## DID YOU KNOW?
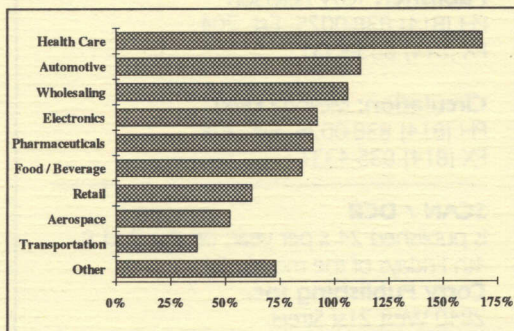
### HEALTH CARE, AUTOMOTIVE AND WHOLESALE TO LEAD DEMAND FOR 2-D BAR CODE

End-user demand for 2-D bar code products and services will create a $200 million global market by the year 2000. Transportation-related industries were the largest consumers of 2-D bar code

**1995-1999 GLOBAL CONSUMPTION ANNUAL GROWTH RATES OF 2-D BAR CODE PRODUCTS BY VERTICAL MARKET**
**1995 Total = $14.9 million US**

| Market | |
|---|---|
| Health Care | |
| Automotive | |
| Wholesaling | |
| Electronics | |
| Pharmaceuticals | |
| Food / Beverage | |
| Retail | |
| Aerospace | |
| Transportation | |
| Other | |

(0% – 175%)

products and services in 1995. However, a number of industries are predicting consumption growth of more than 100% per year for the next five years.

Health care industries are expected to lead the growth with applications such as lot/item tracking, records management, and security and access control. Vendors are responding with broader product offerings and more robust education and training.

For more information: **Venture Development Corporation**, Natick, MA, PH (508) 653-9000, FX (508) 653-9836, E-mail: vdc4u@aol.com.

## Symbol, Telxon, And Aironet Working Together?

*by Rick Morgan*

Those who doubt the power of customer demand should take note of significant milestones occurring in the radio frequency, wireless LAN [local area network] industry. End-users of wireless LAN systems have demanded their suppliers "get their act together" and finalize a standard for interoperability. Proof of this power was evident in a recent press release claiming that **Symbol Technologies**, **Telxon** and **Aironet Wireless Communications, Inc.** [a wholly-owned subsidiary of Telxon] were "working together" to provide interoperability of their wireless LAN products.

It is no secret to anyone in the ADC [automatic data capture] industry that Telxon and Symbol Technologies are fierce competitors. What may be a secret is the pressure their major customers are exerting on them to put aside their differences and work for true interoperability. "Customer demand has been the driving force behind the recent surge of RF manufacturers pledging allegiance to the IEEE 802.11 wireless LAN standard," said David Loadman, Telxon senior vice president. "The issue of interoperability is important to our companies because our customers are tired of seeing us [manufacturers of wireless LAN products] bickering and squabbling amongst ourselves. Customers want our products to interoperate and they want it to happen now."

Symbol and Telxon are not the only companies being pressured by end-users of wireless LAN systems. Press releases have been pouring in weekly from companies professing support for IEEE 802.11. There is a sudden urge to work for interoperability. Although many of these companies have been involved in developing standards, the need to produce a finalized specification seems to have intensified in the past three months. And, after six years of debate over the interoperability problem, the IEEE 802.11 committee finally agreed to accept the Draft 4 version of the standard and are sending it forward for ratification by IEEE 802 members [see accompanying story page 3].

As recently as two months ago, **Proxim** [a manufacturer of access points for wireless LAN systems] announced the Wireless LAN Interoperability Forum [WLIF], a consortium of manufacturers who joined together to develop an interim specification for interoperability. Their theory was that the IEEE 802.11 standard could be a long time coming and customers want interoperability now. Members of the WLIF said their customers were delaying purchasing decisions because of frustration over proprietary hardware and the lack of interoperability. [*Editor's note: Proxim's RangeLan2 access point does not meet the current IEEE 802.11 D4 standard. In the press release announcing the WLIF, Proxim stated, "As new standards emerge, including 802.11 in the 2.4GHz band and other standards in different bands, the WLIF will incorporate them into its charter activities and will develop a transition path to them from the current RangeLan2-based interface."*]

Throughout the industry, companies are scrambling to convince their customers interoperability is coming soon. But how much of the information being released should be taken at face value? With the passage of IEEE 802.11 and the professed support from most of the industry, can end-users of wireless LAN systems now assume, for example, that a Telxon pen-based scanner will automatically communicate with a Symbol access point? We don't think so.

