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## Charagma Watch

### An Annotated Update of

“Evaluation of the Church in the U.S.A.” (1982, 1983)

by John and Sylvia Ronsvalle, empty tomb, inc., Champaign, IL

#### I. Preface

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The reader may note occasional repetition of quoted material in different sections of this document. This is due to at least two factors. First, as a Web document, individual sections are readily available to function as standalone content. The content of a single quote might contribute to more than one semi-independent discussion. Second, different aspects of the same quote may contribute to the discussion in different sections of this document.

## II. Introduction

Eugen Weber, in an article entitled, "Apocalypse through History," provides interesting and useful insights into the concept of apocalypse.

Ends, along with beginnings, have played a large part in humanity's experience of itself—not least in the Judeo-Christian tradition that forms the backbone of Western history from Asia Minor to the Pacific's shores...Apocalypse—the revelation or unveiling of the world's destiny and of humankind's fate—has fascinated Jews and their Christian offspring for at least the past 2,200 years...

One tends to think of Advent as leading up to the birth of Christ. But it culminates in his Second Coming, and that is what the rite, the lessons, and the sermons of the rite are about: the Judgment to come, and before it, the Son of Man coming in a cloud with great power and glory, and the terrors that precede his coming, and the magic millennial interlude between his preliminary and his final victory over Satan...

...[O]ne might well wonder why a motif and motivating agency so pervasive has been so long ignored in modern times, especially by professional historians.

Just 30 years ago, Christopher Hill began his Riddell Lectures of 1969 with a similar remark. Historians—Hill calls us intellectual snobs—“have ignored the lunatic fringe that believed in the imminence of the end and the necessary preliminary of Antichrist,” paying no heed to Milton, Cromwell, Newton, and so many others who shared a belief in the imminent end of the world.

Great historian of the 17<sup>th</sup>-century England that he is, Hill saw the need to attend to the beliefs of that time, because beliefs influence action—as they encouraged Cromwell to readmit Jews to England in hope of advancing the time of the Lord’s return. Nevertheless, Hill’s scholarship and his language characterized, hence intellectually marginalized, the believers he studied as a lunatic fringe. That was not so until the 17<sup>th</sup> century or even the 18<sup>th</sup> century; and many 18<sup>th</sup>- and 19<sup>th</sup>-century reformers would have to be counted among the lunatic fringe: Lord Shaftesbury and his friends, the supporters of Jewish emancipation and of Zionism, and abolitionists like Harriet Beecher Stowe—and scores of others—who, in Britain and North America and even in France, eventually brought the slave trade to an end...

In 1957, another serious scholar, Norman Cohn, memorably assigned the apocalyptic tradition to the “obscure underworld of popular religion.” Christianity was being recast. It had been through the ages, but now its supernatural foundations were being meddled with, and reconstruction can shore up structures or help to weaken them. Subtract one aspect of the supernatural, and the edifice may crumble. Another few years and even such a distinguished theologian as Paul Tillich dismissed belief in the afterlife as “a corrupt form of theological expression, disseminated among the relatively poor and uneducated.” If some don’t think as we, the educated think, it must be because they are uneducated, poor, or crackpots.

They may conversely, be sociologically all right but simply mistaken. Or they may not be mistaken at all. Condescension, at any rate, is not the right approach. History is not an exclusively rational process; nor is it about exclusively rational processes—and anyway, one man’s reason is another man’s nonsense.<sup>1</sup>

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<sup>1</sup> Eugen Weber, “Apocalypse through History,” *The Key Reporter*, Phi Beta Kappa, vol. 65, no. 1, Autumn, 1999, pp. 4, 7. The article included the following information about the author. “*Eugen Weber (ΦBK [Phi Beta Kappa], honorary member, UCLA, 1978) is a ΦBK [Phi Beta Kappa] senator. His latest book is Apocalypses: Prophecies, Cults and Millennial Beliefs through the Ages (Harvard University Press, 1999). An earlier version of this article was delivered in March 1999 as the Barbara Frum Memorial Lecture at the University of Toronto.*”

In the early 1980s, an “Evaluation of the Church in the U.S.A.”<sup>2</sup> Chapter 5 of a manuscript understood the 666 Mark of the Beast, which will be needed for buying and selling, as an emerging end point of a culture in which selfish consumption eclipsed missional living for others in response to Jesus’ sacrificial love for us.

That Chapter 5 looked at the implications of the emerging Electronic Transfer System and its relationship to both the technology for implanting newly developed chips in animals, and the 666 mark of the Beast described in the Biblical book of Revelation.

Chapter 5 included a quote from the Preface of John Wicklein’s *Electronic Nightmare* (1981) work that serves to provide a bridge to the following material. Wicklein, writing from a secular point of view, stated:

Every technique of the communication revolution that I discuss in this book is already in place somewhere in the world. In many cases, the services are fully operational in commercial or government applications. And for almost every blessing these techniques bring, they pose a danger to our individual liberty and our privacy...

From studying the developments over the last ten years, and researching and reporting almost full time for two, I have come to feel the shape of things to come is quite clear. How the shape is to be filled out by new equipment is a question the development engineers are answering, and will continually reanswer, as each new discovery makes a specific technique easier and less expensive to use. Knowing the hardware is not nearly so important as knowing the techniques and what they can do for us — and to us.<sup>3</sup>

What follows are, for the most part, referenced and occasionally annotated updates of the identification, development and spread of “new equipment.” Where appropriate, an occasional new insight is briefly presented.

### III. Thesis

If a standardized location in the right hand or forehead emerges, the human RFID microchip implant may be used as the mark of the beast spoken of in Revelation. The response to these possibilities and future developments should be increased obedience to Jesus Christ now. Such increased obedience to Jesus Christ, in this Age of Affluence, should include a focus on giving our stored time and talent, that is, our money, on behalf of others’ needs via word and deed mission.

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<sup>2</sup> John and Sylvia Ronsvale, “Evaluation of the Church in the U.S.A.,” Chapter 5 of typescript, empty tomb, inc., Urbana, Ill., 1982 with minor edits in 1983, that sans ms. Chapter 5 was published as *The Hidden Billions: The Potential of the Church in the U.S.A.* (Champaign, Ill.: C-4 Resources, 1984). The major portion of “Evaluation of the Church in the U.S.A.,” was subsequently published on the Web in 2003 under a “Theology and Technology” heading at <<http://www.emptytomb.org/TheolTech.html>>.

<sup>3</sup> John Wicklein, *Electronic Nightmare: The New Communications and Freedom*, The Viking Press, New York, 1981, pp. vii and viii.

#### IV. Abstract

The major portion of this document tracks the use and spread of Radio Frequency Identification (RFID) microchip implants, tags, and readers. RFID microchip implants and tags are designed to identify vehicles, pets, humans, as well as most other commercial products and services globally.

This document addresses various topics related to microchipping humans including, though not limited to, crime, potential markets, government, technology, identity theft, security, medical uses, commerce, terrorism, societal evaluation, legal matters, and theology.

The spread of RFID tagging of pets, humans, and all commercial objects on earth is leading to a blanketing of the earth with RFID readers.

Humans interface with these ubiquitous RFID readers by means of RFID chips in contactless smart cards, consumer electronic devices such as cell phones, and implants in humans themselves.

Identification microchips implanted in humans are a strong candidate for the Biblical mark of the beast in the right hand or forehead needed in order to buy and sell. It is suggested that humans will be increasingly exposed to commercial coercion to accept an RFID microchip implant in either the right hand or forehead in order to buy or sell.

While secular privacy concerns focus on protecting privacy in relation to retail items with embedded RFID microchips, Christians concerned with the mark of the beast may well observe that the spread of RFID microchips in retail items means the spread of RFID microchip readers. These ubiquitous microchip readers then set the scene for a next step of commercial coercion. Individuals will be pressured to accept human microchip implants, read by the ubiquitous microchip readers, for various reasons, including that of strengthening financial transaction security.

Two scenarios relevant to Christians are explored. First, any excess accumulated money will have been wasted if Christians are raptured at a time before RFID human microchip implants are required in order to buy or sell. Second, if RFID human microchip implants are required in order to buy or sell before Christians are raptured, Christians' excess accumulated money will become worthless, and for all practical purposes be stolen, if Christians opt not to accept the mark that becomes necessary in order to buy or sell.

The Christians' response to these possibilities and future developments should be increased obedience to Jesus Christ now. Such increased service to Jesus Christ, in this Age of Affluence, should include a focus on giving our stored time and talent, that is, our money, on behalf of others' needs via word and deed mission.

#### V. RFID (Radio Frequency ID) Microchip Tags: Vehicles

##### A. Urban Road Pricing in Europe: Project Duration: January 1999-June 2000

PRIMA (Pricing Measures Acceptance)<sup>4</sup> is one of 277 projects carried out in the Fourth Framework Transport Research Programme of The European Commission.<sup>5</sup> PRIMA, with results related to the "Integrated policy aspects" theme,<sup>6</sup> provided information related to electronic road pricing and privacy. PRIMA discussed "electronic road pricing based on GPS and other technical devices..."

#### 1. Road Congestion Charging: PRIMA: December 11, 2002

The PRIMA page of the Transport Research Programme Project Results site provided general information regarding road congestion charging. One policy implication noted was that implementation of road tolls could raise acceptance of congestion charging.

Congestion charging is seen as an economically efficient way of combating the build-up of traffic and consequently making road transport in urban areas reliable for both passengers and freight. This involves charging motorists at times and places where the roads are heavily used. Nevertheless, experiences show that it is difficult to gain acceptance for urban road pricing and hence to get it implemented...

The objectives for PRIMA were to identify the reasons behind the acceptance or non-acceptance of road pricing and to produce recommendations for the implementation of urban road pricing in Europe...

PRIMA found that, in general, public opinion is against congestion charging, although the polluter pays principle is broadly accepted as a general guideline for policy making. On the other hand, there is considerable support for road pricing as a way to finance investment in transport. This includes the funding of public transport and the construction of road bypasses, with some preference for the former. Therefore, implementation of road tolls can be a stepping stone to raising acceptance for congestion charging.<sup>7</sup>

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<sup>4</sup> "PRIMA: Pricing Measures Acceptance;" Transport Research Programme Knowledge Centre, The European Commission; site updated December 11, 2002; <<http://europa.eu.int/comm/transport/extra/primia.html>>; p. 1 of 4/8/03 10:12 AM printout.

<sup>5</sup> "Home Page;" Transport Research Programme Knowledge Centre, The European Commission; site updated December 11, 2002; <<http://europa.eu.int/comm/transport/extra/home.html>>; p. 1 of 4/8/03 10:16 AM printout.

<sup>6</sup> "Project Results Related to Theme: Integrated Policy Aspects;" Transport Research Programme Knowledge Centre, The European Commission; site updated December 11, 2002; <[http://europa.eu.int/comm/transport/extra/res\\_integrated\\_policy\\_aspects.html](http://europa.eu.int/comm/transport/extra/res_integrated_policy_aspects.html)>; pp. 1-2 of 4/8/03 10:25 AM printout.

<sup>7</sup> "PRIMA: Pricing Measures Acceptance;" Transport Research Programme Knowledge Centre, The European Commission; site updated December 11, 2002;

## 2. Electronic Road Pricing and Privacy:

A PRIMA “Final Report for Publication,” entitled “Ways and Means to Increase the Acceptance of Urban Road Pricing,” funded by The European Commission under the Transport RTD [Research and Technological Development<sup>8</sup>] Programme of the 4th Framework Programme, provided information about electronic road pricing and privacy.

Eventually electronic road pricing based on GPS and other technical devices may even make it practically possible to abolish toll-plazas and to charge individual vehicles momentarily according to the external effects they give rise to...

More and more people are daily using sophisticated electronic devices such as computers, mobile phones, smart cards etc. Vehicles are becoming increasingly computerised and road informatics will...be a growing business.

Few people seem especially concerned about the possibilities for others to trace which internet sites they have visited, which phone calls they have made or what kind of consumer products or services they have paid for with credit cards. This observation is in line with the information from the case cities. The privacy issues linked to road pricing do not seem to have played or to play an important negative role. Only a small minority of the 240 interviewees in the PRIMA cities considers protection of individual privacy as a major political issue.

This does not mean that privacy is unimportant to people. In one of PRIMA's case cities a leading transport politician named electronic road pricing "satellite police". There is no doubt that many people feel that the government (or the market for that matter) already knows too much about their doings. Some interviewees also think that the argument of dangers with regard to data protection would become useful in the political fight against road pricing. It is, however likely that the most emotionally oriented kind of arguments will lose in power. The more familiar urban citizens become of using various electronic devices and connecting with different networks, the more likely it is that their attitudes to electronic road pricing will become more positive. Furthermore, it seems likely that new techniques

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<<http://europa.eu.int/comm/transport/extra/primia.html>>; pp. 1 of 4/8/03 10:12 AM printout.

<sup>8</sup> The meaning of the abbreviation “RTD” was found in the following two sources. “The Families Project;” The European Community; published n.d.; <<http://216.239.57.100/search?q=cache:ufe-yIX5dlcC:www.families-project.com/doc/RTD.pdf+RTD++Programme++abbreviation&hl=en&ie=UTF-8>>; p. 2 of 4/8/03 9:41 AM. “Research;” European Commission; published n.d.; <[http://europa.eu.int/comm/research/index\\_en.html](http://europa.eu.int/comm/research/index_en.html)>; p. 1 of 4/8/03 9:46 AM.

will also open up new possibilities for the protection of privacy.<sup>9</sup>

#### B. LoJack: Doppler Radio Direction Finding (RDF)

Consumer awareness of LoJack warrants a brief description of this device. LoJack utilizes both radio frequency transmissions and radio frequency receivers or readers. Global Positioning System (GPS) devices also are based on radio signals, that is, “high-frequency, low-power **radio signals** from the GPS satellites.”<sup>10</sup>

##### 1. LoJack: Radio Direction Finding: WirelessReport: September 5, 2002

Alan Wilensky, Reporting Analyst of WirelessReport, provides some technical information about Radio Direction Finding.

Commercial Geo-location products serve in a number of industries; many predate the availability of GPS. Some examples of these services include truck and freight tracking, maritime distress signaling, and wildlife management. Many of these services are GPS based, but several started as terrestrial-based systems built on the evolved Pseudo-Doppler radio direction finding method (DDF).

The wholesale conversion of practically all geo-location applications to GPS has made tremendous sense, as GPS obviates the need to build out terrestrial locator networks. It is incorrect to assume, however, that GPS is the best solution to all Geo-Location problems...

Many non-GPS based applications served in the past, and still serve us well. The Maritime Safety and Distress system, although now based on GPS, still has an operating counterpart in Doppler based EPRB beacons used by smaller commercial fishing and pleasure craft. The most popular stolen vehicle location system, Lojack, is not GPS based - it is a pure distributed pseudo-Doppler system. These aforementioned are two examples of current applications illustrating that GPS, in defined circumstances, confers no particular advantages over the earlier DDF technology.<sup>11</sup>

<sup>9</sup> Björn Hårsman, Sirje Pädam, and Bo Wijkmark; “Ways and Means to Increase the Acceptance of Urban Road Pricing;” The European Commission under the Transport RTD Programme of the 4th Framework Programme; project duration: January 1999-June 2000; pdf created April 17, 2002, based on icon Get Info; <[http://europa.eu.int/comm/transport/extra/final\\_reports/road/PRIMA.pdf](http://europa.eu.int/comm/transport/extra/final_reports/road/PRIMA.pdf)>; pp. 28-29 of 5/17/02 printout.

<sup>10</sup> Marshall Brain and Tom Harris; “How GPS Receivers Work: 3-D Trilateration;” HowStuffWorks, Inc.; published n.d.; <<http://electronics.howstuffworks.com/gps2.htm>>; p. 2 of 4/2/03 12:17 PM printout.

<sup>11</sup> Alan Wilensky; “Personal Geo-Location Services Vendors Exhibit a Stunning Lack of Imagination;” September 5, 2002;

2. Radio Direction Finding (RDF) and Radio Frequency Identification (RFID): Joe Moell

Joe Moell, author of a “monthly column on RDF in *73 Amateur Radio Today* magazine,” notes the role of RDF and distinguishes between RDF and RFID.

a. Radio Direction Finding (RDF)

Joe Moell notes some of the uses of RDF.

Radio direction finding is used to find sources of interference to any form of wireless electronic communications, including broadcast and two-way radio, television, and telephones. It is also used to track missing or stolen cars and other property. Search and rescue workers use it to find persons in distress. Emergency Locator Transmitters in downed aircraft are tracked with RDF techniques.<sup>12</sup>

b. Features of Radio Direction Finding (RDF) and Radio Frequency Identification (RFID)

Joe Moell distinguishes between RDF and RFID in response to a question about whether RFD can be used to help a construction company deal with the loss of small tools.

Radio Direction Finding (RDF) technology is typically done at considerable distance (from yards to miles and beyond). To do that, transmitters require long-term power sources (such as batteries) and antennas. They're usually too large to be placed on or in a hand tool. In addition, the transmitted signal can be detected by anyone with a receiver tuned to the proper frequency, so these systems are not covert.

RFID technology at the jobsite exit is probably more appropriate for this tool-detection application. RFID systems track property and objects at relatively close range with unique codes. For instance, chips (also called tags or transponders) can be implanted in pets to provide positive proof of ownership if the pet strays into the pound or is stolen. A reader device, passed over the chip, detects it and reads out the chip's unique ID code. Similar RFID systems sound an alarm when non-paid-for merchandise passes through the doors of a store...At one time, the FasTrack transponders for southern California toll roads could even be used to quickly pay for a McDonald's burger at the offramp.

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<<http://technologyreports.net/wirelessreport/?articleID=485>>; p. 1 of 4/2/03 3:16 PM printout.

<sup>12</sup> Joe Moell; “Homing In: Welcome to Homing In: All About Radio Direction Finding (RDF);” updated March 27, 2003; <<http://members.aol.com/homingin/index.html - toc>>; p. 2 of 4/2/03 11:34 AM printout.

(This feature was discontinued because so many transponders were being stolen out of cars and then used for this purpose!)

In an ideal situation, the chips are "passive," meaning that they don't require battery power. They usually cannot be detected with conventional receivers, but only by a reader or polling device designed to be used with them.<sup>13</sup>

### 3. LoJack History and Technology: LoJack

LoJack provided the following information about its history and technology on its Web site.

LoJack Corporation...[has been] the acknowledged global market leader in stolen vehicle recovery technology since 1987...

The patented LoJack system includes a small radio-frequency transceiver that is hidden in the vehicle at the time of installation. When the vehicle theft is reported to the police, the unit is automatically activated, which causes silent radio signals to be emitted from the transceiver. The police are able to follow the signal to locate and recover the vehicle.<sup>14</sup>

### 4. LoJack Utilizes Police Radio Band Allocated by the Federal Communications Commission

LoJack provided the following information on its Web site about LoJack's use of a police radio band allocated by the Federal Communications Commission.

LoJack introduced its patented technology to the public in Massachusetts in 1986. In 1989, as LoJack expanded to other states, the Federal Communications Commission allocated a police radio band for the Stolen Vehicle Recovery Network, allowing the LoJack technology to operate nationwide.<sup>15</sup>

### 5. LoJack Coverage

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<sup>13</sup> Joe Moell; "Frequently Asked Questions and Answers About T-hunting and RDF: Part 3 - Questions about Transmitters and Covert Tracking;" updated March 10, 2003; <<http://members.aol.com/homingin/FAQ.html - part3>>; p. 11 of 4/2/03 11:31 AM printout.

<sup>14</sup> "About Us: Company Overview;" LoJack; published 2002.; <<http://www.lojack.com/about/index.htm>>; p. 1 of 4/2/03 9:12 AM printout.

<sup>15</sup> "About Us: Company Overview: Company History;" LoJack; published 2002.; <<http://www.lojack.com/about/overview.htm>>; p. 1 of 6/30/03 2:44 PM printout.

LoJack provides coverage both within the United States and internationally.

a. United States

LoJack provides information about its coverage within the United States.

LoJack offers protection in high crime areas in the United States where auto theft is prevalent. LoJack works with local law enforcement agencies to ensure that sufficient coverage is provided in the major crime areas in each state...

LoJack continually expands and improves the coverage network, so there may be additional coverage available than what is shown here.

Statewide coverage (over 80% of the population) is available in [eight states and the District of Columbia]...

Major Metropolitan areas, cities and high crime area coverage is available in: [12 states or portions of states].<sup>16</sup>

b. International

LoJack provides information about its “International Network.”

International Offices

Operational Countries [27 countries]

Licensed Countries (Not Yet Operational) [13 countries]<sup>17</sup>

C. Cargo Theft Prevention Exploring RDF, Cell Phone Network, GPS, and RFID: *Fleet Owner*: November 1, 2001

A 2001 *Fleet Owner* article by Larry Kahaner reported on a number of technological approaches to the problem of cargo theft.

Cargo thefts in the United States are growing, with FBI estimates ranging up to \$10 billion annually...

Seeing the rise in cargo thefts, Dedham, MA-based LoJack decided this year to transfer its expertise in retrieving stolen autos to retrieving purloined trailers. The product, dubbed “LoJack for Trailers,” is a police-operated system that works the same way as the company's car-locating system...

<sup>16</sup> “For Your Company: Where LoJack’s Available;” LoJack; published n.d.; <<http://www.lojack.com/forcomp/where.htm>>; p. 1 of 4/2/03 9:03 AM printout.

<sup>17</sup> “LoJack - International Contact Information;” LoJack; published n.d.; <<http://www.lojack.com/international/>>; p. 1 of 4/2/03 5:07 PM printout.

For fleets interested in both trailer and cargo retrieval, the game becomes more challenging. Terion, Melbourne, FL, comes close with its FleetView device, which works off the nation's cell phone network... In concert with a cargo movement sensor, the unit telephones the company's data center when something is amiss and the owner is notified...

[John] Albrecht's [vice president of Transport Security, Waconia, MN.] company and an undisclosed truckload carrier are Beta-testing a device that is about the size of a pager and is aimed at high-value freight. "It's GPS oriented, but that won't give us line of sight, so there's also going to be a wireless (cellular) component, too," he says...

Another future possibility is so-called radio frequency identification or RFID tags. These are inexpensive chips that can easily fit inside a pallet or even in individual merchandise boxes. They operate like tags in retail stores. Walk through the doors without paying and the alarms goes off. For trucks, the units would always be on and transmitting a signal to a reader or 'interrogator' in the trailer or cab. When the reader no longer detects a signal from the RFID tag, an alarm goes off or a signal is sent to a remote location.<sup>18</sup>

- D. "How E-ZPass Works": RFID; Electronic Readers: HowStuffWorks, Inc.  
Kevin Bonsor explains how E-ZPass works.

Today, most toll roads are equipped with an **electronic toll-collection system**, like E-ZPass, that detects and processes tolls electronically. E-ZPass is used by several U.S. states, but most other electronic toll systems are very similar to E-ZPass. Basically, E-ZPass uses a vehicle-mounted **transponder** that is activated by an **antenna** on a toll lane. Your account information is stored in the transponder. The antenna identifies your transponder and reads your account information. The amount of the toll is deducted and you're allowed through...<sup>19</sup>

Drivers usually have to pay a deposit to obtain a transponder, which is about the size of a deck of cards. This device is placed on the inside of the car's windshield behind the rearview mirror. A transponder is a battery-operated, **radio frequency identification** (RFID) unit that transmits radio signals. The transponder is a two-way radio with a microprocessor, operating in the **900-MHz band**. Stored in this RFID transponder is some basic account information, such as an identification number.

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<sup>18</sup> Larry Kahaner; "Under Surveillance;" *Fleet Owner*; published November 1, 2001; <[http://fleetowner.com/ar/fleet\\_surveillance/](http://fleetowner.com/ar/fleet_surveillance/)>; pp. 1-3 of 4/2/03 9:52 AM printout.

<sup>19</sup> Kevin Bonsor; "How E-ZPass Works: Introduction to How E-ZPass Works;" HowStuffWorks, Inc.; published n.d.; <<http://auto.howstuffworks.com/e-zpass.htm>>; p. 1 of 4/3/03 2:17 PM printout.

Antennas, or **electronic readers**, are positioned above each toll lane. These antennas emit radio frequencies that communicate with the transponder. The detection zone of an antenna is typically 6 to 10 feet (2 to 3 m) wide and about 10 feet long. These two devices, the transponder and the antenna, interact to complete the toll transaction.<sup>20</sup>

E. Vehicles Identified through RFID: *USA Today*: April 11, 2002

Kevin Maney, *USA Today*, observes that in various situations, vehicles are identified through RFID microchip tags.

These days RFID shows up in a few familiar places. The technology is in ExxonMobil's Speedpass — a key fob that works like a credit card, wirelessly identifying you to a gas pump. On highways across the USA, wireless toll booth systems such as E-ZPass work on RFID.

Singapore relies on the technology to control traffic. Its system, called Electronic Road Pricing, or ERP, charges different prices to drive on different roads at different times. Driving on one main artery between 8:30 a.m. and 9 a.m. costs \$3 (in Singapore dollars — about \$1.60 in U.S. currency) but is free from 2 p.m. to 5:30 p.m. The pricing encourages drivers to stay off busy roads at busy times.

Every car must have an RFID tag, which communicates with readers along every major road. The road readers identify each car and send information to a central computer, which adds up car owners' bills...

...[I]nsurance companies might want to use the technology to know where you take your car, so they can charge more if you regularly park in high-crime neighborhoods.<sup>21</sup>

F. “HID Proximity Cards Integrated With Advanced Long Distance Automatic Vehicle ID Reader”: HID Corporation

An HID Corporation Press Release presents information about “the introduction of proximity card-enabled Automatic Vehicle Identification Reader (AVI) technology.” Fargo Electronics, Inc. provides a definition of proximity cards, which are a type of smart card. “Proximity cards or simply ‘prox cards’ communicate through an antenna similar to contactless smart cards except that they are read-only devices that generally have a greater range of operation.”<sup>22</sup>

<sup>20</sup> Kevin Bonsor; “How E-ZPass Works: The Basics;” HowStuffWorks, Inc.; published n.d.; <<http://auto.howstuffworks.com/e-zpass1.htm>>; p. 1 of 4/3/03 2:17 PM printout.

<sup>21</sup> Kevin Maney; “New Chips Could Make Everyday Items ‘Talk’;” *USA Today*; published April 11, 2002; <<http://www.usatoday.com/tech/news/2002/04/12/tinyband.htm>>; pp. 2, 4 of 3/21/03 4:34 PM printout.

<sup>22</sup> “Smart Cards: Proximity Cards;” Fargo Electronics, Inc.; published 2001; <[http://www.fargo.com/smart\\_cards/proximity.asp](http://www.fargo.com/smart_cards/proximity.asp)>; p. 1 of 4/3/03 10:11 AM printout.

HID and NEDAP, a leading Dutch RFID technology manufacturer and systems developer, announce the introduction of proximity card-enabled Automatic Vehicle Identification Reader (AVI) technology. This new dual ID, long distance, high speed AVI system integrates HID proximity cards with an in-vehicle mounted "Combi-Booster." The 2.45 GHz transmitter securely transmits both the driver's proximity serial ID number and an embedded vehicle ID simultaneously.

Extending the read range of a proximity card up to 33 Feet (10 Meters), the new AVI system can be read at vehicle speeds of up to 125 miles per hour (200 Km/h). The system can be configured to provide hands-free vehicle access to gated and secured areas, without the need to come to a stop. Eliminating the need to stop reduces the chances of an assault on the occupants of a vehicle and enables fast, convenient, and secure access for authorized vehicles and driver.

Benefits include the ability to substantially improve the level of security and operational efficiency while controlling access for vehicles which are commonly driven by many different drivers (e.g. buses, police, etc.). TRANS-IT AVI can be used for applications including automated parking payment, airport and seaport security, automated toll collections, and more...

As the largest manufacturer of contactless access control readers and cards for the security industry, HID has shipped over 150 million credentials to customers worldwide. HID pioneered the development of radio frequency identification (RFID) technology for security.<sup>23</sup>

G. University of Michigan: Automatic Vehicle Identification (AVI): April 26, 2002

In a document entitled, "Access Control Using AVI Technology," The University of Michigan Parking Services provided an explanation of its use of Automatic Vehicle Identification (AVI) to control access to its parking areas.

1. "System Overview"

The "System Overview" section of the document provided the following information.

Parking & Transportation Services is now using Automatic Vehicle Identification Technology (AVI) to control access to Gold parking areas. AVI is the same technology used for years at toll roads for non-stop service by those who have prepaid fees. This same system may be used in the future to

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<sup>23</sup> "HID Proximity Cards Integrated With Advanced Long Distance Automatic Vehicle ID Reader;" HID Corporation; published n.d.; <<http://www.hidcorp.com/pages/avi-tech-pr.html>>; pp. 1-2 of 3/31/03 1:33 PM printout.

control access to the Blue parking in our structures and in a few larger surface lots.

The AVI system has been installed and is operational at five gated Gold areas. As of the end of February, over 350 Gold parkers have obtained AVI devices to access these locations. Use of AVI is voluntary through the end of this permit year (June 30th). As of July 1st, the existing card access system will be removed from service and AVI device will be required for all Gold parkers who use gated Gold parking areas.

2. “System Overview: Why Use Automatic Vehicle Identification (AVI) Technology?”

The University of Michigan “System Overview” provided the following information in partial response to the question, “Why use Automatic Vehicle Identification (AVI) technology?”

The AVI system has been reliably used for control of parking areas at other organizations and universities and is in use at the City/University Forest Street structure and, as of February 2002, at our gated Gold areas.

3. “System Overview: How Does AVI Technology Work?”

In partial response to the question, “Why use Automatic Vehicle Identification (AVI) technology?” the “System Overview” provided the following information.

AVI antennas are installed at entrance and exit lanes that emit an RF (radio frequency) signal.

AVI devices mounted in vehicles return the signal and an identification number back to the antenna.

The identification number is sent to a computer database for verification.

The number is verified and the gate opens.

4. “About the AVI Device”

A portion of the “About the AVI device” section provided the following information.

The AVI device is lightweight, battery-free and will function indefinitely. It is constructed of hard plastic and is approximately the size of a credit card.

Devices are mounted in vehicles on the front windshield in the lower left-hand corner using Velcro-like adhesive strips that will allow them to be transferred between vehicles.<sup>24</sup>

#### H. Houston's Traffic Monitoring System: Automatic Vehicle Identification (AVI): 2003

The Houston TranStar Automatic Vehicle Identification (AVI) Traffic Monitoring System provided an explanation of its use of Automatic Vehicle Identification (AVI) to address freeway congestion.

##### 1. "Introduction"

The "Introduction" Web page provided the following information.

The Houston TranStar Automatic Vehicle Identification (AVI) traffic monitoring system is used to collect real-time information showing current travel conditions on Houston area freeways and high occupancy vehicle (HOV) lanes. This information is provided to personnel within the Houston TranStar Center for use in detecting freeway congestion. This travel information is also provided to the public through media reports, displays on selected roadside electronic message signs, and on the Houston TranStar Web Site.<sup>25</sup>

##### 2. Houston TranStar: "AVI Technology"

The "AVI Technology" Web page provided the following information.

The system uses Automatic Vehicle Identification (AVI) technology developed by the Amtech Systems Division of TransCore to collect the real-time traffic information. Houston was the first city to apply AVI technology for monitoring traffic conditions.

The AVI system operates through the use of AVI antennas and readers which are installed on structures along Houston area freeways. The AVI antennas and readers monitor the passage of vehicles equipped with transponder tags. The transponder tags are powered by a small battery which enables them to reflect signals transmitted from the antennas/readers.<sup>26</sup>

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<sup>24</sup> "Access Control Using AVI Technology;" University of Michigan Parking Services; content modified April 26, 2002; <<http://www.parking.umich.edu/parking/AVI/>>; pp. 1-2 of 3/31/03 11:14 AM printout.

<sup>25</sup> "Houston TranStar AVI Traffic Monitoring System: Introduction;" Houston TranStar; published 2003; <<http://traffic.tamu.edu/aviinfo/avi-intro.html>>; p. 1 of 4/3/03 4:34 PM printout.

<sup>26</sup> "Houston TranStar AVI Traffic Monitoring System: AVI Technology;" Houston TranStar; published 2003; <<http://traffic.tamu.edu/aviinfo/avi-tech.html>>; p. 1 of 4/3/03 4:34 PM printout.

### 3. Houston TranStar: "How It Works"

The "How It Works" Web page provided the following information.

The system uses vehicles equipped with transponder tags as vehicle probes. The main source of vehicle probes are commuters using the "EZ-Tag" automatic toll collection system installed by the Harris County Toll Road Authority (HCTRA). Transponder tag readers are placed at 1 to 5 mile intervals along freeways and HOV lanes. Each reader senses probe vehicles as they pass a reader station and transmits the time and location of the probes to a central computer over a telephone line. As the probe vehicles pass through successive AVI readers, software calculates average travel times and speeds for a roadway segment. The averages are made available to software which provides the data for the Houston TranStar web site.<sup>27</sup>

#### I. Oregon Task Force Considers GPS or AVI/Odometer Linked Technology

1. Declan McCullagh: "George Orwell, Here We Come": CNET News.com: January 6, 2003

Declan McCullagh comments on the Oregon state task force's work.

Last week, The Associated Press reported that an Oregon state task force wants a law requiring all cars to sport GPS receivers and recorders. The stated purpose: To measure how far you drive and calculate how much you owe in road taxes. The Nov. 15, 2002 report from the task force envisions some privacy protections--but those could be eliminated if homeland security worries become more acute, possibly leaving all Oregonians tracked whenever they're on the road.<sup>28</sup>

2. Road User Fee Task Force: Preferred Scenario for a Vehicle Miles Traveled (VMT) Fee: Oregon: November 15, 2002

Following is Preferred Scenario information regarding Data Collection Technology, Data Upload Technology, and Privacy Protections.

*(Note: The Preferred Scenario is based on Scenario Two in the Preliminary Report presented to the Oregon Legislative Assembly on September 30, 2002)...*

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<sup>27</sup> "Houston TranStar AVI Traffic Monitoring System: How It Works;" Houston TranStar; published 2003; <<http://traffic.tamu.edu/aviinfo/avi-hou.html>>; p. 1 of 4/3/03 4:34 PM printout.

<sup>28</sup> Declan McCullagh; "George Orwell, Here We Come;" CNET News.com; published January 6, 2003 10:58 AM PT; <<http://news.com.com/2010-1071-979276.html>>; p. 1 of 3/31/03 9:30 AM printout.

### **Data Collection Technology**

GPS or AVI/odometer Linked Technology. The task force prefers a policy that encourages or mandates installation of technology that facilitates electronic collection of VMT [Vehicle Miles Traveled] data for purposes of straight application of a fee amount per mile. In this respect, the task force chose the options of either a “simple” Global Positioning System (GPS) or an AVI/odometer Linked Technology, depending upon the interoperability of these technologies with other elements of the preferred VMT fee system and the extent the technology is retrofitted into older vehicles.

### **Data Upload Technology**

Radio Frequency Upload to Service Station. VMT data would be uploaded from GPS device or AVI/odometer linked technology within the vehicle via radio frequency to a gasoline service station for purposes of calculating the fee based upon actual VMT...

### **Privacy Protections**

Task Force Preference – Design Limitation. State would be required to build into the data collection system a design limitation that prevents state from accessing a GPS device to locate passenger vehicles in real time or to determine detailed travel history of vehicle other than to upload summary data. AND

Task Force Preference – Legal Prohibition. A civil and/or criminal law statute would prohibit anyone connected with a state agency from using accessing a GPS device to locate passenger vehicles in real time or to determine detailed travel history of vehicle other than to upload summary data.<sup>29</sup>

3. “Technology Evaluation For Implementation Of VMT Based Revenue Collection Systems: Final Report”: Department of Industrial and Manufacturing Engineering, Oregon State University: November 2002

David S. Kim, David Porter and Robin Wurl of the Department of Industrial and Manufacturing Engineering, Oregon State University authored a November 2002 Final Report for The Oregon Department of Transportation Road User Fee Task Force. The Abstract of the Report notes the technologies explored.

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<sup>29</sup> “The Preferred Scenario for a Mileage-Based Fee;” Road User Fee Task Force; published November 15, 2002; <[http://www.odot.state.or.us/ruftf/pdfs/VMTPreferred\\_Scenario\\_Nov1502.pdf](http://www.odot.state.or.us/ruftf/pdfs/VMTPreferred_Scenario_Nov1502.pdf)>.

Technologies explored include, but were not limited to, GPS-based devices, Radio-Frequency Automatic Vehicle Identification devices, and different means of electronic data transfer.<sup>30</sup>

4. Oregon Consideration of Vehicle Mileage Tax: Associated Press: December 31, 2002

A December 31, 2002 Associated Press article reported on Oregon's consideration of a vehicle miles traveled fee.

The Road User Fee Task Force set up by the 2001 Legislature plans to ask the 2003 session to authorize testing the feasibility of a vehicle mileage tax...

[Jim] Whitty[, the task force administrator,] said the task force at this point wants a charge per mile...

"We also have to have a way to track mileage only within the state," Whitty said...

"Technology has improved to the degree that this can be done, with an electronic device," he said. The device, in a car, would be linked to the Global Positioning Satellite or GPS system, which allows pinpoint navigation by bouncing signals off satellites...

Whitty said there are several options for collecting fees. One is to send vehicle owners a monthly bill.

Another is to outfit gas stations so they can read the vehicle transponders and collect the tax at fueling stops...

To protect drivers' privacy, using the system to track cars in real time would be illegal. New cars would be required to have the GPS technology. Owners of older cars would be allowed to take part by retrofitting them.<sup>31</sup>

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<sup>30</sup> David S. Kim, David Porter and Robin Wurl; "Technology Evaluation For Implementation Of VMT Based Revenue Collection Systems Final Report: Technical Report Documentation Page Abstract;" Department of Industrial and Manufacturing Engineering, Oregon State University; published November 2002; <[http://www.odot.state.or.us/ruftf/pdfs/OSU\\_VMT\\_Final\\_Report\\_WEB.pdf](http://www.odot.state.or.us/ruftf/pdfs/OSU_VMT_Final_Report_WEB.pdf)>; p. i of 4/4/03 printout.

<sup>31</sup> "Oregon Drivers May Pay More: A Panel Will Consider a Mileage Tax for the State's Motorists;" Associated Press on siliconinvestor.com; published December 31, 2002; <<http://www.siliconinvestor.com/stocktalk/msg.gsp?msgid=18390313>> [At the end of the siliconinvestor.com Associated Press article, the following link to the Salem, Oregon StatesmanJournal.com with a specific number nevertheless goes to the home page of StatesmanJournal.com: <<http://news.statesmanjournal.com/article.cfm?i=54184>>]; pp. 1-2 of 4/4/03 10:54 AM printout.

5. "State Tracking Of Auto Movements By GPS Called 'Nutty' ":  
CNSNews.com; January 2, 2003

Mark Morano, CNSNews.com Senior Staff Writer, provided further perspective on the vehicle mileage tax considered by Oregon.

If a proposal by an Oregon State task force becomes law, the government would be able to use satellite equipment to keep track of each driver's mileage and tax that driver accordingly in order to pay for road repairs.

Even the state administrator who proposed the plan thinks citizens "should be concerned" about the possibility of civil liberties violations. And Chris Edwards, director of fiscal policy at the free market Cato Institute, told **CNSNews.com**, "I think it's nutty and I don't think it's ever going to happen.

"I don't think Americans are ready to be subjected to that type of civil liberties intrusion," Edwards explained, "where government tracks them around wherever they drive"...

Jim Whitty, administrator of Oregon's Road User Fee Task Force, in an exclusive interview with **CNSNews.com**, called the GPS mileage tracking tax proposal necessary because "it costs a certain amount to drive on the road per vehicle and people ought to pay their fair share of their usage."

Democratic Gov. John Kitzhaber and the state legislature set up the Road User Fee Task Force in November 2001 to explore methods of financing transportation costs...

"You go to technology and you look and say we can calculate mileage electronically, so it can be paid electronically ... That is where the GPS device came in," Whitty said.

Whitty envisions a system that would either send auto owners a monthly bill for their miles or set up gas stations so they could read the GPS transponders and collect the tax during fueling stops. The new tax per mile would be called a VMT fee or Vehicle Miles Traveled fee.

Whitty would also like to see other technologies besides GPS considered.

"There is an odometer sensor which can calculate mileage and then data can be transferred by radio frequencies to a fuel pump. We are going to be looking at both," Whitty explained.

Whitty believes that despite the fears of potential civil liberties violations, the new method of calculating road taxes is needed to make transportation taxes fairer...

When asked about possible civil liberties violations, Whitty admitted that people should be cautious about the state's use of the mileage tracking technology.

"They should be concerned and they should watch this and make sure that it doesn't turn into such a thing," Whitty said.

However, "that is not the purpose of this fee," he added. "The state transportation department has no interest in knowing where people are going either currently or after the fact."

Whitty believes police may ultimately end up using the GPS data for criminal investigations.

"If there was a police necessity perhaps, but we are not looking at that. That is not our concern," he said.

Edwards remains unconvinced.

"You can say it's not the purpose, but later on, it will be abused and expanded," Edwards said.

"We don't need the government to have Big Brother precise tracking systems to make sure the highways are precisely paid by precisely the right people who use them," Edwards continued. "The gas tax now is roughly efficient."<sup>32</sup>

#### 6. Road User Fee Task Force New Release: Oregon: January 2003

James M. Whitty, Administrator of Oregon's Road User Fee Task Force, wrote an opinion piece News Release commenting on the Task Force's work. Following are excerpts from that piece.

The Road User Fee Task Force believes the best user fee is based on the amount of mileage driven...

The way a mileage fee would work is every passenger vehicle in Oregon would be equipped with an electronic means to calculate miles driven over specific time periods. A device would transmit the number of miles driven since the last reading to a reader at a central location or a service station. A fee rate of between 1.25 and 1.5 cents per mile

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<sup>32</sup> Mark Morano; "State Tracking Of Auto Movements By GPS Called 'Nutty';" CNSNews.com; published January 2, 2003; <<http://www.cnsnews.com/Politics/archive/200301/POL20030102a.html>>; pp. 1-2 of 4/4/03 10:34 AM printout.

would be charged as part of the gasoline fill up payment or in a monthly bill.

Early on the task force decided that it did not want Oregonians to pay fees for miles driven out of state. This led to researching electronic means of calculating miles driven.

Some people have expressed concern about the potential use of one particular device with the ability to calculate mileage, the Global Positioning System, and condemned the whole concept out of a legitimate concern for privacy.

While this concern is understandable, it is misplaced. Any GPS device used would be a simple version manufactured to calculate and record mileage data and send information no more than a few feet – from a vehicle to a reader at a fuel pump, for example. It would not record vehicle location data or transmit to a wider area. The task force is certainly not recommending the state of Oregon track the whereabouts of individual motorists.

Furthermore, at this point the task force has not settled on any particular device to gather the mileage data. GPS devices will not be recommended if privacy concerns are not able to be resolved. Fortunately, other options exist for electronic calculation of mileage, such as an odometer sensor tag.

As required by law, ODOT is undertaking a pilot test of the task force recommendations. The pilot test will take approximately three years.<sup>33</sup>

7. Industry Uses RFID to Identify Vehicles: *RFID Journal*; March 13, 2003

*RFID Journal* reported that the German company, Siemens, “has added real-time locating technology from WhereNet to its RFID product line.”

Siemens is filling out its MOBY line of RFID products by licensing WhereNet's real-time locating technology. The agreement with WhereNet gives Siemens the ability to offer customers products that can track assets from a few feet away to hundreds of feet...

WhereNet, which is based in Santa Clara, Calif., says a large European carmaker has agreed to pilot the Siemens-branded technology. The carmaker will hang an active

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<sup>33</sup> James M. Whitty; “Task Force Seeks New Revenue System for Roads;” Road User Fee Task Force, Oregon; updated January 15, 2003; <<http://www.odot.state.or.us/ruftf/news/2003jan10news.html>>; pp. 1-2 of 4/4/03 10:48 AM printout.

locating tag on the windshield of each vehicle as it rolls off the assembly line. Each tag will have a unique serial number that will be used to identify the vehicle.

...With this system, the automaker can locate the specific cars with the problem and ship the others to a dealer. Ford Motor Co. has been using WhereNet's system this way at a facility in the U.S.<sup>34</sup>

8. "Low-Cost Tags for Vehicle ID": *RFID Journal*; March 18, 2003

*RFID Journal* reported a new development with regard to low-cost vehicle identification.

Sirit [Technologies']...new offering, to be part of the company's Identity Flex product line, will allow for read ranges of 15 to 20 feet, according to Fred Veinot, Sirit's VP of marketing and strategy. The tags are typically placed on the driver's side of a car's windshield.

Sirit has been supplying vehicle identification and electronic toll collection systems for several years. It provided the system used at the Golden Gate Bridge...Veinot says the company is also looking to market the system as a payment option for drive-thru establishments.

Sirit embarked on a pilot with McDonald's in 1999 for just that purpose but McDonald's has since decided not to pursue a full-scale rollout. Cost of implementation was a factor in that decision, says Veinot, who is hoping the new offering will break the price barrier for some hesitant customers.<sup>35</sup>

9. "Low-Cost Tags for Vehicle ID": *RFID Journal*; March 18, 2003

An *RFID Journal* news story reported on Goodyear Tire & Rubber Co.'s approach to address the "TREAD (Transportation, Recall Enhancement, Accountability and Documentation) Act, passed by the US Congress in November 2000." Goodyear "has teamed with Siemens VDO Automotive to build the Tire IQ System."

The Automotive Industry Action Group's B-11 standard for North America calls for a reading distance of 24 inches and a 915 MHz frequency. The Goodyear system, which uses

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<sup>34</sup> "Siemens Offers RTLS Technology;" *RFID Journal*; published March 13, 2003; <<http://www.rfidjournal.com/article/articleview/339/1/1/>>; p. 1 of 3/20/03 11:16 AM printout.

<sup>35</sup> "Low-Cost Tags for Vehicle ID;" *RFID Journal*; published March 18, 2003; <<http://www.rfidjournal.com/article/articleview/348/1/1/>>; p. 1 of 3/18/03 8:14 AM printout.

RFID and sensor technology from Siemens, has a reading distance of just six inches...

What makes Goodyear's system unique is its ability to automatically detect the type of tire on the vehicle, whether it's a winter or summer tire or a spare, for example...

The TREAD (Transportation, Recall Enhancement, Accountability and Documentation) Act, passed by the US Congress in November 2000, requires new motor vehicles from 2004 onward to be equipped with a system that will warn the driver when a tire is significantly under-inflated.

Goodyear's pressure monitoring system is expected to be available on new vehicles in 2006...

Texas Instruments and Philips Semiconductors have also introduced RFID-driven tire pressure and temperature monitoring systems (see [RFID Chip To Monitor Tire Pressure](#)). And Michelin has announced plans to offer automakers a system for tracking individual tires using RFID tags (see [Michelin Embeds RFID Tags in Tires](#)).<sup>36</sup>

10. Possible for Computers to Identify Every Car Axle Anywhere in World: Auto-ID Center Lab at the University of St. Gallen: April 8, 2003

An invitation to the April 8, 2003 opening of the Auto-ID Center Lab at the University of St. Gallen suggests the possibility of identifying vehicles via computer worldwide.

Radio Frequency Identification (RFID) is a simple concept with enormous implications. Put a tag on a can of soda or car axle, and suddenly a computer can «see» it.

Put tags on every can of soda and every car axle, and suddenly the world changes. No more inventory counts. No more lost shipments. No more guessing how much material is in the supply chain.

The Auto-ID Center is designing, building, testing and deploying a new global infrastructure—a layer on top of the Internet—that will make it possible for computers to identify any object anywhere in the world instantly...

This is the next computer revolution.<sup>37</sup>

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<sup>36</sup> “Goodyear Opts for 125 KHz Tire Tag;” *RFID Journal*; published March 19, 2003; <<http://www.rfidjournal.com/article/articleview/349/1/1/>>; pp. 1-2 of 3/20/03 11:08 AM printout.

<sup>37</sup> “Opening of the Auto-ID Center Lab at the University of St. Gallen (HSG);” Auto-ID Center; pdf created March 27, 2002, based on icon Get Info; <[http://autoidcenter.com/media/StGallen\\_lab.pdf](http://autoidcenter.com/media/StGallen_lab.pdf)>; p. 6 of 4/8/03 printout.

J. "New 'Pay As You Go' RFID System": *RFID Journal*; May 29, 2003

Jonathan Collins reported in an *RFID Journal* news article that, "TransCore will make it possible for people to use RFID toll collection systems to pay for parking."

TransCore, a privately held transportation services company based in Dallas, Texas, hopes to cash in on the popularity of RFID toll payment systems by launching a pay-as-you-go system for the parking industry. The new program takes advantage of battery-powered transponders already installed on many vehicles...

Currently, most wireless parking and RFID toll collection systems require that you set up an account and deposit money in it. The account is then debited each time you park or pass through a toll, and the account is replenished automatically. TransCore says it can now link RFID and other vehicle tags to a subscriber's credit card or bank account, so that they can be used for a range of larger and less regular payments.

"Road toll fees can be as little as 25 cents, whereas five days' parking at an airport can be \$125," says Frank Dittoe, director of sales, Western US at TransCore. "That would be well over the threshold of existing toll credit"...

...According to TransCore, the new system is the first of a number of additional applications that can leverage the growing tag subscriber base across the country.

"Houston and Dallas, for example, both have 1 million toll tags in use and that installed base can be used for multiple commercial applications," says Dittoe. "With so many subscribers in such high concentration, there [are] clearly uses beyond parking and toll payments"...

The first deployment of its system is set to be at Chicago O'Hare International Airport. "We already have 300 lanes using our automatic vehicle identification system in downtown Chicago, which will be brought online as well," says Dittoe.<sup>38</sup>

VI. RFID Microchip Implants: Pets and Other Animals

A. Introduction

Microchipping of pets preceded that of humans by some 20 years. The historical development of pet microchipping is of added interest insofar as it may provide insights into various future developments and issues related to the microchipping of humans.

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<sup>38</sup> Jonathan Collins; "New 'Pay As You Go' RFID System;" *RFID Journal*; published May 29, 2003; <<http://www.rfidjournal.com/article/articleview/440/1/1/>>; pp. 1-2 of 5/29/03 8:11 AM printout.

## B. Number of Pets Chipped in the United States, and Timeframe for Spreading

### 1. December 22, 2001 Philadelphia AP Story

A December 22, 2001 Philadelphia AP story provides a brief overview of the history and extent of microchipping within the United States:

In the last few years, millions of dogs and cats—as well as tigers and other unusual pets—have been implanted with these microchips, which are encoded with unique numbers to make identifying lost, stolen or abandoned animals a snap...

Microchip implantation has been around since the 1980s but was relatively rare until the mid-1990s, when chipmakers introduced a universal scanner that could read every model.

Scanners are now found in most shelters and animal control agencies across the country, according to Mary Madsen, a customer service supervisor for AVID Identification Systems Inc. Norco, Calif.-based AVID is one of two dominant chipmakers. As of last year, 2.5 million pets were listed in the company database.

The American Kennel Club operates the other database, which contains more than 1.1 million pets and is affiliated with Schering-Plough Animal Health, distributor of the HomeAgain chip.

Most of the pets in the AKC database are dogs (842,645) and cats (265,349). However, HomeAgain chips, made by Destron Fearing Corp., can also be found in birds, horses, rabbits, tigers, monkeys, seals and many other unusual pets.

More than 70,000 lost pets have been reunited with their owners since the AKC program's inception in 1995, said Associate Director Keith Frazier.<sup>39</sup>

### 2. April 19, 2000 Albany, NY, AP Story

An April 19, 2000 Albany, NY, Associated Press story provides a somewhat different perspective:

Several companies manufacture the chip, which has grown steadily in popularity. California-based Avid Inc. registered 608 pets in 1996, but that grew to 4,414 in 1999, according to company spokesman Mike Tuttle.

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<sup>39</sup> “Microchips Helping Reunite Lost Pets with Their Owners;” Associated Press (Philadelphia) article on *yorknewstimes.com*; published December 22, 2001, <[http://www.yorknewstimes.com/stories/122201/nat\\_1222010032.shtml](http://www.yorknewstimes.com/stories/122201/nat_1222010032.shtml)>; last updated at 11:52 PM; pp. 1-2 of 4/19/02 11:05 AM printout.

“We’ve sold about 7 million microchips to shelter operators and veterinarians,” Tuttle said. “Shelters in big cities like Phoenix, St. Louis and New York City have all been using the chip for several years.”<sup>40</sup>

### 3. National Animal Interest Alliance (NAIA)

An article published on the NAIA Web site points out that the American Kennel Club enrollment includes animals “identified with a chip or tattoos.” The article also provides information related to the growth of the microchip system:

But the American Kennel Club has a CAR that can help ... This CAR is the Companion Animal Recovery program, AKC’s partnership with Schering-Plough Animal Health that installs microchips under the skin and enrolls the chip number in a data base, making it possible to identify any animal and many inanimate possessions with an injection and an enrollment fee. Dubbed “Home Again,” the microchips are the size of a grain of rice and have an imbedded number unique to each chip ...

Microchips have been available for several years, but until the development of a universal scanner that reads all available chips, many shelters were reluctant to scan incoming pets, offer microchip clinics to the public, or install chips in adopted animals. In addition, stories about the chips moving under the skin after injection were bandied about. Then came two breakthroughs: Schering-Plough and microchip company Destron Fearing introduced a new chip held in place by a bio-glue and in 1996 came up with a universal scanner.

In 1995, AKC became the registrar for the Schering Plough Home Again microchip system. And along with registering animals chipped through the Home Again program, CAR also accepted enrollment of any animal identified with a chip or tattoos. By September 11, 1995, 10,000 animals were enrolled, and the number topped 325,000 by the end of 1998.<sup>41</sup>

### 4. The American Kennel Club Companion Animal Recovery (CAR)

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<sup>40</sup> Jonathan Ewing; “Micro Dog: A Chip as Small as a Grain of Rice Will Help Keep Fido Close to Home;” Associated Press (Albany, NY) article on *abcNEWS.com*; published April 19, 2000; <<http://abcnews.go.com/sections/tech/DailyNews/Dogchips0000418.html>>; p. 1 of 4/19/02 10:55 AM printout.

<sup>41</sup> Norma Bennett Woolf; “AKC’s CAR brings dogs Home Again;” National Animal Interest Alliance; <<http://www.naiaonline.org/body/articles/archives/akcscar.htm>>; published n.d., Web site text copyright 2000/2001; p. 1 of 5/7/02 6:45 AM printout.

An American Kennel Club Companion Animal Recovery Web page states:

Over one million pet owners are now participating in the AKC-CAR program, which is the largest direct-to-owner database of microchipped pets in the United States.<sup>42</sup>

5. Grand Forks Air Force Base's *The Leader Online*

The June 15, 2001 edition of *The Leader Online* contains the following numbers:

As of April 1, the AKC Companion Animal Recovery Program has more than 866,000 pets enrolled, and has had 46,729 pets safely recovered and returned home due to the HomeAgain microchip identification system.<sup>43</sup>

6. Digital Angel: 2000

A Digital Angel Web site with a 2000 copyright date reports on the number of pets microchipped with its system:

*In addition, Digital Angel is: ... The worldwide leader in pet recovery with approximately 1 million pets in the U.S...protected by Digital Angel Animal Identification Systems Division patented microchips.*<sup>44</sup>

7. Digital Angel: 2002

A May 8, 2002, article on Bloomberg.com stated:

Randolph K. Geissler, chief executive officer of Digital Angel Corp. (Amex: DOC) was interviewed yesterday on CEOcast.com...

The recorded interview can be accessed at <http://www.ceocast.com> through May 13, 2002...

Digital Angel chips have been implanted in more than 10 million pets so far during the past eight years...<sup>45</sup>

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<sup>42</sup> "Storm Center;" American Kennel Club, Incorporated Companion Animal Recovery; published 2001; <<http://www.akccar.org/resources/stormcenter/index.cfm>>; p. 1 of 4/19/02 10:48 AM printout.

<sup>43</sup> Capt. Wendy May, 319th Veterinary Clinic; "Chip Can Help Keep Your Pet Safe;" *The Leader Online*; Grand Forks Air Force Base; published June 15, 2001; <<http://www.grandforks.af.mil/15jun.asp>>; p. 2 of 5/7/02 10:09 AM printout.

<sup>44</sup> Digital Angel Corporation; "Only Digital Angel Technology Combines Real-time Location And Condition Acquisition With Real-time Data Delivery;" published 2000; <<http://www.digitalangel.net/commercial.asp>>; p. 2 of 3/9/02 4:50 PM printout.

<sup>45</sup> "Digital Angel Corp. CEO Interviewed on CEOcast.com;" PRNewswire-FirstCall article on Bloomberg.com published 5/8/2002;

## 8. PetPlace.com: 2001 Article

- a. A 2001 PetPlace.com article: number of registered animals

A 2001 PetPlace.com article details information about the number of registered animals:

Today, more than a million pets are registered with either the American Kennel Club's Companion Animal Recovery system (which uses the HomeAgain system) or American Veterinary Identification Devices. And more than 150,000 lost pets have been reunited with their owners through these systems.<sup>46</sup>

- b. A 2001 PetPlace.com article: microchips AVID and HomeAgain have sold

The article goes on to provide more specific information about the number of microchips AVID and HomeAgain have sold.

## 1) AVID

To date, AVID has sold several million microchips. According to a spokesperson, a pet is reunited with their owner every 32 minutes. Currently, over 142,000 lost pets have been returned home...<sup>47</sup>

## 2) HomeAgain

To date, HomeAgain has sold over 500,000 microchips and over 34,000 pets have been reunited with their owners.<sup>48</sup>

## 9. Associated Press: Washington Post: 2002 Article

A February 11, 2002, *Washington Post* article includes information about the number of animals that have been chipped:

More than 3.5 million pets have been "chipped."<sup>49</sup>

## 10. Scripps Howard News Service 2000 Article

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<[http://www.bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APNkL4hFQRGI naXRh](http://www.bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APNkL4hFQRGI naXRh)>; p. 1 of 5/8/02 8:59 PM printout.

<sup>46</sup> Laura Williams; "Microchipping for Your Dog's Safety;" PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; pp. 1-2 of 4/19/02 11:01 AM printout.

<sup>47</sup> Laura Williams; "Microchipping for Your Dog's Safety;" PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 3 of 4/19/02 11:01 AM.

<sup>48</sup> Laura Williams; "Microchipping for Your Dog's Safety;" PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 3 of 4/19/02 11:01 AM.

<sup>49</sup> Michael Rubinkam; "A Chip on His Shoulder;" Associated Press article on Washington Post; published February 11, 2002; <<http://www.washingtonpost.com/ac2/wp-dyn/A55535-2002Feb10>>; p. C14; p. 1 of 4/19/02 10:51 AM printout.

A July 10, 2000 story stated that:

Teddi the terrier ... is one of more than 1.6 million pets whose owners have opted for microchips to tag their animals...

While pets with chips constitute a little over 1 percent of the nation's 120 million dogs and cats, more and more owners are taking advantage of the technology a decade after it was introduced.<sup>50</sup>

#### 11. WorldNetDaily 2000 Article

An August 7, 2000 story stated that:

Approximately 3 million animals nationwide and about 7 million worldwide have been implanted with the chips.<sup>51</sup>

#### C. Universal Standard for Scanners

1. A July 10, 2000 Scripps Howard News Service story stated that:

Industry infighting slowed the spread of microchips, but now chip-makers Schering-Plough Animal Health, AVID and InfoPet have established a universal standard for scanners that lets veterinarians, shelter operators or animal-control officers read chips the way a supermarket checker reads bar codes on grocery items.<sup>52</sup>

This article then provides brief descriptive information about the three Schering-Plough, AVID and InfoPet products:

##### a. Schering-Plough Animal Health

'The chips are ... a lot easier than animal tattoos that used to identify pets,' says Marta Lewis of the American Kennel Club's Companion Animal Recovery.

"The kennel club has operated its registry around the clock for six years, for the more than 633,000 pets that have received the Schering-Plough HomeAgain chips. Registering ... has resulted in

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<sup>50</sup> Mary Deibel; "No Longer Is It a Doggone Shame When Your Pet Disappears;" Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

<sup>51</sup> JoAnn Kohlbrand; "Microchips Required for Adopted Animals: L.A. Requires Electronic Implants for Pets Leaving Shelters;" WorldNetDaily.com; published August 7, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=18758](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=18758)>; p. 1 of 5/7/02 8:55 AM printout.

<sup>52</sup> Mary Deibel; "No Longer Is It a Doggone Shame When Your Pet Disappears;" Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

the return of 32,168 pets, almost 100 percent recovery for pets lost but registered through AKC.”<sup>53</sup>

b. AVID

“AVID—the American Veterinary Identification Device—registers its FriendChip through a PeTRAC system that also is open around the clock.”<sup>54</sup>

c. InfoPet

“The InfoPet system outside the United States has compatible scanners for Americans who take pets abroad.”<sup>55</sup>

2. A March 15, 2001 Wired News story comments on the current lack of standardization from the perspective of one actual institutional user.

Kathy Jenks, director of Ventura County, CA department of animal regulation indicates that, in practice, standardization has not yet been fully implemented:

But the technology isn't perfect, said Jenks, who tested four different microchips on the office dog before choosing one for use at the shelter.

...Chips made by one manufacturer can't be read by another manufacturer's scanner.<sup>56</sup>

3. A November 20, 2002 UK Department for Environment, Food and Rural Affairs (DEFRA) News Release entitled, “Pets Travel Scheme Extended to USA and Canada,” addresses the standardization situation from an international perspective:

In the UK and Europe most microchips and scanners comply with ISO Standards. The USA and Canada have different microchips. Owners of animals identified with non-ISO microchips may experience some difficulties in

<sup>53</sup> Mary Deibel; “No Longer Is It a Doggone Shame When Your Pet Disappears;” Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; pp. 1-2 of 4/19/02 11:04 AM printout.

<sup>54</sup> Mary Deibel; “No Longer Is It a Doggone Shame When Your Pet Disappears;” Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

<sup>55</sup> Mary Deibel; “No Longer Is It a Doggone Shame When Your Pet Disappears;” Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

<sup>56</sup> Julia Scheeres; “Dog Bytes Say More Than Bark;” Wired News; published March 15, 2001; <<http://www.wired.com/news/print/0,1294,42430,00.html>>; p. 2 of 7/24/02 10:35 AM printout.

demonstrating that their animal has been microchipped. Such owners are advised to provide their own scanner.<sup>57</sup>

#### D. Global in Scope: 50 Countries

##### 1. Asia: Thailand and Hong Kong: PetPlace.com

Laura Williams, in an article entitled “Microchipping for Your Dog’s Safety,” writes:

Chips also are becoming popular in other countries. To help stem the huge stray dog population in Thailand, the government there recently launched a campaign to encourage dog owners to implant their four-footed buddies with the chips. And in Hong Kong, it is mandatory to have your dog microchipped.<sup>58</sup>

##### 2. Canada: PetNet

###### a. PetNet: Canada’s National Pet Registry

PetNet is a division of Anitech Enterprises Inc. of Markham, Ontario. It is currently the only supplier of the microchip in Canada and runs the only national database of owner and pet information.<sup>59</sup>

###### b. The Web site of PetNet, Canada’s National Pet Registry

The “Frequently Asked Questions” section of the Web site of PetNet, Canada’s National Pet Registry, in response to the question “Can the microchip harm my pet?”, states:

The Canadian Veterinary Medical Association and humane societies across Canada endorse microchipping. Indeed, many humane societies make microchipping mandatory for all adopted pets. In addition to the 400,000 chipped pets in Canada, over 1 million pets are chipped in Europe where countries make it mandatory.<sup>60</sup>

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<sup>57</sup> “News Release: Pets Travel Scheme Extended to USA and Canada,” United Kingdom Department for Environment, Food and Rural Affairs; published November 20, 2002; <<http://www.defra.gov.uk/news/2002/021120c.htm>>; p. 2 of 12/18/02 5:09 PM printout.

<sup>58</sup> Laura Williams; “Microchipping for Your Dog’s Safety,” PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 3 of 4/19/02 11:01 AM.

<sup>59</sup> “PetNet: Canada’s National Pet Registry,” *London Bytes*: Produced by the students in the graduate program in journalism in the Faculty of Information and Media Studies at the University of Western Ontario; published n.d.; <<http://www.uwo.ca/journ/newmedia/issue2/f4petnet2.html>>; p. 1 of 4/19/02 10:21 AM printout.

<sup>60</sup> “Frequently Asked Questions: 2. Can the microchip harm my pet?,” PetNet.ca: PetNet Microchip Identification: Canada’s National Pet Registry; published n.d.; <[http://www.petnet.ca/petnet\\_live/servlet/Faq](http://www.petnet.ca/petnet_live/servlet/Faq)>; p. 1 of 4/19/02 11:07 AM printout.

c. Anitech: PetNet Microchip Identification

Over 400,000 Canadian pets are microchipped and registered with the PetNet database, over 4,000 new pets are added every month, and, microchipping is being included in many municipal by-laws. There are 8 million pets in Canada!<sup>61</sup>

3. Europe

a. European Pet Network, in short EuroPetNet or EPN

- 1) Self-described as the “ultimate website to find the owner of an animal,” EPN is “a non-profit-making association grouping several animal databanks from various European countries.” The aim of the association is:

To give to everyone concerned a tool to find the owner of an animal identified by a microchip and registered in a databank (some animals identified by a tattoo are also registered).

- 2) The EPN Website continues:

It will take time to carry out such project and cooperation from a large number of persons, associations and microchip dealers.

4.296.333 microchips numbers from our members are already recorded in EPN today.<sup>62</sup>

- 3) In addition to the Non Official Member, Cyprus, the following Official Members are listed on the EPN Website:

AT	Austria
BE	Belgium
CH	Switzerland
DE	Germany
DK	Denmark
ES	Spain
GB	United Kingdom
LU	Luxemburg
NL	The Netherlands
NO	Norway
PL	Poland <sup>63</sup>

b. The Pasadena Humane Society & SPCA

<sup>61</sup> “PetNet Microchip Identification;” Anitech Enterprises Inc.; copyright 2000.; <<http://www.anitech.com/petnet/petnet.html>>; p. 1 of 7/1/02 3:20 PM printout.

<sup>62</sup> “European Pet Network, in short EuroPetNet or EPN;” European Pet Network; published n.d.; <<http://www.europetnet.com/english/presentation/index.asp>>; p. 1 of 5/2/02 11:47 AM printout. A printout dated 4/19/02 10:25 AM stated, “4.057.611 microchips numbers from our members are already recorded in EPN today.”

<sup>63</sup> “EPN Members;” European Pet Network; published n.d.; <<http://www.europetnet.com/english/members/index.htm>>; p. 1 of 5/8/02 11:44 AM printout.

At the bottom of The Pasadena Humane Society & SPCA's home page, one finds the American Kennel Club Companion Animal Recovery logo along with the statement " 'Microchip your Pets!' The Pasadena Humane Society agrees – click to find out why."<sup>64</sup> In a "Success Overseas" section of its Microchip Web page, The Pasadena Humane Society & SPCA states:

Did you know that in Europe, permanent companion animal identification is mandatory? For dozens of years tattoos have been required and now microchips are being used as an easier, more accurate and humane option. Statistics from the English National Dog Warden Association show in 2001 that 73,230 were dogs impounded, 12,966 (18%) returned directly to the owner, 24,391 (33%) claimed by their owner from kennels. This indicates 51% of dogs are being returned to owners (RTO) in England. Overall, the United States has a 14% national RTO rate, and while the Pasadena Humane Society in 2001 had a 27% RTO rate for dogs, we were only able to RTO 2% of all cats.<sup>65</sup>

#### 4. Europe: Belgium and Luxembourg: idchips.com

"ID Chips— Animal Registration Data: The Belgian & Luxembourg Electronic Identification & Tracking System for Animals: ID Chips: Who We Are" Web site contains the following information:

ID Chips is the non profit Belgian organization which organizes the data management and tracking about the animals which are identified by microchip in Belgium & Luxemburg.

We have been running this service since 1990 continuously.

Our databank has more than 400.000 recorded animals.<sup>66</sup>

#### 5. Europe: Canada and Europe: PetNet.ca: Microchip Identification

PetNet, Canada's National Pet Registry, in response to the question "Can the microchip harm my pet?" provides the following information on the PetNet.ca Web site in the "Frequently Asked Questions" section:

<sup>64</sup> "Home;" The Pasadena Humane Society & SPCA; published n.d.; <<http://www.phsspca.org/main.shtml>>; p. 1 of 7/2/02 8:59 AM printout.

<sup>65</sup> "American Kennel Club Companion Animal: 'Microchip your Pets!' "; The Pasadena Humane Society & SPCA; published n.d.; <<http://www.phsspca.org/tags/microchip.htm>>; p. 1 of 5/7/02 9:19 AM printout.

<sup>66</sup> "ID Chips— Animal Registration Data: ID Chips: Who We Are;" IC Services; published 2001; <<http://www.idchips.com/en/WhoWeAre.htm>>; p. 1 of 5/3/02 11:06 AM printout.

The Canadian Veterinary Medical Association and humane societies across Canada endorse microchipping. Indeed, many humane societies make microchipping mandatory for all adopted pets. In addition to the 400,000 chipped pets in Canada, over 1 million pets are chipped in Europe where countries make it mandatory.<sup>67</sup>

6. Europe: Germany: TASSO e.V.

a. “Tasso International” Web page

On its “Tasso International” Web page, Tasso e. V., based in Germany, states:

Welcome...to TASSO-Online, Europe’s largest institution for pet- and animal-registration. At the moment not every topic is available in English language. So we might give you a short summary of the most important menu-options.

The menu-option REGISTRIERUNG gives you the possibility to register your pet online. Registration is absolutely cost free.

As a[n] animal welfare institution we finance our work by donations. If your animal is registered at TASSO’s central-database you have the safety that your pet can be identified all over Europe in case it gets lost.<sup>68</sup>

b. “Tasso International” Web page’s “REGISTRIERUNG”

Clicking on the “Tasso International” Web page’s “REGISTRIERUNG,” leads to a registration page, which asks for “Transponder-Nummer”, i.e., “Transponder number.” The registration page also provides blank spaces in which to enter tattoo numbers for the ear and thigh, both right and left.<sup>69</sup>

c. “Tasso International” Web page’s “TS-Links”

Clicking on the “Tasso International” Web page’s “TS-Links,” leads to, among other items, a list of four European registration places:

Italy  
Belgium  
Poland

<sup>67</sup> “Frequently Asked Questions: 12. Can the microchip harm my pet?,” PetNet.ca: PetNet Microchip Identification: Canada’s National Pet Registry; published n.d.; <[http://www.petnet.ca/petnet\\_live/servlet/Faq](http://www.petnet.ca/petnet_live/servlet/Faq)>; p. 1 of 4/19/02 11:07 AM printout.

<sup>68</sup> “Tasso International;” TASSO e.V.; published n.d.; <<http://www.tiernotruf.org/interna.htm>>; p. 1 of 5/16/02 5:06 PM printout.

<sup>69</sup> “Registrierung;” TASSO e.V.; <<http://www.tiernotruf.org/regist.html>>; published n.d.; p. 1 of 7/3/02 11:30 AM printout; translation from German to English: <[http://babelfish.altavista.com/urltrurl?url=http://www.tiernotruf.org/regist.html&lp=de\\_en&doit=done&urltext=>](http://babelfish.altavista.com/urltrurl?url=http://www.tiernotruf.org/regist.html&lp=de_en&doit=done&urltext=>)>; p. 1 of 7/3/02 10:01 AM printout.

Luxembourg<sup>70</sup>

## 7. Europe: Luxembourg: CIAD-Central office

The “Table of Contents in CIAD Home Page,” in response to the question, “What does the work of the CIAD-Central office consist in?”, states:

At the CIAD-central office the animals are registered with the help of their tattoo, ID-chip or a numbered badge and their coordinates which are computerized so that the animal may be identified immediately after being found.<sup>71</sup>

## 8. Europe: Netherlands: VETAIR

The English version of the Veterinary Animal Identification and Registration, that is, VETAIR, page, entitled, “Electronical Identification of Companion Animals—Microchips for Recognition,” contains the following comments:

The purpose of the VETAIR Foundation is international, professional, and safe identification and registration of pet animals.

We microchip because we love them, because we want to know where they are, and because we want to protect them from theft.

Started more than ten years ago, the VETAIR system was the first and for years the only Dutch database for microchipped pet-animals. Now we are the only one to guarantee your privacy.

We are co-founders of and cooperate with our international colleagues in Europetnet, the European cooperation between databases.

PLEASE REALISE:

IDENTIFICATION                      WITHOUT                      PROPER  
REGISTRATION IS USELESS!!<sup>72</sup>

<sup>70</sup> “Tierschutz-Links und Seiten;” TASSO e.V.; published n.d.; <<http://www.tiernotruf.org/ts-links.html>>; p. 1 of 5/16/02 4:46 AM printout; translation from German to English:

<[http://babelfish.altavista.com/urltrurl?url=http://www.tiernotruf.org/ts-links.html&doit=done&lp=de\\_en&tt=url&urltext=>](http://babelfish.altavista.com/urltrurl?url=http://www.tiernotruf.org/ts-links.html&doit=done&lp=de_en&tt=url&urltext=>)>; p. 1 of 7/3/02 1:03 PM printout.

<sup>71</sup> “Table of Contents in CIAD Home Page;” CIAD: Centre d'Identification pour Animaux Domestiques; published April 10, 2002; <<http://www.ciad.lu/menuuk.html>>; p. 1 of 5/17/02 2:31 PM printout.

<sup>72</sup> “Electronical Identification of Companion Animals—Microchips for Recognition;” VETAIR; published n.d.; <<http://www.vetair.org/home.html>>; p. 1 of 5/16/02 4:16 PM printout.

## 9. Europe: Poland: TOZ

## a. Polish Society for Protection of Animals: Home Page: English Version

The Polish Society for Protection of Animals has headquarters in Warsaw, while the Polish National Office for Animals' Identification and Computer Registration is sited in Gdansk.<sup>73</sup>

## b. Polish Society for Protection of Animals: About Us

Following is information related to the Polish Society for Protection of Animals and its subsidiary, The National Office For Animals' Identification And Computer Registration:

The history of the Polish Society for Protection of Animals (TOZ) begins in the second half of the XIX-th century...

Today TOZ develops its initiatives for protection of animals:...

-cooperates with similar societies and institutions (i.e. with the RSPCA in Horsham near London). TOZ is a member of the World Society for Protection of Animals in London (WSPA). It cooperates also with local authorities, government institutions and parliament.

The programme "Shake Your Paws" (identification and computer registration of animals) realizes almost all of the aims of TOZ in Poland.

The programme is being coordinated through the National Office for Animals' Identification and Computer Registration in Gdansk.<sup>74</sup>

## c. Polish Society for Protection of Animals: Links

## 1) The "Links" Web page lists the following "Cooperating Databases":

Belgium	<a href="http://www.idchips.com">www.idchips.com</a>
Italy	<a href="http://www.easypet.com">www.easypet.com</a>
Germany	<a href="http://www.tiernotruf.org">www.tiernotruf.org</a> <sup>75</sup>

## 2) The "Links" Web page also includes the "The European Database":

[www.europetnet.com](http://www.europetnet.com)<sup>76</sup>

<sup>73</sup> "Home: English Version;" Polish Society for Protection of Animals; published n.d.; <<http://www.podajlape.pl/glownaang.html>>; p. 1 of 5/16/02 4:20 PM printout.

<sup>74</sup> "About Us;" Polish Society for Protection of Animals; published n.d.; <<http://www.podajlape.pl/aboutus.html>>; p. 1 of 5/16/02 5:08 PM printout.

<sup>75</sup> "Links;" Polish Society for Protection of Animals; published n.d.; <<http://www.podajlape.pl/links.html>>; p. 1 of 5/16/02 4:40 PM printout.

- 3) The “Links” Web page also includes the sentence, “Our identification programme is being realized with the microchips and devices of AVID,” which is followed by two links to Avid-related Web sites:

www.avidid.com  
www.avidplc.com<sup>77</sup>

#### 10. Europe: United Kingdom

##### a. The Kennel Club

The Kennel Club’s PetLog Web page states:

The Kennel Club strongly recommends that all pet owners should have their animals microchipped for identification.

PetLog, the National Pet Identification Scheme, managed by The Kennel Club, in association with the RSPCA and Scottish SPCA, is the largest scheme in the UK and microchips can be 'read' at most Police Stations, veterinary practices, by Dog Wardens and all the major rehoming charities.<sup>78</sup>

##### b. UK National German Shepherd Dog Help Line

Following is information drawn from the Web site of the UK National German Shepherd Dog Help Line

- 1) The UK National German Shepherd Dog Help Line Web site has the introductory line, “The UK’s most comprehensive site of its type.”<sup>79</sup> A summary history of, and rationale for, the UK National German Shepherd Dog Help Line is as follows:

The UK National G.S.D. Help Line was established in 1998 when contact points for information and advice pertaining to the breed were recognized to be lacking. The Help Line is operated by a group of GSD enthusiasts within the UK with the welfare of the breed uppermost in their minds.<sup>80</sup>

- 2) Following is information about “Microchip Implantation”:

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<sup>76</sup> “Links;” Polish Society for Protection of Animals; published n.d.; <<http://www.podajlape.pl/links.html>>; p. 1 of 5/16/02 4:40 PM printout.

<sup>77</sup> “Links;” Polish Society for Protection of Animals; published n.d.; <<http://www.podajlape.pl/links.html>>; p. 1 of 5/16/02 4:40 PM printout.

<sup>78</sup> “Introduction to PetLog;” The Kennel Club; published n.d.; <<http://www.the-kennel-club.org.uk/petlog/welcome.asp>>; p. 1 of 4/19/02 10:27 AM printout.

<sup>79</sup> “UK National German Shepherd Dog Help Line;” GSD Helpline; published 2002; <<http://www.gsdhelpline.com/>> p. 1 of 5/7/02 10:04 AM printout.

<sup>80</sup> “UK National German Shepherd Dog Help Line;” GSD Helpline; published 2002; <<http://www.gsdhelpline.com/>> p. 1 of 5/7/02 10:04 AM printout.

Our microchip implanters will be using the latest Electronic Identification Devices (Trovan) microchips. Established in 1983, these products are sold throughout the world and are manufactured by AEG ~ a member of the Daimler Chrysler Group of companies ~ a major European electronics manufacturer with 100 years experience in the manufacture of quality electronics products. Quality and reliability are assured by the use of the same inspection, testing ISO 9001 process controls that AEG use to produce space and defence products.<sup>81</sup>

3) Microchipping is related to the Pet Passport system.

Micro chipping is required as part of the Pet Passport system for those wishing to take their animals out of the country.<sup>82</sup>

4) The “Microchip Implantation” section, published in 2002, includes a statement about “compulsory identification within 5 years”:

The Government's Dog Identification Working Party is about to publish a report recommending voluntary and then compulsory identification within 5 years. According to the report a disturbing 17000 dogs were destroyed in the UK last year.<sup>83</sup>

11. Europe: United States and Europe: Digital Angel: 2000

A Digital Angel Web site with a 2000 copyright date reports on the number of pets microchipped with its system:

*In addition, Digital Angel is: ... The worldwide leader in pet recovery with approximately 1 million pets in the U.S. and over 10 million in Europe protected by Digital Angel Animal Identification Systems Division patented microchips.*<sup>84</sup>

12. Global: More than 50 Countries: menagerie Magazine

<sup>81</sup> “Micro chipping Service;” GSD Helpline; published 2002; <<http://www.gsdhelpline.com/chipservice.htm>> p. 1 of 5/7/02 10:01 AM printout.

<sup>82</sup> “Micro chipping Service;” GSD Helpline; published 2002; <<http://www.gsdhelpline.com/chipservice.htm>> p. 1 of 5/7/02 10:01 AM printout.

<sup>83</sup> “Micro chipping Service;” GSD Helpline; published 2002; <<http://www.gsdhelpline.com/chipservice.htm>> p. 2 of 5/7/02 10:01 AM printout.

<sup>84</sup> “Only Digital Angel Technology Combines Real-time Location And Condition Acquisition With Real-time Data Delivery;” Digital Angel: Commercial; published 2002; <<http://www.digitalangel.net/commercial.asp>>; p. 2 of 3/9/02 4:50 PM printout.

Glenn Lisle, in the Ontario, Canada-based menagerie Magazine, produced by the Publishing Division of GRL Communications Inc., writes in a feature article:

If you are considering microchipping your pet, rest assured you'll be in good company.

A wide variety of creatures, from rattlesnakes to rabbits and elephants to chipmunks, have been chipped along with exotic and endangered species both in zoos and in the wild.

The pet ID microchip is used by film stars such as Keiko (the *Free Willy* Orca) and famous pets including HRH Queen Elizabeth's Corgies.

First marketed in 1991, manufacturers report that more than four million pet ID microchips have been sold to date, in more than 50 countries.<sup>85</sup>

### 13. Global: Computerized Tracking System: PETtrac: AVID

AVID, on its Web site, in response to the Frequently Asked Question "What is PETTrac?" states:

PETtrac is a global computerized tracking system for companion animals identified with the AVID Microchip. When you become a member, PETtrac can reunite your pets directly with you.<sup>86</sup>

#### E. Legally and/or Administratively Required

##### 1. Asia: China: Hong Kong

###### a. Hong Kong: A 1997 relojournal.com article

"John Hollywood, president of Cosmopolitan Canine Carriers in Darien, Connecticut," in a 1997 relojournal.com article provided the following information under the Hong Kong entry in a table entitled, "Document and Quarantine Requirements for Selected Countries":

No quarantine; import permit, distemper and rabies inoculation more than 30 days and less than one year prior to departure; an International Health Certificate signed by an accredited veterinarian and endorsed by a USDA veterinarian in the state capital of origin; and a

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<sup>85</sup> Glenn Lisle; "Ultimate Pet ID;" menagerie Magazine; published 1999; <<http://www.menagerie.on.ca/04-99/feature.html>>; p. 5 of 4/19/02 10:38 AM printout.

