Ford Hosts Convergence 2004

We recently spoke with Dr. Gerhard Schmidt, vice president in charge of research and advanced engineering at Ford and the chairman of Convergence 2004, about the conference and about electronics at Ford. Scheduled for October 18 – 20 at Detroit’s Cobo Hall, Convergence is the largest and most influential conference on automotive electronics. It is attended by a large number of the industry’s movers and shakers from carmakers and suppliers around the world. Eighty-five papers will be presented during the conference’s 15 technical sessions. To register for Convergence, please visit www.convergence2004.org.

This year Ford has chosen “Vehicle Electronics to Digital Mobility: The Next Generation of Convergence” as the conference theme. Digital mobility refers to the next stage of automotive electronics, where control systems and features are connected to each other via data communications networks, making them interdependent and complementary, where software and digital data are the essential ingredients.

Given where the industry is headed, electronics architecture is particularly important, and two noteworthy sessions on systems architecture have been developed. On Tuesday morning, October 19, Peter Thoma, member of the management board of Elmos Semiconductor, chairs a session on physical structures of systems architectures. Dick Brass, vice president of Microsoft’s Automotive Business Unit, leads a session that will focus on software, scheduled for Tuesday afternoon.

Dr. Schmidt came to Ford in 2001 from BMW, where he was senior vice president of vehicle integration. Before that, Dr. Schmidt spent ten years as senior vice president of vehicle integration. Before that, Dr. Schmidt spent ten years as senior vice president of vehicle integration. Before that, Dr. Schmidt spent ten years as senior vice president of vehicle integration.

Defending iDrive

The harsh negativity about iDrive goes well beyond the press. When I visited our local BMW dealer in Portsmouth, New Hampshire this summer, the salesman I spoke with was quick to tell me that his customers “hate” iDrive. “It’s awful. It is impossible during new car delivery to teach customers in one sitting how to use it. If BMW made iDrive a delete option, 99% would have it deleted,” he said. Not at all intuitive, iDrive is difficult to use even by the computer literate.

However, BMW is not about to make iDrive, which is standard on 5, 6 and 7 series vehicles, a delete option on those models. “Once people have driven it for a long time, most appreciate it. If we changed it again, we would get a lot of criticism,” said Michael Pfunder, in charge of E/E interior and cockpit systems engineering at BMW. “Customers would ask, ‘Wy would you change the thing I already know?’” On the BMW 1 series introduced in Europe earlier this year, iDrive is only packaged with the navigation system option.

According to Mr. Pfunder, appreciation for iDrive varies by country. “For example, Japanese drivers are used to very complex systems. There is no criticism whatsoever from Japan, or from Germany. In America the response has been mixed,” he said.

The iDrive human-machine-interface includes steering-wheel switches, a multifunction display, and a multifunction control knob, which can be turned, pressed, and in the 7 series slid to eight different positions.

Turn to iDrive, page 8
Autobytel-Japan.com Surveys Japanese Consumers on Car Electronics

A utobytel-Japan.com recently surveyed users of its website about their car electronics purchases. 6,618 e-mail subscribers responded to the survey, most of them 30- to 40-year-old businessmen, frequent users of the Internet, who live in a metropolitan area. All the respondents had a navigation system in their car already, and of those who didn’t have navigation, 75.8% said they would like to purchase a system.

The survey also indicated that hard disk drive navigation is making inroads in the market and is generating interest among consumers, although DVD-based systems remain far more common today. Navigation users cited high costs and dated information as reasons for dissatisfaction with their current systems.

We’ve listed the survey questions and responses provided by Autobytel-Japan, a joint venture of Autobytel Inc. (Irvine, California), i-cf, Itochu, Trans Cosmos and GE Capital.

