**Roundup of Japanese Auto Electronics Suppliers—FY 2004**

Fiscal year ending March 31, 2005

**Aisin Seiki**
- **FY 2004 Consolidated N et Sales:** ¥1,829.1 billion ($17.0 billion)
- **Change from FY 2003:** up 13.9%
- **FY 2004 N et Income:** ¥46.7 billion ($434.1 million), or 2.6% of sales
- **FY 2005 Estimated Sales:** ¥2,000 billion ($18.6 billion)
- **Change from FY 2004:** up 9.3%

Transmission-related products remain Aisin Seiki’s largest product group, accounting for 42% of sales for the past two years. Brake and chassis parts, the second largest segment, accounted for 20.3% of Aisin sales in FY 2004.

Net income improved 34.6% over the prior year. Seventy-four percent of sales are to customers in Japan, compared with 81% in fiscal 2003. Toyota Motor Corp., Aisin Seiki’s largest customer and largest shareholder with 23.2% of Aisin Seiki stock, increased its global production by 9.2% in fiscal 2004.

**A alpine Electronics**
- **FY 2004 Consolidated N et Sales:** ¥222.7 billion ($2.1 billion)
- **Change from FY 2003:** up 4.6%
- **FY 2004 N et Income:** ¥7.9 billion ($73 million), or 3.5% of sales
- **FY 2005 Estimated N et Sales:** ¥230 billion ($2.13 billion)
- **Change from FY 2004:** up 3.2%
- **FY 2005 Estimated N et Income:** ¥6.5 billion ($60 million), a decline of 18%

Although stand-alone car audio remains Alpine’s largest product group, sales of those products declined 9% from FY 2003, despite robust sales of in-dash CD changers and players in Europe. Sales of car navigation, audio/video and integrated products jumped 28%, with help from a

**Siemens and H yundai Bid for Two Top Korean Auto Electronics Suppliers**

With its joint venture partner, Hyundai Motor Company, Siemens V D O Automotive AG may soon announce the acquisition of the majority interest in two of Korea’s top automotive electronics makers, H yundai A utonet, a spin-off from Hyundai Electronics, and Bontec, which at one time was Kia Motors’ in-house automotive electronics supplier. Together, Hyundai A utonet and Bontec account for about 800 billion won ($900 million) in annual sales.

In the works at least since January 2005, the deal is still in negotiations. On May 3, 2005, Siemens VDO and Hyundaifiled a concentration notification with the European Commission Directorate-General for Competition. The EC cleared the joint acquisition on June 14, 2005.

If the deal is completed, the automotive segment of Siemens AG—Siemens VDO Automotive—will further its reputation as the fastest-growing major automotive electronics supplier worldwide. With $900 million in sales in its 1989 fiscal year, Siemens VDO grew to $9.0 billion ($11.1 billion) in sales by 2004, following its February 2004 acquisition of the Huntsville Electronics division of Chrysler, an astounding 18.0% annual rate of growth. Siemens VDO has grown mainly through acquisitions, the largest being VDO AG in 2001.

The deal would give Siemens VDO insider access to one of the world’s fast-growing major carmakers. According to the Korea Economic Daily, H yundai M otor and its subsidiary, K ia M otors, together plan to sell 3.6 million vehicles in 2005, a 9% increase over 2004. The carmakers plan to sell 5 million vehicles a year by 2010.

M oody’s Investors Service, which in November 2004 upgraded both Hyundai’s and Kia’s debt rating to investment grade for the first time, notes that the two carmakers have a 70% share of the domestic Korean auto market, where demand has been weak. Hyundai/Kia plans to increase exports to India, China and Europe, and opened a new manufacturing plant in the United States last month.

The deal would strengthen Siemens VDO’s relationship with a carmaker who demands world-class quality. For the last three years, H yundai/Kia Motors has been listed among the world’s four best carmakers in T he Hansen Report’s annual analysis of Consumer Reports’ electrical and electronics reliability data. A s key suppliers of electronics to H yundai and K ia M otors, A utonet and Bontec deserve some of that credit.

