Hybrid Market Favors Infineon

According to the German semiconductor maker Infineon, by 2010 a total of sixty-three hybrid models will be in production, and that will mean significantly greater demand for semiconductors. Today a conventional vehicle consumes about one-third of the chips yielded by a 6-inch wafer. A hybrid vehicle will consume the entire 6-inch wafer. Depending on whose forecast you believe, by 2010 carmakers could produce anywhere from one million to more than three million hybrid vehicles annually.

A full hybrid vehicle will use anywhere from $400 to $1,000 worth of semiconductors, just to implement the hybrid powertrain functions. A full hybrid vehicle has an electrical motor sufficiently powerful to propel the vehicle down the road even when the engine isn’t running.

Most of the semiconductor content in a hybrid vehicle is occupied regulating the power management at Infineon.

Source: Infineon

Speech Recognition—What’s Next

The most advanced automotive speech recognition system consumers can buy has been around since the fall of 2004, when Honda introduced the 2005 Acura RL with a standard navigation system capable of speech-driven destination entry. Also available as an option on the Honda Odyssey and the Acura MDX, the jointly developed Honda-IBM system is capable of understanding more than 1.7 million street and city names.

Unchanged from the prior year, the speech recognition system now comes with the 2006 Acura RL, which I recently tested at a local dealership. In concert with the display, the system worked fairly well. When I spoke the word “Portsmouth,” which is the name of the city in New Hampshire where I live, the system displayed the word “Portsmouth” on the vehicle’s LCD as the first choice among five other names that sound like Portsmouth. I made my selection by saying the number “one.”

If it weren’t for the display, it would have been hard to use the navigation system without pouring over the manual to learn some of the 700 commands and other vocabulary words the system can recognize. Depending on where I was in the menu tree, the speech system displayed appropriate word options at each step in the destination entry process.

As I was getting acquainted with the system, I often forgot to press the switch that tells it to listen, so I sometimes wasn’t heard. Other problems in comprehension were the result of too much noise, for instance from an open window, or the A/C fan on its highest speed or if other passengers were speaking. And unless you know the exact street address for your destination, it is difficult to tell the system where you want to go. The points-of-interest database that is part of the navigation map is not recognized by the speech engine.

Improvements Are In the Works

While the Acura RL speech system is the best there is so far, Honda planners realize there is room for much improvement. “There is a disconnect between what people experience using automated customer service systems over the phone and what people experience using the speech recognition feature in the vehicle,” noted Charles Koch, manager of new business development at American Honda. “Some people certainly understand it and appreciate it and are willing to be patient, but others are intimidated by it or they tend to give up on it once they experience a miscommunication.”

New speech recognition systems are in the works that will make destination entry and managing digital music libraries a breeze. “With speech we have just started scratching the surface,” declared Roberto Sicconi, manager of multimodal conversational solutions with IBM Research. IBM’s Embedded ViaVoice system is used in the Acura RL.

“People already have problems remembering what the commands are, and with more telematics services coming, the number of commands they are going to need to remember is going up. So customers are asking for more free-form interaction—the ability to say what they want more naturally,” he said.

Navigation users do not want to pull over and stop driving to manually enter destinations. If speech-operated destination entry systems were simpler to use, more people would buy navigation systems. “You would like to be able to combine street names in all fashions and then associate the attributes,” noted Mr. Sicconi. “For instance, you may not know a destination—the ability to say what they want more naturally,” he said.

Navigation users do not want to pull over and stop driving to manually enter destinations. If speech-operated destination entry systems were simpler to use, more people would buy navigation systems. “You would like to be able to combine street names in all fashions and then associate the attributes,” noted Mr. Sicconi. “For instance, you may not know a destination—the ability to say what they want more naturally,” he said.

