating unit.

> [There had been some talk that the New Zealand automatic data capture companies would join with the Australians, but that idea has not worked out. Although the New Zealanders are too few to sustain a separate AIM organization of their own, they will probably continue to participate in AIMI international events as much as possible as an informal group.]

Kyle estimates that the total Australian market for automatic data capture products and services -- all applications including retail and industrial -- has reached (US)$210 million per year. [This number was admittedly an informed guess on his part, based on a four-year-old survey and an estimated 36% annual growth rate -- "even through the recession."]

With a population of 17 million, these figures would place Australia near the top when measuring the per capita purchase of automatic data capture products. "Australians are very willing to quickly adopt new technologies," Kyle explained. "It has made us an excellent test market for many world suppliers in a number of technologies. It is relatively cheap to make a mistake here. We

have no manufacturers of auto ID products in Australia. The bulk of our members are system integrators and their initiative is on clever application."

The Australian Data Capture Association is a good example of the important services that can be provided by an AIM affiliate to keep its members in touch with related activities throughout the world.

As befitting the largest....

....country in the world, with one of the fastest growing economies, the very first automatic identification exposition scheduled for China promises to attract the largest attendance of any such event ever held -- anywhere.

SCAN-CHINA '94 -- co-sponsored by the Article Numbering Centre of China and AIM International -- will take place on April 12-19 at the China World Trade Centre in Beijing. The organizers predict 40,000 visitors "from all sections of what potentially will become the world's biggest auto ID market."

Considering that this is a first-time event, planned with relatively short notice, the sale of vendor booths is proceeding at an amazing pace. According to the "Fact Sheet" released by the sponsors: "One hundred fifty booths have been sold to domestic Chinese exhibitors who are all manufacturers of automatic identification products -- mainly bar coding, but including some who will feature magnetic stripe and finger print identification. Some of these exhibitors are joint ventures, but the majority are fully Chinese."

Participants will also include 30 Japanese companies and, as of mid-January, seven western companies have signed up: Telxon, PSC, Intermec, Axicon, UBI, Scan Bar Canada and International Bar Code Systems. (A number of other American and European companies are expected to be represented by their Chinese or Japanese joint venture partners or distributors; e.g., Olympus Symbol.)

The unusual conference program will be held in two parts. On April 15-18, foreign presenters from the US, Europe and Japan will be speaking to the Chinese attendees (in English, with simultaneous translation) on a wide range of topics, starting with the development of auto ID technology, symbologies and standards, and moving through case history studies of many wide-ranging applications.

On April 15 and 16, a separate, simultaneous conference schedule will include prominent Chinese speakers from government, industry and commerce who will address the "foreign guests." These topics will introduce the visitors to trading opportunities in China and will cover such subjects as: "How a foreign company can establish a) distribution; b) joint venture; and c) manufacturing partnerships in China."

Arrangements for exhibitor booths, travel, hotel accommodations and special tour excursions are being handled by Ian Smith, ISM Marketing, The Old Vicarage, Haley Hill, Halifax HX3 6DR, England; Phone:44 422 368 368; Fax:44 422 355 604.