Established as an automotive electronics business in January 1985, H yundai A utonet manufactures a broad line of audio and navigation products as well as body, chassis and powertrain electronics, principally serving domestic carmakers Hyundai Motors and K ia M otors. Other O E M customers include G eneral M otors, F ord, C hrysler, V olkswagen, Toyota and N issan. H yundai A utonet also manufactures multimedia products under its own Pontus brand as well as making private label products under Korean, European and U.S. car audio brands. The company is listed as one of XM Satellite Radio’s strategic hardware partners making radios. The company employed 1,150 people as of August 2004. The latest sales figures available report H yundai A utonet shipped products worth a total of 415,077 million won ($413 million) through the first three quarters of 2004. The company is headquartered in Incheon-si, Gyeonggi-do, Korea.

A n in-house parts supplier to K ia M otors, K ia Electronics and S ystems C ompany was founded in 1993 to produce wiring harnesses and electronics. The company’s name was changed to Bontec (for “good technology”) in April 2000.
Expensive, Satellite TV Comes to Cars

This spring satellite mobile TV antenna-maker KVH Industries announced that Cadillac has authorized the company to sell a customized version of the KVH TracVision A5 DIRECTV system as a dealer-installed option on Cadillac Escalades nationally. Getting your car equipped for satellite TV is not at all cheap. A site it is slowly rolled out across the country, the Cadillac option carries a suggested retail price of $2,695, which includes the antenna, 12-volt receiver/decorder with RF remote control, mounting hardware and a three year warranty, but it doesn't include installation. On top of that, consumers must sign up for DIRECTV's Total Choice Mobile package at $41.99 per month, or $4.99 per month for existing DIRECTV subscribers. The DIRECTV package comes with 103+ channels of TV programming plus 36 channels of digital music.

A publicly traded company, KVH Industries began selling TracVision A5 satellite TV systems in September 2003 through its own distribution network of 850 retail locations, selling an impressive 1,700 systems in the fourth quarter of 2003. Having filled its retail pipeline, KVH's TracVision A5 sales as of June 15, 2005, risen. In KVH's distribution network, TracVision A5 retails for a suggested price of $2,295 but comes with just a one year warranty. KVH sales totaled $62.3 million in 2004, up 10% from 2003. Besides mobile satellite television, the Rhode Island based company produces defense guidance systems along with some other products.

Despite KVH Industries' success in landing the Cadillac deal, mobile satellite TV won't find a high volume market anytime soon. The company has been quoting research from Frost & Sullivan, which states that 3 million cars will be equipped with mobile satellite TV by 2011. There's no way that will happen at a price anywhere near today's. Satellite TV only works some of the time. Unless the roof antenna has open access to the southern sky, without tall buildings or trees in the way, there is no TV signal. You must be driving on an open highway away from tall buildings and trees to receive the TV signal.

A nother limitation to the acceptance of mobile satellite TV is the size of the antenna. It's large and heavy, too large to comfortably fit atop most vehicles, except for buses, trucks, RVs and large SUVs like the Cadillac Escalade. Including the housing, KVH's TracVision A5 measures 32.3 by 31 inches wide, by 5.3 inches high, and weighs 45 pounds. The mobile antenna is designed to mimic stationary satellite TV antennas used for the home, which take advantage of an 18-inch diameter parabolic reflector that concentrates the signal. Rather than angling perpendicular to the southern sky to get line of sight to the satellite, the mobile antenna must lie flatter to minimize its height above the roof, and therefore must be wider in diameter to compensate not only for the poor angle but also the lack of a parabolic reflector. TracVision A5 uses an array of 260 antenna elements across the surface of the antenna. A "magnetic lens" redirects and refocuses the satellite signal onto the antenna elements compensating for the requirement that the antenna be perpendicular to the signal. The mobile antenna is motorized to rotate within its housing as fast as 60 degrees per second, to stay pointed to the satellite regardless of the vehicle's direction.