*SCAN/DCR* talked with the principals in the Symbol, Telxon and Aironet "agreement." What we found was there have been discussions amongst the top management of each of the companies. And, all three participants in the talks have agreed to fully promote and support the IEEE 802.11 D4 standard. Beyond that, no definite conclusions can be inferred from the press release.

The most ambiguous part of the press release was the reference to "an agreement to work together to provide future interoperability of their respective frequency-hopping, wireless, local area networks." The first question in our minds [and in our interviews] was, "To what degree will the companies work together?"

When we spoke with Fred Heiman, executive vice president of Symbol Technologies, he told us, "It is indeed our intent to have complete compatibility between all wireless LAN products. We invite Telxon to meet with us to work together toward this end. Our customers have made it clear to us they do not want to be restricted by proprietary products. We believe eventually all wireless networking hardware will be compatible." Heiman is credited by Symbol as the pioneer of the company's wireless LAN system which includes the Spectrum24 frequency-hopping access point.

Roger Murphy, president & CEO of Aironet, stated, "We all recognize interoperability is good for the industry. The open standard provided by IEEE 802.11 will accelerate the growth of the wireless LAN market. However, there has been no written agreement stating that all of our products will be compatible with the Symbol wireless line."

Explaining Telxon's view, Loadman added, "There cannot be

true interoperability between Symbol and Telxon/Aironet products until Symbol gives their support to the Inter-Access Point Protocol (IAPP). Symbol has given no indication it will join **Lucent Technologies**, Aironet Wireless Communications, and **Digital Ocean** in their efforts for interoperability between access points from multiple vendors. However, we have agreed to support the IEEE 802.11 interoperability standard and are willing to allow independent labs to verify compliance of our products with the specification."

Telxon/Aironet plans to release the FCC approved, IEEE 802.11 compliant, Arlan 3000, 2.4 GHz frequency-hopping radio [access point] within the next several weeks. [*There are two types of RF radios, direct-sequence and frequency-hopping. Direct-sequence radios offer higher performance but are more costly to manufacture. A direct-sequence radio operates in a wide band (22 MHZ) frequency and uses all the area or frequencies within the band. Frequency-hopping radios are much less expensive to produce and sell but do not offer the performance of direct-sequence access points. A frequency-hopping radio operates within an 84 MHz band. The RF system uses only one MHz at a time but is constantly switching or hopping from one frequency to another using a total of 79 frequencies of the 84 total available.*]

**Sears** already signed a contract with Telxon for more than 10,000 of the new radios to use for warehousing purposes and this is just the initial rollout. Loadman assured us the company will continue to support its customers using the Aironet direct-frequency wireless systems. "We have over 325,000 of our direct-frequency radios in the field, and these customers deserve our backing for the systems they have in place," said Loadman. "Within the next nine months to a year, we hope to have a modification package to make our direct-frequency radios compliant with 802.11."

According to Loadman, Sears and other major customers have been asking for interoperability for the past three years. Basically, these customers said, "Enough is enough! Your industry needs to get its act together and pass a standard for interoperability in wireless, radio frequency, LAN systems. Hopefully the new standard will offer the stability the industry has been searching for."