What do you have in your vehicle? (Plural answers are accepted.)
- CD player 68.9%
- Navigation system 50.6%
- Radar detector 38.5%
- MD player 31.2%
- TV 29.3%
- ETC 19.2%
- Theft prevention 18.3%
- No devices 10.7%
- DVD player 8.1%
- Video deck 2.4%
- Others 1.5%
- Vehicle-distance detect/control system 0.4%

To those who own navigation systems:
What kind of navigation system do you have?
- DVD 53.9%
- CD 29.8%
- HDD 15.6%
- Others 0.7%

Carmaker or aftermarket navigation system?
- Carmakers 41.7%
- Aftermarket 55.0%
- Others 3.3%

What makes you dissatisfied with the navigation systems? (Plural answers are accepted.)
- Expensive 55.2%
- Old map information 53.2%
- Route guidance error 41.9%
- Troublesome data update 38.3%
- Difficulty to operate 16.0%
- Too many functions 7.4%
- Others 6.9%

Would you like to replace your current system with a new one?
- Not for a while 58.9%
- If the price comes down to reasonable range 27.8%
- When the next-generation model is introduced 7.8%
- Others 3.2%
- As soon as possible 2.3%

To those who don’t own navigation systems: Would you like to purchase a navigation system?
- Yes 75.8%
- No 24.2%

To those who answered yes in the above question: What kind of navigation system would you like to buy?
- HDD 64.4%
- DVD 31.6%
- CD 1.9%
- Others 2.1%

To those who don’t own navigation systems: Can you go to the destination without getting lost?
- Never lost with map and road signs 57.2%
- Sometimes lost with map and road signs 30.0%
- Never lost with road signs without maps 7.0%
- Often lost with map and road signs 5.0%
- Others 0.8%

Would you detour or change the route if you are informed of the traffic jam?
- Yes 69.3%
- No 4.8%
- It depends 25.4%

Autobytel launched its first research and car-buying site in 1995. According to the company, it was the most visited site of its kind in 2003 and generates over a billion dollars a month in vehicle sales.
Electronics Features in New MY 2005 Vehicles

Many 2005 model year vehicles have been delivered to showrooms already, and more will be introduced later this month at the Paris auto show. We looked at a sampling of new or redesigned 2005 models—sedans, compacts, minivans and SUVs—to see which electronic features are becoming more mainstream.

While more high tech features such as lane departure warning and night vision continue to emerge on upscale vehicles, sophisticated electronics features and functions are trickling down from high-end luxury models to more high volume vehicles, especially safety features. Four-wheel ABS (antilock braking system) is standard on 14 of the 18 new 2005 models we looked at and optional on the remainder. Traction control and electronic brake force distribution (EBD), which balances brake forces between the front and rear, are also widely available. Even the Kia Spectra, an entry-level compact, uses EBD and offers optional traction control.

Side airbags or side curtain airbags are widely available in the sample we looked at—standard in the high-end vehicles, optional in most others. Driver and front passenger side airbags are standard in the 2005 Hyundai Tucson and Kia Spectra.

Electronic stability control was a standard feature on 73 different vehicles in North America in the 2004 model year, according to the Electronic Stability Coalition, and carmakers are bringing the feature to more high volume vehicle lines. For example, GM’s version of ESC, Stabilitrak, first introduced in the Cadillac, was also available in the MY 2004 Buick, Oldsmobile and Pontiac sedans, as well as G M’s large SUVs. For MY 2005 the Stabilitrak option is expanded to GM’s new minivans, the Saturn Relay, Buick Terraza and Chevrolet Uplander as well as the all-new Buick LaCrosse sedan. Navigation has not yet taken off in the States. According to Yano Research Institute (Tokyo, Japan) the U.S. market reached just 400,000 units in 2004.

New Features

The 2005 Infiniti FX crossover brings lane departure warning to the U.S. market for the first time. The camera-based system, developed by Valeo and Iteris, tracks lane markings and uses the vehicle’s speed to determine if the vehicle is leaving the lane unintentionally. The camera signal and vehicle speed are sent to the system’s microprocessor, which calculates both the distance between the vehicle and the lane marking and the lateral velocity to the lane marking. It is deactivated by the turn signal. Nissan introduced lane departure warning on the Cima in Japan in 2001. PSA Peugeot Citroën will offer an optional lane departure warning system on the 2005 C4 coupe, which will be shown at the upcoming Paris motor show.

Honda hopes its Intelligent Night Vision system, due this fall in Japan on the Honda Legend (Acura RL), will help reduce accidents involving pedestrians. The system uses two infrared cameras to detect the position and movement of heat-emitting objects, as well as to provide an enhanced view of the road ahead on a head-up display. If the system determines a pedestrian is in the vehicle’s path, the image is framed on the HUD and an audible alarm sounds.