Global IGBT Assembly Market by Supplier

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infineon</td>
<td>17%</td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>33%</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>14%</td>
</tr>
<tr>
<td>Infineon</td>
<td>16%</td>
</tr>
<tr>
<td>Toshiba</td>
<td>4%</td>
</tr>
<tr>
<td>IR</td>
<td>4%</td>
</tr>
<tr>
<td>Hitachi</td>
<td>1%</td>
</tr>
<tr>
<td>Tyco</td>
<td>1%</td>
</tr>
<tr>
<td>Others</td>
<td>6%</td>
</tr>
</tbody>
</table>

2005 Market: $1.7 billion

Source: Infineon

Turn to Hybrids, page 2

Turn to Speech, page 3
Reliability Report for Electrical Systems and Power Equipment

Since 1993 The Hansen Report has been tracking electrical system reliability by carmaker based on reliability ratings published in Consumer Reports' Annual Auto Issue. Until this year, the magazine reported the problem rates in absolute terms, that is, the percentage of survey respondents who reported serious problems in a particular trouble spot—we focused on electrical problems. This year, however, Consumer Reports changed the way it calculates reliability ratings to a more relative method, which factors in how a particular model fared compared with the average vehicle. In the two areas we analyzed this year, electrical systems and power equipment, the average problem rate for 2005 vehicles was 2%.

To determine our carmaker ranking, we assigned a numerical value to Consumer Reports' relative reliability scores for each 2005 vehicle for which the magazine had survey data. We then weighted that value with U.S. sales of each model, as published in Automotive News or provided directly by the carmakers.

Included in the electrical category are problems related to the starter, alternator, battery, horn, gauges, wiper motor, wiring and lights. Because of the changes in Consumer Reports' survey analysis, our rankings this year cannot be directly compared with previous Hansen Report rankings. But even with the added relative factor, in electrical system reliability, the carmakers stacked up generally the same way they have for many years: the Japanese lead, followed by the North Americans, followed by the European luxury brands and Volkswagen. Ford led the non-Japanese.

This year we expanded our analysis to include features Consumer Reports categorizes as power equipment: power mirrors, sunroof, windows, doors and lift gates, central locks, cruise-control switches, power and memory for seat position, heated seats, keyless entry, audio systems, navigation systems and rear seat entertainment systems. Many of these features have become standard in mid-range cars, and navigation and rear entertainment options are proliferating.

In our first look at how carmakers compared in power equipment reliability, Volkswagen, at number four, ranked considerably better than it did in electrical quality—ahead of Honda and Nissan. If Mercedes vehicles are tabulated separately from DaimlerChrysler, Mercedes, with a score of 4.37, would rank well below BMW, and Chrysler would fall between Nissan and General Motors.

Hybrids...

Great amount of power supplied to the electric traction motor, either an AC induction motor or a permanent magnetic synchronous motor. The key power semiconductor components used in the DC to AC converter are the IGBT (insulated gate bipolar transistor) module, consisting of as many as 70 IGBT chips, and a high-current diode. These two components alone will account for anywhere from 50% to 80% of the semiconductor content associated with the hybrid power plant.

While Toyota and Honda and their suppliers account for almost all of the hybrid vehicle components made today, Infineon believes it will be a major player once Western carmakers bring their offerings to market. “We expect to do well because we are the world’s number-two supplier of automotive semiconductors and we are number one in power semiconductors for all markets,” noted Mr. Adenmer. In 2005, Infineon modules accounted for 17% of the global IGBT market valued at $1.7 billion.

<table>
<thead>
<tr>
<th>Problem Ratings for MY2005 Vehicles</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Electrical Systems</td>
<td></td>
</tr>
<tr>
<td>Mazda</td>
<td>0.9</td>
</tr>
<tr>
<td>Subaru</td>
<td>0.9</td>
</tr>
<tr>
<td>Toyota</td>
<td>0.9</td>
</tr>
<tr>
<td>Honda</td>
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</tr>
<tr>
<td>Nissan</td>
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</tr>
<tr>
<td>Hyundai/Kia</td>
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</tr>
<tr>
<td>Ford</td>
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</tr>
<tr>
<td>DaimlerChrysler</td>
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</tr>
<tr>
<td>GM</td>
<td>2.0</td>
</tr>
<tr>
<td>BMW</td>
<td>2.7</td>
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<tr>
<td>VW</td>
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<table>
<thead>
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<th>Problem Ratings for MY2005 Vehicles</th>
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<tr>
<td>Power Equipment</td>
<td></td>
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<tr>
<td>Subaru</td>
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<td>Toyota</td>
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<td>Mazda</td>
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<tr>
<td>VW</td>
<td>1.6</td>
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<tr>
<td>Hyundai/Kia</td>
<td>1.7</td>
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<tr>
<td>Honda</td>
<td>1.7</td>
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<tr>
<td>Nissan</td>
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<tr>
<td>GM</td>
<td>2.1</td>
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<tr>
<td>Ford</td>
<td>2.3</td>
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<tr>
<td>DaimlerChrysler</td>
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<td>BMW</td>
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63 Hybrid Launches Through 2010

