

# Would you take “The Chip”?

## Post-9/11 security fears usher in subdermal chips

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After WorldNetDaily first publicized the “Digital Angel”—a sophisticated miniaturized tracking device intended for subdermal implantation in large numbers of human beings—the manufacturer, Applied Digital Solutions, took cover. Under criticism by privacy advocates, as well as Christians concerned over the biblically prophesied “mark of the beast,” the Nasdaq-traded company removed all references to human implantation from its website. Its CEO claimed publicly that there were “no plans” to make the technology implantable, but rather for the user to “wear” the device outside his body, say, on a wristwatch.

Then came Sept. 11, and the resulting urgent national drive to increase America’s homeland security. And in this new climate of fear, in which many Americans are susceptible to valuing safety over freedom, security over privacy, the company has found its golden opportunity to re-introduce the subdermal microchip implant it had previously deemed too hot for the American public to handle.

**H**eads up, future cyborgs! Implantable chips are back in the news, with the current focus on a tiny chip that can be injected into your body, then used to identify and monitor you.

Media reports are calling it “the stuff of science fiction,” and Reuters likened it to something from the 1999 blockbuster film, “The Matrix.”

Referring to the chip, David Coursey of ZDNet contends that “even paranoia has a point,” and John Soat of *Information Week* predicts that now “the call for a



Photo Courtesy of Applied Digital Solutions

*This little chip is what all the fuss is over. VeriChip—a syringe-injectable, radio-frequency emitting device, smaller than a grain of rice. It is capable of containing your I.D. number, medical record, and golf handicap. It can be used as your key of entry to secure areas or secure computer systems. Is this what the mark of the beast will ultimately look like? Is it possible that you are looking at the very mark itself?*

national ID system takes on a whole new meaning.”

At the center of the worldwide media stir: the announcement by Applied Digital Solutions of Palm Beach, Fla. (Nasdaq: ADSX) of its implantable “VeriChip.”

In a post-9/11 landscape, where various high-tech security systems are vying for supremacy and a lasting relationship with the government, ADS wants its piece of the pie.

These high-tech security systems have sparked a renewed debate over how best to profit from emergent identification technologies while maintaining a fair balance between civil liberties and the increased need for homeland security.

Critics of the chip express concerns over the specter of persons being injected with the chips against their will, perhaps surreptitiously in conjunction with a routine vaccination. In addition, they are concerned about the possibility of such chips eventually being mandated by the

government as a form of ID.

But let’s separate the science from the fiction. What is the VeriChip? How does it work? What is its potential relationship to government? Is it really a potential threat to civil liberties—or a life-saving miracle of science?

### Enhance present forms of ID

The VeriChip is a syringe-injectable radio-frequency device about the size of the tip of a ballpoint pen. It’s designed to carry a unique ID number and other critical personal data. Once injected, the chip can be activated by an external scanner, and radio frequency signals then transmit the ID number and other stored information to a telephone, the Internet or an FDA-compliant data-storage site.

Its initial use is being touted as an ID for medical implants, such as heart-regulating devices and artificial joints. The chip can hold info on required settings, the device’s original components, and other essential parameters. It is also a

ready source of data about the implantee's identity and medical condition.

As WorldNetDaily reported in March 2000, Applied Digital Solutions is also pushing use of the chip for emergency and security applications, to "enhance present forms of ID," to enable search-and-rescue operations, and assist in various law enforcement activities. The company contends that its technology is superior to biometric technologies, pointing out that implantation makes it a "tamper-proof" means of identification, "substantially diminishing theft, loss, duplication or counterfeit."

Are critics' concerns over privacy and tracking capabilities of the chip legitimate? Or are they just the technophobic squawkings of a collective pen of "Chicken Littles"?

The *Los Angeles Times* contends that "these chips are not true tracking devices" and that "the next generation of body chips, which transmit signals from a distance is still several years away." Futurist Paul Saffo says, "This is rightly going to prompt a debate ... but the good news is we still have years to figure it out."

Do we?

To truly understand the future potential of this technology, it is necessary to look back to perhaps one of the most underreported events of 2000.

## Back to the future

The event was the private unveiling of ADS's prototypical Digital Angel technology—a technology centered around an implantable chip that, once injected into a human being, allows it to be tracked in real time via GPS (Global Positioning System), the information then relayed wirelessly to the Internet, where the person's location, movements and vital signs can be remotely monitored and stored in a database.