<sup>86</sup> "Frequently Asked Questions: 12. What is PETTrac?;" American Veterinary Identification Devices (AVID); published n.d.; <[http://www.avidid.com/faq/faq\\_eng\\_complete.html](http://www.avidid.com/faq/faq_eng_complete.html)>; p. 2 of 4/29/02 9:01 AM printout.

micro chip implant. (Please note: the only microchip readable in Hong Kong is an Avid microchip.)<sup>87</sup>

b. “Microchipping for Your Dog’s Safety”

Laura Williams, in an article entitled “Microchipping for Your Dog’s Safety,” writes:

And in Hong Kong, it is mandatory to have your dog microchipped.<sup>88</sup>

2. Asia: Singapore

a. The Agri-food & Veterinary Authority of Singapore (AVA)

The Agri-food & Veterinary Authority of Singapore (AVA) in a Press Releases section of its Web site has an article entitled, “Microchip Identification of Imported Dogs for Better Disease Prevention: Additional Questions and Answers.” The response to question 6, “How will AVA enforce the new requirement for all imported dogs to be identified with a microchip?” reads:

AVA will inform overseas veterinary authorities and local pet handling agents of the new requirement. With effect from 1 May 2001, overseas exporters and owners must microchip their dogs and puppies before exporting them to Singapore. This applies to both commercial consignments as well as personally owned pets. At the same time, overseas veterinary authorities will be requested to verify that dogs are microchipped, and to certify the identities of the dogs before they are exported to Singapore. On arrival in Singapore, AVA officers will inspect all imported dogs at the port of entry. The officers will use microchip readers to scan the dogs and read their microchips. The microchips will assist AVA officers to identify each imported dog with its travel documents.<sup>89</sup>

b. AVA article: “Are there any other areas where compulsory microchipping of dogs is required in Singapore?”

The above AVA article in response to question 11, “Are there any other areas where compulsory microchipping of dogs is required in Singapore?” states:

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<sup>87</sup> “When Fido Goes to a Foreign Location;” *Relocation Journal & Real Estate News*; copyright 1997; <<http://www.relojournal.com/june97/pets.htm>>; p. 2 of 5/7/02 11:51 AM printout.

<sup>88</sup> Laura Williams; “Microchipping for Your Dog’s Safety;” PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 3 of 4/19/02 11:01 AM.

<sup>89</sup> “Microchip Identification of Imported Dogs for Better Disease Prevention;” Agri-food & Veterinary Authority of Singapore; issued by Agri-food & Veterinary Authority on 22 Feb 2001; <<http://www.ava.gov.sg/JAVASCRIPT/module7/press/article19.htm>>; pp. 1-2 of 5/7/02 9:28 AM printout.

To protect the public from being bitten, compulsory microchipping is also required for dangerous breeds of dogs such as Pit Bull, Akita, Neapolitan Mastiff, Tosa and the crosses of these breeds.<sup>90</sup>

### 3. Australia

#### a. Australia: A 1997 relojournal.com article

“John Hollywood, president of Cosmopolitan Canine Carriers in Darien, Connecticut,” in a 1997 relojournal.com article provided the following information under the Australia entry in a table entitled, “Document and Quarantine Requirements for Selected Countries”:

One to four months quarantine depending on a rabies titre test performed by an official diagnostic laboratory, plus a microchip implant. International Health Certificate signed by an accredited veterinarian and endorsed by a USDA veterinarian in the state capital of origin.<sup>91</sup>

#### b. The Agri-food & Veterinary Authority of Singapore (AVA)

The Agri-food & Veterinary Authority of Singapore (AVA) in a Press Releases section of its Web site has an article entitled, “Microchip Identification of Imported Dogs for Better Disease Prevention: Additional Questions and Answers.” The first sentence of the response to question 5, “Do other countries also require microchipping of imported dogs?” reads:

Australia and New Zealand also impose compulsory microchipping for imported dogs.<sup>92</sup>

### 4. Australia: New South Wales (NSW)

#### a. Australian Broadcasting Corporation

An Australian Broadcasting Corporation “7:30 report” transcript entitled, “Multimillion-dollar Pet Microchipping System Not Working,” includes the following comments:

- 1) Maxine McKew: ... So far, it's only compulsory in NSW, while other States have it under consideration...<sup>93</sup>

<sup>90</sup> “Microchip Identification of Imported Dogs for Better Disease Prevention;” Agri-food & Veterinary Authority of Singapore; issued by Agri-food & Veterinary Authority on 22 Feb 2001; <<http://www.ava.gov.sg/JAVASCRIPT/module7/press/article19.htm>>; p. 2 of 5/7/02 9:28 AM printout.

<sup>91</sup> “When Fido Goes to a Foreign Location;” *Relocation Journal & Real Estate News*; copyright 1997; <<http://www.relojournal.com/june97/pets.htm>>; p. 2 of 5/7/02 11:51 AM printout.

<sup>92</sup> “Microchip Identification of Imported Dogs for Better Disease Prevention;” Agri-food & Veterinary Authority of Singapore; issued by Agri-food & Veterinary Authority on 22 Feb 2001; <<http://www.ava.gov.sg/JAVASCRIPT/module7/press/article19.htm>>; p. 1 of 5/7/02 9:28 AM printout.

- 2) Quentin Dempster: Vets and animal welfare groups complain that the database, established for the first time by law in NSW, has major problems...<sup>94</sup>
  - 3) Quentin Dempster: The Companion Animals Act, in place for nearly 12 months, now requires microchipping and registration for both cats and dogs.<sup>95</sup>
- b. The New South Wales Department of Local Government

The New South Wales (NSW) Department of Local Government authored “The Companion Animals Act 1998, Registering Your Dog, Frequently Asked Questions” paper. Following are selected excerpted portions from this paper.

- 1) Brief introductory material includes the comments:

The NSW Government has recently introduced new legislation covering the rights and responsibilities of the owners of companion animals, including cats and dogs.

The new legislation, the Companion Animals Act 1998, replaces the Dog Act 1966. It introduces new registration and identification requirements for cats and dogs and brings in tough new controls on dangerous dogs.<sup>96</sup>

- 2) A response to the question, “Do all companion animals have to be microchipped?” in section 1, “Registration and Microchipping,” states:

All dogs and ... cats born or who have changed owners since the 1 July 1999 are required to be microchipped and lifetime registered. Dogs already registered under the Dog Act can continue to be registered annually for three years to allow time for everyone to change over to the new system.<sup>97</sup>

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<sup>93</sup> “7:30 report: Multimillion-dollar Pet Microchipping System Not Working;” Australian Broadcasting Corporation; transcript 5/07/00, copyright 2000; <<http://www.abc.net.au/7.30/s148804.htm>>; p. 1 of 5/7/02 8:42 AM printout.

<sup>94</sup> “7:30 report: Multimillion-dollar Pet Microchipping System Not Working;” Australian Broadcasting Corporation; transcript 5/07/00, copyright 2000; <<http://www.abc.net.au/7.30/s148804.htm>>; p. 2 of 5/7/02 8:42 AM printout.

<sup>95</sup> “7:30 report: Multimillion-dollar Pet Microchipping System Not Working;” Australian Broadcasting Corporation; transcript 5/07/00, copyright 2000; <<http://www.abc.net.au/7.30/s148804.htm>>; p. 3 of 5/7/02 8:42 AM printout.

<sup>96</sup> “The Companion Animals Act 1998, Frequently Asked Questions;” New South Wales Department of Local Government; n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup> edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 2 of 5/30/02 12:06 PM printout.

<sup>97</sup> “The Companion Animals Act 1998, Frequently Asked Questions;” New South Wales Department of Local Government; n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup>

- 3) A response to the question, “What happens if I don’t identify or register my dog or my new cat?” in section 3, “Penalties And Powers,” states:

Failure to register or microchip your cat or dog as required by the Act attracts a maximum penalty of \$550.<sup>98</sup>

- 4) A response to the question, “What can a council officer do to enforce the legislation?” in section 3, “Penalties And Powers,” states:

Local councils are the authority responsible for implementing the Companion Animals legislation. Under the legislation councils have a range of responsibilities including planning, service provision, community education and enforcement...

Councils also have a range of powers to deal with major or ongoing problems. These powers include the ability to issue nuisance orders, which require the owner of a dog or cat to stop the animal from causing a particular nuisance. Failure to comply with a nuisance order is an offence...<sup>99</sup>

- 5) A response to the question, “If I want to breed from my animal, what should I do?” in section 4, “Buying, Selling and Breeding,” states:

However your responsibilities are not over once you have a litter of healthy puppies or kittens and good homes for them to go to. Under the Companion Animals Act, you cannot sell or give away a puppy or kitten without having it permanently identified by microchip. All puppies or kittens need to be microchipped by the age of 12 weeks, but if you sell or give away the animals before this age, you are still responsible for ensuring that they are microchipped before they

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edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 2 of 5/30/02 12:06 PM printout.

<sup>98</sup> “The Companion Animals Act 1998, Frequently Asked Questions;” New South Wales Department of Local Government; n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup> edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 6 of 5/30/02 12:06 PM printout.

<sup>99</sup> “The Companion Animals Act 1998, Frequently Asked Questions;” New South Wales Department of Local Government; n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup> edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 8 of 5/30/02 12:06 PM printout.

leave your ownership. A maximum penalty of \$550 applies for breaching these provisions.<sup>100</sup>

## 5. Canada

The following information regarding PetNet Microchip Identification indicates that microchipping is being addressed at the municipal level:

Over 400,000 Canadian pets are microchipped and registered with the PetNet database, over 4,000 new pets are added every month, and, microchipping is being included in many municipal by-laws.<sup>101</sup>

## 6. Europe: General

The Web site of PetNet, Canada's National Pet Registry, on the "Frequently Asked Questions" section, indicates, in response to the question "Can the microchip harm my pet?", that there are countries in Europe where it is mandatory to have pets chipped:

The Canadian Veterinary Medical Association and humane societies across Canada endorse microchipping. Indeed, many humane societies make microchipping mandatory for all adopted pets. In addition to the 400,000 chipped pets in Canada, over 1 million pets are chipped in Europe where countries make it mandatory.<sup>102</sup>

## 7. Europe: Belgium

Information about Identification and Registration of Dogs in Belgium," drawn from The Belgium Ministry of Foreign Affairs material on the web site of the Consulate General in Sydney, Australia, states:

A new regulation went into effect in Belgium on September 1, 1998 concerning the mandatory identification and registration of all dogs on Belgian territory.

All dogs must be identified in one of two ways: 1/ either a tattoo; or, 2/ an electronic chip...

Dogs coming from foreign countries and which were already identified in their country of origin will not have to

<sup>100</sup> "The Companion Animals Act 1998, Frequently Asked Questions;" New South Wales Department of Local Government; n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup> edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 10 of 5/30/02 12:06 PM printout.

<sup>101</sup> "PetNet Microchip Identification;" Anitech Enterprises Inc.; copyright 2000.; <<http://www.anitech.com/petnet/petnet.html>>; p. 1 of 7/1/02 3:20 PM printout.

<sup>102</sup> "Frequently Asked Questions: 2. Can the microchip harm my pet?;" PetNet.ca: PetNet Microchip Identification: Canada's National Pet Registry; published n.d.; <[http://www.petnet.ca/petnet\\_live/servlet/Faq](http://www.petnet.ca/petnet_live/servlet/Faq)>; p. 1 of 4/19/02 11:07 AM printout.

follow the identification procedure in Belgium as long as the identification system used conforms to the ISO standard. The owner of the animal will just have to register his dog at ABIEC (Belgian Association for Identification and Registration of Dogs).

If the dog coming from abroad does not have any tattoo and if its owner intends to stay more than 6 months on Belgian territory, the owner will have to go to a veterinarian in Belgium in order to identify the animal (by a tattoo or a chip) and ask the veterinarian to do the necessary in order to register the dog at ABIEC.<sup>103</sup>

## 8. Europe: European Union

### a. Commission of the European Communities: September 18, 2000: either tattoo or microchip allowed:

#### 1) The Commission of the European Communities on September 18, 2000, adopted a “Proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals.”

The proposal seeks to harmonise the animal-health requirements and rules applying to checks with regard to the non-commercial movement of pet animals, between the Member States and from third countries.<sup>104</sup>

#### 2) “Explanatory Memorandum” Overview

Measures need to be adopted at Community level to ensure that rules applicable to non-commercial movement of pet animals in the Member States are consistent.

To date, attempts to harmonise the animal-health requirements applicable to non-commercial movement of pet animals have come to grief over the problem of rabies, which is dealt with in widely divergent ways by the Member States.

However, over the last decade the rabies situation has improved spectacularly throughout the Community in the wake of vaccination campaigns targeting fox populations in regions where rabies is endemic.

<sup>103</sup> “Information about Identification and Registration of Dogs in Belgium;” The Belgium Ministry of Foreign Affairs Consulate General in Sydney, Australia; published n.d.; <<http://www.diplobel.org/australia/Sydney/English/visitors/pets.htm>>; p. 2 of 5/7/02 8:30 AM printout.

<sup>104</sup> “1.4.71. Proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals;” *Bulletin of the European Union*; September 2000 issue; <<http://www.europa.eu.int/abc/doc/off/bull/en/200009/p104071.htm>>; p. 1 of 7/12/02 4:42 PM printout.

The number of cases of rabies among household pets (cats and dogs) dropped from 499 in 1991 to 5 in 1998.

This highly favourable development has prompted the United Kingdom authorities to do away with the six-month quarantine they applied hitherto to cats and dogs entering the UK.

An alternative to the quarantine system has been adopted by the United Kingdom on the basis of the conclusions of a group of independent experts and following a public survey that came out overwhelmingly in favour. It is only intended to cover animals from the Member States and ultimately those from certain third countries where rabies does not exist or is under control. It is now accepted that this alternative system provides an equivalent level of safety to quarantine.

Briefly, it involves:

- electronically identifying the animals;
- vaccinating them with an inactivated vaccine;
- checking their immune response to vaccination by titration of antibodies, to be carried out more than six months prior to movement...

This draft Regulation is largely based on the alternative system adopted by the United Kingdom as regards movement to Member States “historically free of rabies”.

Vaccination only is required for movement between the Member States other than those referred to in the preceding paragraph. In line with a regional approach, the same rules applies to third countries and territories...that can be treated in the same way as the Community.

At a later stage, the regulations applicable to cats and dogs from third countries should be tightened up and stricter controls applied to such movement.

Since the disease is under control in all Member States, the introduction of animals from regions where rabies is endemic now constitutes the major risk of propagation.<sup>105</sup>

- 3) Article 3 of the Commission Proposal, referring to cats and dogs, permitted either a tattoo or a microchip:

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<sup>105</sup> “Proposal for a Regulation of the European Parliament and of the Council on the animal-health requirements applicable to non-commercial movement of pet animals;” Commission of The European Communities; published September 18, 2000; <[http://europa.eu.int/eur-lex/en/com/pdf/2000/en\\_500PC0529.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2000/en_500PC0529.pdf)>; p. 2.

Animals of the species listed in Annex I, Part A, shall be regarded as identified where they bear:

- (a) either a clearly readable tattoo, or
- (b) an electronic identification system (transponder)...<sup>106</sup>

- b. European Parliament Committee on the Environment, Public Health and Consumer Policy: April 10, 2001: only microchip after 8 years transitional period

A “Report on the proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals” of the European Parliament Committee on the Environment, Public Health contains, among other things, “Procedural Page” information, and an amendment of Article 3 regarding method of identification of animals.

#### 1) Procedural Page Information

By letter of 19 September 2000 the Commission submitted to Parliament ... the proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals...

At the sitting of 6 October 2000 the President of Parliament announced that she had referred this proposal to the Committee on the Environment, Public Health and Consumer Policy as the committee responsible...

The committee considered the Commission proposal and draft report at its meetings of 27 February and 10 April 2001.

At the last meeting it adopted the draft legislative resolution with 1 abstention.<sup>107</sup>

#### 2) Amendment of Article 3 regarding Animal Identification: microchip only

Amendment 6, addressing Article 3, requires a transition from either tattoos or microchip identification to microchip only.

<sup>106</sup> “Proposal for a Regulation of the European Parliament and of the Council on the animal-health requirements applicable to non-commercial movement of pet animals;” Commission of The European Communities; published September 18, 2000; <[http://europa.eu.int/eur-lex/en/com/pdf/2000/en\\_500PC0529.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2000/en_500PC0529.pdf)>; p. 6.

<sup>107</sup> “Report on the proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals (COM(2000) 529 – C5-0477/2000 – 2000/0221(COD));” European Parliament Committee on the Environment, Public Health and Consumer; published April 11, 2002; <<http://www2.europarl.eu.int/omk/sipade2?PUBREF=-//EP//NONSGML+REPORT+A5-2001-0125+0+DOC+PDF+V0//EN&L=EN&LEVEL=2&NAV=S&LSTDOC=Y>>; p. 4.

## Amendment 6

## Article 3

3. ***During an 8-year transitional period, beginning from the entry into force of this regulation***, animals of the species listed in Annex I, Part A, shall be regarded as identified where they bear:

- (a) either a clearly readable tattoo, or
- (b) an electronic identification system (transponder)...

***Those Member States who require animals entering their territory other than into quarantine to be identified [by option (b)] may continue to do so during the transitional period.***

***After the transitional period mentioned above only option (b) shall be accepted as the means of identification of an animal.***

*Justification*

*With the potential for tattoos to be difficult to read, to be altered and indeed fade over time, it would be more effective for animals to be microchipped as a means of identification. Eight years is a sufficient period for Member States to introduce a microchip system for all pet animals involved in Annex I Part A, being a major part of their total lifespan.<sup>108</sup>*

- c. European Parliament: May 3, 2001: only microchip after 8 years transitional period

The European Parliament, at first reading on May 3, 2001 adopted the essence of the position adopted by its Committee on the Environment, Public Health and Consumer with regard to accepting only “an electronic identification system (transponder)” after an eight-year transitional period.

*Article 3*

***During an eight-year transitional period, beginning from the entry into force of this Regulation***, animals of the species listed in Annex I, Part A, shall be regarded as identified where they bear:

<sup>108</sup> “Report on the proposal for a European Parliament and Council regulation on the animal-health requirements applicable to non-commercial movement of pet animals (COM(2000) 529 – C5-0477/2000 – 2000/0221(COD));” European Parliament Committee on the Environment, Public Health and Consumer; published April 11, 2002; <<http://www2.europarl.eu.int/omk/sipade2?PUBREF=-//EP//NONSGML+REPORT+A5-2001-0125+0+DOC+PDF+V0//EN&L=EN&LEVEL=2&NAV=S&LSTDOC=Y>>; pp. 8-9.

- (a) either a clearly readable tattoo, or
- (b) an electronic identification system (transponder).

In the case referred to in *(b)*, *the* transponder *must* comply with Standard ISO 11784 and Annex A to Standard ISO *11785*.

*Whatever form the animal identification system takes, provision must also be made for the indication of details identifying the name and address of the animal's owner.*

*Member States which require animals entering their territory, other than into quarantine, to be identified by option (b) may continue to do so during the transitional period.*

*After the transitional period, only option (b) shall be accepted as the means of identifying an animal.*<sup>109</sup>

- d. Commission of the European Communities: June 21, 2001: only microchip after 8 years transitional period

The Commission presented an amended proposal on June 21, 2001 that incorporated the viewpoint of the European Parliament's May 3, 2001 position with regard to accepting only "an electronic identification system (transponder)" after an eight-year transitional period. Material from the "Explanatory Memorandum" highlights this matter:

Most of the modifications are amendments for clarification or introducing obligations on the Commission or on the Member States with no serious incidence on the general objective of the proposal.

The amendment of article 3 is more significant as after a transitional period of 8 years the tattoo will not be recognised for identification of cats and dogs and electronic identification will be the only accepted method.

This amendment is likely to cause some difficulties in a few Member States where tattooing is still practised. Nevertheless it has been considered that the 8 years transitional period should allow a smooth switch to the new technology of the microchip which is more

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<sup>109</sup> "Position of the European Parliament adopted at first reading on 3 May 2001 with a view to the adoption of European Parliament and Council Regulation (EC) No .../2001 on the animal-health requirements applicable to non-commercial movement of pet animals (2000/0221(COD) – PE1);" European Parliament; published May 3, 2001; <[http://www3.europarl.eu.int/dg7/doclegcons/data/word/2000/0221/20000221\(COD\)-PE1-en.doc](http://www3.europarl.eu.int/dg7/doclegcons/data/word/2000/0221/20000221(COD)-PE1-en.doc)>; pp. 1, 4.

acceptable in term of welfare and does not rises any technical problem.<sup>110</sup>

- e. Regulation (EC) No 998/2003 of the European Parliament and of the Council: May 26, 2003: only microchip after 8 years transitional period

The European Parliament and the Council adopted Regulation (EC) No 998/2003 on May 26, 2003. The adopted Regulation states that after an eight-year transitional period, only “an electronic identification system (transponder)...shall be accepted as the means of identifying an animal.”

## CHAPTER I

### General provisions

#### Article 1

This Regulation lays down the animal health requirements applicable to the non-commercial movement of pet animals and the rules applying to checks on such movement.

#### Article 2

This Regulation applies to the movement between Member States or from third countries of pet animals of the species listed in Annex I...

#### Article 4

1. During an eight-year transitional period starting from the entry into force of this Regulation, animals of the species listed in parts A and B of Annex I shall be regarded as identified where they bear:

- (a) either a clearly readable tattoo; or
- (b) an electronic identification system (transponder).

In the case referred to in point (b) of the preceding subparagraph, where the transponder does not comply with ISO Standard 11784 or Annex A to ISO Standard 11785, the owner or the natural person responsible for the pet animal on behalf of the owner must provide the

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<sup>110</sup> “Amended proposal for a Regulation of the European Parliament and of the Council on the animal-health requirements applicable to non-commercial movement of pet animals;” Commission of The European Communities; published June 21, 2001; <<http://europa.eu.int/cgi-bin/eur-lex/udl.pl?REQUEST=Seek-Deliver&COLLECTION=com&SERVICE=eurlex&LANGUAGE=en&DOCID=501PC0349&FORMAT=pdf>>; pp. 2, 5.

means necessary for reading the transponder at the time of any inspection.

2. Whatever form the animal identification system takes, provision shall also be made for the indication of details identifying the name and address of the animal's owner.

3. Member States which require animals entering their territory, otherwise than into quarantine, to be identified in accordance with point (b) of the first subparagraph of paragraph 1 may continue to do so during the transitional period.

4. After the transitional period, only the method referred to in point (b) of the first subparagraph of paragraph 1 shall be accepted as the means of identifying an animal.<sup>111</sup>

#### 9. Europe: United Kingdom

##### a. Abbreviations MAFF and DEFRA

The use of either the abbreviation MAFF or DEFRA in the discussion of pet microchipping and the United Kingdom is explained by the following sentence:

The functions of the Ministry of Agriculture, Fisheries and Food have been taken over by the Department for Environment, Food and Rural Affairs who have a new website.<sup>112</sup>

##### b. The Agri-food & Veterinary Authority of Singapore (AVA)

The Agri-food & Veterinary Authority of Singapore (AVA) in a Press Releases section of its Web site has an article entitled, "Microchip Identification of Imported Dogs for Better Disease Prevention: Additional Questions and Answers."

The response to question 5, "Do other countries also require microchipping of imported dogs?" reads in part:

The UK uses microchipping as a means to identify dogs and cats under their Pet Travel Scheme (PETS) whereby such pets that are properly identified,

<sup>111</sup> "Regulation (EC) No 998/2003 of the European Parliament and of the Council of 26 May 2003 on the animal health requirements applicable to the non-commercial movement of pet animals and amending Council Directive 92/65/EEC;" *Official Journal of the European Union*; vol. 46, June 13, 2003; <[http://europa.eu.int/eur-lex/en/dat/2003/l\\_146/l\\_14620030613en00010009.pdf](http://europa.eu.int/eur-lex/en/dat/2003/l_146/l_14620030613en00010009.pdf)>; pp. 1-3.

<sup>112</sup> "MAFF;" Ministry of Agriculture, Fisheries and Food; published n.d.; <[http://www.defra.gov.uk/maff\\_redirect.htm](http://www.defra.gov.uk/maff_redirect.htm)>; p. 1 of 6/7/02 5:37 PM printout.

vaccinated and blood tested may be imported without the need for quarantine.<sup>113</sup>

c. British Embassy, Copenhagen, Denmark

The Web site of the British Embassy, Copenhagen, Denmark, states:

The Pet Travel Scheme (PETS) allows pet cats and dogs, from certain countries, including Denmark, to enter the UK without quarantine provided they meet certain rules.

To qualify under the Scheme, pets must enter the UK on an approved route with an approved transport company. Those companies will check microchips and the required documentation to ensure that the necessary conditions have been fulfilled...

The Department for Environment, Food and Rural Affairs, DEFRA has approved the operating plans of all these companies, subject to scrutiny of the arrangements which they have put into place...

The conditions which your pet will need to meet are:

first microchipping with an electronic “chip” which meets ISO standards...

Further advice (in English) may be obtained from the British DEFRA's PETS Helpline...<sup>114</sup>

d. PetPlanet

PetPlanet describes itself as “the leading UK dogs cats pets website and online pets products shop.”<sup>115</sup> PetPlanet provides a “Welcome To Britain: A European Dog (and Cat)’s Guide to Visiting Britain” Web page with the following information:

However, dogs and cats, like their owners, have to carry ‘passports’ to enter Britain. These are more complicated than a human’s passport, and consist of...

- A ‘chip’ implanted under the skin, showing your animal’s unique number. Although tattoos are legal in France, they are not sufficient for Britain...

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<sup>113</sup> “Microchip Identification of Imported Dogs for Better Disease Prevention;” Agri-food & Veterinary Authority of Singapore; issued by Agri-food & Veterinary Authority on 22 Feb 2001; <<http://www.ava.gov.sg/JAVASCRIPT/module7/press/article19.htm>>; p. 1 of 5/7/02 9:28 AM printout.

<sup>114</sup> “The Pet Travel Scheme;” British Embassy, Copenhagen, Denmark; published n.d.; <<http://www.britishembassy.dk/pets.shtm>>; pp. 1-2 of 5/7/02 9:45 AM printout.

<sup>115</sup> “PetPlanet.co.uk;” PetPlanet.co.uk; published n.d.; <<http://www.petplanet.co.uk/>>; p. 1 of 6/11/02 4:57 PM printout.

## Travel

Then you MUST book your animal's ticket with one of the ferry companies or airline that has the licence from our Ministry to transport animals into Britain under the Pet Travel Scheme. Their officials have been trained to check the paperwork and use the scanner device to check the animal's 'chip' number...<sup>116</sup>

### e. IgluVillas

IgluVillas is a London based entity that provides "holiday booking," primarily for Europe, for "holiday properties."

IgluVillas "Core Product" is described as follows: "IgluVillas aims to have the largest selection of villas and holiday homes in Europe."<sup>117</sup> On a "Bookings & Enquiries" Web site page, one is informed in the "Pets Abroad" section that, "You can now take your pooch across the channel without the compulsory 6 months of quarantine. Click here for all you need to know about pet passports."<sup>118</sup> The linked "Pet Passports" page states:

To be eligible for the passport scheme, and exempt from quarantine, the pet has to undergo various tests and procedures...

Your pet must be taken to a recognized Veterinary practice for:

- Vaccination
- Inserting an identification chip - tattoos not accepted...

The procedures are microchipping, vaccination against rabies, blood test after vaccination at a MAFF recognised laboratory and a health certificate which states that everything else has been carried out.

The microchip used must be of ISO standard, your vet can tell you if your pet has been chipped with this ISO standard chip or not...

The order of these procedures must be microchip first, then vaccinate, then blood test. The microchip numbers must be on the vaccination and blood test

<sup>116</sup> Verite Reily Collins; "Welcome To Britain: A European Dog (and Cat)'s Guide to Visiting Britain;" PetPlanet.co.uk; published n.d.; <[http://www.petplanet.co.uk/petplanet/travel/welcome\\_to\\_britain.htm](http://www.petplanet.co.uk/petplanet/travel/welcome_to_britain.htm)>; p. 1 of 4/19/02 10:49 AM printout.

<sup>117</sup> "About Iglu;" IgluVillas; published n.d.; <<http://www.igluvillas.com/aboutiglu.cfm>>; p. 1 of 5/7/02 9:25 AM printout.

<sup>118</sup> "Bookings & Enquiries: Pets Abroad;" IgluVillas; published n.d.; <<http://www.igluvillas.com/travel.cfm>>; p. 1 of 6/8/02 5:00 PM printout.

certificates, along with the date and the authorised veterinary signatures. The microchip number is important on the paperwork as it connects the pet with the certificates when the pet is presented and checked at the point of entry/exit.<sup>119</sup>

f. Moggies Web Site

A “Pet Passports (United Kingdom)” page from the Moggies Web Site, “home of the Online Cat Guide,”<sup>120</sup> provides information about the cost of quarantine for pets:

...The animals' arrival marks the easing of anti-rabies controls, which separate owners from their animals at a cost of between £1,500 and £2,000 a time.

From February 28th pets can go to Europe without going through quarantine.

At MAFF (Ministry of Agriculture, etc) Nick Brown is fed up with the French tweaking his nose over British Beef. Deciding he needs positive publicity, he gave pet owners good news by lifting quarantine from February 28th 2000 for pets going to and from certain countries in Europe...

Why are MAFF so concerned about Rabies?

We all should be. Once you have caught rabies, probably from a bite or saliva from an animal incubating rabies, there is no cure. You die a horrible death. However, dogs and cats properly vaccinated and blood-tested should be immune from catching and passing on the disease.

So what do I do if I want to take my dog/cat abroad?

Visit a recognised Veterinary practice for:

- \* Vaccination
- \* Insert identification chip (tattoos not accepted)
- \* Blood sample taken from animal 30 days after vaccination

If OK the Vet will sign papers and that is the pet's “passport.”<sup>121</sup>

<sup>119</sup> “Bookings & Enquiries: Pet Passports;” IgluVillas; published n.d.; <<http://www.igluvillas.com/travel/petpassports.cfm>>; p. 1 of 5/7/02 9:25 AM printout.

<sup>120</sup> “Moggies: Home of the Online Cat Guide;” Moggies; updated June 10, 2002; <<http://www.moggies.co.uk/>>; p. 1 of 6/10/02 2:53 PM printout.

## g. U.S. Air Forces in Europe News Service

The financial incentive for microchipping a pet and participating in the Pet Travel Scheme (PETS) can be further observed in material from the U.S. Air Forces in Europe News Service:

New rules established by the British government will let some U.S. service members and Department of Defense employees avoid the standard six-month quarantine for pets when they arrive in the United Kingdom.

The new rules, which fall under a pilot program called the "Pet Travel Scheme," allow pet owners to bypass the country's quarantine law and save the related costs, provided they meet the strict requirements. The program is set to begin in April 1, 2000.

The estimated cost of complying with the PETS program is about \$340.00 per pet. However, pet quarantine costs average \$2,500.00 per pet.

In order to qualify for the PETS program:

-- Pet owners must be arriving to the United Kingdom from an authorized country...

-- The plan only applies to cats and dogs. The pets must have lived in an authorized country at least six months before their arrival in the United Kingdom.

-- Pets must arrive via specific sea, air and rail routes to the United Kingdom...

-- Pets must have an identification microchip implant. After receiving the implant, pets must also be vaccinated for rabies with an inactivated vaccine. Regular rabies booster vaccinations must be administered...<sup>122</sup>

## h. The UK Department for Environment, Food and Rural Affairs (DEFRA): USA and Canada

- 1) A "What's New?" section continued under "More" from the "Bringing Pets to Britain" home page of The UK Department for Environment, Food and Rural Affairs (DEFRA) Web site provides information about the Pet Travel Scheme (PETS) as it relates both to the United States and Canada, in general, and the U.S. military, specifically:

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<sup>121</sup> "Pet Passports (United Kingdom);" Moggies; published n.d.; <<http://www.moggies.co.uk/stories/petpports.html>>; pp. 1-2 of 5/7/02 9:11 AM printout.

<sup>122</sup> "Pet Quarantine Rules Change in United Kingdom;" U.S. Air Forces in Europe News Service; RAF Mildenhall, England (USAFENS); published December 8, 1999; <<http://www.usafe.af.mil/news/news99/uns99364.htm>> p. 1 of 6/10/02 3:30 PM printout.

a) 11 April 2002

North America

Further to recent press speculation on the USA and Canada joining the Pet Travel Scheme, the position remains unchanged. The Government is examining two recent reports assessing the risk of rabies and other diseases being imported if the Scheme was extended to North America and an announcement will be made in due course. Dogs and cats coming to the UK from the USA and Canada still need to be licensed into quarantine on arrival.

b) 23 April 2002...

New laboratory: VETCOM Food Analysis and Diagnostic Laboratory, Ft Sam Houston, USA- accepts samples taken from US Military Personnel pets only.

c) 30 April 2002

We have been advised that the new laboratory in the USA (see 23 April) accepts blood samples taken from pets belonging only to US Military Personnel and their dependants - not from pets owned by general public.<sup>123</sup>

2) A November 20, 2002 UK Department for Environment, Food and Rural Affairs (DEFRA) News Release entitled, "Pets Travel Scheme Extended to USA and Canada," stated:

The successful PETS Travel Scheme is to be extended to dogs and cats from the United States and Canada, Animal Health Minister Elliot Morley announced today.

From 11 December, people coming to this country from the USA and Canada will be able to bring their vaccinated pets without having to put them into six months quarantine. However, until an approved route from North America is available and official certification agreed, animals will have to go into short stay quarantine, usually only for two to three days, whilst the microchip and paperwork are checked.<sup>124</sup>

Three of five "Notes for editors" at the end of the News Release include the following information:

a) The Pet Travel Scheme (PETS) was launched on 28 February 2000. For the first year it applied only to dogs and

<sup>123</sup> "Bringing Pets to Britain: What's New? — Continued;" United Kingdom Department for Environment, Food and Rural Affairs; last date: April 30, 2002; <<http://www.defra.gov.uk/animalh/quarantine/services/whats-new.shtml>>; p. 1 of 6/5/02 2:24 PM printout.

<sup>124</sup> "News Release: Pets Travel Scheme Extended to USA and Canada;" United Kingdom Department for Environment, Food and Rural Affairs; published November 20, 2002; <<http://www.defra.gov.uk/news/2002/021120c.htm>>; p. 1 of 12/18/02 5:09 PM printout.

cats from Western Europe. On 31 January 2001, it was extended to 28 long haul countries, such as Australia, Japan and New Zealand. Bahrain was added to the Scheme earlier this year.

- b) To date, some 75,000 dogs and cats have entered England under the Scheme without the need for quarantine. The Scheme operates into England on over 50 sea, air and rail routes from around Europe and the rest of the world.
  - c) Early next year we expect the European Union to formally adopt a Regulation covering the animal health requirements applicable to non-commercial movements of pet animals. That Regulation allows the UK's Pet Travel Scheme to continue almost unchanged for at least five years before a review of the Community system takes place. That Regulation will lay down how animals coming into the Community, including the UK, will be treated. Such decisions will be taken by the Community as a whole and not by individual member states. In the meantime, the Government will not be making any significant extensions to the qualifying countries under the Pet Travel Scheme.<sup>125</sup>
- 3) Implications of the United Kingdom decision to extend the Pet Travel Scheme to dogs and cats from the United States and Canada are noted in a press release entitled, "United Kingdom to Permit US and Canadian Pets With Implanted Identification Microchips to Avoid Six-Month Quarantine Upon Entry Into the UK: New Rules Take Effect December 11, 2002 - Change Expected to Benefit Digital Angel Corporation's Patented, Implantable RFID Microchip Technology":

Randolph K. Geissler, CEO of Digital Angel Corporation, commented: "This change in the UK pet quarantine law is a very positive development. It shows that implantable RFID microchips have become an accepted and recognized technology for verifying the health records of the microchipped pet while contributing to the health and safety of the public at large. This official recognition by the UK -- combined with numerous municipalities in the U.S. that are implementing or contemplating requirements for pet RFID chips -- is extremely encouraging. We believe these developments will give a substantial boost to the widespread acceptance of pet RFID chips both in the U.S. and abroad."

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<sup>125</sup> "News Release: Pets Travel Scheme Extended to USA and Canada;" United Kingdom Department for Environment, Food and Rural Affairs; published November 20, 2002; <<http://www.defra.gov.uk/news/2002/021120c.htm>>; p. 2 of 12/18/02 5:09 PM printout.

Mr. Geissler continued: "We're beginning to see clear signs of a substantial payoff from our pioneering efforts to create our patented implantable RFID technology and to establish the infrastructure of more than 75,000 scanners that are in use by vets and animal shelters around the world. This expanding infrastructure is the key to supporting further growth in demand for this technology, which results in about 5,000 recoveries of missing pets in the U.S. and Canada each month."

#### About Digital Angel Corporation

On March 27, 2002, Digital Angel Corporation completed a merger with Medical Advisory Systems, Inc., which for two decades has operated a 24/7, physician-staffed response center in Owings, Maryland. Prior to the merger, Digital Angel Corporation was a 93% owned subsidiary of Applied Digital Solutions, Inc. (Nasdaq: ADSX), which now is a beneficial owner of a majority position in the company. Digital Angel(TM) technology represents the first-ever combination of advanced sensors and Web-enabled wireless telecommunications linked to Global Positioning Systems (GPS). By utilizing advanced sensor capabilities, Digital Angel is able to monitor key functions -- such as ambient temperature and physical movement -- and transmit that data, along with accurate emergency location information, to a ground station or monitoring facility. The company also invented, manufactures and markets implantable identification microchips the size of a grain of rice for use in humans, companion pets, fish, and livestock. Digital Angel Corp. owns the patents for its inventions in all applications of the implantable microchip technology for humans and animals. For more information about Digital Angel Corp., visit <http://www.DigitalAngelCorp.com>.<sup>126</sup>

- i. The UK Department for Environment, Food and Rural Affairs (DEFRA): Pet Travel Scheme (PETS)

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<sup>126</sup> "United Kingdom to Permit US and Canadian Pets With Implanted Identification Microchips to Avoid Six-Month Quarantine Upon Entry Into the UK: New Rules Take Effect December 11, 2002 - Change Expected to Benefit Digital Angel Corporation's Patented, Implantable RFID Microchip Technology"; PRNewswire—First Call; published December 4, 2002; <[http://www.bloomberg.com/fcgci.cgi?T=marketsquote99\\_news.ht&s=APe31cRVmVW5pdGVk](http://www.bloomberg.com/fcgci.cgi?T=marketsquote99_news.ht&s=APe31cRVmVW5pdGVk)>; pp. 1-2 of 12/5/02 1:12 PM printout.

The UK Department for Environment, Food and Rural Affairs (DEFRA) Web site provides information about the Pet Travel Scheme (PETS).

- 1) A “Bringing Pets to Britain” home page provides the following introductory comments:

What you have to do to bring your pet dog or cat into Britain through the Pet Travel Scheme (or PETS for short) without putting it into quarantine. This site also tells you about quarantine in Britain for animals that don't qualify for PETS.<sup>127</sup>

- 2) A “Pets index page” describes the “Pet Travel Scheme”:

The Pet Travel Scheme (PETS) is the system that allows pet animals from certain countries to enter the UK without quarantine as long as they meet certain conditions. It also means that people in the UK can, having taken their pets to these countries, bring them back without the need for quarantine.

PETS was introduced for dogs and cats travelling from certain European countries on 28 February 2000. The Scheme was extended to Cyprus, Malta and certain Long Haul countries and territories on 31 January 2001.

The Scheme:

1. only applies to pet cats and dogs\* ("pets") including guide dogs and hearing dogs.
2. is limited to pets coming into the UK from certain countries and territories
3. only operates on certain sea, air and rail routes to England...

\*It is against the law in Great Britain to possess certain types of dogs and meeting the requirements of PETS will not change that.<sup>128</sup>

- 3) A “What you need to do to bring your pet into the UK” Web site page provides the reader with introductory information about the necessary procedures:

To bring your pet cat or dog into the UK under the Pet Travel Scheme (PETS) from one of the

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<sup>127</sup> “Bringing Pets to Britain;” United Kingdom Department for Environment, Food and Rural Affairs; published n.d.; <<http://www.defra.gov.uk/animalh/quarantine/home.html>>; p. 1 of 6/5/02 2:35 PM printout.

<sup>128</sup> “Pet Travel Scheme;” United Kingdom Department for Environment, Food & Rural Affairs; published June 2001; <<http://www.defra.gov.uk/animalh/quarantine/pets/index.shtml>>; p. 1 of 6/5/02 10:11 AM printout.

qualifying countries you must carry out the following procedures in the order shown.<sup>129</sup>

- 4) The “What you need to do to bring your pet into the UK” Web site page continues, first, to point out that, “Your pet can be fitted with a microchip in any country...,” and then to list the necessary procedures that, in most cases, must be carried out in the order shown. The first four procedures are presented below:

Have your pet microchipped

Before any of the other procedures for PETS are carried out, your pet must be fitted with a microchip so that it can be properly identified.

Have your pet vaccinated

After the microchip has been fitted your pet must be vaccinated against rabies.

Arrange a blood test

After your pet has been vaccinated, it must be blood tested to make sure that the vaccine has given it a satisfactory level of protection against rabies.

Get a PETS certificate

Once these steps have been successfully completed, you can get an official PETS certificate from a government authorised vet.<sup>130</sup>

- 5) A “Certificates” Web site page includes the following information:

The PETS certificate

To get your pet into the UK (or back into the UK) you will need an official PETS certificate. In Great Britain, this is completed and issued by a government-authorized vet known as a Local Veterinary Inspector (LVI).

The certificate will show that your pet:

1. is identified by its microchip number;
2. has a current vaccination against rabies;
3. has had a blood test showing satisfactory protection against rabies.

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<sup>129</sup> “What You Need To Do To Bring Your Pet Into The UK;” United Kingdom Department for Environment, Food & Rural Affairs; published November 20, 2001; <<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/owners.shtml>>; p. 1 of 6/5/02 10:17 AM printout.

<sup>130</sup> “What You Need To Do To Bring Your Pet Into The UK;” United Kingdom Department for Environment, Food & Rural Affairs; published November 20, 2001; <<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/owners.shtml>>; pp. 1-2 of 6/5/02 10:17 AM printout.

If your pet does not meet these conditions, it will not get a PETS certificate.<sup>131</sup>

- 6) A question and answer Web site page includes the following response to the second question, “Do all cats and dogs in the UK have to be microchipped?”:

No. Only those that the owner wants to take abroad and then bring them back to the UK under the Pet Travel Scheme.<sup>132</sup>

- 7) A “PETS Statistics” Web site page provides data on the “Number of pet cats and dogs entering England under PETS each month.” The cumulative total for 2000 and 2001 was 14,549 and 40,818, respectively.<sup>133</sup>

- 8) A “Qualifying Countries in Europe” Web site page entitled, “European Countries Eligible for PETS,” provides the following specifics, with greater detail provided in notes for five countries:

Pets resident in the UK can, having travelled to one or more of the countries below, return to the UK under PETS without quarantine provided they meet the rules of the Scheme. Pets that come from one of these countries and have been resident in any of them for at least six months can also enter the UK under the Scheme as long as they meet the necessary rules.<sup>134</sup>

Andorra	Austria	Belgium
Cyprus <sup>1</sup>	Denmark	Finland
France	Germany	Gibraltar
Greece	Iceland	Italy
Liechtenstein	Luxembourg	Malta <sup>2</sup>
Monaco	Netherlands	Norway <sup>3</sup>
Portugal <sup>4</sup>	San Marino	Spain <sup>5</sup>
Sweden	Switzerland	Vatican

<sup>131</sup> “Certificates;” United Kingdom Department for Environment, Food & Rural Affairs; published January 2002;

<<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/support-info/ctifcates.shtml>>; p. 1 of 5/7/02 9:51 AM printout.

<sup>132</sup> “Microchipping and Identification;” United Kingdom Department for Environment, Food & Rural Affairs; published June 2000;

<<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/support-info/microqa.shtml>>; p. 1 of 6/5/02 10:18 AM printout.

<sup>133</sup> “PETS Statistics;” United Kingdom Department for Environment, Food & Rural Affairs; published February 2002;

<<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/stats.shtml>>; pp. 1-2 of 6/5/02 10:13 AM printout.

<sup>134</sup> “European Countries Eligible for PETS;” United Kingdom Department for Environment, Food & Rural Affairs; published July 2001;

<<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/support-info/countries.shtml>>; p. 1 of 5/7/02 9:47 AM printout.

- 9) A Web site page entitled, “Long Haul Countries Eligible for PETS,” provides information with reference to qualifying non-European countries and territories, or, based on information in the Web site header, “rabies free islands”:

The Pet Travel Scheme was extended on 31 January 2001 to include certain Long Haul (i.e. non-European) countries and territories. These are:

Antigua and Barbuda	Ascension Island
Australia	Bahrain
Barbados	Cayman Islands
Bermuda	Fiji
Falkland Islands	Guadeloupe
French Polynesia	Jamaica
Hawaii	Martinique
Japan	Mayotte
Mauritius	New Caledonia
Montserrat	Réunion
New Zealand	St Kitts & Nevis
St Helena	Singapore
St Vincent	Wallis and Futuna
Vanuatu	

There is a slightly different procedure for bringing pets to the UK from these countries or territories.<sup>135</sup>

- j. The UK Department for Environment, Food and Rural Affairs (DEFRA): Cattle Tracing: “Probably Compulsory” in Future

The following DEFRA material suggests that electronic identification will be “probably compulsory” in the future:

Cattle born after 1 January 1998 must have a DEFRA approved eartag in each ear (double tagging). The tag in each ear must have the same unique number. Such animals will be identified throughout their lifetime by this unique number. Animals born or imported into Great Britain before 1 January 1998 may continue to be identified by a single tag. Cattle born after 1 July 2000 must be identified by all numeric tags...

Electronic tagging of cattle is not compulsory within the European Union, nor in this country. This is still a developing technology which is not yet fully standardised. The European Commission is undertaking a field trial of various electronic devices. Their preference is towards devices which can be implanted in the animal or given as a bolus. The

<sup>135</sup> “Long Haul Countries Eligible for PETS;” United Kingdom Department for Environment, Food & Rural Affairs; published May 2002; <<http://www.defra.gov.uk/animalh/quarantine/pets/procedures/support-info/other.shtml>>; p. 1 of 6/7/02 5:00 PM printout.

Government believes it is sensible to await the outcome of this trial and see what subsequent European rules might be agreed for all Member States before requiring electronic identification. DEFRA is reviewing (with devolved Agriculture Departments) the interim UK policy on electronic identification for livestock.

There is nothing in the Government's rules which prevents farmers from using electronic identification if they wish: that is a commercial decision for them to make. And in the longer run, it seems likely that electronic identification of cattle will become widespread, and probably compulsory.<sup>136</sup>

#### 10. New Zealand

##### a. The Agri-food & Veterinary Authority of Singapore (AVA)

The Agri-food & Veterinary Authority of Singapore (AVA) in a Press Releases section of its Web site has an article entitled, "Microchip Identification of Imported Dogs for Better Disease Prevention: Additional Questions and Answers." The first sentence of the response to question 5, "Do other countries also require microchipping of imported dogs?" reads:

Australia and New Zealand also impose compulsory microchipping for imported dogs.<sup>137</sup>

##### b. The Overseas Briefing Center

The Overseas Briefing Center within The George P. Schultz National Foreign Affairs Training Center of the U.S. State Department in a "Pet Import And Quarantine Restrictions" table section of "Preparing to Go Overseas" observes in the "Import Restriction" column for New Zealand:

...Pets must have microchip inserted or tattoo by vet.<sup>138</sup>

<sup>136</sup> "Animal Tracing and Identification: Cattle Tracing – Tagging"; United Kingdom Department for Environment, Food & Rural Affairs; published December 8, 2000/reviewed February 21, 2002; <[http://www.defra.gov.uk/animalh/tracing/tagging/tag\\_index.htm - Electronic](http://www.defra.gov.uk/animalh/tracing/tagging/tag_index.htm - Electronic)>; pp. 1, 3 of 6/5/02 2:09 PM printout.

<sup>137</sup> "Microchip Identification of Imported Dogs for Better Disease Prevention;" Agri-food & Veterinary Authority of Singapore; issued by Agri-food & Veterinary Authority on 22 Feb 2001; <<http://www.ava.gov.sg/JAVASCRIPT/module7/press/article19.htm>>; p. 1 of 5/7/02 9:28 AM printout.

<sup>138</sup> "Preparing to Go Overseas: Pet Import And Quarantine Restrictions;" Overseas Briefing Center, Foreign Service Institute, The George P. Schultz National Foreign Affairs Training Center, U.S. Department of State; published n.d.; <<http://www.state.gov/www/obc/prepare/petchart.html>>; p. 7 of 6/5/02 11:21 AM printout.

## 11. U.S.: Cities: California: Los Angeles

- a. Scripps Howard News Service July 10, 2000, article in *Connect*, published in *The Columbus Dispatch*

Los Angeles was the first major city to require the use of the chips for any stray pets picked up by control officers. The ordinance, passed in 1998, took effect this spring.<sup>139</sup>

- b. WorldNetDaily.com: August 7, 2000

The City of Los Angeles' animal shelters now require all animals adopted from their facilities be given an identification microchip implant.

After several years of debate and study, the Los Angeles City Council approved a measure to require that, as of Aug. 1, adopted animals be given a small electronic implant that would identify the owner of the pet. While the program has been discussed for many years, cost considerations for increased staff and computer equipment held up its implementation until now.

A \$15 fee covering the cost of the microchip and the implant procedure will be charged to the new pet owners. Current pet owners can bring their animals in for the implants for a \$25 fee. Private veterinarians usually charge between \$25 and \$45 for the procedure.<sup>140</sup>

- c. City of Los Angeles Municipal Code: June 30, 2001

The Los Angeles Municipal Code, with a Revision Date of June 30, 2001, contains "Criminal or regulatory ordinances of the City of Los Angeles."<sup>141</sup> Chapter V, Article 3, Sec. 53.15.5. Electronic Animal Identification Device of The Municipal Code reads:

The Department of Animal Regulation shall implant each dog and cat adopted out of the Department's shelters with an Electronic Animal Identification Device approved and provided by the Department.

<sup>139</sup>Mary Deibel; "No Longer Is It a Doggone Shame When Your Pet Disappears;" Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

<sup>140</sup>JoAnn Kohlbrand; "Microchips Required for Adopted Animals: L.A. Requires Electronic Implants for Pets Leaving Shelters;" WorldNetDaily.com; published August 7, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=18758](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=18758)>; p. 1 of 5/7/02 8:55 AM printout.

<sup>141</sup>"Municipal Code;" City of Los Angeles; published June 30, 2001; <[http://cityfolio.ci.la.ca.us/cgi-bin/om\\_isapi.dll?clientID=206861](http://cityfolio.ci.la.ca.us/cgi-bin/om_isapi.dll?clientID=206861)>; p. 1 of 7/31/02 9:22 AM printout.

The fee for the implanted device shall be \$15.00, to be paid by the person adopting the dog or cat in addition to any other adoption related fee.

Any owner of a dog or a cat may have an Electronic Animal Identification Device provided and implanted by the Department in said dog or cat. The fee for such implanted device shall be \$25.00.

The provisions of this section shall be operative for a period of 36 months following the effective date of this amendment and shall be inoperative thereafter.

**(Sentence Amended by Ord. No. 173,334, Eff. 7/13/00.)**<sup>142</sup>

12. U.S.: Cities and County: California: Los Angeles; California: Ventura County; Illinois: Chicago; Missouri: St. Louis; Pennsylvania: Philadelphia
  - a. “Chicago, St. Louis, Philadelphia and other cities across the United States require that impounded dogs be implanted with the microchip. Los Angeles will join other areas, including its neighboring Ventura County, in requiring the implants for all adopted animals.”<sup>143</sup>
  - b. “Shelters in the California county of Ventura have been implanting chips in strays for 10 years and are very familiar with the chips' performance.”<sup>144</sup>
13. U.S.: Cities and County: California: San Francisco; Florida: Dade County; Indiana: Indianapolis; New Mexico: Albuquerque; South Carolina: Columbia

A Salon Technology and Business Web site article notes a number of U.S. cities in which chip implants are mandatory for pets adopted from shelters:

All paranoia and conspiracy theories aside, it's alarming how quickly a new technological "option" becomes a requirement. The microchipping of pets is a case in point...

<sup>142</sup> “Municipal Code: Chapter V, Article 3, Sec. 53.15.5. Electronic Animal Identification Device;” City of Los Angeles; published June 30, 2001; <[http://Cityfolio.ci.la.ca.us/cgi-bin/om\\_isapi.dll?clientID=191979&advquery=implant&infobase=municipal codes&record={4A30}&softpage=Document42&x=24&y=12](http://Cityfolio.ci.la.ca.us/cgi-bin/om_isapi.dll?clientID=191979&advquery=implant&infobase=municipal codes&record={4A30}&softpage=Document42&x=24&y=12)>; p. 1 of 7/25/02 2:27 PM printout.

<sup>143</sup> JoAnn Kohlbrand; “Microchips Required for Adopted Animals: L.A. Requires Electronic Implants for Pets Leaving Shelters;” WorldNetDaily.com; published August 7, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=18758](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=18758)>; p. 2 of 5/7/02 8:55 AM printout.

<sup>144</sup> Julia Scheeres; “Dog Bytes Say More Than Bark;” Wired News; published March 15, 2001; <<http://www.wired.com/news/print/0,1294,42430,00.html>>; p. 1 of 7/24/02 10:35 AM printout.

All the strays adopted from the San Francisco animal shelter now have such identification chips implanted under their skin. According to the American Kennel Club, a number of localities -- Columbia, S.C.; Indianapolis, Ind.; Albuquerque, N.M.; and Dade County, Fla.; among them -- have adopted ordinances requiring such chip implants. What has been a novelty is now required.<sup>145</sup>

14. U.S.: Cities: Illinois: Chicago

An AP story with a Philadelphia byline notes one situation in which dogs must be microchipped: "In Chicago, owners of dogs considered 'dangerous' are required to have their pets spayed or neutered and fitted with a microchip for identification."<sup>146</sup>

15. U.S.: Cities: Tennessee: Memphis

In a July 10, 2000, Scripps Howard News Service article, Mary Deibel reported:

The city council in Memphis, Tenn., recently backed off requiring all licensed pets to get chips or collar IDs partly because of price. But it was partly over philosophical differences...<sup>147</sup>

16. U.S.: States: Shelters in Many States Scan for Microchips

The Pasadena Humane Society & SPCA observes that shelters in many states scan animals for microchips.

California (and many other states) require by law that shelters scan every animal that comes through the door for a microchip.<sup>148</sup>

17. U.S.: States: California

a. California Law: Shelters: Scanning Required

<sup>145</sup> Katharine Mieszkowski; "Put That Chip Where the Sun Don't Shine;" Salon Technology and Business; published September 7, 2000; <<http://archive.salon.com/tech/feature/2000/09/07/chips/print.html>>; pp. 4-5 of 4/15/03 4:05 PM printout.

<sup>146</sup> "Microchips Helping Reunite Lost Pets with Their Owners;" Associated Press (Philadelphia) article on *yorknewstimes.com*; published December 22, 2001, last updated at 11:52 PM; <[http://www.yorknewstimes.com/stories/122201/nat\\_1222010032.shtml](http://www.yorknewstimes.com/stories/122201/nat_1222010032.shtml)>; p. 2 of 4/19/02 11:05 AM printout.

<sup>147</sup> Mary Deibel; "No Longer Is It a Doggone Shame When Your Pet Disappears;" Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 3 of 4/19/02 11:04 AM printout.

<sup>148</sup> "Why Microchip Your Pet?"; The Pasadena Humane Society & SPCA; published n.d.; <<http://www.phsspca.org/tags/microchip.htm>>; p. 1 of 5/7/02 9:19 AM printout.

California requires by law that shelters scan dogs and cats for a microchip.

- 1) California Food and Agricultural Code Section 31108 (c) states in reference to dogs:

During the holding period required by this section and prior to the adoption or euthanasia of a dog impounded pursuant to this division, a public or private shelter shall scan the dog for a microchip that identifies the owner of that dog and shall make reasonable efforts to contact the owner and notify him or her that his or her dog is impounded and is available for redemption.<sup>149</sup>

- 2) California Food and Agricultural Code Section 31752 (c) states in reference to cats:

During the holding period required by this section and prior to the adoption or euthanasia of a cat impounded pursuant to this division, a public or private shelter shall scan the cat for a microchip that identifies the owner of that cat and shall make reasonable efforts to contact the owner and notify him or her that his or her cat is impounded and is available for redemption.<sup>150</sup>

- 3) The language in the California Food and Agricultural Code Sections 31108 (c) and 31752 (c) derives from California Assembly Bill 2754, which was Chaptered as Chapter 567 on September 21, 2000 with the topic “Stray animals.”<sup>151</sup>

- b. California Law: SB 236: Not Enacted: Microchip Required.

A bill that failed to be enacted was introduced in the California Senate during February of 2001 with the topic of “Dogs and cats: micro-chip: owner’s registry.” This bill was initially intended to require microchips to be implanted in all pets more than 4 months old. Senate Bill 236 was introduced as “An act to add Section 32005 to the Food and Agricultural Code, relating to animals.”<sup>152</sup>

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<sup>149</sup> “California Codes: Food And Agricultural Code: Section 31101-31109”; California Law; published n.d.; <<http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=74457414692+0+0+0&WAISaction=retrieve>>; p. 2 of 12/24/02 8:35 AM printout.

<sup>150</sup> “California Codes: Food And Agricultural Code: Section 31751-31754”; California Law; published n.d.; <<http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=74610916459+1+0+0&WAISaction=retrieve>>; p. 4 of 12/24/02 8:34 AM printout.

<sup>151</sup> “Bill Number: AB 2754”; California Law; chaptered September 21, 2002; <<http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=74155112890+1+0+0&WAISaction=retrieve>>; pp. 3-4 of 12/24/2002 8:51 AM printout.

<sup>152</sup> “Bill Number: SB 236 Introduced”; California Law; introduced February 14, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0201-0250/sb\\_236\\_bill\\_20010214\\_introduced.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0201-0250/sb_236_bill_20010214_introduced.html)>; p. 1 of 12/24/2002 2:15 PM printout.

- 1) The “Legislative Counsel’s Digest” of SB 236 read in part:

The bill would make it a crime for any person to own, harbor, or keep any dog or cat over the age of 4 months, unless that dog or cat has been micro-chipped and the owner's identification has been entered into a national registry approved by the Department of Food and Agriculture. By creating a new crime, this bill would impose a state-mandated local program upon local governments.<sup>153</sup>

- 2) The wording of the germane portion of SB 236 as Introduced read:

It is unlawful for any person to own, harbor, or keep any dog or cat over the age of four months, unless that dog or cat has been micro-chipped and the owner's identification has been entered into a national registry approved by the Department of Food and Agriculture.<sup>154</sup>

- c. California Law: SB 1373: Not Enacted: Microchip Required.

A bill introduced in the California Senate during February of 2002 with the topic of “Dogs and cats: registration and microchipping” was “Refused passage” on May 29, 2002, was “Placed on inactive file on request of” the bill’s author on June 24, 2002, and, on November 30, 2002, “Died on file.”<sup>155</sup>

- 1) The “Legislative Counsel’s Digest” of SB 1373 read in part:

The bill would also require the seller of any dog or cat to ensure that the dog or cat has been microchipped.<sup>156</sup>

- 2) The wording of the germane portion of SB 1373 as Introduced read:

The seller of any dog or cat shall ensure that the dog or cat has been microchipped and the owner's identification has been entered into a local registry maintained by a county, city, or city and

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<sup>153</sup> “Bill Number: SB 236 Introduced”; California Law; introduced February 14, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0201-0250/sb\\_236\\_bill\\_20010214\\_introduced.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0201-0250/sb_236_bill_20010214_introduced.html)>; p. 1 of 12/24/2002 2:15 PM printout.

<sup>154</sup> “Bill Number: SB 236 Introduced”; California Law; introduced February 14, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0201-0250/sb\\_236\\_bill\\_20010214\\_introduced.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0201-0250/sb_236_bill_20010214_introduced.html)>; p. 1 of 12/24/2002 2:15 PM printout.

<sup>155</sup> “Bill Number: SB 1373 Complete Bill History”; California Law; last entry November 30, 2002; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_1351-1400/sb\\_1373\\_bill\\_20021130\\_history.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1351-1400/sb_1373_bill_20021130_history.html)>; p. 1 of 12/23/2002 1:38 PM printout.

<sup>156</sup> “Bill Number: SB 1373 Introduced”; California Law; introduced February 7, 2002; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_1351-1400/sb\\_1373\\_bill\\_20020207\\_introduced.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1351-1400/sb_1373_bill_20020207_introduced.html)>; p. 1 of 12/23/2002 1:38 PM printout.

county agency providing animal control services or into a national registry.<sup>157</sup>

d. California Law: SB 769: Sentry Dogs: Microchip Required.

A bill, SB 769, introduced in the California Senate during February of 2001 with the topic of “Sentry dogs” was “Approved By Governor” on September 28, 2001, was “Filed With Secretary Of State” on October 1, 2001, and, “Chaptered” as Chapter 377.”<sup>158</sup>

1) An excerpt from the “Legislative Counsel’s Digest” of SB 769 read:

Existing law establishes limitations and procedures with respect to the use of sentry dogs.

This bill would require any person, firm, partnership, association, or corporation that operates or maintains a business to sell, rent, or train any attack, guard, or sentry dog to obtain a permit from the local public agency or private society or pound contracting with the local public agency for animal care or protection services...This bill would also require microchipping of animals subject to this bill for identification purposes, and would also require certain immunizations of the animals. This bill would also establish civil penalties for violation of its provisions.<sup>159</sup>

2) The wording of the germane portion of SB 769 as Chaptered read:

SEC. 10. Section 121920 of the Health and Safety Code is amended to read:

121920. (a) The owner or trainer of any attack, guard, or sentry dog shall ensure that the dog has been microchipped and the owner's identification has been entered into a local or national registry.<sup>160</sup>

18. U.S.: States: Hawaii

<sup>157</sup> “Bill Number: SB 1373 Introduced”; California Law; introduced February 7, 2002; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_1351-1400/sb\\_1373\\_bill\\_20020207\\_introduced.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1351-1400/sb_1373_bill_20020207_introduced.html)>; pp. 2-3 of 12/23/2002 1:38 PM printout.

<sup>158</sup> “Bill Number: SB 769 Introduced”; California Law; introduced February 23, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0751-0800/sb\\_769\\_bill\\_20011001\\_chaptered.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0751-0800/sb_769_bill_20011001_chaptered.html)>; p. 1 of 12/23/2002 4:41 PM printout.

<sup>159</sup> “Bill Number: SB 769 Introduced”; California Law; introduced February 23, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0751-0800/sb\\_769\\_bill\\_20011001\\_chaptered.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0751-0800/sb_769_bill_20011001_chaptered.html)>; p. 1 of 12/23/2002 4:41 PM printout.

<sup>160</sup> “Bill Number: SB 769 Introduced”; California Law; introduced February 23, 2001; <[http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb\\_0751-0800/sb\\_769\\_bill\\_20011001\\_chaptered.html](http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_0751-0800/sb_769_bill_20011001_chaptered.html)>; p. 4 of 12/23/2002 4:41 PM printout.

- a. Honolulu, USA : A 1997 relojournal.com article  
 “John Hollywood, president of Cosmopolitan Canine Carriers in Darien, Connecticut,” in a 1997 relojournal.com article provided the following information under the “Honolulu, USA” entry in a table entitled, “Document and Quarantine Requirements for Selected Countries”:

One to four months quarantine depending on a rabies titre test performed by an official diagnostic laboratory, plus a microchip implant. International Health Certificate signed by an accredited veterinarian and endorsed by a USDA veterinarian in the state capital of origin.<sup>161</sup>

- b. State of Hawaii: Department of Agriculture: Animal Quarantine Station

1) *Rabies Quarantine Station Information Brochure*

- a) *The Rabies Quarantine Station Information Brochure*  
 “contains important information about pre- and post-arrival requirements, quarantine station procedures, policies, rules, operations and fees.”<sup>162</sup>

- b) An initial paragraph of the *Rabies Quarantine Station Information Brochure* explains that:

Hawaii is the only rabies free state in the nation. Hawaii's quarantine law is designed to protect residents and pets from potentially serious health problems associated with the presence and spread of rabies. Success of the quarantine program is dependent on maintaining isolation of your pet from other animals for the required quarantine period.<sup>163</sup>

- c) An “It’s the Law” section of the *Rabies Quarantine Station Information Brochure* reads:

Importation of dogs, cats and other carnivores into Hawaii is governed by Chapter 4-29 of the State of Hawaii, Department of Agriculture Administrative Rules. This law says that these animals are

<sup>161</sup> “When Fido Goes to a Foreign Location;” *Relocation Journal & Real Estate News*; copyright 1997; <<http://www.relojournal.com/june97/pets.htm>>; p. 2 of 5/7/02 11:51 AM printout.

<sup>162</sup> *Rabies Quarantine Station Information Brochure*; Animal Quarantine Station, Department of Agriculture, State of Hawaii; Revised February 2002; <<http://www.hawaiiag.org/hdoa/pdf/aqsbrochure.pdf>>; p. 1 of created and modified 2/28/02 7:30 PM aqsbrochure.pdf printout.

<sup>163</sup> *Rabies Quarantine Station Information Brochure*; Animal Quarantine Station, Department of Agriculture, State of Hawaii; Revised February 2002; <<http://www.hawaiiag.org/hdoa/pdf/aqsbrochure.pdf>>; p. 4 of created and modified 2/28/02 7:30 PM aqsbrochure.pdf printout.

required to complete a 120-day confinement in the State Animal Quarantine Station. If specific pre-arrival and post-arrival requirements are met, animals may qualify for 30-day quarantine.

The animal quarantine program began in 1912 with a quarantine period of 120 days. A 30-day quarantine alternate program was approved in 1997.<sup>164</sup>

- d) Material under an “Electronic Microchip” heading in a “General Pre-Arrival Requirements” section of the *Rabies Quarantine Station Information Brochure* reads:

All dogs and cats attempting to qualify for the 30-day quarantine program are required to have an implanted electronic microchip. The microchip, obtained from your veterinarian, must be U.S. made and readable with an AVID standard scanner (AVID chip, Home Again chip). Pet owners in foreign countries can order microchips from the State of Hawaii, refer to the enclosed Request for Electronic Microchip (form AQS-73).<sup>165</sup>

- e) A “Financial Information” section of the of the Rev. 02/02 version of the *Rabies Quarantine Station Information Brochure* contained the following information:

Quarantine Fees (due at the time your pet enters quarantine)

Total fees: 30-day program \$ 655.00

120-day program \$ 1,080.00<sup>166</sup>

- 2) A “Request For Electronic Microchip” form, identified as “AQS-73 05/02,” stated:

All dogs and cats attempting to qualify for the 30-day quarantine program are required to have an implanted electronic microchip. **The microchip does not have to be purchased from the State of Hawaii**, but must be U.S. made and readable

<sup>164</sup> *Rabies Quarantine Station Information Brochure*; Animal Quarantine Station, Department of Agriculture, State of Hawaii; Revised February 2002; <<http://www.hawaiiag.org/hdoa/pdf/aqsbrochure.pdf>>; p. 4 of created and modified 2/28/02 7:30 PM aqsbrochure.pdf printout.

<sup>165</sup> *Rabies Quarantine Station Information Brochure*; Animal Quarantine Station, Department of Agriculture, State of Hawaii; Revised February 2002; <<http://www.hawaiiag.org/hdoa/pdf/aqsbrochure.pdf>>; p. 5 of created and modified 2/28/02 7:30 PM aqsbrochure.pdf printout.

<sup>166</sup> *Rabies Quarantine Station Information Brochure*; Animal Quarantine Station, Department of Agriculture, State of Hawaii; Revised February 2002; <<http://www.hawaiiag.org/hdoa/pdf/aqsbrochure.pdf>>; p. 15 of created and modified 2/28/02 7:30 PM aqsbrochure.pdf printout.

with an AVID universal scanner (AVID chip, Home Again chip).<sup>167</sup>

#### 19. U.S.: Military Installations

##### a. Hawaii: Hickam Air Force Base: U.S. Air Force

The Hickam Air Force Base “Clinic Info” section of the Hickam AFB Service Web pages states under a “Microchip Implant” heading:

Permanent pet I.D., all animals weighing 5 pounds or more, residing on Hickam AFB must be microchipped.<sup>168</sup>

##### b. Kansas: Fort Leavenworth: U.S. Army

*The Fort Leavenworth Lamp Online* states:

One way to permanently identify pets so they can be returned to their owners is microchipping.

Fort Leavenworth regulations require all dogs, cats and other animals maintained in quarters to be registered with the Veterinary Treatment Facility within five days of arrival or acquisition. Written certification of immunizations and proof of microchip must be presented at registration or an appointment will be made to have the required vaccinations and microchip implant at the owner's expense.<sup>169</sup>

##### c. North Dakota: Grand Forks Air Force Base: U.S. Air Force

Grand Forks Air Force Base’s *The Leader Online* states:

Current base housing residents will have until August 1 to have their pets microchipped...

Because of these reasons, mandatory pet microchipping has been included in the updated Grand

<sup>167</sup> “Request For Electronic Microchip”; Animal Quarantine Station, Department of Agriculture, State of Hawaii; <<http://www.hawaiiag.org/hdoa/pdf/aqs-73.pdf>>; Dated May 2002; p. 1 of created and modified 5/1/02 10:00 PM aqs-73.pdf printout.

<sup>168</sup> Kelly Tran, Page Maintainer; “15<sup>th</sup> Services Squadron— Vet Clinic Information: Hickam AFB, Hawaii, Services: Clinic Info;” Hickam Air Force Base, Hawaii, 15<sup>th</sup> Air Base Wing, U.S. Air Force; last updated at 7/24/2001; <[www.hickamservices.com/vetclinic/clinic.html](http://www.hickamservices.com/vetclinic/clinic.html)>; p. 2 of 5/7/02 10:56 AM printout.

<sup>169</sup> Spc. Sheila Hamlett, Veterinary Services, Fort Knox, Ky.; “Microchipping Brings Lost Pets Home”: “Editor’s Note: This article originally appeared in *Inside The Turret*. Spc. Amy S. Pierce of Fort Leavenworth Veterinary Services also contributed to this article.,” *The Fort Leavenworth Lamp Online: Online Archives from The Fort Leavenworth Lamp*; published April 11, 2002; <<http://www.ftleavenworthlamp.com/archives/index.inn?loc=detail&doc=/2002/April/11-1456-news6.txt>>; p. 1 of 5/9/02 9:05 AM printout.

Forks Air Force Base Instruction 31-105, Control of Pets and Stray Animals.

This instruction will require dogs and cats living in base housing to be microchipped. Microchipping does not have to be performed at the base veterinary treatment facility. Pets may be microchipped elsewhere.

However, proof of microchip implantation must be provided to the base VTF. Pets who have already had microchips implanted are considered to be in compliance with the instruction.<sup>170</sup>

d. Spain: U.S. Naval Station, Rota, Spain: U.S. Navy<sup>171</sup>

- 1) In the “text only” version of “Welcome Aboard,” under the general heading of “Dependents” in a section covering “Shipping Pets to Spain” and “Reservation Procedures,” an asterisked note at the conclusion of this material, with no apparent reference mark elsewhere in the text, addresses the matter of microchipping pets:

\*NOTE: All pets belonging to personnel attached to the Naval Facility must be microchipped at the Veterinary Clinic for identification purposes. The cost is \$10.00 per animal.<sup>172</sup>

- 2) While not including the above quote from the “text only” version of “Welcome Aboard,” “The Virtual Welcome Aboard Kit,”<sup>173</sup>

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<sup>170</sup> Capt. Wendy May, 319th Veterinary Clinic; “Chip Can Help Keep Your Pet Safe;” *The Leader Online*; Grand Forks Air Force Base; published June 15, 2001; <<http://www.grandforks.af.mil/15jun.asp>>; pp. 1, 3 of 5/7/02 10:09 AM printout.

<sup>171</sup> Following is definitional information from “The Naval Base: At A Glance;” updated May 9, 2002; <<http://www.rota.navy.mil/navsta/welcome/files/03.html>>; “virtual Welcome Aboard Package;” U.S. Naval Station, Rota, Spain; p. 1 of 5/9/02 9:46 AM printout:

Naval Station Rota...is a Spanish Naval Base, used jointly by Spain and the United States...

Because Rota is a Spanish Naval Base, you may find some things here a little different than at a U.S. military installation.

<sup>172</sup> “Welcome Aboard (text only);

<<http://www.rota.navy.mil/navsta/welcome/files/text.html>>; n.p.; published n.d.; p. 6 of 5/9/02 10:10 AM printout.

<sup>173</sup> Following is introductory information from “The Virtual Welcome Aboard Kit;” updated May 9, 2002; <<http://www.rota.navy.mil/navsta/welcome/files/01.html>>; U.S. Naval Station, Rota, Spain; p. 1 of 5/9/02 9:45 AM printout:

This Virtual Welcome Aboard Kit contains information that we hope will help you have a smooth transfer to Naval Station Rota, Spain.

under a “Base Veterinary Clinic” heading within a “Bringing Your Pets to Spain” section, includes the following statements:

The Naval Station has one US Army veterinarian whose primary mission is food hygiene and safety. Pet care is a secondary function which is provided within time and equipment limitations. The Veterinary Clinic has the microchip pet ID available to identify pets. The clinic provides this microchip and implantation [sic]; the fee for the implantation procedure is \$10.00.<sup>174</sup>

F. Standardized Location: Between Shoulder Blades

1. The Associated Press, in a Washington Post story entitled, “A Chip on His Shoulder”

Michael Rubinkam, Associated Press, in a Washington Post story entitled, “A Chip on His Shoulder,” writes:

Most dogs loved to be scratched behind the ears, down their necks and between their shoulder blades. Do that with Stewart, Patrick McCallion's 13-month-old yellow Lab mix, and you'll be scratching something unusual.

Under the skin and between the pooch's shoulder blades is a little bump about the size of a grain of rice. It's a microchip, implanted so that Stewart will be easy to find if he ever runs away from the Philadelphia park he romps in each day.<sup>175</sup>

2. The Mohawk Hudson River Humane Society

Dr. Laurie Coger, with the Mohawk Hudson River Humane Society, observed that, “Workers use a hypodermic needle to inject a chip just under the skin of a dog or cat — usually in the animal’s shoulder.”<sup>176</sup>

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Like all information kits, it's not all-inclusive. But, your sponsor will be able to fill in the missing details and answer any questions you may have.

<sup>174</sup> “Bringing Your Pets To Spain;” U.S. Naval Station, Rota, Spain; updated May 9, 2002 <<http://www.rota.navy.mil/navsta/welcome/files/pets.html>>; p. 1 of 5/9/02 9:50 AM printout.

<sup>175</sup> Michael Rubinkam; “A Chip on His Shoulder;” Associated Press article on Washington Post; published February 11, 2002; <<http://www.washingtonpost.com/ac2/wp-dyn/A55535-2002Feb10>>; p. C14; p. 1 of 4/19/02 10:51 AM printout.

<sup>176</sup> Jonathan Ewing; “Micro Dog: A Chip as Small as a Grain of Rice Will Help Keep Fido Close to Home;” Associated Press (Albany, NY) article on *abcNEWS.com*; published April 19, 2000; <<http://abcnews.go.com/sections/tech/DailyNews/Dogchips0000418.html>>; p. 1 of 4/19/02 10:55 AM printout.

3. An AP story with a Philadelphia byline

An AP story with a Philadelphia byline provides a further instance of microchip implantation standardization: “So McCallion took out a bit of disappearance insurance, getting a microchip the size of a grain of rice implanted under the dog's skin, between the shoulder blades.”<sup>177</sup>

4. The American Kennel Club Companion Animal Recovery (CAR)

An American Kennel Club Companion Animal Recovery Web page states:

The "chip" is implanted just under the skin in the scruff of the neck of your pet and can be detected and read by a scanner used by veterinarians, animal shelters or other agencies.<sup>178</sup>

5. National Animal Interest Alliance (NAIA)

An article published on the NAIA Web site points out that:

The chips are injected under the skin above the shoulders of the animals by a veterinarian and held in place by a special nontoxic bonding agent.<sup>179</sup>

6. PetPlace.com: 2001 Article

A PetPlace.com article notes standardized locations for chips:

The silicon chips can be inserted in almost any animal, including cats, dogs, horses, reptiles, birds and small mammals...

The chips, technically called transponders, are injected between the shoulder blades through a needle. For birds, the chip is injected under the wing.<sup>180</sup>

7. A July 10, 2000, Scripps Howard News Service article

<sup>177</sup> “Microchips Helping Reunite Lost Pets with Their Owners;” Associated Press (Philadelphia) article on *yorknewstimes.com*; published December 22, 2001, last updated at 11:52 PM; <[http://www.yorknewstimes.com/stories/122201/nat\\_1222010032.shtml](http://www.yorknewstimes.com/stories/122201/nat_1222010032.shtml)>; p. 1 of 4/19/02 11:05 AM printout.

<sup>178</sup> “Storm Center;” American Kennel Club, Incorporated Companion Animal Recovery; published 2001; <<http://www.akccar.org/resources/stormcenter/index.cfm>>; p. 1 of 4/19/02 10:48 AM printout.

<sup>179</sup> Norma Bennett Woolf; “AKC’s CAR brings dogs Home Again;” National Animal Interest Alliance; published n.d., Web site text copyright 2000/2001; <<http://www.naiaonline.org/body/articles/archives/akccar.htm>>; p. 1 of 5/7/02 6:45 AM printout.

<sup>180</sup> Laura Williams; “Microchipping for Your Dog’s Safety;” PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 2 of 4/19/02 11:01 AM printout.

In a July 10, 2000, Scripps Howard News Service article, Mary Deibel reported:

Teddi the terrier arrived home for Christmas—but not before her veterinarian implanted a microchip in the 9-year-old Yorkie’s shoulder for future identification...

Teddi ... had the chip placed in her shoulder area, just under the skin...<sup>181</sup>

8. The Belgian & Luxembourger Electronic Identification & Tracking System for Animals

“ID Chips—Animal Registration Data: The Belgian & Luxembourger Electronic Identification & Tracking System for Animals” Web site observes, “The owner has to go to a Vet who injects the microchip in the animal's neck.”<sup>182</sup>

9. menagerie Magazine

Glenn Lisle, in the Ontario, Canada-based menagerie Magazine, writes:

The ‘standard’ pet ID chip, properly known as a transponder, consists of a miniaturized coil and memory circuit encased in biocompatible glass. The whole thing is small enough to fit in a hypodermic syringe — which is how the tiny device is implanted, just under the skin between the shoulder blades in cats.<sup>183</sup>

10. The UK National German Shepherd Dog Help Line

UK National German Shepherd Dog Help Line Web site, in response to the Frequently Asked Question “Where is the injection site in dogs and cats?” states:

Dogs and cats are injected between the shoulder blades with a deep subcutaneous (under the skin) delivery of the chip.<sup>184</sup>

11. The Pacific Air Force News Service

<sup>181</sup> Mary Deibel; “No Longer Is It a Doggone Shame When Your Pet Disappears;” Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; pp. 1-2 of 4/19/02 11:04 AM printout.

<sup>182</sup> “ID Chips—Animal Registration Data;” IC Services; published 2001; <<http://www.idchips.com/en/WhoWeAre.htm>>; p. 1 of 5/3/02 11:06 AM printout.

<sup>183</sup> Glenn Lisle; “Ultimate Pet ID;” menagerie Magazine; published 1999; <<http://www.menagerie.on.ca/04-99/feature.html>>; p. 2 of 4/19/02 10:38 AM printout.

<sup>184</sup> “General Questions: Where is the injection site in dogs and cats?;” UK National German Shepherd Dog Help Line; published 2000; <<http://www.gsdhelpline.com/aboutchip.htm>>; p. 4 of 5/7/02 10:01 AM printout.

The Pacific Air Force News Service in a Hickam Air Force Base, Hawaii, article states:

Pets arriving in Hawaii will be reunited with their owners sooner as the state's quarantine time was cut from 120 days to 30 days. However, new rules have gone into effect to permit the reduced quarantine time...

The new rules involve ... implanting a mandatory official microchip in all quarantined dogs and cats...

The American Veterinary Identification Devices, or AVID, microchips are implanted between the animal's shoulders.<sup>185</sup>

## 12. The Fort Leavenworth Lamp Online

The Fort Leavenworth Lamp Online, based in Kansas, writes:

The microchip is as small as a grain of rice and is placed under the skin between the shoulder blades. It is not a Big Brother-type tracking device. Pets cannot be followed via satellite.<sup>186</sup>

## 13. The Grand Forks Air Force Base's The Leader On-Line

The Grand Forks Air Force Base's *The Leader On-Line* includes the statement:

The chip is the size of a grain of rice and is injected under the skin between the shoulderblades in the same way annual vaccines are administered.<sup>187</sup>

## 14. New South Wales, Australia

New South Wales, Australia specifies where the microchip is to be implanted:

<sup>185</sup> "Great News for Military Dependent Pets!"; Pacific Air Forces News Service article, Hickam Air Force Base, Hawaii, in Military Living's Military Dependent Pet Press Releases published by Military Living Publications; "This page last updated: October 23, 2001": copyright 1997-2001; <<http://www.militaryliving.com/petpress.html>>; p. 11 of 5/9/02 9:14 AM printout.