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<tr>
<th>Toyota</th>
<th>GM</th>
<th>Nissan</th>
<th>Ford</th>
<th>Honda</th>
<th>DCX</th>
<th>BMW</th>
<th>Hyundai</th>
<th>VW</th>
<th>PSA</th>
<th>Mitsubishi</th>
<th>Full Hybrid: Start-stop, regenerative braking, boost and electric drive</th>
<th>Mild Hybrid: Start-stop, regenerative braking and boost</th>
<th>Micro hybrid: Start-stop only</th>
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<td>17</td>
<td>4</td>
<td>10</td>
<td>4</td>
<td>5</td>
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Source: Infineon

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the street address but you remember a cross street or other pieces of information, qualifiers that reference the place you want to go. You want to be able to do a fuzzy search rather than an exact match.”

One promising source of a more natural speech interface is VoiceBox Technologies, the 50-person Bellevue, Washington, firm which offers what it calls “the world’s first conversational voice search platform.” VoiceBox is collaborating with IBM and others including Johnson Controls, Toyota and XM Satellite Radio to apply its technology in automotive and other applications.

“VoiceBox offers an enhancement that brings out the full capability of IBM’s ViaVoice speech recognition engine,” said David Peterson, vice president in charge of business development for the company. “Together we offer something neither one of us can offer independently: conversational voice search.

“Conversational voice search means you can speak in a free-form way, like we are now; you don’t have to memorize key words, you don’t follow menu trees. Instead, all our context domains—for, say, music, navigation, traffic or weather—are active all the time and can be accessed at any time.

“We take the output of the automated speech recognition [engine] and use our conversational language processor to figure out the intention of the question the user is asking. We then use the search engine to search the appropriate database. Since we are context based and not word based we are tolerant of out-of-vocabulary words and of environmental noise like wind or fans,” explained Mr. Peterson.

VoiceBox is working with several tier-two navigation suppliers on the destination-entry problem. Dave Peterson shared his objectives in concrete terms: “I want to be able to ask questions like, ‘How do I get to the Washington Monument?’ or ‘Where is the nearest Starbucks? How do I get there? Show me a map.’”

Automotive interior systems developer Johnson Controls Inc. is working with VoiceBox and IBM to meld conversational voice search and retrieval features to its BlueConnect Bluetooth wireless mobile device gateway. According to Jim Geschke, vice president, electronics integration at JCI, the company will soon be ready to quote destination entry systems based on this technology for delivery in the 2009 timeframe. “We are definitely seeing improvements in voice recognition software, but there is more to it than that. It only works when you combine that technology with echo and noise cancellation and optimal microphone location and a lot of system know-how. ... Our BlueConnect systems with limited, 10- or 15-word voice recognition systems are already in production in several vehicles, and these perform very well,” said Mr. Geschke.

Mr. Geschke sees a greater challenge coming as voice recognition moves beyond phone use. “We think voice recognition will be a key technology that facilitates the migration of consumer electronics into the vehicle interior. You’ve seen it already with MP3 players, iPods, PDAs and hand-held navigation devices. JCI’s job is two-fold: One is to make the physical integration of those technologies into the vehicle easy. The second is to help the end consumer manage those devices safely and comfortably. That’s where voice recognition comes in, balanced optimally with displays and tactile switches.”

While by far the greatest leverage in advancing the state of the art comes from improvements in the speech recognition algorithms, the declining prices of processors with speeds ranging from 500 MHz to 1 GHz and of large memories are also factors.

Noise cancellation technology like that produced by the small Silicon Valley company Fortemedia is also factoring into the improvement of some speech recognition systems. Fortemedia produces voice processing ICs that can limit wind noise. “It suppresses about 25 decibels of wind noise even in convertibles where you are dealing with as much as 10 meters per second of airflow inside the car,” explained Fortemedia’s marketing vice president, Hans Wang. The ICs are also helpful in sedans when small array microphones with beam-forming effect are required.

