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<u>Is it possible</u>....

....for totally untrained consumers to successfully operate portable bar code scanning-computers?

The answer from the <u>NPD/Nielsen</u> Company is a resounding "Yes." Between now and the end of this year, the Port Washington, NY market research firm will be shipping 15,000 <u>Microwand II</u>'s, produced by <u>Hand Held Products</u>, to a nationwide panel of consumer families. These panelists, who have never held a bar code reader in their hands before, will be scanning the UPC symbols on all of their purchases, and entering additional related information in response to software prompts from the units.

Before UPC, consumer market research data was gathered almost entirely through personal interviews or handwritten home diaries. For many years, for example, NPD Research (one of the partners of NPD/Nielsen), has been the leader among the market research companies that compiles its information from home diaries. NPD maintains a consumer panel of 50,000 families, each of whom records all of its purchases, and then mails completed diaries to the company each month.

Both NPD and its clients, however, were aware that by the time the data from the diaries was entered, processed and analyzed, it was months old. About 10 years ago, therefore, NPD started to experiment with small scanning-computers to be placed in the homes of their panelists to scan the UPC symbol on all purchases. The data was to be downloaded weekly to the home office via modem over standard phone lines.

The concept was sound but there were problems at that time: small, inexpensive, reliable and programmable hardware wasn't available; not all consumer products were UPC source-marked; and a reference dictionary of all UPC product numbers had to be compiled. The project was set aside for a number of years, until 1986, when NPD Research entered into a joint venture with the A.C. Nielsen Co.

> [Nielsen,the largest market research company in the world (now owned by Dun & Bradstreet), earns most of its income from the basic information-gathering services it provides to supermarkets and manufacturers on consumer product movement. The company is best known, however, for its Nielsen Television Ratings, which are derived from the electronic devices that the company attaches to the TV sets of a selected consumer panel. Network programs generally live or die based on the audience share reported by the Nielsen Ratings.]

The new organization, NPD/Nielsen, combined the experience, knowledge and resources of its founding partners. It then set out to establish a nationwide panel of consumers and to place a portable computer-scanner in the hands of each member/family. These devices would be used to record the UPC numbers (and other information such as store name, price, special promotions) from each product purchased. The data would then be transmitted weekly, via phone/modem, to the host computer of the research company.

In addition, a Nielsen "black box" was to be attached to the TV set in each home. Those TV programs and commercials that are watched will be tied directly to the items purchased by the panelist. According to the new company, this was to be the ultimate research tool to test advertising effectiveness.

One of the first steps undertaken by the NPD/Nielsen staff was to select the computer-scanners to be used. By mid-1987, the short-list of suppliers had come down to Telxon and Hand Held Products (HHP). Five hundred units were purchased from each company for extensive field tests that were conducted in homes and in "focus groups" brought together in regional meetings. According to Steve Coffey, NPD/Nielsen's VP Data Collection: "Although both units worked well, the HHP Microwand II seemed to have the ergonomic and operating features that suited us best, and it was selected for final use."

A few months ago, an order was placed with Hand Held Products for over 15,000 of the Microwand II's. These are currently being shipped into the field as fast as NPD/Nielsen can recruit its new consumer panel. Based on hundreds of units tested, according to Coffey, consumer panelists of all ages and backgrounds are able to operate the scanning units almost immediately after unpacking them. The company estimates that, over a 12-month period of operation, about 10% of the units will be returned because of malfunctions.

NPD/Nielsen's major competitor in this type of consumer research is <u>Information Resources Inc</u>. <u>(IRI)</u>. The IRI method is to select a panel, give each panelist an identification card with a bar code symbol, and then try to make sure that these consumers shop only in scanning supermarkets. When IRI selects a panel in a small town, or in a defined neighborhood in a metropolitan area, the company will insure that all stores have front-end scanners -- even if the market research firm has to actually buy and install the scanners themselves in any store that is not yet equipped. IRI then gathers all of its data directly from the stores, which have accumulated the data from the shopping panelists.