*Comment: We believe the announcement of the formation of the WLIF by Proxim and Data General in May of this year triggered a response from members of the wireless LAN industry. Customers were pressuring suppliers of wireless LAN products to address their concerns over interoperability. Proxim forced these suppliers to come forward in favor of IEEE 802.11 by offering interim standards. What remains to be seen is* *how the newly approved IEEE 802.11 standard will affect actual interoperability. Will companies find ways to meet the specification but still maintain a proprietary edge with their products?*

**Aironet Wireless Communications, Inc.**, Akron, OH, PH (330) 665-7900, FX (330) 665-7922, E-mail: tsmit@aironet.com, **Digital Ocean, Inc.**, Lenexa, KS, PH (913) 888-3380, FX (913) 888-3342, E-mail: marketing@digocean.com, **Lucent Technologies**, Murray Hill, NJ, PH (908) 559-6405, FX (908) 559-1997, E-mail: mammen@attmail.com, **Proxim, Inc.**, Mountain View, CA, PH (415) 960-1630, FX (414) 960-1984, E-mail: brian@proxim.com, **Symbol Technologies**, San Jose, CA, PH (408) 369-2600, FX (408) 446-4630, E-mail: fred@psd.symbol.com **Telxon Corporation**, Akron, OH, PH (330) 867-3700, FX (330) 873-2889, E-mail: dload@telxon.com.

# Long-Awaited Standards Are Finally Here For RF Industry

### IEEE 802.11 Passed By Nearly Unanimous Vote
*by Rick Morgan*

If you heard a loud, windy noise on July 12, 1996, it was probably one of two things ... Hurricane Bertha or the sigh of relief from IEEE 802.11 committee members meeting in the Netherlands upon ratifying a new standard for wireless LAN [local area network] interoperability. After six years of labor, the committee accepted the Draft 4 version of IEEE 802.11 by a 91% margin.

Vic Hayes, chairman of the committee [and senior consultant for standards & regulations, **Lucent Technologies**], stated, "There were times when I wondered if we'd ever finish the project. But I knew we'd all have to be patient if we were to come up with a robust standard worthy of our pride. I believe we have achieved our goals with the passage of IEEE 802.11 Draft 4."

There were many reasons why the development of the IEEE 802.11 standard progressed so slowly. Hayes said the group faced a unique challenge because radio frequency LANs are a relatively new medium compared to other technologies in the ADC industry. The debate over standards raised a variety of questions and concerns from the technically-oriented, engineering community who are members of the committee. Working through these problems has taken over six years. The standard had to define power consumption levels, 2.4 GHz frequency-hopping, and other complexities with working over the air rather than through a cabled system.

The IEEE 802.11 committee met at the University of Trente, in Enschede, Netherlands from July 8 to July 12, 1996. Of the 69 members in attendance, only 4 voted 'no' to the standard. After further discussion, three of the 'no' votes were changed to 'yes,' leaving only one 'no' vote on record.

The next level in the approval process is IEEE 802 Committee which meets in November of this year. At this meeting, another vote will be taken. Members discuss objections by those who vote 'no' in this meeting. If necessary, changes will be made to the proposed standard. The 802 Committee will review the revised standard and take a second confirmation ballot.

