Long time readers know that our “Roundup” of North American automotive electronics suppliers’ financial results is an annual feature of The Hansen Report. This year’s Roundup feels more like a search for survivors after a long, hard winter. North American carmakers’ February sales reports sent the month’s SAAR (seasonally adjusted annual rate) of sales down to just over nine million vehicles, the lowest monthly SAAR since December 1981, according to Goldman Sachs. Several analysts are predicting a full-year 2009 SAAR in the range of 10.0 million to 10.5 million. Typical supplier contracts cover the life of the vehicle platform, but since there is often no minimum quantity of parts the carmakers are obligated to buy, vehicle production volumes have a direct and immediate effect on supplier revenue.

Some North American automotive electronics suppliers are fighting to survive. Even with GM’s latest cash advance commitments and its willingness to buy back some Delphi manufacturing operations, along with concessions from DIP (debtors in possession) lenders, Delphi may never emerge from bankruptcy despite its many rounds of employment and benefit cuts, plant closings, downsizing, divestments and reorganizations since 2005. Visteon, which has never shown an annual profit, appears to be moving toward bankruptcy. Its stock was delisted from the New York Stock Exchange on March 5, trading at two cents. Lear has been in default on its main line of credit since the end of 2008.

In February, U.S. auto suppliers requested as much as $25.5 billion in federal aid: some in direct loans to suppliers, some to speed up payment from the carmakers, and some to guarantee suppliers’ receivables from GM, Ford and Chrysler. In March, the Obama administration announced it will seek Congress’ approval to reorganize the auto industry through bankruptcy.

Delphi, Chrysler’s largest supplier, may never emerge from bankruptcy. Visteon, GM’s second largest supplier, which has never shown an annual profit, is also in bankruptcy. The Delphi bankruptcy filing in February was the third since 2005. Visteon’s bankruptcy was the first since 2005. Visteon is the third largest supplier to Chrysler.

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**Internet Radio Use in Cars Will Grow**

Limited Only by the Cost of Smartphone Data Plans

I don’t usually like distractions while I’m working, but I’ve been listening to Pandora Internet radio on my laptop almost constantly since I first sampled it for this story on the future of car radio. If you have an iPhone, you are probably already a Pandora devotee. Pandora is the number-one free application for Apple iPhones, with 3.4 million downloads since the Apple Store’s launch in July 2008. (The social networking site Facebook was the second most popular iPhone application.) According to Pandora, 25% of the more than 17 million iPhone users are already listening to Pandora in their cars. Pandora has 23 million registered users, the vast majority of whom listen from PCs.

Pandora’s website is beautifully simple. After first arriving at www.pandora.com, you are invited to create your own radio station by typing the name of your favorite artist, song or composer, after which Pandora features that music and more music like it. Pandora automatically selects music based on hundreds of musical attributes. Taken together, those attributes capture the unique musical identity of the song—everything from melody, harmony and rhythm, to instrumentation, orchestration, arrangement and lyrics.

![Internet Radio Sales Chart](chart.png)

If I want to listen to my Pandora stations in my car I would need a smartphone capable of accessing the Internet and a data plan. At $199, the iPhone seems a good buy, but at $30 per month, the AT&T data plan feels a little pricey.

Despite the current price of data plans, a number of carmakers, Ford for example, are developing infotainment systems that will accommodate Internet radio. “What Ford Sync is doing is taking the content on your phone that you already paid for and finding a way to connect that application and stream that music to your vehicle so you can access it in a safe and secure manner,” declared Doug Van Dagens, leader of Ford’s connectivity group.

“We are setting up a group of APIs that companies like Pandora can publish to,” noted Mr. Van Dagens. “We would have some voice commands onboard so you could say, ‘start Pandora,’ and you could scroll through different stations or playlists, and vote on songs, either with your voice or through the steering wheel buttons. ... We haven’t announced yet that Pandora will be one of our next features, but we certainly think it is something our customers are interested in,” he said.

“Besides Ford, another of the top five global carmakers is already moving toward Pandora integration, and we have had conversations with numerous others,” said Joe Kennedy, CEO and president of Pandora. Mr. Kennedy was the vice president of sales, service and marketing for Saturn Corporation, a division of General Motors, before he joined Pandora. “We ultimately hope to see the integration of Pandora into automotive audio controls,” he said.