The company first announced that it had acquired the rights to this device in December of 1999. Company documents described Digital Angel as "an implantable transceiver ... inserted just under the skin ... that sends and receives data and can be continuously tracked by GPS. When implanted in a body the device is powered electromagnetically by muscle movement and can be triggered by the 'wearer' or the monitoring facility." Implantation of Digital Angel was said to be "future" and "subject to FDA



Keith Bolton, Vice President of Technology at Digital Solutions poses at his office in Palm Beach, Fla., Thursday, January 10, 2002, with a watch manufactured to not only tell time but to read body temperature. Also featured is a pager called the anger monitor used to sense location boundaries, falls, wander alert and alert calls. These devices can be monitored from a lap top computer or a palm pilot.

approval," with its preliminary use being outside the body, in the form of a wrist-watch.

The strategy implied a "Phase 1—Phase 2" approach: using the technology outside the body first, followed by a Phase 2 for implantation, dictated by the need to wait for FDA approval as well as the need to gain popular acceptance.

Prior to the unveiling of the prototype, Applied Digital Solutions CEO Richard Sullivan issued a statement intended to underline the "historic first" of this "breakthrough in communications technology." He announced that Secretary of Commerce Norman Mineta would attend the private event.

"We're extremely pleased that Secretary Mineta will attend our Digital Angel demonstration," said Sullivan. "Secretary Mineta has been a champion of 'digital inclusion'—making access to digital technologies more widely accessible to all segments of society." The CEO added: "He has been an advocate of creating viable partnerships between the public and private sectors as part of a national digital inclusion campaign. We believe our Digital Angel technology has enormous potential along these lines."

"In fact," added Sullivan, "Digital Angel represents an exciting 'new frontier' in the digital revolution."

The announcement followed Mineta's appearance as keynote speaker at the Inland Empire Technology Summit for ADS subsidiary Timely Technology Corporation. The focus of that event was said to be "sharing insight concerning current and future impact of technology on government, on education and on our daily lives."

The unveiling of Digital Angel was held the evening of Oct. 30, 2000, at Cipriani's of 42nd St. in New York City. The invitation-only event was closed to the public, and was made up mainly of members of the government, the military, private investors and Wall Street analysts. Media presence was scant.

Some of those in attendance were surprised to find that not only was Mineta in attendance, but he was featured as the keynote speaker of the evening.

## Advising Clinton on 'digital inclusion'

On a futuristic set, bathed in a purplish light, CEO Richard Sullivan took the podium welcoming attendees to "the future." He stressed that the evening was special because "we have a number of very important government officials with us this evening ... including ... Norman Mineta." Sullivan emphasized Mineta's role in "helping to develop technology

## Cover Story

and e-commerce” and added: “As if all that weren’t enough ... Secretary Mineta personally advises the president of the United States [then President Clinton] on all matters concerning commerce, economics and Digital Inclusion. ...”

Mineta was further portrayed as a “champion of forging effective partnerships between the public and private sectors.” Sullivan made clear that “this idea of forging ‘partnerships’ is one of the main reasons the secretary is here this evening ... and why we’re so excited about having him here with us.”

After introducing Mineta, the two shook hands as Sullivan announced: “I just want to say how delighted we are at Applied Digital Solutions to launch an exciting new partnership with you and the federal government in the important area of digital inclusion.”

Mineta, flanked by four bodyguards, gave a keynote address underscoring the value of working together to build coalitions, and of partnering with “firms like yours” so that the “elderly and less fortunate” might benefit from the “great technological revolution.” He underscored the historic chance to spread the benefits of the information technology to everyone in society, and emphasized the importance of digital technology to America’s economy, emphasizing the importance of information technology in the economic success of the U.S.

Mineta added: “I applaud you, Dick Sullivan, for your success and the direction you are taking with Applied Digital Solutions. ... As a nation, we cannot afford to miss out on this technology.”

### \$100 billion marketplace

Much was made throughout the evening of the importance of digital technology to the U.S. economy. Economically, what was at stake was a projected \$100 billion marketplace for Digital Angel. Critics have claimed this figure is impossible unless universal implantation mandated by government was being considered. Conservative estimates for use in the U.S. were said to be \$70 billion, characterized as 26 potential vertical markets. A company spokesman, who asked not to be named, revealed that the \$70 billion projection was provided by McKinsey & Co. management consultants. Randy Geissler, CEO of Digital Angel.net Inc., a wholly owned sub-



*Dr. Kevin Warwick of Redding University in the UK is shown having a chip implanted in his upper arm. His associates were able to track him on the university campus and in the laboratory. Computers in the lab were able to recognize him and greet him, by name.*

siary, said that strong alliances were key to Digital Angel’s success, and that the company’s close partnerships with Raytheon-Hughes, the U.S. Department of Energy and pharmaceutical giants like “Schering-Plough” meant that the company was well-positioned for success.