<sup>186</sup> Spc. Sheila Hamlett, Veterinary Services, Fort Knox, Ky.; "Microchipping Brings Lost Pets Home": "Editor's Note: This article originally appeared in *Inside The Turret*. Spc. Amy S. Pierce of Fort Leavenworth Veterinary Services also contributed to this article.;" *The Fort Leavenworth Lamp Online: Online Archives from The Fort Leavenworth Lamp*; published April 11, 2002; <<http://www.ftleavenworthlamp.com/archives/index.inn?loc=detail&doc=/2002/April/11-1456-news6.txt>>; p. 1 of 5/9/02 9:05 AM printout.

<sup>187</sup> Capt. Wendy May, 319th Veterinary Clinic; "Chip Can Help Keep Your Pet Safe;" *The Leader Online*; Grand Forks Air Force Base; published June 15, 2001; <<http://www.grandforks.af.mil/15jun.asp>>; p. 2 of 5/7/02 10:09 AM printout.

6 Manner in which category 1 and 2 companion animals are to be identified...

(2) The implantation is to be subcutaneous in the dorsum between the scapulae in such a way that the microchip lies at an oblique angle to the plane of the skin. The microchip must function properly.<sup>188</sup>

#### G. Microchip: Stationary Position

##### 1. Canada's National Pet Registry: PetNet Microchip Identification

PetNet, on its Web site, in response to the Frequently Asked Question "Can the microchip move once it is inserted?" states:

The PetNet microchip has a patented BioBond® anti-migratory tip. This tip is a plastic cap with tiny barbs and holes. Once inserted the barbs hold the chip in place and tissue quickly forms around the barbs and through the holes.<sup>189</sup>

##### 2. PetPlace.com: 2001 Article

A PetPlace.com article includes an observation on the lack of implanted chip mobility:

Veterinarian Dr. Richard Seader of Rockville, N.Y., began injecting microchips into his patients two years ago...

The chips ... are designed to stay just under the skin. They cannot move into the bloodstream or pass through the digestive tract. "It can't get absorbed," Dr. Seader says. "It just stays around the shoulder blade area."<sup>190</sup>

##### 3. The UK National German Shepherd Dog Help Line

The UK National German Shepherd Dog Help Line Web site, in response to the Frequently Asked Question "Can the microchip move around once inside the body of the animal?" states:

<sup>188</sup> "Companion Animals Regulation 1999 under the Companion Animals Act 1998;" 1999 No 279; "New South Wales, Australia: Government Information Service;" updated November 7, 2001; <[http://www.austlii.edu.au/cgi-bin/download.cgi/download/au/legis/nsw/consol\\_reg/car1999265.rtf](http://www.austlii.edu.au/cgi-bin/download.cgi/download/au/legis/nsw/consol_reg/car1999265.rtf)>; Item 6 (2) of 5/30/02 download and printout.

<sup>189</sup> "Frequently Asked Questions: 5. Can the microchip move once it is inserted?;" PetNet.ca: PetNet Microchip Identification: Canada's National Pet Registry; published n.d.; <[http://www.petnet.ca/petnet\\_live/servlet/Faq](http://www.petnet.ca/petnet_live/servlet/Faq)>; p. 1 of 4/19/02 11:07 AM printout.

<sup>190</sup> Laura Williams; "Microchipping for Your Dog's Safety;" PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; pp. 1-2 of 4/19/02 11:01 AM printout.

When properly implanted, a small layer of connective tissue forms around the microchip, preventing movement or migration of the chip. Instructions and injection sites will vary depending upon the specie. As with any brand of chip, microchips will not migrate if instructions are followed and implantation is correct.<sup>191</sup>

#### 4. Wired News: Dog Bytes Say More Than Bark: Chips Drift

Kathy Jenks, director of Ventura County, CA department of animal regulation indicates that chips are not necessarily stationary:

But the technology isn't perfect, said Jenks, who tested four different microchips on the office dog before choosing one for use at the shelter.

...Also, the chips migrate; one of the chips used on the office dog ended up in its leg.<sup>192</sup>

#### H. Microchips Compared to Other Methods: Tattoos and Collars with Tags

##### 1. Jonathan Ewing, an Associated Press writer

Jonathan Ewing, an Associated Press writer, provided the following information regarding the comparative use of microchips rather than tattoos:

“It was once a select crowd that asked for their animals to be chipped, but over the past few years, more and more people are requesting the procedure,” said Dr. Laurie Coger, with the Mohawk Hudson River Humane Society...

“The tattoo was not a bad idea, but it was difficult to see if hair had grown over the tattoo, or if you had an aggressive animal and had to check their underside,” Dr. Coger said. “I would have to say that scanning is infinitely preferable.”<sup>193</sup>

##### 2. Canada’s National Pet Registry: PetNet Microchip Identification

<sup>191</sup> “General Questions: Can the microchip move around once inside the body of the animal?;” UK National German Shepherd Dog Help Line; published 2000; <<http://www.gsdhelpline.com/aboutchip.htm>>; p. 4 of 5/7/02 10:01 AM printout.

<sup>192</sup> Julia Scheeres; “Dog Bytes Say More Than Bark;” Wired News; published March 15, 2001; <<http://www.wired.com/news/print/0,1294,42430,00.html>>; p. 2 of 7/24/02 10:35 AM printout.

<sup>193</sup> Jonathan Ewing; “Micro Dog: A Chip as Small as a Grain of Rice Will Help Keep Fido Close to Home;” Associated Press (Albany, NY) article on *abcNEWS.com*; published April 19, 2000; <<http://abcnews.go.com/sections/tech/DailyNews/Dogchips0000418.html>>; pp. 1, 3 of 4/19/02 10:55 AM printout.

Canada's National Pet Registry: PetNet Microchip Identification, on its Web site, in response to the Frequently Asked Question "What about collar tags and tattoos?" states:

PetNet provides all microchipped pets with free collar tags embossed with our 24-hour toll free number. But tags fall off and most cats will not wear collars and, if they do, breakaway collars are recommended. That's why microchipping is so important.

Tattoos are painful to apply and after a few years tattoos fade and become very difficult to read. Also, it is often difficult for animal shelter staff to find tattoos. If the tattoo is found and legible there is no comprehensive national registry that operates 24 hours a day. The Ontario Veterinary Medical Association abandoned its tattoo program 3 years ago.<sup>194</sup>

### 3. PetPlace.com: 2001 Article

Laura Williams, writing in a 2001 PetPlace.com article, compares the microchip with tags and tattoos:

The microchip has the advantage of permanence; collar and tags can be lost or removed. Some owners have tattooed their address or phone number, but this procedure takes longer and is more painful to your pet. In addition, if you move or change your phone number, the identification is useless.<sup>195</sup>

### 4. A July 10, 2000, Scripps Howard News Service article

In a July 10, 2000, Scripps Howard News Service article, Mary Deibel reported:

Microchips are intended to increase the rate of return as an alternative to tags that can get lost, or tattoos that get overgrown by hair or fade with time.<sup>196</sup>

### 5. Humane Society of Ottawa-Carleton

<sup>194</sup> "Frequently Asked Questions: 8. What about collar tags and tattoos?;" PetNet.ca: PetNet Microchip Identification: Canada's National Pet Registry; published n.d.; <[http://www.petnet.ca/petnet\\_live/servlet/Faq](http://www.petnet.ca/petnet_live/servlet/Faq)>; p. 1 of 4/19/02 11:07 AM printout.

<sup>195</sup> Laura Williams; "Microchipping for Your Dog's Safety;" PetPlace.com; published 2001; <<http://petplace.netscape.com/netscape/nsArtShow.asp?artID=960>>; p. 2 of 4/19/02 11:01 AM printout.

<sup>196</sup> Mary Deibel; "No Longer Is It a Doggone Shame When Your Pet Disappears;" Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 2 of 4/19/02 11:04 AM printout.

Glenn Lisle, in the Ontario, Canada-based menagerie Magazine, produced by the Publishing Division of GRL Communications Inc., writes:

The first thing that the Humane Society of Ottawa-Carleton (HSOC) does when any animal comes in is to 'ID' it. Shelter workers first check for marks or tattoos inside the flanks and under the ears...

However, tattoos are often hard to read and harder to trace.

"The tattoo is often done at a really young age," Nelson says, "and, by the time the animal has grown up, the tattoo is unreadable."

In fact, Nelson reports, the tattoos on almost four out of every five adult animals the HSOC sees are unreadable.

Where tattoos can fade and collar tags can fall off or be purposely removed to obscure the identity of a pet, implanted microchips cannot be tampered with in any way, providing reliable identification in the few seconds it takes to perform the scan.

"If a dog or cat comes into the shelter and is aggressive, the information can be obtained with a scanner on the end of a pole, so there is no danger to the attendant who could [otherwise] be injured trying to read a tattoo," Nelson adds.<sup>197</sup>

6. The Grand Forks Air Force Base's The Leader On-Line observes:

Collars with tags can be taken off, while tags can be defaced. More than half of all impounded dogs and cats are without collars by the time they arrive at the shelter. Tattoos may also be defaced or altered.<sup>198</sup>

7. The New South Wales Department of Local Government

The New South Wales Department of Local Government authored "The Companion Animals Act 1998, Frequently Asked Questions" paper. An excerpted portion addressing the comparative merits of microchips, tattoos, and collars follows:

Collars can be lost or removed and tattoos can be changed, but microchipping is a once-only form of identification

<sup>197</sup> Glenn Lisle; "Ultimate Pet ID;" menagerie Magazine; published 1999; <<http://www.menagerie.on.ca/04-99/feature.html>>; pp. 3-4 of 4/19/02 10:38 AM printout.

<sup>198</sup> Capt. Wendy May, 319th Veterinary Clinic; "Chip Can Help Keep Your Pet Safe;" *The Leader Online*; Grand Forks Air Force Base; published June 15, 2001; <<http://www.grandforks.af.mil/15jun.asp>>; p. 2 of 5/7/02 10:09 AM printout.

which is designed to last for an animal's lifetime. The introduction of compulsory microchipping aims to ensure that all owned animals have a means of permanent identification which cannot be lost or tampered with.<sup>199</sup>

8. The United Kingdom Department for Environment, Food & Rural Affairs

The United Kingdom Department for Environment, Food & Rural Affairs in response to the first question, "Why not allow identification of animals by tattoo only?", of a questions and answers Web site page entitled, "Microchipping and Identification," answers:

Because tattoos can fade or become unreadable over time. Numbers on a tattoo could also be changed by further tattooing. For these reasons the Advisory Group on Quarantine did not recommend tattooing as a reliable means of positively identifying dogs or cats. In addition, there is no international control on tattooing that avoids the risk of duplication.

As an alternative means of identification, microchips implanted in the animal represent a more reliable and permanent method. They are also easily readable and cannot be tampered with.<sup>200</sup>

9. Wired News: Dog Bytes Say More Than Bark: Chip Limitations

Kathy Jenks, director of Ventura County, CA department of animal regulation indicates that chips are sometimes difficult to read from a safe distance.

But the technology isn't perfect, said Jenks, who tested four different microchips on the office dog before choosing one for use at the shelter.

...Some scanners read a chip from a distance of 14 inches while others can't detect a chip that is more than an inch away -- a limitation that can prove dangerous with rabid dogs, Jenks said.<sup>201</sup>

<sup>199</sup> "The Companion Animals Act 1998, Frequently Asked Questions;" New South Wales Department of Local Government; published n.d. [published August 2000: <<http://www.dlg.nsw.gov.au/dlg/dlghome/documents/information/cafaqq.pdf>> version, 3<sup>rd</sup> edition]; <[http://www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_cainfo.asp - 1.1](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_cainfo.asp - 1.1)>; p. 2 of 5/30/02 12:06 PM printout.

<sup>200</sup> "Microchipping and Identification;" United Kingdom Department for Environment, Food & Rural Affairs; published June 2000; <<http://www.defra.gov.uk/animalh/quarantine/PETS/procedures/support-info/microqa.shtml>>; p. 1 of 5/7/02 9:56 AM printout.

<sup>201</sup> Julia Scheeres; "Dog Bytes Say More Than Bark;" Wired News; published March 15, 2001; <<http://www.wired.com/news/print/0,1294,42430,00.html>>; p. 2 of 7/24/02 10:35 AM printout.

## 10. Pet Collars Not Foolproof: Associated Press

An Associated Press article noted the limitations of collars.

Veterinarians say old-fashioned pet collars are fine, but not foolproof. They can come off, fade, or be chewed.<sup>202</sup>

### I. Working Lifetime of a Chip

#### 1. The UK National German Shepherd Dog Help Line

The UK National German Shepherd Dog Help Line Web site, in response to the Frequently Asked Question “How long does the microchip last?” states:

The microchip has no power supply, battery, or moving parts. It is designed with an operating life of over 25 years and is guaranteed for the life of the animal.<sup>203</sup>

#### 2. menagerie Magazine

Glenn Lisle, in the Ontario, Canada-based menagerie Magazine, writes:

The rated working lifetime of a chip is 75 years — more than sufficient for most species in which it might be used, with the possible exception of some tortoises and parrots.<sup>204</sup>

### J. Chips Implanted at Any Age

#### 1. AVID Web site

AVID, on its Web site, in response to the Frequently Asked Question “What is the youngest age a pet can be identified?” states:

Animals of any age can be injected with the AVID Microchip. Puppies and kittens are identified during their initial vaccine series. Birds, horses and exotics can be identified at any time.<sup>205</sup>

<sup>202</sup> “Microchips Helping Reunite Lost Pets with Their Owners;” Associated Press (Philadelphia) on [yorknewstimes.com](http://www.yorknewstimes.com); published December 22, 2001, <[http://www.yorknewstimes.com/stories/122201/nat\\_1222010032.shtml](http://www.yorknewstimes.com/stories/122201/nat_1222010032.shtml)>; last updated at 11:52 PM; p. 2 of 4/19/02 11:05 AM printout.

<sup>203</sup> “General Questions: How long does the microchip last?;” UK National German Shepherd Dog Help Line; published 2000; <<http://www.gsdhelpline.com/aboutchip.htm>>; p. 1 of 5/7/02 10:01 AM printout.

<sup>204</sup> Glenn Lisle; “Ultimate Pet ID;” menagerie Magazine; published 1999; <<http://www.menagerie.on.ca/04-99/feature.html>>; pp. 2-3 of 4/19/02 10:38 AM printout.

<sup>205</sup> “Frequently Asked Questions: 5. What is the youngest age a pet can be identified?;” American Veterinary Identification Devices (AVID); published n.d.; <[http://www.avidid.com/faq/faq\\_eng\\_complete.html](http://www.avidid.com/faq/faq_eng_complete.html)>; p. 1 of 4/29/02 9:01 AM printout.

2. The UK National German Shepherd Dog Help Line Frequently Asked Question “How early can puppies and kittens be injected with the chip?”

The UK National German Shepherd Dog Help Line Web site, in response to the Frequently Asked Question “How early can puppies and kittens be injected with the chip?” states:

Most breeders identify their breeding between the ages of five and eight weeks of age. Of course, the injection can also be done at any time after that.<sup>206</sup>

3. The UK National German Shepherd Dog Help Line Frequently Asked Question “I have toy breeds/kittens. They are so tiny. Can I use the chip?”

In addition, the UK National German Shepherd Dog Help Line Web site, in response to the Frequently Asked Question “I have toy breeds/kittens. They are so tiny. Can I use the chip?” states:

Absolutely. You can have your puppies/kittens ID’d as early as six weeks. Remember, the same sized microchip and needle are used in animals even smaller than yours, including mice, baby birds, and even fish!<sup>207</sup>

4. The Belgian & Luxembourger Electronic Identification & Tracking System for Animals

In a “Microchip Injection” section, “ID Chips— Animal Registration Data: The Belgian & Luxembourger Electronic Identification & Tracking System for Animals” Web site states, “An animal can be identified at any age.”<sup>208</sup>

#### K. Chips Difficult to Remove

AVID, in an “AVID Technology” section on its Web site, states:

Once implanted, the identity tag is virtually impossible to retrieve. Surgical removal, using the most advanced radiograph techniques available, is extremely difficult. The number can never be altered.<sup>209</sup>

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<sup>206</sup> “General Questions: How early can puppies and kittens be injected with the chip?;” UK National German Shepherd Dog Help Line; published 2000;

<<http://www.gsdhelpline.com/aboutchip.htm>>; p. 4 of 5/7/02 10:01 AM printout.

<sup>207</sup> “General Questions: I have toy breeds/kittens. They are so tiny. Can I use the chip?;” UK National German Shepherd Dog Help Line; published 2000;

<<http://www.gsdhelpline.com/aboutchip.htm>>; p. 4 of 5/7/02 10:01 AM printout.

<sup>208</sup> “ID Chips— Animal Registration Data;” IC Services; published 2001;

<<http://www.idchips.com/en/WhoWeAre.htm>>; p. 1 of 5/3/02 11:06 AM printout.

<sup>209</sup> “AVID Technology;” American Veterinary Identification Devices (AVID); published n.d.; <[http://www.avidid.com/technology/tech\\_english.html](http://www.avidid.com/technology/tech_english.html)>; p. 2 of 4/29/02 9:01 AM printout.

## VII. Relationship between Pet Microchip Implants and Human Microchip Implants

### A. “Calling the Future”: Location of Children As Well As Pets Monitored: Reuters on ABCNEWS.com: October 5, 1999

Looking toward future possibilities, a Reuters article on ABCNEWS.com considers a scenario in which a “phone connected to the house is something quaint that we’ll tell our children about.” The article summary states, “Computer chips under one’s skin, phone devices that turn on appliances, and phone numbers given out at birth may be future trends.” The article contemplates a future where “Homes will have computers and phones that could...monitor the location of pets and children...”

Homes will have computers and phones that could check appliances and schedule their repair, monitor the location of pets and children, or call the grocer when the milk runs out...

Each person may be assigned a phone number—or communications number—at birth that will stay with them for life. It may be technologically possible in the future to embed a computer chip under one’s skin as a link to communications networks and one another, though society may be slow to embrace such advances.

“A phone connected to the house is something quaint that we’ll tell our children about. A phone number per dwelling is an antique idea,” said Pat Morreale, an associate professor of computer science at the Stevens Institute in New Jersey and director of the Advanced Telecommunications Institute. “A phone number per person is the future.”<sup>210</sup>

### B. Pet Microchips Critiqued: Memphis, TN: “A First Step toward...666”

In a July 10, 2000, Scripps Howard News Service article, Mary Deibel reported:

But chips aren't without critics. The city council in Memphis, Tenn., recently backed off requiring all licensed pets to get chips or collar IDs partly because of price. But it was partly over philosophical differences, after council Chairwoman Barbara Swearngen Holt asked if chips could be “a first step toward what the Bible talks about, with people marked with 666.”

For those uneasy with chips, pet-locator Web sites have started to operate.<sup>211</sup>

<sup>210</sup> “Calling the Future;” Reuters on ABCNEWS.com; published October 5, 1999; <[http://abcnews.go.com/ABC2000/abc2000tech/phones\\_991005.html](http://abcnews.go.com/ABC2000/abc2000tech/phones_991005.html)>; pp. 1-2 of 4/19/02 printout 10:33 AM.

<sup>211</sup> Mary Deibel; “No Longer Is It a Doggone Shame When Your Pet Disappears;” Scripps Howard News Service article in *Connect*, published in *The Columbus Dispatch*; published July 10, 2000; <<http://www.dispatch.com/connect/connect071000/>>; p. 3 of 4/19/02 11:04 AM printout.

C. WorldNetDaily: Animal Electronic Chips Modified for Human Use: August 7, 2000

An August 7, 2000 WorldNetDaily story stated that:

While the animal microchip implant has existed for over 10 years, new technology employed in these electronic chips has also been modified for human use. As WorldNetDaily has reported, a device called the Digital Angel® is a human implant whose manufacturer claims it has the capacity for everything from monitoring organ functions to user identification for e-commerce.

One of the touted applications for the Digital Angel® is strikingly similar to pet-tracking -- namely, tracking lost or kidnapped people.

"Ideally, the device will bring peace of mind and an increased quality of life for those who use it, and for their families, loved ones, and associates who depend on them critically," states the "Digital Angel®'s patent. "Adults who are at risk due to their economic or political status, as well as their children who may be at risk of being kidnapped, will reap new freedoms in their everyday lives by employing the device."

While privacy and morality concerns have been raised regarding the use of microchip implants in humans, no opposition has been voiced for what is being described as "electronic pet tags."<sup>212</sup>

D. Declan McCullagh's Politech: "First Pets, Then Humans!": February 14, 2001

A bill, introduced on February 14, 2001 in the California State Senate, was months later not adopted. Declan McCullagh provided an introduction on March 15, 2001 to news coverage of this bill shortly after the time of its initial presentation to the Senate. This introduction touches on the relationship between microchipping pets and humans.

[I'll include some news coverage below. Pet microchips have been around since the 1980s, as you'll see, but requiring them through force of law seems to be a new -- and incomprehensibly bizarre -- idea. "First pets, then humans!" --Declan]<sup>213</sup>

E. Wired News: Privacy: "Twenty Years from Now, They'll Want to Chip Infants": March 15, 2001

<sup>212</sup> JoAnn Kohlbrand; "Microchips Required for Adopted Animals: L.A. Requires Electronic Implants for Pets Leaving Shelters;" WorldNetDaily.com; published August 7, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=18758](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=18758)>; p. 2 of 5/7/02 8:55 AM printout.

<sup>213</sup> Declan McCullagh; "Calif. Bill Makes It A Crime NOT to Implant Pets with Chips;" Politech; published March 15, 2001; <<http://www.politechbot.com/p-01819.html>>; p. 1 of 4/19/02 9:44 AM printout.

The full text of a March 15, 2001 Wired News article by Julia Scheeres that had been excerpted in Declan McCullagh's Politech includes the comments:

Privacy was a concern for one pet owner.

"I just don't like the idea of another government database having my personal information in it," said Kate Jimenez, a Lompoc housewife who owns two dogs and three cats. "It's just one more way of registering people. Twenty years from now, they'll want to chip infants before they leave the hospital."<sup>214</sup>

- F. Human Microchip Implantation Far Behind That in Pets?: Associated Press: February 27, 2002

An Associated Press article links a historical overview of microchip implantation in pets to the idea of future human microchip implantation.

Microchip implantation has been around since the 1980s but was relatively rare until the mid-1990s, when chipmakers introduced a universal scanner that could read every model.

Scanners are now found in most shelters and animal control agencies across the country, according to Mary Madsen, a customer service supervisor for AVID Identification Systems Inc....

Could human microchip implantation be far behind?

Some say it's inevitable. A British researcher had a chip in his arm for nine days in 1998, and U.S. researchers say a chip attached to the retina could someday give blind patients the ability to see. Chips could also be used to carry medical information or criminal history, raising privacy concerns.

But for now it's Rover who has the chip in his shoulder.<sup>215</sup>

- G. VeriChip Similar to 25 million Chips Embedded in Animals All Over the World; *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford reported that, "The VeriChip is similar to the more than 25 million chips already embedded in animals all over the world..."

But critics see surveillance technology like the VeriChip as a growing threat, giving potentially dangerous new power to businesses and government alike. In a report issued in January

<sup>214</sup> Julia Scheeres; "Dog Bytes Say More Than Bark;" Wired News; published March 15, 2001; <<http://www.wired.com/news/politics/0,1283,42430-2,00.html>>; p. 1 of 7/24/02 10:35 AM printout.

<sup>215</sup> "Microchips Helping Reunite Lost Pets with Their Owners;" Associated Press (Philadelphia) article on *yorknewstimes.com*; published December 22, 2001, <[http://www.yorknewstimes.com/stories/122201/nat\\_1222010032.shtml](http://www.yorknewstimes.com/stories/122201/nat_1222010032.shtml)>; last updated at 11:52 PM; pp. 1-2 of 4/19/02 11:05 AM printout.

by the American Civil Liberties Union, Jay Stanley and Barry Steinhardt warned that an explosion of technology has already created a “surveillance monster.”

“Scarcely a month goes by in which we don’t read about some new high-tech way to invade people’s privacy, from face recognition to implantable microchips, data mining, DNA chips, and even ‘brain wave fingerprinting,’ “ they wrote. “The fact is there are no longer any technical barriers to the Big Brother regime portrayed by George Orwell [in his novel ‘1984’].” The VeriChip is similar to the more than 25 million chips already embedded in animals all over the world acting as “pet passports,” allowing customs officials to monitor those animals that do not need to go into quarantine, or to identify your stray dog.<sup>216</sup>

## VIII. RFID Human Microchip Implants: Initial Instances

- A. Hughes Aircraft Company Has Syringe-Implantable Transponder:  
*Washington Times*: October 11, 1993; Congressional Testimony: May 13, 1997

In an October 11, 1993 *Washington Times* article entitled, “High-Tech National Tattoo,” Martin Anderson, a senior fellow at the Hoover Institution and a nationally syndicated columnist, reported, based on “promotional literature” that Hughes Aircraft Company made a “syringe implantable transponder”—“a tiny microchip, the size of a grain of rice” that uses “radio waves” as a “permanent method of...identification.”<sup>217</sup> Economist Stephen Moore of the Cato Institute in his May 13, 1997 Congressional Testimony before the U.S. House of Representatives Subcommittee on Immigration and Claim, Judiciary Committee, presented the following summary of the Hughes Aircraft Company microchip implant.

In the age of the microchip, centralized computers have the capability of holding and processing huge amounts of information about all 265 million American citizens...Even more sophisticated identification systems might remove the need for carrying a card at all.

<sup>216</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip AND date\(last 30 days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=-30qzD&>](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip AND date(last 30 days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=-30qzD&>); p. 2 of 5/22/03 3:03 PM printout.

<sup>217</sup> Martin Anderson, “High-Tech National Tattoo,” *Washington Times*, October 11, 1993, p. A19 [based on electronic copy information]. The following search URL provides access to a Newsbank electronic copy of the foregoing article:  
<[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=WT&p\\_theme=wt&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=Anderson&s\\_dispstring=Anderson AND date\(10/11/1993 to 10/11/1993\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_da](http://nl.newsbank.com/nl-search/we/Archives?p_product=WT&p_theme=wt&p_action=search&p_maxdocs=200&p_text_search-0=Anderson&s_dispstring=Anderson AND date(10/11/1993 to 10/11/1993)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_da)>.

Hughes Aircraft Company has a new identification technology involving a syringe implantable transponder. This "ingenious, safe, and inexpensive" worker identification technology plants a tiny microchip under the skin. It contains a ten character alphanumeric identification code that can never be duplicated. The microchip is read by an electronic scanner--the type that reads the price on the food you buy at the grocery store.

The point here is that depending on how far Congress wants to go in suppressing the rights of the individual in order to deter illegal immigration, the technology exists for a fool-proof if Orwellian identification system. If Congress were willing to further denigrate Americans' civil liberties, many new government controls to enforce our immigration laws could be erected.<sup>218</sup>

B. Professor Kevin Warwick, United Kingdom Scientist, Implanted with a Microchip in 1998

1. BBC News: UK Scientist Implanted with Chip: August 25, 1998

BBC News reported that a UK scientist received an implanted chip.

A silicon chip has been successfully implanted into the arm of a UK scientist.

The experiment, believed to be the first of its kind, means a computer can keep track of the device and its carrier.

The chip has been inserted in Professor Kevin Warwick's upper arm.

The professor, from the University of Reading, in England, is taking part in the experiment to highlight some of the dangers of the technology.

The technology itself is not new. Silicon chips are already used in many countries to identify animals...

Professor Warwick's device, which will be removed after a week, carries 64 pieces of information...

"If we look to the future, compared with what this small chip contains now, in five or six years time the amount of information and the amount of processing capabilities will be enormous," Professor Warwick said.<sup>219</sup>

<sup>218</sup> Stephen Moore; "A National Identification System;" Cato Institute Congressional Testimony before the U.S. House of Representatives Subcommittee on Immigration and Claim, Judiciary Committee; dated May 13, 1997; <<http://www.cato.org/testimony/ct-sm051397.html>>; p. 5 of 4/14/03 4:57 PM printout.

<sup>219</sup> "Technology Gets Under the Skin;" BBC News: Sci/Tech; published August 25, 1998 at 1054 GMT 11:54 UK; <<http://news.bbc.co.uk/1/hi/sci/tech/158007.stm>>; pp. 1-3 of

2. Professor Kevin Warwick, Director of Cybernetics, University of Reading in the U.K.: First Human to Host A Microchip on August 24, 1998: CNN.com

Professor Kevin Warwick, director of cybernetics at the University of Reading in the U.K. was reported to have been, on August 24 , 1998, the first human to host a microchip.

Is the human body a fit place for a microchip? The debate is no longer hypothetical. The same computing power that once required an entire building to harness now can be inserted in your left arm.

Better yet, somebody else's left arm.

Professor Kevin Warwick, director of cybernetics at the University of Reading in the U.K., is that somebody else. On Monday, Aug. 24, 1998, Warwick became the first human to host a microchip. During a 20-minute medical procedure described as "a routine silicon-chip implant" by Dr. George Boulos, who led the operation, doctors inserted into Warwick's arm a glass capsule not much bigger than a pearl. The capsule holds several microprocessors.

The British Broadcasting Corp. was on hand to document the historic event...

Though he declines to reveal the chip's manufacturer, Warwick did disclose that it's a "commercial" product. "For obvious reasons, both positive and negative, they didn't want us shouting about what the name of the exact product was," he says.<sup>220</sup>

- C. *Sunday Times*: Human Microchips Implants: Kidnapping: October 11, 1998

*The Sunday Times of London*, in 1998, reported that a "tiny microchip implant can be tracked by satellite to reveal a kidnap victim's location."

A microchip under the skin that can help to locate hostages is being marketed to combat one of the world's biggest growth industries—there were a record 1,407 abductions for ransom worldwide last year, up 60% since 1990.

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<sup>220</sup> Sam Witt; "Is Human Chip Implant Wave of the Future?"; cnn.com; published January 14, 1999 Web posted at 3:21 p.m. EST;  
<http://www.cnn.com/TECH/computing/9901/14/chipman.idg/>>; pp. 1-2 of 2/17/03 2:57 PM printout. This article was excerpted from Sam Witt; "Professor Warwick Chips In;" published January 11, 1999;  
<http://www.computerworld.com/news/1999/story/0,11280,33499,00.html>>; pp. 1-3 of 3/5/03 4:35 PM printout.

The victim's "little helper" uses natural body energy with James Bond-style technology devised by scientists working for Israeli intelligence.

Space satellites will follow the bleep to detect a victim's movements or hiding place. The information will then be related to a control centre to be used for a rescue operation.

...[F]ilm stars and the children of millionaires are among 45 people, including several Britons, who have been approached and fitted with the chips in secret tests during the past three months. The chips, costing £5,000 a time, are being launched in Milan this week.

...The [Gen-Etics] company developed the [Sky-Eye] chip for commercial use after it was invented by Mossad, the Israeli secret service, and used by agents on special missions...

The 43 Europeans and two Americans who have so far adopted the chip had surgery under a light anaesthetic. Gen-Etics claims the surgery is intended to daze the patient and prevent him or her remembering exactly where the incision was made, so he cannot reveal the chip's location to his abductors even under torture.

Every chip is made of synthetic and organic fibres and measures 4mm by 4mm. It does not need a battery and runs instead on four milliamperes of neurophysiological energy.

Only a small scar is visible and the chip escapes detection by x-rays. It is inserted under the skin but not on areas that can be amputated, including the hands, nose and ears...

The whereabouts of the carrier are followed by six satellites through the global positioning system, which has...previously been used to track the movements of stolen luxury cars. The absence of a signal suggests that the victim has been killed because the body no longer supplies the energy to make the chip function.<sup>221</sup>

- D. Medical Director of Applied Digital Solutions, Dr. Richard Seelig, Inserted Two Chips on September 16, 2001: *Miami Herald*: March 10, 2002

The medical director of Applied Digital Solutions inserted two chips on September 16, 2001.

"The assets we've developed through this technology are so significant it's going to be the savior of the company," said Scott Silverman, who was appointed president of Applied [Digital Solutions] last week.

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<sup>221</sup> Maurice Chittenden and David Lloyd, "007 Implant to Protect Kidnap Targets," *Sunday Times* (London), 11 October 1998, sec. 1, p. 13.

The company's plans for the chip were accelerated when Dr. Richard Seelig, Applied's medical applications director, inserted two chips -- one in his right forearm, the other in his right hip -- on Sept. 16. After the Sept. 11 terrorist attacks, he thought such a device could help identify bodies of victims.

"I would want my healthcare givers to have as much information about me," Seelig said. "You're gushing information, not trying to restrain access to them."<sup>222</sup>

- E. Three Applied Digital Solutions Executives Implanted with Microchips: Thursday: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

*Palm Beach Post* Staff Writer Deborah Circelli, on Friday, May 10, 2002, wrote that three Applied Digital Solutions executives were implanted with microchips.

Three Applied Digital Solutions executives, Chairman Richard Sullivan, President Scott Silverman and Chief Technology Officer, were implanted with the VeriChip Thursday.<sup>223</sup>

- F. Human Microchip Implants: Friday, May 10, 2002: Palm Beach, FL Rollout  
1. Time Magazine: March 11, 2002: Planned Chipping Announced

A March 11, 2002 *Time* article entitled "Meet the Chipsons" and subtitled "Jeffrey, Leslie and their boy Derek will be America's first Cyborg family. Are you ready to 'Get Chipped'?" previews the chipping that then did take place in Boca Raton, Florida, on May 10, 2002.

Derek [Jacobs of Boca Raton, Fla.], his mom Leslie and his dad Jeffrey are the first volunteer test subjects for a new, implantable computer device called VeriChip. Later this spring, pending Food and Drug Administration approval, doctors will load a wide-bore needle with a microchip containing a few kilobytes of silicon memory and a tiny radio transmitter and inject it under the skin of their left arms, where it will serve as a medical identification device. It sounds like science fiction. (Remember the Borg on Star Trek? Resistance is futile!) But VeriChip is quite real. The Jacobs family could be the first in a new generation of computer-enhanced human beings.<sup>224</sup>

<sup>222</sup> Shannon Tan; "An ID Idea: Microchips Under Your Skin;" *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; pp. 2-3 of 1/21/03 10:55 AM printout.

<sup>223</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: PalmBeachPost.com; published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; p. 2 of 5/10/02 8:04 AM printout.

<sup>224</sup> Lev Grossman, "Meet the Chipsons," *Time*, March 11, 2002, p. 56.

2. Family Chipped: Reuters: *The New York Times* on the Web: May 10, 2002

Reuters provided an article about the implantation of microchips in a Florida family.

Doctors implanted microchips containing a way to access medical information in the arms of three members of a Florida family on Friday, making them the first people to get what the manufacturer hopes will become a standard way of retrieving such data in the future...

Jeffrey Jacobs, 48, his wife Leslie Jacobs, 46, and their son Derek Jacobs, 14, volunteered to become the first to be implanted with the VeriChip, made by Palm Beach-based Applied Digital Solutions Inc. They underwent the brief procedure at a Boca Raton medical clinic...

When scanned by an external scanner, the implanted chip—slightly larger than a grain of rice—emits a radio frequency signal that transmits an identification number...

A similar chip that is injected into animals such as pet cats has been marketed by the company for at least 15 years. This version of the chip has been marketed to help people positively identify lost animals.<sup>225</sup>

3. Family Chipped: Associated Press: washingtonpost.com: May 10, 2002

The Associated Press provided an article about the implantation of microchips in a Florida family.

A Florida family on Friday became the first to be implanted with computer chips that researchers hope will someday become an easy way to provide emergency room staffers with patients' medical information.

Jeff and Leslie Jacobs, along with their 14-year-old son, Derek, had the tiny chips implanted in their arms. Each chip is about the size of a grain of rice, and insertion takes about a minute under local anesthesia.

The chips, called the VeriChip, were designed by Palm Beach-based Applied Digital Solutions Inc. They are similar to chips implanted in pets to identify them if they are lost.<sup>226</sup>

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<sup>225</sup> "Florida Family Gets Medical-Data Chip Implants;" Reuters article on The New York Times on the Web; published May 10, 2002 Filed at 6:41 p.m. ET; <<http://www.nytimes.com/reuters/news/news-health-chip.html?pagewanted=print&position=top>>; pp. 1-2 of 5/10/02 printout.

<sup>226</sup> Alex Veiga, Associated Press Writer; "Family Gets Computer Chips Implant;" Associated Press article on washingtonpost.com; published May 10, 2002 1:10 PM;

4. First Alzheimer's Patient to Receive Permanent Identification Microchip: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

Nathan Isaacson of Tamarac was scheduled to become the first Alzheimer's patient to receive a microchip implant.

On a warm Saturday morning, 83-year-old Nathan Isaacson of Tamarac drove his Buick Roadmaster six miles toward his daughter's house in Plantation and stalled just a block away. Isaacson, who is in the early stages of Alzheimer's, had forgotten to fill up his gas tank...

To bring his family peace of mind, Isaacson today will trade in the silver identification necklace he wears to become the first Alzheimer's patient to receive a permanent identification microchip called the VeriChip. It was developed by Palm Beach-based Applied digital Solutions.

The microchip, about the size of a grain of rice, will be injected near Isaacson's right shoulder blade by his own physician, Dr. Harvey Kleiner of Sunrise. In an emergency, the chip can provide a patient's personal information and medical history.

"Somebody has to be first," says Isaacson, who also sports a pacemaker and is getting used to being called "bionic poppy" by his great-grandchildren. "It doesn't make any difference to me one way or the other as long as (my wife and children) have peace"...

Isaacson joins Jeffrey and Leslie Jacobs, and their 14-year-old son, Derek, who are being "chipped" this morning in Boca Raton...

Isaacson will go back to the doctors in about eight months for another first. Doctors will implant a second chip, similar in size to a pacemaker, that will allow his family to track his whereabouts.

"This will always be with him. It can't get lost or removed," said daughter Sherry Gottlieb, 47. "It's like insurance. Everyone needs it, but we hope my dad will never have to use it."<sup>227</sup>

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<<http://www.washingtonpost.com/ac2/wp-dyn/A1261-2002May10?language=printer>>; p. 1 of 5/10/02 printout.

<sup>227</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: PalmBeachPost.com; published May 10, 2002;

<[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; pp. 1-2 of 5/10/02 8:04 AM printout.

## IX. The Spread of Human Microchip Implants: General

### A. Spread of Radio-Frequency Identification (RFID) Chips: *EE Times*: January 7, 2002

Discussion of the spread of radio-frequency identification (RFID) chips in general, and in humans specifically, is reminiscent of talk about the slow spread of Electronic Fund Transfer and related Automatic Teller Machines (ATMs) in the 1970s and early 1980s.

Radio-frequency identification chips, which have found a home in applications ranging from toll road passes to smart retail shelves, may be close to taking up residence in the human body.

A Florida-based company has introduced a passive RFID chip that is compatible with human tissue, and the developer is proposing the chip for use on implantable pacemakers, defibrillators and artificial joints...

Called the VeriChip, the device could open up a broad new segment for the \$900 million-a-year RFID business, especially if society embraces the idea of using microchips for human identification...

"The human market for this technology could be huge," said Keith Bolton, senior vice president of technology development at the company.

Futurists agree that the idea of using microchips inside the body could ultimately represent a large market opportunity, but they doubt whether this initial effort will have a significant effect on the RFID market.

"Are we going to see chips embedded in the human body? You bet we are," said Paul Saffo, a director of The Institute for the Future (Menlo Park, Calif.). "But it isn't going to happen overnight"...

Whether the technology will boost the market for RFID chips remains uncertain. Industry analysts had assumed that by now RFID would constitute a far larger market than its current, \$900 million annual tally.

A consortium of major manufacturers has sought to push the technology as a replacement for bar codes in everyday products ranging from cereal boxes to shaving cream cans, but the cost hasn't dropped low enough to make that feasible. More recently, a group led by the European Central Bank began work on embedding RFID chips in the euro bank note, but the chip category has yet to find its killer app.

Applied Digital nonetheless has high hopes for its RFID technology...<sup>228</sup>

- B. Youth Interest In Microchip Implants: Applied Digital Solutions Chief Technology Officer Keith Bolton: "They Want Their ID Chips Now," Wired News: February 6, 2002

A February 6, 2002 Wired News article entitled, "They Want Their ID Chips Now," comments on the interest among youth in being implanted with microchips.

The chip in question, the VeriChip, is similar to the biochips that have been used to identify pets and livestock for years.

Made by Applied Digital Solutions (ADS), the VeriChip stores six lines of text and is slightly larger than a grain of rice. It emits a 125-kHz radio frequency signal that can be picked up by a special scanner up to four feet away...

Since the VeriChip was announced in December, the company has been bombarded with queries from people interested in the device, [ADS chief technology officer Keith] Bolton said.

"Right now we have over 2,000 kids who have e-mailed, wanting to have the chip implanted," he said. "They think it's cool."

(Currently the chip is immutable once the device is injected via a syringe, using local anesthetic. In future applications, the chip may include a GPS receiver and other advanced features, company officials said.)<sup>229</sup>

- C. About 2,500 People Have Made Contact to "Get Chipped": *Miami Herald*: March 10, 2002

A March 10, 2002, *Miami Herald* article reported that about 2,500 people have made contact to "get chipped."

Nathan Isaacson of Tamarac is one of 2,500 people who want to get computer chips implanted in their bodies.

The 83-year-old is in the early stages of Alzheimer's disease. If he wanders off or gets hurt, family members worry that medical workers won't know who he is or that he's allergic to penicillin. Or that he has a recently implanted pacemaker...

<sup>228</sup> Charles J. Murray; "Injectable Chip Opens Door To 'Human Bar Code';" *EE Times*; published January 7, 2002 12:38 p.m. EST; <<http://www.eetimes.com/story/OEG20020104S0044>>; pp. 1, 3 of 3/9/02 3:30 PM printout.

<sup>229</sup> Julia Scheeres; "They Want Their ID Chips Now;" Wired News; published February 6, 2002; <<http://www.wired.com/news/print/0,1294,50187,00.html>>; p. 1 of 3/9/02 3:19 PM printout.

About 2,500 people have contacted Applied Digital to “get chipped.”<sup>230</sup>

- D. Doctors Say ID Chip Useful Only If Standard Practice Nationally: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

Doctors interviewed in a May 10, 2002 article by *Palm Beach Post* Staff Writer Deborah Circelli indicate that an ID chip is useful only if it is standard practice nationally.

Not surprisingly, the ID chip has gotten mixed reviews in the medical community. Some area doctors say the VeriChip could be helpful, but only if it becomes a standard practice nationally.<sup>231</sup>

- E. Eight Alzheimer’s Patients Injected with Chips: *World Magazine*: June 15, 2002

Mindy Belz’s Special Report “State of the World” article, “Recipe for Progress: ID Chips,” states:

Last month eight Alzheimer’s patients were injected with silicon chips, making them as scannable as a bag of potato chips at the supermarket.

The devices are about the size of a grain of rice and were developed in Florida. They are inserted into the upper back and are invisible except when a hand-held scanner is waved over the area. A radio frequency activates the chip to transmit a signal, which contains an identification number. Information about Alzheimer’s patients, who are prone to forgetfulness, is cross-referenced in a central computer registry. The registry can contain an entire medical history, including important data like drug allergies. Applied Digital Solutions Inc., maker of the VeriChip, will soon have a more complex device. It will be able to receive GPS satellite signals and transmit a person’s location. Critics complain that the chip inserts are like putting a pet on a leash, but in places like Florida—where 4 million people have Alzheimer’s—or Colombia—where one in three of the world’s kidnappings take place—they could mean life or death.<sup>232</sup>

- F. October 24, 2002 Launch of National “Get Chipped™” Promotion Noted: *Business Wire*: November 12, 2002

<sup>230</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; pp. 1, 3 of 1/21/03 10:55 AM printout.

<sup>231</sup> Deborah Circelli; “ID Chip to Track Man’s Whereabouts;” News: *PalmBeachPost.com*; published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; p. 2 of 5/10/02 8:04 AM printout.

<sup>232</sup> Mindy Belz, “Special Report: State of the World: Recipe for Progress: ID Chips,” *World*, June 15, 2002, p. 73.

The October 24, 2002 launch of a national “Get Chipped™” promotion was noted in a Business Wire release, entitled, “Applied Digital Solutions to Participate in Seminar on Human Implantable Microchips at the National Academies—Nov. 15, 2002, in Washington.”

Following the FDA ruling, Applied Digital Solutions announced that it would immediately begin VeriChip marketing efforts in the United States. On October 24, 2002, the Company launched a national "Get Chipped(TM)" promotion making the first 100,000 registrants and all qualified ADSX shareholders eligible for a special introductory savings of \$50 at the time of "chipping." Details about the "Get Chipped" promotion are posted on the Company's website: [www.adsx.com](http://www.adsx.com).<sup>233</sup>

G. Human Microchip Implants: Intended Use: “Universal Means of Identification: January 9, 2003 Web Site Item”

1. Human Microchip Implants: “Universal Means of Identification”: Applied Digital Solutions

Human microchip implants are being promoted “as a universal means of identification.”

We are promoting VeriChip as a universal means of identification. We expect it to be used in a variety of applications including financial and transportation security, residential and commercial building access, military and government security.<sup>234</sup>

2. Human Microchip Implants: Could Reach \$70 Billion Per Year: EE

The estimate that “the worldwide market for such implantable chips could reach \$70 billion per year,” is in keeping with the concept that human microchip implants are being promoted as a universal means of identification.

Called the VeriChip, the device could open up a broad new segment for the \$900 million-a-year RFID business, especially if society embraces the idea of using microchips for human identification. Applied Digital executives ultimately believe that the worldwide market for such implantable chips could reach \$70 billion per year.

<sup>233</sup> “Applied Digital Solutions to Participate in Seminar on Human Implantable Microchips at the National Academies—Nov. 15, 2002, in Washington,” Business Wire; published November 12, 2002; <[http://www.Bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APdFZuxYiQXBwbGll](http://www.Bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APdFZuxYiQXBwbGll)>; p. 2 of 11/12/02 4:47 PM printout.

<sup>234</sup> “VeriChip Personal Identification System - Frequently Asked Questions: Q: How about other uses of VeriChip? Isn’t it used for security screening?”; published n.d.; <<http://www.adsx.com/faq/verichipfaq.html>>; p. 1 of 1/9/03 9:00 AM printout.

"The human market for this technology could be huge," said Keith Bolton, senior vice president of technology development at the company.<sup>235</sup>

- H. "Ten U.S.-Based Authorized VeriChip Centers in Seven States": Business Wire; April 4, 2003

Applied Digital Solutions shipped VeriChips to ten Authorized VeriChip Centers in Seven States.

Applied Digital Solutions, Inc. (Nasdaq: ADSX) an advanced technology development company, announced today that its wholly owned subsidiary, VeriChip Corporation, has completed initial product shipments...to ten Authorized VeriChip Centers based in the United States...

In the United States, shipments of initial VeriChip inventories have been completed to ten Authorized VeriChip Centers, enabling these Centers to begin local VeriChip marketing efforts. Authorized VeriChip Centers are now located in the following cities: Chandler, AZ; Boca Raton, FL; Naples, FL; Port St Lucie, FL; Sunrise (Broward County), FL; Bethesda, MD; New York City, NY; North Charleston, SC; San Antonio, TX; and McLean, VA. For more detailed information on these Centers, visit [www.adsx.com](http://www.adsx.com).<sup>236</sup>

- I. "Day Will Come When Most of Us Will Have Something Similar to the VeriChip under Our Skin": Digital Solutions President Scott Silverman *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford reported on the views of Scott Silverman, president of Florida-based Applied Digital Solutions regarding the future growth of implantable microchips—as well as on the number of persons who have been “chipped.”

“I believe the day will come when most of us will have something similar to the VeriChip under our skin,” said Scott Silverman, president of Florida-based Applied Digital Solutions. “People will regard that its benefits—in terms of financial, security, and health care—far outweigh the possibility of loss of privacy”...

Right now, I am part of a very small club, the 18<sup>th</sup> person in the world—and the first journalist—to get “chipped.” Most of the others are ADS employees along with one Florida family who

<sup>235</sup> Charles J. Murray; “Injectable Chip Opens Door To ‘Human Bar Code’;” *EE Times*; published January 7, 2002 12:38 p.m. EST;

<<http://www.eetimes.com/story/OEG20020104S0044>>; p. 1 of 3/9/02 3:30 PM printout.

<sup>236</sup> “VeriChip Corp. Completes Initial VeriChip Product Shipments in First Quarter 2003;” Business Wire; published April 4, 2003;

<<http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=akxYyzUFJmRg>>; p. 1 of 4/4/03 9:00 AM printout.

have been jokingly dubbed “the Chipsons in a play on the old Jetsons cartoon.”<sup>237</sup>

- J. Twelve U.S.-Based Authorized VeriChip Centers in Eight States: VeriChip Corporation: Copyright 2002, Accessed: June 5, 2003

Applied Digital Solutions’ Web site listed twelve Authorized VeriChip Centers in eight states as of June 5, 2003. Following is a listing of the cities for the 12 centers, and their respective states.

Chandler, AZ; Boca Raton, FL; Naples, FL; Port St Lucie, FL; Sunrise, FL; Hammond, LA; Bethesda, MD; New York City, NY; North Charleston, SC; Mt. Pleasant, SC; San Antonio, TX; and McLean, VA. For more detailed information on these Centers, visit [www.adsx.com](http://www.adsx.com).<sup>238</sup>

- X. The Spread of Human Microchip Implants: Global

- A. South America: Expected Sales: *The Los Angeles Times*: December 19, 2001

*The Los Angeles Times* reported that Applied Digital Solutions expected to sell chips in South America.

A Florida company is poised to become the first to sell microchips designed to be implanted into human beings, an achievement that opens the door to new systems of medical monitoring and ID screening...

Regulatory approval is not necessary overseas, however. Applied Digital expects to be selling chips in South America in about 90 days. One potential market is kidnap targets, who could use these chips in combination with global positioning devices.<sup>239</sup>

- B. Brazilian Government Official: *Miami Herald*: March 10, 2002

<sup>237</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; pp. 1-2 of 5/22/03 3:03 PM printout.

<sup>238</sup> “Authorized VeriChip Centers;” VeriChip Corporation; copyright 2002; <<http://www.adsx.com/prodservpart/verichipcenters.html>>; pp. 1-2 of 6/5/03 10:48 AM printout.

<sup>239</sup> David Streitfeld; “A Chip ID That’s Only Skin-Deep;” *Los Angeles Times*; published December 19, 2001; Start Page: A.1; <<http://pqasb.pqarchiver.com/latimes/main/doc/000000095988263.html?MAC=099cdc7812e33c01a59498a6dee6b5b2&QIID=000000095988263&FMT=FT>>; p. 1 of 4/17/02 11:45 AM printout.

A *Miami Herald* article points out that tracking is ongoing in the U.S. and suggests that, “if trackable chip implants become widely available,” many will want to “get chipped,” not unlike a Brazilian government official was planning to do in March of 2002.

Los Angeles County parolees are being monitored by Digital Angel through a three-year pilot program. Implanted microchips currently track more than 86,000 pets in Florida, as well as livestock and zoo animals. Experts predict that if trackable chip implants become widely available, there will be a long line of military personnel, diplomats, corporate executives, foreign correspondents and celebrities waiting to “get chipped.”

This month, Brazilian government official Antonio de Cunha Lima, the first distributor of the VeriChip in Brazil, will be implanted with the chip.<sup>240</sup>

C. South America: Brazil: Chipped Family: *Time Magazine*: March 11, 2002

A March 11, 2002, *Time* article entitled “Meet the Chipsons” includes a brief discussion of plans to implant humans with microchips in South America.

Two weeks ago, Applied Digital Solutions signed a deal to distribute VeriChips in Brazil, where kidnapping has become epidemic, especially among the rich and powerful. Government officials hope that VeriChips implanted in people considered at high risk could be used to track victims via satellite. “Here [in the U.S.] we’re still dealing with FDA and privacy and civil-liberties issues,” says [Keith] Bolton [vice president of Applied Digital Solutions, the company behind VeriChip]. But we’re not stopping. We’re going into South America right now!” Technology has a way of moving faster than legislation, and if it comes down to a race between cyborgs and Senators, guess who will win? Resistance is futile.<sup>241</sup>

D. South America: Brazilian Politician: Newsfactor: April 5, 2002

A NewsFactor Network article, entitled, “Implantable Spy Chip Gets Green Light from U.S.,” reported that a “Brazilian politician...has been trying to become the first South American to use the implant chip...”

The company [Applied Digital Solutions] also said the chip [VeriChip] could be combined with a global positioning system (GPS) and used for security purposes by potential kidnap victims.

<sup>240</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; pp. 1-2 of 1/21/03 10:55 AM printout.

<sup>241</sup> Lev Grossman, “Meet the Chipsons,” *Time*, March 11, 2002, pp. 56-57.

ADS, which has estimated that the worldwide market for security chips will reach US\$450 million by 2007, already has deals in place in South America.

Brazilian politician Antonio de Cunha Lima has been trying to become the first South American to use the implant chip, according to published reports. Brazil has the fourth highest kidnap rate in the world, after Colombia, Mexico and Indonesia.<sup>242</sup>

- E. Mexico: “VeriChip Corporation Signs First Distributor for Mexico”: Business Wire; April 25, 2002

Applied Digital Solutions signed a distribution agreement with Speko Corporation for VeriChips and VeriChip scanners.

Applied Digital Solutions, Inc....announced that its wholly owned subsidiary, VeriChip Corporation, has signed a non-exclusive distribution agreement with Speko Corporation.

Speko is a leading personal security company in Mexico that provides a full range of security products for government agencies, commercial enterprises and individuals. Speko’s line-up of products includes personal security devices, building access controls, armored plating for vehicles and bulletproof vests.

According to the Distribution Agreement, Speko has agreed to purchase 300 VeriChips and 20 proprietary VeriChip scanners. The Agreement calls for an initial term of six months with a minimum sales quota of an additional 600 VeriChips and 60 proprietary VeriChip scanners. Assuming the minimum sales quota is met, the Agreement will renew for successive six-month terms. Minimum sales quota revenues for the initial six-month term will be \$250,000. Both companies anticipate that sales volume for the first six months will produce a revenue stream of up to \$2 million.<sup>243</sup>

- F. Latin America, World: Subdermal GPS Personal Location Device: Strong Demand for Development of a Subdermal GPS Device from All Over The World, But Particularly in Latin America: April 26, 2002

Applied Digital Solutions announced plans to accelerate development of a Subdermal GPS device in response to “enormous customer demand.”

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<sup>242</sup> Tim McDonald; “Implantable Spy Chip Gets Green Light from U.S.,” NewsFactor Network; published April 5, 2002; <<http://sci.newsfactor.com/perl/printer/17127/>>; p. 2 of 4/19/02 11:09 AM printout.

<sup>243</sup> “VeriChip Corporation Signs First Distributor for Mexico,” Business Wire: Press Release, Source: Applied Digital Solutions; published April 25, 2002 8:20 am Eastern Time; <[http://biz.yahoo.com/bw/020425/252173\\_1.html](http://biz.yahoo.com/bw/020425/252173_1.html)>; p. 1 of 4/25/02 10:09 AM printout.

Applied Digital Solutions, Inc....announced that in response to enormous customer demand it will accelerate its development of what it calls PLD or "personal location device" - a subdermal device that includes GPS emergency location capability.

A working prototype of the device is expected in approximately seven months.

Commenting on the announcement, Scott R. Silverman, President of Applied Digital Solutions said: "Based on what we're hearing from potential customers and partners around the world, the time has come for PLD - our new personal location device...[E]ver since we announced VeriChip(TM) last December, we've heard strong demand for development of a subdermal GPS device. We're hearing this from all over the world, but particularly in Latin America where the tragedy of commercial kidnappings has become rampant. We've decided that accelerating the development of PLD is a valuable service to enhancing personal safety and security."

Mr. Silverman continued: "We're committed to providing customers with a full range of personal safeguard technologies - technologies that enhance personal safety, security and peace of mind. Customers can choose the wearable Digital Angel device. They can choose to "get chipped(TM)" with our VeriChip medical and security identification implant. And now they'll have another option - the implantable PLD for those who want the added security of a personal GPS location feature."<sup>244</sup>

- G. World: 4,000 Worldwide Await Chip: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

The "4,000 worldwide await chip" subheading in a May 10, 2002 article by *Palm Beach Post* Staff Writer Deborah Circelli introduced a brief statement of current demand and future plans.

In two to three years, however, the company's [Applied Digital Solutions] goal is for 90 percent of U.S. hospitals, clinics and paramedics to have the scanners. The company hopes one day it will become routine for all hospitals to scan patients who come into emergency rooms unable to speak, or having Alzheimer's.

About 4,000 people worldwide have registered with the company to be implanted with the VeriChip, [President Scott] Silverman said<sup>245</sup>

<sup>244</sup> "Applied Digital Solutions to Accelerate Development of a Subdermal GPS 'Personal Location Device'; Working Prototype Expected in Seven Months;" Business Wire; published April 26, 2002; p. 1 of 4/26/02 printout.

<sup>245</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: PalmBeachPost.com; published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; p. 3 of 5/10/02 8:04 AM printout.

- H. South Korea; Mexico, Ecuador and Europe: VeriChip Corporation Signs Agreement for South Korean Market; Mention of Mexico, Ecuador and Europe: Business Wire; December 6, 2002

Applied Digital Solutions signed a distribution agreement with Global Integrated Technology, Inc. for VeriChips and VeriChip scanners.

Applied Digital Solutions, Inc. (Nasdaq:ADSX) an advanced technology development company, announced today that its wholly owned subsidiary, VeriChip(TM) Corporation, has signed an exclusive, five-year distribution agreement for the South Korean market with Global Integrated Technology, Inc. (GIT), an American company headquartered in California. The agreement grants GIT the exclusive rights to market and distribute all applications of VeriChip products in South Korea, provided minimum purchase requirements and certain other conditions are met.

The agreement calls for an initial purchase over the next three months of 5,000 VeriChips - tiny, subdermal, personal verification microchips - and 216 proprietary VeriChip scanners. Based on the agreement's five-year, minimum purchase quotas required to retain exclusivity in South Korea, GIT is expected to purchase a total of at least 75,000 VeriChips and more than 7,500 proprietary scanners.

This distribution agreement continues VeriChip's international expansion. As previously announced, the Company recently signed multi-million dollar distribution agreements for Mexico and Ecuador. In Europe, the Company has appointed its first authorized representative with extensive experience in both commercial and government sectors.<sup>246</sup>

- I. Mexico: "VeriChip™ Inventories Shipped to VeriChip's Exclusive Distributor in Mexico": Business Wire; April 4, 2003

Applied Digital Solutions shipped VeriChips to Mexico.

Applied Digital Solutions, Inc. (Nasdaq: ADSX) an advanced technology development company, announced today that its wholly owned subsidiary, VeriChip Corporation, has completed initial product shipments to the Company's exclusive distributor in Mexico...

The product shipments to Mexico fulfilled the initial purchase quota contained in the exclusive VeriChip distribution agreement, announced last October, with Sistemas de Proteccion Integral de Mexico, S.A. de C.V. (SPIMSA), a large

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<sup>246</sup> "VeriChip Corporation Signs Exclusive VeriChip Distribution Agreement for South Korean Market With Global Integrated Technology, Inc.;" Business Wire; published December 6, 2002;  
<[http://www.bloomberg.com/fgcgi.cgi?T=quote/marketsquote99\\_news.ht&s=APfCmlBYgVmVyaUNo](http://www.bloomberg.com/fgcgi.cgi?T=quote/marketsquote99_news.ht&s=APfCmlBYgVmVyaUNo)>; p. 1 of 12/10/02 5:21 PM printout.

private security company in Mexico City, Mexico which is marketing VeriChip through its SoluSat subsidiary. The agreement calls for a minimum purchase quota in excess of \$9 million through the end of 2006.

The initial product shipments to SoluSat - consisting of 1,000 implantable VeriChips and 100 proprietary scanners - were completed in the first quarter of 2003. If annual minimum sales quotas are met, SoluSat will retain the exclusive right to distribute VeriChip and related products in Mexico.

Established over 15 years ago, SPIMSA Corporation provides clients with a range of security-related services, including building access control, personal security, and security consulting. SPIMSA's client base includes some 150 major corporate entities, along with various agencies of government at the federal, state and local levels in Mexico. Marketing and distribution efforts involving VeriChip are expected to be widespread geographically in Mexico, covering a diverse mix of potential customers and meeting a range of needs in the areas of access security and emergency identification.<sup>247</sup>

- J. Latin America: Mexico and Colombia; Israel: *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford reported on interest in Mexico and Colombia for Applied Digital Solution's Personal Locator Device.

The company [Applied Digital Solution] is field testing its Personal Locator Device, or PLD, which ADS says could help track lost children, sick elderly family members, mountain climbers who get lost, or kidnap victims. Company officials say they have been inundated with requests from private companies in Latin America, especially Mexico and Colombia.

The PLD is still years away from wide use, according to Keith Bolton, ADS's chief of technologies. The working prototype is rather large—2 1/2 inches in diameter—and would require major surgery for implantation (though it appears some Israeli secret service agents already carry something similar). It is powered by a pacemaker battery, and just like in a Tom Clancy book, it would let anyone with access to the PLD system follow the wearer anytime, anywhere in the world, at the click of a mouse.<sup>248</sup>

<sup>247</sup> "VeriChip Corp. Completes Initial VeriChip Product Shipments in First Quarter 2003;" Business Wire; published April 4, 2003; <<http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=akxYyzUFJmRg>>; p. 1 of 4/4/03 9:00 AM printout.

<sup>248</sup> Angela Swafford; "Chipping Away at Security Fears"; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-)

- K. International: "VeriChip Subdermal Personal Verification Microchip to Be Featured at IDTechEX 'Smart Tagging in Healthcare' Conference in London, April 28-29, 2003;" Temperature-Sensing Microchip Technology and Potential Human Healthcare Applications: Business Wire: April 25, 2003

At a "Smart Tagging in Healthcare" conference in London, Applied Digital Solutions planned that an "international audience will also see first-ever demonstration of implantable temperature-sensing microchip and learn about potential human healthcare applications."

Applied Digital Solutions, Inc. (Nasdaq: ADSX) an advanced technology development company, announced today that its wholly owned subsidiary, VeriChip Corporation, has been invited to make two presentations at the upcoming IDTechEx "Smart Tagging in Healthcare" conference in London, April 28-29, 2003.

Dr. Richard Seelig, Vice President of Medical Applications for VeriChip Corporation, will provide a live demonstration of VeriChip(TM) and discuss its potential healthcare applications - which are subject to regulation by the US Food and Drug Administration - including:

- Implanted medical device identification
- Emergency access to patient-supplied health information
- Portable medical records access
- In-hospital patient identification
- Medical facility connectivity via patient
- Patient/therapy integration
- Inter-facility patient identification
- Additional healthcare applications which are not Internet dependent, including disease/treatment management of at-risk populations

Dr. Seelig will also provide the first-ever public demonstration of a new temperature-sensing microchip technology, marketed, patented and first announced by Digital Angel Corporation (AMEX: DOC) in February 2003. This new Radio Frequency Identification (RFID) microchip has similar dimensions and performance characteristics as VeriChip, but it can also obtain and transmit body temperature data.

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0=VeriChip&s\_dispstring=VeriChip%20AND%20date(last%2030%20days)&p\_field\_date-0=YMD\_date&p\_params\_date-0=date:B,E&p\_text\_date-0=30qzD&p\_perpage=10&p\_sort=YMD\_date:D&xcal\_useweights=no>; p. 3 of 5/22/03 3:03 PM printout.

This technology for human healthcare applications is subject to appropriate regulations in the US and other jurisdictions. The potential healthcare applications of the new temperature-sensing microchip include, but are not limited to, the following broad treatment categories:

- Chemotherapy treatment management
- Chronic infection monitoring
- Organ transplantation treatment management
- Infertility management
- Postoperative monitoring
- Critical care monitoring
- Medication monitoring
- Response to treatment evaluation

IDTechEx refers to this London conference as the "first major" conference devoted to the potential healthcare benefits of smart tagging technologies. As described by IDTechEx, the conference is intended to help attendees "learn how smart labels can save lives, reduce errors, improve health, reduce costs and lead to new services."<sup>249</sup>

- L. International: "Subdermal VeriChip and New Temperature-Sensing Microchip Technology Successfully Demonstrated at London Healthcare Conference - April 28-29, 2003": Business Wire: April 30, 2003

Applied Digital Solutions announced that "it successfully demonstrated its subdermal VeriChip personal verification microchip, as well as a new, implantable, temperature-sensing microchip technology at the IDTechEx 'Smart Tagging in Healthcare' conference held in London, April 28-29, 2003."

Applied Digital Solutions, Inc. (Nasdaq: ADSX) an advanced technology development company, "announced...that it successfully demonstrated its subdermal VeriChip personal verification microchip, as well as a new, implantable, temperature-sensing microchip technology at the IDTechEx 'Smart Tagging in Healthcare' conference held in London, April 28-29, 2003."

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<sup>249</sup> "VeriChip Subdermal Personal Verification Microchip to Be Featured at IDTechEX 'Smart Tagging in Healthcare' Conference in London, April 28-29, 2003;" Business Wire; published April 25, 2003; <<http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=a9IHBfagMDAQ>>; pp. 1-2 of 4/29/03 3:22 PM printout.

Dr. Richard Seelig, Vice President of Medical Applications for VeriChip Corporation, provided the international audience with a live demonstration of VeriChip and discussed its many potential healthcare applications - which are subject to regulation by the US Food and Drug Administration.

Dr. Seelig also provided the first-ever public demonstration of a new temperature-sensing microchip technology, marketed, patented and first announced by Digital Angel Corporation (AMEX: DOC) in February 2003. This new Radio Frequency Identification (RFID) microchip has similar dimensions and performance characteristics as VeriChip, but it can also obtain and transmit body temperature data. In the live demonstration, a volunteer placed the microchip just behind her ear then passed the handheld scanner over the chip to instantly obtain her temperature reading. Human healthcare applications of this technology are subject to appropriate regulations in the US and other jurisdictions.<sup>250</sup>

M. Mexico: Healthcare Applications of VeriChip Promoted in Mexico: July 2003

1. "SOLUSAT MEDICA to Promote VeriChip's Healthcare Applications in Mexico" Business Wire; July 17, 2003

SOLUSAT MEDICA is designed to promote VeriChip's healthcare applications in Mexico.

Applied Digital Solutions, Inc. (Nasdaq: ADSX), an advanced technology development company, announced today that its exclusive distributor of VeriChip(TM) products and services in Mexico is launching "SOLUSAT MEDICA", a special unit designed to promote the many healthcare-related applications of VeriChip in Mexico...

Approximately 40 TV, radio and print journalists are expected to cover the press conference and live "chipping" - a simple, outpatient procedure that requires only a few minutes for a local anesthetic and insertion of the chip with a specially designed needle.

...According to SOLUSAT, discussions are underway for the donation of scanners to institutions such as the Red Cross and the Mexican Alzheimer's Association and several other public organizations.<sup>251</sup>

<sup>250</sup> "Subdermal VeriChip and New Temperature-Sensing Microchip Technology Successfully Demonstrated at London Healthcare Conference - April 28-29, 2003;" Business Wire; published April 30, 2003; <<http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=ajfYPLwF9RrU>>; p. 1 of 4/30/03 8:36 AM printout.

<sup>251</sup> "'Applied Digital Solutions' Exclusive Mexico Distributor of Subdermal RFID VeriChip is Launching 'SOLUSAT MEDICA' to Promote VeriChip's Healthcare

2. Mexican Company Hopes to Implant Chips in 10,000 People :  
Associated Press on Newsday.com: July 18, 2003

Associated Press Writer Alonso Soto Joya reported on plans to implant chips in 10,000 people in Mexico.

Borrowing from technology for tracking pets, a U.S. company on Thursday launched Mexican sales of microchips that can be implanted under a person's skin and used to confirm health history and identity...

In a two-hour presentation, Palm Beach, Fla.-based Applied Digital Solutions Inc. introduced reporters to the VeriChip...

Antonio Aceves, the director of the Mexican company in charge of distributing the chip here, said that in the first year of sales, the company hoped to implant chips in 10,000 people and ensure that at least 70 percent of all hospitals had the technology to read the devices...

Company officials said they are working on developing similar technology that would use satellites to help find people who may have been kidnapped.

While the idea of using the chip to track people has raised privacy concerns in the United States, the idea has been popular with Mexicans.<sup>252</sup>

#### XI. The Spread of Human Microchip Implants: Children

- A. “ ‘Anti-Abduction’ Implant for Children”: England: BBC News: September 2, 2002

Parents are asking to have tracking microchips implanted under their children’s skin in response to fears about abduction.

Parents afraid that their daughters could be abducted are asking a British scientist to implant a tracking microchip under their skin, so that they can be found quickly.

Cybernetics expert Kevin Warwick said he had received requests for the procedure from "a number of families" following the deaths of 10-year-olds Holly Wells and Jessica Chapman.

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Applications in Mexico;” Business Wire; published July 17, 2003;  
<[http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=a7o\\_2GvOSSk0](http://quote.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=ADSX:US&sid=a7o_2GvOSSk0)>; p. 1 of 4/4/03 9:00 AM printout.

<sup>252</sup> Alonso Soto Joya, Associated Press Writer; “New Chip Can Be Implanted in Humans;” Associated Press on Newsday.com via drudgereport.com; published July 18, 2003 8:10 AM; <<http://www.newsday.com/templates/misc/printstory.jsp?slug=sns-ap-mexico-microchip&section=/news/nationworld/wire>>; pp. 1-2 of 7/18/03 printout 3:09 PM.

One girl, 11-year-old Danielle Duval, will have a device implanted in her arm sometime during the next few months.

Mr Warwick said the system could work by using a mobile phone network or global positioning system, to pinpoint the person on an electronic map via a signal from the implant...

The procedure would involve putting a small transmitter about one inch long into a child's arm or stomach.

Kevin Warwick "A potential abductor wouldn't know the child had the device and it could be switched off to sleep mode when it wasn't needed to conserve its battery," the Reading University academic said...

"But if the general trend in Britain is in favour of such an operation it will be ready to go by Christmas"...

Danielle Duval's mother, Wendy, decided to let her daughter be a guinea pig for the project following the discovery of the bodies of Holly and Jessica, from Soham in Cambridgeshire.

Former school caretaker Ian Huntley, 28, has been charged with their murder and his girlfriend, Maxine Carr, 25, with attempting to pervert the course of justice.

Mrs Duval, from Reading in Berkshire, said: "I think it's just to make sure your children are safe.

"It's a shame you have to go to these lengths to keep your children safe but I would rather do that than have anything happen to her."

She compared the device to the tracking systems fitted to cars and said many of her friends were interested in protecting their children, including boys, in the same way.

Danielle also said she was happy to have the tag fitted.

"I'll feel so much safer - I'll know my mum knows where I am," she said...

Commenting on the Duval's decision he said: "I think they were looking for piece of mind that if anything did happen to Danielle that within a few minutes we would be able to locate them."<sup>253</sup>

B. Global Positioning System (GPS) Implant Chip for Children Doesn't Exist:  
*The Register*: September 2, 2002

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<sup>253</sup> " 'Anti-Abduction' Implant for Children;" BBC News; published September 2, 2002, 15:52 GMT 16:52 UK; <<http://news.bbc.co.uk/1/hi/england/2231634.stm>>; pp. 1-3 of 2/14/03 3:55 PM printout.

John Lettice, writing in *The Register*, indicates that human implant chips are not a GPS device and suggests that current publicity serves the purpose of "softening public opinion."

Following the recent abduction of ten year olds Holly Wells and Jessica Chapman, the *Mirror* reports that Wendy and Paul Duval have decided to implant their daughter, Danielle, with "a microchip to track her every move. "If she was kidnapped her exact location would be discovered via a computer"...

The chip "emits radio waves through a mobile phone network and beams its exact location to a computer. If Danielle went missing, her location would be marked by an X on a computer map.... It will be inserted in her arm by a GP using local anaesthetic. It costs about £20 and will be invisible."

Well then, how does that work? [Reading University Professor Kevin] Warwick's experiments in chipping himself haven't gone as far as GPS, at least publicly, and any communications aspect to them has been decidedly short range. An "invisible" device that handles both GPS and mobile phone communications, and doesn't need its batteries changing every five seconds would however clearly make him a large fortune, if it existed.

Which manifestly it doesn't...

So the "invisible" chip is not a GPS device, and must perforce communicate with a real GPS device secreted somewhere about your person...

However even if you've got a concealed mobile phone with GPS, then what use is the tag? The phone rig does all this already, so for as long as you can hang onto the phone, you're trackable, and if you can't, you're not. After that the chip could help them identify you if they find you, and if for some reason you're not in a position to tell them yourself. Again, we're in VeriChip territory here, albeit a somewhat grimmer variant thereof.

So it's complete hokum, and under the circumstances pernicious. The Holly and Jessica case has generated much concern, and some hysteria in the UK, and stories such as the *Mirror's* serve only to fuel that hysteria by deluding parents into thinking that technology can somehow protect their children. And by pushing positive aspects of tagging, even years before it's actually feasible, they're softening public opinion up for the days when it can be widespread, and when its application can be more sinister...

So in the light of recent tragic events the correct course of action for parents has to be the fitting of a manifestly useless tagging device to their child. "The technology exists," says

Warwick, "it's affordable and accessible." No it doesn't, no it's not...<sup>254</sup>

C. "Girl To Get Tracker Implant": England: *The Guardian*: September 3, 2002

Professor Kevin Warwick of the cybernetics department at Reading University says that an 11-year-old girl will have a microchip implanted in her arm "in the next few months."

The parents of an 11-year-old girl are to take the extraordinary step of having her fitted with a microchip so that her movements can be traced if she is abducted.

Danielle Duval will have the device implanted in her arm in the next few months, the scientist [Professor Kevin Warwick of the cybernetics department at Reading University] assisting the plan claimed yesterday. The miniature chip will apparently send a signal via a mobile phone network to a computer, which will be able to pinpoint her location on an electronic map.

The parents, Wendy and Paul Duval from Reading in Berkshire, said they had decided on the step after the abduction and murder of the schoolgirls Holly Wells and Jessica Chapman.<sup>255</sup>

D. "Microchip Tag Bid To Thwart Perverts": England: *The Reading Evening Post*: September 3, 2002

Professor Kevin Warwick, cybernetics expert at Reading University has designed an implantable microchip that will be used to trace a child's microchip readings on a computer map.

A Reading youngster is to be microchipped in a hi-tech bid to thwart perverts and kidnapers.

Danielle Duval, 11, will have the chip implanted in her arm so she can be traced by computer if she is ever snatched.

Her parents Paul and Wendy made the decision following the deaths of Holly Wells and Jessica Chapman from Soham,

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<sup>254</sup> John Lettice; "Cap Cyborg to Chip 11 Year Old in Wake of UK Child Killings;" *The Register*; published September 2, 2002 at 12:07 GMT; <<http://www.theregister.co.uk/content/54/26908.html>>; pp. 1-2 of 2/17/03 9:10 AM printout. John Lettice's article critiques information that is referenced and linked to "today's Daily Mirror," which presumably would be the September 2, 2002 issue of the *Mirror*, although the online *Mirror* article itself is undated. The reference to the *Mirror* article is as follows. Lorraine Fisher; "Microchipped;" *Mirror*; published: no date; <<http://www.mirror.co.uk/news/allnews/page.cfm?objectid=12164609&method=full&siteid=50143>>; pp. 1-2 of 3/8/03 4:43 PM printout.

<sup>255</sup> Jamie Wilson; "Girl To Get Tracker Implant To Ease Parents' Fears;" *The Guardian*; published September 3, 2002; <<http://www.guardian.co.uk/child/story/0,7369,785073,00.html>>; p. 1 of 2/14/03 4:15 PM printout.

hoping that ‘tagging’ Danielle will go “a long way” to protecting her...

Mrs Duval added that the family, and Danielle, would be reassured she could be found using the chip – which emits radio waves through mobile phone technology – if there were an emergency.

It has been designed by University of Reading cybernetics expert Professor Kevin Warwick...

Prof Warwick said Danielle’s microchip readings would be traced on a computer map to locate her.<sup>256</sup>

- E. “Tagging Girl ‘Is Assault’ ”: England: *The Reading Evening Post*; September 3, 2002

*The Reading Evening Post* reported that an electronics expert was fighting to stop Reading University’s Professor Kevin Warwick from implanting a tracking microchip in a child. Bernard Allbrecht, the electronics expert, contacted the General Medical Council, the police in Reading, the Reading Borough Council, and the Wokingham District Council.

An electronics engineer is fighting to stop cybernetics professor Kevin Warwick from tagging an 11-year-old Spencers Wood girl.

Bernard Allbrecht, a London-based electronics expert, has spent the past two days calling the General Medical Council, social services and the police in a bid to persuade the authorities to prevent the “experiment” from going ahead.

Reading University’s Professor Warwick has developed a microchip which emits a signal and could be implanted under the skin as a tracking device...

He [Allbrecht] said: “From what I was told by the GMC I understood there could be a case for assault if the operation went ahead so I spoke to the police in Reading but I didn’t have any luck with them.

“They felt that if the parents gave consent it would be all right, but I believe there are wider legal principles at stake here.”<sup>257</sup>

<sup>256</sup> “Microchip Tag Bid To Thwart Perverts;” *The Reading Evening Post*; published September 3, 2002; <<http://www.getreading.co.uk/story.asp?intid=4565>>; p. 1 of 2/15/03 10:22 AM printout. Publication date information available at “Related Articles;” <<http://www.getreading.co.uk/relatedsearch.asp?intid=4565>>; p. 1 of 2/18/03 4:23 PM printout.

<sup>257</sup> “Tagging Girl ‘Is Assault’ ;” *The Reading Evening Post*; published September 5, 2002; <<http://www.getreading.co.uk/story.asp?intid=4598>>; p. 1 of 2/14/03 3:59 PM printout. Publication date information available at “Related Articles;” <<http://www.getreading.co.uk/relatedsearch.asp?intid=4598>>; p. 1 of 2/19/03 10:31 AM printout.

- F. “Kidnap Chip 'Untested' and May Not Work”: England: *Sunday Herald* September 8, 2002

Stephen Naysmith, Science Correspondent for the Sunday Herald reported that the technology for implanting a tracking implant in a child may not work.

The scientist [cybernetics professor Kevin Warwick] who gained world wide publicity for his plan to implant a tracking device in a schoolgirl's arm in the wake of the Soham killings has admitted he has not tried the technology and cannot guarantee it works.

Other experts in mobile telecommunication do not believe any such tracking device exists.<sup>258</sup>

- G. Growing Interest in Tracking Children: England: *The Observer*: September 8, 2002

*The Observer* reported a growing interest in tracking children electronically, whether via an external GPS-enabled watch, or via an implanted locator.

Moves to introduce child trackers are gaining momentum. The Personal Locator, made by Wherify Wireless, will this week begin nationwide trials in the United States. The company has said that it is preparing to sell them in Britain next year.

Reading University scientist Kevin Warwick is also trying to develop a locator that would be implanted into children...

It was the temporary loss of his two children at a zoo that led Timothy Neher, head of Wherify, to develop his Personal Locator. 'I looked at a menu to order lunch and when I looked back they had gone,' he said.

His locator - which costs \$400, plus a monthly service charge - consists of a wristwatch receiver that picks up signals from global positioning satellites. The wearer's location is automatically transmitted via cellphones to a central receiver. Parents can then look at a website to see their children's location. The locator wristwatch can be locked on to a child's wrist and is fitted with a panic button so that he or she can alert parents and police if danger arises.

The company says it has already sold thousands of devices over the last two months, with delivery beginning this week. Their popularity is not an American phenomenon: a survey carried out by nVision, the online database of the British think tank

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<sup>258</sup> Stephen Naysmith, Science Correspondent; “Kidnap Chip 'Untested' and May Not Work;” *Sunday Herald*; published September 8, 2002; <<http://www.sundayherald.com/print27519>>; p. 1 of 2/17/03 8:46 AM printout.

Future Foundation, has revealed that 75 per cent of British parents would like such a device.<sup>259</sup>

- H. “Beckhams Consider Micro-Chipping Sons”: England: *The Reading Evening Post*: November 11, 2002

*The Reading Evening Post* reported that a celebrity couple, (“Spice Girls”) Posh (Victoria Beckham) and husband soccer star Becks (David Beckham), is considering having their sons security chipped.

Posh and Becks are planning to have their two sons micro-chipped using technology being pioneered by a University of Reading professor.

The celebrity couple are considering the move, according to a Sunday newspaper, following the arrest of five people on suspicion of planning to kidnap Victoria Beckham and her children.

The Beckhams are reported to be planning to consult Professor Kevin Warwick, who hit headlines earlier this year when a Ryeish Green couple asked him to security chip their daughter, following the murder of the two teenage girls, Holly Wells and Jessica Chapman in Soham.<sup>260</sup>

- I. “Kid-Chips: Parents, Activists Debate How Far We Should Go To Protect Children”: Gannett News Service in *Norwich Bulletin*: November 18, 2002

Mary Challenger, Gannett News Service, reported on implanting tracking microchips in children.

When eight young girls were abducted and murdered in a span of just seven months in the United States, a number of terrified parents considered investing in \$400 personal locators that children can wear like a bracelet.

When a pair of 10-year-old British friends were found slain two weeks after disappearing from their hometown in eastern England, the efforts to protect children went a step further -- too far, many believe.

Kevin Warwick, a cybernetics professor from the University of Reading in England, is in the process of developing a tracking microchip for children...

<sup>259</sup> Robin McKie and Amelia Hill; “Tagging Children Will Not Protect Them, Say Experts;” *The Observer*; published September 8, 2002; <<http://society.guardian.co.uk/children/story/0,1074,788638,00.html>>; pp. 1-2 of 2/17/03 10:11 AM printout.

<sup>260</sup> “Beckhams Consider Micro-Chipping Sons;” *The Reading Evening Post*; published November 11, 2002; <<http://www.getreading.co.uk/story.asp?intid=5196>>; p. 1 of 2/15/03 10:18 AM printout. Publication date information available at “Related Articles;” <<http://www.getreading.co.uk/relatedsearch.asp?intid=5196>>; p. 1 of 2/18/03 3:41 PM printout.