IRI claims that its "passive" approach to gathering the data insures greater cooperation from the panelist, and thus more accuracy than the NPD/Nielsen method. IRI's arguments go a little like this: Our panelists' total effort is to just present their ID cards when shopping; NPD/Nielsen's panelists are difficult to sign up because not everyone wants to do all that work, and they probably don't scan and record everything when they get home anyway.

NPD/Nielsen rejects the IRI position. It maintains that its tests and data controls prove that their in-home scanning panelists do record substantially all their purchases; that IRI is losing purchases made in non-scanning retail outlets (e.g. convenience stores, drug stores); and that the NPD/Nielsen panel is a much more representative sample of the total population.

The battle is joined and the stakes are enormous. There are hundreds of millions of dollars spent annually in the US on market research. Billions more are invested in advertising and promotion programs which are largely based on

the accuracy of consumer market research. The one thing that everyone agrees upon is that these new methods for gathering accurate statistics have been made possible by the UPC symbol.

[One last note: Although untrained consumers can handle the scanner-computers, no one we've spoken with sees any other large market in the near future for in-home scanners. Remember the Magic Wand Speaking Reader from Texas Instruments (SCAN July 82)? The Casiotone Musical Keyboard with scanner (SCAN Feb 82)? The Panasonic VCR with automated programing input via scanning (SCAN Mar 87, Aug 87)? None of these consumer products had any staying power. We do expect to see Arbitron Ratings, another market research company, make a move toward installing in-home scanners similar to the NPD/Nielsen type. It appears, however, that Arbitron (a division of Control Data Corp.) will take a few years -- and an estimated $125 million -- before its program will develop into any meaningful quantity of equipment.]

During the next three months....

....we will be receiving direct reports from SCAN-TECH shows to be held in 7 countries on 4 continents. Some are important continuations of established events -- others will be breaking new ground.

The largest and oldest, of course, is SCAN-TECH/US. It was just 6 years ago that the first SCAN-TECH was held in Dallas (SCAN Dec 82). There were 61 tabletop exhibits, which complemented a seminar program explaining the basics of bar code scanning. This year, from October 31 to November 1, SCAN-TECH/US will be at Chicago's McCormick Place where 225 exhibitors, supported by over 2,000 vendor personnel, will be parading their best for about 6,000 visitors.

The second-largest auto ID show is SCAN-TECH/Europe 88, scheduled October 11-13 at last year's successful Dusseldorf venue. The show will be more than double the size of the 1987 exhibition.

This year, both SCAN TECH/US and Europe are featuring field trips for demonstrations of bar code scanning systems in manufacturing operations. From Chicago, a group will visit the successful Allen-Bradley state-of-the-art factory-within-a-factory, where hundreds of bar code scanners are in use in their Computer Integrated Manufacturing (CIM) facility. From Dusseldorf, the field trip will be to the Mannesmann Pipe Fabrication Plant, where the huge pipes transporting gas from the Soviet Union are manufactured with the help of bar code scanning.

Talking about the Soviet Union, we will be attending the premier of SCAN/Moscow on September 20-21. Although no one anticipates an overnight explosion of automatic identification in that country, it does offer a significant opportunity to make important trading contacts for the future (the shortage of "hard" foreign currency, and the unknown prospects for glastnost and perestroika notwithstanding).

From the other side of the world, we will be covering SCAN-TECH shows in Japan and Australia, scheduled for September 7-10 and August 30-31 respectively. Bill Hakanson, Executive Director of AIM, will be representing AIM Int'l at both events and promises to provide SCAN with a complete account. Other national shows scheduled for September are in Sweden and Finland.

COMMENT

Are there too many shows? That depends. We have consistently maintained that there can't be too many educational seminars. If the dissemination of information is the driving force behind a show, and if it is supported by simple exhibits to help demonstrate operating systems, we have no quarrel. We are not so sure about the razzmatazz of the full-blown "expositions," however, which often detract from the effort needed to get the word out to corporate management of the potential customers.

It is generally acknowledged that the <u>non-retail</u> *market for auto ID all over the world is not growing at the pace expected -- whether it be in factories, warehouses, health provider facilities, or transportation. The automatic identification industry must channel even more of its efforts and energies to enlighten and educate the decision makers of those companies not yet fully committed to this technology..*

Four good examples of worthwhile....