## IEEE 802.11 FLOW CHART

**Working Group Formed
To Develop Goals & Objectives**

↓

**IEEE 802 Committee
Hears Goals & Gives
Approval To Proceed,
Working Group Proceeds As
IEEE 802.11 Committee.**

↓

**Upon Ratification By IEEE 802.11,
The Standard Is Sent Back To
IEEE 802 Committee For Approval**

↓

**Final Approval By
IEEE Standards Board**

↓

**Standard Is
Published**
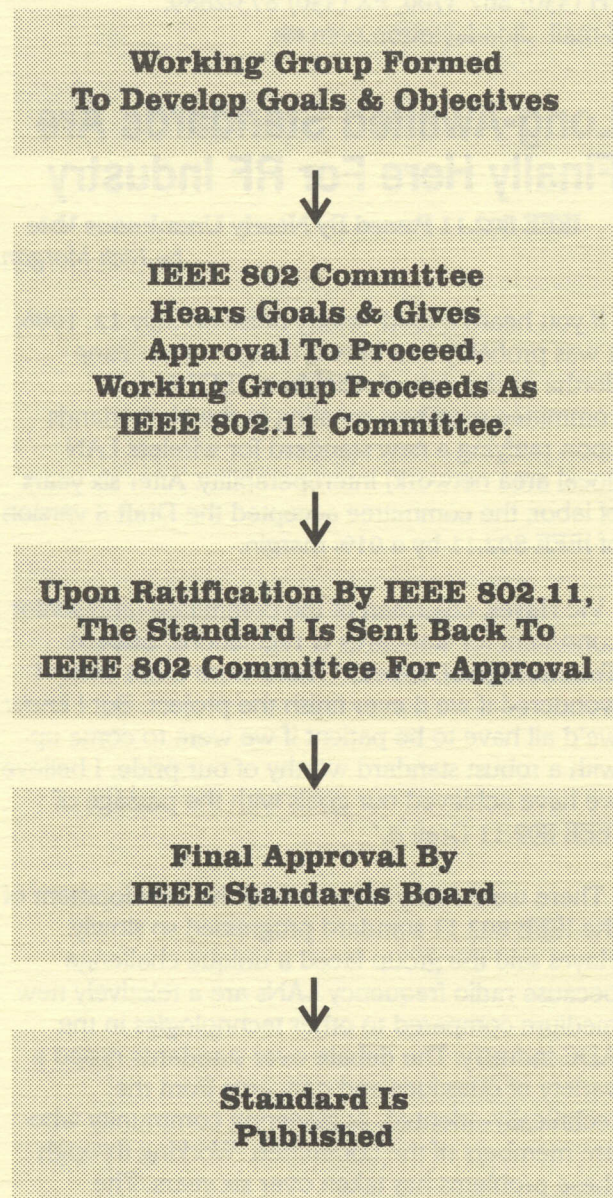
In March 1997, the specification will be forwarded to the IEEE Standards Board. In June 1997, another vote will be taken for formal ratification and if accepted, the standard will be published in

September. Hayes is confident all will go well with the approval process because "the industry is eager to put this to rest and move on."

The IEEE 802.11 "working group" was formed in July 1990 and held its first meeting in September of that year. In March 1991, the committee received approval for their project from the Standards Board and the real work of forming the standard began.

Committee membership was on a floating basis. This means members could attend meetings whenever they were able. To establish formal membership, candidates had to participate in at least two meetings. At the third meeting, they became floating members with voting privileges. The committee started with 29 floating members. Membership peaked at the November 1993 meeting when 127 members attended.

From our conversations with leaders in the wireless LAN industry, it appears people are lining up to congratulate the IEEE 802.11 committee for finalizing the specification. "I'm proud of what our committee has done," said Hayes. "This was a very impressive group of people and their attitudes were great. Members put aside their companies' individual concerns to work on a standard that is good for the industry." *SCAN*

# Biometrics Identification Is Reaching New Markets
*by Rick Morgan*

What is the most widely-used body part in biometric technology? If your answer was the fingerprint, you're absolutely _wrong_. The most-widely used body part in biometric technology is hand geometry with over 12,000 installations around the world.

According to Bill Spence, director of sales and marketing, **Recognition Systems, Inc.**, many people confuse hand geometry with a palm print. Hand geometry is a 3-Dimensional [3-D] view of four fingers and about 3/4 of the actual hand. With the use of a CCD [charged couple device] "hand reader," a 3-D video photo is taken of the hand. The odds of two people having the same hand geometry are less than the odds of two people having the same fingerprint.

[Biometric ID systems digitally encode and store personal characteristics, ie. **voice**, **fingerprint**, **signature**, **retina/iris**, and **hand**. These characteristics can be used to instantaneously and nearly infallibly identify individuals. Biometric ID systems have three primary components: an

automated mechanism that scans and captures a digital or anolog image of a living personal characteristic; a second component which handles compression, processing, storage and comparison of the image with the stored data; and, a third component which interfaces with applications systems.]

In 1986, when Recognition Systems developed the concept of reading hand geometry, biometric systems were used primarily for high-security applications. These systems ranged from $8,000 to $20,000 in cost. The first hand reader marketed by the company sold for $8,000. By 1988, the company improved the technology and lowered the price to $5,000. In 1991, the company lowered the cost of its readers to the current selling price of $2,500.