KVH says it is in the R&D process right now to develop a lower profile, all electronic antenna that wouldn't have to rotate. It would be thin enough to fit between the roof and the headliner, with nothing protruding from the roof. Still early in the development process, that antenna has not yet been prototyped. The vehicle's roof would have to be made of fiberglass or plastic, so the satellite signal could penetrate.

KVH is not the only game in town. By mid-summer RaySat (Vienna, Virginia) will begin selling a slightly larger antenna than KVH's through Audiovox. The RaySat product measures 5.5 inches by 34 or 35 inches in diameter. But RaySat has already begun sampling a smaller antenna that measures 2 inches in height and is working on a fully electronic version that's just 1 inch high. RaySat entered the satellite TV market with its acquisition of the Bulgarian company SkyGate Bulgaria Ltd., which in 2004 was building high-speed Internet antennas for trains.

KVH TracVision A5-Equipped Vehicles by Model

Luxury and full-size SUV owners are early adopters of mobile satellite TV.

Luxury SUVs, 25%

FULL-sized SUVs, 47%

Luxury SUVs, 3%

Vans, 4%

Chevrolet Tahoe, 4.1%

Lincoln Navigator, 5.6%

Ford F-Series, 5.8%

Hummer H2, 22.3%

Cadillac Escalade, 20.6%

Other, 11.5%

TracVision A5-Equipped Vehicles by Class

Luxury and full-size SUV owners are early adopters of mobile satellite TV.

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FULL-sized SUVs, 47%

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higher demand in North America and Japan for cars with integrated audio/video/navigation. A line introduced the world’s first iPod interface that links the portable music player to the car’s head-unit controls.

R&D investment increased to 10% of FY 2004 sales, from 9% of sales in FY 2003. The company has planned “aggressive R&D investment in the communications equipment market,” as well as cooperative R&D with its parent company, Aips Electric.

Geographic distribution of sales remained the same as last year: Europe is A line’s largest market, accounting for 40% of total sales; North and South America combined 36%; and Japan, 19%. Seventy-five percent of A line’s sales are to OEM customers.

Calsonic Kansei
FY 2004 Consolidated N et Sales: ¥695.0 billion ($6.5 billion)
Change from FY 2004: up 12.2%
FY 2004 N et Income: ¥5 billion ($462.2 million), or 0.7% of sales

Net income declined 38.1% compared with FY 2003, mostly due to a ¥10 billion ($93 million) extraordinary loss resulting from a revaluation of fixed assets.

Nissan owns 41.9% of Calsonic Kansei and accounts for roughly two-thirds of the company’s sales.

Clarion
FY 2004 Consolidated N et Sales: ¥178.3 billion ($1.7 billion)
Change from FY 2003: up 5.6%
FY 2004 N et Income: ¥7.3 billion ($67.8 million), or 4.1% of sales

Most of Clarion’s sales are car audio and multimedia products including CD and DVD players, radios, amplifiers and speakers, and navigation equipment. (Also see Hitachi.)

Denso Corp.
FY 2004 Consolidated N et Sales: ¥2,799.9 billion ($26.0 billion)
Change from FY 2003: up 9.3%
FY 2004 Consolidated N et Income: ¥132.6 billion ($1.2 billion), or 4.7% of sales

Denso attributes its record-high net sales, net income and operating income to increased production by Japanese automakers both at home and abroad. Toyota accounts for roughly half of Denso’s sales. Increased sales of car navigation/information systems contributed to Denso’s 9.3% domestic growth.

The company’s fastest-growing region, at 30.1%, is Asia/Oceania, where Denso benefited from the launch of Toyota’s IMV (Innovative/International Multiple Purpose Vehicle) platform in Southeast Asia. In the Americas, currency effects limited sales growth to 4% even though Toyota increased North American vehicle production 13% during 2004. Denso’s laser A CC (adaptive cruise control) was introduced on the 2005 Toyota Avalon in the U.S.