If Warwick is successful in his efforts and the tracking microchip becomes a reality in England, it probably won't be long before parents on this side of the Atlantic are clamoring for it.

Legal and ethical issues will prevent it from becoming available in the United States any time soon, however, predicts Cheryl Erwin, an assistant professor of family medicine who specializes in biomedical ethics and medical humanities at the University of Iowa Carver College of Medicine in Iowa City.

Because the chip would be an experimental product, its creators would be required to follow certain guidelines, she says. Normally that entails years of testing in animals first to make sure the procedure doesn't cause more harm than good, then incorporating children into the research only after it has been proven safe in less vulnerable populations.

For the chip to get a green light in this country, the benefits would need to outweigh the risks, Erwin says. In this case, that means weighing the miniscule threat of a child being abducted against the chance of hurting a child by implanting an unknown, untested, unproven device in his or her body.

"I think this is totally unacceptable," Erwin says. "I think this would never happen in this country -- at least not until we have a good deal more information on this sort of thing."<sup>261</sup>

- J. Children and the Implications of a Human Tracking System: Mohan Tanniru, Professor of Information Systems, University of Arizona: *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford reported on the reflections by Mohan Tanniru, University of Arizona Professor of Information Systems, on the implications of a human tracking system.

Businesses already use technology to track their products around the world, but we should stop and think about the implications before starting a human tracking system, cautions Mohan Tanniru, professor of information systems at the University of Arizona.

I am not going to put a chip on my kid thinking that she could be kidnapped," he says, "unless I know the chip will be activated only if I report that my kid is lost. But how do I know that the police are only going to activate it when I say so, and not when they feel like it? You can't just say that technology is bad just because it is there. So it is a matter of deciding what trusting agency should be given that responsibility."

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<sup>261</sup> Mary Challenger; "Kid-Chips;" Gannett News Service in *Norwich Bulletin*; published November 18, 2002; <<http://www.norwichbulletin.com/news/stories/20021118/living/394258.html>>; pp. 1, 3 of 2/17/03 8:02 AM printout.

Tanniru actually thinks that human tracking might be welcome in certain cases, such as following criminals on probation or making sure foreign nationals don't overstay their visas.<sup>262</sup>

## XII. The Spread of Human Microchip Implants: Crime

### A. "Surgical Tags Plan for Sex Offenders: Silicon Chip To Be Inserted under Skin": *The Observer*: November 17, 2002

Martin Bright, home affairs editor of *The Observer*, wrote that Britain is considering a plan to track sex offenders with surgically implanted "electronic tags."

Britain is considering a controversial scheme to implant surgically electronic tags in convicted paedophiles amid fears that the extent of the abuse of children has been massively underestimated.

Documents obtained by The Observer reveal the Government could track paedophiles by satellite, with a system similar to that used to locate stolen cars.

The tags can be put beneath the skin under local anaesthetic and would also be able to monitor the heart rate and blood pressure of the abuser, alerting staff to the possibility that another attack was imminent.

A letter from Hilary Benn, the Minister responsible for the supervision of sex offenders in the community, reveals the Home Office's electronic monitoring team is already developing technology to track paedophiles constantly. The team is now investigating the 'implant tag' after it was alerted to its capabilities by a campaign group for victims of paedophiles.

Tracker, the company which runs Britain's largest stolen vehicle monitoring network, has already been approached about paedophile monitoring and computer company Compaq has been asked to develop the software.

Compaq Software Solutions has developed similar technology for Nasa to monitor remotely the bodily functions of astronauts...

In a letter to Labour MP Andrew Mackinley, Benn wrote: 'The Electronic Monitoring Team is... looking actively at the

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<sup>262</sup> Angela Swafford; "Chipping Away at Security Fears"; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 3 of 5/22/03 3:03 PM printout.

possibilities for using tracking technology to monitor offenders' whereabouts as they move from one place to another...

Ministers would need to pass new legislation to oblige offenders to be surgically fitted with the tags.<sup>263</sup>

B. "UK Home Office Unit Looking at Electronic Offender Tagging": *The Register*: November 18, 2002

John Lettice, writing for *The Register* on November 18, 2002, commented on an article that had appeared in the November 17, 2002 issue of *The Observer*. Lettice questions the availability of implantable chip human technology that can track individuals.

Has Hilary Benn MP become the UK's Minister for Cyborging? An article in yesterday's *Observer* newspaper might imply he's dangerously near to it. The story, unfortunately, starts the usual hares about people-chipping in its lead-in paragraphs, which does kind of obscure the real story lurking beneath.

The paper got hold of a copy of a letter from Benn to Labour MP Andrew Mackinley. Benn is currently government Minister for Community and Custodial Provision, which among other things covers the observation and control of sex offenders. Says Benn: "The Electronic Monitoring Team is... looking actively at the possibilities for using tracking technology to monitor offenders' whereabouts as they move from one place to another."

Electronic Monitoring Team? What electronic monitoring team would that be? But it's listed, if not explained, here<sup>[264]</sup> (right hand column). Benn continues: "To date... the team is unaware of any available technology which uses bodily implants to track offenders' movements or which can measure bodily functions to predict likely criminal activity. Such future improvements are, however, worthy of consideration if it can be demonstrated to be feasible and reliable in delivering improvements in public protection."

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<sup>263</sup> Martin Bright, Home Affairs Editor; "Surgical Tags Plan for Sex Offenders;" *The Observer*: Guardian Unlimited © Guardian Newspapers Limited; published Sunday, November 17, 2002; <<http://politics.guardian.co.uk/Print/0,3858,4548381,00.html>>; p. 1 of 2/17/03 11:59 AM printout. An article by Dominic Tonner with related content that appeared in *The Sunday Times of London*, is entitled, "Paedophiles May Be Fitted with Electronic Tags." This *Sunday Times* article was found on prisonplanet.com at <[http://www.prisonplanet.com/news\\_alert\\_111702\\_microchips.html](http://www.prisonplanet.com/news_alert_111702_microchips.html)>; p. 1 of 2/17/03 9:53 AM printout. The prisonplanet.com page provides the following information for the *Sunday Times* article: "Original Link: <<http://www.timesonline.co.uk/article/0,,2087-483510,00.html>>."

<sup>264</sup> "Criminal Policy Group: Unit Links: Electronic Monitoring;" Home Office, United Kingdom; Last updated December 11, 2002; <<http://www.homeoffice.gov.uk/cpg/cpg.htm>>; p. 1 of 3/4/03 8:42 AM printout.

So this team is looking at using devices to monitor offenders, but at least knows that there's no way of doing it with today's technology via a surgical implant. Should they come up with something, then it's more likely to be a home confinement 'curfew' system, or one of the larger luggable units combining GPS and wireless...<sup>265</sup>

### XIII. Human Microchip Implants: Market

There may be an overlap between the market for external and implanted wireless, Global Positioning System (GPS) devices. Thus the perceived "Market Opportunity" of Wherify Wireless, Inc., "the leading location services provider," with its "wrist-worn locator," is informative. Following is a partial listing of Wherify Wireless, Inc.'s "Corporate Backgrounder" pdf "Our Market Opportunity" section.

#### A. "Location-based Services"

Following is information from two of the four bulleted items under the "Location-based Services" heading.

1. "By 2004, nearly 90 percent of cellular/PCS subscribers will have location capabilities on their handsets, generating \$4.5 billion in revenue for the carriers – *IDC...*"
2. "The number of wireless messages sent per month will balloon from 3 billion in December 1999 to 244 billion by December 2004 – *Cahners In-Stat Group.*"

#### B. "Children's Safety"

Following is information from two of the two bulleted items under "Children's Safety."

1. "Approximately 750,000 children will be reported missing in the U.S. this year. That's one child every 42 seconds – *Lost Children's Network.*"
2. "Every year, 359,000 children are kidnapped – *U.S. Justice Department.*"

#### C. "Elderly and Mentally Handicapped"

Following is information from one of the three bulleted items under "Elderly and Mentally Handicapped."

1. "Of the 4 million Americans with Alzheimer's Disease, 60 percent will wander. Furthermore, 20 percent will wander more than once – *Alzheimer's Association.*"

#### D. "Criminal Justice"

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<sup>265</sup> John Lettice; "UK Home Office Unit Looking at Electronic Offender Tagging;" *The Register*; published November 18, 2002 at 12:37 GMT; <<http://www.theregister.co.uk/content/archive/28148.html>>; p. 1 of 2/14/03 4:36 PM printout.

Following is information from two of the two bulleted items under “Criminal Justice.”

1. “There are an estimated 5.5 million people serving a sentence of some type, 19 percent of which have movement restriction as part of their sentence – *U.S. Justice Department*.”
2. “Research has shown that 11 percent of movement restricted prisoners fail to report and cannot be located again – *U.S. Justice Department*.”

E. “Pets”

Following is information from the one bulleted item under “Pets.”

1. “There are approximately 59 million cats, 52 million dogs, and 6 million horses in the U.S. – *American Veterinary Medical Association*.”<sup>266</sup>

XIV. Human Microchip Implants: Government

A. Human Microchip Implants: Federal Communications Commission (FCC) Approval

1. Digital Angel Has FCC Approval: WorldNetDaily: February 4, 2002

WorldNetDaily reported that Digital Angel has FCC approval.

ADS acquired the company [Destron Fearing] in order to leverage its management experience and relevant technologies...Under the guise of Destron Fearing, Digital Angel has won FCC licensing approval of the frequencies needed for widespread tracking of humans.<sup>267</sup>

2. Applied Digital Solutions Says Has Permission from FCC: *Los Angeles Times*: December 19, 2001

*The Los Angeles Times* reported that Applied Digital Solutions says that it has permission from the FCC.

A Florida company is poised to become the first to sell microchips designed to be implanted into human beings, an achievement that opens the door to new systems of medical monitoring and ID screening...

The company [Applied Digital Solutions] said it already has secured permission from the Federal Communications

<sup>266</sup> “Corporate Backgrounder;” Wherify Wireless, Inc.; Corporate\_backgrounder.pdf created August 9, 2002, 6:18 PM; <[http://www.wherifywireless.com/pubRel/Corp\\_backgrounder.pdf](http://www.wherifywireless.com/pubRel/Corp_backgrounder.pdf)>; pp. 1-3 of 3/7/03 printout.

<sup>267</sup> Sherrie Gossett; WorldNetDaily.com; published February 4, 2002; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=26316](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=26316)>; p. 7 of 2/17/03 11:30 AM printout.

Commission--necessary because the chips use radio frequencies.<sup>268</sup>

3. Applied Digital Solutions Claims Has Approval from FCC: December 19, 2001 *Los Angeles Times* summarized in December 20, 2001 NLECTC *Law Enforcement & Corrections Technology News Summary*

The National Law Enforcement and Corrections Technology Center (NLECTC) in the December 20, 2001 *Law Enforcement & Corrections Technology News Summary* notes that Applied Digital Solutions claims, in regard to its implanted microchips, that it has gained approval from the FCC.

Applied Digital Solutions of Palm Beach is planning to capitalize on microchips that can be implanted within the human body...Applied Digital expects the FDA to approve the chips by the middle of next year; the company claims to have gained approval from the FCC, since the chips use radio frequencies.<sup>269</sup>

#### B. Human Microchip Implants: Food and Drug Administration (FDA)

1. Applied Digital Solutions Expects to Receive FDA Approval: *The Los Angeles Times*: December 19, 2001

*The Los Angeles Times* reported that Applied Digital Solutions expects to receive FDA approval.

A Florida company is poised to become the first to sell microchips designed to be implanted into human beings, an achievement that opens the door to new systems of medical monitoring and ID screening...

The chips would need approval from the Food and Drug Administration, which Applied Digital said it expects to receive by midyear.<sup>270</sup>

<sup>268</sup> David Streitfeld; "A Chip ID That's Only Skin-Deep;" *Los Angeles Times*; published December 19, 2001; Start Page: A.1; <<http://pqasb.pqarchiver.com/latimes/main/doc/000000095988263.html?MAC=099cdc7812e33c01a59498a6dee6b5b2&QIID=000000095988263&FMT=FT>>; p. 1 of 4/17/02 11:45 AM printout.

<sup>269</sup> NLECTC *Law Enforcement & Corrections Technology News Summary* abstract of David Streitfeld, *Los Angeles Times* (12/19/01) p. A1; The National Institute of Justice, the research and development agency of the U.S. Department of Justice; published December 20, 2001; <<http://www.nlectc.org/justnetnews/12202001.html - story10>>; p. 3 of 2/20/03 11:29 AM printout.

<sup>270</sup> David Streitfeld; "A Chip ID That's Only Skin-Deep;" *Los Angeles Times*; published December 19, 2001; Start Page: A.1; <<http://pqasb.pqarchiver.com/latimes/main/doc/000000095988263.html?MAC=099cdc7812e33c01a59498a6dee6b5b2&QIID=000000095988263&FMT=FT>>; p. 1 of 4/17/02 11:45 AM printout.

2. FDA Will Not Regulate Implantable Chip in People if Contains No Medical Data: Associated Press on washingtonpost.com: April 4, 2002

The FDA will not regulate implantable chips in people if the chips do not contain medical data.

A company plans to begin selling a computer ID chip that can be embedded beneath people's skin, now that the Food and Drug Administration has said it will not regulate the implant as long as it contains no medical data...

Applied Digital had held off sales pending discussions with the FDA of whether an implanted chip would be considered a medical device. If the chip solely provides identification, it needs no FDA clearance, the agency confirmed Thursday—advice officials have long given others developing ID for tracking children, prisoners or workers with top-security clearances.

But, “if they put medical records in, we would be concerned about the use,” said the FDA’s medical device chief, Dr. David Feigal, who made clear that the agency could step in at that point...

For now, the VeriChip will bear only an identification number, said David Hughes of Technology Sourcing International, a consulting firm helping Applied Digital in its discussions with the FDA. But that ID code could be cross-referenced with a database to detail any kind of information.

The company said production would begin immediately.<sup>271</sup>

3. “VeriChip Receives Favorable FDA Guidance”: Business Wire: April 4, 2002

Business Wire reported that “VeriChip Receives Favorable FDA Guidance.”

Applied Digital Solutions, Inc. (Nasdaq: ADSX), an advanced technology development company, announced today that it has received written guidance that the U.S. Food and Drug Administration (FDA) does not consider VeriChip™ to be a regulated device.

This clears the way for the company to begin sales, marketing and distribution of VeriChip™ in the United States.

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<sup>271</sup> “Company to Sell Implantable Chip;” Associated Press on washingtonpost.com; published April 4, 2002 3:43 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A61845-2002Apr4?language=printer>>; p. 1 of 4/5/02 printout 11:17 PM.

Commenting on the FDA notification, Scott R. Silverman, President of Applied Digital Solutions said: "...This favorable FDA guidance was a major goal of Applied's new management team. It has been accomplished. We can now begin to sell, market and distribute VeriChip in the United States."<sup>272</sup>

4. FDA: VeriChip: "Not Considered a Medical Device and Therefore Is Not Subject to FDA Regulation": Newsfactor: April 5, 2002

A NewsFactor Network article, entitled, "Implantable Spy Chip Gets Green Light from U.S.," reported that an implantable microchip received the "go-ahead from the U.S. Food and Drug Administration."

A Florida company Thursday said that it will begin marketing and selling a microchip that can be implanted under the skin, after receiving the go-ahead from the U.S. Food and Drug Administration (FDA).

The FDA advised the company, Applied Digital Solutions (Nasdaq: ADSX), that its biochip, called "VeriChip," is not considered a medical device and therefore is not subject to FDA regulation.

FDA officials said that as long as the biochip is used for identification purposes only, it will not have to meet strict FDA guidelines. The ruling saves the product from having to undergo the agency's rigorous and lengthy safety testing procedures.

"The FDA said that VeriChip has no medical function, and Applied Digital Solutions is now free to sell, market and insert the chips in individuals," company spokesperson Matthew Cossolotto told NewsFactor.

'Distinction Without a Difference'

Although the company has advertised the VeriChip in the past as a potential method of storing a person's complete medical history, at this stage the device will contain only a number to be used for identification.

However, that ID code can be transmitted via Internet or phone to a secure data storage site, where it can be cross-referenced, allowing authorized personnel to obtain detailed medical information.

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<sup>272</sup> "VeriChip Receives Favorable FDA Guidance – Sales, Marketing and Distribution of VeriChip to Begin in the United States;" published April 4, 2002; <<http://investor.cnet.com/investorpw/privatewire/latimes/0-7478857-54-0-54-9618987.html>>; p. 1 of 4/17/02 printout 11:25 AM.

"In some ways, it's kind of a distinction without a difference," Cossolotto said. "We could have, and we might in the future, put more information on the chip. But right now we're very happy to put just the ID verification code and start getting it into the marketplace."

The company said it has targeted VeriChip and its "life-enhancing" technology toward patients who may arrive at hospitals unconscious or unable to speak, as well as at workers who need top-security clearance.

The biochip also could prove valuable for tracking children, Alzheimer's patients and convicted felons on parole.

Similar technology has been used in the last few years to keep track of pets.<sup>273</sup>

5. Applied Digital Solutions: FDA: Testing Not Required for Implantable Chip: *The New York Times* on the Web: April 5, 2002

*The New York Times* on the Web, in a "Technology Briefing" section, reported that Applied Digital Solutions said that the FDA does not require the company's implantable chip to "undergo testing by the Food and Drug Administration."

**IMPLANTABLE CHIP HEADED FOR MARKET** A skin-embedded computer chip is not required to undergo testing by the Food and Drug Administration and will thus be available soon, the company that designed the product said. The company, Applied Digital Solutions..., has publicized the device, called Verichip, as a substitute for medical tags, saying that wireless readers could be used with it to get information like the pacemaker model or drug allergies of a person brought to a hospital. In reality, however, the chips would only contain identification codes that would refer to a database of medical information. Applied Digital Solutions said because the chip would not contain medical information, the product was able to avoid F.D.A. review. The company has said it will begin distributing equipment to read the chips to hospitals in Palm Beach and Broward Counties in Florida...Scott Silverman, the chief executive, said it was shifting its focus from the information technology business to emerging technologies like Verichip.<sup>274</sup>

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<sup>273</sup> Tim McDonald; "Implantable Spy Chip Gets Green Light from U.S.;" NewsFactor Network; published April 5, 2002; <<http://sci.newsfactor.com/perl/printer/17127/>>; p. 1 of 4/19/02 11:09 AM printout.

<sup>274</sup> Jennifer 8. Lee; "Hardware: Technology Briefing: Implantable Chip Headed for Market;" *The New York Times* on the Web; published April 5, 2002; <<http://www.nytimes.com/2002/04/05/technology/05TBRF.html>>; p. 1 of 4/6/02 5:16 PM printout.

6. Applied Digital Solutions Requested a Modification of Nasdaq Decision Based in Part on FDA Regulatory Review Process: Business Wire: October 17, 2002

Applied Digital Solutions requested "an additional 60 days to comply with \$1.00 minimum bid price requirement...based in part, on the prolonged and unexpected regulatory review process by the FDA concerning VeriChip(TM)."

Applied Digital Solutions, Inc. (Nasdaq: ADSX), an advanced technology development company, announced today that it has requested that the NASDAQ Listing Qualifications Panel modify its prior decision NQ4063N-02.

...The Company's request is based, in part, on the Food and Drug Administration's (FDA) prolonged and unexpected regulatory review process concerning VeriChip, the Company's subdermal personal verification microchip.

Specifically, at the suggestion of FDA officials in June, the Company voluntarily submitted two separate written requests to the Center for Devices and Radiological Health (CDRH) under Section 513(g) of the Federal Food, Drug, and Cosmetic Act (FDC Act). The first "513(g)" request, which was received by the FDA on July 1, 2002, concerned VeriChip's use in security, financial, and personal identification/safety applications.

The second "513(g)" request, received by the FDA on July 9, 2002, covered the use of the VeriChip in health information applications. In both applications, the Company requested an FDA determination that VeriChip is not a regulated "device" as defined by the FDC Act for the intended uses described in the 513(g) requests.

The FDC Act requires the FDA to respond to 513(g) requests with a decision within 60 days of receipt. The 60-day response period for the first 513(g) request expired on September 1, 2002, while the response period for the second request expired on September 8, 2002.

Commenting on the Company's request to NASDAQ and the FDA's review process, Scott R. Silverman, President of Applied Digital Solutions, said: "Without question, the Company respects the FDA and the important role it plays in protecting the health and safety of the public. Throughout this prolonged process, the Company has cooperated fully, even voluntarily suspending further commercial "chipping" procedures in the United States. Based on our legal counsel's extensive review of relevant statutes, the Company continues to believe firmly that VeriChip is not a medical device as defined by law and could therefore lawfully be marketed right now. However,

out of respect for the Agency and our desire to cooperate, we have not begun to market the product here in the United States. In view of the expired 60-day deadlines for responding to our 513(g) applications, we have respectfully requested that the FDA provide us with the necessary clarification immediately. We believe these unusual and extenuating facts justify the 60-day extension. In the worst case, the Company would move to the NASDAQ Small Cap Market. In this event, the Company remains confident that within the next 180 days it will be able to satisfy the minimum bid requirement and regain national market listing."<sup>275</sup>

7. "FDA Ruling - Subdermal VeriChip is Not a Regulated Medical Device 'For Security, Financial, and Personal Identification/Safety Applications'": Business Wire: October 22, 2002

Business Wire reported that Applied Digital Solutions said that the FDA determined that a subdermal chip "is not a regulated medical device 'for security, financial, and personal identification/safety applications.' "

Applied Digital Solutions, Inc....today announced that the Food and Drug Administration (FDA) has determined that VeriChip is not a regulated medical device "for security, financial, and personal identification/safety applications."

The Agency specified in its ruling that VeriChip is a regulated medical device for health information applications "when marketed to provide information to assist in the diagnosis or treatment of injury or illness."

The ruling was communicated to the Company by letter from the FDA. The FDA's decision - responding to the Company's pending "513(g)" applications - comes five months after the Company voluntarily suspended marketing of VeriChip in the United States pending review of VeriChip by the FDA. As a result of the FDA's ruling, the Company will immediately resume sales, marketing and distribution efforts of VeriChip in the United States for security, financial, and personal identification/safety applications.

Commenting on the FDA's ruling, Scott R. Silverman, President of Applied Digital Solutions, said: "We are very pleased with the FDA's decision. Although the process took longer than expected, the Company is thrilled to be able to bring this exciting technology to market in the United States. In the next several days, we will outline our

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<sup>275</sup> "Applied Digital Solutions Requests a Modification of Nasdaq Listing Qualification Panel's Prior Decision;" Business Wire; published October 17, 2002; <[http://www.bloomberg.com/fcgci.cgi?T=quote/marketsquote99\\_news.ht&s=APA6wnRXtQXBwbGll](http://www.bloomberg.com/fcgci.cgi?T=quote/marketsquote99_news.ht&s=APA6wnRXtQXBwbGll)>; pp. 1-2 of 10/22/02 10:05 AM printout.

domestic sales, marketing and distribution plans and provide further updates on our international sales and expansion efforts.”<sup>276</sup>

8. Warning Letter to Applied Digital Solutions: Food and Drug Administration (FDA): November 8, 2002

The FDA sent a Warning Letter dated November 8, 2002, addressed to Mr. Richard J. Sullivan, Chairman/Chief Executive Officer, Applied Digital Solutions. The URL for the FDA Warning Letter was <[http://www.fda.gov/foi/warning\\_letters/g3668d.htm](http://www.fda.gov/foi/warning_letters/g3668d.htm)>.<sup>277</sup> Following is an excerpt from part of the second paragraph of the November 8, 2002 FDA letter.

As the Food and Drug Administration (FDA) has repeatedly advised ADS and its counsel, most recently by letter from the Office of the Chief Counsel dated October 21, 2002, the VeriChip is a medical device if it is marketed with claims of medical utility (e.g., to provide access to medical history or other information to assist medical personnel in diagnosing or treating an injury, illness, or condition)...Indeed, the "marketing plan" described in Mr. Silverman's letter appears to hinge precisely on the very claims of medical utility that, as we have repeatedly advised ADS, make the VeriChip a medical device under Section 201(h) of the Federal Food, Drug, and Cosmetic Act (FD&C Act or Act), 21 U.S.C. 321(h). ADS's conduct flagrantly disregards FDA's prior comprehensive advice.

9. Applied Digital Solutions Announced A Few Weeks Before That The FDA Determines VeriChip Not A Regulated Medical Device “for Security, Financial, and Personal Identification/Safety Applications”: Business Wire: November 12, 2002

Applied Digital Solutions announced that the FDA determined that VeriChip is not a regulated medical device for “security, financial, and personal identification/safety applications.” A Business Wire release, entitled, “Applied Digital Solutions to Participate in Seminar on Human Implantable Microchips at the National Academies—Nov. 15, 2002, in Washington,” stated:

The seminar is taking place just a few weeks after Applied Digital Solutions announced that the FDA had determined

<sup>276</sup> “FDA Ruling - Subdermal VeriChip is Not a Regulated Medical Device ‘For Security, Financial, and Personal Identification/Safety Applications’;” Business Wire; published October 22, 2002; <[http://www.bloomberg.com/fcggi.cgi?T=marketsquote99\\_news.ht&s=APbVQZBP8RkRBIFJ1](http://www.bloomberg.com/fcggi.cgi?T=marketsquote99_news.ht&s=APbVQZBP8RkRBIFJ1)>; p. 1 of 10/22/02 10:07 AM printout.

<sup>277</sup> Warning Letter dated November 8, 2002 to Applied Digital Solutions; Food and Drug Administration; “Web page created by god 11/15/02;” <[http://www.fda.gov/foi/warning\\_letters/g3668d.htm](http://www.fda.gov/foi/warning_letters/g3668d.htm)>; pp. 1-2 of 2/14/03 8:27 AM printout.

that VeriChip is not a regulated medical device for security, financial, and personal identification/safety applications. The Agency specified in its ruling that VeriChip is a regulated medical device for health information applications.<sup>278</sup>

- XV. Human Microchip Implants: National Academies<sup>279</sup> Christine Mirzayan Internship Program Seminar on Human Microchip Implantation: November 15, 2002, Washington, DC

The National Academies Internship Program Seminar on “Human Microchip Implantation: It’s More Than Skin Deep” was scheduled on Friday, November 15, 2002 from 12:30 pm to 2:30 pm at The National Academies, 500 5<sup>th</sup> Street, NW, Room 100, Washington, DC.

- A. According to an announcement on the National Academies Web site, questions that were scheduled to be discussed included:
1. “What are the possible applications of this technology?”
  2. “Under what circumstances can a microchip device be used?”
  3. “Which applications are beneficial and which may have negative consequences to the general public?”
  4. “What information can be collected and by whom?”
  5. “Can this technology endanger the bearer?”
- B. “Distinguished Speakers” who were scheduled for the seminar were:
1. Clyde Wayne Crews Jr. is the director of technology studies at the Cato Institute in Washington, D.C.

<sup>278</sup> “Applied Digital Solutions to Participate in Seminar on Human Implantable Microchips at the National Academies—Nov. 15, 2002, in Washington,” Business Wire; published November 12, 2002; <[http://www.Bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APdFZuxYiQXBwbGll](http://www.Bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APdFZuxYiQXBwbGll)>; p. 2 of 11/12/02 4:47 PM printout.

<sup>279</sup> The National Academies, described as “Advisers to the Nation on Science, Engineering, and Medicine,” consist of four organizations including the National Academy of Sciences, and are private organizations that are created by congressional charter, with 85 percent of funding by federal government funds. “The Committee on the Judiciary of the U.S. House of Representatives reviews the Treasurer’s Report of the National Academy of Sciences each year.” It is noted that, “industry cannot provide more than 50 percent of the support for a project.” Further one learns, the “National Academies strive to be similarly responsive to requests from the executive and the legislative branches of government for guidance on scientific and technological issues.” The foregoing information was based on “Organization of the National Academies;” The National Academies; published 2002; <<http://www.nationalacademies.org/about/faq1.html>>; pp. 1-2 of 11/13/02 8:21 AM printout

2. Philip J. Phillips is the Deputy Director of Science and Regulatory Policy in the Office of Device Evaluation at the FDA's Center for Devices and Radiological Health. Mr. Phillips is responsible for the evaluation of medical devices that are the subject of premarket submissions requesting FDA authorization for distribution in the United States. The FDA regulates devices that are defined in Section 201(h) of the Federal Food, Drug, and Cosmetic Act. Mr. Phillips will address the risk factors inherent with this technology.
3. Marc Rotenberg is the Executive Director of the Electronic Privacy Information Center (EPIC) in Washington, DC. His interests include focusing public attention on emerging civil liberties issues and protecting privacy, the First Amendment, and constitutional values. He teaches information policy law at Georgetown University Law Center...
4. Dr. Richard Seelig is the Director of Medical Applications at Applied Digital Solutions, VeriChip Corporation. VeriChip™ is a miniaturized, implantable identification technology with possible financial, healthcare, and security applications. Dr. Seelig is a former surgeon who was the first to embed a VeriChip™ in his arm and hip.<sup>280</sup>

XVI. Human Microchip Implants Compared with Biotechnologies of Retinal Scanning, Finger Printing and Facial Scanning, and with Externally Worn Devices: Competitive and Parallel Technologies

It is reasonable to assume that any desire for mass human identification will standardize on human microchip implants rather than other biotechnologically based systems, not unlike the case with pets. At the same time, it is conceivable that human microchip implants will be complemented by an array of biotechnological identification and externally worn tools.

A. The Case Study of Pets

As has been seen in the case of pets, the microchip implant is winning out as the standardized ID over tattoos and, incidentally dog collar tags, in the European Union including Great Britain's forerunner Pet Travel Scheme (PETS), with the United States and Canada having recently been accepted into Great Britain's PETS.

B. Shortcomings of Facial Scanning

Shortcomings inherent in facial scanning have the net effect of indirectly providing support for those promoting human microchip implants. Following are instances detailing the shortcomings in facial scanning.

1. Theoretically Acknowledged Shortcomings of Facial Scanning:  
University of Illinois Research: November 3, 2002

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<sup>280</sup> "Human Microchip Implantation: It's More Than Skin Deep;" National Academies Christine Mirzayan Internship Program; scheduled November 15, 2002; <[http://www7.nationalacademies.org/internship/Third\\_Seminar.html](http://www7.nationalacademies.org/internship/Third_Seminar.html)>; p. 1 of 11/12/02 4:46 PM printout.

The use of facial scanning in order to distinguish someone from the total universe of all people has theoretical limitations.

[UI Professor Thomas] Huang, a computer and electrical engineering professor, has been working on recognition systems for some time...

Still, while Huang thinks recognition systems have a future in “access control” from a security perspective, he's not sure they will ever be useful for picking the faces of bad guys out of the crowd, because faces can change too easily.

“Facial hair, hat, sunglasses, makeup cause a lot of problems,” Huang said. “It's more useful for cooperative subjects ... in special cases like access to a lab, access to a computer, where ... the user wants to get in.”<sup>281</sup>

2. High Margin of Error with Face-Recognition Surveillance: CNET News.com: March 27, 2002

Rachel Konrad, Staff Writer for CNET News.com, notes the limitations of face-recognition surveillance.

"It is abundantly clear that the security benefits of (face-recognition surveillance) would be minimal to nonexistent, for a very simple reason: The technology doesn't work," according to a recent report from the ACLU, citing a survey from the Department of Defense on the technology's high margin of error in pinpointing terrorists.<sup>282</sup>

3. Facial-Recognition Limited in “One-to-Many” Searches: *The New York Times*: February 12, 2003

Jennifer Lee, writing for *The New York Times*, distinguishes between “one to one” verification and “one to many” searches using facial recognition.

...As databases grow, the ability to make accurate matches often declines...

Commercial facial recognition technology had about a 90 percent accuracy rate of "one to one" verification — that is, confirming that the person being scanned is the same one who was issued the document. It had a 1 percent false positive rate. But the study found that when the photographs were of lower quality — taken outdoors, for

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<sup>281</sup> Greg Kline, “Tech Research at UI Focused on U.S. Safety: 9/11 Sparked Shift to Security Technology Effort,” *Champaign (Ill.) News-Gazette*, 3 November 2002, pp. A-1, 5.

<sup>282</sup> Rachel Konrad; “Biometrics May Scan Air Travelers;” CNET News.com; published March 27, 2002, 4:00 AM PT; <<http://news.com.com/2100-1017-869622.html>>; p. 3 of 3/12/03 2:00 PM printout.

example, — the technology's accuracy rate could fall to as little as 47 percent.

Facial recognition is not as good as fingerprint recognition in "one to many" searches — that is, trying to match a single face against a huge database of faces. In experiments with 10,000 faces, the first identification was a match only about 77 percent of the time.

While its accuracy rate was above 90 percent, fingerprint recognition had its problems as well, especially with individuals whose fingertips had worn down, like farm workers, housecleaners and the elderly.<sup>283</sup>

C. Economic Comparative Advantage of Human Microchip Implants Touted:  
Adrian Sainz: Associated Press: April 1, 2002

An Associated Press article includes a quote about the comparative economic advantage of human microchip implants in relation to other biotechnologies.

The VeriChip, made by Applied Digital Solutions in Palm Beach County, is about the size of a grain of rice. It would be injected under a person's skin, probably in the arm, and could be read only by scanners.

Similar technology has been used in the past few years on millions of dogs and cats as a way to identify the pets if they are lost or stolen...

Ultimately, the chips could be coupled with global-positioning satellites to locate Alzheimer's patients who have wandered off, or find kidnapping victims - an idea the company hopes to market in Latin America.

The chip could also be used as a security tool.

"It can be used as an inexpensive method to gain entry into a secure power plant, the cockpit of an airplane, or any place where a high level of authentication is required for entrance to a building," said Keith Bolton, Applied Digital vice president and chief technology officer. "It's a lot less expensive than retina scanning or thumbprint recognition equipment."<sup>284</sup>

D. British Scientist Kevin Warwick: Advantage of Implanted Chip Compared to Externally Worn Device: BBC News: September 2, 2002

<sup>283</sup> Jennifer 8. Lee; "Report Suggests Use of Facial and Fingerprint Scanning on Foreigners;" *New York Times*; published February 11, 2003; <<http://www.nytimes.com/2003/02/12/technology/12IDEN.html>>; p. 2 of 2/12/03 9:31 AM printout.

<sup>284</sup> Adrian Sainz; "Family Wants Data Chips Implanted"; Associated Press article on AOL News; published April 1, 2002 22:41 EST; p. 1 of 4/2/02 printout.

Reading University academic indicated implanted microchips would be more effective than an externally worn tracking device.

Parents afraid that their daughters could be abducted are asking a British scientist to implant a tracking microchip under their skin, so that they can be found quickly...

[Reading University academic] Mr [Kevin] Warwick said the system could work by using a mobile phone network or global positioning system, to pinpoint the person on an electronic map via a signal from the implant...

The procedure would involve putting a small transmitter about one inch long into a child's arm or stomach...

[Cybernetics expert] Mr Warwick said that watches with a similar function now on sale in the US, are too easy to remove and discard.

...[I]f the general trend in Britain is in favour of such an operation it will be ready to go by Christmas"<sup>285</sup>

## XVII. Human Microchip Implant: Technology

### A. General: Batteries, GPS-Mobile Phone Communications, Technological/Medical Ethics, Etc.

#### 1. "Kidnap Chip 'Untested' and May Not Work": England: *Sunday Herald* September 8, 2002

Stephen Naysmith, Science Correspondent for the *Sunday Herald* reported that the technology for implanting a tracking implant in a child may not work.

The scientist [cybernetics professor Kevin Warwick] who gained worldwide publicity for his plan to implant a tracking device in a schoolgirl's arm in the wake of the Soham killings has admitted he has not tried the technology and cannot guarantee it works.

Other experts in mobile telecommunication do not believe any such tracking device exists.

Controversial cybernetics professor Kevin Warwick...has admitted to the *Sunday Herald* that the implant may never go ahead.

Worldwide headlines last week trumpeted Warwick's announcement that he was poised to implant a microchip in

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<sup>285</sup> " 'Anti-Abduction' Implant for Children;" BBC News; published September 2, 2002, 15:52 GMT 16:52 UK; <<http://news.bbc.co.uk/1/hi/england/2231634.stm>>; pp. 1-2 of 2/14/03 3:55 PM printout.

the arm of 11-year-old Danielle Duval. Details were sketchy, but Warwick said the chip would let parents track a child even if he or she had been abducted.

He conceded yesterday, however, that he does not have ethical approval to proceed, but denied that the announcement was a publicity stunt.

...[H]e wants to fit a 'tracker' implant to Danielle, implanting it in her arm or her stomach.

Warwick suggested there were 'several options', including the mobile phone network and the global positioning satellite (GPS) system, for locating the girl were she to go missing.

The story was enthusiastically reported around the world. Sceptics, however, have queried whether the technology exists to miniaturise the transmitter while giving it enough power to work with the mobile phone or GPS system.

Mobiles and GPS devices need batteries for computing and signalling power. They also need aerials. The device could not simply replicate the chips used to tag domestic pets, as these are usually inert -- enabling identification only once an animal is located. Other devices used for tracking animals are not small enough to be implanted.

Warwick says his one-inch-long transmitter would stay largely in 'sleep' mode and send a signal only when activated. 'It could be switched off when it wasn't needed,' he says.

Dr James Irvine, an expert in mobile telecommunications at Strathclyde University's electrical and electronic engineering department, said it was theoretically possible to locate someone using mobile phone base stations or the GPS system.

He said: 'The difficulty is, you would need to upgrade the mobile phone network to allow that to happen. It is not there at the moment.'

'The GPS system can have very good accuracy but doesn't work well indoors.'

'Companies are now promoting a device the size of a large wristwatch which can do this, but you would have problems getting power to an implant.'

Even a passive system would need power and battery life would limit its usefulness. 'You are talking about tens of hours rather than years,' Dr Irvine said...

I wouldn't say this is impossible, but I do doubt whether it is practical...

At the sea mammals research unit of the University of St Andrews, senior research scientist Bernie McConnell is developing a system for tracking the movements of seals using GPS. His device has a volume of five cubic inches -- small but not implantable.

'I'm not aware of any implantable systems,' said McConnell, 'especially not ones which would last for months at a time. Such a transmitter would be incredibly useful and exciting, but I doubt it can be done'...

Critics also say research data could be gathered without subjecting a child to surgery with no medical benefit.

Dr Andrew Herxheimer, an expert on medical ethics and fellow at the Cochrane Centre for interventions in health care, said: 'This is linked to the fear of abduction which is a very small risk, and could be seen as exploiting a distorted and unreal fear. It should be tried out on animals. This is not a case of women and children first.'

Reading University's guidelines require any experimental procedure on a human subject to be approved by its ethical committees. Professor Warwick has not sought such approval.

The implant story was promoted not by the university, but by INS News Group of Reading...

A Reading University spokeswoman initially referred calls to INS, but later admitted: 'We didn't know anything about this. Our understanding is he has not yet put in for ethical approval because he isn't ready to do it.'

Warwick has pledged to perform the implant on Danielle before Christmas if he can get ethical approval. He said part of his goal was to 'provoke debate' on a technology which 'raised enormous ethical questions'.

He declined to elaborate on the technical details...

'I'm not going to tell you whether we have a prototype. There are commercial interests involved. 'Until Danielle is implanted we are not going to have a test case. When that happens we will see how it works.'<sup>286</sup>

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<sup>286</sup> Stephen Naysmith, Science Correspondent; "Kidnap Chip 'Untested' and May Not Work;" *Sunday Herald*; published September 8, 2002; <<http://www.sundayherald.com/print27519>>; pp. 1-2 of 2/17/03 8:46 AM printout.

## B. Batteries

1. “Natural Body Energy”: Gen-Etics’ Sky-Eye Human Microchips Implants: *Sunday Times*: October 11, 1998

The *Sunday Times of London* reported that Gen-Etics’ Sky-Eye Human Microchips Implants are powered by “natural body energy.”

A microchip under the skin that can help to locate hostages is being marketed to combat one of the world’s biggest growth industries—there were a record 1,407 abductions for ransom worldwide last year, up 60% since 1990.

The victim’s “little helper” uses natural body energy with James Bond-style technology devised by scientists working for Israeli intelligence.

Space satellites will follow the bleep to detect a victim’s movements or hiding place. The information will then be related to a control centre to be used for a rescue operation...

Every chip is made of synthetic and organic fibres and measures 4 mm by 4 mm. It does not need a battery and runs instead on four milliamperes of neurophysiological energy.

Only a small scar is visible and the chip escapes detection by x-rays. It is inserted under the skin but not on areas that can be amputated, including the hands, nose and ears...

The whereabouts of the carrier are followed by six satellites through the global positioning system, which has a 150-metre margin of error and has previously been used to track the movements of stolen luxury cars. The absence of a signal suggests that the victim has been killed because the body no longer supplies the energy to make the chip function.<sup>287</sup>

2. British Scientist Kevin Warwick: Anticipates Battery with Sleep Mode: BBC News: September 2, 2002

Reading University academic Kevin Warwick discusses a device that could be switched to sleep mode in order to conserve its battery.

Parents afraid that their daughters could be abducted are asking a British scientist to implant a tracking microchip under their skin, so that they can be found quickly.

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<sup>287</sup> Maurice Chittenden and David Lloyd, “007 Implant to Protect Kidnap Targets,” *Sunday Times* (London), 11 October 1998, sec. 1, p. 13.

Mr Warwick said the system could work by using a mobile phone network or global positioning system, to pinpoint the person on an electronic map via a signal from the implant...

The procedure would involve putting a small transmitter about one inch long into a child's arm or stomach.

Kevin Warwick "A potential abductor wouldn't know the child had the device and it could be switched off to sleep mode when it wasn't needed to conserve its battery," the Reading University academic said.<sup>288</sup>

3. Technological Problem: How Recharge Human Implant Chip's Battery:  
*The Guardian*: September 3, 2002

Professor Kevin Warwick of the cybernetics department at Reading University comments on the technological problem of recharging the battery of a human chip implant.

The parents of an 11-year-old girl are to take the extraordinary step of having her fitted with a microchip so that her movements can be traced if she is abducted.

Danielle Duval will have the device implanted in her arm in the next few months, the scientist [Professor Kevin Warwick of the cybernetics department at Reading University] assisting the plan claimed yesterday. The miniature chip will apparently send a signal via a mobile phone network to a computer, which will be able to pinpoint her location on an electronic map.

Professor Warwick said there were a few technological problems to be ironed out, including exactly how to recharge the chip's battery, but he expected Danielle to be fitted with the device, under local anaesthetic by a doctor, in the next few months. "Her parents want me to proceed as quickly as possible, and I wouldn't waste their time if I thought it wasn't capable of working," he said.

Among the technical questions to be addressed is whether the chip should remain dormant in the limb until an emergency arose, or whether it should emit a signal 24 hours a day.<sup>289</sup>

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<sup>288</sup> " 'Anti-Abduction' Implant for Children;" BBC News; published September 2, 2002, 15:52 GMT 16:52 UK; <<http://news.bbc.co.uk/1/hi/england/2231634.stm>>; pp. 1-3 of 2/14/03 3:55 PM printout.

<sup>289</sup> Jamie Wilson; "Girl To Get Tracker Implant To Ease Parents' Fears;" *The Guardian*; published September 3, 2002; <<http://www.guardian.co.uk/child/story/0,7369,785073,00.html>>; p. 1 of 2/14/03 4:15 PM printout.

### C. Patents

Following is U.S. patent information related to microchip implants.

#### 1. United States Patent Number: 5,211,129: May 18, 1993

##### a. United States Patent and Trademark Office

Patent number 5,211,129 is for a “Syringe-implantable identification transponder.”

##### 1) Assignee

The Assignee for the May 18, 1993 patent was “Destron/IDI, Inc. (Boulder, CO); Hughes Aircraft Co. (Boulder, CO).”<sup>290</sup>

##### 2) Abstract

The Abstract for the May 18, 1993 patent provides a summary of the patent.

An improved transponder for transmitting an identification of an animal or the like is described which is sufficiently miniaturized to be syringe-implantable, thus avoiding the necessity of surgical procedures. The transponder comprises a coil which receives an interrogation signal and transmits an identification signal in response thereto. The transponder receives the energy required for transmission by inductive coupling to an interrogator. A single integrated circuit chip is provided which detects the interrogation signal, rectifies it to generate power needed for transmission, stores an identification of the transponder and hence of the animal in which it is implanted, and generates a frequency-shift-keyed, Manchester encoded identification signal in response to the interrogation signal. The device transmits the identification signal in real time, that is, immediately upon commencement of the interrogation signal, such that no discrete elements for energy storage are required. The transmission frequency and the bit rate are both determined by integer division of the interrogation signal such that no discrete elements such as crystal oscillators are required for signal generation.<sup>291</sup>

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<sup>290</sup> “United States Patent: 5,211,129: Syringe- Implantable Identification Transponder: Assignee;” USPTO Patent Full-text and Image Database; patent date May 18, 1993; <<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129>>; p. 1 of 6/16/03 11:12 AM printout.

<sup>291</sup> “United States Patent: 5,211,129: Syringe- Implantable Identification Transponder: Abstract;” USPTO Patent Full-text and Image Database; patent date May 18, 1993; <<http://patft.uspto.gov/netacgi/nph->

## 3) Claims

The May 18, 1993 patent has 27 claims. Following is the initial portion of “What is claimed” for the first claim

1. A transponder for syringe implantation in a host animal including fish or other living creatures for responding to an interrogation signal from a remote signal generator over a monitoring period extending at least over a plurality of months...<sup>292</sup>

## 4) Description: Field of the Invention

The May 18, 1993 patent “Field of the Invention” noted that the identification transponder is passive.

This invention relates to identification transponders for implantation into animals for their identification, useful in monitoring migratory patterns and for other purposes. More particularly, this invention relates to an identification transponder which is passive, meaning that it receives all its operating power from an interrogator device, which is...durable and reliable over a period of years.<sup>293</sup>

## b. Applied Digital Solutions and Patent #5,211,129

In addition to the U.S. Patent and Trademark Office material, various other documents provided information regarding patent #5,211,129, Applied Digital Solutions, and Digital Angel.

## 1) Patent #5,211,129 a “Keystone” Patent of Digital Angel Corporation/Applied Digital Solutions

Patent #5,211,129 was considered a “keystone” patent of Digital Angel Corporation in an Applied Digital Solutions announcement about a different patent.

As previously announced by Digital Angel Corporation, the new patent builds on Digital

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[Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129](http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129)>; p. 1 of 6/16/03 11:12 AM printout.

<sup>292</sup> “United States Patent: 5,211,129: Syringe- Implantable Identification Transponder: Claims;” USPTO Patent Full-text and Image Database; patent date May 18, 1993;

<<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129>>; p. 2 of 6/16/03 11:12 AM printout.

<sup>293</sup> “United States Patent: 5,211,129: Syringe-Implantable Identification Transponder: Description: Field of the Invention;” USPTO Patent Full-text and Image Database; patent date May 18, 1993; <<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129>>; p. 6 of 6/16/03 11:12 AM printout.

Angel Corporation's underlying "keystone" patent (#5,211,129) for its implantable RFID microchip...

Applied Digital Solutions is the beneficial owner of a majority position in Digital Angel Corporation...<sup>294</sup>

2) History: Digital Angel Corporation, Destron Fearing, and Destron/IDI

Destron/IDI, the Assignee of the May 18, 1993 patent #5,211,129 merged with Fearing Manufacturing in November 1993 to form Destron Fearing. Destron Fearing became a wholly owned subsidiary of Digital Angel Corporation.

a) Destron/IDI Merged with Fearing Manufacturing

Destron/IDI merged with Fearing Manufacturing in November 1993.

Destron Fearing Corporation has been in the animal identification business since 1945... As the animal identification industry expanded, the Company realized tremendous growth, and with the merger of Fearing Manufacturing and Destron/IDI in November 1993, Destron Fearing emerged as the innovative world leader in visible and electronic animal identification...

Destron Fearing Corporation owns patents worldwide in microchip technology and is a leader in the world evolution of radio frequency animal identification. The products of the future are here for the world today, and Destron Fearing Corporation is ready to move into the 21st century as the world leader in animal identification.<sup>295</sup>

b) Destron Fearing a Subsidiary of Digital Angel Corporation.

Destron Fearing became a wholly owned subsidiary of Digital Angel Corporation.

(1) "DigitalAngel.net Merged with Destron Fearing":  
*Business 2.0*

Rick Overton reported in *Business 2.0* on the relation between Digital Angel and Destron Fearing.

<sup>294</sup> "Verichip Corporation Will Benefit From New United States Patent (#6,400,338) Awarded To Digital Angel Corporation -- Manufacturer Of Verichip™;" Applied Digital Solutions; published October 7, 2002; <<http://www.adxs.com/news/2002/100702.html>>; p. 1 of 6/16/03 1:55 PM printout.

<sup>295</sup> "Company Profile: Company History;" Destron Fearing; published n.d.; <<http://destronfearing.com/comp/comp.html>>; p. 1 of 6/17/03 8:08 AM printout.

In September, DigitalAngel.net merged with Destron Fearing, a maker of embedded devices for tracking animals. And Destron Fearing already has a partnership with Schering-Plough, the maker of allergy drug Claritin.<sup>296</sup>

(2) Destron Fearing a Subsidiary of Digital Angel Corporation

The Destron Fearing Web site stated the relation between Digital Angel and Destron Fearing.

Welcome to the Destron Fearing Corporation Web Site. Destron Fearing is a wholly owned subsidiary of Digital Angel Corporation.<sup>297</sup>

(3) “About Digital Angel.net Inc.”

The “Press Releases” section of the Digital Angel Web site stated the relation between Digital Angel and Destron Fearing.

In September of 2000, Applied Digital Solutions acquired Destron Fearing Corporation and merged it into its Digital Angel subsidiary. Destron Fearing, based in South St. Paul, Minnesota, has been in the animal identification business since 1945 and manufactures a broad line of electronic and visual identification devices and information systems for companion animals, livestock, laboratory animals, fish and wildlife. The company owns patents worldwide in microchip technology and is a leader in the world evolution of radio frequency animal identification.<sup>298</sup>

2. United States Patent Number: 5,629,678: May 13, 1997

a. United States Patent and Trademark Office

<sup>296</sup> Rick Overton; “Digital Angel Is Watching You;” *Business 2.0*; published December 2000; <<http://www.business2.com/articles/mag/print/0,1643,14362,00.html>>; p. 1 of 4/25/02 9:43 AM printout.

<sup>297</sup> “Digital Angel Corporation: Destron Fearing;” Destron Fearing; published n.d.; <<http://destronfearing.com/index.html>>; p. 1 of 6/17/03 8:08 AM printout.

<sup>298</sup> “Press Releases: Digital Angel.net Signs Memorandum of Understanding With BITKOM Member Blue Impact AG to Supply Digital Angel Technology for ‘TellMan’ Palm PC Product: About Digital Angel.net Inc.,” Digital Angel; published n.d.; <[http://web.archive.org/web/20010204014700/http://digitalangel.net/press\\_releases/pr\\_2000/pr\\_11\\_15\\_00.htm](http://web.archive.org/web/20010204014700/http://digitalangel.net/press_releases/pr_2000/pr_11_15_00.htm)>; p. 1 of 12/15/00 8:07 AM printout.

Patent number 5,629,678 is for a “Personal tracking and recovery system.”

1) Assignee

The Assignee for the May 13, 1997 patent was “Gargano; Paul A. (Belmont, MA).”<sup>299</sup>

2) Abstract

The Abstract for the May 13, 1997 patent provides a summary of the patent.

Apparatus for tracking and recovering humans utilizes an implantable transceiver incorporating a power supply and actuation system allowing the unit to remain implanted and functional for years without maintenance. The implanted transmitter may be remotely actuated, or actuated by the implantee. Power for the remote-activated receiver is generated electromechanically through the movement of body muscle. The device is small enough to be implanted in a child, facilitating use as a safeguard against kidnapping, and has a transmission range which also makes it suitable for wilderness sporting activities. A novel biological monitoring feature allows the device to be used to facilitate prompt medical dispatch in the event of heart attack or similar medical emergency. A novel sensation-feedback feature allows the implantee to control and actuate the device with certainty.<sup>300</sup>

b. Applied Digital Solutions and Patent #5,629,678

In addition to the U.S. Patent and Trademark Office material, various other documents provided information regarding patent #5,629,678, Applied Digital Solutions, and Digital Angel.

- 1) Applied Digital Solutions Acquired Patent Rights to Patent #5,629,678 Technology, Referred to as “Digital Angel™”: “Special Report: Background and Technical Abstract: Digital Angel™: E-Business Security, Emergency Location and Medical Monitoring”

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<sup>299</sup> “United States Patent: 5,211,129: Syringe- Implantable Identification Transponder: Assignee;” USPTO Patent Full-text and Image Database; patent date May 18, 1993; <<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5,211,129.WKU.&OS=PN/5,211,129&RS=PN/5,211,129>>; p. 1 of 6/16/03 11:12 AM printout.

<sup>300</sup> “United States Patent: 5,629,678: Personal Tracking and Recovery System;” USPTO Patent Full-text and Image Database; patent date May 13, 1997; <<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/srchnum.htm&r=1&f=G&l=50&s1=5629678.WKU.&OS=PN/5629678&RS=PN/5629678>>; p. 1 of 4/24/02 3:29 PM printout.

A "Special Report: Background and Technical Abstract: Digital Angel™ : E-Business Security, Emergency Location and Medical Monitoring" document noted that, on December 10, 1999, Applied Digital Solutions acquired patent rights to patent #5,629,678 technology, referred to as "Digital Angel™."

On May 13, 1997, United States Patent Number 5,629,678 was granted for a "personal tracking and recovery system," consisting of a miniature digital transceiver -- implantable in humans -- with a built-in, electromechanical power supply and actuation system. These features enable the device to remain implanted and functional for years without maintenance. This transceiver sends and receives data and can be continuously tracked by Global Positioning Satellite (GPS) technology.

On December 10, 1999, Applied Digital Solutions, Inc. (ADS) acquired the patent rights to this technology, which the company refers to as "Digital Angel™." The agreement gives ADS the right to develop this unique product for all of its applications or to sublicense the development of specific applications to other entities. ADS is actively seeking joint venture partners to develop and market this technology. We expect to produce a prototype of the device by the end of 2000. We believe the potential global market for this device - in all of its applications -- could exceed \$100 billion...

The Digital Angel™ transceiver can be implanted just under the skin or hidden inconspicuously on or within valuable personal belongings and priceless works of art...

Although still in the early developmental stage, we believe Digital Angel™ could have an array of beneficial potential applications: provide a tamper-proof means of locating and identifying individuals for e-business and e-commerce security; locate individuals, including children, who are lost or who have been abducted; monitor the medical conditions of at-risk patients; track and locate military, diplomatic and other essential government personnel; determine the location or the authenticity of valuable property; track the whereabouts of wilderness sports enthusiasts (mountain climbers, hikers, skiers, etc.).<sup>301</sup>

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<sup>301</sup> "Special Report: Background and Technical Abstract: Digital Angel™ : E-Business Security, Emergency Location and Medical Monitoring; Applied Digital Solutions; published n.d.; <<http://www.mvcf.com/news/cache/00064/>>; pp. 1-2 of 4/24/02 3:02 PM printout.

- 2) Applied Digital Solutions Acquired Patent Rights to Patent #5,629,678 Technology, Referred to as “Digital Angel”: “Patents / Proprietary: Background and Technical Abstract: Financial and Security Identification Applications”

A “Patents / Proprietary: Background and Technical Abstract: Financial and Security Identification Applications” Applied Digital Solutions document noted that, on December 10, 1999, Applied Digital Solutions acquired patent rights to patent #5,629,678 technology, referred to as “Digital Angel.”

On May 13, 1997, United States Patent Number 5,629,678 was granted for a "personal tracking and recovery system," consisting of a miniature digital transceiver.

On December 10, 1999, Applied Digital Solutions, Inc. (ADS) acquired the patent rights to this technology, which the company refers to as "Digital Angel." The agreement gives ADS the right to develop this unique product for all of its applications or to sublicense the development of specific applications to other entities. ADS is actively seeking joint venture partners to develop and market this technology. We believe the potential global market for this device -- in all of its applications -- could exceed \$100 billion.<sup>302</sup>

- 3) Applied Digital Solutions Acquired Patent Rights to Miniature Digital Transceiver, Referred to as “Digital Angel”: “Patents / Proprietary: Background and Technical Abstract: Financial and Security Identification Applications”

The “Press Releases” section of the Digital Angel Web site announced in December 1999 that Applied Digital Solutions “had acquired patent rights to a miniature digital transceiver— which it has named Digital Angel.”

In December of 1999, Applied Digital Solutions announced that it had acquired the patent rights to a miniature digital transceiver -- which it has named Digital Angel. Digital Angel will be able to send and receive data and be located by GPS (Global Positioning System) technology. The company believes this technology will enable it to tap into a multi-billion dollar marketplace with a number of applications that will prove to be extremely popular. These potential applications include: monitoring the medical condition of at-risk patients; tracking endangered wildlife or household pets; managing livestock and other

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<sup>302</sup> “Patents / Proprietary: Background and Technical Abstract: Financial and Security Identification Applications;” Applied Digital Solutions; published n.d.; <<http://www.adxs.com/prodservpart/patentsproprietary.html>>; p. 1 of 2/7/03 4:08 PM printout.

farm-related animals; pinpointing the location of valuable stolen property; finding lost airline baggage and postal packages; managing the commodity supply chain; preventing the unauthorized use of firearms; and providing a tamper-proof means of identification for enhanced e-commerce security.<sup>303</sup>

4) “Applied Digital Solutions Paid Inventor Paul Gargano for Patent Rights”: *Business 2.0*

Rick Overton reported in *Business 2.0* on the relation between Applied Digital Solutions, Digital Angel, inventor Paul Gargano, and “patent rights to a ‘personal tracking and recovery system’ ”.

The force behind Digital Angel is Applied Digital Solutions (ADS), an Internet telephony company in Palm Beach, Fla. In late 1999 ADS paid Massachusetts inventor Paul Gargano for the patent rights to a "personal tracking and recovery system." The patent described the combination of GPS and wireless, but lacked a biosensor. ADS set up Digital Angel.net as a wholly owned subsidiary in Hauppauge, N.Y., and within a month hired engineer Peter Zhou to oversee the research. In late October, DigitalAngel.net was set to unveil a prototype and hoping to attract press attention and investors.<sup>304</sup>

## XVIII. Human Microchip Implant: Registry

### A. Human Microchip Implant Registry Launch Set for May 1, 2002: April 9, 2002 Announcement

The launch date of a commercial registry for human microchip implants was set for May 1, 2002 and first announced on April 9, 2002. Following are excerpts from an April 9, 2002 Business Wire press announcement.

VeriChip(TM) subscribers can store pertinent personal verification and healthcare information in secure database

Applied Digital Solutions, Inc. (Nasdaq:ADSX), an advanced technology development company, announced today that its wholly owned subsidiary, VeriChip Corporation, has selected May 1, 2002, for the launch of its new Global VeriChip Subscriber (GVS) Registry service.

<sup>303</sup> “Press Releases: Digital Angel.net Signs Memorandum of Understanding With BITKOM Member Blue Impact AG to Supply Digital Angel Technology for ‘TellMan’ Palm PC Product: About Digital Angel.net Inc.,” Digital Angel; published n.d.; <[http://web.archive.org/web/20010204014700/http://digitalangel.net/press\\_releases/pr\\_2000/pr\\_11\\_15\\_00.htm](http://web.archive.org/web/20010204014700/http://digitalangel.net/press_releases/pr_2000/pr_11_15_00.htm)>; p. 1 of 12/15/00 8:07 AM printout.

<sup>304</sup>Rick Overton; “Digital Angel Is Watching You;” *Business 2.0*; published December 2000; <<http://www.business2.com/articles/mag/print/0,1643,14362,00.html>>; p. 1 of 4/25/02 9:43 AM printout.

This program will enable VeriChip subscribers to store pertinent personal verification and healthcare information in the company's secure database.

VeriChip is a miniaturized, implantable, radio frequency identification device (RFID) that can be used in a variety of security, emergency and healthcare applications. About the size of a grain of rice, each VeriChip is composed of FDA-accepted materials and contains a unique verification number that can seamlessly integrate to the GVS Registry.

The GVS Registry is hosted and maintained by Digital Angel Corporation's (Amex: DOC) state-of-the-art, FDA-compliant operations center in Owings, Maryland.

Information provided by the subscriber will be stored in the GVS Registry database. Only information authorized by the subscriber will be available for access via VeriChip's proprietary scanner. Instant access to such vital information as allergies to medications, medical device implants, pre-existing medical conditions and emergency contact numbers could save lives in an emergency and enhance the peace of mind of subscribers and their loved ones.

GVS Registry participants will pay a monthly subscription fee, enabling them to include and change pertinent information in the secure GVS Registry database. Associate Registry subscribers such as healthcare clinics, hospitals, search and rescue units, and EMTs will be able to use proprietary VeriChip scanners to read a subscriber's VeriChip and gain access to the subscriber's Registry information if authorized to do so by the subscriber.

Commenting on this announcement, Scott R. Silverman, President of Applied Digital Solutions, said: "The integration of secure software applications with proprietary, life-enhancing hardware defines the evolution of Applied Digital's Advanced Technology Group. VeriChip with its GVS Registry and Digital Angel with its proprietary Delivery System exemplify this integration. As VeriChip becomes the standard in emergency information and verification applications, we anticipate a rapid growth pattern in an estimated market that exceeds \$15 billion. Our first-mover advantage and patented technology will enable Applied Digital to gain significant market share."

Silverman continued: "From a business view, the GVS Registry will provide a recurring revenue stream for both Applied Digital and Digital Angel Corporation. As the beneficial owner of approximately 82% of Digital Angel Corporation, we remain committed to enhancing the value of both companies through joint sales, marketing and technology efforts. The GVS

Registry is the first example of how all Applied Digital-related companies will continue to integrate and grow."<sup>305</sup>

B. Human Microchip Implant Registry Ready: May 2, 2002 Announcement

The launch date of May 1, 2002 for a commercial registry for human microchip implants was first announced on April 9, 2002. Following are excerpts from a May 2, 2002 Business Wire press announcement stating that a commercial registry for human microchip implants is “ready” and “fully operational.”

Applied Digital Solutions, Inc. (Nasdaq: ADSX), an advanced technology development company, announced today that its Global VeriChip Subscriber (GVS) Registry service is ready for the first-ever VeriChip "chipping" procedure on May 10, 2002 and VeriChip's official market launch in the United States.

The GVS Registry service, first announced April 9, 2002, supports VeriChip subscribers, authorized VeriChip centers and VeriChip System Affiliates (such as hospitals, EMTs, search and rescue units, and urgent care clinics) by providing immediate access to vital subscriber information in an emergency.

Full-scale marketplace operation of the GVS Registry service will begin with the historic Jacobs family "chipping" procedure on May 10, 2002. The procedure will be followed by a press conference and an invitation-only brunch for business partners and community leaders. During the press conference and the business brunch, Applied Digital executives will unveil more details about VeriChip's rollout plans.

VeriChip is a miniaturized, implantable, radio frequency identification device (RFID) that can be used in a variety of security, emergency and healthcare applications. About the size of a grain of rice, each VeriChip is composed of FDA-accepted materials and contains a unique verification number that can seamlessly integrate to the GVS Registry via a proprietary VeriChip scanner. Instant access to such vital information as allergies to medications, medical device implants, pre-existing medical conditions and emergency contact numbers could save lives in an emergency and enhance the peace of mind of subscribers and their loved ones.

The new GVS Registry Service is hosted and maintained by Digital Angel Corporation's (Amex: DOC) state-of-the-art, FDA-compliant operations centers in Riverside, California and Owings, Maryland. Complementary, 24/7 call-center services are provided by a physician-supervised staff of support associates in Owings, Maryland.

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<sup>305</sup> “VeriChip Sets May 1st Launch of New Global VeriChip Subscriber Registry Service;” Business Wire; published April 9, 2002 10:22 Eastern; <<http://www.businesswire.com>>; pp. 1-2 of 4/9/02 printout.

The GVS Registry service will initially support VeriChip subscribers in South Florida who will be "chipped" during the company's initial product rollout beginning with the Jacobs family on May 10, 2002. Performed under the supervision of the company's first Authorized VeriChip Center in Palm Beach County, the rollout will feature the use of the first ChipMobile(TM) - a state of the art, medically equipped mobile unit that will deliver VeriChip to initial target markets such as elder care centers, critical care facilities and Generation Y events. The Palm Beach County rollout will last until June 30, 2002, at which time the company expects to move into other geographic markets and initiate nationwide distributor alliance programs.

Commenting on this announcement, Scott R. Silverman, President of Applied Digital Solutions, said: "As promised, the GVS Registry is now fully operational and is prepared to securely house subscriber information so it can be accessed by Authorized VeriChip Affiliates such as hospitals and EMS units. We're confident the GVS Registry's secure software and database will integrate seamlessly with the VeriChip product and proprietary scanners to provide our subscribers with instant access to potentially life-saving, accurate, complete emergency healthcare information stored in the Registry."

#### About VeriChip(TM)

VeriChip, first announced on December 19, 2001, is a miniaturized, implantable, radio frequency identification device (RFID) that can be used in a variety of security, emergency and healthcare applications. On April 4, 2002, the company announced that it had received written guidance that the U.S. Food and Drug Administration (FDA) does not consider VeriChip's personal verification device to be a regulated medical device, enabling the company to begin sales, marketing and distribution of VeriChip in the United States. About the size of a grain of rice, each VeriChip is composed of FDA-accepted materials and contains a unique verification number. That number is captured by briefly passing a proprietary, external scanner over the VeriChip. A small amount of radio frequency energy passes through the skin energizing the dormant VeriChip, which then emits a radio frequency signal transmitting the verification number. The company believes its first-mover advantage will enable it to gain significant market share in the emergency information and verification market that is estimated to exceed \$15 billion. VeriChip Corporation is a wholly owned subsidiary of Applied Digital Solutions.

#### About Digital Angel Corporation

Digital Angel Corporation (Amex: DOC) was formed on March 27, 2002, in a merger between Digital Angel Corporation and Medical Advisory Systems, a global leader in telemedicine that has operated a 24/7, physician-staffed call center in Owings,

Maryland, for two decades. Prior to the merger, Digital Angel Corporation was a wholly owned subsidiary of Applied Digital Solutions. Applied Digital Solutions is the beneficial owner of 19.6 million shares of Digital Angel Corporation. Digital Angel(TM) technology represents the first-ever combination of advanced biosensors and Web-enabled wireless telecommunications linked to the Global Positioning System (GPS). By utilizing advanced biosensor capabilities, Digital Angel will be able to monitor key body functions - such as temperature and pulse - and transmit that data, along with accurate emergency location information, to a ground station or monitoring facility. For more information about Digital Angel, visit [www.digitalangel.net](http://www.digitalangel.net).

#### About Applied Digital Solutions, Inc.

Applied Digital Solutions (Nasdaq: ADSX) is an advanced technology development company that focuses on a range of early warning alert, miniaturized power sources and security monitoring systems combined with the comprehensive data management services required to support them. Through its Advanced Technology Group, the company specializes in security-related data collection, value-added data intelligence and complex data delivery systems for a wide variety of end users including commercial operations, government agencies and consumers. For more information, visit the company's website at <http://www.adsx.com>.<sup>306</sup>

#### C. Human Microchip Implant: Registry Service Fee: Noted January 9, 2003

The Applied Digital Solutions “VeriChip Personal Identification System - Frequently Asked Questions” Web page contains the following information.

Q: Is there a fee for the GVS (Global VeriChip Subscriber) Registry service?

A: The GVS Registry subscription fee is \$9.95 per month, billed automatically to subscriber’s credit card.<sup>307</sup>

#### XIX. Human Microchip Implants and Identify Theft

##### A. “One of Most Promising Areas”: Identity Theft: Business Wire: June 6, 2002

A Business Wire release reported that identity theft would be deterred by VeriChip, “a miniaturized radio frequency identification device (RFID)

<sup>306</sup> “Global VeriChip Subscriber -GVS- Registry Ready for First-ever VeriChip ‘Chipping’ Procedure On May 10th and Launch of VeriChip Into U.S. Market;” Business Wire; published May 2, 2002 13:03 GMT; <[http://www.bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APNE5JRYIR2xvYmFs](http://www.bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APNE5JRYIR2xvYmFs)>; pp. 1-2 of 5/2/02 printout.

<sup>307</sup> “VeriChip Personal Identification System - Frequently Asked Questions”; published n.d.; <<http://www.adsx.com/faq/verichipfaq.html>>; p. 1 of 1/9/03 9:00 AM printout.

...[a]bout the size of a grain of rice,” that “...contains a unique verification number and will be available in several formats, some of which will be insertable under the skin.”

Applied Digital Solutions, Inc. (Nasdaq: ADSXE), an advanced technology development company, today announced that it is preparing to launch a "Protected by VeriChip(TM)" product awareness campaign to demonstrate the potential for VeriChip(TM) as a personal safeguard technology that includes applications in the defense, security and financial sectors...

One of the most promising areas being explored is identity theft. Crime statistics show that identity theft claims hundreds of thousands of victims every year. VeriChip offers a simple solution: a tamper-proof, personal verification technology that will deter identity theft by making it virtually impossible for criminal elements to access someone else's financial accounts and records.<sup>308</sup>

#### B. Indications of Problems regarding Identify Theft

1. “Identity Theft Complaints Up, Feds Say”: Associated Press article at nytimes.com: January 22, 2003

An Associated Press article reported an increase in identity theft complaints.

The government received twice as many complaints about identity theft last year over 2001, with victims reporting hijacked credit cards, drained banked accounts and tarnished reputations...

The number of identity theft complaints rose from about 86,000 in 2001 to about 162,000 last year, the Federal Trade Commission said Wednesday. The figures come from a government database of 380,000 fraud complaints collected by the FTC, the FBI and scores of law enforcement and consumer groups.

Identity theft accounted for 43 percent of the complaints, topping the government’s list of consumer frauds for a third consecutive year.<sup>309</sup>

2. “Identity-theft Complaints Almost Double in 2002”: Associated Press article at cnn.com: January 22, 2003

<sup>308</sup> “Applied Digital Solutions Prepares ‘Protected by VeriChip’ Product Awareness Campaign;” Business Wire; published June 6, 2002; <[http://quote.bloomberg.com/fcgi.cgi?T=marketsquote99\\_news.ht&s=APP9PZxX8QX BwbGll](http://quote.bloomberg.com/fcgi.cgi?T=marketsquote99_news.ht&s=APP9PZxX8QX BwbGll)>; pp. 1-2 of 6/6/02 10:02 AM printout.

<sup>309</sup> “Identity Theft Complaints Up, Feds Say;” Associated Press on nytimes.com; January 22, 2003 Filed at 6:21 p.m. ET; <<http://www.nytimes.com/aponline/business/AP-Identity-Theft.html>>; p. 1 of 1/22/03 6:20 PM printout.

An introductory summary sentence to an Associated Press article at [cnn.com](http://cnn.com) reported an increase in identity theft complaints.

Complaints about identity theft nearly doubled in 2002 as the fast-growing crime topped the government's list of consumer frauds for a third consecutive year.<sup>310</sup>

3. "Identity Theft": Federal Trade Commission: Revised February 21, 2003

The Federal Trade Commission maintains an "Identity Theft" Web site.

Welcome to the U.S. government's central website for information about identity theft.

This site is maintained by the Federal Trade Commission. Please continue to visit this site often and share the information with your family, friends and colleagues. More information will be added to the site regularly, including government reports and Congressional testimony, law enforcement updates, and links to other sites with helpful information about identity theft.

How can someone steal your identity? By co-opting your name, Social Security number, credit card number, or some other piece of your personal information for their own use. In short, identity theft occurs when someone appropriates your personal information without your knowledge to commit fraud or theft.<sup>311</sup>

## XX. Human Microchip Implants and Security

- A. "Protected by VeriChip™": Security: Business Wire: June 6, 2002

A Business Wire release reported that Applied Digital Solutions outlined security applications for VeriChip, "a miniaturized radio frequency identification device (RFID) ...[a]bout the size of a grain of rice," that "...contains a unique verification number and will be available in several formats, some of which will be insertable under the skin."

Applied Digital Solutions, Inc. (Nasdaq: ADSXE), an advanced technology development company, today announced that it is preparing to launch a "Protected by VeriChip(TM)" product awareness campaign to demonstrate the potential for VeriChip(TM) as a personal safeguard technology that includes applications in the defense, security and financial sectors...

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<sup>310</sup> "Identity-theft Complaints Almost Double in 2002;" Associated Press on [cnn.com](http://cnn.com); January 22, 2003 Posted 12:53 PM EST; <<http://www.cnn.com/2003/TECH/ptech/01/22/identity.theft.ap/index.html>>; p. 1 of 1/22/03 6:15 PM printout.

<sup>311</sup> "Identity Theft;" Federal Trade Commission; Revised February 21, 2003; <<http://www.consumer.gov/idtheft/>>; p. 1 of 2/25/03 3:33 PM printout.

In the security field, the company is actively developing applications for VeriChip in a variety of security, defense, homeland security and secure-access applications. These opportunities include using VeriChip to control authorized access to government installations and private-sector buildings, nuclear power plants, national research laboratories, correctional facilities, and sensitive transportation resources. VeriChip can enhance airport security, airline security, cruise ship security, intelligent transportation and port congestion management. In these markets, VeriChip could function as a stand-alone, tamper-proof personal verification technology or it could operate in conjunction with other security technologies such as standard ID badges and advanced biometric devices (i.e. retina scanners, thumbprint readers or face recognition devices).

The concept of using VeriChip as a means for secure access could also be extended to include a range of consumer products such as PCs, laptops, cars, cell phones, and even homes and apartments...

Commenting on the "Protected by VeriChip" awareness campaign, Scott R. Silverman, President of Applied Digital Solutions, said: "This 'Protected by VeriChip' awareness campaign will demonstrate the far-reaching applications of VeriChip in security, homeland security, personal identification, defense, emergency, and a range of financial and anti-fraud areas. We're moving forward on all of these applications as quickly as possible. We believe the phrase 'Protected by VeriChip' will serve as a positive reminder that VeriChip subscribers will enjoy an added measure of safety, security and peace of mind."<sup>312</sup>

- B. "VeriChip Invited to COSTO Security Conference in Washington, D.C., October 15, 2002": Security: Business Wire: October 9, 2002

Applied Digital Solutions President, Scott R. Silverman, was scheduled to "discuss VeriChip(TM)'s subdermal, personal verification microchip technology on COSTO panel dedicated to biometric verification, personal authentication and identification systems."

As previously announced, the Company [Applied Digital Solutions] is actively developing applications for VeriChip in a variety of security, defense, homeland security and secure-access applications. These opportunities include using VeriChip to control authorized access to government installations and private-sector buildings, nuclear power plants, national research laboratories, correctional facilities, and sensitive transportation resources. VeriChip is able to function as a stand-alone, tamper-proof personal verification technology or it can operate in

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<sup>312</sup> "Applied Digital Solutions Prepares 'Protected by VeriChip' Product Awareness Campaign;" Business Wire; published June 6, 2002; <[http://quote.bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APP9PZxX8QX BwbGll](http://quote.bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APP9PZxX8QX BwbGll)>; pp. 1-2 of 6/6/02 10:02 AM printout.

conjunction with other security technologies such as standard ID badges and advanced biometric devices (e.g. retina scanners, thumbprint readers or face recognition devices).

The concept of using VeriChip as a means for secure access could also be extended to include a range of consumer products such as PCs, laptops, cars, cell phones, and even homes and apartments...

The Council of Security and Strategic Technology Organizations is a private organization for professionals in the Corporate, City, State & Local Government, Military, Intelligence & International Sectors, with the purpose of accelerating the development and application of safety and security technologies. It is intended that the Council be an international organization, with open membership. COSTO member sectors include: Homeland Security Inter-Agency Initiatives; Business Continuity Planning; Transportation, Travel & Border Security Initiatives; Enterprise Security & Personnel Security; Digital Security & IT Defense; Disaster Communications, Broadband Networks & Emergency Preparedness; Emergency Medical Preparedness; International Initiatives & Global Preparedness; and Digital Defense Technologies. For more information about COSTO, visit <http://www.costo.info/index.html>...

VeriChip is a miniaturized radio frequency identification device (RFID) that can be used in a variety of security, financial, emergency identification and healthcare applications. About the size of a grain of rice, each VeriChip product contains a unique verification number and will be available in several formats, some of which will be insertable under the skin.<sup>313</sup>

## XXI. Human Microchip Implants and Terrorism

### A. Introduction

#### 1. Electronic Fund Transfer and Terrorism: 1982 Observations

In 1982, empty tomb staff developed a manuscript that considered the power of real time surveillance inherent in an Electronic Fund Transfer system. Further, as noted below, the manuscript observed, "Electronic Fund Transfer would benefit...a...society attempting to implement adequate controls because its national security is being threatened internally by disruptive conventional or nuclear terrorism." Following is a brief excerpt of relevant material from Chapter 5 of the 1982 manuscript.

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<sup>313</sup> "VeriChip Invited to COSTO Security Conference in Washington, D.C., October 15, 2002;" Business Wire; published October 9, 2002; <[http://bloomberg.com/fgcgi.cgi?T=marketsquote99\\_news.ht&s=APaQ5shWtVmVyaUNo](http://bloomberg.com/fgcgi.cgi?T=marketsquote99_news.ht&s=APaQ5shWtVmVyaUNo)>; pp. 1-2 of 10/11/02 1:30 PM printout.

Chapter 1 of The Final Report of the National Commission on Electronic Fund Transfer deals with privacy...

In Part VII of The Final Report, a section of Separate Statements by a number of the Commissioners, Albert A. Foer, Associate Director, Bureau of Competition, Federal Trade Commission, addresses the topic of privacy and focuses on a problem as follows:

The most dramatic danger of EFT, from the civil liberties perspective is real time surveillance. By this I mean a use of an EFT system to pinpoint at the time of an EFT transaction the physical location and/or identification of activities of a cardholder, for purposes unrelated to the functioning of the EFT system itself.<sup>314</sup>

The Commission did recommend, “that EFT systems should not be used for surveillance of individuals, either as to their physical location or patterns of behavior.”

Yet the text of the Report immediately following this recommendation includes important exceptions: “The legitimate needs of law enforcement agencies should be balanced against the individual’s right to privacy. For example, law enforcement efforts should not be rendered ineffective against serious organized crime problems or *serious threats to national security*” (emphasis added)...<sup>315</sup>

In addition to providing consumer convenience and decreasing costs for consumers and private retailers and banking institutions, there would be incentives for governments to encourage widespread usage of Electronic Fund Transfer systems.

Electronic Fund Transfer would benefit either a communist society seeking further control of its citizenry or a capitalist society attempting to implement adequate controls because its national security is being threatened internally by disruptive conventional or nuclear terrorism.<sup>316</sup>

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<sup>314</sup> *EFT in the United States: Policy Recommendations and the Public Interest*, The Final Report of the National Commission on Electronic Fund Transfer, Washington, D.C., October 28, 1977, p. 257.

<sup>315</sup> *EFT in the United States: Policy Recommendations and the Public Interest*, The Final Report of the National Commission on Electronic Fund Transfer, Washington, D.C., October 28, 1977, p. 25.

<sup>316</sup> John and Sylvia Ronsvalle, “Evaluation of the Church in the U.S.A.,” Chapter 5 of typescript, empty tomb, inc., Urbana, Ill., 1982 with minor edits in 1983, that sans ms. Chapter 5 was published as *The Hidden Billions: The Potential of the Church in the U.S.A.* (Champaign, Ill.: C-4 Resources, 1984). The major portion of “Evaluation of the Church in the U.S.A.,” was subsequently published on the Web in 2003 under a “Theology and Technology” heading at <<http://www.emptytomb.org/TheolTech.html>>.

## 2. Potential Microchip Use and Terrorism: 1982 Observations

Following a discussion of microchips existing at that time, designed to be implanted into animals or humans, the 1982 manuscript discussed the conditions that might lead to widespread use of microchip identifiers in humans.

The use of a mark or microchip identifier might first be introduced into society as a generally beneficial security measure, perhaps in the control of criminals. Joseph Meyer, an engineer with the National Security Agency notes:

To the average person who is not a criminal, a big electronic system which affected the criminals but left him alone would not be regarded as a burden.<sup>317</sup>

The final step, mandatory use of a Personal Identification Number, in a Western society with its traditional emphasis on freedom, could come easily after a major threat to national security. Public support for a Governmental desire to know instantaneously the whereabouts of all citizens and aliens who make purchases as well as the time and content of their purchases for purposes of national security could swell dramatically and forcefully given certain circumstances. For example, such a move would seem much more reasonable after a terrorist group once held a major urban center such as New York, Chicago or Los Angeles hostage with the threat of detonating a powerful nuclear device. Consider the previous Wicklein (re Brazil) and Armer (re Soviet Secret Police) scenarios in regard to concerns for effective security.

In this case the usefulness of the EFT PIN system, with the number invisibly encoded on the body, would shift from providing added security for the individual's bank account. Rather this system would provide security for a nation and its wealth as a whole. This would be partly accomplished as indicated above through an increase in government's surveillance of its people's whereabouts and purchases.<sup>318</sup>

### B. Terrorism Increased Interest in Security-Related Technology

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<sup>317</sup> Joseph A. Meyer, "Crime Deterrent Transponder System," *Transactions on Aerospace and Electronic Systems*, Institute of Electrical and Electronics Engineers, Vol. AES - 7, No. 1, January 1971, p. 19.