Biometric technology is typically used to ensure the security of controlled access areas or equipment. But in the last two years, selling "time & attendance" [T&A] systems has become a lucrative market for Recognition Systems. "Time and attendance is by far our fastest growing market," said Spence. "After only two years, it now accounts for 30% of our total shipments."

Recognition Systems offers a basic software package for access control [HandNet]. The package costs $650 and has the ability to process up to 256 users. A $450 upgrade raises the potential user capacity to 27,000. In addition, the company's hand readers interface with software from other T&A providers.

It takes approximately 30 seconds to record and store a person's hand geometry into the reader. The user places his hand in the reader and the device takes a 3-D photo, similar to how a television camera operates. The information is compressed onto a nine-byte template. The same reader that records and stores a person's hand geometry also serves as a reader for facility access. Using the reader to gain access to a building takes about 2-3 seconds.

Hand geometry readers have a 99.9% accuracy rate compared to 99% for fingerprints. In an application with 400 people using the system each day, fingerprint reading would yield four errors (people who are denied access) per day or 20 errors per week. With hand geometry reading, there would only be two errors per week.

Therefore, hand geometry eliminates many of the problems associated with traditional forms of access control. Access systems using some form of cards [usually a bar code or mag stripe] for entry are more expensive to maintain. In addition to the initial cost of the cards, there is the cost of replacement due to



*This ID3D Hand Key, hand-geometry, scanner from Recognition Systems, Inc. will be used as a major part of security at the 1996 Olympic Games in Atlanta, Georgia. Biometric Identification will help control access to the Olympic Village.*

loss or theft. Employees using card systems often say, "Oops, I forgot my ID card," or "My dog ate it." Obviously, few employees forget their hands or have them eaten by the family pet.

Applications for biometric systems continue to grow and have grown significantly in the last five years. Any company that uses a form of identification via an ID card, password/PIN or key and lock, has the ability to successfully install and use hand geometry readers. Some examples of application areas which currently use RSI's hand scanning systems include:

**Airports:** The San Francisco International Airport has installed more than 80 of RSI's ID3D HandKey™ portals to provide identification and access control to all entryways onto the airport tarmac. At this point, the airport's biometric system serves more than 30,000 individual users.

**Courts:** The Lane County Courthouse in Oregon uses hand identification for entry into judicial offices and the judge's chambers. In Southern California, the Los Angeles Criminal Court house, which housed the highly-publicized O.J. Simpson trial, has also installed hand geometry technology.

**Prisons:** More than 25 prisons across the globe have installed hand geometry technology for entry verification/control (EVC) and guard and visitor identification. The pilot program was conducted in a federal prison in Georgia, but has since been installed and instituted within prisons based in the United States, Colombia and the United Kingdom.

**Colleges:** The University of Georgia has employed hand geometry technology to control access to the student cafeteria. More than 5,000 students require access each day, creating over 15,000 transactions per day. New York University's Manhattan campus installed biometric hand readers to replace ID card identification and secure access to a 1,000 student dormitory.

**Athletic Clubs:** Over 40 YMCA's and health clubs across the country have installed hand geometry systems for access and identification since the pilot program at the Ashland, Oregon YMCA.

**Day-Care Centers:** Lotus Development Corporation in Cambridge, MA installed a biometric identification system into the on-site employee daycare facility to avoid unauthorized pick-up of children.

**Nuclear Power Plants:** More than 60% of the nation's power plants have implemented biometric technology to provide employee identification and access control.

### International applications:

**Government:** The Colombian government has integrated biometric devices into voting machines used by members of the national parliament. This ensures that elected representatives are actually the individuals doing the voting.

**Banks:** The banking community in Italy has selected hand recognition as an effective means for quickly identifying and giving access to customers.