<table>
<thead>
<tr>
<th>Model</th>
<th>4-Wheel ABS*</th>
<th>Electronic Stability Control*</th>
<th>Side Airbags*</th>
<th>Navigation/Telematics*</th>
<th>Other*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Acura RL (Sedan)</td>
<td>With traction control, EBD</td>
<td>Vehicle Stability Assist</td>
<td>Front, rear head bags</td>
<td>Navigation, OnStar, optional traffic info via XM Radio</td>
<td>Steering wheel controls, Bluetooth hands-free phone</td>
</tr>
<tr>
<td>2005 Audi A6 (Sedan)</td>
<td>With traction control, EBD</td>
<td>Electronic Stability Program</td>
<td>Front and rear</td>
<td>Optional navigation</td>
<td>MMI multifunction control; ACC; adaptive headlights; keyless go</td>
</tr>
<tr>
<td>2005 Audi A3 (Compact)</td>
<td>With traction control</td>
<td>Electronic Stability Program</td>
<td>Front, optional for rear</td>
<td>Optional navigation</td>
<td>Sensors activate low beams and/or wipers; electromechanical power steering</td>
</tr>
<tr>
<td>2005 BMW 1 (Compact)</td>
<td>With traction control</td>
<td>Dynamic Stability Control</td>
<td>Front plus side curtain</td>
<td>Optional navigation includes Drive controller</td>
<td>Brake force display; optional Bluetooth phone link and Park Distance Control</td>
</tr>
<tr>
<td>2005 Buick LaCrosse (Sedan)</td>
<td>Optional; Standard on CXS model</td>
<td>Optional Stabilitrak on CXS</td>
<td>Optional side curtain</td>
<td>OnStar</td>
<td>Optional factory remote start and steering wheel controls</td>
</tr>
<tr>
<td>2005 Cadillac STS (Sedan)</td>
<td>With traction control</td>
<td>Stabilitrak</td>
<td>Front plus side curtain</td>
<td>OnStar; optional navigation</td>
<td>Optional ACC with HUD, IntelliBeam, factory remote start</td>
</tr>
<tr>
<td>2005 Chevrolet Uplander (Minivan)</td>
<td>Traction control optional</td>
<td>Optional Stabilitrak on LT model</td>
<td>Front; optional on base model</td>
<td>OnStar</td>
<td>Driver info center; rear seat DVD; optional Phaetnise 40 GB HDD digital audio player</td>
</tr>
<tr>
<td>2005 Chrysler Town &amp; Country (Minivan)</td>
<td>Standard except on base model</td>
<td>Not available</td>
<td>Optional for front only</td>
<td>Optional navigation</td>
<td>Optional UConnect Bluetooth phone link</td>
</tr>
<tr>
<td>2005 Dodge Magnum (Crossover SUV)</td>
<td>Optional on SE, SXT; std. on RT</td>
<td>Electronic Stability Program std. on RT; optional on SE, SXT</td>
<td>Optional side curtain</td>
<td>Optional navigation</td>
<td>Optional UConnect Bluetooth phone link on RT model</td>
</tr>
<tr>
<td>2005 Ford Five Hundred (Sedan)</td>
<td>Traction control optional</td>
<td>Not available</td>
<td>Optional front and rear</td>
<td>Not available</td>
<td>Optional electronically controlled AWD</td>
</tr>
<tr>
<td>2005 Honda Odyssey (Minivan)</td>
<td>With traction control</td>
<td>Vehicle Stability Assist</td>
<td>Front plus side curtain</td>
<td>Optional navigation</td>
<td>Optional rear seat DVD</td>
</tr>
<tr>
<td>2005 Hyundai Tucson (Compact SUV)</td>
<td>Optional, with traction control</td>
<td>Not available</td>
<td>Front; side curtain optional</td>
<td>Not available</td>
<td>Electronic Interactive Torque Management</td>
</tr>
<tr>
<td>2005 Jeep Grand Cherokee (SUV)</td>
<td>With traction control</td>
<td>Optional Electronic Stability Program</td>
<td>Optional side curtain</td>
<td>Optional navigation radio</td>
<td>Rain sensing wipers; optional rear seat DVD; park assist</td>
</tr>
<tr>
<td>2005 Kia Spectra (Compact SUV)</td>
<td>Optional on XT model, EBD</td>
<td>Not available</td>
<td>Front plus side curtain</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>2005 Mercedes CLS (Sedan)</td>
<td>With traction control, Brake Assist, Sensotronic Brake Control</td>
<td>Electronic Stability Program</td>
<td>Front plus side curtain; rear bags optional</td>
<td>Optional navigation</td>
<td>Optional ACC; park assist; adaptive headlights; keyless go</td>
</tr>
<tr>
<td>2005 Saturn Relay (Minivan)</td>
<td>Traction control optional</td>
<td>Optional Stabilitrak</td>
<td>Optional seat mounted bags</td>
<td>OnStar</td>
<td>Rear seat DVD; optional factory remote start</td>
</tr>
<tr>
<td>2006 Scion tC (Compact)</td>
<td>With EBD</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>2006 Toyota Highlander Hybrid (SUV)</td>
<td>With EBD</td>
<td>Vehicle Stability Control</td>
<td>Optional front bags and side curtain</td>
<td>Optional navigation</td>
<td>Hybrid Synergy Drive; optional rear seat DVD</td>
</tr>
</tbody>
</table>