<sup>318</sup> John and Sylvia Ronsvalle, "Evaluation of the Church in the U.S.A.," Chapter 5 of typescript, empty tomb, inc., Urbana, Ill., 1982 with minor edits in 1983, that sans ms. Chapter 5 was published as *The Hidden Billions: The Potential of the Church in the U.S.A.* (Champaign, Ill.: C-4 Resources, 1984). The major portion of "Evaluation of the Church in the U.S.A.," was subsequently published on the Web in 2003 under a "Theology and Technology" heading at <<http://www.emptytomb.org/TheolTech.html>>.

## 1. Research

The September 11, 2001 terrorism acts increased interest in security-related technology research. Following are excerpts from an article on “security technology”— “a topic of increasing interest among UI researchers.” The article, entitled, “Tech Research at UI Focused on U.S. Safety: 9/11 Sparked Shift to Security Technology Effort,” stated:

The UI already has been designated a national center for computer security education. And it appears poised to win major National Science Foundation funding for a center it has started, involving 45 faculty members from a variety of fields, that's dedicated to ensuring the computer systems and networks we've come to rely on are trustworthy.

“We have enormous capability in data and information security,” said David Daniel, dean of the College of Engineering and one of the UI officials working to create an umbrella Illinois Program for Security Technology at the university.

Daniel said that effort started shortly after the events of Sept. 11, 2001. In part, it was the same kind of reaction other Americans had in the wake of the attacks.

“We had a feeling that we wanted to roll up our sleeves,” Daniel said. “We started breaking down the problems or threats. We went on sort of an information accumulation internal project.”

They found UI researchers already engaged in nearly \$30 million worth of projects related to homeland safety and security concerns...

Eventually, Daniel sees the possibility of several research centers at the UI focused on things like building safety, aviation security and chemical and biological threats, in addition to computer security.

The UI has invested several hundred thousand dollars in startup projects. The area looks to be a wellspring of federal funding. President Bush signed a defense-spending bill two weeks ago including more than \$16 billion for research, up nearly 10 percent. There's a proposal for a five-year doubling of the National Science Foundation budget.

“The monies have not really started flowing to the universities yet, but we seem to be right on the precipice of that, and we think we're well-positioned,” Daniel said.<sup>319</sup>

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<sup>319</sup> Greg Kline, “Tech Research at UI Focused on U.S. Safety: 9/11 Sparked Shift to Security Technology Effort,” *Champaign (Ill.) News-Gazette*, 3 November 2002, p. A-5.

2. Law: Enhanced Border Security and Visa Entry Reform Act

a. Associated Press Article: May 14, 2002

The September 11, 2001 terrorism acts increased interest in security-related technology law:

President Bush signed an immigration bill Tuesday meant to screen out terrorists by using high-tech passports and more border enforcers to check millions of people who enter the United States each year...

Sen. Dianne Feinstein, D-Calif., called the measure "the most important bill passed post-9/11."

"It's the first time security has really become part of immigration policy," she said.

The new law will require that passports issued after 2003 contain fingerprints or facial recognition technology and be tamperproof. It will bar the use of certain visas by people from countries listed as terrorism sponsors.<sup>320</sup>

b. Office of the Press Secretary: May 14, 2002

The September 11, 2001 terrorism acts resulted in additional "biometric identification" tools being written into law:

The bill I sign today enhances our ongoing efforts to strengthen our borders...It makes it easier for the INS and other federal agencies to get better information about people and products that come into America. It requires every foreign visitor desiring entrance into the United States to carry a travel document containing biometric identification -- that would be fingerprints or facial recognition -- that will enable us to use technology to better deny fraudulent entry into America.<sup>321</sup>

C. Terrorism Increased Interest in Human Locator Devices

1. "Terrorism Is Shifting Attitudes": *The Los Angeles Times*: December 19, 2001

<sup>320</sup> Scott Lindlaw, Associated Press Writer; "Bush Signs Border Security Bill;" [washingtonpost.com](http://www.washingtonpost.com); published Tuesday, May 14, 2002 5:57 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A16046-2002May14?language=printer>>; p. 1 of 5/16/02 8:40 AM printout.

<sup>321</sup> President George W. Bush; "President Signs Border Security and Visa Entry Reform Act": Remarks by the President at Signing of the Enhanced Border Security and Visa Entry Reform Act, Presidential Hall, Dwight D. Eisenhower Executive Office Building; Office of the Press Secretary, The White House; published May 14, 2002; <<http://www.whitehouse.gov/news/releases/2002/05/print/20020514-4.html>>; p. 2 of 5/16/02 8:48 AM printout.

*The Los Angeles Times* reported that Applied Digital Solutions said that terrorism is influencing attitudes toward implantable chips.

A Florida company is poised to become the first to sell microchips designed to be implanted into human beings, an achievement that opens the door to new systems of medical monitoring and ID screening.

Implantable chips have long been discussed by technologists and denounced by those who object on religious grounds or fear their use by a totalitarian state. But the company that did the test, Applied Digital Solutions of Palm Beach, said the specter of terrorism is shifting attitudes. The direct union of man and computer is no longer dismissed out of hand.

“The bottom line is, when people are trying to regain their peace of mind, they’re more open to new approaches,” said Keith Bolton, Applied Digital’s chief technology officer.<sup>322</sup>

2. After September 11 Terrorist Attacks, A Medical Consultant to Applied Digital Solutions, Dr. Richard Seelig, Injected Two Chips in September 2001: *EE Times*: January 7, 2002

Under a subheading, “Inspired by Sept. 11,” one reads that a medical consultant to Applied Digital Solutions inserted two chips into himself in September 2001.

In September, Applied Digital Solutions implanted its first human chip when a New Jersey surgeon, Richard Seelig, injected two of the chips into himself. He placed one chip in his left forearm and the other near the artificial hip in his right leg.

“He was motivated after he saw firefighters at the World Trade Center in September writing their Social Security numbers on their forearms with Magic Markers,” Bolton said. “He thought that there had to be a more sophisticated way of doing an identification.”

Applied Digital said Seelig, who serves as a medical consultant to the company, has now had the chips implanted in him for three months with no signs of rejection or infection.

Ordinarily, the company said, the chips would be implanted in a doctor's office under local anesthesia.<sup>323</sup>

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<sup>322</sup> David Streitfeld; “A Chip ID That’s Only Skin-Deep;” *Los Angeles Times*; published December 19, 2001; Start Page: A.1;  
<<http://pqasb.pqarchiver.com/latimes/main/doc/000000095988263.html?MAC=099cdc7812e33c01a59498a6dee6b5b2&QIID=000000095988263&FMT=FT>>; p. 1 of 4/17/02 11:45 AM printout.

3. After September 11 Terrorist Attacks, Medical Director of Applied Digital Solutions, Dr. Richard Seelig, Inserted Two Chips on September 16, 2001: *Miami Herald*: March 10, 2002

After the September 11 terrorist attacks, the medical director of Applied Digital Solutions inserted two chips on September 16, 2001.

“The assets we’ve developed through this technology are so significant it's going to be the savior of the company,” said Scott Silverman, who was appointed president of Applied [Digital Solutions] last week.

The company’s plans for the chip were accelerated when Dr. Richard Seelig, Applied’s medical applications director, inserted two chips -- one in his right forearm, the other in his right hip -- on Sept. 16. After the Sept. 11 terrorist attacks, he thought such a device could help identify bodies of victims.

“I would want my healthcare givers to have as much information about me,” Seelig said. “You're gushing information, not trying to restrain access to them.”<sup>324</sup>

4. “Sept. 11 Solidified...Resolve to Market the Human Chip”: Associated Press: February 26, 2002

The September 11, 2001 terrorism acts “solidified...resolve to market the human chip.”

A Florida technology company is poised to ask the government for permission to market a first-ever computer ID chip that could be embedded beneath a person’s skin...

Other uses of the technology on the horizon, from an added device that would allow satellite tracking of an individual’s every movement to the storage of sensitive data like medical records, are already attracting interest across the globe for tasks like foiling kidnappings or assisting paramedics.

Applied Digital Solutions’ new “VeriChip” is another sign that Sept. 11 has catapulted the science of security into a realm with uncharted possibilities—and also new fears for privacy...

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<sup>323</sup> Charles J. Murray; “Injectable Chip Opens Door To ‘Human Bar Code’;” *EE Times*; published January 7, 2002 12:38 p.m. EST; <<http://www.eetimes.com/story/OEG20020104S0044>>; pp. 2-3 of 3/9/02 3:30 PM printout.

<sup>324</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; pp. 2-3 of 1/21/03 10:55 AM printout.

More than a decade ago, Applied bought a competing firm, Destron Fearing, which had been making chips implanted in animals for several years. Those chips were mainly bought by animal owners wanting to provide another way for pound workers to identify a lost pet.

Chips for humans aren't that much different.

But the company was hesitant to market them for people because of ethical questions. The devastation of Sept. 11 solidified the company's resolve to market the human chip and brought about a new sensibility about the possible interest.

"It's a sad time...when people have to wonder whether it's safe in their own country," [Keith] Bolton[, chief technology officer and a vice president at Applied Digital] said...

Applied Digital says technology to let the chip to be used for tracking is already well under development.

Eight Latin American companies have contacted Applied Digital and have openly encouraged the company to pursue the internal tracking devices. In some countries, kidnapping has become an epidemic that limits tourism and business.<sup>325</sup>

5. Human Locator Devices: Applied Digital Solutions Comments: 10meters.com

The September 11, 2001 terrorism acts increased interest in human locator devices.

Before Sept. 11, Digital Angel was simply an up-and-coming company with an honorable mission: creating cutting-edge location-technology products to help parents and caregivers keep track of both the whereabouts and basic well-being of loved ones...

The devices, scheduled to ship in early November, were "discovered" shortly after Sept. 11 by an anxious public. [Digital Angel's Chief Technology Officer Keith] Bolton said the callers wondered if the Digital Angel products could be used for more than wanderers.

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<sup>325</sup> Christopher Newton, Associated Press Writer; "U.S. to Weigh Computer Chip Implant;" Associated Press article on washingtonpost.com; published February 26, 2002 7:55 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A7240-2002Feb26?language=printer>>; pp. 1-2 of 2/28/02 7:49 AM printout.

Also of interest: the sophisticated technology the devices bring to location services. Digital Angel's products are able to read and return data from the interior of buildings...

As interest swelled, Digital Angel found itself in need of more devices than originally scheduled for distribution and has "accelerated the pace" of its manufacturing process, Bolton said...

"Everything has changed since Sept. 11," said Bolton. What hasn't changed, he added, is the Digital Angel mission to save lives.<sup>326</sup>

6. VeriChip Provided Positive Step after Sept. 11, 2001 Attack on World Trade Center: Leslie Jacobs: *The Boston Globe*: May 20, 2003

Leslie Jacobs, the mother in the first "chipped" family, decided that VeriChip provided a positive step after the September 11, 2001 attack on the World Trade Center:

Since the attack on the World Trade Center on Sept. 11, 2001, she [Leslie Jacobs] continues, "we know that our lives are increasingly vulnerable. If we want increased safety, security, and peace of mind, we need to take positive steps. We've decided that having a VeriChip is one way to do just that."<sup>327</sup>

7. In Context of 9/11 Personal Security Outweighs Privacy Rights for Some: *The Boston Globe*: May 20, 2003

Applied Digital Solutions president Scott Silverman, in the context of both injected microchips and the events of 9/11, observes that personal security outweighs privacy rights for some.

For ADS's Silverman, both the VeriChip and its future GPS-based version are a matter of individual choice.

"No one is forcing you to have a VeriChip. If you want a chip in your right arm you are going to know it is there because you will see it injected. When you look at the events of 9/11 and the way people measure their own

<sup>326</sup> Karen E. Peterson; "A 'Digital Angel' for Troubling Times"; 10meters.com; published n.d.; <<http://www.10meters.com/digitalangel.html>>; pp. 1-4 of 4/24/02 9:36 AM printout.

<sup>327</sup> Angela Swafford; "Chipping Away at Security Fears"; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=-30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=-30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 2 of 5/22/03 3:03 PM printout.

personal security today versus the way they did a few years ago, there is a much higher concern to make sure that family members are safe and sound and some people now put that above privacy rights.”<sup>328</sup>

#### D. It Is Posited That Any Further Significant Terrorism in the U.S. Will Likely Increase Usage of Implanted Human Microchips

It is likely that the use of microchips implanted in humans as security devices would increase if further terrorist acts of mass destruction are carried out in the United States.

##### 1. Shortcomings in Alternative Systems of Security

There are limits to facial recognition systems.

[UI Professor Thomas] Huang, a computer and electrical engineering professor, has been working on recognition systems for some time, for example, with the idea of making computers more user friendly.

Existing systems suffer from shortcomings he and his students are trying to overcome with better algorithms – the software that does the recognizing – and by techniques such as combining face and voice recognition to get highly accurate results, at least with a small database of users.

They're also using off-the-shelf parts, such as the video camera that serves as the computer's eye, in an effort to make such systems less expensive.

Still, while Huang thinks recognition systems have a future in “access control” from a security perspective, he's not sure they will ever be useful for picking the faces of bad guys out of the crowd, because faces can change too easily.

“Facial hair, hat, sunglasses, makeup cause a lot of problems,” Huang said. “It's more useful for cooperative subjects ... in special cases like access to a lab, access to a computer, where ... the user wants to get in.”<sup>329</sup>

##### 2. Michael Kelly: Further Terrorism Would Restrict Liberties

<sup>328</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=-30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=-30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; pp. 3-4 of 5/22/03 3:03 PM printout.

<sup>329</sup> Greg Kline, “Tech Research at UI Focused on U.S. Safety: 9/11 Sparked Shift to Security Technology Effort,” *Champaign (Ill.) News-Gazette*, 3 November 2002, pp. A-1, 5.

The late Michael Kelly, editor of the *Atlantic* and a columnist for the Washington Post Writers Group discussed the conditions under which “the public will demand, and will get, immense restrictions on liberties”:

Democracy in America does at this moment face a serious threat. But it is not the threat the judge has in mind, at least not directly. It is true that last September's unprecedented mass-slaughter of American citizens on American soil inevitably forced the government to take security measures that infringed on some rights and privileges. But these do not in themselves represent any real threat to democracy. A real threat could arise, however, should the government fail in its mission to prevent another Sept. 11. If that happens, the public will demand, and will get, immense restrictions on liberties. To maintain the security that allows the luxury of democracy, the government must temporarily insult democracy. Which it is, and generally properly, doing.<sup>330</sup>

### 3. Past Terrorism Increased Interest in Implanted Human Microchips

As noted elsewhere in this document, September 11, 2001, terrorism increased interest in human locator devices.

## E. A Number of Informed Sources Assert Further Terrorism Will Take Place

### 1. Nuclear Terrorism: “Terrorists Will Get Nukes”: Defense Secretary Donald H. Rumsfeld

A May 21, 2002 14:28 EDT, Associated Press article by John J. Lumpkin published on AOL News reported the U.S. Defense Secretary's assessment of the type and likelihood of further terrorist attacks.

Terrorists are sure to eventually acquire and use nuclear, chemical and biological weapons, Defense Secretary Donald H. Rumsfeld said Tuesday.

Iraq, Iran, Syria, Libya and North Korea are developing such weapons of mass destruction and will supply them to terrorists to which they already are linked, Rumsfeld said.

“They (terrorists) inevitably will get their hands on them and they will not hesitate to use them,” Rumsfeld told a Senate Appropriations subcommittee...

Rumsfeld declined to discuss specific terrorist threats, saying the government sees hundreds a day and as many as

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<sup>330</sup> Michael Kelly; “Secrecy, Case By Case”; *Washington Post*; published Wednesday, August 28, 2002; Page A23; <[http://www.washingtonpost.com/ac2/wp\\_dyn?pagename=article&node=&contentId=A4518-2002Aug27&notFound=true](http://www.washingtonpost.com/ac2/wp_dyn?pagename=article&node=&contentId=A4518-2002Aug27&notFound=true)>; 12/31/02 2:24 PM printout; also published as “Justice Department Cries ‘Terrorism’ Once Too Often”; *Champaign (Ill.) News-Gazette*, 30 August 2002, p. A-9.

90 percent of them are designed to test the government's response.

“They jerk us around, try to jerk us around, and test us,” Rumsfeld said.

Gen. Richard Myers, chairman of the Joint Chiefs of Staff, said that while the war on terror has hurt al-Qaida, the terrorist network remains a threat. “Just like a wounded animal is the most dangerous, they (al-Qaida) still pose a threat to our armed forces,” Myers said.

At his White House briefing, press secretary Ari Fleischer said he hadn't heard Rumsfeld's exact words, but that “the secretary knows what the president knows and that is that we're in the middle of a war to protect the country and diminish the ability of people who would do us harm from getting their hands on such weapons” ...

“We have, after Sept. 11, brought the war to the enemy. It does not surprise the American people that the enemy will now try to bring the war back to the United States,” Fleischer said. “That’s the definition of a war, and unfortunately we are in one.”<sup>331</sup>

2. Terrorism: “another attack...near certainty”: Vice President Dick Cheney

A May 21, 2002 14:28 EDT, Associated Press article by John J. Lumpkin published on AOL News reported Vice President Dick Cheney’s assessment of the likelihood of further terrorist attacks.

Rumsfeld’s warning was the latest administration voice suggesting another attack is inevitable. Last weekend Vice President Dick Cheney said another attack is a near certainty.<sup>332</sup>

3. Terrorism: “There will be another terrorist attack”: FBI Director Robert Mueller

Another version of the May 21, 2002 Associated Press article by John J. Lumpkin, that had been published on AOL News, was published by Intercissors For America and reported FBI Director Robert Mueller’s assessment of the likelihood of further terrorist attacks.

“There will be another terrorist attack. We will not be able to stop it,” FBI Director Robert Mueller told a meeting of

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<sup>331</sup> John J. Lumpkin; “Rumsfeld: Terrorists Will Get Nukes;” Associated Press: AOL News; published May 21, 2002 14:28 EDT; pp. 1-2 of 5/21/02 printout.

<sup>332</sup> John J. Lumpkin; “Rumsfeld: Terrorists Will Get Nukes;” Associated Press: AOL News; published May 21, 2002 14:28 EDT; p. 1 of 5/21/02 printout.

the National Association of District Attorneys on Monday. “It's something we all live with.”

He said suicide bombers like those who have attacked Israeli buses and restaurants are inevitable in the United States. His words – “I wish I could be more optimistic” – came one day after Vice President Dick Cheney said it was almost a certainty the United States would be attacked again by terrorists.<sup>333</sup>

4. Terrorism: “New Terrorist Assault ‘Almost a Certainty,’ 9/11 Probe Finds”: Sen. Bob Graham, co-chairman of the Joint House-Senate Intelligence Committee probe

Jeff Johnson, Congressional Bureau Chief of Cybercast News Service reported Sen. Bob Graham’s assessment of the likelihood of further terrorist attacks.

Results from the congressional inquiry into alleged intelligence failures leading up to the 9/11 terrorist attacks released Wednesday indicate a number of systemic problems with U.S. intelligence gathering, analysis, sharing, and response. The report was introduced with a somber warning from the co-chairman of the Joint House-Senate Intelligence Committee probe.

“It is almost a certainty that, in the coming months, Americans will face another attempted terrorist assault; an assault that could quite possibly be on the same scale as that of September the 11th, 2001,” Sen. Bob Graham (D-Fla.).

“It is a certainty that such an attack will be attempted,” Graham continued. “The question is whether we'll do a better job of intercepting it before it kills more people than we did prior to September the 11th.”

Graham made those remarks prior to releasing the declassified version of the Joint Committee's findings and recommendations.<sup>334</sup>

5. Bioterrorism: “U.S. Vulnerable to Attack on Food Supply, Experts Say”: National Research Council

<sup>333</sup> John J. Lumpkin; “Rumsfeld: Terrorists Will Get Nuclear Weapons: Defense Secretary Testifies before Senate Panel;” Associated Press: Intercessors For America; published May 21, 2002; <[http://www.ifa-usapray.org/ARCHIVE\\_TERRORISM/Rumsfeld\\_Says\\_Terrorists\\_Will\\_Get\\_Nuclear\\_Weapons\\_-\\_May\\_21,\\_2002.html](http://www.ifa-usapray.org/ARCHIVE_TERRORISM/Rumsfeld_Says_Terrorists_Will_Get_Nuclear_Weapons_-_May_21,_2002.html)>; p. 2 of 1/3/03 2:34 PM printout.

<sup>334</sup> Jeff Johnson, Congressional Bureau Chief; “New Terrorist Assault ‘Almost a Certainty,’ 9/11 Probe Finds;” Cybercast News Service; published 2002; <<http://new.crosswalk.com/news/1176057.html>>; p. 1 of 12/12/02 8:49 AM printout.

An Associated Press article provided the National Research Council's assessment of the United States' vulnerability to bioterrorism.

A year after the Sept. 11 attacks, the United States remains vulnerable to bioterrorism aimed at farms that produce the nation's food, a panel of scientists said in a report released Thursday.

"It's not a matter of 'if.' It's a matter of when," said R. James Cook, a committee member from Washington State University. "While there may be a very low probability now, what about in 20 years?"

The scientists said an attack was unlikely to result in a famine or malnutrition but could shake public confidence in the food supply and devastate the economy—costing anywhere from millions of dollars to tens of billions of dollars.

The report was prepared by the National Research Council, an arm of the National Academy of Sciences.

It is one of the most comprehensive reviews of the nation's plans to fight bioterrorism.<sup>335</sup>

#### 6. Nuclear Terrorism: "Virtually a Certainty": Warren Buffett

A May 6, 2002, CBS MarketWatch article headlined, "Buffett: Count on Another Terror Attack," reported Warren Buffett's assessment of the type and likelihood of further terrorist attacks.

Warren Buffett, celebrated as the "oracle of Omaha," has offered this grim prediction about terrorist attacks on U.S. soil: More lie ahead.

Speaking to investors and the media over the weekend at his annual conclave, Buffett conceded that he didn't know when an attack would come, but he said that he was sure there would be one and that it would be "a major nuclear event in this country."

"Whether it'll happen in 10 years or 10 minutes, or 50 years...it's virtually a certainty," he told reporters. "We are the No. 1 target"...

Buffett told the more than 10,000 people gathered at what has been dubbed "Woodstock for capitalists" in his hometown that the Sept. 11 terrorist attacks "jolted" him

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<sup>335</sup> "U.S. Vulnerable to Attack on Food Supply, Experts Say," an Associated Press (Washington) article appearing in *Champaign (Ill.) News-Gazette*, 20 September 2002, sec. A, p. 3.

and his companies. His insurance units lost billions of dollars...

And it cost him plenty. Between losses at General Re and Geico Insurance caused largely by the terrorist attacks, Berkshire's losses lopped \$3.8 billion off its value and knocked Buffett's personal fortune down to \$35 billion, according to Forbes magazine.

Buffett used the platform at the packed marathon annual meeting in his hometown to renew his calls for a federal terror insurance program and nuclear exclusions in insurance policies. Without those, he said, the insurance industry would be wiped out.

“We take on a lot of terrorism insurance, but we can't be unlimited,” he said. “We can't insure ... Manhattan from a nuclear event”...

He's not covering nuclear, chemical or biological attacks, he said, asserting that no insurance company can take on the kind of capacity that a nuclear attack, for example, would require.<sup>336</sup>

#### 7. Terrorism: “Next Time—The Question Is Not If, But When”

A Scripps Howard News Service article provided an assessment by some of the top terrorism experts about the likelihood of further terrorist attacks.

Most likely to be a suicide bomb blast, the next assault—if it succeeds—probably will bring a much smaller death toll than the 3,014 people who died in the unprecedented 9/11 tragedies.

That is the general consensus of some of the nation's top terrorism experts about the threat the nation faces, a year after the suicide planes slammed into the twin towers of the World Trade Center, the Pentagon and a Pennsylvania field.

Though the loose global terror network has been significantly disrupted, and its attempts to stage follow-up attacks have largely failed so far, analysts believe it is inevitable that al-Qaida will continue to try to strike at the United States, at home and abroad.

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<sup>336</sup> “Buffett: Count on Another Terror Attack;” CBS MarketWatch; published May 6, 2002, last update 2:10 PM ET;  
<<http://cbs.marketwatch.com/news/story.asp?guid={CCB4454F-33FE-4A7D-A8FD-54B1A9A23451}&siteid=mktw&dist=&archive=true>>; pp. 1-2 of 5/6/02 4:18 PM printout.

“Without doubt, there will be an attack, probably sooner rather than later,,” said Gregory Treverton, a terrorism expert at the RAND think tank, which conducts research for the Pentagon and other national security agencies.<sup>337</sup>

8. Weapon of Mass Destruction in Next Two Years: “U.S.: High Chance of al-Qaida WMD Attack”: Associated Press: June 10, 2003

Associated Press Writer Edith M. Lederer reported on a U.S. government report regarding the likelihood of an attack using a weapon of mass destruction.

There is a “high probability” that al-Qaida will attempt an attack with a weapon of mass destruction in the next two years, the U.S. government said in a report Monday...

The report said the terrorist organization "will continue its efforts to acquire and develop biological, chemical, radiological, and nuclear (CBRN) weapons."

"We judge that there is a high probability that al-Qaida will attempt an attack using a CBRN weapon within the next two years," it said...

"Al Qaida most likely will use the same tactics that were successful on Sept. 11 in carrying out any future attack in the United States, including efforts by cell members to avoid drawing attention to themselves and to minimize contact with militant Islamic groups and mosques in the United States. They will also maintain strict operational and communications security," the report said.<sup>338</sup>

#### F. An Exploration of the Relation, If Any, between Terrorism and Poverty

1. Kathy Read: Publisher of the Wilson Quarterly, The Woodrow Wilson Center for International Scholars: “America Should Attack Terrorists and the Terror of Hunger”:

Kathy Read states that it is “nonsense” that “America is to blame for not addressing the poverty and hopelessness that the writers contend breed acts of terror.” Read writes:

Even before justice is done—and it will be—Americans ought to consider another form of terror that we have the

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<sup>337</sup> Lisa Hoffman, “Next Time—The Question Is Not If, But When,” a Scripps Howard News Service article appearing in *Champaign (Ill.) News-Gazette*, 8 September 2002, sec. B, p. 1.

<sup>338</sup> Edith M. Lederer, “U.S.: High Chance of al-Qaida WMD Attack;” Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published June 10, 2003 10:17 AM; <<http://www.washingtonpost.com/wp-dyn/articles/A38993-2003Jun10.html>>; pp. 1-2 of 6/11/03 9:20 AM printout.

power to eradicate: the terror that stems from realizing you and your loved ones are slowly starving to death.

I've seen a lot of columns recently that somehow suggest America is to blame for not addressing the poverty and hopelessness that the writers contend breed acts of terror.

Those suggestions, of course, are nonsense from people who let their emotions get in the way of critical thinking...

The plain truth is that terrorists who attacked our common humanity on Sept. 11 are little more than thugs...

Having acknowledged that should not dull Western guilt about our callousness and complicity in allowing a world in which 3 billion people subsist on less than \$2 a day and hundreds of millions of children go to bed hungry every night...

There's also talk of building a memorial to the victims, but I doubt if mere marble or sculptured metal can really do justice to our national tragedy.

A far better way to memorialize an act of hate is with an act of love. The best veteran's memorial we've ever constructed in this country is the one we constructed to World War II veterans during the Truman administration.

It was called the Marshall Plan, and we used it to provide massive aid that quickly helped rebuild the nations we fought. In all of human history, it was an unprecedented gesture. We fought a bloody war to save our own democracy and then—instead of subjugation—bestowed that precious gift on our enemies.

Today, two peace-loving democracies—Germany and Japan—are the most fitting memorials to the 291,557 American service personnel who died in World War II.

Alleviating and eventually eliminating world hunger, I believe, would be the most fitting memorial we could construct to honor September's victims of terror. '

A good place to start would be congressional passage of a fully funded international school lunch program. The idea was first proposed by former Democratic presidential candidate George McGovern. With bipartisan help from former Republican presidential candidate Bob Dole, McGovern persuaded President Clinton to provide \$300 million to jump-start the program in 1999.

President Bush endorsed the concept earlier this year when he reappointed McGovern as U.S. representative to the U.N. Food and Agriculture Program in Rome.

Unfortunately, the initial U.S. commitment is only about one-fourth of the money needed to get McGovern's global school lunch program fully operational.

Increasing that amount by \$900 million—about a half of 1 percent of our current budget surplus—and swiftly putting the program into effect would make a powerful statement about America's commitment to humanity.

Eliminating Vitamin A deficiency, for instance, will prevent the deaths of as many as 2 million children a year as well as 500,000 cases of blindness.

Ending hunger establishes hope, and hopeful humans have the will to pursue education and a better life. That better life can best be fulfilled under governments that encourage political and economic freedoms.

We can never restore the dead to life; but we can honor their sacrifice by resurrecting the lives of millions now living.<sup>339</sup>

2. Associated Press: U.N. General Assembly: Discussion of Terrorism: October 3, 2001

The U.N. General Assembly provided a forum in which a relation between extremism and poverty was asserted.

Arab nations on Tuesday pledged to eradicate terrorism but demanded independence for Palestinians, whom they called “victims of modern terrorism.”

The debate came during the second day of a weeklong session of the U.N. General Assembly to discuss terrorism after the Sept. 11 attacks against the World Trade Center’s twin towers and the Pentagon.

Pakistan, which has pledged support for the U.S. campaign to punish Osama bin Laden and his network, also warned that the West must do more to eliminate world poverty, which it said breeds extremists...

On Tuesday, Pakistani U.N. Ambassador Shamshad Ahmad said his country stood firm in its pledge to aid a global coalition on terrorism. But he said more must be done to fight poverty and “the inequality of societies” that leads to resentment and extremism.<sup>340</sup>

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<sup>339</sup> Kathy Read, “America Should Attack Terrorists and the Terror of Hunger,” *Champaign (Ill.) News-Gazette*, 30 September 2001, sec. B, p. 4.

<sup>340</sup> “Nations Vow to Assist in Effort,” an Associated Press article appearing in *Champaign (Ill.) News-Gazette*, 3 October 2001, sec. A, p. 3.

3. *San Francisco Chronicle*: “Secular States in Mideast Feel Threatened”: October 21, 2001

A San Francisco Chronicle article provided an analysis of the “underlying appeal of the Islamic movements” as they relate to the poor.

“Secular nationalism failed to deliver a winning war against Israel,” says Dr. Mohammed el Sayed Said, assistant director of the prestigious Center for Political and Strategic Studies in Cairo, “and secular liberalism failed to address social issues—extreme poverty, dispossession, the concentration of land in a few hands.”

Reeling with demoralization, “a whole generation gave up on both approaches and started looking to the mosque for guidance,” he says.

“The underlying appeal of the Islamic movements is that they appear to speak for the poor,” says a political scientist in Cairo. Their influence is less about religion than it is about their monopoly today on the language of the oppressed.”<sup>341</sup>

4. Associated Press: World Economic Forum: U.N. Secretary-General Kofi Annan: February 4, 2002

Discussants at the World Economic Forum reviewed how to stop terrorism, in the context of poverty.

Presidents, kings and moguls wrapped up five days of swanky parties, serious elbow-rubbing and weighty discussions on Monday on how to stop terrorism, resolve long-standing international conflicts and ease grinding poverty.

With luxury jets waiting to whisk the world's power players to their homes, the World Economic Forum closed its one-time New York experiment and 32nd annual meeting with a warning by U.N. Secretary-General Kofi Annan that the Sept. 11 terrorist attacks have exposed a huge gap between the world's rich and poor.

In remarks to the forum's 2,700 participants, Annan encouraged business and governments to give hope to billions of people struggling to survive in developing countries.

Otherwise, Annan said the world risks the collapse or relapse of poor nations into conflict and anarchy where they would be "a menace to their neighbors and potentially

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<sup>341</sup> Frank Viviano, *San Francisco Chronicle*, “Secular States in Mideast Feel Threatened,” *Champaign (Ill.) News-Gazette*, 21 October 2001, sec. B, p. 4.

- as the events of Sept. 11 so brutally reminded us - a threat to global security."<sup>342</sup>

5. Associated Press: World Economic Forum: Secretary of State Colin Powell: February 2, 2002

Participants at the World Economic Forum discussed the need to stop poverty as part of fighting terrorism.

Americans can fight terrorism around the globe but can't eliminate it without stopping the poverty and despair that helps create terrorist, participants said Friday on the second day of the World Economic Forum.

"We have to show people who might move in the direction of terrorism that there is a better way," Secretary of State Colin Powell told movers and shakers from around the world, who are discussing the globe's biggest problems at a Manhattan hotel...

Powell, speaking at a panel on building a coalition for a stable world, said the United States is just beginning its campaign against terrorism and will "make sure we root it out, wherever it exists."

But America will also help countries solve problems that make them hotbeds for terrorism, Powell added. He cited Afghanistan, where he said the United States will continue humanitarian efforts to rebuild the shattered country.<sup>343</sup>

6. Associated Press: World Economic Forum: February 1, 2002

Participants in the World Economic Forum discussed the relationship between fighting terrorism and economic considerations.

Giving up their usual lofty retreat in the Alps to come to terrorism-shattered New York, participants in the World Economic Forum pledged to turn their attention to the world's needs instead of its balance sheets.

The nearly 3,000 attendees - a who's who of business leaders, politicians and celebrities - kicked off the five-day meeting Thursday as hordes of police on Manhattan's streets braced for unrest that never materialized. Forum participants painted the Sept. 11 attacks as a global wake-up call and encouraged efforts against poverty, the

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<sup>342</sup> Eileen Alt Powell, AP Business Writer; "World Economic Forum Wraps Up;" [washingtonpost.com](http://www.washingtonpost.com); published February 4, 2002 8:52 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A23307-2002Feb4?language=printer>>; p. 1 of 2/6/02 8:04 AM printout.

<sup>343</sup> "Powell: U.S. Will Battle Poverty," an Associated Press article appearing in *Champaign (Ill.) News-Gazette*, 2 February 2002, sec. A, p. 3.

AIDS epidemic and other scourges that have bred frustration and anger toward wealthy countries...

The forum, in its 32nd year, is being held somewhere other than the Swiss retreat of Davos for the first time since its founding. The move was meant to show sympathy for New York - and to improve the image of the forum, often seen as a pricey retreat for rich businessmen.

"We are gathered here to exercise, more than ever, leadership in fragile times and to develop a vision for a shared future," Klaus Schwab, the forum's founder, said at the official opening ceremony...

The meeting opened with an accounting of the world's economy following the Sept. 11 attacks. Economists predicted that the U.S. economy would bounce back by year's end, with Europe expected to follow closely behind. But they said there was no end in sight for Japan's 10-year-old slump.

Helping the weakest economies and creating strong middle classes there are the best ways to fight terrorism in the long term, panelists said at an afternoon discussion.

"When you have that, it's easier to have democratic values and practices," said Alain Dieckhoff, the research director at France's Center for International Studies and Research...

More than 2,700 participants from 106 countries are attending the meeting, including 30 heads of state, 100 Cabinet ministers and 74 ambassadors.

Speakers include King Abdullah II of Jordan; Kofi Annan, secretary-general of the United Nations; Gloria Macapagal Arroyo, president of the Philippines; Michael Dell, chairman and chief executive of Dell Computer, and Microsoft Chairman Bill Gates.

President Bush won't attend but is sending Secretary of State Colin Powell and Treasury Secretary Paul O'Neill.<sup>344</sup>

7. Associated Press: U.N. International Conference on Financing for Development: March 22, 2002

World leaders discussed the connection between eliminating terrorism and combating terrorism.

Nations of the world launched a major initiative Friday to combat poverty, with rich countries promising to try to

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<sup>344</sup> Chris Hawley; "World Forum Looks at Global Security;" Associated Press (New York): AOL News; published February 1, 2002 0401 EST; pp. 1-2 of 2/1/02 printout.

double their aid and poor countries agreeing to do more with what they get.

Leaders of poor countries from Tunisia to Venezuela and rich countries from France to the United States all agreed that terrorism will not be eliminated without a major push to help the world's poorest. Three billion people - half the world's population - live on less than \$2 a day.

"We fight against poverty because hope is an answer to terror," said President Bush, adding: "Men and women were made for freedom, and prosperity comes as freedom triumphs."

French President Jacques Chirac said world leaders need to commit the same resources to battling poverty as they did to combatting terrorism after the Sept. 11 attacks in the United States.

"What can be done against terrorism can surely be done against poverty, in the name of a more human, manageable globalization," he said. "Let us form a coalition to build together a universal civilization where there is a place for everyone, where everyone is respected, and where everyone has a chance"...

The adoption of the "Monterrey Consensus" on Friday capped the weeklong U.N. International Conference on Financing for Development, the first anti-poverty summit to bring together heads of state, finance ministers, business leaders, aid activists and international lending institutions...

The document, which was approved months earlier at the United Nations, was adopted by consensus at the summit Friday morning. Already, the United States and Europe pledged billions of dollars more in development aid last week.<sup>345</sup>

8. Associated Press: U.N. International Conference on Financing for Development: President George Bush: March 22, 2002

An Associated Press article reported President Bush's on the relationship between poverty and terrorism.

As fresh terrorist worries loomed, President Bush told a U.N. poverty summit on Friday that the United States will lead rich nations in helping the world's most desperate regions prosper because "hope is an answer to terror."

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<sup>345</sup> Niko Price; "World Leaders to Give More to Poor;" Associated Press (Monterrey, Mexico): AOL News; published March 22, 2002 1430 EST; pp. 1-2 of 3/22/02 printout.

"History has called us to a titanic struggle whose stakes could not be higher because we're fighting for freedom itself. We're pursuing great and worthy goals - to make the world safer and, as we do, to make it better," Bush told some four dozen heads of state meeting here.

Outlining his new foreign aid doctrine, the president pledged to press Congress to approve within the next 12 months the first wave of his proposed \$10 billion, three year program of additional funds rewarded to poor nations only if they root out corruption, commit to open markets and undertake serious political reform.

"By insisting on reform, we do the work of compassion," Bush said at the U.N. International Conference on Financing for Development, in which 171 countries participated.

The United States is committed to helping the world's poorest people, Bush said, as part of a "new compact for development defined by greater accountability." He called liberty, education and the rule of law "the conditions of development."

"And they are the common hopes of mankind," he said.

"We fight against poverty because hope is an answer to terrorism," Bush said. "We fight against poverty because opportunity is a fundamental right and human dignity. We fight against poverty because faith requires it and conscience demands it. And we fight against poverty with the growing conviction that major progress is within our reach."

Bush said the United States is determined to challenge "the poverty and hopelessness and lack of education and failed governments that too often allow conditions that terrorists can seize and try to turn to their advantage."<sup>346</sup>

9. Associated Press: "Bankers, IMF Discuss Debt, Poverty": November 19, 2001

World Bank President James Wolfensohn commented on the global import of "poverty and distress" in light of terrorism.

"There is, I think, an almost uniform recognition that poverty and distress in one part of the world is poverty and distress in another," World Bank President James Wolfensohn said. "The notion of two worlds - the rich and

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<sup>346</sup> Sandra Sobieraj; "Bush Vows to Help Globe's Poor: New Terrorism Worries Follow President on Latin American Trip;" Associated Press (Monterrey, Mexico): AOL News; published March 22, 2002 1459 EST; p. 1 of 3/22/02 printout.

poor, or the developed and developing world - collapsed with the World Trade Center."<sup>347</sup>

10. *Christian Century*: "Collective Consciences": U.S. Catholic Bishops: December 5, 2001

The U.S. Catholic Bishops commented on poverty that is exploited by terrorists.

In Washington, D.C., also on November 15, the U.S. Catholic bishops gave greater support to America's military actions, saying the "dreadful deeds of September 11 cannot go unanswered." The bishops, approving the statement in a 167-4 vote after a wide-ranging debate, cautioned that more attention must be paid to "those conditions of poverty and injustice which are exploited by terrorists."<sup>348</sup>

11. Associated Press: Louis Farrakhan: September 16, 2001

Louis Farrakhan was quoted in a September 16, 2001 AP article.

Nation of Islam leader Louis Farrakhan, at a mosque in Chicago, condemned the "wild beasts" who perpetrated the assault and supported harsh punishment for them.

But Farrakhan also argued U.S. foreign policy fostered hatred overseas, a feeling that could change if the government did more to help poor countries.<sup>349</sup>

12. News-Gazette: "Martin Marty": September 16, 2001

Martin Marty comments on the relationship between "movements of discontent" and poverty.

If fundamental religious believers committed the terrorist attacks on the United States last week, the Rev. Martin Marty, one of America's foremost theologians who lives in the Chicago suburbs, knows some of their mind-sets...

Marty, professor emeritus of the Divinity School at The University of Chicago, was project director for the recently completed five-year Fundamentalism Project of the American Academy of Arts and Sciences. The project studied comparative fundamentalist religious movements around the world.

<sup>347</sup> "Bankers, IMF Discuss Debt, Poverty," an Associated Press (Ottawa) article appearing in *Champaign (Ill.) News-Gazette*, 19 November 2001, sec. A, p. 5.

<sup>348</sup> "Collective Consciences," *Christian Century*, 5 December 2001, p. 10.

<sup>349</sup> Rachael Zoll; "Americans Fill Churches to Pray;" Associated Press: AOL News; published September 16, 2001 2004 EDT; p. 3 of 9/17/02 printout.

Marty is scheduled to talk in Champaign-Urbana Thursday. He was invited months ago by the Center for Advanced Study at the University of Illinois and the Mortenson Center for International Library Programs. His speech, “Religion on the Global Scene: The Killer that Heals,” also was planned months ago.

“I’m changing it in a sense that what might have been whispers are now shouts and what would have been footnotes are now headlines,” Marty said...

The lecture is planned at 4 p.m. Thursday in the Colwell Playhouse of the Krannert Center for the Performing Arts...

In the speech, Marty said he would talk about some of his research findings. He stated some of his points...

“I also plan to talk about the healing side of religion,” he said about his talk Thursday.

“Movements of discontent often are born of discontent occasioned by poverty,” he said. For the future, “Maybe more generous policies to help abolish poverty would help.”<sup>350</sup>

## XXII. Human Microchip Implants: Evaluation

### A. Air Force 2025: Implanted Microscopic Chips: “Information Operations: A New War-Fighting Capability,” “A Research Paper Presented To *Air Force 2025*”

Of interest in *Air Force 2025*, a study (see “Disclaimer” below for a brief description) is the “Ethical and Public Relations Issues” section below, which notes that, “Implanting ‘things’ in people raises ethical and public relations issues.<sup>112</sup> While these concerns may be founded on today’s thinking, in 2025 they may not be as alarming. We already are evolving toward technology implanting.”<sup>351</sup> The following material from *Air Force 2025* is included in order to provide a reasonable degree of context for these comments from the “Ethical and Public Relations Issues” section.

#### 1. “Disclaimer”

<sup>350</sup> Lynda Zimmer, “Fundamentalist Religion Expert to Speak Here,” *Champaign (Ill.) News-Gazette*, 16 September 2001, sec. E, p. 6.

<sup>351</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Chapter 4, System Description;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-4.htm - v3c2-4>>; p. 4 of 2/27/03 9:59 AM printout.

A “Disclaimer” at the beginning of “Information Operations” includes a brief explanation of *Air Force 2025*. Following is the text of the “Disclaimer.”

*2025* is a study designed to comply with a directive from the chief of staff of the Air Force to examine the concepts, capabilities, and technologies the United States will require to remain the dominant air and space force in the future. Presented on 17 June 1996, this report was produced in the Department of Defense school environment of academic freedom and in the interest of advancing concepts related to national defense. The views expressed in this report are those of the authors and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States government.

This report contains fictional representations of future situations/scenarios. Any similarities to real people or events, other than those specifically cited, are unintentional and are for purposes of illustration only.

This publication has been reviewed by security and policy review authorities, is unclassified, and is cleared for public release.<sup>352</sup>

## 2. “Executive Summary”

The following excerpted passages from the “Executive Summary” provide background and context for “implanted microscopic chips” discussed in the Air Force *2025* research paper, “Information Operations: A New War-Fighting Capability.” “Implanted microscopic chips” are intended to be used for “computer-generated mental visualizations,” in order, via a system, called the Cyber Situation, to help optimize “commanders' ability to operate air and space systems. The Cyber Situation enables commanders and decision makers to have in-time access to the battlespace, characterize the nature of the engagement, determine the calculated probabilities of success from the various authorized lethal or nonlethal options, decide what to do, employ the weapons chosen, and receive in-time feedback on the result of the engagement.

In its most basic form, commanders have always performed the functions of observe, orient, decide, and act (OODA Loop) to prosecute military operations.<sup>1</sup> As with Alexander the Great, history shows the military commander who best analyzes, decides, and controls the speed of the engagement prevails in nearly every conflict. To master the

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<sup>352</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Disclaimer;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-1.htm>>; pp. 1-2 of 2/27/03 9:57 AM printout.

OODA Loop, military leaders have pushed technology to obtain more information.<sup>2</sup> Ironically, this situation now leads to the requirement to solve two fundamental challenges if the United States expects to maintain air and space dominance in 2025. First, the proliferation of unintegrated military war-fighting architectures gives the commander potentially conflicting perspectives of the battlespace.<sup>3</sup> Second, the explosion of available information creates an environment of mental overload leading to flawed decision making. Failure to master these challenges critically weakens the military instrument of power. This paper presents a solution to these challenges by confronting commanders as they employ future airpower forces.

Regarding the first challenge, the large number of specialized war-fighting architectures makes information integration supporting overall coordination and control more important and more difficult. Simultaneously, the speed and the range of modern weapons drastically reduces the time commanders have to integrate conflicting information and decide on a course of action.

The second challenge is to harness the information explosion to combat mental overload, thus improving decision making. Recent exercises reveal an alarming number of unread messages because of information overload.<sup>4</sup> As the quantity of data rises, the difficulty of preparing and interpreting it for decision making grows. Traditionally, the military attempted to solve this problem by increasing the number of communications nodes. These past solutions only injected additional inputs and information without improving decision-making capability.

The optimum solution must integrate the functions within the OODA Loop and allow the commander to control the momentum of the cycle. This paper describes how a system, called the Cyber Situation, can do just that, thus optimizing commanders' ability to operate air and space systems. The Cyber Situation enables commanders and decision makers to have in-time access to the battlespace, characterize the nature of the engagement, determine the calculated probabilities of success from the various authorized lethal or nonlethal options, decide what to do, employ the weapons chosen, and receive in-time feedback on the result of the engagement.

The Cyber Situation system includes five major components. First, all-source information collectors will transmit raw data to the Information Integration Center (IIC), as discussed below. Second, archival databases, linked to the IIC, will be used for historical analyses to fill information gaps if the data is not available for collection.

Third, the IIC, an integrated and interconnected constellation of "smart" satellites will analyze, correlate, fuse, and deconflict all relayed data. Fourth, implanted microscopic chips link users to the IIC and create computer-generated mental visualizations.<sup>5</sup> The visualization encompasses the individual and allows the user to place himself into the selected battlespace. Fifth, lethal and nonlethal weapons will be linked to the IIC, allowing authorized users to employ them from the Cyber Situation.

Implied in the Cyber Situation are five key technologies evolving on separate paths that will synergize by 2025 to achieve this goal. They include collection platforms, communications infrastructure, computing power, intelligent software, and human systems and biotechnology. Most of these technologies will evolve through the commercial community, but the military must focus research and development efforts on biological and computational intelligent software and biotechnology breakthroughs to allow mental visualization.<sup>353</sup>

### 3. "Implanted Microscopic Chip": Two Functions

The implanted microscopic brain chip is intended to perform two functions, as described in Chapter 4 of the Air Force **2025** research paper, "Information Operations: A New War-Fighting Capability."

The implanted microscopic brain chip<sup>110</sup> performs two functions. First, it links the individual to the IIC, creating a seamless interface between the user and the information resources (in-time collection data and archival databases). In essence, the chip relays the processed information from the IIC to the user. Second, the chip creates a computer-generated mental visualization based upon the user's request. The visualization encompasses the individual and allows the user to place himself into the selected battlespace.<sup>354</sup>

### 4. "Human Systems and Biotechnology: Charting the Brain"

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<sup>353</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; "Information Operations: A New War-Fighting Capability: Executive Summary," *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-1.htm> - Introduction>; pp. 1-2 of 2/27/03 9:57 AM printout.

<sup>354</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; "Information Operations: A New War-Fighting Capability: Chapter 4, System Description," *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-4.htm> - v3c2-4>; pp. 3-4 of 2/27/03 9:59 AM printout.

“[T]o place the human computer interface directly in the brain” is “[t]he logical extension” considered in Chapter 3 of the Air Force 2025 research paper, “Information Operations: A New War-Fighting Capability.”

Computers can play a significant role in nearly every area of human-information processing. Their potential lies in organizing information to assist human decision making. They can produce more options than a human brain can recall.<sup>91</sup> In fact, computers have become the preferred medium for information storage and recall.<sup>92</sup>

However, a gap still exists in the information flow between humans and computers. Information is processed by a human looking at a screen, reading the data, and translating it into something useful through internal thought. "We talk longingly about human-computer interactions and conversational systems, and yet we are fully prepared to leave one participant in this dialogue totally in the dark. It is time to make computers see and hear."<sup>93</sup> Users should "converse" with computers. Intelligent systems outlined above provide only part of the answer to improve human-computer interaction. The missing piece is a better way to format and transmit information from the digital computer processor in the computer chip to the analog human processor in the human brain.

Instead of formatting a cathode ray tube (CRT) to more easily access and display data, a computer can be designed and programmed to bypass the CRT and format information which can be immediately processed by the brain. The logical extension would be to place the human computer interface directly in the brain. Some significant progress already has been made in this area by the Stanford University research center and their development of a nerve chip.

It is an electronic interface for individual nerve cells to communicate with a computer. This human-machine linkage will. . . enhance human capability in many ways. If artificial eyes can convert video to nerve signals, won't it be possible to use the same technique to superimpose computer-generated information in front of one's field of view?<sup>94</sup>

This capability will have extraordinary commercial applications from medical advances. These advances will help restore patients with damaged neural, audio, and

visual systems as well as enable individuals to achieve the "ultimate virtual reality trip."<sup>95</sup> 355

5. "Human Systems and Biotechnology: Visualization and Mental Imaging"

[A] brain implant hooked to the all the sensory segments of the brain, not just the eye" is considered in Chapter 3 of the Air Force **2025** research paper, "Information Operations: A New War-Fighting Capability."

This second broad category encompasses a realm of the cyberspace essential to the concept. Developing technologies are based around the idea of virtual projection systems that evolve into holographic image projection. The National Center for Supercomputing Applications Virtual Reality Laboratory "is a research facility engaged in the exploration of new methods of visualizing an interfacing with scientific data and simulations."<sup>96</sup> To further their objectives, they have created the CAVE a "surround-screen surround-sound, projection-based virtual reality system."<sup>97</sup> Multiple participants can enter the CAVE and interact by wearing stereo glasses rather than a helmet. "The CAVE can be coupled to remote data sources, super computers and scientific instruments via high-speed networks."<sup>98</sup> The NWV Information Technology Panel considers significant virtual reality advancements in the next 10 to 20 years. However, the display mechanism will primarily involve a helmet.

Commercial applications are easy to envision, witness the growing entertainment market for virtual reality games. This appears to be the next step from video teleconferencing. Another useful application will be for training systems-especially simulations.<sup>99</sup> This has wide commercial applications, especially as future systems will require such high-knowledge levels to use them as transportation and manufacturing.

A more specific military application of this type of technology is the DOD simulation network (SimNet). This capability allows a simulator to emulate a battlefield precisely. Trainees sit in their own aircraft or tank simulator and are able to "view" the battlefield from their own perspective. "Army tankers in trainers in Fort Knox can look out of their sites and see the same location-only

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<sup>355</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; "Information Operations: A New War-Fighting Capability: Chapter 3, Technology Investigation;" *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-3.htm - v3c2-3>>; pp. 10-11 of 2/27/03 9:58 AM printout.

from each of their individual perspectives. Air Force pilots in California can 'fly' missions . . . at the same time."<sup>100</sup>

A combination of brain processes and visual imaging already has been developed in the laboratory. The California Institute of Technology has developed an energy efficient computer chip which emulates the analog thinking of the human brain. It is specifically modeled on the construction of the human brain, specifically the cerebral cortex.<sup>101</sup> When this capability is fully mature, this chip could provide the baseline for a brain implant hooked to the all the sensory segments of the brain, not just the eye.

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## 6. “Bringing It Altogether--The Nexus: Human Systems and Biotechnology”

The need for “one big leap over a single chasm”—that is, the chasm of “understanding the way information is formatted in the brain and how it is used” is considered in Chapter 3 of the Air Force **2025** research paper, “Information Operations: A New War-Fighting Capability.”

This area requires the most work to achieve the Cyber Situation. Work is expected to continue at a modest pace until a breakthrough in...this technology is achieved.<sup>107</sup> Like many advanced research areas, work here will require one big leap over a single chasm. In this case, the chasm is understanding the way information is formatted in the brain and how it is used. Once this chasm is achieved, progress in human computer interaction will grow exponentially and quickly catch up with the other technology areas.

By 2025 the five technology areas will be effectively linked to develop the Cyber Situation to enable commanders to achieve information dominance. The next chapter will describe the Cyber Situation system, its components, and how it meets the attributes of the OODA Loop tasks.<sup>357</sup>

## 7. “Conclusion”

<sup>356</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Chapter 3, Technology Investigation;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-3.htm - v3c2-3>>; p. 11 of 2/27/03 9:58 AM printout.

<sup>357</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Chapter 3, Technology Investigation;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-3.htm - v3c2-3>>; p. 13 of 2/27/03 9:58 AM printout.

That the “brain chip” technology was not “well along in development” as of 1996, is noted in Chapter 8 of the Air Force **2025** research paper, “Information Operations: A New War-Fighting Capability.”

Once a decision had been reached, the commander transmits execution orders. These orders must be properly formatted and transmitted to subordinate units for action. Again, there is an unavoidable time lag between when the orders are transmitted and when they are acted upon. In these precious hours, the situation the commander desires to effect can change dramatically.

With the capability provided by the Cyber Situation, the commander can employ forces instantly and flexibly. Whether the weapon of choice is a laser, UAV, or F-22, through the Cyber Situation the commander has instant access to it.

What is even more compelling about the capability available through the Cyber Situation is that with the exception of the brain chip, the technologies required to field it are well along in development in 1996. Communications architectures are growing in both commercial and military applications and computer power is still on an exponential growth rate. Software, too, is becoming more intelligent. Indeed, the required capability is on the horizon.<sup>358</sup>

8. “Cyber Situation Components: Why the Implanted Microscopic Chip?”

The question of “Why the implanted microscopic chip?” is addressed in Chapter 4 of the Air Force **2025** research paper, “Information Operations: A New War-Fighting Capability.”

While other methods such as specially configured rooms, special helmets, or sunglasses may be used to interface the user with the IIC, the microscopic chip is the most viable. Two real operational concerns support the use of implanted chips and argue against larger “physical” entities to access the Cyber Situation.

First, future operations will demand a highly flexible and mobile force that is ready at moment's notice to employ aerospace power. The chip will give these forces the ability to communicate, visualize, and prosecute military operations. Having to manage and deploy a “physical” platform or room hampers mobility and delays time-

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<sup>358</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Chapter 8, Conclusion;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-6.htm - v3c2-6>>; p. 6 of 2/27/03 9:59 AM printout.

sensitive operations. US aerospace forces must be prepared to fight or to conduct mobility or special operations anywhere in the world on extremely short notice although some of these operations may be staged directly from the continental United States.<sup>111</sup>

Second, a physical entity creates a target vulnerable to enemy attack or sabotage. A highly mobile information operations center created with the chip-IIC interface makes it much more elusive to enemy attack. These reasons argue against a larger physical entity for the Cyber Situation.

While this is a reasonable portability rationale for the use of chip, some may wonder, "Why not use special sunglasses or helmets?" The answer is simple. An implanted microscopic chip does not require security measures to verify whether the right person is connected to the IIC, whereas a room, helmet, or sunglasses requires additional time-consuming access control mechanisms to verify an individual's identity and level of control within the Cyber Situation.

Further, survey any group of commanders, decision makers, or other military personnel if they enjoy carrying a beeper or "brick" at all times. Likely, few like to carry a piece of equipment. Now, imagine having to maintain a critical instrument that allows an individual to access the Cyber Situation, and thus control the US military forces. Clearly, this is not an enviable position, since the individual may misplace or lose the helmet or sunglasses, or worse yet, the enemy may steal or destroy it. These are unnecessary burdens.<sup>359</sup>

#### 9. "Cyber Situation Components: Ethical and Public Relations Issues"

The "ethical and public relations issues" related to "[i]mplanting 'things' in people" such as "microscopic chips" are addressed in Chapter 4 of the Air Force **2025** research paper, "Information Operations: A New War-Fighting Capability."

Implanting "things" in people raises ethical and public relations issues.<sup>112</sup> While these concerns may be founded on today's thinking, in 2025 they may not be as alarming. We already are evolving toward technology implanting. For example, the military currently requires its members to receive mandatory injections of biological organisms (i.e., the flu shot). In the civilian world, people receive

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<sup>359</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; "Information Operations: A New War-Fighting Capability: Chapter 4, System Description;" *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-4.htm - v3c2-4>>; p. 4 of 2/27/03 9:59 AM printout.

mechanical hearts and other organs. Society has come to accept most of these implants as a fact of life. By 2025 it is possible medical technology will have nerve chips that allow amputees to control artificial limbs or eye chips that allow the blind to see.<sup>113</sup> The civilian populace will likely accept an implanted microscopic chips that allow military members to defend vital national interests. Further, the US military will continue to be a volunteer force that will freely accept the chip because it is a tool to control technology and not as a tool to control the human.<sup>360</sup>

#### 10. Illustrative Instances of “Neuroengineering” and “Cyborgs”

The following instances of direct brain interaction with various aspects of external reality merely serve to illustrate the type of research that may relate to the “brain chip” technology noted the Air Force **2025** research paper, “Information Operations: A New War-Fighting Capability.”

- a. “Emory Neuroscientists Use Computer Chip To Help Speech-Impaired Patients Communicate”: *Science Daily*: Emory University Health Sciences Center: November 11, 1998

Emory University research reported in 1998 has shown that brain implants have been used to control computer signals.

Roy E. Bakay, M.D., a neurosurgeon at Emory University and neuroscience colleague Phillip R. Kennedy, M.D., have developed a neurotrophic electrode that can be placed in the brain to help these patients communicate through a computer...

The neurotrophic electrode is implanted into the motor cortex of the brain using a tiny glass encasing. Neurotrophic factors are implanted into the glass, and the cortical cells grow into the neurotrophic electrode and form contacts. It takes several weeks for the cortical tissue to grow into the electrode.

The neurons in the brain transmit an electronic signal when they "fire." Recording wires are placed inside the glass cone to pick up the neural signals from the ingrown brain tissue and transmit then through the skin to a receiver and amplifier outside of the scalp. The system is powered by an induction coil placed over the scalp. There are no wires going through the skin. Neural signals are used to drive the computer cursor in the same way a computer mouse is moved back and forth. The recorded neural signals are

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<sup>360</sup> LTC William B. Osborne (USA), Maj Scott A. Bethel, Maj Nolen R. Chew, Maj Philip M. Nostrand, Maj YuLin G. Whitehead; “Information Operations: A New War-Fighting Capability: Chapter 4, System Description;” *Air Force 2025*; published August 1996; <<http://fas.org/spp/military/docops/usaf/2025/v3c2/v3c2-4.htm - v3c2-4>>; p. 4 of 2/27/03 9:59 AM printout.

connected to the computer and are used as a substitute for the mouse cursor.

"Our present patient, who is at the Atlanta Veterans Affairs Medical Center, is paralyzed except for his face due to brainstem stroke following a heart attack, is dependent on a ventilator and cannot speak, yet he is fully alert and intelligent," Dr. Bakay said. "This patient, who was implanted five months ago with the electrode, can move the cursor from icon to icon in a horizontal direction. As each icon is encountered, a phrase is spoken by the computer. The patient's favorite is, "See you later. Nice talking with you"..."

The neurotrophic electrode technology was developed and patented by Dr. Kennedy while at the Georgia Institute of Technology. Its testing and development in animals over the past 12 years has been a collaboration between Emory University and Georgia Tech. The research has been supported by the Emory/Georgia Tech Biomedical Research Consortium, the American Paralysis Association and the Department of Veterans Affairs. The National Institutes of Health (NIH) has recently awarded funding to continue the Phase I research in at least one more patient.<sup>361</sup>

- b. "Scientists Create Robo-Fish Cyborg Using a Lamprey's Brain ... No, Really": *Small Times*

*Small Times* Senior Writer Tom Henderson reports on the use of a fish brain to control a robot. A photo caption reads, "Above, the robot, running on lamprey power, takes aim at a light bulb."<sup>362</sup>

Dr. Ferdinando Mussa-Ivaldi and his fellow researchers at Northwestern University, the University of Illinois at Chicago and the University of Genoa in Italy use the brain stem and part of the spinal cord of a lamprey to control a wheeled robot. It is research they hope will allow people to be fitted with prosthetics wired to a variety of small-tech sensors that are directly controlled by the brain...

"This will help us establish better communications between the brain and machines," says Mussa-Ivaldi...

<sup>361</sup> "Emory Neuroscientists Use Computer Chip To Help Speech-Impaired Patients Communicate;" Emory University Health Sciences Center news release adapted for story in *Science Daily*; published November 11, 1998; <<http://www.sciencedaily.com/releases/1998/11/981111080706.htm>>; pp. 1-2 of 4/15/03 3:33 PM printout.

<sup>362</sup> Tom Henderson; "Scientists Create Robo-Fish Cyborg Using a Lamprey's Brain ... No, Really;" *Small Times*; copyright 2002; <[http://www.smalltimes.com/document\\_display.cfm?document\\_id=1489](http://www.smalltimes.com/document_display.cfm?document_id=1489)>; p. 1 of 4/15/03 3:39 PM printout.

This is high tech done on the cheap. Pointing to the light sensors, the computer, the motion-dampened table, the electrodes going in and out of the fish brain, Mussa-Ivaldi says: "These are all off-the-shelf components."

The components are also out of the toy box, and out of the fishing-tackle box...

The project was funded in its first three years by a grant from the Office of Naval Research. A second three-year Navy grant has just begun.

According to a spokesperson for the Office of Naval Research, the two grants for the lamprey project have totaled \$660,000.

The office funded the project, said the spokesperson, "because it is in the forefront of technologies related to the development of intelligent robots. The research is an early step towards adaptive robotic systems of the future."

Mussa-Ivaldi didn't want to speculate on how long his research might take to result in real applications but says it is all part of the momentum that is building in related research. "The interest in this area, neuroengineering, is becoming very big."<sup>363</sup>

- c. "Scientists Create Robo-Fish Cyborg Using a Lamprey's Brain ... No, Really": Cyborgs around the World: *Small Times*

*Small Times* Senior Writer Tom Henderson reports that, "Animal-machine cyborgs are becoming reality at research institutions around the world." Henderson then reports on four "noteworthy examples."

Researchers at Emory University and Georgia Institute of Technology have collaborated to use neurons from leeches to solve simple addition problems, through an interaction with a PC.

Also at Atlanta's Emory University, Phillip Kennedy and Roy Bakay, both with the department of neurosurgery, have implanted electrodes into the motor cortex of patients who are "locked in" - that is, those suffering from Lou Gehrig's disease or severe stroke who are aware of their surroundings but no longer able to communicate. With cortex implants, patients have been able, through the power of thought,

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<sup>363</sup> Tom Henderson; "Scientists Create Robo-Fish Cyborg Using a Lamprey's Brain ... No, Really;" *Small Times*; copyright 2002; <[http://www.smalltimes.com/document\\_display.cfm?document\\_id=1489](http://www.smalltimes.com/document_display.cfm?document_id=1489)>; pp. 1-3 of 4/15/03 3:39 PM printout.

to control a cursor on a computer screen and, as a result of a corresponding computer program, produce audible sounds.

This summer, Kevin Warwick, a professor who heads up the Cybernetics Department at the University of Reading in the United Kingdom, plans to implant a silicon chip in his own body, which will interact with his brain. Surgeons will connect the chip to nerve fibers in his left arm, and the chip is supposed to exchange signals between his brain and a computer. It is hoped that as Warwick makes various motions, the computer will eventually be able to replicate the signals to his arm, too, and control motion when asked to.

Miguel Nicolelis, a bioneurologist at Duke University, published an article in *Nature* last November detailing his work on owl monkeys that operate a robot arm using only their brain signals. Eventually, he theorizes, amputees could use what he calls a hybrid brain-machine interface to control artificial arms or legs, or those paralyzed by spinal-cord injuries could transmit signals back and forth between body parts and brain. "The brain is still the best computer around," says Mussa-Ivaldi. "The more we understand it, the better we can emulate it in an artificial situation."<sup>364</sup>

B. *Sunday Times*: Human Microchips Implants: Kidnapping: Pros and Cons: October 11, 1998

*The Sunday Times of London*, in 1998, reported the pros and cons of implanting microchips in humans to thwart kidnapping.

A microchip under the skin that can help to locate hostages is being marketed to combat one of the world's biggest growth industries—there were a record 1,407 abductions for ransom worldwide last year, up 60% since 1990...

The Sky-Eye is seen as an alternative to surrounding the children of the rich and famous with teams of burly bodyguards...

Others are more cynical about the microchip, however. Robert Davies, a special risks underwriter for Hiscox, an insurance group that holds 5,000 kidnap policies, said it might work in Britain or the United States but could prove hazardous in less developed countries, where victims were likely to be shot in

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<sup>364</sup> Tom Henderson; "Scientists Create Robo-Fish Cyborg Using a Lamprey's Brain ... No, Really;" *Small Times*; copyright 2002; <[http://www.smalltimes.com/document\\_display.cfm?document\\_id=1489](http://www.smalltimes.com/document_display.cfm?document_id=1489)>; pp. 3-4 of 4/15/03 3:39 PM printout.

rescue attempts and the police were sometimes in league with the kidnapers.

“We are aware that kidnap gangs in Mexico, the most sophisticated in the world, are searching victims for scars that might hide such devices...” Terry Waite, who was a hostage in Beirut for 5 1/2 years, said: “It is very dangerous because once kidnapers get to know about these things they will skin you alive to find them. There were rumours when I was kidnapped that I had been planted with locator devices.

“I was given rigorous searches, my clothes were changed and I even had my teeth checked.”<sup>365</sup>

C. Professor Kevin Warwick, United Kingdom Scientist, Implanted with a Microchip in 1998: Evaluative Aspects

1. BBC News: UK Scientist Implanted with Chip States Positive and Negative Sides: August 25, 1998

BBC News reported that a UK scientist who received an implanted chip stated the positive and negative sides of such a development.

A silicon chip has been successfully implanted into the arm of a UK scientist...

[Professor Kevin Warwick], from the University of Reading, in England, is taking part in the experiment to highlight some of the dangers of the technology...

But he says the real reason for having the chip inserted was to demonstrate the sinister side of the pushing the frontiers of technology forward.

"There are positive sides and negative sides - positive in helping people around big building, negative are the...big brother issues - machines or computers controlling humans," he said.

He says that if their use became widespread we would never enjoy any privacy and could be followed and identified wherever we went.<sup>366</sup>

2. Range of Reactions to Implant: computerworld.com: January 11, 1999

<sup>365</sup> Maurice Chittenden and David Lloyd, “007 Implant to Protect Kidnap Targets,” *Sunday Times* (London), 11 October 1998, sec. 1, p. 13.

<sup>366</sup> “Technology Gets Under the Skin;” BBC News: Sci/Tech; published August 25, 1998 at 1054 GMT 11:54 UK; <<http://news.bbc.co.uk/1/hi/sci/tech/158007.stm>>; pp. 1-3 of 1/20/03 3:23 AM printout. This item was located initially via <<http://www.raidersnewsupdate.com/bbc.html>>; pp. 1-2 of 4/24/02 8:57 AM printout..

There was a range of reaction to microchip implantation of Professor Kevin Warwick, director of cybernetics at the University of Reading in the U.K.

Though the experiment sounds like an episode of Dr. Who, real-world implications are "right around the corner," says Warwick, who foresees enormous medical applications. Through a system of embedded chips interfacing with an artificial motor system, Warwick imagines paraplegics walking...

Not everybody is as avid, of course. In a world in which cloning already is a reality, the microprocessor implant gives rise to more staggering ethical questions...

Reactions to the experiment have ranged from enthusiasm to fear to disbelief...

Warwick has received outraged E-mail from what he calls "the very strong end of the Charlton Heston lobby" at suggestions made by radio pundits that gun owners be embedded to prevent anyone else from using their firearms. Articles and talk shows from London to Des Moines to Oslo have buzzed with ethical hesitation from people of all manner of political and religious beliefs.

Not everybody shares this hesitation. In addition to encouragement from his scientific colleagues, various envoys from the chip industry have been in touch. "The latest count is 23," Warwick says, including "one particular company, a very large one, not too far from where you're sitting."

The reporter was sitting in San Francisco. Warwick declined to be more specific. An Intel Corp. spokeswoman wouldn't verify any contact with Warwick.

The implant experiment has brought millions of dollars in corporate research money to the cybernetics department at the University of Reading. Part of Warwick's motivation may have been to attract more financial assistance to the school.

But mostly, the professor seems motivated by good, old-fashioned scientific curiosity...<sup>367</sup>

- D. Peter Zhou, Applied Digital Solutions, Digital Angel: "Inventors are not responsible for evil use of their technology... You cannot blame Einstein for the atom bomb.": Business2.0: December 2000

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<sup>367</sup> Sam Witt; "Professor Warwick Chips In;" published January 11, 1999; <<http://www.computerworld.com/news/1999/story/0,11280,33499,00.html>>; p. 2 of 3/5/03 4:35 PM printout.

An article entitled, "Digital Angel Is Watching You," includes reflections on human implant chips. The article was introduced with a two-sentence overview: "Bio-digital implants that monitor and broadcast your every move could save your life in an emergency. Or destroy your last vestige of privacy."

The force behind Digital Angel is Applied Digital Solutions (ADS), an Internet telephony company in Palm Beach, Fla. In late 1999 ADS paid Massachusetts inventor Paul Gargano for the patent rights to a "personal tracking and recovery system." The patent described the combination of GPS and wireless, but lacked a biosensor. ADS set up Digital Angel.net as a wholly owned subsidiary in Hauppauge, N.Y., and within a month hired engineer Peter Zhou to oversee the research. In late October, DigitalAngel.net was set to unveil a prototype and hoping to attract press attention and investors...

In an age when people are increasingly sensitive to issues surrounding surveillance, privacy, and data security, a technology that gathers deeply personal information and knows where people are is not going to get a free ride.

ADS already knows this. "It has the ability to be perceived as an invasion-of-privacy, Big Brother technology that, if not handled properly, could lead to abuses," [Bob] Jackson[, director of investor relations for ADS] says. If ADS one day decides to offer implantation of Digital Angel, the company would set up an oversight board to monitor deployment because of the ethical issues sure to be raised by such a move, he says.

"I can see someone who's 90 years old and has a bad heart," says Deborah Pierce, a staff attorney for the Electronic Frontier Foundation. "You want to know where they are and save their life." But Pierce worries about whom besides the doctors would be privy to this personal information. "If law enforcement comes knocking on the door with a warrant, even a civil subpoena, then you are going to have to turn that over," she says...

Zhou is candid and good-humored in interviews, and is not shy about discussing the ethical implications of his research. "If I can, I will make it hard to use Digital Angel for anything other than to save life," he says. But Zhou is not sure how far his responsibility extends. "Inventors are not responsible for evil use of their technology. What other people do I cannot control," Zhou says. "You cannot blame Einstein for the atom bomb."<sup>368</sup>

#### E. Limited Discussion: HighGrader Magazine: May-June 2001

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<sup>368</sup> Rick Overton; "Digital Angel Is Watching You;" *Business2.0*; published December 2000; <<http://www.business2.com/articles/mag/print/0,1643,14362,00.html>>; pp. 1-2 of 4/25/02 9:43 AM printout.

An article entitled, "Dark Angels: New Micro-chip Technology for Pets, Children and You," comments on the narrow range of discussion on microchip implants.

What is becoming clearer and clearer with the wireless revolution is that notions of privacy are being quickly outdated. And the only ones who seem to be really freaked out are the doomsday 'Mark of the Beast' folks. I've been checking out their websites - besides the numerology and end times ranting there's actually a lot of stuff about globalization and the onset of some disturbing technologies.

Chris Gray is one person who is concerned that the discussion has been relegated to the fringe.

"Well, there are a lot of people who are concerned about this technology, but the only real discourse on these issues is occurring either in the political extremes or in academia," says Gray, a Cyborgologist (the study of the interface between humans and machines) from the University of Great Falls in Montana.<sup>369</sup>

- F. Pilots Could Be Chipped; Violent Criminals and Terrorists Should Be Chipped; Microchips Could Track Foreigners: "They Want Their ID Chips Now," Wired News: February 6, 2002

A February 6, 2002 Wired News article entitled, "They Want Their ID Chips Now," included evaluative comments after first reporting that the Jacobs family "could become the first family in the world to be implanted with microchips..."

The chip in question, the VeriChip, is similar to the biochips that have been used to identify pets and livestock for years.

Made by Applied Digital Solutions (ADS), the VeriChip stores six lines of text and is slightly larger than a grain of rice. It emits a 125-kHz radio frequency signal that can be picked up by a special scanner up to four feet away...

(Currently the chip is immutable once the device is injected via a syringe, using local anesthetic. In future applications, the chip may include a GPS receiver and other advanced features, company officials said.)...

The idea of requiring people to be implanted was brought up by Applied Digital Solutions CEO Richard Sullivan in an interview with the Palm Beach Post, in which he suggested microchips be used to track foreigners visiting the United States. (The company has since downplayed his comments.)

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<sup>369</sup> Brit Griffin; "Dark Angels: New Micro-chip Technology for Pets, Children and You;" *HighGrader Magazine*; published May-June 2001; <<http://www.grievousangels.com/highgrader/2001/angel.html>>; p. 6 of 1/14/02 9:06 AM printout.

But an X-Files-type scheme where everyone is forcibly marked and monitored by the government worries both civil libertarians and Christians, who believe new technologies such as biometrics and biochips may be the feared "Mark of the Beast" of Biblical lore that is described in Revelations 13:16:

"He also forced everyone, small and great, rich and poor, free and slave, to receive a mark on his right hand or on his forehead, so that no one could buy or sell unless he had the mark, which is the name of the beast or the number of his name."

Gary Wohlscheid, the president of The Last Day Ministries — a group espousing the belief that humanity is on the verge of an apocalyptic showdown between the forces of good and evil — believes the VeriChip could be this mark. Although the chip is not yet small enough to be injected into the forehead or right hand at the moment, it could be in the future, he said.

"Out of all the technologies with potential to be the mark of the beast, the VeriChip has got the best possibility right now," he said. "It's definitely not the final product, but it's a step toward it. Within three to four years, people will be required to use it. Those that reject it will be put to death."

Wohlscheid felt so strongly about this possibility that he created a Web page to warn others of the microchip's evil potential.

To quell Christians' fears, [Keith] Bolton [senior vice president of technology development], the Jacobses and a theologian recently appeared on the 700 Club, hosted by televangelist Pat Robertson.<sup>370</sup>

#### G. CBS News Correspondent Andy Rooney: February 10, 2002

CBS News Correspondent Andy Rooney in a February 10, 2002 weekly commentary, entitled, "Finding The Bad Guys," gives positive consideration to "something planted permanently" in his arm that would identify him.

We need some system for permanently identifying safe people. Most of us are never going to blow anything up and there's got to be something better than one of these photo IDs - a tattoo somewhere maybe.

The Saudis used an American devi[c]le to scan the eyes of travelers. I wouldn't mind having something planted permanently in my arm that would identify me.<sup>371</sup>

<sup>370</sup> Julia Scheeres; "They Want Their ID Chips Now;" Wired News; published February 6, 2002; <<http://www.wired.com/news/print/0,1294,50187,00.html>>; pp. 1-2 of 3/9/02 3:19 PM printout.

<sup>371</sup> Andy Rooney, CBS News Correspondent; CBS News, New York; published February 10, 2002;

H. Associated Press: Three Options: Governmental Tracking, Biblical Apocalypse, or Evolution of Man and Technology: February 12, 2002

An Associated Press article on *The Miami Herald* Web site reported three options for microchips implanted in humans: governmental tracking, Biblical apocalypse, or evolution of man and technology.

A family in Boca Raton have volunteered to be implanted with microchips, which would make them the first family imbedded with the identification devices.

Derek Jacobs, a 14-year-old computer whiz, is poised to become the first child to receive the implant, which can be scanned for identification and medical information...

Only two adults have been implanted with the microchip, one in Europe and a doctor working for Applied Digital Solutions, the Palm Beach company that makes the microchip, called a VeriChip.

The microchips have been criticized both as governmental attempts to track citizens and as Biblical signs of the apocalypse[.]

But Derek doesn't share those views.

"I see it as more of an evolution of man and technology," he said.<sup>372</sup>

I. Function Creep: Electronic Frontier Foundation: Associated Press: February 26, 2002

A senior attorney for the Electronic Frontier Foundation considers privacy concerns in light of the fact that the use of any given technology may change over time.

For airports, nuclear power plants and other high security facilities, the immediate benefits could be a closer-to-foolproof security system. But privacy advocates warn the chip could lead to encroachments on civil liberties.

The implant technology is another case of science fiction evolving into fact. Those who have long advanced the idea of implant chips say it could someday mean no more easy-to-counterfeit ID cards nor dozing security guards.

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<<http://www.cbsnews.com/stories/2002/02/08/60minutes/rooney/printable328752.shtml>>; p. 1 of 4/17/02 3:38 PM printout.

<sup>372</sup> "Boca Raton Family Volunteers To Be First for Microchip Implants;" Associated Press article on *The Miami Herald* Web site; posted on February 12, 2002; <<http://www.miami.com/mld/miami/news/2654727.html>>; p. 1 of 3/1/03 8:40 AM printout.

Just a computer chip—about the size of a grain of rice—that would be difficult to remove and tough to mimic.

Other uses of the technology on the horizon, from an added device that would allow satellite tracking of an individual's every movement to the storage of sensitive data like medical records, are already attracting interest across the globe for tasks like foiling kidnappings or assisting paramedics.

Applied Digital Solutions' new "VeriChip" is another sign that Sept. 11 has catapulted the science of security into a realm with uncharted possibilities—and also new fears for privacy.

The problem is that you always have to think about what the device will be used for tomorrow," said Lee Tien, a senior attorney for the Electronic Frontier Foundation, a privacy advocacy group.

"It's what we call function creep. At first a device is used for applications we all agree are good but then it slowly is used for more than it was intended," he said.<sup>373</sup>

- J. Line in the Sand: VeriChip Always Voluntary: Applied Digital Solutions' Chief Technology Officer; Function Creep: Electronic Frontier Foundation's Senior Attorney: *World Magazine*: March 9, 2002

*World's* Chris Stamper contrasts Applied Digital Solution's Keith Bolton's "line in the sand" with Electronic Frontier Foundation's Lee Tien's "function creep."

A Florida company wants to market perhaps the most controversial security measure ever devised: a computer ID chip that can be embedded under someone's skin. Privacy advocates object, but the idea's backers say it provides almost foolproof protection for airports, nuclear facilities, and other strategic sites.

Applied Digital Solutions' new VeriChip is about the size of a grain of rice, hard to remove, and difficult to counterfeit...

"The line in the sand that we draw is that the use of the VeriChip would always be voluntary," said Keith Bolton, Applied Digital's chief technology officer. "We would never provide it to a company that intended to coerce people to use it."

The privacy issues raised by VeriChip won't die easily. Lee Tien, a senior attorney for the Electronic Frontier Foundation, complained that unscrupulous people could begin using it for

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<sup>373</sup> Christopher Newton, Associated Press Writer; "U.S. to Weigh Computer Chip Implant;" Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published February 26, 2002 7:55 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A7240-2002Feb26?language=printer>>; p. 1 of 2/28/02 7:49 AM printout.

dangerous purposes. “It’s what we call function creep,” he said. “At first a device is used for applications we all agree are good but then it slowly is used for more than it was intended.”<sup>374</sup>

- K. Steven Keating, Executive Director of the Privacy Foundation: “It Can Become Commercially Coercive”: *Miami Herald*: March 10, 2002

Steven Keating, executive director of the Privacy Foundation reflects on the possibility of government ever requiring “a technology like this on a segment of its population” and ways in which the use of chips can become “commercially coercive.”

Even famous curmudgeon Andy Rooney is pro-chip...

“I wouldn’t mind having something planted permanently in my arm that would identify me.”

But not everyone will want to become a human bar code.

“If a government ever requires a technology like this on a segment of its population, then I think it’s going to be very provocative,” said Stephen Keating, executive director of the Denver-based Privacy Foundation.

For example, airlines could encourage demand for chips by allowing people with implants to get faster security clearance. “It can become commercially coercive,” Keating said.<sup>375</sup>

- L. Chipped Family: *Time Magazine*: March 11, 2002

A March 11, 2002 *Time* article that previewed the chipping of the Jacobs family that took place on May 10, 2002, touches briefly on a critique of human microchip implanting.

There are plenty of skeptics, but Jeffrey Jacobs is not one of them. “People have been worried about Big Brother for years,” he says. “The three of us want to be part of not just this new technology but an evolution of humanity”...

The FDA is expected to approve the Jacobses’ implants within two months, and there are other ways to speed up the evolution. Two weeks ago, Applied Digital Solutions signed a deal to distribute VeriChips in Brazil, where kidnapping has become epidemic, especially among the rich and powerful. Government officials hope that VeriChips implanted in people considered at high risk could be used to track victims via satellite. “Here [in the U.S.] we’re still dealing with FDA and privacy and civil-liberties issues,” says [Keith] Bolton [vice president of Applied

<sup>374</sup> Chris Stamper, “Technology: New...But Improved?: Under My Skin,” *World*, March 9, 2002, p. 42.