Demand for diesel fuel injection components. Part of Hitachi’s growth came from its 2004 acquisition of Tokico Ltd., which was merged into Hitachi Unisia Automotive. Hitachi Automotive has set a goal of 17.2% annual growth of sales to reach ¥1 trillion ($9.3 billion) by 2010.

In December 2004, Hitachi Ltd. purchased shares equal to 14.5% of the voting rights of Clarion Co. Ltd., making Hitachi Clarion’s largest shareholder. The two companies in May 2005 announced their intention to cooperate in expanding their car information systems (CIS) businesses. Plans call for comprehensive collaboration ranging from software platform development to procurement, production, sales and after-sales service. Hitachi expects to launch a jointly developed product in 2008.

Nippon Seiki
FY 2004 Consolidated N et Sales: ¥147.7 billion ($1.4 billion)
Change from FY 2003: up 6.3%
FY 2004 N et Income: ¥13.7 billion ($127 million), or 9.3% of sales

Nippon Seiki makes instrument clusters for Honda, Subaru, Fiat and others, and is also a major supplier of head-up displays.

Omron Automotive Electronic Components Segment
FY 2004 Consolidated N et Sales: ¥64.6 billion ($600 million)
Change from FY 2003: up 9.7%
FY 2005 Estimated Sales: ¥72 billion ($669 million)
Change from FY 2004: up 11.5%

Contributing to higher automotive sales for Omron were new products including laser radar, electric power steering controllers and door lock controllers. Nearly 60% of the automotive electronics business was done overseas in FY 2004.

New business in Korea, Asia and Europe offset lower production volumes in North America and the effects of the stronger yen. See page 8.
Background
Satellite radio is one of the fastest-growing markets in the United States, where three-quarters of people age twelve or older, in over 110 million households and 230 million registered vehicles, listen to the radio daily, according to the market research firm Arbitron. Only two satellite radio broadcasters offer uninterrupted, commercial-free music programming for a monthly fee. While XM Satellite Radio’s sales have grown 671% annually since it began broadcasting in 2001, its 4 million subscribers represent less than 2% of the potential mass market.


XM’s first satellite was launched on March 18, 2001; the second went up May 8, 2001. The company began commercial operations in two markets on September 25, 2001 and completed its national rollout on November 12, 2001.

As of March 2005, XM Satellite Radio had 3.8 million subscribers, a 73% share of satellite radio market. Its only direct competitor, Sirius, had 1.4 million subscribers at that time. XM reached 4 million subscribers by mid-May 2005. The company expects to reach 5.5 million by year-end 2005, and 20 million by 2010.

A year-end 2004, XM had incurred capital expenditures of $1.2 billion and aggregate net losses of about $2.1 billion. XM says its free cash flow will turn from negative to positive sometime in 2006, and EBITDA will turn positive sometime in 2007. Both would be firsts for the company since its founding. When The Hansen Report last profiled XM, in April 2001, the company predicted cash flow would turn positive in 2004.

XM programming is distributed to consumers through partnerships with carmakers, car rental companies (Avis, National, and A lamo), air carriers (A irTran Airways and soon JetBlue) and national consumer electronics retailers such as Best Buy, Circuit City and Wal-M art. In October 2004, XM channels were made available on the Internet with the launch of XM Online.

CD Radio became Sirius Satellite Radio in 1999. XM Satellite Radio Holdi ngs Inc. was created in 1997 as a holding company for XM Satellite Radio Inc. and was IPO’d in October 1999, offering shares at $12.

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Of the 151 channels XM offers, 67 are commercial-free music channels, 63 channels deliver news, sports including Major League Baseball and college sports, talk and entertainment, and 21 channels are dedicated to XM Instant Traffic & Weather audio only. The comedy and “decades” music channels, especially the 60s, 70s and 80s, have been the most popular among listeners. During the racing season, NA S C A R has also been very well-received, but NA S C A R will transfer to Sirius Radio in 2007.