*Standard feature unless otherwise noted.
The Company Profile... **ATX Group**

**Headquarters:** 8550 Freeport Parkway, Irving, Texas 75063 USA; telephone 972-753-6200; www.atxg.com

**Product:** Telematics services

**2003 Data:**
- **Sales:** $49.4 million, including Vodafone Passo sales since July 2003
- **Net Margin:** 3.1%
- **Free Cash Flow:** $15.6 million
- **R&D:** $1.3 million

**Customers:** Mercedes-Benz and BMW drivers accounted for 97.9% of net revenues in 2003.

**Subscribers as of March 31, 2004:**
- 335,500, two-thirds of whom are paying

**Subscriber Renewal Rate:** About 70%

**Owners:** Entrepreneur James Leininger of San Antonio, Texas, owns 51.6%; Vodafone Deutsche GmbH owns 23.2%.

**Shareholders' Deficit:** $111.1 million

**Employees**: 358

**Sales Per Employee:** About $139,163

ATX Background

ATX Group, an independent provider of telematics services primarily to Mercedes and BMW, was founded in 1994 in San Antonio, Texas. The company initially provided call center services and in-vehicle hardware for On-Guard Tracker, an early vehicle tracking service offered through the automotive aftermarket and to commercial fleet managers. In 1999, ATX acquired Protection One Mobile Services for $29.5 million and since then has focused exclusively on providing telematics services and systems integration for automotive OEMs. Telematics can be broadly defined as data communications to and from a vehicle. Protection One Mobile Services had worked with Ford Motor Co. and Motorola to develop the Lincoln RESCU system, the first in-vehicle emergency response system, launched in 1996. RESCU integrated GPS location technology with hands-free cell phone communications to provide 24-hour driver assistance through live operators at a call center.

Net Profit (Loss) in $ Thousands

<table>
<thead>
<tr>
<th>Year</th>
<th>Profit/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>26.1</td>
</tr>
<tr>
<td>2000</td>
<td>(35.5)</td>
</tr>
<tr>
<td>2001</td>
<td>(24.0)</td>
</tr>
<tr>
<td>2002</td>
<td>6.9</td>
</tr>
<tr>
<td>2003</td>
<td>1.5</td>
</tr>
</tbody>
</table>

*Includes partial year revenues from the BMW services business of Vodafone Passo GmbH, which ATX purchased on July 31, 2003.

*Fully diluted basis, as of August 23, 2004

**As of March 31, 2004**

Ninety-eight percent of ATX's revenue is earned by providing call center-based telematics services to Mercedes and BMW. ATX provides consumer services including emergency medical and breakdown assistance, automatic collision notification, navigation and real-time traffic information. With $49.4 million in sales in 2003 and 335,500 subscribers as of March 31, 2004, ATX is the world's second largest telematics service provider, after GM's OnStar unit in North America, which boasts 2.5 million subscribers. About two-thirds of ATX's subscribers are paying customers, the rest are in their first year of service, which is free for both BMW and M ercedes new vehicle buyers. According to ATX, 70% of subscribers renew each year. ATX defines renewals as the number of paying subscribers divided by the average number of subscribers in that year.