<sup>375</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; p. 2 of 1/21/03 10:55 AM printout.

Digital Solutions, the company behind VeriChip]. But we're not stopping. We're going into South America right now!"<sup>376</sup>

- M. Steven Aftergood, Senior Research Analyst at the Federation of American Scientists: "Technology Has Outpaced the Policy Process": *Time Magazine*: March 11, 2002

In a March 11, 2002 *Time* article entitled "Meet the Chipsons," Steven Aftergood, a senior research analyst at the Federation of American Scientists, indicates that "There's a feeling that technology has outpaced the policy process."

Security is part of the VeriChip business plan...[Dr. Richard] Seelig, Applied Digital Solutions...medical-applications director] believes [an implantable computer device...with a microchip containing a few kilobytes of silicon memory and a tiny radio transmitter called ]VeriChip could function as a theft-proof, counterfeit-proof ID, like having a driver's license embedded under your skin. He suggests that airline crews could wear one to ensure that terrorists don't infiltrate the cockpit in disguise. "I travel quite a bit," he says, "and I want to make sure the pilots in that plane belong there."

Could the airlines or government really require pilots to get chipped? "I think we have a right to demand that," says Seelig. "Our lives are in their hands." It sounds extreme, but there are precedents. In the early '90s several states considered laws that would have required female child abusers and women on welfare to wear birth-control implants. The proposals were not very popular. "There's a feeling that technology has outpaced the policy process," says Steven Aftergood, a research analyst at the Federation of American Scientists. "We aren't in a position to apply these new devices with the wisdom and prudence that is needed."<sup>377</sup>

- N. Civil Libertarians and Religious Advocates: Associated Press: AOL News: April 1, 2002

An Associated Press article published on AOL News notes the debate occasioned by human microchip implants.

The VeriChip, made by Applied Digital Solutions in Palm Beach County, is about the size of a grain of rice. It would be injected under a person's skin, probably in the arm, and could be read only by scanners.

Similar technology has been used in the past few years on millions of dogs and cats as a way to identify the pets if they are lost or stolen...

<sup>376</sup> Lev Grossman, "Meet the Chipsons," *Time*, March 11, 2002, pp. 56-57.

<sup>377</sup> Lev Grossman, "Meet the Chipsons," *Time*, March 11, 2002, p. 57.

Ultimately, the chips could be coupled with global-positioning satellites to locate Alzheimer's patients who have wandered off, or find kidnapping victims - an idea the company hopes to market in Latin America.

The chip could also be used as a security tool...

The chip has stirred debate over its potential use as a "Big Brother" device to track people or invade the privacy of their homes or workplaces. Civil libertarians call it crypto-fascism or high-tech slavery. Religious advocates say it represents "the mark of the Beast," or the anti-Christ.<sup>378</sup>

- O. "Big Brother"—"Invaluable in Emergency Situations": Associated Press on [washingtonpost.com](http://www.washingtonpost.com): April 5, 2002

Contrasting views are briefly noted in an April 5, 2002 Associated Press article:

For now, the VeriChip will bear only an identification number, said David Hughes of Technology Sourcing International, a consulting firm helping Applied Digital in its discussions with the FDA. But that ID code could be cross-referenced with a database to detail any kind of information.

The company said production would begin immediately.

VeriChip emits a radio signal and has been derided by some for its "Big Brother" implications. Applied Digital has said it could prove invaluable in emergency situations when someone is either unconscious or cannot otherwise give information.<sup>379</sup>

- P. Privacy Advocates and Some Religious Sects: Newsfactor: April 5, 2002

A NewsFactor Network article, entitled, "Implantable Spy Chip Gets Green Light from U.S.," reported that, "A Florida company Thursday said that it will begin marketing and selling a microchip that can be implanted under the skin... FDA officials said that as long as the biochip is used for identification purposes only, it will not have to meet strict FDA guidelines." In a concluding "Mark of the Beast" section, the article reports evaluative comments.

The VeriChip is not without controversy. It has been challenged by privacy and political advocates, who say that if the chip were to fall into the wrong hands, totalitarian regimes could use it to track political dissidents.

<sup>378</sup> Adrian Sainz; "Family Wants Data Chips Implanted;" Associated Press: AOL News; published April 1, 2002 2241 EST; pp. 1-2 of 4/2/02 printout.

<sup>379</sup> "Company to Sell Implantable Chip;" Associated Press on [washingtonpost.com](http://www.washingtonpost.com); published April 5, 2002 12:41 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A61845-2002Apr4?language=printer>>; p. 1 of 4/5/02 printout 11:17 PM.

The technology also could be used as a tool in a national ID system -- an idea that has waned in popularity since peaking right after the September 11th terrorist attacks.

A March survey by Gartner Dataquest showed that 41 percent of those surveyed in the United States oppose a national ID system, while just 26 percent support one.

Also, some religious sects have said the biochip is the "Mark of the Beast" from the Book of Revelations. They claim that a graphic the company used early in the product's life cycle "clearly" resembled the satanic numbers "666."<sup>380</sup>

- Q. Members of Medical Community Evaluate ID Chip: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

Members of the medical community interviewed in a May 10, 2002 article by *Palm Beach Post* Staff Writer Deborah Circelli comment on ID chips.

Not surprisingly, the ID chip has gotten mixed reviews in the medical community. Some area doctors say the VeriChip could be helpful, but only if it becomes a standard practice nationally.

But others in the medical community who specialize in the treatment of Alzheimer's are skeptical. They point to the national ID bracelet program, claiming it is more proven, humane and accepted by hospitals and law enforcement.

"My dog has one on the back of his neck, but I don't think it's appropriate for people," said Mary Barnes, executive director of Alzheimer's Community Care, a nonprofit group that operates seven daycare centers in Palm Beach and Martin counties."<sup>381</sup>

- R. Privacy Implications of "A Radio Chip in Every Consumer Product": nytimes.com: February 25, 2003

Claudia H. Deutsch and Barnaby J. Feder report in *The New York Times* about the privacy implications of putting radio-frequency identification chips in consumer products.

Consumer privacy is also an issue. It would be easy to combine credit card data with information from the retail chips to know who bought what, and when — and, conceivably, track the product even after it left the store.

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<sup>380</sup> Tim McDonald; "Implantable Spy Chip Gets Green Light from U.S.;" NewsFactor Network; published April 5, 2002; <<http://sci.newsfactor.com/perl/printer/17127/>>; pp. 1-2 of 4/19/02 11:09 AM printout.

<sup>381</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: PalmBeachPost.com; published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; p. 2 of 5/10/02 8:04 AM printout.

"I don't think the average consumer understands the threat to personal privacy that these kinds of technologies can present," said Alan N. Sutin, a partner specializing in information technology at the law firm of Greenberg Traurig.

William H. Steele, a consumer products analyst with Bank of America, doubts companies will "succumb to the temptation to keep tracking products in the consumers' hands," but he, too, stops short of calling the issue specious. "There should be a certain level of skepticism on the part of the U.S. consumer," he said.<sup>382</sup>

S. Surgically Implanted IDs: "Orwellian" or "Social Security Numbers of the Future": *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford ("the first journalist—to get 'chipped' ") presented contrasting views regarding surgically implanted IDs.

In my case, the tiny chip inside me can transmit personal information to anyone with a special handheld scanner.

Theoretically, this VeriChip will allow doctors to call up my medical records even if I'm too badly hurt to answer questions. It is also supposed to allow me to get money from an automatic teller machine by flashing my arm instead of punching in my PIN number. Or reassure airport security that I am a journalist, not a terrorist.

And, though the VeriChip strikes critics as Orwellian, its makers think the surgically implanted IDs could be the Social Security numbers of the future in a nervous world.

"I believe the day will come when most of us will have something similar to the VeriChip under our skin," said Scott Silverman, president of Florida-based Applied Digital Solutions. "People will regard that its benefits—in terms of financial, security, and health care—far outweigh the possibility of loss of privacy"...

But critics see surveillance technology like the VeriChip as a growing threat, giving potentially dangerous new power to businesses and government alike. In a report issued in January by the American Civil Liberties Union, Jay Stanley and Barry Steinhardt warned that an explosion of technology has already created a "surveillance monster."

"Scarcely a month goes by in which we don't read about some new high-tech way to invade people's privacy, from face recognition to implantable microchips, data mining, DNA chips,

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<sup>382</sup> Claudia H. Deutsch and Barnaby J. Feder; "A Radio Chip in Every Consumer Product;" *nytimes.com*; published February 25, 2003; <<http://www.nytimes.com/2003/02/25/technology/25THEF.html?pagewanted=print&position=top>>; p. 2 of 2/25/03 2:40 PM printout.

and even ‘brain wave fingerprinting,’ “ they wrote. “The fact is there are no longer any technical barriers to the Big Brother regime portrayed by George Orwell [in his novel ‘1984’].” The VeriChip is similar to the more than 25 million chips already embedded in animals all over the world acting as “pet passports,” allowing customs officials to monitor those animals that do not need to go into quarantine, or to identify your stray dog...

As far as I am concerned, having a chip with a code in it is not giving me the chills. I think it would be nice to use it to get cash or pay for gas, and I wouldn’t mind paramedics having access to my health records in the blink of an eye. Besides, I know it would never get lost.<sup>383</sup>

### XXIII. Human Microchip Implants: Evaluation: Children

#### A. CNN’s Larry King Live!: John Walsh, Host of America’s Most Wanted (Fox): Implantable GPS Microchips: “It’s a brilliant idea”: March 4, 2002

John Walsh, host of America’s Most Wanted (Fox), on March 4, 2002, provided a positive evaluation of implantable GPS microchips on CNN’s Larry King Live!

The subject of implantable microchips with GPS location capabilities was discussed on March 4, 2002, on CNN's Larry King Live! John Walsh, host of America's Most Wanted (Fox), was asked by a caller from Tampa, Florida, about the potential for using implanted GPS as protection against kidnapping. Mr. Walsh replied:

"It's a brilliant idea. I wish someone would develop it because, No. 1, time is crucial when a child is missing and you could locate them by the chip. And even if you weren't lucky enough to locate them, finding the body is crucial for two things: the ending of the search of the parents and helping with the prosecution of the case. So I hope that somebody develops that in my lifetime."<sup>384</sup>

#### B. Evaluative Response to Planned Microchip Implants in Children: BBC News: September 2, 2002

<sup>383</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; pp. 1-2, 4 of 5/22/03 3:03 PM printout.

<sup>384</sup> John Walsh, host of America’s Most Wanted (Fox); “Applied Digital Solutions to Accelerate Development of a Subdermal GPS ‘Personal Location Device’; Working Prototype Expected in Seven Months;” aired CNN’s Larry King Live! March 4, 2002, published by Business Wire April 26, 2002; p. 1 of 4/26/02 printout.

BBC News reported evaluative responses to Reading University academic Kevin Warwick's plans to implant tracking microchips in children.

Parents afraid that their daughters could be abducted are asking a British scientist to implant a tracking microchip under their skin, so that they can be found quickly.

Cybernetics expert Kevin Warwick said he had received requests for the procedure from "a number of families" following the deaths of 10-year-olds Holly Wells and Jessica Chapman.

One girl, 11-year-old Danielle Duval, will have a device implanted in her arm sometime during the next few months...

He said it was up to society to decide if the procedure was ethical and whether parents, the police or a judge would have the power to activate the microchip.

"There are of course many more questions to be asked and I suspect there will be objections to an implant," he said...

"But if the general trend in Britain is in favour of such an operation it will be ready to go by Christmas"...

Danielle Duval's mother, Wendy, decided to let her daughter be a guinea pig for the project following the discovery of the bodies of Holly and Jessica, from Soham in Cambridgeshire.

Former school caretaker Ian Huntley, 28, has been charged with their murder and his girlfriend, Maxine Carr, 25, with attempting to pervert the course of justice.

Mrs Duval, from Reading in Berkshire, said: "I think it's just to make sure your children are safe.

"It's a shame you have to go to these lengths to keep your children safe but I would rather do that than have anything happen to her."

She compared the device to the tracking systems fitted to cars and said many of her friends were interested in protecting their children, including boys, in the same way.

Danielle also said she was happy to have the tag fitted.

"I'll feel so much safer - I'll know my mum knows where I am," she said...

Commenting on the Duval's decision he said: "I think they were looking for piece of mind that if anything did happen to Danielle that within a few minutes we would be able to locate them"...

His latest project was attacked by children's charity Kidscape.

A spokesman told The Guardian newspaper: "We do not think this is a good idea.

"Children should be taught about the possible dangers, rather than having something stuck on them that can maybe track them, and perhaps then only when it's too late."<sup>385</sup>

C. Kidscape: Microchip Implant "A Step towards Big Brother": England: *The Reading Evening Post*: September 3, 2002

One children's safety campaigners organization connected an implantable microchip that will be used to trace a child's microchip readings on a computer map, with the idea of Big Brother.

A Reading youngster is to be microchipped in a hi-tech bid to thwart perverts and kidnapers.

Danielle Duval, 11, will have the chip implanted in her arm so she can be traced by computer if she is ever snatched...

Mrs Duval added that the family, and Danielle, would be reassured she could be found using the chip – which emits radio waves through mobile phone technology – if there were an emergency.

It has been designed by University of Reading cybernetics expert Professor Kevin Warwick...

Prof Warwick said Danielle's microchip readings would be traced on a computer map to locate her...

However, the scheme worried children's safety campaigners Kidscape who felt it was a step towards Big Brother.

Project co-ordinator Megan Burns said: "We completely understand the concern of all parents, particularly in the light of what happened to Holly and Jessica, but we do not feel it is the way forward.

"We are always sceptical when things like this are released after a tragic event like this."

Ms Burns said the microchip should not be seen as a replacement for teaching children about stranger-danger.

The best use would be for children with severe special needs, she said.<sup>386</sup>

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<sup>385</sup> " 'Anti-Abduction' Implant for Children;" BBC News; published September 2, 2002, 15:52 GMT 16:52 UK; <<http://news.bbc.co.uk/1/hi/england/2231634.stm>>; pp. 1-3 of 2/14/03 3:55 PM printout.

D. Child Abductions Rare; Abuse Within Home: England: *The Guardian*: September 3, 2002

A response by a spokesman for the NSPCC [National Society for the Prevention of Cruelty to Children] to plans for implanting tracking microchips in children observes that the greatest abuse of children occurs within the home.

A spokesman for the NSPCC said: "Parents and guardians must remember child abductions are extremely rare, and that the vast majority of abuse happens within the home."<sup>387</sup>

E. "Would You Microchip Your Child?": England: *The Guardian*: September 4, 2002

Sally Weale interviewed seven persons, including two children and three persons identified, in part, as mothers. Following are excerpts from the article for three of the seven.

1. Professor Kevin Warwick

Professor Kevin Warwick is "Reading University's cybernetics department and designer of the tracker microchip."

We are going to get people saying it won't work, but we are confident it will and time will prove that. Whether we should or should not do it, these are the important issues that should be raised. The technology is not much of an infringement on the individual. A lot of children have their ears pierced and different body piercings. This does not amount to much more than that. And if it saves just one life, then it would be worth it.

There are a lot of scared parents and children out there. Since this story appeared, the phone has gone berserk. I have had hundreds of calls. We hope they will never have need to use it, but it can give parents some peace of mind...

I don't think it is anything that should be forced on people, but the option should be there.

2. Mary MacLeod

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<sup>386</sup> "Microchip Tag Bid To Thwart Perverts;" *The Reading Evening Post*; published September 3, 2002; <<http://www.getreading.co.uk/story.asp?intid=4565>>; p. 1 of 2/15/03 10:22 AM printout. Publication date information available at "Related Articles;" <<http://www.getreading.co.uk/relatedsearch.asp?intid=4565>>; p. 1 of 2/18/03 4:23 PM printout.

<sup>387</sup> Jamie Wilson; "Girl To Get Tracker Implant To Ease Parents' Fears;" *The Guardian*; published September 3, 2002; <<http://www.guardian.co.uk/child/story/0,7369,785073,00.html>>; p. 2 of 2/14/03 4:15 PM printout.

Mary MacLeod is “Chief executive of the National Family and Parenting Institute.”

Knowing where a child is does not mean that child is safe. Statistically, children are more likely to be harmed by someone they know, rather than by a stranger, so chipping them does not guarantee you will be able to keep your child safe.

We are seriously concerned and believe that parents need to think very hard before using this invasive procedure to deal with a risk - appalling as it is - which is still very small. While parents' anxieties are understandable, and we know that children are anxious too, a lot of this has to do with the constant media coverage.

It is very important to reassure children how very, very rare this kind of event is. We feel that this sort of procedure would be an extreme response to this anxiety.

### 3. Pauline Nolan

Pauline Nolan is the “Mother of 15-year-old Dan who went missing on January 1 this year after going fishing with friends in Hamble, near Southampton.”

I saw the tracker implant on television on Monday night and thought it was a fantastic idea. I wish Dan had had a chip on him, because the chances are we would know where he was now...

What makes me angry is when you hear parenting experts and child protection people on television - it happened after Soham - saying abduction is extremely rare. But there are just so few cases that get national media coverage - people are unaware that it's happening as often as it does. As many as 220 under-18s go missing on a daily basis, 70% of those come back home within 72 hours, but that still leaves 60 children unaccounted for every day. Those children are vulnerable out there and they need to be found.<sup>388</sup>

#### F. Ruthless Kidnappers: Unintended Consequences of Human Microchip Implants Considered: England: *The Register*: September 9, 2002

An article in *The Register* by John Lettice considers “the effect widespread chipping is likely to have on ruthless kidnappers.”

Thanks, incidentally, to all of those readers who wrote in with suggestions, pointers and comments. One common thought we

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<sup>388</sup> Sally Weale; “Would You Microchip Your Child?;” *The Guardian*; published September 4, 2002; <<http://education.guardian.co.uk/schools/story/0,5500,785832,00.html>>; pp. 2-4 of 2/14/03 4:18 PM printout.

think worth considering is the effect widespread chipping is likely to have on ruthless kidnapers; the less evident such devices are, the more exploratory surgery they're likely to do. Even the Whereify [Wherify] system (an example of a GPS-wireless combo with the same objective as [Professor Kevin] Warwick's device) could be vulnerable to this. Yes, it's a bracelet, but oh dear, parents can lock it on. Such parents should make sure their kids carry bolt-cutters, or only get kidnapped by kidnapers who own some. We note from the BBS at [www.kevinwarwick.com](http://www.kevinwarwick.com) that LRAM of Columbia says "In Colombia we have 3500 Kidnapping each year We are interesting in your implantable tracking device for security applications, please send an e-mail to me in other to be more closer to your developpe. We have the 65% of the kidnapping in the world. Please help us!" We shudder to think what the FARC's idea of exploratory surgery might be.<sup>389</sup>

G. "Tagging Children Will Not Protect Them, Say Experts": England: *The Observer*: September 8, 2002

The Observer reported contrasting views of tracking children electronically, whether via an external GPS-enabled watch, or via an implanted locator.

Proposals to tag children in Britain electronically could result in increased numbers of boys and girls losing their lives and cause major psychological problems for thousands of others, British scientists warn.

They say that rare tragedies such as those involving Jessica Chapman and Holly Wells do not justify hi-tech responses, which only exploit parents' fears.

Moves to introduce child trackers are gaining momentum...

Reading University scientist Kevin Warwick is also trying to develop a locator that would be implanted into children.

'The technology is not much of an infringement,' he said. 'Children have their ears and bodies pierced. This does not amount to much more than that. And if it saves just one life, it would be worth it'...

His [Timothy Neher, head of Wherify] locator - which costs \$400, plus a monthly service charge - consists of a wristwatch receiver that picks up signals from global positioning satellites. The wearer's location is automatically transmitted via cellphones to a central receiver. Parents can then look at a

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<sup>389</sup> John Lettice; "Kid-chipper Cap Cyborg Reported to Police, Social Services;" *The Register*; published September 6, 2002 at 13:38 GMT; <<http://www.theregister.co.uk/content/54/27003.html>>; p. 2 of 3/11/03 8:36 AM printout. This paragraph of John Lettice's was linked to Wherify: <[http://www.wherifywireless.com/prod\\_watches.htm](http://www.wherifywireless.com/prod_watches.htm)> and to <<http://www.kevinwarwick.com/>>.

website to see their children's location. The locator wristwatch can be locked on to a child's wrist and is fitted with a panic button so that he or she can alert parents and police if danger arises.

The company says it has already sold thousands of devices over the last two months, with delivery beginning this week. Their popularity is not an American phenomenon: a survey carried out by nVision, the online database of the British think tank Future Foundation, has revealed that 75 per cent of British parents would like such a device.

Experts contacted by *The Observer* were horrified. They pointed out that, of the few murders that occur each year, all but a small fraction are caused by individuals known to the child's family.

'This is an absolutely disgusting idea,' said Professor Colin Pritchard, of Southampton University's psychiatric social work department. 'This will cost lives, not save them.' Professor William Yule, of the Institute of Psychiatry in London, agreed. 'This sort of thing surely breaches the UN Convention on the Rights of the Child.'

Elizabeth Mapstone, a child abuse expert, said: 'Tagging children is entirely futile. It's an extreme response and it distracts attention from the real danger.'<sup>390</sup>

- H. "Surgical Tags Plan for Sex Offenders: Silicon Chip To Be Inserted under Skin": "Civil Liberties Groups Expressed Horror; Phoenix Survivors Spokeswoman...Said...You Have to Know What They Are Doing All the Time": *The Observer*: November 17, 2002

Martin Bright, home affairs editor of *The Observer*, wrote that Britain is considering a plan to track sex offenders with surgically implanted "electronic tags." Civil rights groups and a survivors' group expressed differing evaluations of human chip implants.

Britain is considering a controversial scheme to implant surgically electronic tags in convicted paedophiles amid fears that the extent of the abuse of children has been massively underestimated...

A letter from Hilary Benn, the Minister responsible for the supervision of sex offenders in the community, reveals the Home Office's electronic monitoring team is already developing technology to track paedophiles constantly. The team is now investigating the 'implant tag' after it was alerted to its capabilities by a campaign group for victims of paedophiles...

<sup>390</sup> Robin McKie and Amelia Hill; "Tagging Children Will Not Protect Them, Say Experts;" *The Observer*; published September 8, 2002; <<http://society.guardian.co.uk/children/story/0,1074,788638,00.html>>; pp. 1-2 of 2/17/03 10:11 AM printout.

In a letter to Labour MP Andrew Mackinley, Benn wrote: 'The Electronic Monitoring Team is... looking actively at the possibilities for using tracking technology to monitor offenders' whereabouts as they move from one place to another...

Ministers would need to pass new legislation to oblige offenders to be surgically fitted with the tags.

Civil liberties groups expressed horror at the proposals last night. 'Implanting tracking devices provides a very frightening vision for the future. We already know that the rules protecting our privacy are inadequate. Where would this stop?' said John Wadham, director of Liberty. 'This would be used initially for sex offenders, but we would soon find that other marginalised groups, such as asylum seekers, would find they were forced to have implants.'

The implant tag has been proposed by Phoenix Survivors, a group of child abuse victims who were traded as child prostitutes in the north-west of England. Their name is taken from Operation Phoenix, an investigation into the activities of 72-year-old Stanley Claridge.

Claridge's stepdaughter and Phoenix Survivors' spokeswoman Shy Keenan said: 'I am sick to death of it being acceptable that I am a victim because these people have to have their human rights. These people live outside the law and cannot be controlled, so you have to know what they are doing all the time.'<sup>391</sup>

- I. John Wadham, Director of Liberty: "Where Will This End?"  
Prisonplanet.com: *Sunday Times of London*: November 17, 2002

John Wadham serves as director of Liberty. Dominic Tonner writing in the November 17, 2002 *Sunday Times of London* noted Wadham's response to the article entitled, "Paedophiles May Be Fitted with Electronic Tags."

Electronic tracking devices could be implanted into convicted paedophiles under plans being considered by the government.

Microchips would be surgically fitted beneath the skin under local anaesthetic, enabling officials to follow abusers' movements and monitor their heart rate and blood pressure.

The tagging technology is similar to that used to locate stolen cars. It works by using satellites or a mobile phone network to pinpoint the person on an electronic map via a signal from the implant...

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<sup>391</sup> Martin Bright, Home Affairs Editor; "Surgical Tags Plan for Sex Offenders;" *The Observer*: Guardian Unlimited © Guardian Newspapers Limited; published Sunday, November 17, 2002; <<http://politics.guardian.co.uk/Print/0,3858,4548381,00.html>>; pp. 1-2 of 2/17/03 11:59 AM printout.

Tracker Network, the company that runs Britain's largest stolen vehicle monitoring system, has been approached about paedophile monitoring and an American company has reportedly been asked to develop the software. Similar software that remotely monitors the bodily functions of astronauts has already been developed for Nasa.

In the US, the microchip maker Applied Digital Solutions says it has been inundated by demands to produce electronic implants that can be used to keep tabs on kidnap victims via satellite...

The Home Office minister Hilary Benn revealed the government's plan to implant electronic tags into convicted paedophiles in a letter to the Labour MP Andrew Mackinlay.

"The (Home Office's) electronic monitoring team is . . . looking actively at the possibilities for using tracking technology to monitor offenders' whereabouts as they move from one place to another," he wrote.

New legislation would have to be passed to require offenders to be surgically fitted with the tags.

The plan has alarmed civil liberties campaigners. John Wadham, the director of Liberty, said he was concerned that the technology's application could be widened to cover other marginalised groups, such as asylum seekers.

"Where will this end? Liberty's 70-year history has shown that restrictions on human rights are first brought in to deal with the bad, the wicked and the marginalised, but, in the absence of proper regulations such as privacy laws, are almost always extended to include other categories (of people)," he said.<sup>392</sup>

- J. "Kid-Chips: Parents, Activists Debate How Far We Should Go To Protect Children": Gannett News Service in *Norwich Bulletin*: November 18, 2002

Mary Challenger, Gannett News Service, reported on the debate over implanting tracking microchips in children. The debate is "over how far a parent -- or society -- should go in limiting personal freedoms in the interest of safety." Challenger notes that, "It's a question that residents of the United States have been struggling with for a very different reason since Sept. 11," and that, "Answers are no easier to come by when our children rather than our country are threatened." Challenger observes that, "To Paul and Wendy Duval, whose daughter, Danielle, is slated to become the first recipient of an implant, the chip makes about the same amount of common

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<sup>392</sup> "Paedophiles May Be Fitted with Electronic Tags;" prisonplanet.com; <[http://www.prisonplanet.com/news\\_alert\\_111702\\_microchips.html](http://www.prisonplanet.com/news_alert_111702_microchips.html)>; p. 1 of 2/17/03 9:53 AM printout. This article found on prisonplanet.com is a *Sunday Times of London* article by Dominic Tonner dated 11/17/02. The prisonplanet.com page provides the following information for the *Sunday Times* article: "Original Link: <<http://www.timesonline.co.uk/article/0,,2087-483510,00.html>>."

sense as a safety belt or a car seat.” In a section entitled, “Big Brother,” Challenger continues her analysis.

Others view it as the trapdoor to an Orwellian society conveniently hidden behind a nation's fears for its children.

Just the concept of a microchip that can be used to keep tabs on a person's movements horrifies many. To Randall Wilson, legal director for the Iowa Civil Liberties Union, the microchip is a radical solution to the problem of child abduction.

It's not just a question of whether parents want to be able to track their children, he says. It's a question of whether parents also want the government to be able to track their children -- and by extension, themselves.

Every parent has a fear -- even terror -- of losing a child, Wilson says. What's important is for parents to balance that fear against the thought of raising their child in a world with very little personal freedom and no real expectation of freedom.

"We always take some risks and pay some costs to have freedom," he says. "I would rather probably use this on my pet than on my child"...

Many civil libertarians, child safety experts and even parents view the tracking microchip as a massive overreaction to a numerically small problem.

They cite statistics showing the number of children kidnapped by strangers has actually decreased. According to FBI statistics, the number of reported child abductions by strangers has dropped from 134 cases in 1999 to 93 in 2001. In the first half of this year, there were 46 child abductions reported nationally.

Statistics, though, are cold comfort to parents when a child can't be found...<sup>393</sup>

#### XXIV. Human Microchip Implants: Legal Considerations

##### A. Preemptive Legislative Safeguards Considered: Franklin Pierce Law Center *Risk* article: 1997

1. Attorney Elaine M. Ramesh, in an article entitled, “Time Enough? Consequences of Human Microchip Implantation,” presents the position that, “the legal ramifications” of human microchip implantation “need to be explored now.”

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<sup>393</sup> Mary Challenger; “Kid-Chips;” Gannett News Service in *Norwich Bulletin*; published November 18, 2002; <<http://www.norwichbulletin.com/news/stories/20021118/living/394258.html>>; pp. 1-4 of 2/17/03 8:02 AM printout.

Ramesh writes in the Introduction:

If the technology were extended to humans, a myriad of identification-related applications could be envisaged such as the capability to find lost children or confused Alzheimer's patients, or to determine if job applicants are illegal immigrants or criminals. By encoding the microchip only with a single number, it might also carry, e.g., medical or criminal history. Also, devices can be used for tracking.

Although each such application has utility, privacy implications are ominous. The level of intrusion<sup>[3]</sup> necessitated by implantation may be objectionable, for there are many legal rights which would be impinged upon. It is plausible that, since the technology has not yet been perfected, there is no need to address the incipient legal problems until devices are used.<sup>[4]</sup> However, because of the very drastic reductions in personal liberty and privacy that such implantation represents, the legal ramifications need to be explored now. The reasons that a mandatory program of implantation for all citizens must be necessary for an identification program to be effective will be explored.<sup>[5]</sup> A system using the technology, once in place, may be difficult to dislodge despite limitations of individual freedoms because its advantages will be extremely attractive. The positive applications may be said to outweigh the detrimental legal consequences at that time. Therefore it is not too soon to consider the repercussions that mandatory microchip implantation would have, as a pre-emptive measure.<sup>[6]</sup>

The first part will explore the technology and discuss possible applications for microchip implantation into humans. The second will discuss common law, constitutional, and property rights affected by mandatory implantation. Last, we consider protections that can be effectuated if the technology is used.<sup>394</sup>

2. Also in the second footnote of the article within the Introduction, Ramesh, after referencing Alan F. Westin's 1967 *Privacy and Freedom* and the "Book of Revelation in the Bible" states, "That mark could well be the microchip implant."<sup>395</sup>

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<sup>394</sup> Elaine M. Ramesh; "Time Enough? Consequences of Human Microchip Implantation;" *Risk*, vol. 8, pp. 373 ff.; Franklin Pierce Law Center; published 1997; <<http://www.piercelaw.edu/Risk/Vol8/fall/Ramesh.htm>>; p. 1 of 1/21/03 8:09 AM printout.

<sup>395</sup> Elaine M. Ramesh; "Time Enough? Consequences of Human Microchip Implantation;" *Risk*, vol. 8, pp. 373 ff.; published 1997; Franklin Pierce Law Center; <<http://www.piercelaw.edu/Risk/Vol8/fall/Ramesh.htm>>; p. 14 of 1/21/03 8:09 AM printout.

3. The Summary and Conclusion section of the article points to the value of the enactment of “appropriate legislative safeguards...now, rather than when it is too late.”

Ramesh writes:

Although use of such a device at first appears farfetched, examination of the existing technology and the potential utility proves that microchip implantation is both possible and, for some purposes, desirable. Beginning with voluntary introduction, Americans may be lulled into accepting them. This article thus sounds a warning bell. The time to prevent grievous intrusion into personal privacy by enacting appropriate legislative safeguards is now, rather than when it is too late.<sup>396</sup>

- B. Value of Legal Protections Discussed re Likely Chipification of Humans: salon.com

In a salon.com Web site article by Katharine Mieszkowski, Academic Chris Hables Gray discusses the likelihood of the “chipification” of humans.

Others see the chipification of humans as all but inevitable. Chris Hables Gray, professor, self-proclaimed “cyborgologist” and author of the forthcoming book “Cyborg Citizen,” says that it really doesn't matter whether or not the “Digital Angel” flies in October. “If this company doesn't do it, someone else will,” he says. And watch out when they do.

“They will start implanting them in prisoners, parolees, child abusers, sex offenders and drunk drivers,” he predicts. Gray says that it's been a military project for some 20 years to find a way to track every soldier on the battlefield ...

No matter how creepy we find the prospect of such a technology, we can't stop its creation -- nor would we necessarily want to. “Technology is continually trumping the constitutional guarantees that we have,” says Gray. He'd like to see protections against the misuse of such chips as they become commercially available: “Citizens could ask for a law that made it a crime to put these into a person without their permission, and to forbid, under any conditions, for the government to put these into prisoners, parolees, illegal aliens, soldiers, citizens”...<sup>397</sup>

<sup>396</sup> Elaine M. Ramesh; “Time Enough? Consequences of Human Microchip Implantation;” *Risk*, vol. 8, pp. 373 ff.; published 1997; Franklin Pierce Law Center; <<http://www.piercelaw.edu/Risk/Vol8/fall/Ramesh.htm>>; p. 14 of 1/21/03 8:09 AM printout.

<sup>397</sup> Katharine Mieszkowski; “Put That Chip Where the Sun Don't Shine;” *Salon Technology and Business*; published Sept. 7, 2000; <<http://archive.salon.com/tech/feature/2000/09/07/chips/print.html>>; pp. 3-4 of 4/15/03 4:05 PM printout.

C. FindLaw Forum: CNN.com/LawCenter: Legal Questions re Human Chip Implants

A “Special to CNN.com” article entitled “FindLaw Forum: What legal questions are the new chip implants for humans likely to raise?” was authored by FindLaw Columnist Julie Hilden, who “is currently a freelance writer and practiced First Amendment law at the D.C. law firm of Williams & Connolly from 1996-99.” An “About the Company” section of the FindLaw Web site states, “FindLaw is the highest-trafficked legal Web site, providing the most comprehensive set of legal resources on the Internet for legal professionals, businesses, students and individuals.”<sup>398</sup> Hilden addresses the following points.

1. Overview of Legal Questions

In an introductory section of the article, Hilden raises a number of questions:

After Verichip, the company's next product will be Digital Angel, which resembles a pager and uses tracking similar to the Global Positioning System (GPS) to follow people's movements. Digital Angel is already being used in a pilot program to track Los Angeles parolees.

It is also likely that GPS chips for implantation in humans will also be available in the near future. And inevitably, Verichip or other companies' similar products are likely to be used to encode not only medically important information, but other information as well.

Based on these developments, one can easily see how, quite soon, future developments relating to the use of information chips, GPS pagers, and even GPS chips are likely to raise very serious legal questions.

Among the questions are: Could the government mandate chips like these -- containing information, GPS systems, or both -- for all citizens (or all legal aliens), or does the law require that we always have a right to reject them? What about classes of citizens, such as government employees, who have traditionally been allowed to contract away their rights? And what about ex-felons, who have been thought to have forfeited many of their rights as citizens by virtue of their prior conduct? Finally, is there any way that, conversely, the chips might actually enhance our civil rights and civil liberties?<sup>399</sup>

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<sup>398</sup> “About the Company;” FindLaw; copyright 1994-2003; <<http://company.findlaw.com/>>; p. 1 of 1/14/03 11:07 AM printout.

<sup>399</sup> Julie Hilden; “FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?”; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; p. 1 of 8/8/02 10:51 AM printout.

## 2. Legislation Needed

Hilden states that present law is insufficient to address the potential for abuse presented by GPS microchips implanted in humans.

Answering these questions, as I will try to do below, shows that the chips will have a huge potential for abuse, even if they are used within current legal limits. Without legislation on this topic, the background law -- including even constitutional law -- will not be sufficient to maintain the privacy and freedom that we so value.<sup>400</sup>

## 3. Citizens Could Not Be Required to Be Implanted with a GPS Chip

Hilden asserts that the government could not require citizens to be implanted with a GPS chip.

It is important to stress that the government could never simply require every citizen to be implanted with a chip containing a GPS system, information (medical or otherwise), or both. To a virtual certainty, the Supreme Court would unanimously hold such a law to be unconstitutional, as a violation of the Fourth Amendment -- and probably of other Amendments as well. This would probably also be the case, especially based on more recent Court precedents, with respect to legal aliens as well.<sup>401</sup>

## 4. Government Employees Face More Mixed and Conflicted Legal Precedents Regarding GPS Chip Implantation

Hilden asserts that the government may be able to require government employees to be implanted with a GPS chip.

However, what if the person the government would like to chip is a government employee? In that event, the situation could be much more complex, and the legal precedents far more mixed and conflicted.

Consider that government employees, the Supreme Court has held, can be forced to give up their First Amendment rights by contract, as a condition of working for the government. Would the Court hold, similarly, that government employees, as a term in their contracts, can be

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<sup>400</sup> Julie Hilden; "FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?"; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; p. 1 of 8/8/02 10:51 AM printout.

<sup>401</sup> Julie Hilden; "FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?"; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; p. 1 of 8/8/02 10:51 AM printout.

required to be chipped, and thus to give up their Fourth Amendment rights?

That remains to be seen -- and I would not be confident, especially in the current climate, that the Court would strike down a law broadly mandating "chip contracts" for high-security government employees. For example, spies within our government who might become counter-spies for foreign governments would be easier to follow and catch if they were forced to be chipped with GPS.

When the chips are so useful, for purposes like these, and employees "voluntarily" contract to have them implanted, would the Court really stand in the way?<sup>402</sup>

#### 5. Ex-felons May Be Legally Forced to Be Chipped

Hilden asserts that, "the situation of ex-felons...is even more precarious than that of government employees."

Meanwhile, the situation of ex-felons, whose rights are already constricted, is even more precarious than that of government employees who may have to lose their jobs if they resist being chipped. Ex-felons can already be stripped of the right to vote, the most basic right in a democracy. They also can be placed under stringent probation conditions (including house arrest), and sometimes are even required to wear an ankle bracelet for monitoring purposes...

Considering that Digital Angel is already being used in Los Angeles in a pilot program for parolees, as mentioned above, can either informational or GPS system chips be far behind?<sup>403</sup>

#### 6. Benefits Noted by Author of FindLaw's CNN Article

Hilden states that a number of benefits may accrue to implanting humans with microchips.

Yet a close examination not only of chips' harms, but also of their virtues, shows that we should keep an open mind as to their potential benefits, especially in the area of law

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<sup>402</sup> Julie Hilden; "FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?"; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; p. 2 of 8/8/02 10:51 AM printout.

<sup>403</sup> Julie Hilden; "FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?"; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; p. 2 of 8/8/02 10:51 AM printout.

enforcement and personal liberty. In some ways, chips might make us less free, but in other ways, more...

Meanwhile, if GPS chips could be imbedded so deeply as to be very hard to remove, they could make recidivist suspects' flight futile, and leave many fewer cases for America's Most Wanted to solve.

Furthermore, GPS and information chips also may ultimately be an alternative to incarceration, house arrest, or ankle bracelets. Potentially cheaper than prison, they may be a way to stem the expansion of prisons and prison budgets that has plagued us...

On the one hand, systems like Digital Angel or a future human GPS chip offer liberty only at the price of an incursion on privacy. But on the other hand, they do promise somewhat more liberty for prisoners by holding out the hope of earlier and more frequent release...

In setting forth our fears about chipping humans, we should not forget the possibilities chips can offer of improving our lives -- not only by improving the quality of medical services we can expect, but also by expanding the freedom with which we can live.<sup>404</sup>

## XXV. Human Microchip Implants: Theology

### A. Money Unused or Stolen Depending on Pretribulation or Posttribulation Views, Respectively

There are at least two major views with regard to whether or not Christians will indeed go through the end-time tribulations mentioned in the New Testament or, alternatively, whether they will be raptured to heaven at the second coming of Jesus Christ before the tribulation period. Without addressing the correctness of these two competing views, it is interesting to think about the implications of each view as they related to financial discipleship in this present 50-year old Age of Affluence.

#### 1. Pretribulation Rapture: Money Hoarded

If, in fact, Christians are raptured prior to the tribulation, then all raptured church members' excess accumulated wealth would be left behind and not have accomplished its potential good for God's kingdom prior to the time such church members expect to be raptured. This assumes that in fact individuals with excess accumulated wealth are Christians and will be raptured.

##### a. Individuals

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<sup>404</sup> Julie Hilden; "FindLaw Forum: What Legal Questions Are the New Chip Implants for Humans Likely to Raise?"; published May 14, 2002 3:31 p.m. EDT; <<http://www.cnn.com/2002/LAW/05/columns/fl.hilden.chip/index.html>>; pp. 1-3 of 8/8/02 10:51 AM printout.

Sociologist Philip Slater lists five types of addiction to wealth, one of which is “money addicts” who like to make and accumulate it.<sup>405</sup>

b. Institutions

Many church congregations, denominational national and middle judicatory agencies, and parachurch agencies have focused on establishing large endowments and foundations.

1) Current Giving vs. Endowments: *The State of Church Giving*

Chapter 8 of *The State of Church Giving through 1997*, entitled, “The Future of Congregational Giving: The Need for Creative Church Policy,” presents the basis for an emphasis on current giving rather than on building up endowments.

In this chapter, a mathematical model is presented that compares the results of the endowment approach with the results of immediate distribution. This model demonstrates that investing immediately in human beings may have more long-term benefits than building up endowment funds, even if the purpose of those endowments is also mission funding. A moratorium on gifts to endowments with a renewed focus on “endowing” human beings presently alive might provide an alternative agenda that will increase giving.<sup>406</sup>

2) Current Giving vs. Endowments: *The Wall Street Journal*

The September 10, 2002, issue of the *Wall Street Journal* had a fairly extensive above the fold, front-page story with the following four summary headlines and subheads:

- a) Giving While Living;
- b) Some Foundations Have a New Idea: Spend It All Now;
- c) Dollars Given Today May Have More Impact on Problems; The ‘Time Value’ Analysis; and
- d) Julius Rosenwald’s Legacy.<sup>407</sup>

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<sup>405</sup> Philip Slater, *Wealth Addiction* (New York: E. P. Dutton, 1980), pp. 34-35, quoted in John and Sylvia Ronsvalle, *Behind the Stained Glass Windows* (Grand Rapids, MI: Baker Books, 1996), p. 258. Slater’s five types of wealth addiction are also listed in John and Sylvia Ronsvalle, “A Profile of the Lukewarm Church Member,” p. 1, at <http://www.emptytomb.org/ProfileLukewarm.pdf> sited at <http://www.emptytomb.org/research.html>.

<sup>406</sup> John and Sylvia Ronsvalle, “The Future of Congregational Giving: The Need for Creative Church Policy,” *The State of Church Giving through 1997* (Champaign, Ill.: empty tomb, inc., 1999), p. 72. This chapter has also been published at <http://www.emptytomb.org/FutureGiving.pdf> sited at <http://www.emptytomb.org/research.html>.

<sup>407</sup> David Bank, “Giving While Living; Some Foundations Have a New Idea: Spend It All Now,” *Wall Street Journal*, 10 September 2002, p. A1.

The continuation of the story on the inside of the paper is bannered, “Charitable Foundations Plan Their Own Demise,” and reads, in part, “The spend-it-all approach has some precedent. In 1913, Julius Rosenwald, chairman of Sears, Roebuck and Co., declared, ‘Permanent endowment tends to lessen the amount available for immediate needs, and our immediate needs are too plain and too urgent to allow us to do the work of future generations.’ ”<sup>408</sup>

c. Tragedy of Unused Billions of Dollars: Henry T. Blackaby Comments

In an October 14, 2003 presentation at the Association of Christian Foundations Meeting in Atlanta, noted author and speaker Dr. Henry T. Blackaby stated:

Do you know what one of the greatest tragedies will be when our Lord returns is—the billions of dollars that God’s people have in the bank that they never used because they were using the world’s methods. I believe that when the Lord returns there’s going to be billions of dollars in the bank that never was used because we were only using the interest.<sup>409</sup>

d. Hoarded Wealth in the Last Days: Scripture

The James 5: 1, 3 (NIV) passage has an interesting perspective about wealth around the general time of the mark of the Beast.

<sup>1</sup>Now listen, you rich people, weep and wail because of the misery that is coming upon you...<sup>3c</sup>You have hoarded wealth in the last days.

2. Posttribulation Rapture: Money Stolen

a. Individuals

It may be instructive to consider the implications if Christians will be on earth at the time of mark of the Beast, and believers refuse the 666 mark of the Beast needed in order to be able to buy or sell.

It would seem that such church members’ excess accumulated wealth would not be accessible and usable if they are not able to buy and sell.

Indeed, the accumulated wealth of individuals and families would be confiscated and become worthless or stolen to the extent one could not access or use such wealth due to a proscription against buying and selling without the mark of the Beast.

<sup>408</sup> David Bank, “Giving While Living; Some Foundations Have a New Idea: Spend It All Now,” *Wall Street Journal*, 10 September 2002, p. A8.

<sup>409</sup> Henry T. Blackaby, *God’s Vision*, compact disk of lecture presented at meeting of the Association of Christian Foundations, Atlanta, October 14, 2002.

A fairly recent historical instance in which a people's accumulated wealth was stolen by a governing entity can be seen in the Nazi's widespread confiscation of Jews' property in the past century.

Information on this historical precedent is available on the State Department Web site that "is a permanent electronic archive of information released prior to January 20, 2001" and contains the *Proceedings of the Washington Conference On Holocaust-Era Assets*. These *Proceedings* include, for example, Chapter 4 on "Nazi-Confiscated Art Issues" and Chapter 5 on "Holocaust-Era Insurance Claims."<sup>410</sup>

b. Institutions

Institutions, as well as individuals, would see their excess accumulated wealth effectively stolen were they unable to buy or sell.

c. Scripture

Jesus, speaking in Matthew 6:19 (NRSV), warns against storing up treasures where it can be stolen.

Do not store up for yourselves treasures on earth,  
...where thieves break in and steal...

3. Law-Grace, Faith-Works, or Faith-No Faith

The technology and *raison d'être* for the mark of the beast is on the cultural horizon. Indeed, they are hurtling toward us. Both individuals as household members, and individuals governing institutions, face decisions as to whether, and to what degree, to focus their efforts on either accumulating wealth, or on distributing accumulated wealth for current word and deed mission needs in Jesus' name.

Such decisions may benefit from considering that large amounts of accumulated wealth will either be wasted or stolen upon either the Pretribulation rapture, or the Posttribulation rapture, respectively.

How those who accumulate wealth individually and institutionally—rather than use it for current word and deed mission needs in Jesus' name—are, and will be, viewed by God has to do with faith in, and accompanying obedience to, Jesus Christ.

Such questions are best seen not as ones of law-grace, faith-works, but rather faith-no faith. These topics, in the context of a review of scripture and insights from Luther, Calvin and Bonhoeffer, were

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<sup>410</sup> *Proceedings of the Washington Conference On Holocaust-Era Assets*; Washington DC: Released by the Office of the Coordinator for the Washington Conference On Holocaust-Era Assets, April 1999); <<http://www.state.gov/www/regions/eur/holocaust/heac.html>>; p. 1 of 1/16/03 9:08 AM printout.

considered in “The Theological Implications of Church Member Giving Patterns.”<sup>411</sup>

B.  $\epsilon\pi\iota$ : epi: New Testament Greek Word used for both “in” and “on”: “Mark of the Beast” Is Under the Skin or On Top of the Skin?

1. Associated Press Article Touches on Issue of Whether “Mark of the Beast” Is Under the Skin or On Top of the Skin

Interestingly, a topic based on the translation of the New Testament Greek text has recently become a news issue reported by the secular press.

This topic deals with whether the text of the Bible states that the mark of the Beast presented in the New Testament book of Revelation must be on the surface of the hand or forehead, or whether the mark of the Beast may be under the surface of the skin of the hand or forehead.

The Associated Press article reads:

A Florida technology company is poised to ask the government for permission to market a first-ever computer ID chip that could be embedded beneath a person’s skin.

For airports, nuclear power plants and other high security facilities, the immediate benefits could be a closer-to-foolproof security system. But privacy advocates warn the chip could lead to encroachments on civil liberties...

Theologian and author Terry Cook said he worries the identification chip could be the “mark of the beast,” an identifying mark that all people will be forced to wear just before the end times, according to the Bible.

Applied Digital [Solutions] has consulted theologians and appeared on the religious television program the “700 Club” to assure viewers the chip didn’t fit the biblical description of the mark because it is under the skin and hidden from view.<sup>412</sup>

2. Two Translations of Revelation 13:16

<sup>411</sup> John and Sylvia Ronsvalle, “The Theological Implications of Church Member Giving Patterns,” *The State of Church Giving through 1995* (Champaign, Ill.: empty tomb, inc., 1997), pp. 83-96. This chapter has also been published at <http://www.emptytomb.org/implications.html> sited at <http://www.emptytomb.org/research.html>.

<sup>412</sup> Christopher Newton, Associated Press Writer; “U.S. to Weigh Computer Chip Implant;” Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published February 26, 2002 7:55 PM; <http://www.washingtonpost.com/ac2/wp-dyn/A7240-2002Feb26?language=printer>; pp. 1-2 of 2/28/02 7:49 AM printout.

Two illustrative translations are presented in order to portray the alternative translations of “epi” as either “in” or “on” the right hand, or the forehead.

a. The New Living Translation

The New Living Translation, along with most major translations, translates “epi” as “on.”

He required everyone – great and small, rich and poor, slave and free – to be given a mark on the right hand or on the forehead.

b. The King James Version (Authorized)

The King James Version (Authorized) translates “epi” as “in.”

And he causeth all, both small and great, rich and poor, free and bond, to receive a mark in their right hand, or in their foreheads:

3. Translation of “epi” in Two Other Illustrative Passages

The versatility of “epi” can be observed in two additional passages.

a. Revelation 5:1

In this passage, both The New Living Translation and The King James Version (Authorized), along with most major translations, translate “epi” as “in.”

1) The New Living Translation

As noted, The New Living Translation translates “epi” as “in,” for the construction “in the right hand.”

And I saw a scroll in the right hand of the one who was sitting on the throne. There was writing on the inside and the outside of the scroll, and it was sealed with seven seals.

2) The King James Version (Authorized)

As noted, The King James Version (Authorized) translates “epi” as “in,” for the construction “in the right hand.”

And I saw in the right hand of him that sat on the throne a book written within and on the backside, sealed with seven seals.

b. Revelation 20:1

In this passage, both The New Living Translation and The King James Version (Authorized), along with most major translations, translate “epi” as “in.”

1) The New Living Translation

As noted, The New Living Translation translates “epi” as “in,” for the construction “in his hand.”

Then I saw an angel come down from heaven with the key to the bottomless pit and a heavy chain in his hand.

2) The King James Version (Authorized)

As noted, The King James Version (Authorized) translates “epi” as “in,” for the construction “in his hand.”

And I saw an angel come down from heaven, having the key of the bottomless pit and a great chain in his hand.

4. Lexicon Uses of “epi” with hand and with forehead in Revelation “mark” passages

The word “epi” is used with hand and forehead in Revelation 13:16, 14:9, and 20:4. In four instances “epi” is used in the accusative case, and once each in the genitive for hand and for forehead.

A review of the range of uses of “epi” in *A Greek-English Lexicon of the New Testament and Other Early Christian Literature* is informative:

- a. “with the genitive...of place...lit.”
  - 1) “*on, upon*, answering the question ‘where?’...”
  - 2) “*on, upon* answering the question ‘where?’; w. verbs of motion...”
  - 3) “*at, near* of immediate proximity to things...”
  - 4) “*before* w. persons., esp. in the language of lawsuits...”
- b. “with the accusative...of place...lit.”
  - 1) “*across, over* w. motion implied...”
  - 2) “of motion that reaches its goal completely...*on, upon someone or someth...*”
  - 3) “of motion that comes close to someth. or someone *to, up to, in the neighborhood of, on...*”
  - 4) “of motion that takes a particular direction *to, toward...*”
  - 5) “*against* w. hostile intent...”
  - 6) “answering the question ‘where?’...*on, over someth...*”<sup>413</sup>

5. Summary Comments Regarding “epi”

The breadth of the use of “epi,” including its sense “of place,” suggests that one would situate excessive weight upon an unduly narrow and constricted sense of “epi” to insist dogmatically that “epi” is used in the

<sup>413</sup> William F. Arndt and F. Wilbur Gingrich, *A Greek-English Lexicon of the New Testament and Other Early Christian Literature* (A translation and adaptation of Walter Bauer’s *Griechisch-Deutsches Wörterbuch zu den Schriften des Neuen Testaments und der übrigen urchristlichen Literatur*, Fourth Revised and Augmented Edition, 1952), (Chicago: University of Chicago Press, 1957), pp. 285-289.

New Testament literature, in general, and Revelation, specifically, to mean only and precisely, “on the surface of,” exclusive of any more general sense of place.

Thus the linguistic evidence does not support the conclusion that one can be assured by “Applied Digital” [Solutions], as reported by the Associated Press, that a human microchip implant does not “fit the biblical description of the mark because it is under the skin and hidden from view.”<sup>414</sup> Indeed, based on additional information reviewed in this document, it would seem that a human microchip implant remains a viable, emerging candidate for “the biblical description of the mark.”

C. Implicit Relationship between National Identification Card, Implantable Microchip, and Mark of the Beast: The Cato Institute Congressional Testimony: May 13, 1997

Economist Stephen Moore of the Cato Institute in his May 13, 1997 Congressional Testimony before the U.S. House of Representatives Subcommittee on Immigration and Claim, Judiciary Committee, on the one hand noted how an implantable microchip might substitute for a national identification card, and, on the other hand, how President Ronald Reagan commented on a relationship between a national numbering system and the mark of the beast.

In the age of the microchip, centralized computers have the capability of holding and processing huge amounts of information about all 265 million American citizens...Even more sophisticated identification systems might remove the need for carrying a card at all.

Hughes Aircraft Company has a new identification technology involving a syringe implantable transponder. This "ingenious, safe, and inexpensive" worker identification technology plants a tiny microchip under the skin. It contains a ten character alphanumeric identification code that can never be duplicated. The microchip is read by an electronic scanner--the type that reads the price on the food you buy at the grocery store...

The point here is that depending on how far Congress wants to go in suppressing the rights of the individual in order to deter illegal immigration, the technology exists for a fool-proof if Orwellian identification system. If Congress were willing to further denigrate Americans' civil liberties, many new government controls to enforce our immigration laws could be erected...

Mr. Chairman, I wish to congratulate Rep. Melvin Watt for his courageous opposition to this bad idea. It saddens me to see Republicans, who took control of Congress in 1995 for the first

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<sup>414</sup> Christopher Newton, Associated Press Writer; “U.S. to Weigh Computer Chip Implant;” Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published February 26, 2002 7:55 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A7240-2002Feb26?language=printer>>; p. 2 of 2/28/02 7:49 AM printout.

time in forty years on an agenda of "less government, more freedom," so enamored with an idea that so fundamentally contradicts that platform. Ironically, many of the same Republicans who belittled the Clinton administration for proposing a national health security card now want an even more insidious national i.d. card system with a centralized computer data base to control illegal immigration. Indeed, some advocates of the i.d. card idea have suggested that the card could and should be used for both purposes.

I wish to remind Republicans that this idea first surfaced in a Reagan cabinet meeting in 1981. Then Attorney General William French Smith argued that a perfectly harmless i.d. card system would be necessary to reduce illegal immigration. A second cabinet member asked why not tattoo a number on each American's forearm. According to Martin Anderson, the White House domestic policy adviser at the time, Reagan blurted out: "My god, that's the mark of the beast." Anderson reports "that was the end of the national identification card" during the Reagan years. But bad ideas never die in Washington; they wait for another day.<sup>415</sup>

- D. Implanted ID System Sounds Like Mark of the Beast Described in New Testament: Richard M. Smith, Internet Security and Privacy Consultant, Brookline, Mass.: December 27, 2001

Richard M. Smith, a Brookline, Mass., Internet Security and Privacy Consultant, provided succinct comments on how an implanted ID system might be perceived by "many Christians." Smith also provided quotes of the NIV translation of Rev. 13:16 and Rev. 14:9 in describing what "the book of Revelations has to say about how a VeriChip-like systems might be used in the future" and "why Christians will likely stay away from a product like the VeriChip," respectively.

Applied Digital Solutions faces a very tough sell for its new VeriChip implant ID system for human beings. A VeriChip is a small radio transmitter about the size of a piece of rice that is injected under a person's skin. It transmits a unique personal ID number whenever it is within a few feet of a special receiver unit. The technology is designed to replace ID systems such as company ID cards and medical emergency ID brac[e]lets. In the future VeriChips may also be used like driver licenses, passports, and credit cards.

For most folks, the idea of being injected with an electronic transmitter is just plain creepy. However for many Christians, the product will likely be rejected on religious grounds. They'll be worried that the use of the product will mean paying the ultimate price: eternal damnation in hell. VeriChip sounds too

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<sup>415</sup> Stephen Moore; "A National Identification System;" Cato Institute Congressional Testimony before the U.S. House of Representatives Subcommittee on Immigration and Claim, Judiciary Committee; dated May 13, 1997; <<http://www.cato.org/testimony/ct-sm051397.html>>; p. 5, 7 of 4/14/03 4:57 PM printout.

much like the Mark of the Beast which is described in the New Testament.<sup>416</sup>

- E. Microchips Used for Buying or Selling? Possible Prototype for Mark of Beast?: The Christian Broadcasting Network: CBN News: Regent University Professor and an Internet Consultant's Response: 2002

CBN News Senior Reporter Dale Hurd reported Regent University professor Dr. Joseph Kickasola's opinion about any relationship between an implanted microchip and Revelation's mark of the Beast. Richard M. Smith, an Internet Security and Privacy Consultant, published, on <[www.computerbytesman.com](http://www.computerbytesman.com)>, his response to Dr. Joseph Kickasola's opinion.

1. Human Microchip Implant Not for Buying and Selling: The Christian Broadcasting Network: CBN News: Regent University Professor Doctor Joseph Kickasola: 2002

CBN News Senior Reporter Dale Hurd reported Regent University professor Dr. Joseph Kickasola's comment that human microchip implants are "not for buying or selling."

Microchip technology is no longer just for Palm Pilots and cell phones, now people can store important information about themselves right beneath their skin. A chip about the size of a Tic Tac can carry up to six lines of text, readable with a scanner.

Science fiction has become reality. A Florida company plans to bring their new VeriChip to the market this year. It's a product that excites a lot of people, but worries many others...

A GPS tracking device is currently too large to fit into the tiny VeriChip, but miniaturization is probably only a matter of time. Some believe a tracking device inside the body could deter kidnapping. "We've had six Latin American countries in here in just the last two weeks, and they are begging us to create an embedded integrated technology," Bolton said.

But the thought of being tracked and carrying vital information in the body makes a lot of people's skin crawl. And it reminds some of a frightening prophecy in the Bible about the mark of the Beast.

Revelation 13 says the Beast will force everyone "to receive a mark on his right hand or forehead, so that no one could buy or sell unless he had the mark, which is the name

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<sup>416</sup> Richard M. Smith; "Tough Sell Ahead for the Verichip Implant Id System;" published December 27, 2001; <<http://www.computerbytesman.com/biometrics/verichip.htm>>; p. 1 of 2/28/03 4:23 PM printout.

of the Beast or the number of his name... His number is 666."

Applied Digital has been attacked by some Christians for making what some fear is a prototype mark of the Beast. So does this chip, as it is now, have any relationship to the prophecy in the book of Revelation? CBN News asked Regent University professor Doctor Joseph Kickasola.

"My judgement is, no they do not," Kickasola said. "I think it's both illogical and unfair to make that assertion, and let me tell you why. I think the Bible clearly says the mark of the Beast is for buying and selling and that it is also coerced, it's government enforced. On the face of it, these microchips are for good purposes, like for medical records, like for lost children. They're not for buying or selling, as is described in the book of Revelation.<sup>417</sup>"

2. Human Microchip Implant Is for Buying or Selling: Internet Security and Privacy Consultant Richard M. Smith:  
<[www.computerbytesman.com](http://www.computerbytesman.com)>: February 1, 2002

In published e-mail to Dr. Kickasola, Internet Security and Privacy Consultant Richard M. Smith observes that human microchip implants "can replace credit cards."

Not being a Biblical scholar, I can't really comment on the book of Revelation. However as a technologist, it is pretty clear to me that the VeriChip identification system can replace credit cards as more convenient and secure method of paying for goods and services. A VeriChip couldn't be lost or stolen like a credit card. In addition, I believe that the technology makes it difficult for the crooks to duplicate someone's ID number.

In commerce, I would expect that the VeriChip identification system to be used much the SpeedPass system from ExxonMobil is used today:

<http://www.speedpass.com/index.jsp>

This system makes use of a key ring gadget to replace a credit card at self-service stations to buy gas...

A VeriChip payment system would work just like a SpeedPass, except a person would just wave their hand by a reader instead of a SpeedPass...

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<sup>417</sup> Dale Hurd; "A Microchip Makes Its Mark: VeriChip & the Beast;" CBN News; published 2002; <<http://www.cbn.com/cbnnews/news/020131a.asp>>; p. 1 of 2/28/03 4:30 PM printout.

Even though someone might originally have a VeriChip installed in their hand as a medical id tag, the same chip could also be used in a payment system like I've outlined.

The business development folks at Applied Digital Systems are almost surely interested in the payment system market for VeriChip. It is the ultimate market for this technology because they get to sell chips to every person who uses a credit card today and readers to every merchant.<sup>418</sup>

## XXVI. Human Microchip Implants: Advice

One article entitled, "Dark Angels: New Micro-chip Technology for Pets, Children and You," concludes with advice regarding not accepting human microchip implants "in your right hand or forehead."

Chris Gray says that technology like Digital Angel raises some serious issues about the direction humanity is taking. "We have this break-down in our communities, the pace of life, and so we worry about our children. But we should know where our children are. First we create a problem with technology and then we turn to it for a solution. It is a ridiculous spiral."

Gray says the pace of technological change is just too fast and is creating a cultural crisis.

"Early humans were defined by their tool use. Eventually this became more complicated, gradually we entered into the era of the machine, which developed to the point where we are surrounded by, and highly dependent, on machines. Now we are incorporating technology into ourselves on a very intimate level. We are moving towards an era where we will be post-human."

Will the day come when employers will be able to keep track of the comings and goings of their employees? Or the government monitor anyone it decides warrants tracking? Or parents need not go outside to check on the kids but will watch them on their computer screen?

Who knows?

But thinking about it brings me back to one fringe website which makes it as plain as day: "WARNING: Do NOT let anyone, for any reason, inject a chip in your right hand or forehead."

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<sup>418</sup> Richard M. Smith; "Using the VeriChip ID System to Replace Credit Cards;" e-mail to Dr. Kickasola: joekick@regent.edu; sent February 1, 2002 2:36 PM; <<http://www.computerbytesman.com/biometrics/vcom.htm>>; p. 1 of 2/28/03 4:24 PM printout.

Sounds like solid advice to me. In a world of digital angels, I'm definitely more comfortable on the fringe.<sup>419</sup>

## XXVII. Human Microchip Implants: Stationary Position

### A. Microchip Implant Stays in Place: Applied Digital Solutions

The Applied Digital Solutions “VeriChip Personal Identification System - Frequently Asked Questions” Web page notes that the microchip implant “stays in place.”

Q: What is “the chip”?

A: VeriChip is an inert, encapsulated microchip that is energized and transmits its information when activated by a VeriChip reader. Because VeriChip is so small (about the size of a pen point) it is virtually undetectable and practically indestructible once inserted under your skin. The chip has a special polyethylene sheath that helps skin bond to it – so it stays in place...<sup>420</sup>

### B. Prevent Chip from Migrating: *The Boston Globe*: May 20, 2003

Dr. Harvey Kleiner explained a method designed to “prevent the chip from migrating to another part of the body...” in response to a question about “health hazards,” by *Boston Globe* Correspondent Angela Swafford.

I did, however, have a few questions about its health hazards. So I asked Dr. [Harvey] Kleiner.

“The VeriChip is extremely safe,” he says. “Pacemakers are hundreds of times larger and more complicated and nobody has problems with them. To prevent the chip from migrating to another part of the body there is a little polymer at one end of the capsule that will adhere to the skin and hold it in place.”<sup>421</sup>

## XXVIII. Human Microchip Implants: Omnipresent, Ubiquitous RFID Readers

Human microchip implants are candidates for the Biblical mark of the beast technology. With regard to human microchip implants, the main significance of

<sup>419</sup> Brit Griffin; “Dark Angels: New Micro-chip Technology for Pets, Children and You;” *HighGrader Magazine*; published May-June 2001; <<http://www.grievousangels.com/highgrader/2001/angel.html>>; p. 6 of 1/14/02 printout.

<sup>420</sup> “VeriChip Personal Identification System - Frequently Asked Questions;” published n.d.; <<http://www.adsx.com/faq/verichipfaq.html>>; p. 1 of 1/9/03 9:00 AM printout.

<sup>421</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 4 of 5/22/03 3:03 PM printout.

radio frequency identification (RFID) chips or tags is that the spread of RFID tags in consumer goods will mean an accompanying spread of RFID readers. These RFID readers then would then provide the infrastructure to provide ubiquitous readers of human RFID microchip implants.

A. Widespread Presence of Readers Required for Human Microchip Implant System.

Any widespread, human microchip implant-based electronic identification system used for identification, in general—or buying and selling, specifically—would require an extensive, if not universal, presence of microchip readers.

B. Pet Chipping Business Model Based on Free Distribution of Readers

The business model for pets was based on the free distribution of scanners to veterinarians and animal shelters.

C. Human Microchip Implant Business Model Initially Based on Widespread Distribution of Readers via Medical Community

The business model for chipping people was similar to that for pets, which was based on the widespread free distribution of scanners to veterinarians and animal shelters.

1. Business Model Based on Widespread Distribution of Scanners: *The Register*: June 10, 2002

The people business model is based, according to Applied Digital, on Digital Angel's HomeAgain animal identification system. Vets and animal shelters were given free scanners, and there you go, some kind of critical mass brewing. It's also significant that three of the company's execs have been chipped, not because they have any ailments (not disclosed ones, anyway), but because they wanted "to demonstrate to the world our complete confidence in the success of this exciting, life-enhancing technology."

So although vertical markets are being targeted initially, really they want people to accept it as natural on the basis that it's entirely positive, and everybody should have it done. The security potential is substantial, and the privacy issues come clanking along behind.<sup>422</sup>

2. Goal Is for 90 Percent of U.S. Hospitals, Clinics and Paramedics to Have Scanners: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

A May 10, 2002 article by *Palm Beach Post* Staff Writer Deborah Circelli reported on plans for human microchip implant chip scanners to be available nationwide.

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<sup>422</sup> John Lettice; "First People Injected with Id Chips, Sales Drive Kicks Off;" *The Register*; published June 10, 2002 at 08:52 GMT; <<http://www.theregister.co.uk/content/54/25640.html>>; p. 1 of 3/7/03 4:20 PM printout.

The VeriChip process also is similar to one started by St. Paul, Minn.-based Destron Fearing Inc., which was bought by Applied Digital in 2000.

The company is hoping Destron's expertise and experience implanting ID chips in more than 10 million pets throughout the country will be helpful with the VeriChip.

To help bolster the VeriChip's appeal, Applied Digital is distributing the \$1,200 scanners free to hospitals in Palm Beach and Broward counties...

In two to three years, however, the company's [Applied Digital Solutions] goal is for 90 percent of U.S. hospitals, clinics and paramedics to have the scanners. The company hopes one day it will become routine for all hospitals to scan patients who come into emergency rooms unable to speak, or having Alzheimer's.

About 4,000 people worldwide have registered with the company to be implanted with the VeriChip, [President Scott] Silverman said<sup>423</sup>

D. Human Microchip Implant Business Model Based on Distribution of Readers via Medical Community May Be Affected by FDA Warning

A November 2002 FDA warning not to market the VeriChip "with claims of medical utility" would, at that time, on the face of it, seem to have an influence on any plans to build a market for human microchip implants based on the nationwide distribution of human microchip scanners via the medical community.

E. Radio Frequency Identification (RFID) Reader System Conceptualized in Number of Ways

RFID systems that are being designed to provide universal microchip readers have been conceptualized and named in a variety of ways.

1. Wireless IDs<sup>424</sup>
2. Internet of Things<sup>425</sup>

<sup>423</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: PalmBeachPost.com; published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; pp. 2-3 of 5/10/02 8:04 AM printout.

<sup>424</sup> Cheryl Rosen; "The Fast Track;" *InformationWeek*; published June 18, 2001; <<http://www.informationweek.com/story/IWK20010618S0001>>; p. 1 of 3/31/03 printout.

<sup>425</sup> Chana R. Schoenberger; "The Internet of Things;" Forbes.com; published March 18, 2002; <[http://www.aliantechnology.com/news/The\\_Internet\\_of\\_Things.htm](http://www.aliantechnology.com/news/The_Internet_of_Things.htm)>; p. 1 of 3/18/03 3:35 PM printout; and "About the Technology: Creating an Internet of Things;" Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_creating.asp](http://www.autoidcenter.org/aboutthetech_creating.asp)>; p. 1 of 3/24/03 10:54 AM printout.

3. A Network of Trillions of Things<sup>426</sup>
4. Silent Commerce<sup>427</sup>
5. Reality Online<sup>428</sup>
6. A Virtual Double of the Real World<sup>429</sup>
7. Universal Commerce; U-Commerce<sup>430</sup>
8. Ubiquitous RFID; Ubiquitous ID; Ubiquitous Computing<sup>431</sup>
9. Radar for Everyday Products<sup>432</sup>
10. Track-and-Trace<sup>433</sup>
11. Electronic Article Surveillance (EAS)<sup>434</sup>

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<sup>426</sup> Simon London; "Alien Concept Coming to a Store Near You;" *Financial Times*; published March 5, 2003; <<http://www.equitekcapital.com/Library/FT.com - Comment & Analysis - Inside track.htm>>; pp. 1-2 of 3/19/03 1:56 PM printout.

<sup>427</sup> Bob Violino; "Get Ready for Reality Online;" *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/343>>; p. 1 of 3/18/03 8:20 AM printout; and "Seize the Day: The Silent Commerce Imperative;" Accenture; pdf created September 20, 2002, based on icon Get Info; <<http://www.accenture.com/xdoc/en/services/technology/vision/SiezeTheDay.pdf>>; p. 2 of 3/19/03 printout.

<sup>428</sup> Bob Violino; "Get Ready for Reality Online;" *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/343>>; p. 1 of 3/18/03 8:20 AM printout.

<sup>429</sup> Bob Violino; "Get Ready for Reality Online;" *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/343>>; p. 1 of 3/18/03 8:20 AM printout.

<sup>430</sup> John G. Spooner, Staff Writer; "Visa Readies Wireless Smart Cards" CNET News.com; published September 19, 2002 10:05 AM PT; <<http://news.com.com/2100-1017-958612.html>>; p. 1 of 2/18/03 10:08 AM printout.

<sup>431</sup> "Japanese Promote Ubiquitous RFID;" *RFID Journal*; published March 21, 2003; <<http://www.rfidjournal.com/article/articleview/341/1/1/>>; pp. 1-2 of 3/21/03 8:37 AM printout; and Marc Langheinrich; Distributed Systems Group, Institute for Pervasive Computing, Swiss Federal Institute of Technology; pdf created September 14, 2002, based on icon Get Info; <<http://www.inf.ethz.ch/vs/publ/papers/uc2002-pws.pdf>>; p. 1 of 3/19/03 printout.

<sup>432</sup> Scott Kirsner; "Building a 'Radar for Everyday Products';" *Newsweek*; published March 18, 2002; <[http://www.aliantechnology.com/library/pdf/Radar\\_for\\_Products.pdf](http://www.aliantechnology.com/library/pdf/Radar_for_Products.pdf)>; p. 1 of 3/19/03 printout.

<sup>433</sup> "Gillette, Michelin Begin RFID Pilots;" *Frontline Solutions*; published March 1, 2003; <<http://www.frontlinetoday.com/frontline/article/articleDetail.jsp?id=48562>>; p. 1 of 3/28/03 8:30 AM printout.

<sup>434</sup> "Identification;" Philips Semiconductors; copyright 2003; <<http://www.semiconductors.philips.com/markets/identification/products/icode/ic/>>; p. 1 of 3/29/03 3:56 PM printout.

12. The Next Computer Revolution<sup>435</sup>

13. A New Global Infrastructure—A Layer on Top of The Internet<sup>436</sup>

F. Historical Note: Radio Frequency Identification (RFID) First Developed in World War II: Reuters: April 8, 2003

A Reuters article reported that Radio Frequency Identification (RFID) was first developed in World War II.

First developed in World War II as a way to help radar operators distinguish between friendly and enemy aircraft, RFID tags are already used to track cattle, identify lost pets, and enable commuters to drive through tollbooths without pausing.<sup>437</sup>

G. Radio Frequency Identification (RFID) Readers: RFID Readers May Become Omnipresent to Read both RFID Tagged Items in Retail Outlets, and Potentially, RFID Human Microchip Implants

Scanners that read RFID microchips may become omnipresent in stores if RFID tagged items are introduced in retail establishments on a broadscale basis. Following are indications of the spread of RFID readers and RFID tagged items. Presumably, omnipresent, ubiquitous RFID readers will be able to read non-contact RFID smart cards, and passive or active RFID human microchip implants.

1. An RFID Test, a Planned RFID Rollout, and RFID Use in Books: *InformationWeek*: June 18, 2001

Cheryl Rosen, writing in *InformationWeek* covered an RFID experiment in Tulsa, Okla., “one of the first major commercial rollouts of RFID technology,” and “a market for RFID in more than 30 libraries and universities.”

Tulsa, Okla., is the site of this summer's most innovative experiment in inventory management. A group of retailers, manufacturers, and vendors-dubbed the Auto-ID Center-is wiring the entire city with analog radio-frequency gear that can track packages equipped with microchips.

The system will make it possible to track inventory as it moves from point to point across the city. "We're putting

<sup>435</sup> “Opening of the Auto-ID Center Lab at the University of St. Gallen (HSG); Auto-ID Center; pdf created March 27, 2002, based on icon Get Info;

<[http://autoidcenter.com/media/StGallen\\_lab.pdf](http://autoidcenter.com/media/StGallen_lab.pdf)>; p. 6 of 4/8/03 printout.

<sup>436</sup> “Opening of the Auto-ID Center Lab at the University of St. Gallen (HSG); Auto-ID Center; pdf created March 27, 2002, based on icon Get Info;

<[http://autoidcenter.com/media/StGallen\\_lab.pdf](http://autoidcenter.com/media/StGallen_lab.pdf)>; p. 6 of 4/8/03 printout.

<sup>437</sup> “Retail Tracking Technology Could Turn World into Fishbowl;” Reuters (Washington) article on usatoday.com; published April 8, 2003;

<[http://www.usatoday.com/tech/news/techinnovations/2003-04-08-retail-tags\\_x.htm](http://www.usatoday.com/tech/news/techinnovations/2003-04-08-retail-tags_x.htm)>; p. 1 of 4/9/03 5:16 PM printout.

RFID [radio-frequency identification] chips on everything that moves," says John Balboni, VP of E-business at International Paper Co. in Stamford, Conn...

Eventually, the wireless IDs are likely to replace many bar-code applications, in which retailers and manufacturers continue to invest...

...San Francisco International Airport...next month will begin one of the first major commercial rollouts of RFID technology. Its new baggage-tracking system will use a high-frequency system from SCS Corp. that includes a chip and microwave antenna on an adhesive-backed strip...

...When a receiver finds an RFID-tagged bag, it triggers levers to automatically direct the bag to a security area...

[Mark] Denari[, the airport's operations security coordinator,] says the airport will begin passing along the cost of the devices to the airlines. Eventually, he sees the airport generating revenue by offering RFID tracking of all luggage as an outsourced service.

Checkpoint Systems Inc., a supplier of security tags and radio-frequency devices, has...also found a market for RFID in more than 30 libraries and universities. Last week, the University of Connecticut announced that it's putting tags on every book. Rockefeller University's library in New York has added them to 112,000 books and journals...<sup>438</sup>

2. "A Radar for Everyday Products": *Newsweek*: March 18, 2002

Scott Kirsner, a technology columnist for *The Boston Globe* writing in *Newsweek*, provided an overview of RFID as of the March 18, 1992 issue of *Newsweek*.

[Kevin] Ashton is a Procter & Gamble brand manager on loan to MIT, where he serves as director of the Auto-ID Center. His mission: to reinvent the quarter-century-old bar code used at checkout counters everywhere...

The next-generation technology that Ashton's group is developing, a cheap microchip affixed to the container, would tell all... Ashton refers to it as "radar for everyday products"...

With inexpensive electronic tags embedded in products and a network of wirelessly linked tag readers tracking those

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<sup>438</sup> Cheryl Rosen; "The Fast Track;" *InformationWeek*; published June 18, 2001; <<http://www.informationweek.com/story/IWK20010618S0001>>; pp. 1-3 of 3/31/03 printout.

products, store managers would have a real-time tally of the products on their shelves...

One promising sign: the Uniform Code Council—keeper of the bar code—has endorsed the Auto-ID Center’s efforts, and Ashton says the group is on track to have its technological specifications finished and released by October 2003.<sup>439</sup>

3. “The Internet of Things”: Forbes.com: March 18, 2002

*Forbes* wrote about radio frequency ID chips in March 2002.

Much as the humble bar code helped companies understand what they were selling, these new tags, which bear a unique number known as an electronic product code, will let businesses track what customers are *buying*...

And once these radio-frequency ID chips are ubiquitous, more advanced uses are expected to emerge, making retailers omniscient about every product moving through the supply chain...

Much of this new work is under way at the two-year-old **AutoID Center** at MIT, which has \$9 million in research funding from a consortium of big companies and government agencies, including Pepsi, Johnson & Johnson, UPS and the Department of Defense. Kevin Ashton, the Procter & Gamble exec who heads the center, foresees RFID leading to complete automation of data collection. "We need an 'Internet-for-things', a standardized way for computers to understand the real world," says Ashton.

Radio chips have long been used to tag livestock and are immensely successful in highway toll-gathering schemes. ExxonMobil's SpeedPass wireless payment system allows drivers to pay by waving a key-chain fob next to the pump. It has already enlisted 6 million drivers...

The Gap, in conjunction with tagmaker Texas Instruments, recently tagged a suburban Atlanta store. It tracked jeans from the distribution center to the store shelves, which had embedded readers. Scanning at 50 tags per second allowed store personnel to get a computer snapshot of where every pair of boot-cut women's indigo jeans was located.

McDonald's is also trying out the tags. In Boise, Idaho 31 restaurants give out chip-embedded key chains carrying stored-value payment information, which is linked to a

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<sup>439</sup> Scott Kirsner; “Building a ‘Radar for Everyday Products’;” *Newsweek*; published March 18, 2002; <[http://www.aliantechnology.com/library/pdf/Radar\\_for\\_Products.pdf](http://www.aliantechnology.com/library/pdf/Radar_for_Products.pdf)>; p. 1 of 3/19/03 printout.

customer's credit card or checking account. The tags, from Wayne, Pa. startup **FreedomPay**, rack up rewards such as free sodas.

"You walk up, place your order, wave the wand, and in two seconds it's authorized and approved," says David Rosal, a strategy director for McDonald's, which is also testing ExxonMobil's SpeedPass in 450 Chicago restaurants...

Privacy advocates are also quaking over the possibility that anyone with a radio-frequency reader, including the government, could find out where a passerby had purchased his shoes. It would be easy for Wal-Mart, say, to use its in-store readers to figure out which competitors its customers frequented. Even scarier, some credit-card issuers are considering implanting radio tags into their plastic cards.

"It's quite serious," cautions **Tien**, a lawyer with the **Electronic Frontier Foundation**, a San Francisco watchdog group. "Once you go down that road, one has to consider the possibility that while Wal-Mart and Kmart might not share that information with each other, there will be times when that information will be demanded by the government for purposes of investigation."

It's a long way since the first bar-coded item, a ten-pack of Wrigley's gum, was scanned in 1974. Ten years from now that package may well have a chip inside.<sup>440</sup>

#### 4. Tags Will Be on Everything: *USA Today*: April 11, 2002

Kevin Maney, writing for *USA Today*, comments on the extent to which objects will be chipped.

Each tag will contain a computer chip, storing a small amount of data, and a minuscule antenna that lets the chip communicate with a network.

In time, when billions of tags are out there and communicating, the technology will infiltrate business and everyday life to a greater extent than today's personal computers, cell phones or e-mail. In decades to come, its impact might be as fundamental as the invention of the light bulb.

Those tags will someday be on everything — egg cartons, eyeglasses, books, toys, trucks, money and so on. All those items will be able to wirelessly connect to networks or the

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<sup>440</sup> Chana R. Schoenberger; "The Internet of Things;" *Forbes.com*; published March 18, 2002; <[http://www.aliantechnology.com/news/The\\_Internet\\_of\\_Things.htm](http://www.aliantechnology.com/news/The_Internet_of_Things.htm)>; pp. 1-4 of 3/18/03 3:35 PM printout.

Internet, sending information to computers, home appliances or other electronic devices.<sup>441</sup>

5. RFID Tags: Inevitable and Can't Un-invent: *USA Today*: April 11, 2002

Kevin Maney, writing for *USA Today*, reports that some see RFID tags inevitable.

"This idea is seeming less and less crazy and more and more desirable," says Auto-ID's [Kevin] Ashton [executive director of the Auto-ID Center at the Massachusetts Institute of Technology]. "Technological breakthroughs show it's not only desirable, but inevitable"...

Privacy "is an issue. There will have to be a social discourse about what we want and don't want," says Accenture's [Glover] Ferguson [chief scientist at consulting firm Accenture]. "But the technology isn't going away: You can't un-invent it." <sup>442</sup>

6. "The Manhattan Project: Excessive Secrecy Could Be the Auto-ID Center's Achilles Heel": *RFID Journal*: July 22, 2002

In an "Opinion" piece, *RFID Journal* observed that the RFID Electronic Product Code, designed to succeed the Universal Product Code (UPC), was developed secretly.