Geissler was the former head of the animal-tagging company Destron Fearing. ADS acquired the company in order to leverage its management experience and relevant technologies, like its trademarked “BioBond,” a polymer sheath used to coat the glass-encased chip, causing fibrocytes and collagen fibers to grow around the chip, preventing migration of the chip through body tissue. Under the guise of Destron Fearing, Digital Angel has won FCC licensing approval of the frequencies needed for widespread tracking of humans.

The most anticipated part of the event was the actual demonstration of the technology, described as a “show” by Chief Scientist Dr. Peter Zhou. A former research scientist at the Max Planck Institute in Stuttgart, Germany, and a holder of advanced degrees in solid state physics and materials science from the Beijing University of Science and Technology and the University of Pennsylvania, Zhou also has numerous patents in the field of electronic detection

systems.

Zhou announced that an ADS engineer equipped with the chip would be tracked through the streets of Manhattan. Attendees watched as the engineer’s location and movements were tracked in real-time via GPS, relayed wirelessly to the Internet, and displayed on a large screen before the audience. The computer screen represented the engineer’s location as a red arrow on a large color street map of New York City. The red arrow moved forward, backward, to the left or right, as the engineer, miles away, moved through the city. A separate Internet screen displayed the employee’s pulse and body temperature for the past two weeks.

Not all of the medical monitoring capabilities of the technology were displayed, such as monitoring heart patients, or using blood-oxygen analysis to determine if the subject being monitored is awake or asleep. The person monitoring the subject can even tell exactly where on the continuum between waking and sleeping he is.

### How it works

The building blocks of Digital Angel technology are a convergence of microelectronics, information technology and life sciences. The centerpiece is an implantable microchip. It includes an

antenna that receives signals from GPS satellites and collects biological information from embedded bio-sensors. At the request of the ground station, it will send these two groups of information to the monitoring center, through different levels of ground stations and Internet systems. It has a built-in GPS receiver and a wireless transceiver.

To communicate potential uses of Digital Angel, a video of edited news reports was shown, depicting human tragedies that might have been avoided had the technology been used. These included the death of a tractor-trailer driver who fell asleep at the wheel, as well as the search for missing children.

The potential applications for Digital Angel advocated by ADS were stunning in their scope and novelty. Also notable was the number of items that would make the government a customer.

Applications included medical monitoring: enabling a doctor to remotely access a "wearer's" vital signs and analyze them, as well as detect potential problems before he was even aware of symptoms. Of course, "the doctor would know where to locate the patient." Security applications included locating kidnap victims, lost children, autistic persons and the elderly. Warfare applications promised to enable commanders to "always know where their soldiers are located and whether they are alive or wounded." In this capacity, Digital Angel was said to be "an invaluable aid, both tactically and strategically."

In the realm of personal identification, the company stressed that "requiring this ID for logon would prevent unauthorized access to computers." The suggestion was also made that in this context, Digital Angel could conceivably become a universal standard for computer access security, superior to all other systems, because other systems reside in the machine, not the person. However, this estimate discounted viable biometric logon set-ups, such as Compaq's fingerprint scanner.

Law enforcement uses recommended for Digital Angel included its use "to track parolees, people under house arrest, and individuals in witness protection programs." Use of the chip was even advocated as a method of gun control, preventing "unauthorized use of firearms." It was predicted that overall, "Digital Angel will become an interface between the human and electronic networks."

Early press coverage of Digital Angel was scarce, but news reports and commentaries by WorldNetDaily and a few others generated sufficient grass-roots protests to ADS over implantation plans that the company backed away temporarily from talking about subcutaneous microchips, and using terms like "cashless society."

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### Implantation? What implantation?

Indeed, two weeks prior to the Oct. 30, 2000, prototype demonstration, references to human implantation were removed from the company's website, including references in archived press releases, and the fact that the implantable "future" version of Digital Angel would be "subject to FDA approval."

Also removed from the site was a description of the company as the "pioneer and developer of syringe-injectable, miniaturized microchip technology for implantation under the skin," the method of implantation said to be "similar to a routine vaccination"—the microchip said to contain the "individual's unique ID number," which would be "stored permanently, just under the skin, where it cannot be lost or altered."

The microchip was said to remain for "the life of the individual with the unique ID number intact." The wording was exactly the same as that used under the

Destron Fearing animal-tracking page, with the substitution of "individual" for "animal."

Although these references to human implantation were removed from the website, there are archived versions in various forms preserved on individual home pages and other areas of the Internet.