Effective April 2, 2005, XM raised its subscription rates from $9.99 to $12.95 per month, although existing subscribers could lock-in the $9.99 rate for up to five years by prepaying.

Satellite Degradation
XM Radio broadcasts throughout the continental United States from two satellites positioned over the equator, one at 85 degrees west longitude, which runs through Michigan and the western edge of Florida, and the other at 115 degrees west, which runs through Las Vegas. Two satellites are used to enhance the probability that a satellite will have clear line-of-sight communications with XM radio receivers coast-to-coast.

The satellites were supposed to have a useful life of 15 years, but in September 2001, XM notified its insurers that a progressive solar array power degradation problem would lead to premature failure.
of both. XM and its satellite maker, Boeing Satellite Systems, have since adjusted the expected life of the two satellites to approximately 6.75 years from launch. In July 2004, XM reached an agreement with its insurers that has yielded a recovery of $142 million. XM invested approximately $300 million in the first two satellites.

As a result of the progressive degeneration of the first two satellites, XM launched a third satellite in February 2005; a fourth will be launched in 2007. Improved solar array panels have been installed in the new satellites. XM satellite radio transmissions are complemented by 1,000 terrestrial repeaters operating in 60 markets. Radio transmission from the repeaters augments the satellite signal, which can be blocked by tall buildings.

Automotive
Carmakers accounted for 31% of the 713,101 new subscribers XM gained in the last quarter of 2004. In order to encourage the largest number of paid subscribers possible, Paul Kirsch, vice president in charge of XM’s OEM activities, wants carmakers to install as many XM-ready radios, a number that is currently running at about 2.3% of the total. Mr. Kirsch employed auto parts-maker Delphi for 19 years, most recently as general director global sales and marketing for the Thermal and Interiors unit.

Number of Vehicles Produced With Factory-Installed XM-Ready Radios

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Vehicles</th>
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<tbody>
<tr>
<td>2004</td>
<td>1.5 million</td>
</tr>
<tr>
<td>2005</td>
<td>2.1 million</td>
</tr>
<tr>
<td>2010</td>
<td>7 million to 8 million</td>
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XM has signed agreements to be the exclusive OEM factory-installed satellite radio distribution partner or the preferred provider of satellite data services to General Motors, Honda, Toyota, Hyundai and Nissan. Given the agreements already in place, Mr. Kirsch expects carmakers to produce somewhere between 7 million and 8 million vehicles with XM radios factory-installed by the end of 2010. “The number of factory-installed radios will continue to dwarf the number of dealer-

Asian automotive firms Honda, Hyundai and Toyota, among others, have signed agreements to be the exclusive provider of factory-installed XM radios in vehicles produced by Ford, Chrysler, Mercedes-Benz, and BMW, which together comprise 36% of U.S. light vehicle sales.

General Motors
A major investor in XM Satellite Radio Holdings, GM will produce roughly 1.5 million XM-equipped vehicles in 2005. An agreement covering a 12-year period ending September 2013 requires GM’s OnStar division to exclusively distribute and market XM radio services and install XM radios in GM vehicles. GM also has a non-exclusive right to arrange for the installation of XM radios in non-GM vehicles equipped with OnStar systems. XM has agreed to subsidize part of the cost of the radios and make incentive payments to GM when the vehicle owners become XM subscribers. Under the terms of the GM distribution agreement, XM must pay GM $80.7 million in 2007, $106.7 million in 2008, and $132.9 million in 2009, plus interest.

While OnStar serves as GM’s window to XM, OnStar’s and XM’s future product plans aren’t integrated. OnStar, which helps facilitate factory installation of XM radios into GM’s product line, is a wholly-owned GM unit and telematics service provider to GM and other carmakers. Currently a factory-installed option on 57 GM models, including Hummer, Buick, Cadillac, Chevrolet, GMC, Pontiac, Saab and Saturn, XM radios come pre-activated with the service so GM dealers can offer subscriptions to new car prospects during vehicle test drives and the vehicle delivery process. Ninety days of complimentary service is offered to any purchaser of an XM-equipped vehicle.