During my interview with Alan Haberman, who was closely involved in the development of the bar code 25 years ago, for this week's feature, he mentioned something interesting. All of the meetings that the committees and subcommittees involved in the effort were open to not just people in the industry, but also to the press and public. Haberman said the minutes from the meeting were written up and distributed. And when the bar code and Universal Product Code were finally presented to the industry, there were companies ready to implement it immediately.

This struck me because it contrasts so sharply with the Auto-ID Center's current posture. The center is highly secretive. So secretive, in fact, that I've begun to think of it as the Manhattan Project. The difference in attitude towards releasing information is related to the difference in

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<sup>441</sup> Kevin Maney; "New Chips Could Make Everyday Items 'Talk';" *USA Today*; published April 11, 2002; <<http://www.usatoday.com/tech/news/2002/04/12/tinyband.htm>>; p. 1 of 3/21/03 4:34 PM printout.

<sup>442</sup> Kevin Maney; "New Chips Could Make Everyday Items 'Talk';" *USA Today*; published April 11, 2002; <<http://www.usatoday.com/tech/news/2002/04/12/tinyband.htm>>; pp. 2-4 of 3/21/03 4:34 PM printout.

the effort to create the UPC and the effort to create the Electronic Product Code that is designed to succeed it.<sup>443</sup>

7. Forrester Research, a Cambridge, Mass., Research Firm Issues New Report, Entitled "RFID: The Smart Product (R)evolution": *RFID Journal*: September 4, 2002

In a news article, *RFID Journal* covered Forrester Research's new report.

Christine Spivey Overby, the Forrester CPG analyst who wrote the report, says the aim was to clarify some of the confusion surrounding RFID...

Among the challenges early adopters face, according to the report, are the lack of worldwide data standards, the lack of an available RFID spectrum worldwide (in Japan, for example, the UHF spectrum can't be used for commercial purposes), tag and reader incompatibility, data overload and distrust among employees...

[Overby says,] "The big question is whether or not we get to the point where the economics let us cross the chasm from pallet- and case-level to item-level tagging"...

Among the factors needed to foster wide-scale adoption are global standards, low-cost tags, affordable multi-frequency readers, and successful pilots, such as the Auto-ID Center's field test. Overby also says that "power retailers" like Wal-Mart and Ahold will have to drive adoption.<sup>444</sup>

8. "Seize the Day: The Silent Commerce Imperative": Accenture: September 20, 2002

An Accenture report's introductory page indicates that, globally, a number of companies are using RFID.

At Accenture, we keep close tabs on the future, looking for companies that are implementing silent commerce technologies in both predictable and surprising ways. In this report, we take a close look at a number of companies (ExxonMobil, Figleaves.com, Ford Motor Company, Marks and Spencer, Shell and others) in a wide range of industries (automobile manufacturing, distribution, energy, retail, and others) that are currently using a core silent commerce technology, radio frequency identification (RFID)...

<sup>443</sup> "The Manhattan Project," *RFID Journal*; published July 22, 2002; <<http://www.rfidjournal.com/article/view/159>>; p. 1 of 2/18/03 9:51 AM printout.

<sup>444</sup> "RFID Offers Benefits Today," *RFID Journal*; published September 4, 2002; <<http://www.rfidjournal.com/article/articleview/63>>; pp. 1-2 of 3/14/03 2:54 PM printout.

As our examples from Asia, Europe and the United States illustrate, many successful companies are finding innovative ways to use RFID technology and leverage the power of resulting information to meet and create customer demand. We believe that silent commerce will help companies around the world do the same.<sup>445</sup>

9. Alien Technology to Mass Produce Low-Cost RFID Tags: *RFID Journal*: September 24, 2002

In a news article, *RFID Journal* reported on Alien Technology's plans to mass produce low-cost RFID tags.

For more than a year, Alien Technology, a Morgan Hill, Calif., startup, has been getting a lot of press based on its ability to mass produce microchips the size of a grain of pepper for low-cost RFID tags...

[Jeff] Jacobsen [Jacobsen, Alien's senior vice president of new market development] said that Alien sold 300,000 tags to the Auto-ID Center's field test for 20 cents a piece. The company plans to drop the price by 2 cents per quarter, which means that by the time the Auto-ID Center launches its technology late next year, the tags would cost about ten cents. But strategic partners buying hundreds of millions of tags may get them for that price before then.

Alien also showed off a tiny RFID strap, a chip in a bow tie-like band that could be attached to an antenna printed with conductive ink...

But Alien envisions the ink being mixed with regular packaging ink to create antennas on boxes of cereal and other disposable packaging...

Jacobsen says that within two years, Alien could be selling the RFID straps to packaging companies for about two cents if they are buying tens of millions per year. "With these things you could literally tag a pack of chewing gum," he said.<sup>446</sup>

10. "Power Paper Plans to Design Battery-Powered Labels": *RFID Journal*: October 29, 2002

The *RFID Journal* reported on "flexible batteries to power smart labels that actively broadcast information"

<sup>445</sup> "Seize the Day: The Silent Commerce Imperative;" Accenture; pdf created September 20, 2002, based on icon Get Info; <<http://www.accenture.com/xdoc/en/services/technology/vision/SiezeTheDay.pdf>>; p. 2 of 3/19/03 printout.

<sup>446</sup> "Alien Technology Seen in Chicago;" *RFID Journal*; published September 24, 2002; <<http://www.rfidjournal.com/article/view/76>>; pp. 1-2 of 2/18/03 9:48 AM printout.

One problem with RFID has always been its performance in the real world. When a forklift zooms through a dock door, the reader isn't always able to read a passive tag. Power Paper, a five-year-old company based in Tel-Aviv, Israel, hopes to change that by using its thin, flexible batteries to power smart labels that actively broadcast information.

The company has created a new division called PowerID. Baruch Levanon, Power Paper's founder and executive director, will head the division...

Power Paper's battery is printed and can be made to almost any shape. It is just 0.5 mm thick, provides 1.5 volts of power and is guaranteed to last up to two and a half years. Increasing the battery size can extend the shelf life.

Levanon says Power Paper's battery has greater storage capacity than the thin-film battery recently unveiled by Cymbet Corp. (see [Thin-Film Battery May Energize RFID](#)). Unlike Cymbet's product, however, Power Paper's battery is not rechargeable. But Levanon says the company is working to develop a rechargeable version.

Thin-film batteries are ideal for certain RFID applications because they can be used in labels, just like passive tags...

...Levanon says Power Paper should have an active smart label on the market by the end of 2004. He adds that the battery will add only two cents to the cost of the label, when manufacturing billions per year.<sup>447</sup>

11. "Gillette to Buy 500 Million EPC Tags": *RFID Journal*: November 15, 2002

In an "Exclusive" news article, *RFID Journal* reported on Gillette's plans for a large-scale purchase of RFID tags.

At the Auto-ID Center's board meeting yesterday, there was one piece of news that everyone was talking about. Just before the representatives from 83 sponsor companies broke for lunch, Dick Cantwell, Gillette's VP of worldwide beauty care products, told the group that his company plans to purchase 500 million RFID tags from Alien Technology, the Morgan Hill, Calif. Startup.

Cantwell said...shipments of the tags, which will be compliant with the Auto-ID Center's specification, should begin in March.

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<sup>447</sup> "New Unit for Active Smart Labels;" *RFID Journal*; published October 29, 2002; <<http://www.rfidjournal.com/article/articleview/243/1/1/>>; pp. 1-2 of 5/30/02 8:25 AM printout.

The news is stunning because of the sheer size of the order. No one has good market numbers, but half a billion tags is probably more than the total number of RFID tags in use today. "People couldn't stop talking about it over lunch," says one person present, who didn't want to be identified.

Gillette was a founding sponsor of the Auto-ID Center, and Cantwell serves as chairman of the MIT-based organization. So it's probably no surprise that the company is the first to actually commit to using the tags, which will carry the Auto-ID Center's electronic product code. Still, the news came as a surprise because no one expected a major company to make a purchase this soon.

Cantwell told the sponsors how important RFID is to his company and to the consumer packaged goods industry. He said Gillette would tag pallets and cases...

The purchase by Gillette, when it is made official, will mark a major milestone in the commercialization of low-cost RFID tags and the development of the Auto-ID Center's EPC network.<sup>448</sup>

12. "The World Just Changed": *RFID Journal*: November 15, 2002

In an "Opinion" piece, *RFID Journal* commented on Gillette's plans for a large-scale purchase of RFID tags. On Nov. 15, we reported exclusively that The Gillette Company plans to buy half a billion RFID tags from Alien Technology (see [Gillette to Purchase 500 Million EPC Tags](#)). It is not only the most important news that *RFID Journal* has broken; it's the most important news this industry has ever seen...

We now have some clarity in the market...

Gillette's decision makes it clear to end users that the Auto-ID Center's technology is real, works and is a viable option when implementing RFID...

And Gillette is not alone. Several other major multinationals that belong to the Auto-ID Center will likely place orders for RFID tags within the next couple of months, as they ramp up pilots. In other words, your company is probably at least a year behind.<sup>449</sup>

13. Auto-ID Center: "About The Center," "About The Technology," "The Latest News," and "Q&A"

<sup>448</sup> "Gillette to Buy 500 Million EPC Tags;" *RFID Journal*; published November 15, 2002; <<http://www.rfidjournal.com/article/view/115>>; p. 1 of 2/18/03 9:32 AM printout.

<sup>449</sup> "The World Just Changed;" *RFID Journal*; published November 18, 2002; <<http://www.rfidjournal.com/article/view/146>>; pp. 1-2 of 2/18/03 9:36 AM printout.

The Auto-ID Center Web site has sections entitled, "About The Center," "About The Technology," "The Latest News," and "Q&A," among others. Following is information from these three sections.

a. "About the Center": Auto-ID Center

1) Overview

The Auto-ID Center provided overview information about the Auto-ID Center, including information about "cheap agile readers" on the [autoidcenter.org](http://autoidcenter.org) Web site.

Founded in 1999, the Auto-ID Center is a unique partnership between more than 87 global companies and three of the world's leading research universities; the **Massachusetts Institute of Technology** in the US, the University of Cambridge in the UK and the University of Adelaide in Australia. Together they are creating the standards and assembling the building blocks needed to create an "Internet of things."

Radio frequency identification (RFID) is a simple concept with enormous implications. Put a tag - a microchip with an antenna - on a can of Coke or a car axle, and suddenly a computer can "see" it. Put tags on every can of Coke and every car axle, and suddenly the world changes...

The Auto-ID Center is designing, building, testing and deploying a global infrastructure - a layer on top of the Internet - that will make it possible for computers to identify any object anywhere in the world instantly...

The Auto-ID Center is designing the critical elements of the new network. These elements include: Electronic Product Code or EPC, specification for cheap tags and cheap agile readers...<sup>450</sup>

2) "The New Network: Identify Any Object Anywhere Automatically"

The Auto-ID Center's "About the Auto-ID" Web page included a "[Click here to Download a Brochure](#)" option.<sup>451</sup> That option led to a pdf document entitled, "The New Network: Identify Any Object Anywhere Automatically." "The New Network" includes an informative comment by Dick Heyman, Global Head of Life Science & Consumer Product Industries, Sun Microsystems Inc.

In the near future, every single object will be connected to the Internet through a wireless

<sup>450</sup> "About the Center;" Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/aboutthecenter.asp>>; p. 1 of 3/19/03 7:35 AM printout.

<sup>451</sup> "About the Center;" Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/aboutthecenter.asp>>; p. 1 of 3/19/03 7:35 AM printout.

address and unique identifier. The Auto-ID Center is creating the standards that will shape this new age.”<sup>452</sup>

### 3) “Our Sponsors”

The Auto-ID Center’s “Our Sponsors” Web page included the following information about the Center’s Board of Overseers and the Technology Board, as well as a listing of members of each Board via a “View members for” “Board of Overseers,” and “Technology Board” drop-down list box.

End-user sponsors - those that will buy EPC-related technologies - are eligible to join the Center's Board of Overseers. All Overseers are required to make a one-time donation of \$300,000. Vendors that plan to sell EPC-related technologies or services are eligible to join the Technology Board. All technology vendors are required to donate \$50,000 to \$150,000, depending on their annual sales.<sup>453</sup>

#### a) Auto-ID Center Board of Overseers

Accessing the Auto-ID Center “Board of Overseers” drop-down list box on March 19, 2003 yielded a list of 40 entities, 29 of which are listed below.

Abbott Laboratories, Best Buy Corporation, Canon Inc., Coca-Cola, CVS, Department of Defense, Eastman Kodak, Home Depot, International Paper, Johnson & Johnson, Kellogg's Corporation, Kimberly Clark Corporation, Kraft, Lowes Companies, Inc., Nestle, Pepsi, Pfizer, Philip Morris USA, Procter and Gamble Company, Sara Lee, Target Corp., Tesco Stores Ltd., The Gillette Company, Unilever, United States Postal Service, UPS, Wal-Mart Stores, Inc., Wegmans Food Markets, Inc., and Westvaco.<sup>454</sup>

#### b) Auto-ID Center Technology Board

<sup>452</sup> “The New Network: Identify Any Object Anywhere Automatically;” Auto-ID Center; pdf created December 18, 2002, based on icon Get Info; <[http://www.autoidcenter.org/new\\_media/brochures/ENGLISH\\_AUTO\\_ID\\_CENTRE.pdf](http://www.autoidcenter.org/new_media/brochures/ENGLISH_AUTO_ID_CENTRE.pdf)>; p. 5 of 3/19/03 printout.

<sup>453</sup> “About the Center: Our Sponsors;” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthecenter\\_oursponsors.asp](http://www.autoidcenter.org/aboutthecenter_oursponsors.asp)>; p. 1 of 3/19/03 11:54 AM printout.

<sup>454</sup> “About the Center: Our Sponsors: Board of Overseers;” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthecenter\\_oursponsors.asp](http://www.autoidcenter.org/aboutthecenter_oursponsors.asp)>; p. 1 of 3/19/03 11:52 AM printout.

Accessing the Auto-ID Center “Technology Board” drop-down list box on March 19, 2003 yielded a list of 52 entities, 11 of which are listed below.

ACNielsen, Alien Technology, Avery Dennison, British Telecommunications (BT), IBM Business Consulting Services, Intel, NCR Corporation, Nihon Unisys Ltd., Philips Semiconductors, Sun Microsystems, Zebra Technologies Corporation.<sup>455</sup>

b. “About The Technology”: Auto-ID Center

The Auto-ID Center provided six segments about the technology related to the work of the Auto-ID Center on the autoidcenter.org Web site.

1) “Introduction”

The first section, entitled, “Introduction” includes the following observations.

The Auto-ID Center aims to change the world. By creating an open global network that can identify anything, anywhere, automatically, it seeks to give companies something that, until now, they have only dreamed of: near-perfect supply chain visibility.<sup>456</sup>

2) “What is Automatic Identification?”

The second section, entitled, “What is Automatic Identification?” includes the following observations.

Automatic identification, or Auto-ID for short, is the broad term given to a host of technologies that are used to help machines identify objects...

RFID is a generic term for technologies that use radio waves to automatically identify individual items. There are several methods of identifying objects using RFID, but the most common is to store a serial number that identifies a product, and perhaps other information, on a microchip that is attached to an antenna (the chip and the antenna together are called an RFID transponder or an RFID tag). The antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves returned from the RFID tag into a form that can then be passed on to computers that can make use of it.

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<sup>455</sup> “About the Center: Our Sponsors: Technology Board;” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthecenter\\_oursponsors.asp](http://www.autoidcenter.org/aboutthecenter_oursponsors.asp)>; p. 1 of 3/19/03 11:52 AM printout.

<sup>456</sup> “About the Technology: Introduction;” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/aboutthetech.asp>>; p. 1 of 3/24/03 10:55 AM printout.

This is the technology the Auto-ID Center has chosen to focus on.<sup>457</sup>

3) “Why Focus on Radio Frequency Identification?”

The third section, entitled, “Why Focus on Radio Frequency Identification?” includes the following observations.

[B]ar codes have one big shortcoming: they are line-of-sight technology... Radio frequency identification, by contrast, doesn't require line of sight. RFID tags can be read as long as they are within range of a reader... And standard bar codes identify only the manufacturer and product, not the unique item.

RFID is a proven technology that's been around since the Second World War. Up to now, it's been too expensive and too limited to be practical for many commercial applications. But if tags can be made cheaply enough, they can solve many of the problems associated with bar codes.<sup>458</sup>

4) “The Importance of Tracking Individual Items”

The fourth section, entitled, “The Importance of Tracking Individual Items,” includes the following observation.

[C]ompanies will be able to know exactly where every item in their supply chain is at any moment in time.<sup>459</sup>

5) “Creating an Internet of Things”

The fifth section, entitled, “Creating an Internet of Things,” includes the following observations.

The Internet connects computers to one another. What the Auto-ID Center aims to do, in effect, is develop a network that connects computers to objects - boxes of laundry detergent, pairs of jeans, airplane engines. We are not creating just the hardware (RFID tags and readers) or just the software to run the network...

Creating one, open global network for RFID... also means that manufacturers of RFID equipment can make equipment in vast quantities, since it

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<sup>457</sup> “About the Technology: What is Automatic Identification?,” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_what.asp](http://www.autoidcenter.org/aboutthetech_what.asp)>; p. 1 of 3/24/03 10:48 AM printout.

<sup>458</sup> “About the Technology: Why Focus on Radio Frequency Identification?,” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_whyfocus.asp](http://www.autoidcenter.org/aboutthetech_whyfocus.asp)>; p. 1 of 3/24/03 10:53 AM printout.

<sup>459</sup> “About the Technology: The Importance of Tracking Individual Items,” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_theimportance.asp](http://www.autoidcenter.org/aboutthetech_theimportance.asp)>; p. 1 of 3/24/03 10:53 AM printout.

will work with anyone's system, which will help bring down the price of both tags and readers.<sup>460</sup>

6) “Identifying Trillions of Items”

The sixth section, entitled, “Identifying Trillions of Items,” includes the following pertinent observations.

a) “How do you distinguish between one can of Coke and another?”

A response to the question, “How do you distinguish between one can of Coke and another?” states:

There are a number of ways, but the best solution we've found is to give each item a unique number - a license plate, if you will. The Auto-ID Center has proposed a universal standard for product "license plates" - the Electronic Product Code.

b) “How do you track the item using the license plate?”

A response to the question, “How do you track the item using the license plate?” states:

The answer is to create a network of RFID readers (sometimes called interrogators).<sup>461</sup>

c. “The Latest News”: Auto-ID Center: Jan/Feb 2003

1) “The Latest News”: Auto-ID Center: Jan/Feb 2003

“The Latest News” Jan/Feb 2003 section of the Auto-ID Center Web site had reports on a number of topics. Following is information from two topics of “The Latest News” Jan/Feb 2003 section.

a) “Auto-ID Center Launches New Website”

The Auto-ID Center provided information about a new Website launched “the 27<sup>th</sup> of January.”

The Auto-ID Center has updated its Website to include the very latest information and resources...

The new site was launched on Monday the 27th of January - check it out at:

<http://www.autoidcenter.org/main.asp><sup>462</sup>

<sup>460</sup> “About the Technology: Creating an Internet of Things;” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_creating.asp](http://www.autoidcenter.org/aboutthetech_creating.asp)>; pp. 1-2 of 3/24/03 10:54 AM printout.

<sup>461</sup> “About the Technology: Identifying Trillions of Items;” Auto-ID Center; published n.d.; <[http://www.autoidcenter.org/aboutthetech\\_identifying.asp](http://www.autoidcenter.org/aboutthetech_identifying.asp)>; p. 1 of 3/24/03 10:48 AM printout.

<sup>462</sup> “The Latest News: Jan/Feb 2003: Auto-ID Center Launches New Website;” Auto-ID Center; published January/February 2003;

## b) “Auto-ID Center Opens Lab in Japan”

The Auto-ID Center provided information about the opening of an Auto-ID Center research lab in Japan.”

The Auto-ID Center announced the opening of its fourth research lab at Keio University in Japan on January 22nd 2003.<sup>463</sup>

## 2) “The Latest News”: Auto-ID Center: Mar/Apr 2003

“The Latest News” Mar/Apr 2003 section of the Auto-ID Center Web site had reports on a number of topics. Following is information from one topic, “Auto-ID Center and Tokyo Ubiquitous ID Center Plan Alliance,” of “The Latest News” Mar/Apr 2003 section.

Talks are underway between the Auto-ID Center and the University of Tokyo’s new Ubiquitous ID Center about joint research and a possible alliance. The Ubiquitous-ID Center is led by Professor Ken Sakamura..., inventor of the TRON real-time operating system and a leader in the emerging field of Ubiquitous Computing. The Auto-ID Center’s Executive Director Kevin Ashton met with Professor Sakamura in Tokyo at the beginning of March to discuss the plan, which could see the Ubiquitous ID project working closely with the Auto-ID Center’s Keio University Lab in Tokyo, headed by Professor Jun Murai. “Professor Sakamura has an incredible track record in envisioning the future and making it real,” said Ashton. “We had a very positive meeting, and I think we are all very excited by the prospect of working together to make ubiquitous automatic identification a success.”<sup>464</sup>

## d. “Q&amp;A”: Auto-ID Center

The “Q&A”, i.e., Question and Answer, section of the Auto-ID Center Web site has subsections entitled, “Field Test” and “About the Center,” among others. Following is information from these two subsections of the Q&A section.

## 1) “Field Test”

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<[http://www.autoidcenter.org/thelatestnews\\_monthlyreport\\_janfeb\\_03d.asp](http://www.autoidcenter.org/thelatestnews_monthlyreport_janfeb_03d.asp)>; p. 1 of 3/24/03 3:39 PM printout.

<sup>463</sup> “The Latest News: Jan/Feb 2003: Auto-ID Center Opens Lab in Japan;” Auto-ID Center; published January/February 2003;

<[http://www.autoidcenter.org/thelatestnews\\_monthlyreport\\_janfeb\\_03.asp](http://www.autoidcenter.org/thelatestnews_monthlyreport_janfeb_03.asp)>; p. 1 of 3/21/03 3:14 PM printout.

<sup>464</sup> “The Latest News: Mar/Apr 2003: Auto-ID Center and Tokyo Ubiquitous ID Center Plan Alliance;” Auto-ID Center; published March/February 2003;

<[http://www.autoidcenter.org/thelatestnews\\_monthlyreport\\_marapr\\_03f.asp](http://www.autoidcenter.org/thelatestnews_monthlyreport_marapr_03f.asp)>; p. 1 of 6/11/03 8:22 AM printout.

The Auto-ID Center provided information about a “Field Test” on the “Q&A” section of the [autoidcenter.org](http://autoidcenter.org) Web site. The “Field Test” material is organized in response to the following three questions.

- a) “I’ve read about a test that the Auto-ID Center is conducting. What is being tested?”

Following is an excerpt from the answer to this question.

On October 1, 2001 the Auto-ID Center and a group of its sponsors started a field test of prototype, supply-chain technology. Elements of this technology...

...will be combined with a network of tags, readers, and computers - assembled from existing technologies - to track pallets and cases of products as they move across a limited supply chain.<sup>465</sup>

- b) “Where is the field test located, and who is participating?”

Following is an excerpt from the answer to this question.

The supply chain, specially selected for this test, will include several distribution centers and two retail outlets...The retail outlets will include a Sam’s Club and Wal-Mart store in Tulsa, Oklahoma.

Test collaborators include the Auto-ID Center, CHEP, International Paper, Gillette, Johnson & Johnson, Kraft Foods, Procter & Gamble, Savi Technologies, Unilever, Wal-Mart, Sun Microsystems, Coca-Cola and others.<sup>466</sup>

- c) “When will the test be done, and what are you hoping to accomplish from it?”

Following is an excerpt from the answer to this question.

The test began on October 1, 2001, and will proceed in two phases over the course of eight-plus months...

If these technologies can be proven in the field (outside the lab), they have the potential

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<sup>465</sup> “Q&A: Field Test: I’ve Read about a Test that the Auto-ID Center Is Conducting. What Is Being Tested?;” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/qanda.asp?CategoryID=5&Section=1&QuestionID=7>>; p. 1 of 3/24/03 3:32 PM printout.

<sup>466</sup> “Q&A: Field Test: Where Is The Field Test Located, and Who Is Participating?;” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/qanda.asp?CategoryID=5&Section=1&QuestionID=8>>; p. 1 of 3/24/03 3:32 PM printout.

to significantly improve supply-chain management.<sup>467</sup>

2) “About the Center”

The Auto-ID Center provided information “About the Center” on the “Q&A” section of the autoidcenter.org Web site. Following were answers to two of the “About the Center” questions.

a) “What will the Center actually deliver and when?”

Following is an excerpt from the answer to this question.

By the end of 2003, we will have enabled vendors and users to start investing in EPC-related technology with reasonable assurance that the technology works, that there are compelling commercial reasons to do so, and that the public will be comfortable with the technology.<sup>468</sup>

b) “What makes the Auto-ID Center unique? Is there any competition?”

Following is an excerpt from the answer to this question that notes a “global network for... low-cost RFID tags and readers.”

...[T]he Auto-ID Center may be the first time in history that companies from different industries and different regions of the world have come together to develop technology they feel would benefit their businesses – and their competitors’ businesses. There are groups of RFID vendors that have come together to propose standards or to foster the development in the RFID industry in other ways. These are not, however, the Auto-ID Center’s competitors. None are focused on developing an open, global network for tracking individual items with low-cost RFID tags and readers.<sup>469</sup>

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<sup>467</sup> “Q&A: Field Test: When Will The Test Be Done, and What Are You Hoping to Accomplish from It?,” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/qanda.asp?CategoryID=5&Section=1&QuestionID=9>>; p. 1 of 3/24/03 3:32 PM printout.

<sup>468</sup> “Q&A: About the Center: What Will the Center Actually Deliver and When?,” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/qanda.asp?CategoryID=1&Section=1&QuestionID=30>>; p. 1 of 3/19/03 11:59 AM printout.

<sup>469</sup> “Q&A: About the Center: What Makes the Auto-ID Center Unique? Is There Any Competition?,” Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/qanda.asp?CategoryID=1&Section=1&QuestionID=32>>; p. 1 of 3/19/03 12:00 PM printout.

14. Microsoft Joining Auto-ID Inc.: *RFID Journal*: June 11, 2003

The *RFID Journal* reported that, "Microsoft announced that it is joining Auto-ID Inc."

Microsoft announced that it is joining Auto-ID Inc., saying it will develop software for RFID applications. Microsoft has been in talks with the Auto-ID Center for months. It is interested in not just supplying software, but also tracking its Xbox, which has been a hit with gamers.<sup>470</sup>

15. Widescale RFID Project to Be Announced: *USA Today*: January 27, 2003

Michelle Kessler, writing for *USA Today*, reports that a widescale RFID Project is expected to be announced.

By the end of the year, a host of consumer products will, for the first time, be sold with tiny computer chips known as RFID tags in them...

Next month, the Massachusetts Institute of Technology's Auto-ID research center, which designs the chip technology, is expected to announce a widescale RFID project, involving big partners such as Johnson & Johnson, Coca-Cola, Pepsi, Home Depot and Target. The center has not yet specified which products will be tested in which stores.<sup>471</sup>

16. Seismic Shift: RFID: *Line56*: February 13, 2003

An article in *Line56*, "RFID Rising," reported on "the first seismic shift" occurring with regard to RFID.

We have been watching for awhile, but it was just five months ago that we introduced our own readers to the topic of radio frequency identification, (RFID) passive and active semiconductor chips that could be embedded in products and read on the fly to help track goods in the supply chain, and reduce theft and counterfeiting. (Older readers might recall being fascinated 25 years ago by the barcodes and security devices RFID is just beginning to replace.)

Now the game is afoot, and companies quick to the mark are looking pretty smart for it. We're mere months from the

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<sup>470</sup> "RFID the Hot Topic at Retail Show;" *RFID Journal*; published June 11, 2003; <<http://www.rfidjournal.com/article/articleview/461/1/1/>>; p. 1 of 6/11/03 8:09 AM printout.

<sup>471</sup> Michelle Kessler; "Several Consumer Products to Get 'Tagged';" *USA Today*; published January 27, 2003; <[http://www.usatoday.com/money/industries/retail/2003-01-27-rfid\\_x.htm](http://www.usatoday.com/money/industries/retail/2003-01-27-rfid_x.htm)>; p. 1 of 3/18/03 4:40 PM printout.

first standards release (driven by the folks at MIT, thank goodness) the stars are aligning, and companies are not waiting. The latest vision was last month's commitment by Gillette to buy 500 million RFID tags from privately held Alien Technology. Five hundred million is a lot of anything, but it's really the tip of the iceberg.

"When we saw Alien and Gillette coming, we just looked at each other and said well, here comes the first seismic shift that takes this from being on peripheral vision to something on radar," says Lyle Ginsburg, managing partner of technology innovation at Accenture Technology Labs in Chicago.

...In Gillette's case, Ginsburg thinks risk is minimal since the company is working through a single consortium and standard going forward driven by 80-some of the top companies in the world. The global 'punch' of this is not to be underestimated. "Now they're saying, 'here's the way we are going to do this so everybody please start building this way.'<sup>472</sup>

17. Bologna, Italy, Company Designed RFID System for Tracking Garments: *RFID Journal*: February 19, 2003

In a news article, *RFID Journal* reported that Lab ID has designed an RFID system for tracking garments and other items.

Marco Astorri wants to make RFID fashionable. The executive VP of Lab ID, based in Bologna, Italy, has been working on a complete radio frequency identification system to be used to track garments and other items.

Lab ID has spent 10 million Euros and 15 months developing tags, readers and antennas that operate at high frequency (13.56 MHz), as well as the software necessary to manage the readers...

Astorri says that Lab ID is also working with companies that make and sell consumer goods, electrical appliances, and electronics equipment. "We think these will become significant markets pretty soon," he says.<sup>473</sup>

18. "A Radio Chip in Every Consumer Product": nytimes.com: February 25, 2003

<sup>472</sup> "RFID Rising;" *Line56*; published February 13, 2003; <<http://www.line56.com/articles/default.asp?ArticleID=4418&ml=3>>; p. 1 of 3/18/03 5:00 PM printout.

<sup>473</sup> "RFID: The Next Fashion from Italy?;" *RFID Journal*; published February 19, 2003; <<http://www.rfidjournal.com/article/view/311>>; pp. 1-2 of 3/12/03 3:50 PM printout.

Claudia H. Deutsch and Barnaby J. Feder report in *The New York Times* about radio-frequency identification.

Such technology, known as radio-frequency identification — the same techniques that enable an electronic sensor to record data from an E-ZPass tag or an office door to open for people with chip-equipped cards in their pockets — could one day stymie pilferers. But it is also capable of doing much more for commerce. Beyond Gillette and Procter & Gamble, companies as diverse as International Paper and Canon USA are teaming up with retailers and customers to apply R.F.I.D., as it is known, to tracking products from the time they leave an assembly line to the time they leave the store.

The companies are tagging clothes, drugs, auto parts, copy machines and even mail with chips laden with information about content, origin and destination. They are also equipping shelves, doors and walls with sensors that can record that data when the products are near. "We want to track all of our merchandise, and that includes items that people are unlikely to steal," William C. Wertz, a spokesman for Wal-Mart Stores, said...

Even the United States Postal Service has gotten into the act. Last month, it promoted Charles E. Bravo, until then its chief technology officer, to the new job of senior vice president for intelligent mail and address quality, and charged him with studying tracking technologies.<sup>474</sup>

19. "RFID Security Applications Attract Attention Post-September 11th, 2001": *Frontline Solutions*: February 18, 2003

Frontline Solutions reported that September 11<sup>th</sup>, 2001, influenced the attention given to RFID security applications.

RFID security applications attract attention post-September 11th, 2001 -- the increased demand for security applications such as homeland security, employee identification, people tracking and access control exerted a strong influence on RFID shipments in 2002. VDC research says there was an increase in end user evaluation of, and spending for, RFID-enabled access control systems and employee tracking/identification programs across all economic sectors.<sup>475</sup>

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<sup>474</sup> Claudia H. Deutsch and Barnaby J. Feder; "A Radio Chip in Every Consumer Product;" nytimes.com; published February 25, 2003; <<http://www.nytimes.com/2003/02/25/technology/25THEF.html?pagewanted=print&position=top>>; p. 1 of 2/25/03 2:40 PM printout.

<sup>475</sup> "RFID Made Progress in 2002;" *Frontline Solutions*; published February 18, 2003; <<http://www.frontlinetoday.com/frontline/article/articleDetail.jsp?id=46871>>; p. 1 of 3/18/03 4:58 PM printout.

20. "RFID System Secures Idle PCs": *RFID Journal*: February 27, 2003

In a news article, *RFID Journal* reported that "Access Denied Systems combines proximity cards with fingerprint authentication to lock up computers when users leave their keyboards."

As viewers of the film "Catch Me If You Can" know, identity theft can be tough to stop. Access Denied Systems, located in St. Louis, Missouri, has come out with an RFID security system that could verify that only authorized users get access to a company's computer terminals.<sup>476</sup>

21. Handheld and Fixed RFID Electronic Product Code (EPC) Readers: *RFID Journal*: February 28, 2003

In a news article, *RFID Journal* reported on Matrics' introduction of handheld and fixed RFID readers.

Matrics, an RFID equipment provider in Columbia, Maryland, has introduced a new handheld RFID reader and revealed plans to market the first fixed RFID reader that handles tags based on the Auto-ID Center's Class 0 and Class 1 specifications.

Matrics says its handheld can read up to 200 tags per second at a read range of up to 10 feet. Most UHF handheld readers operating in the UHF range have a read range of two to three feet. "That's huge in terms of efficiency because you can step back from items and scan fairly aggressively," says Matrics CEO Piyush Sodha...

Matrics has also introduced a new fixed reader, called Advanced RFID Reader...

Matrics says the reader can read more than 1,000 tags per second at a read range of up to 30 feet...

The handheld will be available from April. The fixed reader will begin shipping in June.<sup>477</sup>

22. Brief Historical Overview of Human RFID Microchip Implants: "Chips in Alzheimer's Patients ... Most ... Publicly Acceptable Use of Human Implants with Which to Begin": *Privacy Journal*: Summary of February 2003 Edition Article in the March 2003 Edition

<sup>476</sup> "RFID System Secures Idle PCs;" *RFID Journal*; published February 27, 2003; <<http://www.rfidjournal.com/article/articleview/320/1/1/>>; p. 1 of 3/12/03 3:37 PM printout.

<sup>477</sup> "Matrics Unveils Two EPC Readers;" *RFID Journal*; published February 28, 2003; <<http://www.rfidjournal.com/article/articleview/324/1/1/>>; pp. 1-2 of 3/12/03 3:40 PM printout.

*Privacy Journal* provided a brief historical overview of germane elements of the use of human RFID microchip implants.

There [is] a “ChipMobile” moving about the nation – or at least about communities in Florida. It’s Applied Digital Solutions’ “state-of-the-art, fully equipped mobile unit to spread awareness about the benefits of VeriChip to wide audiences.”

VeriChip, first announced in December 2001, is a miniaturized radio-frequency identification device (RFID) that can be used in “a variety of security, financial, emergency, identification and health-care applications,” according to the company. It now has seven authorized VeriChip centers in Florida, Washington, D.C., and elsewhere in the U. S.

Back in September 1994, PRIVACY JOURNAL reported, “Entrepreneurs in the microchip-implant business who are eager to sell their products to ‘the human market’ have said that implanting identity chips in Alzheimer’s patients would be the most benign and publicly acceptable use of human implants with which to begin.”

Indeed, doctors for Applied Digital Solutions first implanted the tiny VeriChip transponder in a memory-impaired patient on May 10, 2002. Now there are 20 Americans walking around with them, including the company’s public relations consultant, who proudly wears an implant in his upper right arm. The new chips are inert demos right now because the reading devices for them are scarce and because the chips do not locate the individual or store medical information.

For the complete story, ask us for a sample copy of the February 2003 edition:

E-mail us for a sample copy.<sup>478</sup>

### 23. RFID Pilot Projects: *Frontline Solutions*: March 1, 2003

*Frontline Solutions* reported on two pilot projects employing RFID.

Two major pilot programs put in place in the last two months could end up catapulting radio frequency identification (RFID) into a mainstream supply chain technology.

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<sup>478</sup> “Highlights From Recent Issues: A New Fashion Statement?”; *Privacy Journal*; published March 2003: summary of February 2003 edition article in the March 2003 edition; <<http://www.privacyjournal.net/newsletter.htm>>; pp. 1-2 of 3/21/03 8:32 AM printout.

The Gillette Co., Boston, in the first commercial application of tags using the Electronic Product Code (ePC) technology, announced that it will begin large-scale testing later this year...

In an equally as promising development, Michelin North America Inc., Greenville, S.C., announced it is testing RFID tags to meet federal government regulations for tire traceability in the event of a recall.

Once testing is completed (about 18 months), Michelin—which is making the tag technology available to its competitors—could begin producing RFID-tagged tires for passenger vehicles and light trucks in the 2005 model year. "Applications like [the one at Michelin] will drive the ability of the tire industry to provide full track-and-trace capabilities," says Saleem Miyan, global strategic manager, Philips Semiconductors, Eindhoven, The Netherlands.

Miyan expects these applications, particularly the one at Michelin, to kick-start demand for the whole RFID industry. "The market has been waiting for someone to be first," he says, adding that the tire application has the additional weight of government regulations and the existence of an accepted industry standard between it.<sup>479</sup>

#### 24. A Network of Trillions of Things: *Financial Times*: March 5, 2003

Simon London, writing in the *Financial Times*, suggests that RFID chips will transform the Internet "to a network of trillions of 'things'."

Alien Technology is a small California-based company that sells microchips...

While a thumbnail-sized Pentium is capable of processing monumental amounts of data, an Alien chip is about the size of a grain of sand and is designed to do only one job: storing a miserly 96 bits of information, just enough to endow it with a unique identity...

If you believe the futurists, chips like those from Alien will transform the internet from a network of millions of computers to a network of trillions of "things".

According to this vision, every last widget, tyre and packet of Cheerios will come with a tiny microchip and antenna embedded, allowing it to be tracked from factory to warehouse to store and, perhaps, out into the world.

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<sup>479</sup> "Gillette, Michelin Begin RFID Pilots;" *Frontline Solutions*; published March 1, 2003; <<http://www.frontlinetoday.com/frontline/article/articleDetail.jsp?id=48562>>; p. 1 of 3/28/03 8:30 AM printout.

Welcome to the world of radio frequency identification, otherwise known as RFID...

For retailers, the potential gains include smaller inventories, shelves that are always stocked and lower labour costs. Gillette is working with Wal-Mart, the world's largest retailer, and Tesco, the UK's biggest supermarket group, to test smart shelves that can recognise its tagged razors.

A quick look through a list of corporate sponsors of the Auto-ID Center at the Massachusetts Institute of Technology, which is leading the development of industry standards for RFID, hints at other big companies that are likely to follow. The growing list includes Procter & Gamble, Coca Cola, Home Depot, International Paper, Johnson & Johnson, Unilever, UPS and the United States Postal Service.<sup>480</sup>

25. Goal for RFID Is to Increase Productivity: OHIO: "Zero Human Involvement Operations": *RFID Journal*: March 10, 2003

In an "Opinion" piece, *RFID Journal* reflected on a goal for RFID to increase productivity via OHIO, "zero human involvement operations."

But it is crystal clear to me, and has been for a while, that radio frequency identification has the potential to boost productivity in ways that very few other technologies can. That's because RFID takes people out of the loop.

John Greaves, director of RFID at CHEP, has coined the term OHIO, for "zero human involvement operations." OHIO is a place where people don't have to scan bar codes. That saves time and makes employees more productive. [0]HIO is a place where people don't waste time counting inventory over and over, where people don't sit at a keyboard and enter routine information about what was shipped and when, where robots can identify and interact with components.

But getting to OHIO is not going to be easy. I've said this before: Putting tags on goods and readers on doorways is the easy part...

RFID can take human beings out of particular operations, but no technology will replace good management.<sup>481</sup>

<sup>480</sup> Simon London; "Alien Concept Coming to a Store Near You;" *Financial Times*: published March 5, 2003; <<http://www.equitekcapital.com/Library/FT.com - Comment & Analysis - Inside track.htm>>; pp. 1-2 of 3/19/03 1:56 PM printout.

<sup>481</sup> "Getting to OHIO;" *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/336/1/1>>; pp. 1-2 of 3/12/03 4:21 PM printout.

26. RFID Technology “Unstoppable”: *RFID Journal*: March 10, 2003

Bob Violino, writing in an *RFID Journal* “Special Sponsored Section” that focuses on Accenture, covers views about the future of RFID technology.

Many business executives around the world are wondering about all the buzz surrounding radio frequency identification. What makes a radio-powered microchip with a serial number so important? The answer, according to Glover Ferguson, Chief Scientist at Accenture, can be summed up in one word: Information...

Accenture calls this “silent commerce.” But Ferguson sees this as only the first stage in a trend toward what he calls “reality online.”

Once individual objects can be identified, companies then can add temperature, motion, radiation and other sensors, as well as miniature microphones or video cameras. Then, not only will these objects be able to identify themselves to computers, they will be able to provide information about their status and condition. That data can be stored online to create a digital representation of the physical world - a virtual double of the real world...

As tag and reader prices come down, RFID will proliferate because companies need ways to gather accurate real-time information...

Ferguson gets extremely excited by the prospect when he talks about it. But he takes pains to explain that most of the needed technology exists today and that this is not just a pie-in-the-sky idea way off in the future.

"It's unstoppable, it's inexorable, he says. "This is going to happen."<sup>482</sup>

27. Benetton Clothing: A Case Study regarding Early Consideration of RFID Tags’ Use in Consumer Goods

Benetton clothing stores’ consideration of early use of RFID tags in consumer goods provides initial information for a case study.

- a. “Benetton Selects Philips to Introduce Smart Labels across 5,000 Worldwide Stores”: Philips Press Release: March 11, 2003

A Philips press release announced its role in providing Benetton garments with “RFID-enabled labels.”

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<sup>482</sup> Bob Violino; “Get Ready for Reality Online;” *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/343>>; pp. 1, 3 of 3/18/03 8:20 AM printout.

Royal Philips Electronics...today announced that it has joined forces with LAB ID and Psion Teklogix to provide Benetton with the world's largest and most comprehensive item level tagging implementation of Radio Frequency Identification (RFID) technology in the fashion industry to date...

Clothes produced under Benetton's core brand Sisley have been fitted with RFID-enabled labels based on Philips' I.CODE semiconductor technology...

"Benetton has thousands of retail outlets worldwide and therefore wanted to put in place a future-proof technology to bring clear cost benefits to the business whilst seamlessly enabling garments to be tracked throughout their lifetime," said Terry Phipps, electronic data processing (EDP) director at the Benetton Group...

Smart labels overcome the limitations of traditional barcode technology...

This technology will also be employed at the point of sale, automatically registering sales and returns...<sup>483</sup>

- b. "Benetton Clothing to Carry Tiny Tracking Transmitters": Associated Press on SFGate.com: March 11, 2003

Jim Krane, AP Technology Writer, reported that Benetton's Sisley clothing will contain a radio frequency ID tag.

Clothes sold at Benetton stores will soon contain microchip transmitters that allow the Italian retailer to track its garments from their point of manufacture to the moment they're sold in any of its 5,000 shops.

Benetton's introduction of "smart tag" tracking technology will be the largest example of a trend now emerging in the retail industry, according to Phillips Semiconductors, a unit of the Dutch electronics giant that designed 15 million tags being delivered to Benetton this year.

Benetton's Sisley line of clothing will contain a Philips Electronics radio frequency ID tag that will replace ubiquitous bar codes, which have to be manually scanned...

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<sup>483</sup> "Benetton Selects Philips to Introduce Smart Labels across 5,000 Worldwide Stores;" Philips Press Release; published March 11, 2003; <[http://www.semiconductors.philips.com/news/content/file\\_936.html](http://www.semiconductors.philips.com/news/content/file_936.html)>; p. 1 of 3/20/03 7:43 AM printout.

Such scenarios could lead to protests over "spy clothes" on privacy grounds, said Wayne Madsen of the Electronic Privacy Information Center.

"There really needs to be legislation if companies are doing this," Madsen said. "They say it's for internal use. But what would prevent them from sharing it with third parties, with the government or criminal investigators?" ...

Philips has already sold a half-billion of the inexpensive chips, the largest portion of which are used in smart cards for public transportation systems, [Karsten] Ottenberg[, senior vice president of Philips Semiconductors, based in Hamburg, Germany] said.<sup>484</sup>

- c. "Benetton to Tag 15 Million Items": *RFID Journal*: March 12, 2003

In a news article, the *RFID Journal* reported on Benetton's plans for using RFID for its clothes in more than 5,000 stores globally.

[Y]esterday...Philips Semiconductors revealed that Benetton, the clothing retailer based in Treviso, Italy, would be tagging a complete line of its clothes at more than 5,000 stores globally.

Philips says it will ship 15 million chips this year for use in labels that will be put on the clothes when they are manufactured. That makes this one of the largest RFID implementations ever by any company. The Gillette Co. recently ordered 500 million RFID tags, but those will be delivered over three years, and the company has only just begun to take delivery

Clothes produced under Benetton's core brand Sisley will be fitted with RFID labels...

It's not clear how long it will take Benetton to install readers in its 5,000 stores...<sup>485</sup>

- d. "Clothier Benetton Adopts Philips' RFID Technology for 'Smart' Labels": *EE Times*: March 12, 2003

An *EE Times* article comments on the extent to which RFID chips have been used in some aspects of industry.

<sup>484</sup> Jim Krane, AP Technology Writer; "Benetton Clothing to Carry Tiny Tracking Transmitters;" SFGate.com; published March 11, 2003 22:20 PST; <<http://www.sfgate.com/cgi-bin/article.cgi?file=/news/archive/2003/03/11/financial1508EST0170.DTL>>; pp. 1-3 of 3/20/03 7:40 AM printout.

<sup>485</sup> "Benetton to Tag 15 Million Items;" *RFID Journal*; published March 12, 2003; <<http://www.rfidjournal.com/article/articleview/344/1/1/>>; pp. 1-2 of 3/18/03 10:29 AM printout.

Philips Semiconductors' RFID chip will be embedded into the label of every new garment bearing the name of Benetton's core clothing brand, Sisley...

While Philips' RFID chips are already in wide use for tracking parts throughout manufacturing process at Dell Computers, Toyota and Ford, the deal with Benetton makes it "the single biggest roll-out of RFID technology in the fashion industry to date," Scott McGregor, chief executive officer at Philips Semiconductors, said in a statement.<sup>486</sup>

- e. Journal Reports Boycott Called in Response to Benetton Plans to Tag 15 Million Items: *RFID Journal*: March 12, 2003

In a news article, the *RFID Journal* reported on a boycott called in response to Benetton's plans for using RFID for its clothes in more than 5,000 stores globally.

[Y]esterday...Philips Semiconductors revealed that Benetton, the clothing retailer based in Treviso, Italy, would be tagging a complete line of its clothes at more than 5,000 stores globally...

It's not clear how long it will take Benetton to install readers in its 5,000 stores, but the retailer, which had sales of \$2 billion last year, is likely to raise privacy concerns. Even though the tags have a read range of just three feet, some privacy groups are concerned about the possible abuse of the technology.

CASPIAN (Consumers Against Supermarket Privacy Invasion and Numbering) has called for a worldwide boycott of Benetton. A Philips's spokesperson told *RFID Journal* that the tags "have a feature that enables the retailer to disable the chip once a product has been purchased. This destroy command deactivates the chip and erases data stored on it thereby granting the privacy of the buyer."

The "self-destruct" command can be used at the discretion of the retailer and depends on the set-up of the project. Benetton has not said whether it will disable the tags at the point of sale.

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<sup>486</sup> Junko Yoshida; "Clothier Benetton Adopts Philips' RFID Technology for 'Smart' Labels;" *EE Times*; published March 12, 2003 4:41 p.m. EST; <<http://www.eetimes.com/sys/news/OEG20030311S0028>>; p. 1 of 3/20/03 7:42 AM printout.

Unless there is a big public outcry, however, Benetton is not going to be the last retailer to adopt RFID.<sup>487</sup>

- f. Press Release regarding Benetton and RFID Microchips: April 4, 2003

A press release addressed and clarified Benetton's position regarding RFID microchips.

Benetton Group, with reference to articles recently published in the press, declares that no microchips (Smart Labels) are present in the more than 100 million garments produced and sold throughout the world under its brand names, including the Sisley brand.

Benetton, which has always been a leader in technological innovation in the clothing sector, is currently analysing RFID (Radio Frequency Identification) technology to evaluate its technical characteristics and emphasizes that no feasibility studies have yet been undertaken with a view to the possible industrial introduction of this technology.

On completion of all studies on this matter, including careful analysis of potential implications relating to individual privacy, the company reserves the right to take the most appropriate decision to generate maximum value for its stakeholders and customers...<sup>488</sup>

- g. Benetton Press Release in Response to Negative Press: *RFID Journal*: April 11, 2003

The *RFID Journal* reported on a Benetton press release related to "putting RFID tags in clothes."

Benetton...issued a press release saying it is not committed to putting RFID tags in clothes. The move was in response to negative press drummed up by privacy advocates after Benetton announced plans to tag i[t]s Sisley line of clothing.<sup>489</sup>

- h. "Benetton Explains RFID Privacy Flap": *RFID Journal*: June 23, 2003

<sup>487</sup> "Benetton to Tag 15 Million Items;" *RFID Journal*; published March 12, 2003; <<http://www.rfidjournal.com/article/articleview/344/1/1/>>; pp. 1-2 of 3/18/03 10:29 AM printout.

<sup>488</sup> "Press Release Document; Benetton: No Microchips Present in Garments on Sale; No Decision Yet Taken On Industrial Use;" Benetton; published April 4, 2003; <[http://www.benetton.com/press/sito/press\\_releases/press2003/corporate/chip.html](http://www.benetton.com/press/sito/press_releases/press2003/corporate/chip.html)>; p. 1 of 6/3/03 3:25 PM printout.

<sup>489</sup> "EPC in Fashion at Marks & Spencer;" *RFID Journal*; published April 11, 2003; <<http://www.rfidjournal.com/article/articleview/377/1/1/>>; p. 2 of 4/11/03 8:26 AM printout.

An *RFID Journal* article reported in a leading summary sentence that, "Mauro Benetton clears up the confusion behind the Benetton Group's RFID announcement."

Does Benetton plan to use RFID tags to track garments made under its Sisley brand? Why did one of its suppliers say it was and why did the company later refute that? These questions have been lingering since the flap over privacy erupted, and now they have been answered by Mauro Benetton, director of marketing for the Benetton Group, in an exclusive interview with *RFID Journal*. (For detailed excerpts of the interview, which covered much more than privacy, see [Benetton Talks about RFID Plans](#))

Before we get to his explanation of the controversy, a little background for those who haven't followed the story. Back on March 11, [Philips Semiconductors](#) revealed that Benetton planned to put RFID labels on all clothes produced under Benetton's core Sisley brand and track them through the supply chain to more than 5,000 stores globally...

...And *RFID Journal* revealed that Mauro Benetton was, in fact, president of [Lab ID](#), the RFID systems integrator Benetton was using (see [Behind the Benetton Brouhaha](#)).

So what really happened?

"The confusion was probably caused by the fact that my name is Benetton," says Mauro Benetton. "[Lab ID is] testing RFID with Benetton and with a lot of different partners. But the fact that my name is Benetton made Philips think that the technology was being used by Benetton, but it wasn't" [editorial brackets in original].

Benetton points out that there were a number of factual errors in the Philips release. One was that Benetton was buying 15 million transponders this year. The retailer does produce 15 million garments under its Sisley brand, but it had no plans to tag them all this year, according to Mauro. The release also indicated that Benetton has 5,000 stores, when it has only around 1,800. And it failed to make clear that the plan was to test the technology first and roll it out to the entire line only if the tests showed there Benetton would get a return on its investment...

Will Benetton still consider tagging its clothes? Mauro...says "we never stopped the test." He believes Benetton will go ahead with plans to tag the Sisley line if the tests are successful, albeit with more

sensitivity to the need to educate consumers about the technology.<sup>490</sup>

28. "The Wal-Mart Factor": *RFID Journal*: March 17, 2003

In an "Opinion" piece, *RFID Journal* commented on the effect Wal-Mart will have "on how RFID technology is adopted."

Consider a few facts. Wal-Mart's annual sales are greater than the combined sales of the entire semiconductor industry. Wal-Mart's sales are greater than the gross domestic product of Turkey. Wal-Mart imports more goods from China (\$14 billion) than Japan does (\$10 billion). And it employs more people than Ford, General Motors, Exxon Mobil and GE combined.

Size gives Wal-Mart clout to make demands on suppliers that many other companies couldn't make. So it's understandable that suppliers are nervous about whether -- or perhaps when -- Wal-Mart will require them to put RFID tags on products. In this week's feature, we answer the question: Will Wal-Mart Order RFID Tagging?...

I've said this before, but the Electronic Product Code technology being developed by the Auto-ID Center will take off when Wal-Mart decides to adopt it. That's the Wal-Mart Factor, and it's now in play. As our feature this week clearly indicates, Wal-Mart is going to set the pace for RFID adoption. The wheels are in motion. Something could derail the effort, no doubt, but if I were a Wal-Mart supplier, I would start boning up on RFID.<sup>491</sup>

29. Companies Develop Small, Low-Cost Microchips for RFID Tags: *RFID Journal*: March 20, 2003

In a news article, *RFID Journal* reported that the Swiss semiconductor company, EM Microelectronics, along with other manufacturers, has developed small low-cost microchips for RFID tags.

EM Microelectronics has developed an ultra-small microchip for RFID tags operating in the UHF band. The chip is just .5 millimeters by .5 millimeters and will sell for less than 10 cents in large volumes...

A number of manufacturers, including Alien Technology and Matrics, have developed small RFID chips as a way to

<sup>490</sup> "Benetton Explains RFID Privacy Flap;" *RFID Journal*; published June 23, 2003; <<http://www.rfidjournal.com/article/articleview/471/1/1/>>; pp. 1-2 of 6/26/03 8:30 AM printout.

<sup>491</sup> "The Wal-Mart Factor;" *RFID Journal*; published March 17, 2003; <<http://www.rfidjournal.com/article/articleview/346/1/1/>>; pp. 1-2 of 3/17/03 1:45 PM printout.

bring down the overall tag costs. Hitachi recently unveiled a prototype of the world's smallest chip (see [Hitachi Unveils Smallest RFID Chip](#)).<sup>492</sup>

### 30. Ubiquitous Computing

- a. Ubiquitous RFID: RFID Tags Attached to People: *RFID Journal*: March 21, 2003

The *RFID Journal* reported that a number of Japanese companies have organized to promote ubiquitous RFID. "In one experiment, RFID tags were attached to people..."

Several major Japanese companies have joined forces to back the Ubiquitous ID Center. The goal of the center is to develop technologies that will enable the widespread use of radio frequency identification and other pervasive computing technologies. It could emerge in Japan as a rival to the Auto-ID Center.

Among the center's backers are Dai Nippon Printing, Hitachi, NEC and Toppan Printing. Ken Sakamura, a professor of information science at the University of Tokyo, runs the center, which was established in December...

The center is not aimed at pure research, but rather will work with the companies supporting it to develop products. Sakamura has run RFID projects since the early 1990s. In one experiment, RFID tags were attached to people, paper documents and electronic IDs to electronic documents...

"As an extension of that, it is necessary to attach IDs to all things involved in ubiquitous computing, not just office furniture," Sakamura told *RFID Journal*. "The Ubiquitous ID Center is the base for all the elements, such as the embedded devices, smart cards, and RFID tags, that form the networks."

Unlike the Auto-ID Center, which seeks to create a single, global numbering system, the Ubiquitous ID Center uses a meta-code format. Meta-tags stored on the R[FI]D chip refer to other number systems, such as the JAN Code in Japan, the Universal Product Code (UPC) in the US and the International Standard Book Number.<sup>493</sup>

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<sup>492</sup> "EM Micro Readies New RFID Chip;" *RFID Journal*; published March 20, 2003; <<http://www.rfidjournal.com/article/articleview/350/1/1/>>; pp. 1-2 of 3/20/03 11:24 PM printout.

<sup>493</sup> "Japanese Promote Ubiquitous RFID;" *RFID Journal*; published March 21, 2003; <<http://www.rfidjournal.com/article/articleview/341/1/1/>>; pp. 1-2 of 3/21/03 8:37 AM printout.

## b. Ubiquitous Computing: Concept of Privacy: September 14, 2002

Marc Langheinrich of the Distributed Systems Group, Institute for Pervasive Computing, Swiss Federal Institute of Technology, Zurich, Switzerland, wrote about the concept of privacy in relation to ubiquitous computing.

As the field of ubiquitous computing matures, more and more of the key issues start shifting away from mere technical problems to those that have a fundamentally *social* background: How are we to use those smart devices in our daily routine? When should they be turned on and off? What should they be allowed to see, feel, or hear? And whom should they tell about it?

Among such questions, privacy is probably the most prominent concern when it comes to judging the effects of a widespread deployment of ubiquitous computing. This is certainly due to the already imminent threat to privacy caused by the ever growing use of distributed commercial databases that record large parts of our daily electronic transactions. By virtue of its very definitions, ubiquitous computing has now the potential to create an even more invisible and comprehensive surveillance network covering an unprecedented share of our public and private life. Consequently, much has been written about privacy in light of automated data processing [3, 5, 6], though less so in the context of ubiquitous computing [2, 9, 10].

The following article tries to add a more differentiated view on the impact of ubiquitous computing on personal privacy by first examining *why* personal privacy is desirable, describing *when* we feel that it has been violated, and then assessing *how* ubiquitous computing affects all that.<sup>494</sup>

31. Auto-ID Lab: Switzerland, China: *RFID Journal*: April 8, 2003

The Auto-ID Center, with a focus on RFID, is a partnership of various types of institutions, including the following research universities: the Massachusetts Institute of Technology in the US, the University of Cambridge in the UK, the University of Adelaide in Australia,<sup>495</sup> and

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<sup>494</sup> Marc Langheinrich; Distributed Systems Group, Institute for Pervasive Computing, Swiss Federal Institute of Technology; pdf created September 14, 2002, based on icon Get Info; <<http://www.inf.ethz.ch/vs/publ/papers/uc2002-pws.pdf>>; p. 1 of 3/19/03 printout.

<sup>495</sup> "About the Center;" Auto-ID Center; published n.d.; <<http://www.autoidcenter.org/aboutthecenter.asp>>; p. 1 of 3/19/03 7:35 AM printout.

Keio University in Japan,<sup>496</sup> The Auto-ID Center opened a new lab at the University of St. Gallen in Switzerland and planned to open a lab in China.

The Auto-ID Center today opens a lab in the heart of continental Europe, with a facility at the University of St. Gallen in Switzerland...

The Auto-ID Center is eager to promote the adoption of EPC technology in Europe (see Will Europe Embrace the EPC?). The new lab gives the center a presence in the center of Europe, where anyone can drive to learn about its work, see demonstrations. The center has had a lab in Cambridge, England, since 2001. A lab will open in China next month.<sup>497</sup>

32. "EPC in Fashion at Marks & Spencer": *RFID Journal*: April 11, 2003

The *RFID Journal* reported on Marks & Spencer's plans to test "RFID technology in a pilot."

Marks & Spencer this week said it will launch a pilot in which it will tag individual apparel items. The company plans to use UHF tags based on the Electronic Product Code technology developed by the Auto-ID Center. One key aim will be to determine whether the technology can improve customer service and increase sales.

The pilot will be run in one store from September to December. If it proves as successful as pilots run by the Gap and other retailers, it could lead Marks & Spencer to eventually tag 350 million apparel items a year.

"The significance of this announcement is really twofold," says Adrian Segens, business development manager for Intellident, the Manchester-based systems integrator that will be installing the technology. "It's the first significant move of RFID into a retail environment, and it's the first [...] time EPC is being used to any serious extent in Europe."

Bella Pagdin, a spokesperson for Marks & Spencer, said that the company got £305,000 (US\$478,846) from the UK's Department of Trade & Industry (DTI) to launch the pilot...

<sup>496</sup> "The Latest News: Jan/Feb 2003: Auto-ID Center Opens Lab in Japan;" Auto-ID Center; published January/February 2003; <[http://www.autoidcenter.org/thelatestnews\\_monthlyreport\\_janfeb\\_03.asp](http://www.autoidcenter.org/thelatestnews_monthlyreport_janfeb_03.asp)>; p. 1 of 3/21/03 3:14 PM printout.

<sup>497</sup> "Auto-ID Lab Opens in Switzerland;" *RFID Journal*; published April 8, 2003; <<http://www.rfidjournal.com/article/articleview/373/1/1/>>; pp. 1-2 of 4/8/03 8:37 AM printout.

The announcement came only days after another European retailer, Benetton, issued a press release saying it is not committed to putting RFID tags in clothes...Marks & Spencer has not formulated a formal privacy plan but will address the issue.<sup>498</sup>

33. "RFID Makes Connections at Event": *RFID Journal*: April 10, 2003

The *RFID Journal* reported about a new "RFID conference badge" that utilizes readers "placed strategically around the meeting rooms."

At a conference to be held in Las Vegas later this month, ... everyone will be wearing an nTag, an RFID-powered conference badge that could make events more productive for both attendees and organizers.

...Each nTag has a semi-passive RFID tag operating in the UHF band, which enables a conference organizer to use it for security, to record how many people attended certain sessions, or to track how many people visited certain areas of an exposition floor.

Readers placed strategically around the meeting rooms and show floor can scan data off the tag or write to the tags. So the nTag can be used for interactive audience response and polling. Organizers can also send messages to all attendees or to specific attendees without having to page them. The tags can be reprogrammed en masse.<sup>499</sup>

34. Metro AG, Germany's Largest Retailer, Opens "Store of the Future": *RFID Journal*: April 28, 2003

The *RFID Journal* reported on Metro AG's opening a concept store "designed to test RFID and other technologies."

Metro AG, Germany's largest retailer, today will open what it calls the "store of the future." The concept store is designed to test RFID and other technologies under real-world conditions to see how they perform and how consumers respond to them.

"We are not just building up a store," says Albrecht von Truchsess, a Metro spokesperson. "It's about developing visions for retail in the future."

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<sup>498</sup> "EPC in Fashion at Marks & Spencer;" *RFID Journal*; published April 11, 2003; <<http://www.rfidjournal.com/article/articleview/377/1/1/>>; p. 1-2 of 4/11/03 8:26 AM printout.

<sup>499</sup> "RFID Makes Connections at Event;" *RFID Journal*; published April 10, 2003; <<http://www.rfidjournal.com/article/articleview/375/1/1/>>; p. 1 of 4/10/03 8:27 AM printout.

One of Metro's Extra stores in Rheinberg, Germany, has been outfitted with smart shelves, RFID self-checkout systems, kiosks, smart scales and other leading-edge technologies. The store is open to customers who can either choose to use the new systems or shop the old-fashioned way...

Suppliers, including Gillette, Kraft, and Procter & Gamble are working with Metro to tag goods. Gillette is tagging its razors, which are tracked using smart shelves that were developed by OAT Systems. The shelves monitor the number of items on it, and alert staff when more product needs to be brought out from the back room (see Is This the Future of Retailing?).

Individual products in the Future Store, including CDs, DVDs and videos, are tagged using RFID tags with I-Code microchips from Philips, which incorporate theft protection. The tags operate at 13.56MHz and have a read range of up to 1.5 meters (5 feet). Cosmetics and food products are also being tagged to provide real-time inventory data and to track expiration dates...

In addition to showing the benefits of tracking items with tags, the store will also show how the tags can provide additional benefits to Metro customers. For instance, when you swipe a tagged music CD near a reader, the system will play a sample of music from the disk...

Inside the store, customers can cruise down the aisles pushing a shopping cart that has a touch screen computer that provides directions to products. Shoppers who opt-in can scan their ID card into the computer. They can then scan the bar codes on products they want and put them into the cart. (Later, this could be done with RFID.) The computer on the cart sends the prices to checkout by radio signals through a wireless local area network network. When the customer checks out, the cash register system displays the total and the cashier takes your money and gives you change...

The project uses EPC infrastructure technology, but not actual EPC numbers because there is no organization to issue those numbers yet. The store is the largest deployment of EPC technology in Europe so far. Tesco has been testing smart shelf technology with Gillette at one of its UK stores. And Marks & Spencer revealed that it plans to launch a pilot in which it will track clothes using EPC technology (see EPC in Fashion at Marks & Spencer).<sup>500</sup>

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<sup>500</sup> "Metro Opens 'Store of the Future' "; *RFID Journal*; published April 28, 2003; <<http://www.rfidjournal.com/article/articleview/399/1/1/>>; pp. 1-2 of 4/29/03 3:43 PM printout.

35. "Xtag Unveils Infant Security System": *RFID Journal*: May 27, 2003

The *RFID Journal* reported that a "UK company has devised an RFID system that can be integrated with a hospital's access-control network."

Xtag, a company based in Leeds, UK, has developed a new RFID security system for tracking babies in hospital infant wards or wandering patients in elder care facilities. Xtag says its readers are designed to work with existing access control systems.

The Xtag system consists of a bracelet with an embedded battery-powered tag that operates at 433.92 MHz, readers placed at doorways and in hospital hallways, and software that manages the system. The transponder in a baby or patient's bracelet or a staff member's ID badge emits a signal every two seconds. Readers placed throughout the facility pick up the signal and transmit location data to the software.

The product, which uses an FM transmission signal, also monitors the tags' battery status. If a badge is removed without authorization, an anti-tampering signal is emitted from the chip and is picked up by the readers, which have a read range of 1.5 to 50 feet (0.5 to 15 meters). The system also alerts staff when the battery in a bracelet is running low.

The system can function even if a hospital's local-area network were to go down. The readers are designed to continue monitoring the tags. If a baby or patient were to pass through an exit without authorization, the reader would send an alert to nurses or security staff automatically via email, SMS message, pager or other predefined method. The message relays the exact location where the alarm was triggered, along with the time and date.

The software allows hospitals to create audit reports based on staff and patient activities. The reports can include information such as the patient's name, the event, location, time and date. Personnel records can also be maintained in the software's database for both staff and patients. Those records can include digital photographs of the subject, parents or guardians' names.<sup>501</sup>

36. "GSI to Produce Thin-Film Batteries": *RFID Journal*: May 29, 2003

The *RFID Journal* reported that, "Printed batteries that can power low-cost active RFID labels will likely hit the market next year."

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<sup>501</sup> Jennifer Maselli; "Xtag Unveils Infant Security System;" *RFID Journal*; published May 27, 2003; <<http://www.rfidjournal.com/article/articleview/438/1/1/>>; pp. 1-2 of 5/27/03 8:57 AM printout.

Graphic Solutions, a Burr Ridge, Illinois-based custom print house, has become the first US company to acquire a non-exclusive license from Power Paper to manufacture thin, flexible, environmentally-friendly batteries for the North American market.

Thin-film batteries have the potential to bridge the gap between low-cost passive RFD transponders, which have a limited read range, and more expensive active (battery-powered) tags that can broadcast a signal much further and be read more consistently.<sup>502</sup>

37. "Singapore Fights SARS with RFID": *RFID Journal*: June 4, 2003

The *RFID Journal* reported in a summary statement that, "Hospitals are tracking visitors, patients and staff, so they can trace all of the people with whom a suspected SARS patient has had contact."

Radio frequency identification is playing a role in the global fight to contain Severe Acute Respiratory Syndrome, or SARS. Two hospitals in Singapore are now testing an RFID system that tracks the movement of staff, visitors and patients so they can trace all of the people with whom a suspected SARS patient had contact.

"With this system, exact information on when a person enters or leaves a certain area is recorded automatically," says Joshua Lee, program manager for the Defense Science & Technology Agency (DSTA), which developed the system. "When needed, information on the persons he could have been in contact with can be obtained quickly, using the search and query capability of the system"...

All patients, visitors and staff who enter areas in the two hospitals where the trials are being conducted must provide their name and contact information at the registration counter, so they can be contacted later if necessary. They are then given a card with an embedded RFID transponder that has a small battery.

Hospital employees have also been given ID cards with the transponders in them. The active devices continually transmit RFID signals at 433 MHz to readers placed around the facilities. The emergency department at Alexandra hospital is divided into several zones. A receiver has been installed in the ceiling of each zone...

38. Richard Shim: "Wal-Mart to Throw Its Weight behind RFID": CNET News.com: June 5, 2003

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<sup>502</sup> Mary Lee; "GSI to Produce Thin-Film Batteries;" *RFID Journal*; published May 29, 2003; <<http://www.rfidjournal.com/article/articleview/441/1/1/>>; p. 1 of 5/30/03 8:27 AM printout.

CNET News.com Staff Writer Richard Shim reported on Wal-Mart's expected role in endorsing RFID.

Inventory management technology that uses wireless signals to track products from the factory to store shelves is set to win a major new ally next week: Wal-Mart.

The retail giant is expected to throw its weight behind RFID (radio frequency identification) technology at the Retail Systems 2003 industry conference in Chicago on Tuesday. Sources familiar with the company's plans said executives will make a presentation encouraging its top 100 suppliers to start using wireless inventory tracking equipment--chips affixed to products, and scanners in warehouses--by 2005...

Suppliers are already exploring the use of RFID technology in tracking goods from the factory to warehouses. But backing from retailers is considered important because it could ultimately allow products to be tracked on store shelves...

In the past, Wal-Mart has helped to promote other technologies that have helped to streamline inventory and supply-chain management. Teaming with K-Mart and other retailers in the 1980s, Wal-Mart helped to promote the use of bar code scanning.

A bar code standard was approved in 1973, but by 1984 only 15,000 suppliers were using codes on their products. Wal-Mart threw its weight behind bar codes in 1984 and by 1987 75,000 suppliers were using bar codes, according to AMR Research.

As it looks to cut costs, Wal-Mart has been quicker with its support of RFID technology than with bar codes. And others are following, such as CVS, Target, Lowe's and Home Depot.

RFID-related technologies such as EPC (Electronic Product Codes) are gradually gaining industry support, which should help penetration...

EPC is being developed by the Auto-ID Center and the Uniform Code Council, and many see it becoming commonplace in pallets and cases over the next five years, according to Paul Fox, a Gillette representative.

Although cartons and pallets are the focus of RFID now, the technology isn't expected to truly take off until RFID tags are used on store shelves to give more up-to-date

information on sales and in-store inventory. Trials are ongoing, but cost is the major hitch with such tags.<sup>503</sup>

39. “Wal-Mart Draws Line in the Sand”: *RFID Journal*: June 11, 2003

An *RFID Journal* summary sentence stated, “CIO Linda Dillman made it clear that Wal-Mart intends to have its top suppliers put RFID tags on pallets and cases beginning Jan. 1, 2005.”

A packed room at Retail Systems 2003/VICS Collaborative Commerce heard Wal-Mart CIO Linda Dillman say that Wal-Mart intends to ask its top 100 suppliers to put tags carrying Electronic Product Codes on pallets and cases by Jan. 1, 2005.

Dillman said that Wal-Mart would begin contacting the suppliers over the next few months. She said the company would probably not issue a compliance order in 2004, but would move in that direction over time. "It will become a requirement, like EDI, because if we can't track your product with [EPC tags], it's an added cost for us that we have to pass on to our customers," she said [editorial brackets in original].<sup>504</sup>

40. Nearly 60 Percent of RFID End Users Interested in Item-Level Tracking: *RFID Journal*: June 16, 2003

*RFID Journal* reported that a survey found that almost 60 percent of RFID end users were interested in item-level tracking.

A new survey, released at last week's [RFID Journal Live!](#) executive conference, indicates that there is a great deal of interest in RFID, but integration with back-end systems is almost as big a hindrance to RFID adoption as the cost of the tags. The survey was conducted by [Allied Business Intelligence](#) in conjunction with *RFID Journal*.

Of the end users that responded to the survey, nearly 60 percent said they were interested in deploying RFID for item-level tracking in the supply chain. About 13 percent of those people said they would use more than 500 million tags annually, when a system is fully deployed...

The survey is based on responses from 249 people who did not represent a scientific sample. Most respondents came from large companies. More than 60 percent said their

<sup>503</sup> Richard Shim; “Wal-Mart to Throw Its Weight behind RFID;” CNET News.com; published June 5, 2003 2:41 PM PT; <[http://news.com.com/2100-1008\\_3-1013767.html](http://news.com.com/2100-1008_3-1013767.html)>; pp. 1-2 of 6/18/03 8:35 AM printout.

<sup>504</sup> “Wal-Mart Draws Line in the Sand;” *RFID Journal*; published June 11, 2003; <<http://www.rfidjournal.com/article/articleview/462/1/1/>>; p. 1 of 6/12/03 8:16 AM printout.

company had revenue of greater than \$100 million, and 82 percent said it had a national or global presence.<sup>505</sup>

#### H. Product Codes: RFID Electronic Product Codes (EPC) and Bar Code Universal Product Codes (UPC)

There is evidence that RFID Electronic Product Codes (EPC) are expected to replace Universal Product Codes (UPC).

##### 1. RFID Chips Likely to Replace Many Bar Code Applications: *InformationWeek*: June 18, 2001

An *InformationWeek* article comments on the likely future of RFID chips in relation to bar codes.

Eventually, the wireless IDs are likely to replace many bar-code applications, in which retailers and manufacturers continue to invest.<sup>506</sup>

##### 2. Radio-Frequency Identification (RFID) Chips May Replace Bar Codes: *EE Times*: January 7, 2002

An *EE Times* article suggests that the future may see radio-frequency identification (RFID) chips replace bar codes.

Radio-frequency identification chips, which have found a home in applications ranging from toll road passes to smart retail shelves, may be close to taking up residence in the human body...

A consortium of major manufacturers has sought to push the technology as a replacement for bar codes in everyday products ranging from cereal boxes to shaving cream cans, but the cost hasn't dropped low enough to make that feasible.<sup>507</sup>

##### 3. Smart Tags May Replace Bar-Code: *The Economist*: February 6, 2003

*The Economist* suggests that smart tags may replace the bar-code.

RFID systems are made up of readers and "smart tags"—microchips attached to antennas. When the tag nears a reader, it broadcasts the information contained in its chip...

<sup>505</sup> "Integration Impeding Use of RFID;" *RFID Journal*; published June 16, 2003; <<http://www.rfidjournal.com/article/articleview/453/1/1/>>; pp. 1-2 of 6/16/03 9:03 AM printout.

<sup>506</sup> Cheryl Rosen; "The Fast Track;" *InformationWeek*; published June 18, 2001; <<http://www.informationweek.com/story/IWK20010618S0001>>; p. 1 of 3/31/03 printout.

<sup>507</sup> Charles J. Murray; "Injectable Chip Opens Door To 'Human Bar Code';" *EE Times*; published January 7, 2002 12:38 p.m. EST; <<http://www.eetimes.com/story/OEG20020104S0044>>; pp. 1, 3 of 3/9/02 3:30 PM printout.

If they catch on, smart tags will soon be made in their trillions and will replace the bar-code on the packaging of almost everything that consumer-goods giants such as Procter & Gamble and Unilever make...

Nobody had got it, says Kevin Ashton, who runs the centre [Auto-ID Centre, based in Cambridge, Massachusetts]. Big technology firms such as Intel and Motorola thought it was impossible to build a tag costing a few cents. Traditional RFID makers, who grew up without the internet, did not understand the beauty of removing information from the tag and storing it centrally. So Messrs [Sanjay] Sarma [the centre's research director] and Ashton did the work themselves, designing specifications for a new chip and inventing new software and network services to support their idea.<sup>508</sup>

4. When Will RFID Chips Replace Bar Codes?: *EE Times*: March 12, 2003

An *EE Times* article raises the question of when RFID chips will replace bar codes.

Exactly when RFID chips will replace widely used bar code technology remains a hotly debated question in the industry.<sup>509</sup>

5. RFID Not Simply Bar Code Replacement: *RFID Journal*: March 10, 2003

Bob Violino, writing in a *RFID Journal* "Special Sponsored Section" that focuses on Accenture, notes the relationship between RFID and bar codes.

He [Glover Ferguson, Chief Scientist at Accenture] warns that companies should not wait to implement RFID and that businesspeople should not consider it as simply a bar code replacement.<sup>510</sup>

6. RFID Technology Prices Can Challenge Bar-Code: Philips Semiconductors: 2003

<sup>508</sup> "The Best Thing since the Bar-Code;" *The Economist*; published February 6, 2003; <[http://www.economist.com/business/displayStory.cfm?story\\_id=1563928](http://www.economist.com/business/displayStory.cfm?story_id=1563928)>; pp. 1-2 of 3/19/03 1:46 PM printout.

<sup>509</sup> Junko Yoshida; "Clothier Benetton Adopts Philips' RFID Technology for 'Smart' Labels;" *EE Times*; published March 12, 2003 4:41 p.m. EST; <<http://www.eetimes.com/sys/news/OEG20030311S0028>>; p. 2 of 3/20/03 7:42 AM printout.

<sup>510</sup> Bob Violino; "Get Ready for Reality Online;" *RFID Journal*; published March 10, 2003; <<http://www.rfidjournal.com/article/articleview/343>>; p. 2 of 3/18/03 8:20 AM printout.

Philips Semiconductors describes I.CODE its technology for smart labels, and lists five “Features,” one of which is listed below inasmuch as it provides a conceptual overview of RFID technology.

I·CODE is the most advanced technology for smart labels...With I·CODE, RFID technology is available for the first time at prices which can challenge bar-code in its key strongholds where bar code information is a limiting factor to the application.

Features

Electronic Article Surveillance (EAS)...<sup>511</sup>

7. “How Smart Labels Will Work”: RFID: HowStuffWorks, Inc.

Kevin Bonsor provides an explanation of RFID tags. An introductory paragraph compares the UPC bar code with RFID tags.

Long checkout lines at the grocery store are one of the biggest complaints about the shopping experience. By 2005, these lines could disappear when the ubiquitous Universal Product Code (UPC) bar code is replaced by **smart labels**, also called **radio frequency identification (RFID)** tags. RFID tags are intelligent bar codes that can talk to a networked system to track every product that you put in your shopping cart.<sup>512</sup>

8. “Goodbye UPC Bar Codes”: Associated Press on cnn.com: July 9, 2003

An Associated Press article with a dateline of Washington, appearing on CNN.com/Technology, states that RFID is expected to replace bar codes within two decades.

Razor blades and medicines packaged with pinpoint-sized computer chips and tiny antennae to send retailers and manufacturers a wealth of information about the products - - and those who buy them -- will start appearing in grocery stores and pharmacies this year.

Within two decades, the minuscule transmitters are expected to replace the familiar product bar codes, and retailers are already envisioning the conveniences the new

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<sup>511</sup> “Identification;” Philips Semiconductors; copyright 2003; <<http://www.semiconductors.philips.com/markets/identification/products/icode/ic/>>; p. 1 of 3/29/03 3:56 PM printout.

<sup>512</sup> Kevin Bonsor; “How Smart Labels Will Work;” HowStuffWorks, Inc.; published n.d.; <<http://electronics.howstuffworks.com/smart-label.htm>>; p. 1 of 4/2/03 1:41 PM printout.

technology, called "radio frequency identification," will bring -- even as others are raising privacy concerns.<sup>513</sup>

#### I. Radio Frequency Identification (RFID) Reader System: Published Concerns

1. Declan McCullagh: "RFID Tags: Big Brother in Small Packages": Introduction to RFID: CNET News.com: January 13, 2003

Declan McCullagh, noting the potentially broad use of RFID tags, responds to the question he posed, "Could we be constantly tracked through our clothes, shoes or even our cash in the future?"

I'm not talking about having a microchip surgically implanted beneath your skin, which is what Applied Digital Systems of Palm Beach, Fla., would like to do. Nor am I talking about John Poindexter's creepy Total Information Awareness spy-veillance system, which I wrote about last week.

Instead, in the future, we could be tracked because we'll be wearing, eating and carrying objects that are carefully designed to do so.

The generic name for this technology is RFID, which stands for radio frequency identification. RFID tags are miniscule microchips, which already have shrunk to half the size of a grain of sand. They listen for a radio query and respond by transmitting their unique ID code. Most RFID tags have no batteries: They use the power from the initial radio signal to transmit their response.

You should become familiar with RFID technology because you'll be hearing much more about it soon.<sup>514</sup>

2. "Opposition to RFID Tracking Grows": *RFID Journal*: January 20, 2003

In an introductory, overview sentence of a news article, the *RFID Journal* writes, "News that Gillette will purchase 500 million tags has stirred privacy concerns among consumers." An excerpt from the text of the article elaborates on this theme.

The news that The Gillette Company plans to purchase 500 million radio frequency identification tags was widely

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<sup>513</sup> "Goodbye UPC Bar Codes;" Associated Press on cnn.com; July 9, 2003 Posted 9:09 PM EDT (1309 GMT); <<http://www.cnn.com/2003/TECH/ptech/07/09/beamed.barcodes.ap/index.html>>; p. 1 of 7/9/03 9:44 AM printout.

<sup>514</sup> Declan McCullagh; "RFID Tags: Big Brother in Small Packages;" CNET News.com; published January 13, 2003; <<http://news.com.com/2010-1069-980325.html>>; p. 1 of 3/12/03 2:26 PM printout.

reported around the world. One result has been a growing opposition to the use of RFID in consumer products...

C/Net, the technology news site, recently ran a story by its Washington bureau chief, Declan McCullagh, entitled RFID tags: Big Brother in small packages. The article raises concerns about people being tracked through their positions...

RFID Journal has also received an increasing number of angry e-mails to the editor since it first broke the news of the Gillette purchase back on Nov. 15 (see Gillette to Buy 500 Million EPC Tags).<sup>515</sup>

3. "Fear of Big Brother": *RFID Journal*: January 20, 2003

In an introductory, overview sentence of an opinion piece, the *RFID Journal* writes, "As more people learn about the potential for using RFID to track purchases, privacy concerns are growing." An excerpt from the text of the article elaborates on this theme.