In development are services targeted to OEMs and dealers including connecting drivers to their preferred dealer or to the nearest dealer in an emergency and providing OEMs with remote access to diagnostics and vehicle performance data.

ATX Sales by Year in $ Thousands

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales in $ Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>1,210</td>
</tr>
<tr>
<td>2000</td>
<td>3,456</td>
</tr>
<tr>
<td>2001</td>
<td>14,151</td>
</tr>
<tr>
<td>2002</td>
<td>31,614</td>
</tr>
<tr>
<td>2003 (est.)</td>
<td>49,403*</td>
</tr>
<tr>
<td>2004</td>
<td>70,000</td>
</tr>
</tbody>
</table>

1999 to 2003 Annual Growth Rate: 116.6%

ATX Sales and Employees by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Total 2003 Sales: $49.4 Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>86.7%</td>
</tr>
<tr>
<td>Elsewhere (mostly Germany)</td>
<td>13.3%</td>
</tr>
</tbody>
</table>

ATX Employees by Job Function

<table>
<thead>
<tr>
<th>Job Function</th>
<th>Total Employees March 31, 2004: 358</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales and marketing</td>
<td>31</td>
</tr>
<tr>
<td>Tech support and integra</td>
<td>110</td>
</tr>
<tr>
<td>Response center operators</td>
<td>180</td>
</tr>
<tr>
<td>Finance,legal,administration</td>
<td>37</td>
</tr>
</tbody>
</table>

ATX entered the European telematics service provider market with its July 2003 acquisition of Vodafone Passo GmbH, an affiliate of Vodafone Group. U.K.-based Vodafone bought Mannesmann AG in 2000 and combined the Vodafone Passo telematics business with the telematics business Mannesmann Autocom. After that, Vodafone made a $40 million investment in ATX, roughly 20% of equity.

When ATX bought Vodafone Passo in 2003, ATX assumed responsibility for BMW Assist customers in Germany and the U.K. as well as Online Services and a call center in Düsseldorf, Germany. That business is now ATX Europe GmbH. The remaining business operations of Vodafone Passo, a fleet business and a traffic information service, were shut down soon after the acquisition.
Distinctions Claimed by ATX

- Teamed with Ford and Motorola to introduce RESCU, the first in-vehicle telematics system in North America, in 1996.
- World’s second-largest telematics service provider
- World’s largest telematics service provider not owned by a carmaker

Major Competitors of ATX

North America: OnStar, Cross Country Group
Europe: T-Mobile Traffic, Wireless Car, TargSys, OnStar, IMA

The Business of Telematics

The ATX business of supplying telematics services to paying subscribers, and eventually to carmakers and dealers, requires a car equipped with a telematics platform that can keep track of the vehicle’s location—based on GPS satellite transmissions—and communicate that data to a central office each time data or voice communication is established between the vehicle and central office. That platform embedded in the vehicle typically costs between $200 to $250, according to ATX.

According to ATX’s S-1 financial statement to the SEC: “ATX bills subscribers for the gross amount due under the service contract on behalf of the OEM. ATX retains the portion of the fee related to the wholesale services it performs for the OEM, and remits the remainder to the OEM, which is used in part by the OEM to pay (communications) carrier costs associated with delivering the services. ATX recognizes as net revenue the amount received from the OEM in connection with the services provided.”

ATX has been free cash flow positive since September 2001. 2003 produced $15.6 million in free cash flow and, said Steve Millstein, ATX president and CEO, “We’re expecting anywhere from $10 million to $15 million in free cash flow for 2004. ATX defines free cash flow as cash resulting from operations less cash from investing activities.

Ninety-nine percent of ATX’s 2003 revenues came from subscription fees paid by consumers. ATX expects revenues to grow at the rate or 18% to 22% per year over the next three or four years. First quarter ATX revenues totaled $17.4 million, $18.6 million in the second quarter. While the number of telematics subscribers has grown at the rate of 35% per year since January 1, 2001, ATX does not expect to maintain that growth for long.