Pandora, which pays licensing fees for the music it plays, makes its money through advertising. If and when Pandora comes to the vehicle, advertising will...
Continued from page 1

Chrysler so that suppliers could use those receivables as collateral with their own lenders. At present, no decision had been made by the Treasury department, according to the Original Equipment Suppliers Association.

Autoliv
2008 Consolidated Net Sales: $6,473.2 million
Change from 2007: down 4.4%
2008 Net Income: $164.7 million, 2.5% of sales compared with a 4.3% net margin in 2007
Outlook for 2009: The company is projecting a 45% drop in net sales for the first quarter due largely to an expected 30% decline in global vehicle production for the period. For the full year, Autoliv cautiously predicts that its organic sales growth will slightly outperform light vehicle production growth in Western Europe and North America. Assuming the first quarter of 2009 will be the low point for the year in terms of vehicle production, and assuming that commodity prices will be lower in 2009, Autoliv speculates, “it could be possible to report a positive operating income, excluding restructuring costs, later in the year and potentially even for the full year 2009.”

Europe accounts for more than half of Autoliv’s 2008 revenue; North America accounts for nearly one-fifth. Autoliv’s five largest customers account for 53% of sales. Excluding favorable currency effects and acquisitions, organic sales decreased by almost 10%, but in Japan, organic sales grew 3%, due mainly to increased sales of side curtain airbags and new business with Toyota, Nissan, Mitsubishi, Suzuki and Honda. A slightly carmakers accounted for 29% of 2008 sales.

Organic sales fell 12% in both North America and Europe, which the company directly attributes to lower vehicle production and model mix. Autoliv noted a steeper decline in the production of premium cars and light trucks, which typically have more advanced safety systems and higher value content per vehicle for a U.S. In this change in the vehicle mix toward more entry-level vehicles along with continued industry-wide price pressures has kept the average safety content per vehicle at $270-$275 for the past three years, and Autoliv believes average content will stay close to that level through 2011. Airbags and related products, including electronics, account for 64% of Autoliv’s total sales. Autoliv claims it has an 18% share of the market for safety electronics.

Responding to the tightened credit markets and the instability of GM, Ford and Chrysler, Autoliv took steps to preserve cash, drawing down $500 million from existing credit lines, securing $250 million in new credit, and suspending share buybacks and dividend payments. On a positive note, Autoliv sees promising future sales as a result of more integration of safety functions into the airbag ECU. For example, in 2008 Autoliv introduced an airbag ECU with integrated electronic stability control sensors.

The company also notes that government safety regulations are beginning to ratchet up in countries like China and Brazil, which will grow the market for airbags. Autoliv now spends about 30% of its R&D budget on developing new safety systems for small cars.

According to Autoliv, its September 2008 acquisition of Tyco Electronics’ automotive radar sensor business added $7 million to consolidated sales in 2008. The acquisition is not expected to materially impact earnings in the short term.

Delphi Corp.
2008 Net Sales: $18,060 million
Change from 2007: down 19%
2008 Operating Income (Loss): $(1,481 million)
2008 Net Sales by Operating Segment:
Electronics and Safety: $4,048 million, down 21.1%
Powertrain Systems: $4,470 million, down 21.1%
Electrical/Electronic Architecture: $5,649 million, down 5.3%
Thermal Systems: $2,121 million, down 12.1%
Automotive Holdings Group: $1,348 million, down 54.2%
With the exception of Thermal Systems, all the product segments posted operating losses for 2008. GM agreed recently to prop up Delphi’s liquidity, increasing the amount it would advance Delphi to $450 million from $300 million, and agreeing to take over Delphi’s steering operations, including 17 manufacturing plants. Both provisions are subject to approvals from Delphi’s bankruptcy court and the overseers of GM’s federal loan funds. A according to a Delphi press release, “Delphi believes that GM’s commitment of additional liquidity coupled with the support it has received from its lenders under its debtor-in-possession financing facility should allow Delphi to manage its liquidity into May 2009.”

Sales to GM and its consolidated subsidiaries accounted for 31% of Delphi’s sales, down from 37% of sales in 2007. Not included in the calculation are sales to GM’s non-consolidated subsidiaries and sales to tier ones who sell directly to GM. Sales to GM fell by $2.8 billion in 2008 compared with 2007. Sales to non-GM customers fell $1.4 billion, or 10.3%.