**INSPASS:** One of the newest implementations of biometric technology for identification and security is the use of hand geometry by the Immigration and Naturalization Service [INS] in the Passenger Accelerated Service System [INSPASS]. This system speeds up customs admission to the United States for frequent international travelers. [SCAN/DCR May 10, 1996]

There have even been hand geometry systems installed for security and identification in gambling casinos and sperm banks. But the most publicized installation is at the 1996 Olympic Games in Atlanta, Georgia. Recognition Systems is providing hand geometry readers for use within the parameters of Olympic Village. The devices provide a biometric aspect to the security system for athletes, families, officials, coaches and other visitors. When access to a particular area or identification is required, the ID3D HandKey reader recalls the user's template which is retrieved from memory via a password.

The user is identified or rejected through the 3-Dimensional scan of his/her hand geometry. The overall security system was developed by Sensormatic.

According to Spence, user-acceptance is the most critical aspect of biometric systems. "Hand geometry does not cause as much fear in the user as other forms of biometric identification," said Spence. "Although retinal/iris scanning is a very accurate solution, there is a natural tendency for the public to shy away from anything placed near the eye. Fingerprinting has the stigma of criminal processing attached to it. Hand geometry is not plagued by these problems, but it is still very important to make users feel comfortable with the system."

The trend for biometric system application is toward banks, health clubs, YMCAs, etc. The beauty of the system is that it can also be incorporated into a smart card system. For example, rather than using a PIN (personal identification number) system for security, hand geometry information can be loaded into a computer chip on a smart card and used for access control. As our day-to-day lifestyles become more dependent on ADC technology, the use of biometric systems will become increasingly important as a method of securing information.

For more information: **Recognition Systems, Inc.**, Campbell, CA, PH (408) 364-6960, FX (408) 370-3679, E-mail: billspence@recogsys.com. ▚

## FINANCIAL NEWS

# Analysts Divided Over Telxon Stock Performance

*by Rick Morgan*

The June 14, 1996 issue of *SCAN/DCR* contained an analysis of **Telxon's** fiscal year end report and the subsequent drop in price of the company's stock. In a matter of days, the company's stock dropped from a high near $28 1/2 to $19 1/2. Within a week, the stock dropped to $17 7/8 and on June 20, the stock's value plummeted 32% in one day to a 1996 low of $9 7/8. It has currently been hovering around the $11 to $12 mark.

The July 5 edition of *The Wall Street Journal* contained an article by staff reporter, John Dorfman, on the recent activity of Telxon's stock. If you missed it, we think there's information you should know.

There are two main schools of thought that abide throughout the article. Not surprisingly, one says buy Telxon stock now, it's on sale. The other says don't touch it with the proverbial ten-foot pole.

The argument for buying the stock is based on Telxon's history of hitting bottom, restructuring and rebounding. Telxon went through similar problems in late 1992 and early 1993(SCAN 2/93). When analysts were skeptical of the company's fiscal, year-end report, a major reorganization took place throughout the company. The price of its stock dropped drastically. Former Telxon President, Ray Meyo was ousted. Telxon was sued by shareholders who alleged the company kept stock prices high by issuing misleading projections. However, the good news is that the company not only recovered from its problems but in the last five years, revenues have grown from $200 million per year to $600 million per year.

The article in *The Journal* quoted a number of analysts who follow public companies in the ADC market. One such analyst was David A. Katz, chief investment officer of **Matrix Asset Advisors**. Katz noted that Telxon has had three significant declines in the last eight years. In the previous two, it proved smart to "buy in the dip." His firm bought the stock in 1993 after its last major decline and Katz believes it may be time to do it again. "We made about 100% in about 1 1/2 years," said Katz.

## TELXON CORPORATION - TEN YEAR HIGH AND LOW STOCK PRICES

| YEAR | LOW | HIGH |
|------|------|------|
| 1985 | 8.113 | 16.000 |
| 1986 | 13.836 | 27.500 |
| 1987 | 10.500 | 28.500 |
| 1988 | 13.000 | 24.750 |
| 1989 | 6.375 | 20.250 |
| 1990 | 4.750 | 15.500 |
| 1991 | 13.375 | 28.125 |
| 1992 | 11.250 | 28.250 |
| 1993 | 6.500 | 12.500 |
| 1994 | 10.000 | 18.250 |
| 1995 | 12.000 | 26.500 |
| 1996 | 9.750 | 28.500 |

Katz did not speak highly of the company in terms of the way they communicate or run their business. He also pointed out that their profits are often erratic. But at the current price of the company's stock, he feels it's a good buy.