....educational conferences and seminar series that are scheduled to take place during the next few months:

- The <u>Automotive Industry Action Group (AIAG)</u> is launching <u>AUTO-TECH 88</u> at Detroit's Cobo Hall on October 11-13. The upbeat program announcement promises a detailed look at automatic identification, computer-aided design and manufacturing (CAD/CAM) and electronic data interchange (EDI). According to the AIAG, these three technologies are expected to "power North America's resurgent auto industry in the 1990's." There will be 30 speakers appearing at the conference. Workshop leaders, exhibitors and industry representatives will be available to answer the questions of both new and experienced users. AIAG, 17117 W. Nine Mile Road, Southfield, MI 48075; 313/569-6505.

- <u>Future Forum</u>, characterized by its sponsor as an "interesting and unique event," will focus on RF/ID and Smart Cards. The three-day conference will be organized in three sections: Part One will deal with the future in terms of marketing and sales opportunities and product improvements; Part Two will explain how this technology will be used; Part Three will allow the government and the user communities to state their current and future needs. The Future Forum will be held on November 29-30 and December 1 at the Sheraton National Hotel, Arlington, VA. The sponsor of this first-time event is Bushnell Consulting Group, 24 Far View Road, Chalfont, PA 18914; 215/822-6880.

- The <u>American Management Association</u> (AMA), with the cooperation of the Automatic Identification Manufacturers (AIM), is presenting "Bar Coding in Manufacturing Operations." A number of very knowledgeable individuals from the auto ID industry will be making presentations at this AMA/AIM series: Rich Bravman (Symbol Tech); Ron Donoghue (Lowry); Ivan Jeanblanc (IDI); Henry Johnson (Allen Bradley); Jack Kindsvater (Zebra); Ben Nelson (Scanmark); Bill Shultz (Laserlight); and Jeff Turcotte (Dennison). The seminars are scheduled to be held in New York (Sept. 19-20); Los Angeles (Oct. 12-13); and Southfield, MI (Nov. 15-16). AMA, 135 West 50 Street, New York, NY 10020; 518/891-0065.

- The <u>Rochester Institute of Technology</u> (RIT) has maintained a long involvement with bar coding as it relates to the Graphic Arts Industry. This month, RIT will sponsor "How to Make Bar Code Technology Pay Off" in Tarrytown, NY (September 14-15); Chicago (September 19-20); and Los Angeles (September 26-27). These presentations, led by Dean Szajna and Jerome O'Neill, of the consulting firm Abel, Hale & Black, will focus on "How to Reap the Benefits of Bar Code Data Collection in Your Graphic Arts Operations." RIT/T&E Seminar Center, One Lomb Memorial Drive, Rochester, NY 14623; 716/475-2757.

<u>Today's riddle: Name the company</u>....

....which doubled its sales and increased its earnings 2 1/2 times during its past fiscal year (ended 6/30/88); which anticipates another record year in FY 89 (although not at the same rates as the past few years); which some analysts are projecting to earn about $1.30-$1.40 per share in FY 89 vs. $1.07 in FY 88 -- and whose common shares plummeted 40%, from a high of about 28 to under 17, near the end of August?

The company, of course, is <u>Symbol Technologies.</u> The firm's financial image is suffering from a negative backlash, particularly among the institutional investors who hold about 2/3 of the company's stock. This drop in share value seems to have been prompted by lukewarm reports from a few financial analysts, and also from the somewhat flat results and forecasts of other auto ID companies (notably MSI and Telxon).

One factor that contributed to the analysts' caution is Symbols' lowered sales projection for the first half of its FY 89. This reduction is based on the company's strong dependence on the department store retail market, and the reports that some chains have deferred purchases of front-end automation equipment until early (calendar) 1989. (We might add that the investment community wasn't too thrilled when financier Saul Steinberg -- the company's largest stockholder -- sold 109,000 shares of his stock last May when the market price was near its all-time high.)