Focus on North America and Europe

ATX serves two regional markets, Western Europe and North America. Primary in the United States, prior to the acquisitions of Vodafone Passo, substantially all of ATX’s revenues came from the United States, but in 2003, Europe accounted for 13.3% of sales for the year and 24.3% of sales in the first quarter of 2004.

In North America, there are few OEMs that ATX can court for new business. General Motors has demonstrated 100% commitment to its OnStar division, and Chrysler has no telematics product that requires an outside telematics service provider. Since Ford shut down development of its in-house telematics service, Wingcast, in June 2002, it has shown no interest in providing telematics services to Ford brand customers. A number of potential North American OEM customers are already hooked up with OnStar, namely, Honda (Acura RL, CL and TL), Acura (A 4, A 6, A 8, Quattro), Isuzu (Ascender), Subaru (Outback), and Volkswagen (Golf, Jetta, Passat, New Beetle, Touareg and Phaeton), plus Toyota through the Lexus Link branding of OnStar. That leaves a small number of car lines as potential customers. Nevertheless, over the next several years ATX expects to get most of its sales from North America.

While the market in North America is considerably larger (because of OnStar) and more monolithic, Steve Millstein is keen to expand ATX’s market in Europe, especially in Germany, France, the U.K., Italy and Spain. So far, ATX has significant business only in Germany, where it serves BMW Europe. If ATX is successful providing telematics services to BMW outside of Germany, it can offer other carmakers services in those countries as well, where ATX and their customers could benefit from economies of scale.

ATX Europe established new response center facilities in Italy in September 2004. A part of the acquisition, Vodafone agreed not to render traffic telematics services or products to OEMs in Europe until August 1, 2005. ATX serves Mercedes customers in North America, but it does not have Mercedes business in Europe. Mercedes in Europe is served by ATX competitor T-Mobile Traffic.

In December 2003, ATX signed an agreement to supply consumer telematics services to Peugeot in certain European countries. Peugeot has not yet announced

<table>
<thead>
<tr>
<th>ATX Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
</tr>
<tr>
<td>Mercedes-Benz</td>
</tr>
<tr>
<td>USA and Canada</td>
</tr>
<tr>
<td>BM USA, Canada</td>
</tr>
<tr>
<td>and Europe</td>
</tr>
<tr>
<td>Maybach USA</td>
</tr>
<tr>
<td>and Canada</td>
</tr>
<tr>
<td>Rolls-Royce USA</td>
</tr>
<tr>
<td>and Canada</td>
</tr>
</tbody>
</table>
the details of the service or when it will begin. ATX is having discussions with another French carmaker about supplying telematics services and expects to have an agreement in place within 90 days.

OEM Services

Not content to base its future entirely on the consumer services market, ATX has been developing a number of OEM services including remote diagnostics, speech operated owners manual and off-board navigation. ATX hopes the new OEM services, targeted at both carmakers and dealers, will begin to kick in with sales in perhaps five years. OEM services accounted for just one percent of ATX sales in 2003.

OEM services that benefit the car owner and help deliver improved repair services can improve brand loyalty. Collected diagnostics data about the performance of new models can also help engineers fix problems early, well before they become expensive recalls.

“Carmakers are still collecting data the same way they were doing it 50 years ago,” said Mr. Millstein. “That isn’t going to work much longer in today’s competitive environment.” ATX sees promise in keeping track of the vehicle’s mileage and the vehicle’s battery, so the dealer can preemptively notify the customer to have the battery checked. Despite ATX’s readiness to collect vehicle data on behalf of carmakers and dealers, vehicles haven’t been designed to provide access to a lot of data. That would require significant architectural changes to the vehicle, changes that would take years to implement.

ATX believes that because it already provides consumer services to Mercedes and BMW vehicle owners, it can make a strong business case to expand into OEM services. “They have already made the investment in telematics; it’s already embedded in their vehicles,” said Mr. Millstein. For example, ATX believes that carmakers could save money on warranty costs if consumers could be retrained by a call center that a problem they are experiencing is not serious and that a trip to the dealer isn’t necessary right away. On the other side of the coin, the call center could advise customers of real problems that do require a trip to the dealer. That could help dealers. “Today, only one in four people bring their vehicle back to the dealer after the warranty period has expired,” according to Mr. Millstein.