In addition to IBM’s, popular automotive speech recognition engines are made by Temic Speech Dialog Systems, a division of Harman International, and by Nuance, formerly known as ScanSoft, the company that acquired Lernout and Hauspie. ◆

Visteon’s Product Life Cycle Strategy Targets Aftermarket First

According to T.C. Wingrove, senior manager of electronics product marketing for Visteon, the company tries to be first to market with a product aimed at the independent aftermarket through the company’s dealer distribution channels as well as the 12-volt channels.

Next, Visteon aims for accessories business through car dealers, followed by the “end-all,” high volume factory-installed production with carmakers where the bulk of revenues can be made.
Visteon

The Company Profile...

**Background**

Visteon is in much better shape today than it was in December 2002, when we last profiled the company. It is leaner, it is rid of 80% of its high-priced UAW workers, it is less dependent on Ford, and its product line is more focused. Visteon expects to show a profit in 2006—its first since 2000—on $11.2 billion in sales, which is approximately two-thirds of 2005 revenues.

Formerly Ford’s Automotive Parts Operation, the company took the Visteon name in 1997 and in January 2000 became a wholly-owned subsidiary of Ford Motor Company. Visteon was formally separated from Ford on June 28, 2000 when all of the company’s common stock was transferred to Ford stockholders.

Since October 2005, Visteon’s credit rating by Standard and Poor’s has been B+ with a negative outlook, meaning the rating could be lowered. Two notches into junk bond status, a B+ credit rating means the company is vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet its financial commitments. The company is currently looking at financing options for a $350 million loan that comes due in June 2007.

Visteon’s financial plight was to a large extent a reflection of the financial plight of its leading customer Ford, which accounted for 62% sales in 2005. Ford’s share of the North American vehicle market has declined from about 27% in 1995 to 18% in 2005. In 2006, Visteon expects sales to Ford will account for 42% of sales, and 36% of sales by 2008.

Visteon plans to grow its businesses outside of North America, especially with Asian OEMs. By 2008 sales to Asian OEMs are forecast to equal sales to Ford at 36%. In November 2005, Visteon opened its China Technical Center in Shanghai to support electrical and interiors system development for Asian customers.

**Restructuring**

As part of a major restructuring agreement that will lower Visteon’s costs in North America, on October 1, 2005 Visteon transferred 23 facilities and 18,000 UAW employees back to its former parent, Ford. Among the transferred facilities are 17 plants, including three that produce glass, three that produce non-electronic powertrain components and four that make chassis components.

Visteon received $300 million for the transferred assets. The businesses accounted for $9.0 billion dollars in sales in 2004 and $6.1 billion in sales for the nine-month period in 2005 when they were owned by Visteon. Wall Street has not been at all thrilled with the stock since the restructuring was completed. Visteon’s stock price has plummeted from a high last summer of nearly $11 down to around $4.20 in April 2006.

**Distinctions Claimed by Visteon**

- World’s number-two climate control supplier
- World’s fourth-largest automotive electronics supplier
- World’s number-two interiors supplier
- World’s first OEM in-dash 6-disk CD changer
- World’s first OEM hands-free Bluetooth application, BMW in 2003
- World’s first OEM factory-installed HD radio application, BMW in model year 2006
- Visteon’s AM/FM/single CD player has won J.D. Power and Associates’ Audio Quality award 4 out of the last 5 years.

---

**Visteon Sales and Net Loss by Year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Profit in $ Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>(115)</td>
</tr>
<tr>
<td>2002</td>
<td>(379)</td>
</tr>
<tr>
<td>2003</td>
<td>(1,229)</td>
</tr>
</tbody>
</table>

CAGR 2001 to 2005: (1.3%) In $ millions

<table>
<thead>
<tr>
<th>Year</th>
<th>In $ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>17,843</td>
</tr>
<tr>
<td>2002</td>
<td>18,385</td>
</tr>
<tr>
<td>2003</td>
<td>17,660</td>
</tr>
<tr>
<td>2004</td>
<td>18,657</td>
</tr>
<tr>
<td>2005</td>
<td>16,976</td>
</tr>
<tr>
<td>2006 Est.</td>
<td>11,200</td>
</tr>
</tbody>
</table>

**Visteon Sales by Product Segment**

- Glass, 2.3%
- Services, 1.0%*
- Electronics, 11.2%
- Powertrain, 15.9%
- Interior, 22.0%
- Climate Control, 24.4%
- Chassis, 18.8%
- Automotive, 96.7%

*About 5,000 salaried Visteon employees will provide services to Ford at cost to support the 23 facilities transferred to Ford at the end of September 2005.