SYMBOL TECHNOLOGIES	12 Months ended 6/30		3 Months ended 6/30	
	1988	1987	1988	1987
Revenues ($000)	$89,033	$45,443	$24,441	$15,296
Net Income ($000)	20,205	8,040	5,412	2,570
Net Income/Share	1.07	.57	.28	.15

The question remains: was the market's judgment of Symbol's future too high at $28/share -- or too low at $17? Whichever turns out to be true, it's another example of the investment community's obsession with short term results (SCAN Dec 87, Aug 88). Financial analyst Walter Winnitzki (Brown Brothers Harriman), who has been following the auto ID stocks, is sticking with his earnings estimate of $1.30 per share for fiscal year 1989. While he notes the probable slow first half of that year for the company, he tends to discount any short-term earnings fluctuations, and remains "bullish" on Symbol Technologies for the long-term.

Symbol Technologies received two US patents in July, bringing its total to 13. According to Chairman/CEO Jerome Swartz, "Patent number 4758717 is a basic patent on the combination of a laser scanner and intelligent data collection computer in a single handheld unit. In 1984 Symbol licensed Mars Electronics under the technology covered by this patent." The second patent -- No. 4760248 -- relates to the lightweight and compact design of Symbol's laser diode-based scanners.

If we were to take ....

...a financial snapshot of the bar code scanning industry as of the middle of 1988 -- based on the public companies whose reports we can examine -- the resulting picture is of two distinct tiers, both in size and results.

The top tier is made up of the four larger, more successful companies: Intermec, MSI Data, Symbol Technologies and Telxon. These companies have emerged as the bellwethers that the financial community has adopted as their benchmarks to measure the progress of the automatic identification industry. It is no accident that the reported financial results of any one of the "Big Four" tend to affect the reaction of the stock market to the others. The performance of this group over the past three years, with some minor blips, has been characterized by substantial increases in both annual revenues and earnings.

The second tier consists of four smaller companies whose recent results indicate generally flat sales, accompanied by somewhat erratic earnings performances. This "Gang of Four" -- Computer Identics (CI), Graphic Technology (GTI), Imtec and Photographic Sciences (PSC) -- are still seeking the way to break out of this pack and join the leaders.

- At CI, revenues continue to run at the annual rate of $12-$13 million, coupled with substantial losses ($675,000 for the 6 months ended June 30 this year compared to last year's $1.6 million deficit). It is still too early to assess CI's recent move to cut some of its losses by shutting down its System Division (SCAN June 88, July 88). The company has opened two new sales offices in the US and is stepping up its efforts to develop and sell standard hardware and software for the industrial automation, material handling and data collection markets. Through it all, President Frank Wezniak voices optimism that CI will emerge as a successful, profitable company.

- Graphic Technology's performance stands out as the possible exception in this group of smaller companies, and this firm may have the best potential for moving into the "top tier." GTI has reported a consistent, if not spectacular, record of sales and earnings increases over the past three years. The results of this last fiscal year (June 30, 1988) showed improved earnings -- up 36% to $2.2 million ($.57 per share) -- on $25.6 million in revenues. Sales for the year were up a modest 9% with fourth quarter revenues fairly flat. These results do not yet reflect any significant returns from new products that President Terry van der Tuuk expects will contribute more substantially to future sales and earnings. In particular, GTI looks to its Accu-Chek electronic shelf label to become one of its winners (SCAN July 87).

- Imtec, the smallest company in the second tier group, has been running at around the break-even point in earnings for the past two years, with sales stuck in the $3-$4 million range. The company is attempting to break away from its recent dependence on US government sales (48% last year, compared with 24% so far this year), which it considers "an uncertain" source of business. Imtec is concentrating on new products and is expanding sales efforts in the industrial bar code market, which President Jim William sees as the future for his company.

- With its new management team in place for only half a year (SCAN Jan 88), PSC reported sales up 25% (to $5.5 million) for the six months ended June 30, with earnings at about break-even -- an improvement over last year's $.08 per share loss. PSC continues to do well with its Quick-Check verifiers and handheld (infrared) laser diode scanners. The major test for the company lies ahead when the <u>visible</u> laser diode scanners are scheduled to come on the market in volume by the end of this year. If PSC is to ride the revenue and profit curves upward, it will have to be based on the success of that product.