A North American transplant carmaker (not Mercedes or BMW) is presently “scoping out” a project with ATX that will look at the feasibility of various OE services, Mr. Millstein said. “A part of a three-year program, they have asked us to come up with a suite of applications based on existing [vehicle] hardware that can improve their warranty costs, improve dealer economics and improve customer service,” he explained. “That’s due at the end of the year. Phase two asks what are the things we can do that the [vehicle] hardware can’t?” ATX will not be paid for the project.

ATX thinks it will have an advantage over OnStar when it comes to collecting and distributing diagnostic and other data on behalf of carmakers. “Given that OnStar is owned by General Motors, you have to wonder if Honda’s data would fall into the hands of G M,” cautioned Gary Wallace, vice president for corporate relations. “That would never happen if ATX was collecting the data.”

ATX is in final testing with Mercedes of a spoken-audio owners manual, which drivers can access using voice commands. “This carmaker was being inundated with calls to its customer care center from drivers wanting to understand how to operate some of the electronics features in their new vehicles,” explained Mr. Millstein. “Instead of spending $25 per call using live operators, they will spend only 50 cents using this speech automated telematics approach.”

Speech Recognition

ATX has been developing speech recognition systems to improve the experience that drivers have with the response center. Rather than embedding the recognition system in the vehicle, ATX believes that speech recognition systems should reside in the response center servers, which have plenty of computing power and enough memory to store all the vocabulary needed. A noted advantage of centrally located speech recognition is that with the help of human programmers, they can adapt to the way people actually speak. Over time they get better and better.

ATX currently employs speech recognition to automate the routing of calls from the vehicle. In the Mercedes system, drivers can be routed to traffic information, a concierge, to their dealer, and...
other services by speaking the key words “traffic,” “concierge,” “dealer,” or other key words.

ATX is presently demonstrating a recognition system that does what many people consider to be the most difficult automotive speech application—destination entry. Like automated telephone directory information systems, the ATX system involves an operator in the recognition process to help clarify the correct address when the system is unable to do it automatically. Usually operating behind the scene from a computing console, the operator either does nothing, clicks on the right word from a list of probable words or clicks and types what she hears. “The key advantage of the system is that the driver only has to speak the address one time,” said Thomas Schalk, vice president, voice technology at ATX. “A further advantage is that the operator’s time is reduced by a factor of ten, relative to an operator working without speech recognition.” Once the correct address is entered, the infrastructure-based navigation system delivers the directions by automated speech. The system will be ready for commercial applications in two to three years.

IPO Withdrawn

On March 9, 2004, ATX announced it had filed a registration statement with the U.S. Securities and Exchange Commission in advance of an initial public offering (IPO). On July 7, 2004 the company announced that it had commenced marketing of 5 million shares of common stock (22.6% of the company) at an estimated price of $14 to $16 per share. That would have valued the company at between $310 million and $354 million, if those prices held up in trading. By July 28, 2004 the company decided to withdraw its IPO, citing adverse market conditions. “The bankers were uncomfortable, but they had to lower their share price estimates by about 20%,” explained Steve Millstein. ATX spent $1.25 million on its attempted IPO and has no plans to try again.

Even without the IPO and the influx of funds it would have provided, Mr. Millstein believes there is enough money to make other acquisitions: “We are most interested in making acquisitions to provide services with other carmakers. We want OEMs and we want subscribers.” ATX is particularly interested in businesses that serve consumers in Italy, Germany, the U.K., France and Spain. “In North America there are only two providers,” noted Mr. Millstein. “In Germany alone there are three. The European market is very fragmented with too many suppliers.”

Had the IPO been completed, Dr. Leininger’s and Vodafone Deutschland’s positions would have declined from 51.6% to 35.9% and from 23.2% to 21.7%, respectively, due to dilution of value resulting from the additional 5 million newly issued shares.

ATX had intended to use the IPO funds to repay outstanding principal under a line of credit provided by Dr. Leininger, to make the €6.0 million ($7.4 million) deferred payment obligation incurred in the acquisition of Vodafone Passo and use the balance for general purposes, including business development.