**Visteon Sales by Region**

- 2005 Sales: $16,976 million
- Asia, 12%
- South America, 3%
- Europe, 24%
- North America, 61%
2005 would have looked like this had the restructuring with Ford taken place at the beginning of 2005 instead of the end of September 2005.

2005 Sales: $10.7 billion*
- Other, $1.8 billion
- Interiors, $2.8 billion
- Electronics, $2.6 billion
- Climate, $4.0 billion

Visteon aims to increase its reliance on European and Asian customers.

2005* 2008
- Europe & South America
  - 43% 39%
- Asia Pacific
  - 18% 27%
- North America
  - 39% 34%

*Pro forma product sales estimate excludes Automotive Components Holdings Services division revenue and is presented as if certain transactions with Ford ACH were consummated as of January 1, 2005.

Following the implementation of the company's restructuring agreements with Ford, Visteon was reorganized into four global product groups: Climate, Electronics, Interiors and Other. The Other product group contains businesses that Visteon will eventually exit, including chassis-related products and powertrain products.

Managers of each of these product groups have operating responsibility for design, development and manufacturing. Separately, regional customer groups are responsible for marketing, sales and service of the company's product portfolio. Such functions as purchasing, information technology and other administrative activities are managed globally.

“We are a smaller company now but a lot more focused on our core businesses: electronics, climate and interiors,” noted Steve Meszaros, vice president of Visteon’s Electronics product group. “Even before the transaction, 95% of our business wins were focused in these areas.”

According to the company’s 10-K filing with the SEC, “[Visteon] expects additional restructuring activities, and business improvement actions will be needed in the foreseeable future for the Company to achieve sustainable success in an increasingly challenging environment.”

“The [October 1, 2005] transaction addressed the bulk of our noncompetitive footprint but there are still legacy operations in Europe like powertrain and chassis activities that need to be addressed,” explained Mr. Meszaros. Globally, Visteon is engaged in efforts to sell six nonstrategic plants and fix 17 others. With overall P&L responsibility for the global electronics business, Mr. Meszaros is responsible for core engineering, manufacturing, program launches, quality, program purchasing and business planning for electronics. He has a bachelor's degree in mechanical engineering from the Massachusetts Institute of Technology and a master's in manufacturing systems engineering from Stanford University.

Electronics Product Group

The Electronics product group encompasses all the electronics manufactured by Visteon and includes five product lines run by global directors based in the United States and Europe. Powertrain electronics and vehicle function modules, including body, security and climate control electronics, are led by a director in the U.S. Audio/infotainment, driver in-

R&D Expenditures by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>In $ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>911</td>
</tr>
<tr>
<td>2003</td>
<td>913</td>
</tr>
<tr>
<td>2004</td>
<td>896</td>
</tr>
<tr>
<td>2005</td>
<td>804</td>
</tr>
</tbody>
</table>

Visteon's Largest Shareholders

- Brandes Investment Partners 10.00%
- Donald Smith & Co. 9.99%
- Wellington Management Company 7.04%

formation electronics and exterior lighting including LED lighting systems are directed from Europe.

In a bold move for a company headquartered in greater Detroit, Visteon’s Electronics group recently relocated its headquarters to the China Technical Center in Shanghai, apparently not just because engineers are less expensive there. According to Mr. Meszaros, “Asia is the center of the global consumer electronics business, a world that is getting more intertwined with automotive electronics. In electronics, things here move at a faster pace.” Of the approximately 2,000 engineers employed by the Electronics group, 250 of them presently work in China, and that number will increase to 500 engineers by 2008. In the same time frame the number of software engineers working for the Electronics group in India will double from 400 to 800. In 2005, 70% of Visteon engineers were working in high-cost countries; by 2008 that will drop to about 50% in high-cost countries.