Lear Corp.
2008 Net Sales: $13,570.5 million
Change from 2007: down 15.2%. In North America sales dropped 32%; in Europe sales were down 4%; rest of world sales grew 11.6%. Lear sold its Interiors business in 2007.

continued on page 3
come along with it. On the PC, most Internet advertising is visual, but in the vehicle it will be visual.

"We hope to eventually have Pandora incorporated into all vehicles," said Mr. Kennedy, "so we have been spreading the word in automotive circles that Pandora is already the largest radio service in the industry and the fastest growing. Historically, 40% of radio listening is in the car. A 3G and ubiquitous broadband become the norm, I certainly foresee a day when the majority of radio listening in the car is Internet delivered." Mr. Kennedy will speak this June at the Telematics Detroit meeting, as will Ford’s Mr. Van Dagens.

**Blaupunkt’s Internet Radio**

In the second half of 2009, Blaupunkt will be selling an Internet radio in the European and U.S. aftermarkets. The radio, which includes AM/FM and a USB connector for playback from mass storage devices, will connect to the Internet through a Bluetooth link to the driver’s mobile phone. It is priced to retail at $400 or €300 depending on where it is sold. "Our idea is to offer a global radio that works anywhere," said Gerhard Pitz, who is responsible for Blaupunkt’s car radio business. "It is being very well-received; people in Europe, the U.S. and even China are telling me they like this idea very much."

The new Blaupunkt radio will connect to the Internet through **miRoamer**, an Australian online radio portal that provides access to 30,000 radio stations in 200 countries. "That’s more stations than you would ever listen to," suggested Dr. Pitz. "We have done some evaluations of how many stations a typical customer would like to hear. It is between one-and-a-half and two-and-a-half stations."

Internet listeners will be able to go to the miRoamer home page, select the station language or country, and set up station pre-selects on their car radio. Blaupunkt has been talking to a number of European carmakers including BMW, Mercedes, Volkswagen and Audi about installing its Internet radio at the factory.

**Much Depends on Smartphone Data Communication Costs**

The popularity of Internet radio in the car will largely depend on the cost of the communications pipeline to the vehicle. Pandora streams music at up to 128 Kbps. Users will need a broadband connection of at least 150 Kbps. As already has been pointed out, smartphone data plans with that capability in the U.S. are fairly expensive, though, you get a whole lot more with the data plan than just Internet radio. iPhone’s data plan adds $30 to the monthly cost of using the cell phone, bringing the total for basic voice and data to at least $69.99 per month, plus additional fees and taxes.

The monthly cost to use smartphones in Europe is less than in the U.S., according to Blaupunkt’s Dr. Pitz. "And I expect... Turn to Radio, page 8
Background

In 1987, SGS Microelettronica of Italy merged its semiconductor business with the non-military business of Thomson Semiconducteurs, then owned by Thomson CSF of France, to form SGS-Thomson Microelectronics. An IPO was completed in December 1994, and the company name was changed to STMicroelectronics in 1998.

ST targets five major market segments: communications, digital consumer, automotive, computer peripherals and industrial. It has been among the world’s top five semiconductor suppliers since 2005. At present, ST is the fifth-largest overall; in automotive semiconductors, ST holds the number three position. Since its founding, ST has grown faster than the semiconductor industry.

Weathering the Economic Crisis

STMicroelectronics has not escaped the global economic downturn. Sales are off and earnings have gone negative. In the fourth quarter, ST’s net margin was minus 16.1%; in the third quarter it was minus 11.1%. ST’s net margin for the full year 2008 was a loss of 8% of sales. On March 2, 2009, ST’s stock was trading at $4.26 per share, down almost 80% from its price on April 16, 2007. ST’s automotive business made a slight sales gain in 2008, growing at 3.3%, down from its five-year average growth rate of 8.9%. In 2009 automotive sales are expected to be down 10% to 12% compared with 2008, with North America down even more. ST expects sales to begin the climb back to normal recent highs at least by 2011.

Despite the tough times, ST says it is definitely sticking with its automotive customers. “We are doing what we can to help all our customers succeed in this tough environment,” declared Kevin Gagnon, automotive business unit vice president, North America. “We’ve been in the auto industry for more than 20 years. We’ve never turned our back on anyone and we won’t do so now.”