Honda
A another major investor in XM Satellite Radio Holdings, Honda exclusively offers XM as a dealer-installed option in most Honda models. XM is a factory-installed standard feature on all Acura models except the RSX.

Honda will produce 400,000 XM-equipped vehicles in the 2005 model year, up from 200,000 vehicles in MY 2004. The carmaker has arrangements with XM to make use of some of XM Radio’s bandwidth and jointly develop telematics services and technologies.

Toyota
A ccording to an agreement signed in December 2004, Toyota has selected XM as the sole supplier of satellite-delivered data services for Toyota, Lexus and Scion vehicles. In addition, starting in 2006, the continued on following page
carmaker will offer XM radios as a factory-installed option on Toyota and Lexus vehicles. Further, the agreement stated that during 2005 Toyota will expand the number of models offering XM as a dealer-installed option. At the end of 2004, XM was available as a dealer-installed option on 11 Toyota models including the Camry, plus Lexus and Scion models.

**Hyundai**

In 2006 Hyundai will begin to implement its plan to factory-install XM radios in all H-1 models. By the end of 2006, 75% of H-1 models will be XM-equipped. Hyundai will ship more than 500,000 XM-equipped vehicles in 2007.

**Nissan/Infiniti**

In January 2005, XM announced that it had been chosen by Nissan North America to deliver data and telematics services, such as in-vehicle messaging and XM NavTraffic, to Nissan and Infiniti vehicles equipped with XM-ready navigation systems. Nissan currently offers XM as a dealer or port-installed option on all Nissan and Infiniti models, 18 in all.

**Volkswagen/Audi**

XM is available as an option on the Audi A4, A4 Avant, A4 Cabriolet, A6, A6 4.2, S4, S4 Avant, A6L, TT, RS6 and Quattro models as well as the Volkswagen Beetle, Golf and Jetta. Some of these are factory programs and some are dealer installs.

**Data Services/Telematics**

While its 151 channels of music and talk programming will provide the vast majority of revenue, XM has developed technology that can provide its OEM partners with a narrow, one-way data pipeline to the vehicle. XM has the capability to send data to a single vehicle, groups of vehicles or all vehicles equipped with XM satellite receivers.

Perhaps the most promising data service application so far, XM NavTraffic, has already been rolled out. A graphical traffic advisory service, XM NavTraffic comes standard on the 2005 Acura RL and is offered optionally on the 2005 Cadillac CTS. Other data applications are stock quotes and sports scores, which can now be displayed on all aftermarket and most OEM XM receivers.

**XM Radio Subscribers**

XM has been delivering real-time weather data to mariners and aviators since 2003. That data is provided to XM by Weather Works, an affiliate of Baron Services of Huntsville, Alabama.

In addition to GM and Honda/Acura, XM has data services agreements with Toyota and Nissan/Infiniti, though XM is not saying exactly which data services are being developed or for whom. Possibilities include traffic services for those not yet offering this service, text messaging, geolocated weather data, navigation map or point-of-interest updates, and maybe even video downloads. "We have a data pipe to the car so if somebody can think of something valuable to do with it, we will consider that," said Stell Patsiokas, executive vice president, technology and engineering for XM, adding "Since the technology is already in place, the data service is simply a matter of software, which we write in-house."

The company has been making significant investments in technologies that support data applications. Of the $23.5 million spent by XM on R&D in 2004, $9.6 million was spent on telematics applications. XM says it will continue to invest in telematics.

The thickness of XM’s data communications pipeline is limited. Within the entire 12.5 MHz of satellite radio spectrum assigned to XM by the FCC, just 4 Mbps can be transmitted. That’s the absolute maximum bit rate and it must cover all 151 channels of audio programming, error correction and data services.