Visteon has 21 manufacturing facilities in China, 19 of them joint ventures. In two years, 75% of hourly manufacturing workers will be employed in low labor cost countries.

The company is not interested in developing technologies for all the systems it develops. Given its history as Ford’s parts operation, Visteon believes it is best suited to the integration of technology into the vehicle. So it can quickly deliver innovative, competitive solutions to its customers, Visteon will work more closely with partners as required.

continued on following page
Visteon

Visteon spends about $2 million annually on market research, including usability studies, product clinics, ethnographic research, focus groups and Internet studies. According to T.C. Wingrove, electronics product marketing manager, Visteon’s emphasis on market research is unique in the industry. “We continually hear that this is a major point of difference between Visteon and our competitors. The OEs will spend a lot of money on research about which features consumers might want, like a navigation system or Bluetooth. We probe much more deeply on the actual execution of those features to ensure that the customer and the OE get that feature executed in the best possible way.”

Targeted Electronics Products

Visteon is expecting especially good sales growth from the following products.

◆ Side Object Detection

Visteon has just won an order with a global carmaker for a radar side-object detection system, which will debut in the 2009 model year. According to Visteon, side-object detection has tested very well with consumers, who rate the feature highly as something they want in their vehicles. M/A-COM (Lowell, Massachusetts), a division of Tyco Electronics, will supply the 24 GHz ultra-wideband radar sensor. Visteon’s key contribution to the system is the human factors interface. “You want to alert the driver only when there is a threat, not if the object is something he has already seen,” explained Tim Tiernan, senior manager of advanced cross-system development. “For example, when you pull up to a car at a stop sign, you don’t want to alert on it. But if you’re sitting there and someone pulls up to the side of you, then you do want the alert.” The Visteon system alerts the driver by lighting an icon in the side mirror.

◆ Lateral Drift System

Visteon has been gaining experience with road-departure warning systems through its recently concluded work on a U.S. government-funded project with UMTRI (University of Michigan Transportation Research Institute) testing a fleet of 80 vehicles equipped with vision-based lane-departure warning. “[In those tests] we saw very good customer acceptance and a huge improvement in turn-signal usage and a huge reduction of lane excursions,” noted Mr. Tiernan. Presently in the concept prove-out stage of development, Visteon is ready to quote such systems to carmakers. Visteon would take responsibility for the system, integrating the CMOS imager with a digital board manufactured by Visteon. Lane-departure algorithms would come from AssistWare Technology (Gibsonia, Pennsylvania, near Pittsburgh), which worked with Visteon on the UMTRI project.

Mr. Tiernan admitted that the carmakers’ interest in lane departure warning systems is not yet as high as he’d like, and that some challenges need to be addressed before the feature will see widespread acceptance. Camera systems are still sensitive to sunlight and glare, and pattern recognition algorithms must fully comprehend which lane changing situations require an alert and which don’t in order to win consumer confidence. For instance, drivers would likely not appreciate alerts during emergency evasive maneuvers or when driving through construction zones, where drive lanes are narrow and lane markings can be erratic.

◆ Dockable Rear-Seat Entertainment

One of Visteon’s most promising new products is its Dockable Family Entertainment system, which is essentially a portable DVD player that can be physically and electrically connected and disconnected from the vehicle’s overhead panel.

Visteon’s Customers

Ranked by 2005 Sales
1. Ford Motor Company
2. Hyundai/Kia
3. Nissan
4. PSA/Peugeot
5. General Motors
6. Renault
7. Volkswagen
8. DaimlerChrysler

“A few years ago when we put this concept in front of focus groups the reaction was tremendously positive,” noted Mr. Wingrove. “People saw the benefit of rear-seat entertainment systems, but they didn’t buy them because they didn’t want to spend $1,500 for something that would be stuck in their vehicle the entire time.”

Weighing 2.5 pounds with a 10.2 inch screen, the portable DVD player can be detached from the car and brought onto an airplane or into a hotel room, for example. A sensor knows when the monitor is docked upside down in the vehicle and automatically inverts the image for rear-seat viewing. The audio can be played through IR connected headphones or over the vehicle’s sound system.