ATX is not the only company to walk away from an IPO because of low valuations. According to The Wall Street Journal, between June 1, 2004 and August 19, 2004, 36 companies withdrew or postponed their IPOs. Incongruously however, Navteq, which provides digitized map data to navigation and telematics markets in Europe and North America, fared much better. Navteq was IPO’d on August 6, 2004 with a $22 offer price and on August 23, 2004 closed at an all-time high of $32 per share.

### ATX Services to Vehicle Owners

<table>
<thead>
<tr>
<th>Type of Service</th>
<th>Area of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location-based emergency and breakdown assistance</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Automatic collision notification</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Stolen vehicle recovery</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Voice navigation</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Destination/points of interest downloads</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Real-time traffic information</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Electronic owner's manual</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Concierge</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Remote door unlock</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>Connection to customer service representatives</td>
<td>North America, Europe</td>
</tr>
<tr>
<td>to update customer profile, change emergency contact information, billing and other questions</td>
<td></td>
</tr>
<tr>
<td>Consumer-based website lists available services, FAQs, access to billing information</td>
<td>North America, Europe</td>
</tr>
</tbody>
</table>

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Convergence...

Ford Back to Electronics Basics

Unlike Mercedes, BMW and GM, which often pioneer with leading edge electronics, Ford's back-to-basics focus takes a more cautious approach to electronics. "Back-to-basics is about quality and affordability," declared Dr. Schmidt. "We will not compromise quality. Where it is necessary we introduce [leading edge electronics] but where it is maybe nice to have but not necessary, we go at another pace," he said.

"For me electronics is just a tool to deliver safe vehicles that don't damage the environment," said Dr. Schmidt. "I use electronics to make this happen. I don't want another 90 additional ECUs in our cars just to be number-one in electronics." Roughly 50% of Dr. Schmidt's organization is devoted to powertrain engineering and research.

While Ford is careful to avoid unnecessary electronics complexity, Dr. Schmidt's research and advanced engineering organization did develop Roll Stability Control. "Once we figured out that this is really outstanding technology, we partnered with Volvo and introduced it on the 2003 XC90 sport utility vehicle," said Dr. Schmidt. "We developed the algorithms and associated software and implemented the electronics." Ford worked with Continental Teves on the system, which makes the gyroscopic roll stability control sensor. The sensor detects when the vehicle begins to roll and sends a signal to the electronic stability control system, adjusting traction and individual brakes to bring the vehicle under control. The system is presently available on the 2004 Lincoln Aviator and Navigator and will also be available on the 2005 Ford Explorer, Ford Expedition and Mercury Mountaineer.

iDrive...

iDrive operates a little bit faster, according to Mr. Broede. M. Pfunder added, "It is the right solution. People don't copy something that is bad."

MMI

Volkswagen Group is getting high praise for its MMI device. "One of the finest computing devices ever to roll off the assembly line," writes pcmag.com. "A 'just right' approach to mixing dials, buttons and LCD menus," declares Edmunds.com. Audi calls MMI "the most innovative command system on the market," in advertisements in upscale magazines.

The MMI control panel is located on the center console between the gearshift lever and the center armrest. Centered in the panel is a round aluminum dial control that can be turned or pushed. Four soft switches surround the dial, one at each corner. Below the knob are three switches: forward, reverse and a "return" key, which functions like the escape key on a PC. On each side of the panel are four hard switches, which immediately bring you to specific menus: Radio, CD/TV, Name (address book for storing telephone numbers and navigation destinations), Telephone, Navigation, Information, Car and Setup.

Getting from the navigation menu to the radio menu is far less complicated with MMI than with iDrive, which doesn't provide hard keys for different parts of the menu. Rather, on iDrive the multifunction knob must be slid to one of eight (or four on the newer version) unlabeled positions.

A further advantage of MMI is the way it functions in concert with the slide-out display, which is positioned atop the center stack. The display's graphics mimic the layout of the multifunction switch panel. "When you look at the display screen you will find a circular design in the center that indicates the rotary [knob]," explained Volkmar Tanneberger, responsible for the development of functional electronics at Volkswagen Group. "You will also see on the display the four soft switches with a description of their current functionality." According to Dr. Tanneberger, the rotary control itself is superior to the one used in iDrive. "The knob provides precise haptic feedback where each click of the dial yields a corresponding result shown on the display," he explained.