Since Nov. 15, when *RFID Journal* broke the news that Gillette planned to buy 500 million RFID tags, opposition to RFID tracking has been growing...

I've been receiving angry e-mails because *RFID Journal* is a proponent of the technology. That's understandable, I guess. But the truth is, I think the concerns about invasion of privacy are justified. History has shown us that self-regulation rarely works, that there are always companies that will act unscrupulously...<sup>516</sup>

4. Global Surveillance Network: CASPIAN Press Release: March 13, 2003

The lead sentence of a March 13, 2003, CASPIAN press release headline reads, "Hidden sensors in clothing may fuel global surveillance network."

An American consumer privacy group has called for an immediate, worldwide boycott of Benetton (NYSE:BNG) following disclosures that the company has placed identification and tracking devices into its clothing products.

CASPIAN (Consumers Against Supermarket Privacy Invasion and Numbering) announced today that it will

<sup>515</sup> "Opposition to RFID Tracking Grows;" *RFID Journal*; published January 20, 2003; <<http://www.rfidjournal.com/article/articleview/275/1/1/>>; p. 1 of 3/12/03 4:41 PM printout.

<sup>516</sup> "Fear of Big Brother;" *RFID Journal*; published January 20, 2003; <<http://www.rfidjournal.com/article/articleview/276/1/2/>>; p. 1 of 3/12/03 4:36 PM printout.

oppose Benetton's plans to place Radio Frequency Identification (RFID) chips into clothing labels intended for the consumer market. RFID chips function as tiny radio transmitters, allowing clothing to be identified and tracked at a distance.

According to a joint press release yesterday by Benetton and chip manufacturer Philips Electronics, the devices are "imperceptible to the wearer and remain in individual items of clothing throughout their lifetime." The chips have already begun appearing in Benetton's "Sisley" clothing line.<sup>517</sup>

5. "Retail Tracking Technology Could Turn World into Fishbowl;" Reuters: April 8, 2003

A Reuters article reported on evaluative aspects of Radio Frequency Identification (RFID) usage.

Tiny wireless transmitters promise to link tires, razors and other everyday items to the Internet, creating a world where money actually talks and the walls really do have ears. Marketing experts say the new technology, known as radio-frequency identification, or RFID, could revolutionize the retail industry as stores personalize service and manage inventory more efficiently.

But civil-liberties advocates say the sensors could also enable an Orwellian world where sales clerks and law-enforcement officials, with the wave of a wand, could find out the contents of a purse...

"When I found out about it, it chilled me more than anything else I've encountered," said consumer-privacy advocate Katherine Albrecht, a Harvard doctoral researcher who has called for a boycott of Italian fashion company Benetton, which is testing RFID technology for possible use...

One major Las Vegas casino is looking to embed tags in employee uniforms to make sure that thieves cannot infiltrate gaming floors by impersonating dealers, said James Hall, head of technology research at consulting firm Adventure.

"We are entering a world of what we call 'reality online' in which every manufactured item is linked to the Internet, Hall told executives at a recent conference in Germany...

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<sup>517</sup> "Consumer Group Calls for Immediate Worldwide Boycott of Benetton;" CASPIAN Press Release; March 13, 2003; <[http://www.boycottbenetton.org/PR\\_030313a.html](http://www.boycottbenetton.org/PR_030313a.html)>; p. 1 of 3/29/03 4:52 PM printout.

"The interesting thing about technology is once it's deployed, people come out of the woodwork and say, 'What other uses are there for it?' " said computer consultant Richard M. Smith.

Technologists say they are not blind to these concerns. Privacy advocate Simson Garfinkel, working with the Massachusetts Institute of Technology's AutoID Center, has proposed an "RFID Bill of Rights" that would let consumers know when and why RFID tags are being used and give them the right to deactivate the tags at checkout.

The industry-backed AutoID Center also promotes a standard that would allow cashiers to "kill" the chips by blowing their fuses with a jolt of electricity upon purchase. Benetton has also said it will allow consumers themselves to disable the tags if it decides to implement them.

"Companies know they're not going to get any benefits if they try to ram this down people's throats," said the RFID Journal's Roberti.

But such voluntary efforts may not be enough, Albrecht said, as the massive amounts of data collected by RFID tags may prove too tempting for marketers and law enforcement. What's needed are laws to regulate usage, such as one soon to be introduced in the Massachusetts state legislature, she said.<sup>518</sup>

6. "Marketer's Dream or Consumer's Nightmare": RFID Journal Live!: June 13, 2003

"RFID Journal Live! is a high-level executive conference designed to give leaders from both Global 1000 companies and midsize enterprises a deeper understanding of the latest advances in RFID and the benefits and challenges the technology presents."<sup>519</sup> A 10:20 am June 13, 2003, breakout session is entitled, "Marketer's Dream or Consumer's Nightmare?"

RFID will fundamentally change the way companies market because intelligent shelves will, for the first time, provide insight into customer behavior in the store. Marketers will know in real time how consumers react to a price decrease, or a special promotion. But many privacy advocates are staunchly opposed to the idea of having RFID tags in individual products. They fear "Big Brother"

<sup>518</sup> "Retail Tracking Technology Could Turn World into Fishbowl;" Reuters (Washington) article on usatoday.com; published April 8, 2003; <[http://www.usatoday.com/tech/news/techinnovations/2003-04-08-retail-tags\\_x.htm](http://www.usatoday.com/tech/news/techinnovations/2003-04-08-retail-tags_x.htm)>; pp. 1-3 of 4/9/03 5:16 PM printout.

<sup>519</sup> "RFID Journal Live!;" RFID Journal, Inc.; copyright 2002; <<http://www.rfidjournallive.com/>>; p. 1 of 3/29/03 6:09 PM printout.

will be able to track the goods we buy, the clothes we wear, and even the places we visit. Is there a way for marketers to use RFID effectively without infringing on customers privacy? Is having an opt-in program enough? And how can governments ensure that data from RFID tags won't be abused?<sup>520</sup>

J. Radio Frequency Identification (RFID) Reader System: Proposed Protections for Privacy Concerns

1. Proposed Response to Privacy Concerns: Disable RFID Tags

One proposed response to privacy concerns stemming from the addition of RFID microchips to sundry items is to disable RFID tags at the checkout counter.

a. “The Privacy Nightmare”: *RFID Journal*: August 12, 2002

An introductory sentence to an opinion piece by Mark Roberti, Editor of *RFID Journal*, notes that, “Only an aggressive PR campaign and an enforceable code of ethics will get people to accept self-regulat[ion] of RFID tracking of consumer products.”

What can be done? Three things. First, and most obvious, the industry needs to come up with a sensible opt-in policy – that is, companies agree that they won't track consumers' purchases unless those consumers expressly agree to it through some kind of loyalty program...

Second, I think the industry needs to begin a loosely coordinated PR campaign as soon as a set of proposals is drafted. In politics, you always try to define your opponent in the public's min[d] before he has a chance to define himself. The same principle applies here. The public needs to be convinced RFID is good before scaremongers convince them it is bad...

Even if a positive image of RFID is created, it may not be enough to overcome negative articles that appear later. The way to do that, in my view, is to make self-regulation enforceable.<sup>521</sup>

b. Declan McCullagh: “RFID Tags: Big Brother in Small Packages”: CNET News.com: January 13, 2003

Declan McCullagh does not see a privacy threat to RFID tags unless they are active when the purchaser leaves a store. Therefore Declan

<sup>520</sup> “Marketer's Dream or Consumer's Nightmare?: RFID Journal Live!;” *RFID Journal*, Inc.; copyright 2002; <<http://www.rfidjournallive.com/agenda.html>>; p. 4 of 3/17/03 2:54 PM printout.

<sup>521</sup> Mark Roberti; “The Privacy Nightmare;” *RFID Journal*; published August 12, 2002; <<http://www.rfidjournal.com/article/view/144/1/1/>>; pp. 1-2 of 3/12/03 4:40 PM printout.

McCullagh's privacy concerns would be met by implementing "four voluntary guidelines."

The privacy threat comes when RFID tags remain active once you leave a store. That's the scenario that should raise alarms--and currently the RFID industry seems to be giving mixed signals about whether the tags will be disabled or left enabled by default...

If you care about privacy, now's your chance to let the industry know how you feel. (And, no, I'm not calling for new laws or regulations.) Tell them that RFID tags are perfectly acceptable inside stores to track pallets and crates, but that if retailers wish to use them on consumer goods, they should follow four voluntary guidelines.

First, consumers should be notified--a notice on a checkout receipt would work--when RFID tags are present in what they're buying. Second, RFID tags should be disabled by default at the checkout counter. Third, RFID tags should be placed on the product's packaging instead of on the product when possible. Fourth, RFID tags should be readily visible and easily removable.<sup>522</sup>

c. "Fear of Big Brother": *RFID Journal*: January 20, 2003

An "Opinion" piece dedicated to addressing RFID-related privacy concerns, Mark Roberti, Editor of *RFID Journal*, concisely restates three proposals that he had earlier suggested in an August 12, 2002, article. Roberti then adds a fourth suggestion.

My views on this are very simple and clear. I'll restate the three points I made back in August:

1. The retail industry should devise an opt-in strategy, where only consumers who agree to allow their purchases to be tracked are tracked.
2. There should be some industry mechanism for penalizing those who do not adhere strictly to the guidelines established.
3. There should be an aggressive campaign to educate people about the policy and about the consumer benefits of RFID.

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<sup>522</sup> Declan McCullagh; "RFID Tags: Big Brother in Small Packages;" CNET News.com; published January 13, 2003; <<http://news.com.com/2010-1069-980325.html>>; pp. 2-3 of 3/12/03 2:26 PM printout.

And I'll add one more: National governments should pass guidelines about how law enforcement bodies can use RFID for investigative purposes.<sup>523</sup>

## 2. Unanswered Questions about RFID Privacy Concerns

However, such a consumer protection scheme of disabling RFID tags at the checkout counter does not address a number of additional concerns.

### a. Global Reader Network: CASPIAN: March 13, 2003

If the RFID human chip implant is used for purchasing items and becomes standardized in the right hand or forehead in the future, the current, major concern with RFID microchips attached to items is that such a system concomitantly puts in place a global RFID microchip reader network that could then be used to read RFID human chip implants.

From a secular perspective, the "News Article" Web page of a CASPIAN: Boycott Benetton Web site indicated an awareness that the significance of widely distributed RFID wireless chips lies importantly in the concomitantly widespread distribution of microchip readers. This awareness is seen by the following heading introducing articles about RFID devices.

Pervasive Global Reader Network as Envisioned by  
RFID Proponents<sup>524</sup>

- b. Disabling RFID tags will not eliminate the privacy issues related to the fact that currently computer systems already have the inherent ability to link an individual's purchase information with credit card, check, and contact or non-contact RFID smart card transactions.
- c. "Commercial coercion" could come into play for those who elected to have RFID tags disabled. For example, two theoretical scenarios quickly come to mind. First, one can easily imagine the complications that could develop related to returns and warranty service for items with a disabled RFID tag. Second, it is also conceivable that longer checkout lines could face those who did not choose to breeze through RFID readers that read enabled RFID tags accompanied by non-contact smart cards.
- d. The intrinsic purpose of some RFID tags lies in the fact that they remain active. Vehicle tires provide a clear example of items that are designed to retain active RFID microchips.

*Frontline Solutions*, March 1, 2003, reported on two pilot projects employing RFID.

Two major pilot programs put in place in the last two months could end up catapulting radio frequency

<sup>523</sup> "Fear of Big Brother;" *RFID Journal*; published January 20, 2003; <<http://www.rfidjournal.com/article/articleview/276/1/2/>>; pp. 1-2 of 3/12/03 4:36 PM printout.

<sup>524</sup> "News Articles;" CASPIAN: Boycott Benetton; published n.d.; <<http://www.boycottbenetton.org/news.html>>; p. 1 of 3/29/03 3:57 PM printout.

identification (RFID) into a mainstream supply chain technology...

In an equally as promising development, Michelin North America Inc., Greenville, S.C., announced it is testing RFID tags to meet federal government regulations for tire traceability in the event of a recall.

Once testing is completed (about 18 months), Michelin-which is making the tag technology available to its competitors-could begin producing RFID-tagged tires for passenger vehicles and light trucks in the 2005 model year. "Applications like [the one at Michelin] will drive the ability of the tire industry to provide full track-and-trace capabilities," says Saleem Miyan, global strategic manager, Philips Semiconductors, Eindhoven, The Netherlands.

Miyan expects these applications, particularly the one at Michelin, to kick-start demand for the whole RFID industry. "The market has been waiting for someone to be first," he says, adding that the tire application has the additional weight of government regulations and the existence of an accepted industry standard between it.<sup>525</sup>

### 3. Proposed Federal Legislation: "RFID Right to Know Act of 2003"

#### a. Press Release: Proposed Federal Legislation: "RFID Right to Know Act of 2003": June 11, 2003

A June 11, 2003 CASPIAN press release unveiled "federal legislation calling for mandatory disclosures on consumer products containing radio frequency identification (RFID) chips."

CASPIAN (Consumers Against Supermarket Privacy Invasion and Numbering) today unveils federal legislation calling for mandatory disclosures on consumer products containing radio frequency identification (RFID) chips. The "RFID Right to Know Act of 2003" would protect consumers against unwittingly purchasing products embedded with remote surveillance devices.<sup>526</sup>

#### b. Proposed Federal Legislation: "RFID Right to Know Act of 2003": CASPIAN

<sup>525</sup> "Gillette, Michelin Begin RFID Pilots;" *Frontline Solutions*; published March 1, 2003; <<http://www.frontlinetoday.com/frontline/article/articleDetail.jsp?id=48562>>; p. 1 of 3/28/03 8:30 AM printout.

<sup>526</sup> "Press Releases: Consumer Group Unveils RFID Labeling Legislation;" CASPIAN; published June 11, 2003; <<http://www.nocards.org/press/pressrelease06-11-03.shtml>>; p. 1 of 6/18/03 8:34 AM printout.

CASPIAN's "RFID Right to Know Act of 2003" is "[p]roposed legislation to mandate labeling of RFID-enabled products and consumer privacy protections." It is an Act:

To require that commodities containing radio frequency identification tags bear labels stating that fact, to protect consumer privacy, and for other purposes.<sup>527</sup>

K. Radio Frequency Identification (RFID) Readers: Read RFID Human Microchip Implant

Once RFID readers are in place to read both RFID tags in individual items being sold, and RFID smart cards that have debit card features, the same reader will presumably be able to read RFID human microchip implants. Thus the widespread usage of RFID tags in products that is currently emerging will provide universal readers for RFID human microchip implants.

L. Radio Frequency Identification (RFID) Readers: RFID Human Microchip Implants Useable for Buying and Selling

Human microchip implants, to the extent utilized, will then be available for use in buying and selling.

XXIX. RFID Readers: Read RFID Smart Cards and Cash

Once RFID readers are in place to read RFID tags in individual items that are being sold, the same reader will presumably be able to read RFID smart cards or their equivalents. Just as RFID chips are designed to tag electronically all purchased objects globally, RFID contactless smart cards serve the function of electronically tagging all purchasing human beings. RFID contactless smart cards may serve as an intermediate technological step before humans are widely implanted with RFID microchips. It is conceivable that human microchip implants could be marketed as being less likely to be stolen or lost than smart cards—thus offering the benefit of reducing identity theft and increasing security.

A. Abolish and Displace Cash: Replace with Identification Smart Cards

1. Harvey F. Wachsman: "Abolish Cash": Replace with Identification Cards: *The New York Times*: December 29, 1990

The December 29, 1990 issue of *The New York Times* identified Harvey F. Wachsman as "a neurosurgeon and lawyer, [who] is president of the American Board of Professional Liability Attorneys. Wachsman wrote one article entitled "Abolish Cash" under the general heading, "Three Radical Proposals That Could Transform New York City, The Nation and, Maybe, the World."

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<sup>527</sup> "RFID Right to Know Act of 2003;" CASPIAN; published 2003; <<http://www.nocards.org/rfid/rfidbill.shtml>>; p. 1 of 6/18/03 8:28 AM printout.

If all the people who do business in cash were forced to report their incomes accurately — if the underground economy were forced to the surface — the Government could collect an additional \$100 billion a year for the national treasury — without raising taxes. States and cities, many in serious financial trouble, would also benefit from collecting previously unpaid income and sales taxes.

How do we create a system to keep cash businesses honest? Eliminate cash. This may sound revolutionary, but the exchange of cash for electronic currency is already used in nearly all legitimate international business transactions...

Here's how it would work. The Government would change the color of the currency and require all old money to be exchanged at the Treasury.

Then, all the new currency would be returned by its owners to the bank of their choice...

We would offer a period of tax amnesty to encourage compliance, but as a practical matter compliance would be assured because after a certain date all currency would be worthless.

In place of the paper money, we would receive new cards — let's call them Americards — each biomechanically impregnated with the owner's hand and retina prints to insure virtually foolproof identification...

Fugitives would be easier to track down, legal judgments easier to enforce, illegal aliens simpler to spot, debtors unable to avoid their responsibilities by skipping town...

Some people might be concerned about possible abuses of civil liberties. But there would be a record of anyone who entered another's account — officials would be granted access only after electronic verification of their hand and retina prints. Civil and criminal penalties for theft of information would be devastatingly severe...

And besides, I'd like to ask every parent whose child walks to school through a gauntlet of drug dealers, everyone whose home has been robbed, whether they think that their rights are jeopardized by a system that could solve all these problems?...

Americard may seem like a drastic approach but its advent is inevitable. In the days of the telegraph and the pony express, who could have imagined that one day there would be a phone on every street corner in Manhattan?<sup>528</sup>

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<sup>528</sup> Harvey F. Wachsman, "Abolish Cash," *New York Times*, 29 December 1990, p. 23.

2. “Money: The Age of Cybercash”: *Newsweek*: December 23, 1994/January 2, 1995

*Newsweek* in an article’s subheading from a section entitled, “The Millennium,” observed, “E-money will change our lives—once it becomes more than just e-payments.”

The technologies that make the information revolution possible—cheaper and more powerful computers, software and wireless communications—will make electronic money possible, too. In the run-up to the new millennium, bet on e-money being the technology that transforms our lives

In a sense it already has. We can now track balances and transfer money between accounts with our ATM cards and even buy stocks on our desktop PCs. But everyone from bankers to software makers is counting on doing much more...

But electronic commerce demands true e-money. What we have so far are ways of making payments electronically...

If the Internet is ever to become the cybermall some dream of, then someone will have to create e-money for your electronic wallet...

The consequences of global e-money will change your life. And not just because of the convenience. It will change the way we’re governed...Your virtual wallet may soon be here, but so will the Virtual Fed to regulate it.<sup>529</sup>

3. “The Big Bank Theory and What It Says about the Future of Money”: *Time*: April 27, 1998

Joshua Cooper Ramo’s article in *Time* takes a look at the future of cash.

Cash is already headed for a whole new dimension. MasterCard, for example, has invested millions in the development of an E-cash system called Mondex. Smart Mondex cards have tiny embedded microchips that can store not only electronic dollars but also five other types of currency, an abbreviated medical history and even a personalized electronic “key” that can open everything from your apartment to your office. Says Henry Mundt, MasterCard executive vice president for global access: “The chip that we are putting on the card now will form the platform for the ultimate in remote access for consumers to their funds, anytime, anywhere. What we really see happening in the future is consumers being able to design their cards to meet their individual needs. We refer to that

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<sup>529</sup> “Money: The Age of Cybercash,” *Newsweek*, December 23, 1994/January 2, 1995, p. 128.

as moving more toward life-style cards.” E-cash is already everywhere, from highway tolls to subways. Security? Privacy? The second is more troublesome than the first and presents a fearsome scenario for crime-busters and tax collectors alike.<sup>530</sup>

4. Visa “Goal of Displacing Cash”: Use Smart Cards: CNET News.com: September 19, 2002

John G. Spooner, Staff Writer, CNET News.com, noted Visa’s “goal of displacing cash.”

[Sue Gordon-Lathrop, Visa's vice president for emerging consumer environments, said...] "This latest effort and other compelling initiatives tied to chip and magnetic stripe technologies move us closer to our goal of displacing cash"...

Visa sees a wide range of potential uses for smart cards as Americans overcome their preference for cold cash; these include paying for parking, buying gas at a service station and getting a snack at a vending machine.<sup>531</sup>

#### B. Cash with Embedded RFID Tags

1. “Euro Bank Notes To Embed RFID Chips by 2005”: *EE Times*: December 19, 2001

Some of the goals that have been associated with abolishing cash might be accomplished through embedding RFID chips within traditional cash.

The European Central Bank is working with technology partners on a hush-hush project to embed radio frequency identification tags into the very fibers of euro bank notes by 2005, *EE Times* has learned. Intended to foil counterfeiters, the project is developing as Europe prepares for a massive changeover to the euro, and would create an instant mass market for RFID chips, which have long sought profitable application.

The banking community and chip suppliers say the integration of an RFID antenna and chip on a bank note is technically possible, but no bank notes in the world today employ such a technology. Critics say it's unclear if the technology can be implemented at a cost that can justify the effort, and question whether it is robust enough to survive the rough-and-tumble life span of paper money.

<sup>530</sup> Joshua Cooper Ramo, “The Big Bank Theory and What It Says about the Future of Money,” *Newsweek*, April 27, 1998, p. 48.

<sup>531</sup> John G. Spooner, Staff Writer; “Visa Readies Wireless Smart Cards;” CNET News.com; published September 19, 2002 10:05 AM PT; <<http://news.com.com/2100-1017-958612.html>>; p. 1 of 2/18/03 10:08 AM printout.

A spokesman for the European Central Bank (ECB) in Frankfurt, Germany confirmed the existence of a project, but was careful not to comment on its technologies. At least two European semiconductor makers contacted by *EE Times*, Philips Semiconductors and Infineon Technologies, acknowledged their awareness of the ECB project but said they are under strict nondisclosure agreements...

In theory, an RFID tag's ability to read and write information to a bank note could make it very difficult, for example, for kidnappers to ask for "unmarked" bills. Further, a tag would give governments and law enforcement agencies a means to literally "follow the money" in illegal transactions.

"The RFID allows money to carry its own history," by recording information about where it has been, said Paul Saffo, director of Institute for the Future (Menlo Park, Calif.).<sup>532</sup>

2. European Central Bank and RFID Chips in Euro: *EE Times*: January 7, 2002

Charles J. Murray, writing in the *EE Times*, observes the work of the European Central Bank with RFID chips.

More recently, a group led by the European Central Bank began work on embedding RFID chips in the euro bank note...<sup>533</sup>

### C. RFID Smart Cards

1. Smart Card Technology Improved to Hasten Broader Use: CNET News.com: April 23, 2002

CNET News.com reported that, "Allies of "smart cards"...are improving the technology in hopes of hastening their broader use."

Smart cards offer advantages...but getting consumers and companies to switch to the new technology has been an uphill struggle...

SchlumbergerSema, a Schlumberger business unit that makes and sells smart cards, introduced ICitizen, a new smart card with features such as security and counterfeiting resistance. It also has large storage capacity for recording

<sup>532</sup> Junko Yoshida; "Euro Bank Notes To Embed RFID Chips by 2005;" *EE Times*; published December 19, 2001 (3:03 p.m. EST); <<http://www.eet.com/story/OEG20011219S0016>>; pp. 1-2 of 2/11/03 4:26 PM printout.

<sup>533</sup> Charles J. Murray; "Injectable Chip Opens Door To 'Human Bar Code';" *EE Times*; published January 7, 2002 12:38 p.m. EST; <<http://www.eetimes.com/story/OEG20020104S0044>>; p. 3 of 3/9/02 3:30 PM printout.

data such as fingerprints or other biometric data, driver's license numbers, health data and digital signatures, the company said...

The SchlumbergerSema card can also run programs written in Java Card, Sun Microsystems' version of Java software for smart cards...

Four banks--First USA, FleetBoston, Providian and Retailers National Bank--have issued more than 10 million Visa smart cards so far, Visa said...

MasterCard's smart card strategy supports the Java Card software as well as the Multos smart card operating system.<sup>534</sup>

2. Federal Aviation Administration (FAA) to Run Smart Card Trial Program: CNET News.com: May 28, 2002

CNET News.com reported that the Federal Aviation Administration (FAA) plans to run a smart card trial program.

The Federal Aviation Administration will run a trial program this summer issuing smart cards to its employees and some contract workers...

The cards will initially be used as ID badges, but the FAA plans to add biometric data and eventually use the cards to control access to locations and computers, she said...

The FAA is part of the team working with the Transportation Security Administration on developing a standard for smart cards that could eventually be applied throughout the Department of Transportation.<sup>535</sup>

3. Smart Card Description: *RFID Journal*: October 29, 2002

An *RFID Journal* news article reports that, "Inside Contactless of Aix en Provence, France," which "wants to be a world leader in contactless smart cards," has "plans to introduce an RFID card that uses a 16-bit microprocessor and new encryption technology." The article provides a succinct description of smart cards.

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<sup>534</sup> Stephen Shankland; "How 'Smart' Is Your ID Card?;" CNET News.com; published April 23, 2002 4:40 PM PT; <<http://news.com.com/2100-1001-890129.html?tag=rn>>; pp. 1-2 of 3/12/03 1:54 PM printout.

<sup>535</sup> Margaret Kane; "FAA Takes First Swipe at Smart Cards;" CNET News.com; published May 28, 2002 11:00 AM PT; <<http://news.com.com/2100-1017-923403.html?tag=rn>>; p. 1 of 3/12/03 2:00 PM printout.

[C]ontactless smart cards...use RFID technology to transfer data from a chip in the card to a point-of-sale terminal.<sup>536</sup>

4. Defense Department Plans for RFID in ID Cards: *RF Design*: August 1, 2002

The Defense Department planned to use RFID in identification cards.

In addition to wireless communication, the DoD is looking for technologies that secure assets. This includes the use of RFID in DoD military and civilian personnel ID cards. The DoD is looking to produce over 3 million of the high-tech IDs over the next few years.<sup>537</sup>

5. Contactless Smart Cards: "Visa Readies Wireless Smart Cards": Smart Cards Not Yet Popular in the United States: U.S. Government Agencies to Use Smart Cards: CNET News.com: September 19, 2002

John G. Spooner, Staff Writer, CNET News.com, reported both on Visa's initiative with contactless RFID smart cards, and the plans by U.S. government agencies to use smart cards.

Visa International is making a push with a new smart-card payment system that would allow hands-free transactions.

The credit card company said Thursday that it plans to set up a new system that uses smart cards fitted with radio-frequency chips (sometimes called RF identification, or RFID, tags) that will allow people to conduct a transaction, such as paying a subway fare or buying a soda, without having to fish for change or swipe a credit card.

Visa, which will install the first such system in South Korea, says wireless smart cards have the potential to make life easier for a range of users...

"Visa's vision of universal commerce, or u-commerce, enables people to decide when, where and how to make a payment," Sue Gordon-Lathrop, Visa's vice president for emerging consumer environments, said in a statement.

But despite their popularity in Europe and Asia, smart cards have yet to catch on in the United States for consumer purchases. Several U.S. government agencies, including the Federal Aviation Administration, plan to use

<sup>536</sup> "Inside's Next-Gen Smart Card;" *RFID Journal*; published October 29, 2002; <<http://www.rfidjournal.com/article/view/101/1/1/>>; p. 1 of 2/18/03 10:07 AM printout.

<sup>537</sup> Roger Lesser, Editor; "DoD Looking to High-Tech to Fight the War;" *RF Design*, Primedia Business Magazines & Media Inc.; published August 1, 2002; <[http://rfdesign.com/ar/radio\\_dod\\_looking\\_hightech/index.htm](http://rfdesign.com/ar/radio_dod_looking_hightech/index.htm)>; pp. 1-2 of 4/3/03 8:02 AM printout.

smart cards for identification and for access to buildings and computer networks.<sup>538</sup>

6. “Smart Card Basics: What Is a Smart Card?”: Gemplus: 2003

“In 2001, Gemplus was the world number one in smart card shipments according to Gartner-Dataquest. Based on Eurosmart estimates, Gemplus shipped 34% of the worldwide market.”<sup>539</sup> The Gemplus Website provides a “Smart Card Basics” section that includes a response to the question “What is a smart card?”

The smart card is one of the latest additions to the world of information technology. Similar in size to today's plastic payment card, the smart card has a microprocessor or memory chip embedded in it that, when coupled with a reader, has the processing power to serve many different applications...

Smart cards come in two varieties: memory and microprocessor. Memory cards simply store data and can be viewed as a small floppy disk with optional security. A microprocessor card, on the other hand, can add, delete and manipulate information in its memory on the card. Similar to a miniature computer, a microprocessor card has an input/output port operating system and hard disk with built-in security features.

Contact vs contactless

Smart cards have two different types of interfaces: contact and contactless. Contact smart cards are inserted into a smart card reader, making physical contact with the reader. However, contactless smart cards have an antenna embedded inside the card that enables communication with the reader without physical contact. A combi card combines the two features with a very high level of security.<sup>540</sup>

7. “Smart Card Basics: What Is the Potential for the Smart Card Business?”: Gemplus: 2003

“The Gemplus Website provides a “Smart Card Basics” section that includes a response to the question “What is the potential for the smart card business?”

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<sup>538</sup> John G. Spooner, Staff Writer; “Visa Readies Wireless Smart Cards” CNET News.com; published September 19, 2002 10:05 AM PT; <<http://news.com.com/2100-1017-958612.html>>; p. 1 of 2/18/03 10:08 AM printout.

<sup>539</sup> “About Gemplus;” Gemplus; published 2003; <<http://www.gemplus.com/companyinfo/aboutgemplus/index.html>>; p. 1 of 4/1/03 9:02 AM printout.

<sup>540</sup> “Smart Card Basics: What Is a Smart Card?,” Gemplus; published 2003; <<http://www.gemplus.com/basics/what.html>>; p. 1 of 3/26/03 3:32 PM printout.

A survey completed by Card Technology Magazine indicated that the industry had shipped more than 1.5 billion smart cards worldwide by the end of 1999...A March 10, 2000 study by Dataquest predicts almost 28 million smart card shipments (microprocessor and memory) in the U.S. for 2000. According to this study, an annual growth rate of 60% is expected for U.S. smart card shipments between 1998 and 2003.<sup>541</sup>

8. “Smart Card Basics: Why Are Other Countries Ahead of the U.S. in Applying Smart Card Technology?”: Gemplus: 2003

“The Gemplus Website provides a “Smart Card Basics” section that includes a response to the question “Why are other countries ahead of the U.S. in applying smart card technology?”

Card issuers in different countries are building their business case to justify the issuance of smart cards for different reasons. Here in the U.S., American Express launched the first wide-scale rollout of smart cards in 1999 with Blue from American Express, a credit card with a smart chip that offers extra security when shopping online. New markets, or markets that are evolving for other reasons, will further help make smart cards widespread in North America.<sup>542</sup>

9. Smart Cards: “Gateway to A Cashless World”: CASPIAN

CASPIAN (Consumers Against Supermarket Privacy Invasion and Numbering) notes that “Smart Card News” provides information about “Smart Cards.” CASPIAN also states that “Smart Cards” are “the gateway to a cashless world.”

...“Smart Cards...” [are] the gateway to a cashless world where chip-encoded ID numbers will be required to buy food (and everything else).<sup>543</sup>

10. Smart Card Alliance: “Who Is the Smart Card Alliance?”

The Smart Card Alliance Website answers the question “Who Is the Smart Card Alliance?”

The Smart Card Alliance is a not-for profit, multi-industry association of over 185 member firms working to

<sup>541</sup> “Smart Card Basics: What Is the Potential for the Smart Card Business?,” Gemplus; published 2003; <<http://www.gemplus.com/basics/potential.html>>; p. 1 of 3/26/03 3:33 PM printout.

<sup>542</sup> “Smart Card Basics: Why Are Other Countries Ahead of the U.S. in Applying Smart Card Technology?,” Gemplus; published 2003; <<http://www.gemplus.com/basics/headstart.html>>; p. 1 of 3/26/03 3:34 PM printout.

<sup>543</sup> “Food Industry News: ‘Smart Card’ News;,” CASPIAN; copyright 1999-2003; <<http://www.nocards.org/news/index.shtml>>; p. 8 of 3/20/03 3:53 PM printout.

accelerate the widespread acceptance of multiple application smart card technology. Our membership includes leading companies in the banking, financial services, computer, telecommunications, technology, healthcare, retail, and entertainment industries, as well as a number of government agencies. The convergence of these major industry players is unprecedented and represents a shared vision and commitment to providing an interoperable platform for the delivery of a new generation of products and services based on smart card technology.

The Alliance was created when the industry's key organizations, the Smart Card Industry Association and the Smart Card Forum, joined forces in early 2001. The newly combined membership brings together leading users and technologists from both the public and private sectors. Membership is open to anyone focusing resources and energy on the utilization of smart card technology.<sup>544</sup>

#### 11. Smart Card Alliance: "Mission"

The Smart Card Alliance Website presents Its "Mission."

To stimulate the understanding, adoption, use and widespread acceptance of single and multi-application smart card technology through specific projects such as educational programs, market research, advocacy, industry relations and by bringing together, in an open forum, leading users and technologists from both the public and private sectors.<sup>545</sup>

#### 12. Smart Card Alliance: "Current Members"

The Smart Card Alliance Website presents the Smart Card Alliance's "Current Members." Following is a partial listing of Current Members' Leadership Council Members, General Members, Government Members, and a complete listing of both University Members. The Current Members Web page lists the category of "Associate Members," but no entities were listed under this category.

##### a. Leadership Council Members

Following is a partial listing of the 20 Leadership Council Members.

Bank of America, Datacard Group, Gemplus, Hitachi America Ltd., IBM, Infineon Technologies, MasterCard International, Northrop Grumman

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<sup>544</sup> "Who We Are;" Smart Card Alliance; published n.d.; <[http://www.smartcardalliance.org/about\\_alliance/index.cfm](http://www.smartcardalliance.org/about_alliance/index.cfm)>; p. 1 of 3/26/03 9:05 AM printout.

<sup>545</sup> "Mission;" Smart Card Alliance; published n.d.; <[http://www.smartcardalliance.org/about\\_alliance/mission.cfm](http://www.smartcardalliance.org/about_alliance/mission.cfm)>; p. 1 of 3/26/03 9:05 AM printout.

Information Technology, Philips Semiconductors, SCM Microsystems, Smart Card Alliance, The Boeing Company, Unisys Corporation, and Visa USA.

b. General Members

Following is a partial listing of the 50 General Members.

American Bankers Association, Citicorp Electronics Financial Services, Inc., Discover Financial, and Zebra Tech Corp.

c. Government Members

Following is a partial listing of the 24 Government Members.

Bureau of Public Debt, Defense Manpower Data Center, DISA, Disbursing & Cash Management Activity, Federal Aviation Administration, General Services Administration, NASA, Navy e-Business Operations Office, OCC, Transportation Security Administration, U.S. Customs, U.S. Department of State, U.S. Dept. of Transportation Volpe Center, and U.S. Treasury FMS.

d. University Members

Following is a listing of both University Members.

Cornell University and University of Illinois.<sup>546</sup>

13. “RFID Smart Cards Gain Ground”: *RFID Journal*: April 9, 2003

An *RFID Journal* news article reports on the increasing “adoption of contactless smart cards.”

Convenience, control, speed and ease of use are driving adoption of RFID smart cards...

The Hong Kong Octopus Card is a prime example of a successful RFID-enabled deployment. More than 95 percent of the Hong Kong population uses the card, which [...] uses Sony's 13.56 MHz FeliCa RFID chip. The card is accepted by more than 100 transportation service providers and 160 retailers, including 7-Eleven, Starbucks, and Park & Shop. It can also be used at pay phones, photo booths, and parking garages.<sup>547</sup>

<sup>546</sup> “Current Members;” Smart Card Alliance; published n.d.; <[http://www.smartcardalliance.org/about\\_alliance/current\\_members.cfm](http://www.smartcardalliance.org/about_alliance/current_members.cfm) - 5>; p. 1 of 3/26/03 9:12 AM printout.

<sup>547</sup> “RFID Smart Cards Gain Ground;” *RFID Journal*; published April 9, 2003; <<http://www.rfidjournal.com/article/articleview/374/1/1/>>; p. 1 of 4/9/03 4:35 PM printout.

14. Smart Card Chips in Consumer Electronic Devices: "Making RFID Payments Ubiquitous": *RFID Journal*: June 2, 2003

Lynn DeRocco reported in an *RFID Journal* news article reported that efforts are underway to embed RFID "smart card chips in a wide variety of consumer electronics products." A summary of the article states, "Philips and Visa want people to be able to pay for goods and services anywhere by using RFID chips embedded in phones and other devices."

The folks at Visa International would like you to use your Visa credit or debit card to pay for everything, no matter where you are. Their counterparts at Royal Philips Electronics would like to sell millions of RFID chips used in smart cards. So the two companies have teamed up to try to make wireless payments as common as pocket change...

Philips has been pursuing a goal of embedding its smart card chips in a wide variety of consumer electronics products...

The general concept behind the Philips-Visa alliance is that you might use an RFID tag in a handheld device to authenticate yourself to an online music site, so you could download your favorite tunes. Or you might wave a chip embedded in your mobile phone near a reader on a bus to pay the transit fare. In both cases, the payment would be charged to your Visa card or deducted from your account through a Visa debit card.

...No more looking for an ATM card or digging a credit card out of your wallet. Just whip out your phone or PDA, wave it by the reader and you've paid. The technology to make this possible already exists. Philips and Visa will work with third parties to create specific applications and devices to employ contactless technology.

Reinhard Kalla, VP and general manager of identification at Philips Semiconductors, sees contactless Visa payments using Philips technology as a big opportunity for both companies...

"Philips has been working for years in RFID with tags and labels, and contactless applications are also based on RFID," Kalla says, "You would use this technology as if it were a smart card." He adds that consumers will see "new and more exciting applications and content" resulting from the relationship with Visa in about a year.<sup>548</sup>

15. "RFID Payment Systems Take Off": *RFID Journal*: June 9, 2003

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<sup>548</sup> Lynn DeRocco; "Making RFID Payments Ubiquitous;" *RFID Journal*; published June 2, 2003; <<http://www.rfidjournal.com/article/articleview/444/1/1/>>; pp. 1-2 of 6/2/03 9:28 AM printout.

Lynn DeRocco of the *RFID Journal* reported in a summary statement that, “A new report says the use of contactless smart cards and other RFID payment systems will continue to rise.”

Within five years, RFID payment systems will be as common as credit card payments in fast food restaurants, video stores, movie theaters and other outlets that do a lot of low-value transactions. That's the conclusion of a new study by Celent, an IT research and consulting firm to the financial services industry.

The report, titled "Contactless Payments: Replacing Cash with Convenience: The Case for RFID," was written by Ariana-Michele Moore, a senior analyst at Celent. She interviewed merchants, consumers, and such companies as Texas Instruments, MasterCard, and Bank of America. The study indicates that there are enough benefits for consumers, merchants and banks to overcome obstacles to adoption, which include consumer concerns about security and investments in new equipment that merchants would have to make.<sup>549</sup>

XXX. Human Microchip Implants: Running Timeline of Movement toward Standardized Location

A. BBC News: UK Scientist Implanted with Chip in Arm: August 25, 1998

BBC News reported that a UK scientist received an implanted chip.

A silicon chip has been successfully implanted into the arm of a UK scientist...

The chip has been inserted in Professor Kevin Warwick's upper arm.<sup>550</sup>

B. *Sunday Times*: Human Microchips Implants: Not on Areas That Can Be Amputated: October 11, 1998

*The Sunday Times*, of London, in 1998, reported that a “tiny microchip implant can be tracked by satellite to reveal a kidnap victim’s location.”

The 43 Europeans and two Americans who have so far adopted the chip had surgery under a light anaesthetic. Gen-Etics claims the surgery is intended to daze the patient and prevent him or her remembering exactly where the incision was made, so he

<sup>549</sup> Lynn DeRocco; “RFID Payment Systems Take Off;” *RFID Journal*; published June 9, 2003; <<http://www.rfidjournal.com/article/articleview/452/1/1/>>; p. 1 of 6/10/03 9:18 AM printout.

<sup>550</sup> “Technology Gets Under the Skin;” BBC News: Sci/Tech; published August 25, 1998 at 1054 GMT 11:54 UK; <<http://news.bbc.co.uk/1/hi/sci/tech/158007.stm>>; pp. 1-3 of 1/20/03 3:23 AM printout. This item was located initially via <<http://www.raidersnewsupdate.com/bbc.html>>; pp. 1-2 of 4/24/02 8:57 AM printout.

cannot reveal the chip's location to his abductors even under torture...

Only a small scar is visible and the chip escapes detection by x-rays. It is inserted under the skin but not on areas that can be amputated, including the hands, nose and ears...<sup>551</sup>

- C. Dr. Richard Seelig: Applied Digital Solutions: Forearm and Hip/Leg: *EE Times*, January 7, 2002, and *Miami Herald*, March 10, 2002

The *EE Times* reported that "He placed one chip in his left forearm and the other near the artificial hip in his right leg," while the March 10, 2002, *Miami Herald* reported that he "inserted two chips -- one in his right forearm, the other in his right hip."

1. In an Article Dated January 7, 2002, *EE Times* Reported on September, 2001, Regarding Chip Inserts in Dr. Richard Seelig in His Capacity of A Medical Consultant to Applied Digital Solutions

In September, Applied Digital Solutions implanted its first human chip when a New Jersey surgeon, Richard Seelig, injected two of the chips into himself. He placed one chip in his left forearm and the other near the artificial hip in his right leg.<sup>552</sup>

2. On March 10, 2002, The *Miami Herald* Reported on September 16, 2001, Regarding Chip Inserts in Dr. Richard Seelig in His Capacity of The Medical Director of Applied Digital Solutions

The company's plans for the chip were accelerated when Dr. Richard Seelig, Applied's medical applications director, inserted two chips -- one in his right forearm, the other in his right hip -- on Sept. 16. After the Sept. 11 terrorist attacks, he thought such a device could help identify bodies of victims.<sup>553</sup>

- D. *Time Magazine*: March 11, 2002: Left Arms of Three Family Members

A March 11, 2002 *Time* article entitled "Meet the Chipsons" and subtitled "Jeffrey, Leslie and their boy Derek will be America's first Cyborg family. Are you ready to 'Get Chipped'?" states that a microchip will be injected in their left arms.

Derek [Jacobs of Boca Raton, Fla.], his mom Leslie and his dad Jeffrey are the first volunteer test subjects for a new,

<sup>551</sup> Maurice Chittenden and David Lloyd, "007 Implant to Protect Kidnap Targets," *Sunday Times* (London), 11 October 1998, sec. 1, p. 13.

<sup>552</sup> Charles J. Murray; "Injectable Chip Opens Door To 'Human Bar Code';" *EE Times*; published January 7, 2002 12:38 p.m. EST;

<<http://www.eetimes.com/story/OEG20020104S0044>>; p. 2 of 3/9/02 3:30 PM printout.

<sup>553</sup> Shannon Tan; "An ID Idea: Microchips Under Your Skin;" *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; p. 3 of 1/21/03 10:55 AM printout.

implantable computer device called VeriChip. Later this spring, pending Food and Drug Administration approval, doctors will load a wide-bore needle with a microchip containing a few kilobytes of silicon memory and a tiny radio transmitter and inject it under the skin of their left arms, where it will serve as a medical identification device.<sup>554</sup>

- E. Computer Chip Would Be Injected “Probably in the Arm”: Adrian Sainz: Associated Press: April 1, 2002

An Associated Press article notes that the computer chip would be implanted in a person’s arm.

The VeriChip, made by Applied Digital Solutions in Palm Beach County, is about the size of a grain of rice. It would be injected under a person's skin, probably in the arm, and could be read only by scanners.<sup>555</sup>

- F. Microchips Implanted in Arms of Three Family Members: Reuters: *The New York Times* on the Web, and Associated Press: washingtonpost.com: May 10, 2002

Reuters noted in an article about the implantation of microchips in a Florida family that the microchips would be implanted in the arms. Associated Press Writer Alex Veiga noted that chips were implanted in the arms of three family members.

1. In an Article Dated May 10, 2002, Reuters: *The New York Times* on the Web, Reported on Microchips Implanted in Arms of Three Family Members

Reuters noted in an article about the implantation of microchips in a Florida family that the microchips would be implanted in the arms.

Doctors implanted microchips containing a way to access medical information in the arms of three members of a Florida family on Friday, making them the first people to get what the manufacturer hopes will become a standard way of retrieving such data in the future...

Jeffrey Jacobs, 48, his wife Leslie Jacobs, 46, and their son Derek Jacobs, 14, volunteered to become the first to be implanted with the VeriChip, made by Palm Beach-based Applied Digital Solutions Inc. They underwent the brief procedure at a Boca Raton medical clinic...<sup>556</sup>

<sup>554</sup> Lev Grossman, “Meet the Chipsons,” *Time*, March 11, 2002, p. 56.

<sup>555</sup> Adrian Sainz; “Family Wants Data Chips Implanted”; Associated Press: AOL News; published April 1, 2002 22:41EST; p. 1 of 4/2/02 printout.

<sup>556</sup> “Florida Family Gets Medical-Data Chip Implants;” Reuters article on *The New York Times* on the Web; published May 10, 2002 Filed at 6:41 p.m. ET; <<http://www.nytimes.com/reuters/news/news-health-chip.html?pagewanted=print&position=top>>; p. 1 of 5/10/02 printout.

2. In an Article Dated May 10, 2002, Associated Press: [washingtonpost.com](http://www.washingtonpost.com), Reported on Microchips Implanted in Arms of Three Family Members

Associated Press Writer Alex Veiga noted that chips were implanted in the arms of three family members.

Jeff and Leslie Jacobs, along with their 14-year-old son, Derek, had the tiny chips implanted in their arms. Each chip is about the size of a grain of rice, and insertion takes about a minute under local anesthesia.

The chips, called the VeriChip, were designed by Palm Beach-based Applied Digital Solutions Inc...<sup>557</sup>

- G. First Alzheimer's Patient to Receive Permanent Identification Microchip Near Right Shoulder Blade: *Palm Beach Post* Staff Writer: Friday, May 10, 2002

Nathan Isaacson, an Alzheimer's patient, was scheduled to receive a microchip implant near his right shoulder blade.

On a warm Saturday morning, 83-year-old Nathan Isaacson of Tamarac...who is in the early stages of Alzheimer's, had forgotten to fill up his gas tank...

To bring his family peace of mind, Isaacson today will trade in the silver identification necklace he wears to become the first Alzheimer's patient to receive a permanent identification microchip called the VeriChip. It was developed by Palm Beach-based Applied digital Solutions.

The microchip, about the size of a grain of rice, will be injected near Isaacson's right shoulder blade by his own physician, Dr. Harvey Kleiner of Sunrise...

Isaacson will go back to the doctors in about eight months for another first. Doctors will implant a second chip, similar in size to a pacemaker, that will allow his family to track his whereabouts.<sup>558</sup>

- H. Chips Inserted into Backs of Eight Alzheimer's Patients: *World Magazine*: June 15, 2002

<sup>557</sup> Alex Veiga, Associated Press Writer; "Family Gets Computer Chips Implant;" Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published May 10, 2002 1:10 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A1261-2002May10?language=printer>>; p. 1 of 5/10/02 printout.

<sup>558</sup> Deborah Circelli; "ID Chip to Track Man's Whereabouts;" News: [PalmBeachPost.com](http://www.gopbi.com); published May 10, 2002; <[http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news\\_c3bd443b30d700aa00be.html](http://www.gopbi.com/partners/pbpost/epaper/editions/friday/news_c3bd443b30d700aa00be.html)>; pp. 1-2 of 5/10/02 8:04 AM printout.

Mindy Belz's Special Report "State of the World" article, "Recipe for Progress: ID Chips," states:

Last month eight Alzheimer's patients were injected with silicon chips, making them as scannable as a bag of potato chips at the supermarket.

The devices are about the size of a grain of rice and were developed in Florida. They are inserted into the upper back and are invisible except when a hand-held scanner is waved over the area...Applied Digital Solutions Inc., maker of the VeriChip, will soon have a more complex device. It will be able to receive GPS satellite signals and transmit a person's location.<sup>559</sup>

- I. Applied Digital Solutions: Web page: Upper Arm: Noted January 9, 2003  
The Applied Digital Solutions "VeriChip Personal Identification System - Frequently Asked Questions" Web page notes that the microchip implant is inserted in the upper arm.

Q: Where and how is the chip inserted?

A: The chip is inserted just under the skin in the fleshy part (underneath portion) of your upper arm...<sup>560</sup>

- J. "Applied Digital Solutions[']...Public Relations Consultant...Wears an Implant in His Upper Right Arm": *Privacy Journal*: Summary of February 2003 Edition Article in the March 2003 Edition

*Privacy Journal* reported that an "Applied Digital Solutions[']...public relations consultant...wears an implant in his upper right arm."

Indeed, doctors for Applied Digital Solutions first implanted the tiny VeriChip transponder in a memory-impaired patient on May 10, 2002. Now there are 20 Americans walking around with them, including the company's public relations consultant, who proudly wears an implant in his upper right arm. The new chips are inert demos right now because the reading devices for them are scarce and because the chips do not locate the individual or store medical information.

For the complete story, ask us for a sample copy of the February 2003 edition:

E-mail us for a sample copy.<sup>561</sup>

<sup>559</sup> Mindy Belz, "Special Report: State of the World: Recipe for Progress: ID Chips," *World*, June 15, 2002, p. 73.

<sup>560</sup> "VeriChip Personal Identification System - Frequently Asked Questions"; published n.d.; <<http://www.adsx.com/faq/verichipfaq.html>>; p. 1 of 1/9/03 9:00 AM printout.

<sup>561</sup> "Highlights From Recent Issues: A New Fashion Statement?"; *Privacy Journal*; published March 2003: summary of February 2003 edition article in the March 2003 edition; <<http://www.privacyjournal.net/newsletter.htm>>; p. 2 of 3/21/03 8:32 AM printout.

K. Microchip Injected into *Boston Globe* Correspondent's Right Arm: *The Boston Globe*: May 20, 2003

*Boston Globe* Correspondent Angela Swafford reported that she received a microchip in her right arm.

The painless procedure barely lasted 15 minutes. In his South Florida office, Dr. Harvey Kleiner applied a local anesthetic above the tricep of my right arm, then he inserted a thick needle deep under the skin.

"First we locate a prime spot," he said. "The next thing is to release the button that triggers the injection mechanism, and that's it, the cargo's been delivered."

The "cargo" was a half-inch-long microchip inside a glass and silicone cylinder that carries my permanent identification number.<sup>562</sup>

L. Right Arm Mentioned: *The Boston Globe*: May 20, 2003

Applied Digital Solutions president Scott Silverman noted the right arm in a *Boston Globe* quote.

For ADS's Silverman, both the VeriChip and its future GPS-based version are a matter of individual choice.

"No one is forcing you to have a VeriChip. If you want a chip in your right arm you are going to know it is there because you will see it injected."<sup>563</sup>

M. Arm or Hip; Right Arm : Associated Press on Newsday.com: July 18, 2003

Associated Press Writer Alonso Soto Joya reported on the location of implanted chips. While the microchip "is implanted in the arm or hip," a chip was implanted "in the right arm of employee Carlos Altamirano."

<sup>562</sup> Angela Swafford; "Chipping Away at Security Fears"; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=-30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=-30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 1 of 5/22/03 3:03 PM printout.

<sup>563</sup> Angela Swafford; "Chipping Away at Security Fears"; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=-30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=-30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 3 of 5/22/03 3:03 PM printout.

Borrowing from technology for tracking pets, a U.S. company on Thursday launched Mexican sales of microchips that can be implanted under a person's skin and used to confirm health history and identity...

The microchip, the size of a grain of rice, is implanted in the arm or hip...

In a two-hour presentation, Palm Beach, Fla.-based Applied Digital Solutions Inc. introduced reporters to the VeriChip and used a syringe-like device and local anesthetic to implant a sample in the right arm of employee Carlos Altamirano.<sup>564</sup>

### XXXI. Human Microchip Implants: Needed to Buy or Sell

Steven Keating, executive director of the Denver-based Privacy Foundation reflected on the possibility of the use of chips becoming “commercially coercive.”<sup>565</sup> Following are instances where the possible use of human microchip implants relates to the concept of buying and selling.

#### A. Steven Keating, Executive Director of the Privacy Foundation: Future Possibility: Airlines: *Miami Herald*: March 10, 2002

Steven Keating, executive director of the Denver-based Privacy Foundation considered that, theoretically, airlines could use chips in the future.

For example, airlines could encourage demand for chips by allowing people with implants to get faster security clearance. "It can become commercially coercive," Keating said.<sup>566</sup>

#### B. ADS Chairman and Chief Executive Officer Richard Sullivan, and Dr. Peter Zhou, Chief Scientist for Development of The Implant and President of Digitalangel.Net, Inc., A Subsidiary of ADS: Human Chip Implants May Be Used in The Future for Buying and Selling: WorldNetDaily.com: March 20, 2000.

ADS [Applied Digital Solutions] Chairman and Chief Executive Officer Richard Sullivan, and Dr. Peter Zhou, chief scientist for development of the implant and president of DigitalAngel.net, Inc., a subsidiary of ADS, consider the possibility of human chip implants being used for buying and selling.

<sup>564</sup> Alonso Soto Joya, Associated Press Writer; “New Chip Can Be Implanted in Humans;” Associated Press on Newsday.com via drudgereport.com; published July 18, 2003 8:10 AM; <<http://www.newsday.com/templates/misc/printstory.jsp?slug=sns-ap-mexico-microchip&section=/news/nationworld/wire>>; p. 1 of 7/18/03 printout 3:09 PM.

<sup>565</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; p. 2 of 1/21/03 10:55 AM printout.

<sup>566</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; p. 2 of 1/21/03 10:55 AM printout.

Applied Digital Solutions, an e-business to business solutions provider, acquired the patent rights to the miniature digital transceiver it has named "Digital Angel®." The company plans to market the device for a number of uses, including as a "tamper-proof means of identification for enhanced e-business security"...

"We believe its potential for improving individual and e-business security and enhancing the quality of life for millions of people is virtually limitless," said ADS Chairman and Chief Executive Officer Richard Sullivan. "Although we're in the early developmental phase, we expect to come forward with applications in many different areas, from medical monitoring to law enforcement. However, in keeping with our core strengths in the e-business to business arena, we plan to focus our initial development efforts on the growing field of e-commerce security and user ID verification."

Dr. Peter Zhou, chief scientist for development of the implant and president of DigitalAngel.net, Inc, a subsidiary of ADS, told WorldNetDaily the device will send a signal from the person wearing Digital Angel® to either his computer or the e-merchant with whom he is doing business in order to verify his identity.

In the future, said Zhou, computers may be programmed not to operate without such user identification. As previously reported in WND, user verification devices requiring a live fingerprint scan are already being sold by computer manufacturers. Digital Angel® takes such biometric technology a giant step further by physically joining human and machine.<sup>567</sup>

- C. "Protected by VeriChip™": "Financial Arena": Business Wire: June 6, 2002

A Business Wire release reported that Applied Digital Solutions outlined financial sector applications for VeriChip, "a miniaturized radio frequency identification device (RFID) ...[a]bout the size of a grain of rice," that "...contains a unique verification number and will be available in several formats, some of which will be insertable under the skin."

Applied Digital Solutions, Inc. (Nasdaq: ADSXE), an advanced technology development company, today announced that it is preparing to launch a "Protected by VeriChip(TM)" product awareness campaign to demonstrate the potential for VeriChip(TM) as a personal safeguard technology that includes applications in the defense, security and financial sectors...

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<sup>567</sup> Julie Foster; "Big Brother Gets Under Your Skin;" WorldNetDaily.com; published March 20, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=17834](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=17834)>; pp. 1-2 of 7/27/02 8:31 AM printout.

In the financial arena, the company sees enormous, untapped potential for VeriChip as a personal verification technology that could help to prevent fraudulent access to banking (especially via ATMs) and credit card accounts. VeriChip's tamper-proof, personal verification technology would provide banking and credit card customers with the added protection of knowing their accounts could not be accessed unless they themselves initiated -- and were physically present during -- the transaction.<sup>568</sup>

### XXXII. Human Microchip Implants: Requirement Considered

#### A. BBC News: Possibility of Human Chip Implant Requirement Implied for Babies and Criminals: August 25, 1998

An August 25, 1998 BBC News item considered the possibility of implanting microchips in babies and criminals.

Criminal offenders and even babies can already be tracked using electronic tagging devices attached to their body, the next step could be to implant silicon chips instead.<sup>569</sup>

#### B. ADS Chairman and Chief Executive Officer Richard Sullivan: Human Chip Implants: "No One Will Be Forced": WorldNetDaily.com: March 20, 2000.

Applied Digital Solutions (ADS) Chairman and Chief Executive Officer Richard Sullivan states that "no one will be forced to wear Digital Angel®."

Digital Angel® sends and receives data and can be continuously tracked by global positioning satellite technology. When implanted within a body, the device is powered electromechanically through the movement of muscles and can be activated either by the "wearer" or by a monitoring facility...

[Applied Digital Solutions Chairman and Chief Executive Officer Richard] Sullivan, responding to religious objections to his product, told WorldNetDaily no one will be forced to wear Digital Angel®.

"We live in a voluntary society," he said. According to the CEO, individuals may choose not to take advantage of the technology.<sup>570</sup>

<sup>568</sup> "Applied Digital Solutions Prepares 'Protected by VeriChip' Product Awareness Campaign;" Business Wire; published June 6, 2002; <[http://quote.bloomberg.com/fcgi.cgi?T=marketsquote99\\_news.ht&s=APP9PZxX8QX BwbGll](http://quote.bloomberg.com/fcgi.cgi?T=marketsquote99_news.ht&s=APP9PZxX8QX BwbGll)>; pp. 1-2 of 6/6/02 10:02 AM printout.

<sup>569</sup> "Technology Gets Under the Skin;" BBC News: Sci/Tech; published August 25, 1998 at 1054 GMT 11:54 UK; <<http://news.bbc.co.uk/1/hi/sci/tech/158007.stm>>; p. 3 of 1/20/03 3:23 AM printout. This item was located initially via <<http://www.raidersnewsupdate.com/bbc.html>>; pp. 1-2 of 4/24/02 8:57 AM printout..

<sup>570</sup> Julie Foster; "Big Brother Gets Under Your Skin;" WorldNetDaily.com; published March 20, 2000;

- C. Dr. Peter Zhou, Chief Scientist for Development of The Implant and President of DigitalAngel.Net, Inc., A Subsidiary of ADS: Human Chip Implants May Be Required in The Future To Operate Computers: WorldNetDaily.com: March 20, 2000.

Dr. Peter Zhou, chief scientist for development of the implant and president of DigitalAngel.net, Inc., a subsidiary of ADS [Applied Digital Solutions], considered the possibility that human chip implants may be required in the future to operate computers.

Applied Digital Solutions, an e-business to business solutions provider, acquired the patent rights to the miniature digital transceiver it has named "Digital Angel®." The company plans to market the device for a number of uses, including as a "tamper-proof means of identification for enhanced e-business security."

Digital Angel® sends and receives data and can be continuously tracked by global positioning satellite technology. When implanted within a body, the device is powered electromechanically through the movement of muscles and can be activated either by the "wearer" or by a monitoring facility...

Dr. Peter Zhou, chief scientist for development of the implant and president of DigitalAngel.net, Inc, a subsidiary of ADS, told WorldNetDaily the device will send a signal from the person wearing Digital Angel® to either his computer or the e-merchant with whom he is doing business in order to verify his identity.

In the future, said Zhou, computers may be programmed not to operate without such user identification. As previously reported in WND, user verification devices requiring a live fingerprint scan are already being sold by computer manufacturers. Digital Angel® takes such biometric technology a giant step further by physically joining human and machine.<sup>571</sup>

- D. Dr. Peter Zhou, Chief Scientist For Development Of The Implant And President of DigitalAngel.net, Inc., a Subsidiary of ADS: American Soldiers May Be Required To Wear Human Chip Implants: WorldNetDaily.com: March 20, 2000.

Dr. Peter Zhou, chief scientist for development of the implant and president of DigitalAngel.net, Inc., a subsidiary of ADS [Applied Digital Solutions], considered the possibility that American soldiers may be required to wear human chip implants.

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<[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=17834](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=17834)>; pp. 1-2, 5 of 7/27/02 8:31 AM printout.

<sup>571</sup> Julie Foster; "Big Brother Gets Under Your Skin;" WorldNetDaily.com; published March 20, 2000;

<[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=17834](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=17834)>; pp. 1-2 of 7/27/02 8:31 AM printout.

Digital Angel® sends and receives data and can be continuously tracked by global positioning satellite technology. When implanted within a body, the device is powered electromechanically through the movement of muscles and can be activated either by the "wearer" or by a monitoring facility...

Digital Angel®'s developer told WND [WorldNetDaily] demand for the implant has been tremendous since ADS [Applied Digital Solutions] announced its acquisition of the patent in December.

"We have received requests daily from around the world for the product," [Dr. Peter] Zhou [chief scientist for development of the implant and president of DigitalAngel.net, Inc, a subsidiary of Applied Digital Solutions] said, mentioning South America, Mexico and Spain as examples.

One inquirer was the U.S. Department of Defense, through a contractor, according to Zhou. American soldiers may be required to wear the implant so their whereabouts and health conditions can be accessed at all times, said the scientist.<sup>572</sup>

- E. "Real Question... Who Will Be Able to Demand That a Chip Be Implanted in Another Person...?": Bob Gellman, Washington Privacy Consultant: September 7, 2000

In a salon.com Web site article by Katharine Mieszkowski, Washington privacy consultant Bob Gellman discusses questions .

And, like almost everyone else I talked to in this field, Applied Digital Systems' [CEO Richard] Sullivan dismisses nagging doubts about what it means to literally wire ourselves up. "By our own nature, we tend to avoid things we know the least about and gravitate towards those that we do know. Some of the things that have made the most positive contributions to our lives are the things that there are the most concern about. Like any technology, it's really in the hands of the user," he says. Translation: it's Galileo vs. the church all over again...

However fashionable or discreet tracking devices might become, not everyone is titillated by the possibilities. "I think most people would be repulsed by the idea. This is just a sort of modern version of tattooing people, something that for obvious reasons -- the Nazis tattooed numbers on people -- no one proposes," says Bob Gellman, a Washington privacy consultant. "You can do anything you want voluntarily. You can tattoo a bar code on your forehead if you want."

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<sup>572</sup> Julie Foster; "Big Brother Gets Under Your Skin;" WorldNetDaily.com; published March 20, 2000; <[http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=17834](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=17834)>; pp. 1-3 of 7/27/02 8:31 AM printout.

But the real question, as he sees it, is who will be able to demand that a chip be implanted in another person -- a parent in a child; a prison in an inmate; the INS in an undocumented illegal alien found in the country; an employer in an employee as a condition of being hired?

"I'm sure there's a strong argument that implanting a chip in a person is unconstitutional. It would be cruel and unusual punishment," he says. And for now the legal and social questions of who could turn such a chip on or off and who would have access to the information generated by such a chip is "a totally unexplored area," says Gellman, adding: "And probably one better off left unexplored."<sup>573</sup>

F. "And What If An Implant Isn't Voluntary?": *Business2.0*: December 2000

Rick Overton in a "Potential for abuse" section of an article entitled, "Digital Angel Is Watching You," briefly reflects on the possibility of implants that are not voluntary. The article was introduced with a two-sentence overview: "Bio-digital implants that monitor and broadcast your every move could save your life in an emergency. Or destroy your last vestige of privacy."

And what if an implant isn't voluntary? It's easy to imagine the state making arguments for tracking and maybe treating criminals—such as convicted sex offenders—with implanted devices. In fact, there is a precedent for this. In January 1991, Judge Howard Broadman of the Tulare County Superior Court in California ordered that Darlene Johnson, a convicted child abuser, have the Norplant birth control device implanted in her body. (The sentence was neither carried out nor tested in a higher court because Johnson violated the terms of her parole and was sent to prison.)<sup>574</sup>

G. Human Microchip Implants: Simultaneously Could Be Implanted in Those Unable to Give Consent, While Avoiding Involuntary Identification: *EE Times*: January 7, 2002

Consideration is simultaneously given to implanting chips in those unable to give consent such as young children and adults with Alzheimer's, while avoiding involuntary identification of prisoners or parolees.

Applied Digital's executives said the ability to inject the chips opens up a variety of RFID applications in high-security situations, as well other types of human identification systems. The chips, they said, could be

<sup>573</sup> Katharine Mieszkowski; "Put That Chip Where the Sun Don't Shine;" *Salon Technology and Business*; published Sept. 7, 2000; <<http://archive.salon.com/tech/feature/2000/09/07/chips/print.html>>; p. 2-3 of 4/15/03 4:05 PM printout.

<sup>574</sup> Rick Overton; "Digital Angel Is Watching You;" *Business2.0*; published December 2000; <<http://www.business2.com/articles/mag/print/0,1643,14362,00.html>>; pp. 1-2 of 4/25/02 9:43 AM printout.

implanted in young children or in adults with Alzheimer's disease, to help officials identify people who can't identify themselves.

But the company is backing away from involuntary identification applications, such the tracking of prisoners or parolees. "We are advocating that this technology be totally voluntary," [Keith] Bolton [senior vice president of technology development] said.<sup>575</sup>

H. Pilots Could Be Chipped; Violent Criminals and Terrorists Should Be Chipped; Microchips Could Track Foreigners: "They Want Their ID Chips Now," Wired News: February 6, 2002

A February 6, 2002 Wired News article entitled, "They Want Their ID Chips Now," comments on the possibility of chipping both pilots and foreigners visiting the U.S.

Meet the Jacobs family: Jeffrey, Leslie and their son, Derek. They're a fairly typical American family, middle class and ambitious. The father is a dentist, the mother is an account executive at an interior design magazine and the 14-year-old son plays jazz and tinkers with computers in his spare time.

But one thing may soon make the Jacobses stand out: They could become the first family in the world to be implanted with microchips that contain their personal information.

The chip in question, the VeriChip, is similar to the biochips that have been used to identify pets and livestock for years.

Made by Applied Digital Solutions (ADS), the VeriChip stores six lines of text and is slightly larger than a grain of rice. It emits a 125-kHz radio frequency signal that can be picked up by a special scanner up to four feet away...

Leslie, 46, said she was motivated by security concerns. The Sept. 11 terrorist attacks hit close to home: Her family lives in South Florida, where authorities say 14 of the 19 hijackers lived. Her office is a block away from tabloid publisher American Media, where a photo editor died after contracting anthrax.

The world would be a safer place if authorities had a tamper-proof way of identifying people, she said.

"I have nothing to hide, so I wouldn't mind having the chip for verification," Leslie Jacobs said. "I already have an ID card, so why not have a chip?"

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<sup>575</sup> Charles J. Murray; "Injectable Chip Opens Door To 'Human Bar Code';" *EE Times*; published January 7, 2002 12:38 p.m. EST; <<http://www.eetimes.com/story/OEG20020104S0044>>; p. 3 of 3/9/02 3:30 PM printout.

Pilots could be chipped and scanned before they entered the cockpit, she suggested, to ensure the person sitting at the controls was indeed an airline employee. Her husband went further, suggesting that violent criminals and known terrorists should be routinely chipped as a matter of policy.

The idea of requiring people to be implanted was brought up by Applied Digital Solutions CEO Richard Sullivan in an interview with the Palm Beach Post, in which he suggested microchips be used to track foreigners visiting the United States. (The company has since downplayed his comments.)<sup>576</sup>

- I. Line in the Sand: VeriChip Always Voluntary: Applied Digital Solutions' Chief Technology Officer: Associated Press, February 26, 2002, and *World Magazine*, June 15, 2002
  1. Line in the Sand: VeriChip Always Voluntary: Applied Digital Solutions' Chief Technology Officer/Vice President: Associated Press article in [washingtonpost.com](http://www.washingtonpost.com): February 26, 2002

The assertion was made by Keith Bolton, chief technology officer and a vice president at Applied Digital that “the use of the VeriChip would always be voluntary.”

A Florida technology company is poised to ask the government for permission to market a first-ever computer ID chip that could be embedded beneath a person's skin.

For airports, nuclear power plants and other high security facilities, the immediate benefits could be a closer-to-foolproof security system...

Applied Digital, based in Palm Beach, Fla., says it will soon begin the process of getting Food and Drug Administration approval for the device, and intends to limit its marketing to companies that ensure its human use is voluntary.

“The line in the sand that we draw is that the use of the VeriChip would always be voluntary,” said Keith Bolton, chief technology officer and a vice president at Applied Digital. “We would never provide it to a company that intended to coerce people to use it.”<sup>577</sup>

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<sup>576</sup> Julia Scheeres; “They Want Their ID Chips Now;” *Wired News*; published February 6, 2002; <<http://www.wired.com/news/print/0,1294,50187,00.html>>; p. 1 of 3/9/02 3:19 PM printout.

<sup>577</sup> Christopher Newton, Associated Press Writer; “U.S. to Weigh Computer Chip Implant;” Associated Press article on [washingtonpost.com](http://www.washingtonpost.com); published February 26, 2002 7:55 PM; <<http://www.washingtonpost.com/ac2/wp-dyn/A7240-2002Feb26?language=printer>>; p. 1 of 2/28/02 7:49 AM printout.

2. Line in the Sand: VeriChip Always Voluntary: Applied Digital Solutions' Chief Technology Officer: *World Magazine*: June 15, 2002

Keith Bolton, chief technology officer at Applied Digital Solutions, made the assertion that “the use of the VeriChip would always be voluntary.”

A Florida company wants to market perhaps the most controversial security measure ever devised: a computer ID chip that can be embedded under someone's skin...

Applied Digital Solutions' new VeriChip is about the size of a grain of rice, hard to remove, and difficult to counterfeit...

“The line in the sand that we draw is that the use of the VeriChip would always be voluntary,” said Keith Bolton, chief technology officer and a vice president at Applied Digital. “We would never provide it to a company that intended to coerce people to use it.”<sup>578</sup>

- J. Required Chip Could Solve Problem: Track Undocumented Immigrants: Chief Executive Officer: *Miami Herald*: March 10, 2002

Required human microchip implants was suggested by Richard Sullivan, chief executive officer of Applied Digital Solutions, as a solution to tracking undocumented immigrants.

For all the arguments against chip implants turning people into human LoJacks, the fate of kidnapped Wall Street Journal reporter Daniel Pearl is an example of how safety issues may override privacy concerns. Richard Sullivan, chief executive officer of Applied Digital Solutions, also suggests another application: helping to track undocumented immigrants.

The problem could be solved, he said, if “people were required to be chipped or had some combination of a device requiring them to be scanned and monitored at all times.”

“I think it's not unreasonable to ask people who want to come to work in the country that they respect the rights of people who are citizens in the United States,” Sullivan said.<sup>579</sup>

- K. ADS Medical-Applications Director Dr. Richard Seelig: Right to Demand Pilots Required to Get Chipped: *Time Magazine*: March 11, 2002

In a March 11, 2002 *Time* article entitled “Meet the Chipsons” Dr. Richard Seelig, Applied Digital Solutions (ADS) medical-applications director,

<sup>578</sup> Chris Stamper, “Technology: New...But Improved?: Under My Skin,” *World*, March 9, 2002, p. 42.

<sup>579</sup> Shannon Tan; “An ID Idea: Microchips Under Your Skin;” *Miami Herald*; published March 10, 2002; <<http://www.miami.com/mld/miamiherald/2828025.htm>>; p. 1 of 1/21/03 10:55 AM printout.

states that “we have a right to demand” that the government or airlines have a right to require pilots to get chipped.

Security is part of the VeriChip business plan...[Dr. Richard] Seelig[, medical-applications director] believes [an implantable computer device...with a microchip containing a few kilobytes of silicon memory and a tiny radio transmitter called ]VeriChip could function as a theft-proof, counterfeit-proof ID, like having a driver’s license embedded under your skin. He suggests that airline crews could wear one to ensure that terrorists don’t infiltrate the cockpit in disguise. “I travel quite a bit,” he says, “and I want to make sure the pilots in that plane belong there.”

Could the airlines or government really require pilots to get chipped? “I think we have a right to demand that,” says Seelig. “Our lives are in their hands.”<sup>580</sup>

#### L. Consider Implants for All Children: England: September 2002

1. Professor Calls for Consideration of Implants for All Children: England: *The Guardian*: September 3, 2002

Professor Kevin Warwick of Reading University called for consideration of implants for all children.

He [The designer of the chip, Kevin Warwick of the cybernetics department at Reading University] has called for an urgent government debate on the issue, and believes ministers should consider implants for all children...

Among the technical questions to be addressed is whether the chip should remain dormant in the limb until an emergency arose, or whether it should emit a signal 24 hours a day.

"This is why we need the debate to take place," he said. "In future it may be that only the police have the authority to allow the system to be activated. But, as things stand, parents can have that right themselves."<sup>581</sup>

2. Did Professor Really Call for Consideration of Implants for All Children?: England: *The Register*: September 6, 2002

An article in *The Register* by John Lettice, which quotes, in part, a “Girl To Get Tracker Implant To Ease Parents' Fears” September 3, 2002,

<sup>580</sup> Lev Grossman, “Meet the Chipsons,” *Time*, March 11, 2002, p. 57.

<sup>581</sup> Jamie Wilson; “Girl To Get Tracker Implant To Ease Parents' Fears;” *The Guardian*; published September 3, 2002;

<<http://www.guardian.co.uk/child/story/0,7369,785073,00.html>>; p. 2 of 2/14/03 4:15 PM printout.

article in *The Guardian*, questions Reading University Professor Kevin Warwick's call for consideration of implants for all children.

Most of the pieces published during [Professor] Warwick's media frenzy followed his agenda closely, and the *Guardian's* was no ex[c]e[p]tion. But towards the end you can see another agenda starting to poke out:

"He has called for an urgent government debate on the issue, and believes ministers should consider implants for all children." Could that possibly be what he *really* said? He went on: "This is why we need the debate to take place. In future it may be that only the police have the authority to allow the system to be activated. But, as things stand, parents can have that right themselves." Conjure up your own spectres from that little lot, people.<sup>582</sup>

- M. "New Legislation Would Have To Be Passed To Require Offenders To Be Surgically Fitted with the Tags": Prisonplanet.com: *Sunday Times of London*: November 17, 2002

Dominic Tonner writing in the November 17, 2002 *Sunday Times of London* noted that consideration was given to requiring the implantation of microchips in human beings.

Electronic tracking devices could be implanted into convicted paedophiles under plans being considered by the government.

Microchips would be surgically fitted beneath the skin under local anaesthetic, enabling officials to follow abusers' movements and monitor their heart rate and blood pressure.

The tagging technology is similar to that used to locate stolen cars. It works by using satellites or a mobile phone network to pinpoint the person on an electronic map via a signal from the implant...

The Home Office minister Hilary Benn revealed the government's plan to implant electronic tags into convicted paedophiles in a letter to the Labour MP Andrew Mackinlay.

"The (Home Office's) electronic monitoring team is . . . looking actively at the possibilities for using tracking technology to monitor offenders' whereabouts as they move from one place to another," he wrote.

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<sup>582</sup> John Lettice; "Kid-chipper Cap Cyborg Reported to Police, Social Services;" *The Register*; published September 6, 2002 at 13:38 GMT; <<http://www.theregister.co.uk/content/54/27003.html>>; p. 2 of 3/11/03 8:36 AM printout. John Lettice's article critiques information that is referenced and linked to: Jamie Wilson; "Girl To Get Tracker Implant To Ease Parents' Fears;" *The Guardian*; published September 3, 2002; <[http://www.guardian.co.uk/uk\\_news/story/0,3604,785071,00.html](http://www.guardian.co.uk/uk_news/story/0,3604,785071,00.html)>.

New legislation would have to be passed to require offenders to be surgically fitted with the tags.<sup>583</sup>

- N. “No One Is Forcing You to Have a VeriChip”: *The Boston Globe*: May 20, 2003

Applied Digital Solutions president Scott Silverman noted the role of “individual choice.”

For ADS’s Silverman, both the VeriChip and its future GPS-based version are a matter of individual choice.

“No one is forcing you to have a VeriChip. If you want a chip in your right arm you are going to know it is there because you will see it injected.”<sup>584</sup>

### XXXIII. Concluding Perspective

For the first time in history, the capability is on the horizon to electronically tag every object and every person on earth.

Readers for implanted electronic human numbers are spreading at an accelerating rate.

The Biblical book of Revelation spoke some two millennia ago about the need to have a mark in/on the hand or forehead in order to buy or sell. Humanity is moving toward that point.

At the time of Jesus, the people of God were understandably looking for a messianic conquering king along the lines of their ancestor King David. A number of Jews claimed that the one who came unexpectedly as a suffering servant and conquered death was the long awaited Messiah.

If their assessment of this unanticipated turn of events be true, as the church confesses and proclaims, then the church would do well to approach the mysteries of Revelation with humility. If anything, Revelation is certainly a part of God’s future that we see through a glass darkly.

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<sup>583</sup> “Paedophiles May Be Fitted with Electronic Tags;” prisonplanet.com; <[http://www.prisonplanet.com/news\\_alert\\_111702\\_microchips.html](http://www.prisonplanet.com/news_alert_111702_microchips.html)>; p. 1 of 2/17/03 9:53 AM printout. This article found on prisonplanet.com is a *Sunday Times of London* article by Dominic Tonner dated 11/17/02. The prisonplanet.com page provides the following information for the *Sunday Times* article: “Original Link: <<http://www.timesonline.co.uk/article/0,,2087-483510,00.html>>.”

<sup>584</sup> Angela Swafford; “Chipping Away at Security Fears”; *Boston Globe*, p. C9, section: Health Science; published May 20, 2003; <[http://nl.newsbank.com/nl-search/we/Archives?p\\_product=BG&p\\_theme=bg&p\\_action=search&p\\_maxdocs=200&p\\_text\\_search-0=VeriChip&s\\_dispstring=VeriChip%20AND%20date\(last%2030%20days\)&p\\_field\\_date-0=YMD\\_date&p\\_params\\_date-0=date:B,E&p\\_text\\_date-0=30qzD&p\\_perpage=10&p\\_sort=YMD\\_date:D&xcal\\_useweights=no](http://nl.newsbank.com/nl-search/we/Archives?p_product=BG&p_theme=bg&p_action=search&p_maxdocs=200&p_text_search-0=VeriChip&s_dispstring=VeriChip%20AND%20date(last%2030%20days)&p_field_date-0=YMD_date&p_params_date-0=date:B,E&p_text_date-0=30qzD&p_perpage=10&p_sort=YMD_date:D&xcal_useweights=no)>; p. 3 of 5/22/03 3:03 PM printout.

Some claim that Revelation's mark of the beast referred to events in the days of the Roman Empire. Such a fulfillment, to the extent true, does not preclude an additional future fulfillment on a larger scale. By any standard, Revelation presents a universal picture. It would be difficult, if not impossible, to make a cogent case that the writer of Revelation was generally writing about these universal events that the writer thought had already fully occurred.

From the perspective of Revelation, the mark of the beast—without which one cannot buy or sell—cannot be stopped.

Even so, some church members and institutions may align themselves with those secularists who elect to address privacy concerns that stem from the global tagging of all objects including—through smart cards and microchip implants—human beings.

Yet, while the privacy debate proceeds, a steady blanketing of the globe with electronic readers of microchip implants is proceeding apace.

What is to be the church's response?

After all, the beast's mark may easily be construed as the work of an "angel of light" (2 Corinthians 11:14) that would deceive all but the elect (Matthew 24:24). The situation that involves commercial coercion may well seem to constitute a tragic moral choice that confronts loving family members and friends, and that presents the caring minister with a pastoral dilemma. For example, how does the church address the following hypothetical situation?

A church member requires chemotherapy treatment for cancer or antibiotic treatment for a serious infection. This medically recommended treatment requires continual monitoring of the church member's temperature. Due to limits in staffing, in order to maximize economic efficiencies, the hospital informs the church member and his or her loved ones, including the pastor, that standard medical practice as of 30 days ago now requires the implantation, in the right hand or forehead, of a human microchip implant via a vaccination. The microchip implant, which contains a temperature sensor, continually transmits the patient's temperature over the hospital's wireless network and alerts staff of any noteworthy variation that requires further treatment. Further, the patient and his/her loved ones are informed that the same microchip is now tied into the hospital's billing system and is necessary for processing any insurance claims. The decision as to whether to sign medical authorizations and releases in order to accept the chip and thus the recommended medical treatment must be made prior to admittance to the medical treatment facility. Any delay, one is advised, may affect the treatment outcome and, of course, the longer term prognosis, and possibly have life and death consequences.

What do you do? Jesus said, "Don't be afraid of those who want to kill you. They can only kill your body; they cannot touch your soul. Fear only God, who can destroy both soul and body in hell" (Matthew 10:28, *New Living Translation*). But how awful to be called upon to give advice or make a snap decision on the spot that affects one's child, wife, husband, sister, brother, father, mother, parishioner—or self.

To attempt to stop the spread of electronic readers of microchip implants would not only be futile from within the prophetic logic of Revelation, but would also not go to the heart of Jesus' directives to his disciples.

Christ asks for obedience. The law of love written in the church's heart calls for living for others rather than self. This living for others is an integral part of proclaiming God's offer of Jesus' salvific sacrifice on our behalf.

Obedience to Christ cannot be limited to current time and talent, but must also encompass sacrificial living for others with stored time and talent—that is, money—in this Age of Affluence.

Thus, the approach of ubiquitous electronic RFID readers and human RFID microchip implants, hurtling toward us from over the horizon, stresses the urgency of Jesus' age-old call to live for others in word and deed, on a daily basis, with our money as well as our skills.

One who is not obedient to Jesus Christ out of love for others with money today, will not likely resist the lure of a chip implant that allows you to buy and sell tomorrow.

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