Visteon’s dockable DVD players have been sold as a BMW accessory in Europe for the last year and a half and since August 2005 as a Nissan accessory in the United States.

In April 2006 Visteon released the latest version of its dockable player, one that includes the world’s most popular video game system, Game Boy Advance, from Nintendo. “One of the things that we constantly heard from consumers was, ‘DVDs are great but we want the ability to also play video games,’” noted Mr. Wingrove. “And for our demographics— for the back seat of the car it’s 2-to-12-year-old kids—Nintendo actually had the most attractive portfolio of content.”

◆ HD Radio

Since it already ships HD Radio tuners for factory installation on 2006 BMW 6 and 7 Series, Visteon believes it is well-positioned to profit from the emergence of this U.S. market. According to Visteon, a number of carmakers offer HD Radio tuners in 2006 luxury models and SUVs, and
by 2007 carmakers will begin rolling out the radios in the small and mid-size vehicle segments as well.

According to T.C. Wingrove, demand for HD Radio is finally reaching critical mass for two reasons. First, a consortium of eleven of the largest radio companies have agreed to spend more than $200 million to advertise HD Radio in 2006. Second, the consortium will coordinate the introduction of multicasting, which will allow stations to triple their content. "Before, HD was differentiated on the basis of sound quality, which people are interested in, but that may not have been enough," noted Mr. Wingrove. Instead of devoting all 96 kilobits per second to one CD quality program, FM broadcasters could put out as many as three different programs of lesser sound quality. "One of the programs could be near-CD quality and the two others FM quality. While you give up a little bit in terms of quality, what interests consumers is content, as we’ve seen with satellite radio. What we’ve seen in our consumer research is that HD Radio actually fares better with consumers than satellite radio, because HD is free," Mr. Wingrove pointed out.

With HD Radio, the digital signal is compressed, using technology owned by iBiquity Digital. HD Radio receivers filter out the interference, static, hiss and pop that plague today’s analog radio. More limited than digital FM, digital AM radio has a bandwidth of 36 kilobits per second.

HD radio tuners sell to carmakers for about $100 each. In 2005, 650 radio stations were broadcasting in HD in the United States. By the end of 2006 the number of HD stations is expected to grow to 1,300 and to 2,100 by the end of 2007.

◆ Wireless Charging

For the last few years, Visteon has demonstrated working prototypes of a wireless charging station built into the center console of a concept vehicle that can inductively charge cell phones, PDAs, MP3 players and other portable products that are resting on the pad. One source behind the inductive coupling technology with whom Visteon has worked is Splashpower, a Cambridge, U.K., company focused on the elimination of the “last wire” in electronic devices—the charging lead. According to Visteon, 75% of surveyed consumers would consider purchasing one. While consumers may like the concept, it won’t be available for years—not until portable devices come with inductive charging loops.

◆ Integrated Center Panel (ICP)

Visteon expects that its recent decision to focus on interiors, electronics and climate control systems will produce OEM contracts for integrating center panel electronics, where all three of Visteon’s capabilities intersect. Visteon’s experience integrating climate and head-unit controls into one seamless panel goes all the way back to the 1996 Ford Taurus/Sable. The integrated center panel concept can be adapted to suit any carmaker’s requirements, including haptic feedback and the human machine interface. Increasingly, the ICP will also include displays. Visteon is building the integrated center panel used in the 2006 Outlander from Mitsubishi Motors and will launch additional ICP variants on other Mitsubishi models later this year. “We see this as an emerging market,” said Mr. Maszeros.

◆ USB Audio Interface

In October 2005, Visteon began selling in the European aftermarket a new audio interface module that lets drivers connect their USB music players and portable hard drives to the car’s audio system through the CD changer interface. The module, which replaces the CD changer, supports a number of audio formats including MP3, WMA, WAV, and OggVorbis and can be updated in the field to accommodate new file formats.

The Visteon USB audio interface will be available as a dealer installed option starting in July 2006 on the new Volkswagen Eos convertible coupe. Visteon provides the core electronic design.◆
Consumer Reports Cool to Hybrids and Multifunction Controls

It's hard to find a single publication that's more influential with American automobile customers than the April issue of Consumer Reports, the Annual Auto Issue. The magazine's Annual Car Reliability Survey, which this year provides information on more than one million vehicles, forms the basis of our tabulation of electrical and electronics trouble spots for each carmaker. (Please see page 2.)