A visit to STMicroelectronics’ fiscal year ends on December 31.

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Automotive Product Group

Within the automotive segment, ST focuses on applications in three areas: powertrain and safety, body, and car multimedia and navigation. Since 1994, ST’s automotive sales have grown at the annual rate of 14.4%, from $235 million in 1994 to $1,550 million in 2008. That’s...
considerably faster than the automotive semiconductor market, which since 1994 has grown between 8% and 9% per year, according to the company.

STMicroelectronics cites several reasons why its automotive business has outperformed the market. First and foremost is its longstanding commitment to the industry. “We’ve served the automotive industry consistently. We haven’t come in and out of the market like some of our competitors,” pointed out M. R. Gagnon, “and I would challenge any of our competitors to demonstrate a broader product portfolio than ST’s. I think those two factors, combined with our global footprint and our systems and market knowledge, give us a compelling position in the market. Our strategic partnerships, for example with Bosch, with Freescale, M obileye, NAVTEQ and others also play into ST’s favor,” he explained.

What does ST like about serving the auto industry? “The bottom line is that automotive requirements drive quality,” noted M. R. Gagnon. “It makes the whole company better. And notwithstanding the current economic difficulties, it has been a very stable source of revenues. When you get an order you typically see revenues at full volume for three to five years.”

The Company Profile Continued
GPS

ST believes the market for its GPS receivers and correlators still has some legs. While the PND market globally may have peaked, the company sees a growing market for embedded navigation systems as they become more affordable.

Additionally, the demand for GPS devices will receive a big boost from mandated eCall emergency crash-notification systems, which Claudio Valesani, vice president for the automotive business unit, Europe, noted are quite likely to be required in the 2012 or 2013 timeframe in Europe. “We also see further growth coming from the North American telematics market and from Brazil, where a big market is developing for eCall-like applications and vehicle tracking,” he said.

Radio and Infotainment

Twenty-three percent of ST’s automotive revenue is from car radio and multimedia applications, and the company is the market leader in semiconductors for automotive infotainment. “Car radio is our bread and butter,” said Domenico Rossi, general manager of car radio and multimedia. “We are a one-stop shop, be it for satellite radio, DAB, traditional AM/FM, an infotainment center, a multimedia center, video transmission, Bluetooth connection—everything in the radio.”

“We are market leaders in audio amps as well, market leaders on the front end, on the tuner side and we have a strong presence on the processing side,” said Mr. Notaro. ST leverages its broad range of technologies and strong presence in the consumer market as well as its strength in GPS.

Joint Development Program with Freescale

ST, whose automotive business has profited from several partnerships, sees its alliance with Freescale Semiconductor as its most significant, certainly the one with the largest investment. A total of 400 engineers, half from ST and half from Freescale, are currently working on various joint development programs. A bout 100 engineers from each company are dedicated full time to the joint program.

Two years ago the two competitors teamed up in a wide-ranging initiative focused on automotive applications. The agreement covers:
- High performance 32-bit microcontrollers based on PowerPC cores
- Basic intellectual property for automotive navigation applications
- A alignment of 90-nm embedded Flash process technology
- High-voltage power MOSFETs
- IGBT technologies

The alliance claims to be the first one offering dual sourcing of 32-bit microcontrollers to the automotive community. ST’s 32-bit product roadmap, which starts out with 20-MIPS parts and goes up to 500 MIPs, is intended to cover a wide swath of applications.

“We have already sampled five different product families, all based on the PowerPC architecture,” suggested Fabio Marchio. “Two are for powertrain applications; and each one for dashboard instruments, body and chassis, and safety applications We have four more 32-bit devices under development, all of which will be sampled in either the second or third quarter of this year. Our development machine is at full speed. We want to have in our [automotive] portfolio all the products that the microcontroller market leaders have.” Mr. Marchio is A PG deputy general manager of the powertrain and safety division, microcontrollers, and he serves as general manager of the JDP.

Applications for 32-bit microcontrollers are definitely growing. Allmost all the applications in the car are moving toward 32-bit devices, even body control. The reason is twofold: First, the development costs and the purchase price of a 32-bit device are now much more than for a 16-bit device. Second, the move by many tier-ones to A utosar software is forcing some developers to move up to 32-bit devices.