During his speech, Sullivan sought to allay concerns over implantation, by denying that the company ever had such plans: "Let me be very clear on one important point," he said. "This potential marketplace is for an attachable device ... something worn on the outside...close to the skin. We're not even planning on or even considering any other applications at this time. Only external uses! All our energy, all our focus ... all our effort is in this direction, period. Any other approach or suggestion is purely hypothetical speculation at this time."

Following Sullivan's speech, this reporter asked Dr. Zhou if he had been quoted correctly by WorldNetDaily in a previous interview, when he reportedly said: "Before there may have been resistance, but not anymore. People are getting used to implants. New century, new trend." And, "We will be a hybrid of electronic intelligence and our own soul." He indicated that he had, in fact, been quoted correctly.

In comments following the demonstration, Chief Technology Officer Dr. Keith Bolton, drink in hand, expressed exasperation over implantation protests coming from a "noisy 20 percent," whom he identified as Christians who believe the Digital Angel chip is the "mark of the beast." He was sure "the other 80 percent wouldn't mind." "Besides," he added, "FDA approval could take years, and we can start making money off of this thing now!"

As recently as June, 2001, the company continued to deny implantation plans, when it offered a response statement to be posted on Declan McCullagh's Politech website. The statement asserted, "We are not now developing, nor do we have any plans to develop anything other than an external, wearable device."

At the conclusion of the event, private investors like Nathan Rosenblatt indicated that they were waiting to see more details of the partnership with the government unveiled before investing. Dr.

Yongguang Chen and Dr. Duanyi Wang called Digital Angel a “great invention” and added for “final success” they hoped that the U.S. government would “further loosen” military restrictions on the use of GPS satellites.

The scientists were part of a research team that worked on developing the technology. The prototype was originally scheduled to debut in December of last year, but in July ADS signed an agreement with Princeton University and the New Jersey Institute of Technology, for additional scientists to work on the project, under Zhou’s leadership. They worked on issues like “antenna size” and “body tissue absorption.” As a result, the agreement “helped implement an accelerated schedule for delivery of a working prototype of Digital Angel,” resulting in it debuting nine days before the presidential election.

Following the October event, Mineta had been scheduled to appear with Sullivan at a Boca Raton school, along with business leaders in a PR event, to be held the day before the election. Free computers would be offered for schools, but the centerpiece of the appearance was to be the showing of an edited five-minute video of the New York City event.

When questioned about the nature of the partnership with the government, company spokesman Matthew Cossolotto suggested it would include the subsidizing of Digital Angel for “minorities, the disadvantaged and the elderly.” He added that a formal public announcement of the full extent of the partnership would not be made until one to two weeks after the election.

The event was cancelled at the last minute, perhaps due to the difficulty in securing mass media coverage as a form of free advertising, the day before a presidential election.

### Sept. 11 opens door to implantation

As the saying goes, the Chinese character for “crisis” is similar to the one for “opportunity,” and in the wake of Sept. 11 the company is strongly pushing its product—and openly discussing implantation—adding that now people are more open to it.

Recent company statements have underscored that the VeriChip is superior to biometric technologies, since it is



“In five years, Sullivan said he can see the chips being used in children, the elderly, prisoners, and by employers at facilities such as airports and nuclear plants. Society in general could use them instead of ATM or credit cards.”

designed to be implanted and is thus “tamper-proof.” The company is looking to bring these products to “market as quickly as possible.”

A week after the tragedy, Digital Angel offered its GPS tracking devices (currently in wristwatch form) to New York City’s fire department, as well as to the

U.S. Department of Transportation, saying that they could “aid in continued search-and-rescue efforts.”

CEO Sullivan remarked, “With the recent tragedy, it is our duty to expedite the development process and offer Digital Angel in its current beta form to the rescue efforts of all agencies connected with national and personal safety and security,” adding that “Digital Angel has many applications that can be used during this national tragedy.”

Then in a revelation that gives “profiling” a whole new twist, *Palm Beach Post* writer Deborah Circelli reported that CEO Sullivan complained that the 9-11 tragedy proved “today’s security measures don’t work very well,” and he has a better idea. Namely, implant all foreigners passing through customs or immigrations with the chips. The implanted chip would replace green cards, “allowing officials to monitor their activities better and keep terrorists out.” In the wake of Sept. 11, he said, “the government is more prepared, for the overall benefit of our citizens, to advocate some of these changes.”

Circelli continued: “In five years, Sullivan said he can see the chips being used in children, the elderly, prisoners, and by employers at facilities such as airports and nuclear plants. Society in general could use them instead of ATM or

credit cards.”

Meanwhile, Mineta is still the company's point man in Washington, a fact underscored by Sullivan's comment that, “We chose the NYC Fire Department and the U.S. Department of Transportation due to existing relationships. In fact, Norman Mineta ... was the keynote speaker at the Digital Angel World Launch in October of 2000.”