According to *The Journal*, another analyst who is recommending Telxon stock is Lisa Bogaty, of **Prudential Securities**. Bogaty is impressed with the list of new product entries coming from Telxon

in the Fall of this year. She was particularly impressed with customer reaction to the recently introduced rugged laptop computers and pen computers.

Bogaty mentioned that Telxon has taken an aggressive approach to pricing and lowering costs in the manufacturing of the new products. This has not been a Telxon strength in the past.

Much of what has analysts worried about Telxon is due to a June 20 announcement that the company was in the middle of a new product roll-out and would probably lose money over the next two quarters. Couple this with the way analysts viewed Telxon's fiscal year end earning per share [analysts did not like the quality of the earnings] and it is easy to see why many of them are shying away from the company's stock.

Robert Anastasi of **Robinson-Humphrey**, a three-time All-Star in *The Wall Street Journal's* annual survey of analyst performance, expressed a leery feeling about the stock because Telxon's revenues have grown fast partly due to "aggressive pricing" that hurt profit margins. He was also unsatisfied with Telxon's explanation for the June and September quarters [expected losses are $ .26 for the June quarter and $ .25 for the September quarter].

Since the article ran in *The Journal*, several significant events have happened that could affect Telxon's performance for the balance of the company's fiscal year. One such event is the passage of the IEEE 802.11 wireless LAN interoperability standard. According to almost every manufacturer we talked to in the wireless LAN industry, customers have been pushing for interoperability. And many of the major end-users have been delaying purchasing decisions waiting for the passage of the standard. The timing seems perfect for Telxon.

The company and its subsidiary, **Aironet Wireless Communications, Inc.**, are about to release a new wireless frequency-hopping access point to the market that is IEEE 802.11 compliant. **Sears** placed an order for 10,000 of the radios [see accompanying story from page 1] and this could stimulate sales of Telxon's peripheral product base. Although they would not name names, sources at Telxon told us that at least three other major customers have expressed substantial interest in the company's new products.

*If Telxon can minimize problems with the roll-out of its new products, and if acceptance of these products is as enthusiastic as predicted by Lisa Bogaty, history may repeat itself. Wise investors could profit from it.* ▄▄