XM’s spectrum is divided into three parts—satellites one and two, plus the terrestrial network, each one transmitting XM programming so that if a receiver loses contact temporarily, the loss is not noticeable to a listener. If the entire 4 Mbps were devoted to audio programming, evenly divided each channel would get 26.5 Kbps. The music programs use significantly more bandwidth than the 21 channels of audio traffic updates, where the sound quality is much less important.

XM does not yet know for sure how much of its total bandwidth will ultimately be devoted to data services. That will depend in part on the business opportunities presented. For now, however, XM is figuring that its OEM data services partners will be satisfied with approximately 4 Kbps each.

Well aware of the bandwidth limitations, XM has been exploring ways to make the most efficient use of it. “Without compromising audio quality we can change the bandwidth [on certain channels] at different times of the day,” suggested Dr. Patsiokas.
Traffic

XM’s $12.95 per month XM subscription includes XM Instant Traffic & Weather, which provides separate channels of audio programming on traffic and weather conditions, covering 21 different metro regions, 24 hours a day, 7 days a week. In the fall of 2004 Acura began selling its all new RL model, standard with a separate traffic service called XM NavTraffic, which provides traffic data to XM-ready navigation equipment. Acura will provide XM NavTraffic for free for the first three months of service for free. Without an XM Radio subscription, XM NavTraffic is available for $9.99 per month.

Starting in March 2005, XM NavTraffic is available on the Cadillac CTS when the optional DVD navigation is chosen. CTS buyers get only the first three months of service for free.

XM Satellite Radio receives the NavTraffic data covering 20 metropolitan areas from digital mapmaker NAVTEQ and broadcasts the data nationally over its satellites and terrestrial repeaters. The data is packaged for transmission according to the Radio Data System Traffic Message Channel (RDS-TMC) protocols developed in Europe. The navigation unit displays only the traffic information, flow rates and incident data that are relevant to the vehicle’s location and destination. The information is overlaid on the navigation unit’s map.

So far, traffic incident information including disabled vehicles, road closures and construction, covers only some of the highways and secondary roads within each metro region. Traffic flow rates based on average traffic speeds are also provided but cover even fewer roads. Coverage varies from metro-region to metro-region. Since many alternative routes aren’t monitored, traffic-data subscribers trying to avoid traffic won’t know for sure if the alternate routes they’ve chosen will be better or worse. A nother issue is latency. Some subscribers have been disappointed when they come upon a traffic problem that doesn’t show up on their display.

According to M r. Kirsch, there will always be a lag factor as the system discovers the traffic problem and gets the data out to be broadcast, but it will definitely be improved. “On average we have experienced a five-minute delay, which now is probably down to about four-and-a-half minutes.” Following focus group clinics with subscribers, XM intends to improve not only the lag time but also the level of regional coverage. “Nobody is sitting still on this; we will find ways to provide better coverage,” noted Mr. Kirsch. Much will depend on the willingness of consumers to pay for traffic information that today comes pretty much for free.

XM NavTraffic is now available to after-market consumers who purchase AVIC-N2 or AVIC-D1 navigation units from Pioneer, or the NVE-N72A navigation unit due from Alpine this summer.

Technology

What besides programming and data services distinguishes XM from Sirius Satellite Radio, XM’s only competitor?

“What makes XM technology special is our robust, end-to-end solution,” declared Dr. Patsios. “From the uplink systems, including the signaling protocol, our ground stations, to the satellite and terrestrial networks, to our receivers, all parts were designed in house.” The XM chip sets were designed by XM in conjunction with STMicroelectronics, XM’s only chip partner. Antennas were jointly developed with two manufacturers, Terk and Antenna Specialists. XM employs about 70 engineers most of whom are located in Boca Raton, Florida. “We fundamentally decided to invest heavily in technology,” noted M r. Kirsch. “As a result, we believe we are at least two years ahead of the competition.”