Our concentration on these few public companies does not necessarily reflect the progress of all the smaller companies in the industry. A number of privately-held firms do appear to be doing very well -- Hand Held Products, AccuSort, Metrologic and Control Module come immediately to mind. But, for all of them, breaking out of the annual sales range of $10 to $25 million, coupled with sustained, profitable growth, is not an easy task -- even in an industry with an overall substantial growth rate such as ours.

<u>It's not exactly</u>....

....a battle of epic proportions, but the exchange of barbs by the two leading automatic identification magazines has raised some temperatures.

It heated up when the tabloid-size *Auto ID News* circulated an analysis of its advertising growth purporting to illustrate how successful it has been when compared to its rival *ID Systems*. *Auto ID News* boasted that its gain in advertising lineage was greater than that of its main competitor, when comparing total advertising revenues and annual growth rates. Tim Jameison, who recently succeeded Laura Hanson as the new publisher of *ID Systems* (SCAN June 88), wasn't about to take his rival's claim lying down and issued his own analysis concluding exactly the opposite.

Jameison says, "In comparing advertising page growth, a page of advertising is a page, a half-page is a half-page -- no matter what the size of the magazine." He continues, "We don't think you can count a tabloid page as 1.75 pages, equate it with 1.0 page of standard size, and then say a gap exists -- as the competition says. They're not counting pages, they're counting square inches!"

Doug Edgell, *Auto ID News* publisher, doesn't see it that way at all. "If <u>you</u> sell gallons and <u>I</u> sell quarts," he postulates, "and we both sell 5 each, who's sold more? More what...units? Neither of us. More liquid? You have."

The issue boils down to whether the advertising impact of an 11" x 15" full page ad in a tabloid (*Auto ID News*) is greater than one in a 7" x 10" standard size periodical (*ID Systems*). We remember the same arguments being raised 20 or 30 years ago between *Reader's Digest* and *Life Magazine* -- and we don't know who won that one.

Our only conclusions are that we're happy we don't sell any advertising -- and that the automatic identification industry is fortunate to have two successful and respectable magazines fighting for the available advertising dollars.

The first draft document,....

....written three years ago by the ANSI Committee on Bar Code Print Quality (Joint X3A1.3/MH10), was circulated for comment late in 1985 (SCAN Nov 85). It contained some new -- some thought "radical" -- approaches on how to measure print contrast and bar/space widths.

There was a great deal of confidence, at that time, that the combined efforts of the X3A1.3 group (that had developed the OCR standards) and the newer MH10.8 Committee (which had just completed its work on the bar code symbols on unit load and transport packages) would move ahead rapidly to complete this important standard. More and more anguished cries were being heard from the field, back then, that poorly printed symbols were the weakest link in the proper performance of many bar coding systems.

In subsequent articles (SCAN Apr 86, Oct 86) we urged the Committee to streamline its procedures and provide the industry with a much-needed specification for the verification of printed symbols. In our last review of the committee's work, over a year ago (SCAN Aug 87), a select Work Group was about to release the results of its extensive testing procedures. After a number of meetings, and numerous revisions, the Draft of July 25, 1988 is now out for its initial review and ballot among Committee members.

This current version bears little resemblance to the initial material of 1985. As it is now written, the ANSI standard on bar code print quality presents even more dramatic changes to the methods that have been used, or even proposed, up to now to measure, evaluate and verify bar code symbols.

Some examples: measurements of reflectivity are to be based on variable aperture sizes with a resulting "Scan Reflectance Profile"; measurements of element widths require the establishment of a "global threshold"; a "Scan Reflectance Profile Grading" scheme assigns academic letter grades of A, B, C, D and F as a method of identifying relative levels of print quality; trade-offs of quality between edge definition and print contrast are intended to allow for greater flexibility in quality judgments.

The proposed standard also introduces many more elements that will be involved in print quality evaluation including opacity, porosity, gloss, grain and smoothness of the substrate, as well as environmental effects.

The next meeting of the ANSI Committee will be September 14-16 in Myrtle Beach. More information and copies of the draft are available from co-chairmen Chuck Biss (Photographic Sciences, 800/828-6489) or Gary Ahlquist (Eastman Kodak 716/477-1370).