Within the program, ST and Freescale jointly define and develop the products but independently manufacture, market and price them. Essentially the arrangement provides customers with the security of a dual-source arrangement, where the same development tools and software can
be used regardless of manufacturer. But ultimately the two companies compete with each other for business. The Freescale-ST joint development program has its headquarters in Munich, Germany.

**Smart Power Alliance with Bosch**

ST’s oldest alliance is its 22-year-old cooperation with Bosch. Bosch now licenses ST’s mixed signal BCD (bipolar, C M O S, D MO S) and high-voltage C M O S process technologies for use in its own semiconductor foundry located in Stuttgart. BCD devices show up in almost everything that Bosch produces including powertrain, safety, chassis and body systems. High-voltage C M O S devices are used as sensor interfaces and for analog processing. Bosch, known for leading edge, high-quality technology, is the world’s second-largest auto supplier.

**NA V TEQ Maps for A D A S**

ST has been collaborating with digital mapmaker NAVTEQ on a scaled-down navigation device that combines a GPS receiver with a compact map so the vehicle can automatically keep track of dangerous curves and changes in road inclination. The device, which can be implemented in a small module about the size of a credit card, could be used to warn the driver when he is approaching a curve too quickly and to trigger automatic braking. “If you also connect the map to the powertrain controller, which has access to the engine and transmission, you could improve fuel economy by as much as 8%,” declared Martin Duncan, a PG innovative systems manager. “When you know where the hills are, the vehicle can select the perfect transmission gear and precisely dial in the right amount of fuel.”

**Mobileye**

A year ago ST and vision-system pioneer Mobileye (Jerusalem) announced the availability of the second generation EyeQ2 system-on-chip. A ready in production with several Carmakers, the first generation offers such functionality as lane departure warning, adaptive headlight control, traffic sign recognition, collision avoidance through radar/camera fusion, and forward collision warning—all using a single camera. By increasing processing power sixfold, EyeQ2 enables added functionality such as pedestrian detection.

“Mobileye has several things going in their favor,” said Martin Duncan to explain the company’s success. “They started over ten years ago. They have this database of video taken from moving vehicles that together have logged enough mileage to get to the moon and back eight times. A nytime they have a new algorithm to test they run it against this video footage. Mobileye employs 190 people, three-quarters of whom are writing software algorithms.” The EyeQ2 vision processor has two 64-bit, 34K M I P S C PU’s and eight Vision Computing Engines running at 332 MHz with a 128-bit bus.

ST also produces the C M O S cameras used in Mobileye vision systems.

**Promising Applications**

ST is well-positioned to serve the most pressing automotive needs: energy efficiency, C O 2 reduction and active safety. ST’s products are found in powertrain controllers and in applications that further the electrification of the vehicle, for example in electric-motor-powered steering, fuel pumps and washer pumps. “We are already in production on start-stop systems, which are becoming popular in Europe. We supply drivers and power M O S F E T’s,” noted Claudio Valesani.

“An, starting in 2010 and 2011, our power MOSFETs and IGBTs will be installed on some full-hybrid vehicles.” A 90 kW hybrid vehicle has $600 worth of silicon content, $500 of which is for discrete components.

ST executives are also expecting an uptick in demand for advanced driver assistance systems, especially in Europe where mandates are expected. “Although at the moment the take rate is relatively low for systems like lane departure warning, active cruise control, night vision etc., growth over the next several years will be really quite significant,” predicted Martin Duncan. “For example, lane departure warning and active cruise control will be 100% mandated on trucks in 2013. And while the take rate in Europe for ESC is already 53%, that safety feature will almost certainly be mandated in European cars by 2014.”

In the United States, rear-facing cameras may also be mandated under the terms of a law passed in February 2008.
BMW Takes Open Source Infotainment Platform Public

GENIVI Alliance Seeks to Broaden Participation

Having completed proof of concept for its open source infotainment system reference platform, the GENIVI Alliance, an industry collaboration spearheaded by BMW, Intel and Wind River, is now ready to take on additional participants. Founding members of the alliance also include GM, PSA Peugeot Citroen, Magneti Marelli, Delphi and Visteon.