XM is ahead of the competition in portable devices. Last year Delphi and XM introduced the world’s first portable handheld satellite radio, the Delphi MyFi XM2go. Besides receiving XM’s broadcasts, MyFi can record five hours or more of XM content for playback at a later time. The receiver can record even when it is not in use. Similar XM2go products have been introduced in 2005 under the AriW brand from Pioneer and Tao brand from Giant International. Delphi’s SkyFi2 transportable radio for the home and car is the first satellite radio to offer pause and replay features. Delphi’s Roady2 plug and play satellite radio is the first complete satellite radio for the vehicle for under $120. SkyFi2, MyFi and Roady2 are all equipped to receive scrolling sports scores and stock quotes.

Most XM Satellite Radio receivers, including those distributed by Delphi, were designed by XM and built by contract manufacturers hired by XM Radio.
were domestic, 60% overseas. The company reported decreased sales of aftermarket car navigation declined, and in Japan sales of systems from the aftermarket in favor of OEM-installed devices. In FY 2003, operating income was 9.9% of segment sales.

Pioneer noted a shift in demand in major markets for car audio and navigation systems from the aftermarket in favor of OEM-installed devices. In Japan sales of aftermarket navigation declined, and in Europe and North America the company reported decreased sales of aftermarket car audio and increased sales of OEM audio and navigation.

Forty percent of Car Electronics sales were domestic, 60% overseas. The company plans to focus on growing its audio products business in China and Central and South America. Car Electronics was the most profitable business segment for Pioneer. Overall, the company posted a net loss of $8.8 billion ($81.8 million) on sales of $734 billion ($68.8 billion).

Sumitomo Electric Industries Automotive Business Segment
FY 2004 Consolidated Net Sales: ¥745.2 billion ($6.9 billion)
Change from FY 2003: up 12.2%
FY 2004 Operating Income: ¥50.5 billion ($469 million), or 6.8% of automotive sales
FY 2005 Estimated Sales: ¥787.8 billion ($7.3 billion)
Change from FY 2004: up 5.7%
Wiring harnesses accounted for 64% of Sumitomo Electric’s FY 2004 automotive sales. A automotive is the company’s largest business segment, generating 43% of total sales in FY 2004 and 62% of total operating income.

Korea
Hyundai Mobis (Fiscal year ending December 31, 2004)

 Siemens...
when it withdrew from wiring harness manufacturing to focus on control devices and the car audio business. A according to the Yonhap News World Service, Bontec produced sales of 250 billion won ($249 million) in 2004. Bontec is located in Seoul, Korea. The company made technical alliances with Alpine in 1993 and with TRW in 1995. Bontec is also a strategic partner to XM Satellite Radio. Bontec produces sensors, controls and audio components, including tuners, amplifiers, audio equalizers and digital signal processors. Bontec radio head units are factory-installed in all Kia models sold in the States, except for the A manti, as well as in the Hyundai Tucson.

A according to The Korea Times, in January 2005, an alliance comprised of audio and navigation supplier Harman Becker and Chinese carmaker Shanghai Automotive Group were unsuccessful bidders for Hyundai Audio net. ◆

Hyundai Autonet Products

<table>
<thead>
<tr>
<th>Car Multimedia</th>
<th>XM</th>
<th>Sirius</th>
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<tbody>
<tr>
<td>Electronic tuning radios</td>
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<td>DVD players</td>
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<td>CD players</td>
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<td>CD changers</td>
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<td>A/V systems</td>
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<td>Navigation systems</td>
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<td>MP3 playback devices</td>
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<td>Body Electronics</td>
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<tr>
<td>Airbag ECUs</td>
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<td>ETC devices</td>
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<td>Chassis Electronics</td>
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<td>ABS ECUs</td>
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<td>Dual mode muffler control</td>
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<td>Backup warning systems</td>
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<td>Feedback mixture ECUs</td>
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<td>Crash position sensors</td>
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<td>Noncontact throttle position sensors</td>
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Availability of XM and Sirius Satellite Radio by Carmaker

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<tr>
<th>Carmaker</th>
<th>XM</th>
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*Nissan, Infiniti and Toyota, including Lexus and Scion, signed an agreement with XM to install XM devices in all lines starting in 2007.

Continued from page 1