# SCAN/DCR MARKET WATCH
## For July 17, 1996

| ADC Company Names | Exchange | Symbol | Close Price | 52-Week High | 52-Week Low | Dividend Yield | P/E Ratio ++ | EPS Last 12 Months | Market Value + |
|---|---|---|---|---|---|---|---|---|---|
| Amtec | NASDAQ | AMTC | 6 5/8 | 9 7/8 | 4 5/8 | 1.19 | N/A | -0.24 | 7 1/8 |
| Astro Med | NASDAQ | ALOT | 8 | 11 7/8 | 7 1/2 | 1.45 | 29.46 | 0.28 | 8 1/4 |
| A W Computer | NASDAQ | AWCSA | 2 5/16 | 4 1/2 | 5/16 | 0 | N/A | -0.61 | 2 3/8 |
| Bull Run (DataSouth) | NASDAQ | BULL | 2 9/16 | 4 1/2 | 2 3/8 | 0 | 128.13 | 0.02 | 2 11/16 |
| Burr Brown | NASDAQ | BBRC | 17 1/2 | 41 1/2 | 14 1/2 | 0 | 7.76 | 2.24 | 18 |
| Caere | NASDAQ | CAER | 6 3/8 | 14 | 6 3/8 | 0 | 44.79 | 0.24 | 10 7/8 |
| Checkpoint | NYSE | CKP | 30 1/4 | 39 | 11 | 0 | 56.37 | 0.51 | 28 3/4 |
| Computer Identics | NASDAQ | CIDN | 2 3/8 | 4 | 1 3/4 | 0 | 46.35 | 0.05 | 2 5/16 |
| CSP Inc. | NASDAQ | CSPI | 0 | 7 3/4 | 10 1/4 | 0 | 86.25 | 0.1 | 8 5/8 |
| DH Technologies | NASDAQ | DHTK | 23 1/4 | 27 3/4 | 17 1/2 | 0 | 19.15 | 1.24 | 24 3/4 |
| Eltron | NASDAQ | ELTN | 23 | 38 3/4 | 21 1/4 | 0 | 40.35 | 0.57 | 23 |
| Imtec | NASDAQ | IMTC | 5 1/4 | 14 | 5 3/4 | 0 | 10.83 | 0.6 | 6 3/4 |
| International Imaging | NASDAQ | IMAK | 21 1/2 | 28 1/2 | 16 1/4 | 0 | 19.86 | 1.07 | 22 |
| Itron | NASDAQ | ITRI | 28 1/4 | 60 | 20 3/4 | 0 | 41.12 | 0.76 | 31 1/2 |
| Knogo | ASE | KNA | 10 3/8 | 10 7/8 | 9 9/16 | 0 | 18 | N/A | N/A |
| Kronos | NASDAQ | KRON | 27 3/4 | 37 | 24 3/4 | 0 | 22.38 | 1.24 | 27 3/4 |
| LXE Inc. | NASDAQ | LXEI | 8 1/4 | 14 1/4 | 7 | 0 | 48.53 | 0.17 | 8 7/8 |
| Metrologic | NASDAQ | MTLG | 11 3/4 | 13 1/4 | 8 | 0 | 32.99 | 0.36 | 12 1/4 |
| Norand | NASDAQ | NRND | 18 1/2 | 48 1/4 | 11 | 0 | N/A | -2.58 | 18 3/4 |
| Paxar | NYSE | PXR | 16 5/8 | 18 3/8 | 11 1/8 | 0 | 24.3 | 0.71 | 17 3/8 |
| Peak Technologies | NASDAQ | PEAK | 21 | 34 3/4 | 17 1/4 | 0 | 26.7 | 0.81 | 22 |
| Percon | NASDAQ | PRCN | 11 1/4 | 19 1/8 | 7 3/4 | 0 | N/A | N/A | 12 |
| Prologic Management Systems Inc | NASDAQ | PRLO | 4 | 6 | 3 1/4 | 0 | N/A | -0.76 | 4 |
| PSC Inc. | NASDAQ | PSCX | 9 5/8 | 15 3/4 | 7 1/8 | 0 | 26.74 | 0.36 | 9 5/8 |
| Robotic Vision Systems Inc | NASDAQ | ROBV | 14 7/8 | 27 3/4 | 12 3/8 | 0 | 19.83 | 0.75 | 15 1/8 |
| Scan Source | NASDAQ | SCSC | 11 1/4 | 17 | 10 | 0 | 21.3 | 0.54 | 11 3/4 |
| Sensormatic | NYSE | SRM | 15 1/8 | 28 1/2 | 13 5/8 | 1.43 | N/A | -1.16 | 15 1/2 |
| Symbol Technologies | NYSE | SBL | 39 1/4 | 48 | 29 3/8 | 0 | 22.58 | 1.81 | 41 1/8 |
| Telxon | NASDAQ | TLXN | 11 63/64 | 28 1/2 | 9 3/4 | 0.08 | 11.75 | 1 | 12 |
| Trident International | NASDAQ | TRDT | 20 7/8 | 24 3/4 | 16 3/4 | 0 | N/A | N/A | 21 1/4 |
| Vertex | NASDAQ | VETX | 1 1/8 | 3 5/16 | #3/8 | 0 | N/A | -0.03 | 1 1/4 |
| Western Atlas | NYSE | WAI | 56 1/2 | 65 1/2 | 42 3/8 | 0 | 29.68 | 1.91 | 56 3/4 |
| Zebra Technologies | NASDAQ | ZBRA | 16 | 35 3/4 | 15 | 0 | 18.26 | 0.89 | 16 1/4 |