These Consumer Reports findings are also noteworthy:

- The most fuel efficient hybrid vehicles save as much as $660 per year in gasoline costs but the added cost to purchase and finance them and their extra depreciation compared to non-hybrids mean they can be significantly more expensive to own and operate over their lifetime than equivalent non-hybrid vehicles. According to Consumer Reports' analysis, only the Toyota Prius and Honda Civic Hybrid provided an overall savings, about $400 and $300 respectively, after five years of ownership and only if federal tax credits are factored in. For the other four hybrids analyzed, ownership costs ranged from $1,900 to $5,500 more than their all-gas counterparts for the five year period, assuming gas prices rise to $3 and then $4 a gallon. Still, hybrid sales accounted for 1.26% of annual U.S. sales in 2005, a growing niche.
- Consumer Reports takes a dim view of multifunction controls, finding them frustrating and distracting. "We found BMW's iDrive and Audi's MMI systems particularly complicated."
- When buying a used car, Consumer Reports warns that older navigation systems sometimes lack coverage of rural areas and cannot be updated. In cases where map updates are available they can cost $200 to $250.
- Electronic keys can be annoying. For example, "The BMW 3 Series requires you to insert the key and then press a button, one step too many." Electric keys, says CR, can cost more than $200 to replace and must be purchased and programmed at the dealer.

Lexus Customers Have Bluetooth Issues

Twelve hundred customers called the Lexus customer service center in 2005 with complaints about the way their Bluetooth phones operated with their vehicles. Here is the breakdown of those calls by problem type:

- Compatibility 34%
- Transferring phone book content 24%
- Not using an approved phone 22%
- Pairing 5%
- Operation or ease of use 6%
- Voice dialing 4%
- Other 5%

According to Toyota, many of the problems will go away in a few months, once the Bluetooth Phone Book Access profile is fixed.

Coalition Organizing to Promote Real-Time Traffic Info

Access to real-time traffic data is one of the missing links in ameliorating the problem of congested highways in metropolitan centers in the United States. Some private sector services are offered today such as NAVTEQ Traffic, available for a fee to satellite radio subscribers, but NAVTEQ only covers 31 major markets, not always to perfection. So a coalition of carmakers, traffic data providers, mapping technology specialists and communications services providers is coming together in Washington D.C. to develop a strategy to improve traffic data collection and delivery of services.

VTIC, the Vehicle Traffic Information Coalition, met for the first time on March 9, 2006 with representatives from twenty-one companies in attendance. Board members, currently Honda, Toyota, Mark IV, NAVTEQ, Traffic.com, ATX Group and XM Satellite Radio, have planned an April 11 strategy session to develop an agenda for the coming year. Board members pay $15,000 for a one-year membership.

According to Mike Kanger, director of legislative affairs for e-Copernicus, the Washington lobbying firm coordinating VTIC, the coalition's initial strategy involves forming partnerships with local governments and state departments of transportation. Funds have already been allocated to each state for traffic congestion relief under the Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, for the five-year period 2005 – 2009. SAFETEA-LU, signed into law in August 2005, includes a program called Real-Time System Management Information, a goal of which is “to provide in all states the capability to monitor, in real time, the traffic and travel conditions of the major highways of the U.S. and to share that information to improve the security of the transportation system, address congestion problems ... and facilitate national and regional highway traveler information.” Data exchange formats are to be established within two years.

VTIC's objectives are “to provide the capability to monitor, in real time, the traffic and travel conditions of the major highways of the U.S. and to share that information to improve the security of the transportation system, address congestion problems ... and facilitate national and regional highway traveler information.”

VTIC Organizational Meeting Attendees

Toyota
Honda
NAVTEQ
Nissan
XM Satellite Radio
TruePosition
Trichord Inc.
SpeedInfo Inc.
Intrado (to be acquired by West Corp. by June 2006)
Tele Atlas
ITS America
Ibiquity Digital

Potential future members include Sirius Satellite Radio, Qualcomm, Motorola, Google, ZOOM, Intermap Technologies, Wavetronix, TCS and EIS.