### Financial hopes

Applied Digital Solutions has high hopes for this intense product push. In 1999 it boasted a five-year revenue growth of 64,012 percent and was ranked the fifth-fastest-growing technology company by Deloitte and Touche's “Fast 500.” Earlier in 2000, the company won the prestigious “Technology Pioneer's” award from the World Economic Forum in Davos, Switzerland. The award is given for contributions “to worldwide economic development and social progress through technological advancements.” The World Economic Forum gives such awards as part of its commitment to foster entrepreneurship in the “global public interest.”

But the company lost \$11.4 million in the first quarter of 2001, and \$33.9 million for all of 2000, leading it to gain a 2001 “Turkey of the Year Award” from the *South Florida Business Journal*, for “gushing red ink faster than you can say ‘pass the gravy please.’” Called a “troubled company” that had “suffered sizable losses over the past few years,” SFBJ noted that the company had been “cautioned over a possible delisting from Nasdaq,” that it was earlier in the month “out of compliance with its line of credit,” and that a “recent SEC filing said the company couldn't predict whether or when it would be profitable.” The Turkey column concluded with the plea for someone to “stick a fork in this turkey. It's done!”

Even though the company has a lot riding on this recent public relations push, questions over involuntary uses of the chip remain amid contradictory company communications and recent news reports.

A *Silicon Strategies* article reported that the company was “backing away from involuntary ID applications, such as the tracking of prisoners or parolees,” while a *Wired* magazine article said that Digital Angel technology was “designed with

people who stray in mind, such as parolees.” Reuters had, in fact, already reported in December that the company had won a 3-year trial contract with California to provide its technology to track parolees in Los Angeles. The *Silicon Strategies* report quoted CTO Bolton as saying, “we are advocating that this technology be totally voluntary,” while a *Washington Post* article said Bolton indicated use of the chip should be voluntary unless the law allows otherwise.

“The use of the technology in felons also raises the problem of removal, since such chips are said to be ‘virtually impossible to remove,’ once implanted.”

Regarding the California project to track parolees, Amro Albanna of Digital Angel said, “we hope this program will serve as a model for other counties in the state.”

Civil libertarians agree that technology is value-neutral, amoral. But they add that the key issue at stake is who will control the technology, and whether it could ever be used against the will of people. Referring to the broad gamut of implantable chips, Dr. Ellen McGhee, director of the Long Island Center for Ethics, at Long Island University, writes: “A paramount worry is who will control the technology ... the prospects for sinister invasions of liberty and privacy are alarming.”

Lucas Mast, an Internet privacy and telecommunications analyst at the Cato Institute in Washington, D.C., expresses the same worry: “My biggest concern from this technology is the unknown variables. If the government becomes a customer, will they have access to all databases maintained by ADS? For example, if they implant the technology in felons, will they also be able to track peo-

ple and items which have the technology for other purposes like e-commerce?” He adds that “the slippery slope argument may come into play here—using it for felons, using it for lost persons, and all of a sudden it moves from being a voluntary program to one mandated by our government for the alleged good of society. Now that is scary.”

The use of the technology in felons also raises the problem of removal, since such chips are said to be “virtually impossible to remove,” once implanted.

In her ethical assessment of implantable chips, McGhee and Dr. Gerald Maguire of the Royal Institute of Technology in Kista, Sweden, wisely called for public debate and a multi-disciplinary evaluation from thinkers in fields of computer science, biophysics, medicine, law, religion, philosophy, public policy and international economy. Such a debate and evaluation is “urgently needed,” they said.

And although such implantable chip technology undoubtedly has many beneficial and even potentially life-saving uses, Mast warns that “if the technology of Digital Angel falls into the wrong hands, be that of terrorists or our own government, we may all be concerned and it may be too late to turn back.”

He adds: “It will be interesting to see public reaction to this technology—comparisons to Orwell's 1984 and even the Nazis seem obvious.”

The potential misuses of the implantable technology underscore the role that independent public policy think tanks can play in serving the interests of society. Along with the type of public debate and evaluation called for by McGhee, Maguire and others, policy think tanks could recommend legislative initiatives designed to ensure that the benefits of the technology can be reaped without involuntary implantation of the technology ever becoming a government mandate.

Five years ago, a *Chicago Tribune* writer held that implantable chips were “long a popular delusion among paranoids”—but he nevertheless predicted they were “likely to be marketed as a consumer item early in the next century.”

That prediction is now true. The chips are real, they're here to stay, and they're coming soon to a syringe near you.

Welcome to the future. □