“T he incubation phase is complete; we are now going through a second maturation cycle in order to make the implementation open-source ready,” explained Graham Smethurst, spokesperson for the alliance and BMW Group general manager for infotainment and communications systems. “That will involve some additional development to make sure that when we release the code we will be proud to put the GENIVI name on it.”

The alliance plans to launch a beta level GENIVI platform containing the key automotive extensions in June. Shortly after, four technical work groups will become active, staffed with participants from each of the founding partners. Independent software developers from the open source community will have access to the code and can begin writing applications based on the specification.

“We have consciously adopted an iterative development model and will continue to mature and extend the platform within the GENIVI alliance,” said Mr. Smethurst. BMW plans to offer an infotainment system based on GENIVI by 2012 or sooner.

The initiative, which has had pretty good support from the industry thus far, is presently trying to recruit additional participants. GENIVI wants at least one Japanese carmaker and a major Japanese tier one, as well as another European carmaker and tier one. Once a critical mass of carmakers and suppliers buy into the project, it will be easier to recruit the software developers needed for the work that remains. Those who join the alliance will get early access to the code that has been developed thus far.

The goal is to develop and make public a platform that accounts for roughly 60% of the software that goes into a finished infotainment system. That will lead to significant cost savings and improvements in time to market. The platform will cover the entire range of infotainment products from a small telematics box, to a radio, to a connected radio like the Ford Sync, all the way up to a full-blown navigation/entertainment solution. Carmakers in the alliance will be able to differentiate their products on the basis of applications and user interfaces on top of the platform.

If the platform finds wide support among carmakers, it could potentially change the infotainment industry from one that is dependent on a dozen or more vertically integrated suppliers to an industry that is more horizontal, where systems are configured from components chosen from a longer list of suppliers. For example, if Nuance happens to make the best speech recognition engine available at the time, the carmaker could easily choose that component and not be tied to the speech engine that comes from its tier-one supplier.

One of the difficulties faced by the initiative is that the open source business model has not yet been used in the automotive industry. Carmakers wonder about the quality of open source code, that is, whether it is up to automotive standards. Freely available, open source software is developed in a public collaboration.

“A set for the quality of open source code, we specifically chose to work with tier-one suppliers during the last phase of the incubation activity,” explained Mr. Smethurst. “We asked them outright if they were comfortable with the quality of the open source code. The answer was a definite yes. They said they had been pleasantly surprised, not only with the quality of the code, but also with the level of support they were able to get because the code was supported by an ecosystem.”

The GENIVI platform is based on the Linux operating system distributed by Wind River.

GENIVI will compete with Microsoft Auto—already the basis for Fiat’s Blue&Me and Ford’s Sync connectivity platforms—and with the QNX infotainment platform. QNX is a division of Harman International. Neither of those platforms is truly open source, so the number of companies developing applications for them will be limited.

A liaison members participated in a Linux community-sponsored Open Source Forum at the CeBIT show in Hannover, Germany, on March 5. GENIVI members were also planning to visit Japanese carmakers and suppliers the week of March 15. For more information, please visit www.genivi.org.

Radio...

prices to come down further in both Europe and the States as more devices like the iPhone and Blackberry enter the market,” he said.

While others, including Pandora’s Mr. Kennedy, also expect data plan prices to come down with more users, some people aren’t so sure. The Gartner research firm takes the opposite view. Here is one of its top ten predictions for the year published this past January: “By the end of 2010, wireless operators will cease to offer unlimited (flat-rate) mobile data plans.

Users of data-hungry devices such as the iPhone are already testing the capacity of these networks leading to bandwidth issues and customer churn.”

Still, the great appeal of Internet radio is the way content can be made to perfectly fit a listener’s individual tastes. In contrast, Sirius XM’s satellite programming tries to appeal to a broad listener base across the United States. “Internet radio will definitely change the radio landscape,” said Domenico Rossi, general manager of STM microelectronics’ car radio and multimedia business. A counting to Mr. Rossi, nearly 50% of new cars in the U.S. come with satellite radio capability.

“Internet radio in the vehicle is definitely the future; it is just a matter of time,” said Steve Koenig, in charge of research for the Consumer Electronics Association. “It will make it a lot more difficult for Sirius XM. If you have an Internet connection that is bringing in music, information and local search, why would you want to pay additional for a satellite radio?”