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Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #123

Editorial

New Sound Dimensions In Our Vehicles

BMW IMAGE

Suppliers, manufacturers and software providers are working on whole new sound dimensions for cars. They're driven by changing user behavior on the one hand, and changing hardware topography on the other; increasingly, loudspeakers as we've known them for so many years now compete with interior components and body parts which generate the sound themselves with targeted vibrations. You'll find a close look in this week's in-depth article.

Also this week, we bring you coverage of Cadillac's Lyriq, their first EV—a spatial marvel and harbinger of GM's AVs; LG Electronics and Sound Hound working on an advanced AI voice technology for future infotainment systems; new BMWs to be made from up to 50 per cent recycled material; driver monitoring systems bringing new business opportunities; new car interior safety features; ZF presenting their technologies for steer- and brake-by-wire and electronically controlled active damping; China fixing to surpass Germany this year to become the world's second-largest auto exporter after Japan, and electrification and connectivity creating great potential for modernizing automotive architecture and the driver's experience in the cockpit.

We're glad you're here with us! Not yet a member? come **join in**.

Sincerely yours,

Carsten Befelein
DVN-Interior Consultant

In Depth Interior Technology

In-Car Hi-Fi: Experience the Grand Opera

MERCEDES-BENZ IMAGE

Premium automotive audio systems include speakers and subwoofers spread around the interior of the vehicle to provide a high-end audio experience, as well as diagnostic and in-vehicle services; car telematics; hands-free calling and e-call, and telecommunication and navigation services. The increasing proliferation of premium audio in passenger cars is driving the growth of the market. People increasingly seek premium audio systems in their vehicles partly in response to the increasing number of hours spent in traffic due to traffic delays, while at the same time increasing vehicle autonomy is gradually turning cars into living rooms on wheels—so naturally there should be a great stereo in the living room!

Additionally, the premium audio systems are witnessing a huge technological advancement to match the pace of growth amongst various ranges of vehicles. Some of the key advancements include voice-enabled audio and smartphone controlled systems, along with the focus on an increasing comfort and safety of drivers and passengers.

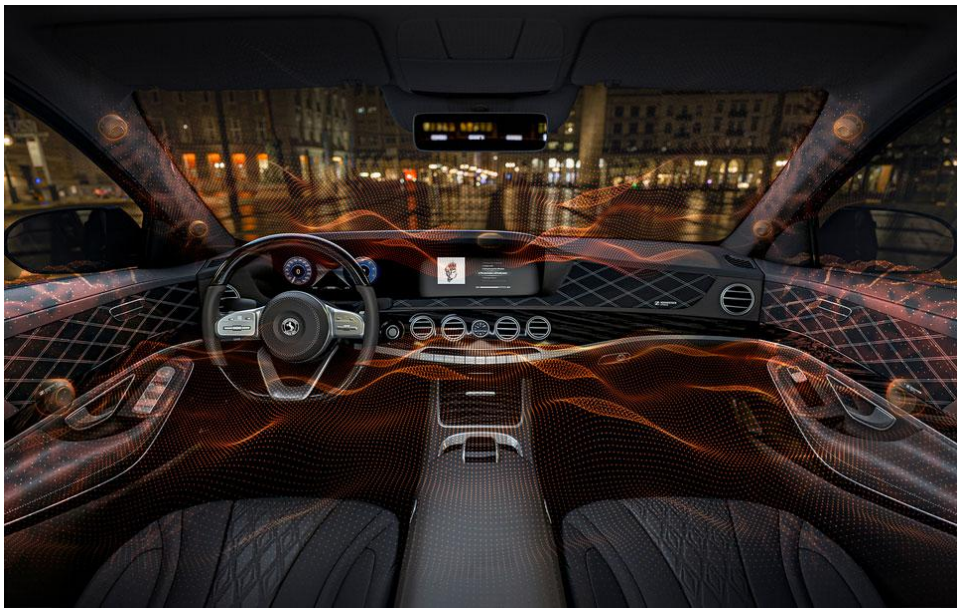
The trend for in-car audio is toward a concert-hall quality with more watts, bigger and bigger subwoofers, and more and more speakers in the car. Even the basic sound system often has half a dozen sound transmitters, which can be optionally upgraded for a few hundred euros or dollars, even in small cars. Higher-end car buyers are willing to spend thousands to add hundreds of watts; loudspeakers everywhere, and glorious brand logos of audiophile tradition to their cars.

In an Aston Martin, Bentley, Rolls or Maybach, the sound system alone can cost around the same as a whole small car, and that money buys the likes of a Burmester system that thunders out high fidelity in concert hall quality and three-dimensional surround sound like in a high-tech movie theater. 21 high-performance speakers including additional speakers from two roof islands between the rear seats. 1,480 watts all in all. That's why experts measure the sound development in the world's most famous concert halls—the Vienna Musikverein, for example—and strive to recreate that sound experience in high-end car audio systems.

Some car owners don't even want to drive, but just want to experience the grand opera from the Arena di Verona in the parking lot. Together with tenor Andrea Bocelli and his favorite opera house in Pisa, JBL has developed such a system for the Fiat 500. But formats originally designed for the cinema, such as Dolby Atmos, are also changing in-car listening. Together with German multimedia company Cinemo, Dolby has developed a system for cars. 21 front, rear, side and treble loudspeakers, as well as 8 solid-borne transducers in the seats, allow the music experience to float freely in space (as well as the signals and warnings that are particularly relevant for people at the wheel).

In addition, the trend is toward a listening island. Many rear-seat passengers already prefer to enjoy a movie or video game on their screens in the front seats or headliners. And with separate screens for the front passenger, they may also want to Skype and not be distracted by the driver's music or navigation announcements. Such separate audio and video channels should soon be found more often in cars.

Greg Sikora is in charge of the acoustic systems engineering department at Harman, the world's largest high-end car audio manufacturer comprising brands including JBL, Infinity, Bowers & Wilkins, Bang & Olufsen, and Marck Levinson. At Harman's Munich car lab is a new Aston Martin prototype, with technicians looking for the ideal position for the deep bass from the subwoofer. That's a tough task, given the tight space constraints of a sports car. The best place, under the seats, is too small a space for the thickest speaker with its need for resonance space. In a car, people hear exactly where the sound is coming from—so Sikora relies on more and smaller speakers that concentrate on the spectrum that is actually audible to the human ear.



AUTONEWS EUROPE PHOTO

Sennheiser and Continental are taking a different approach: they want to produce 3D sound entirely without loudspeakers. Sennheiser has mated their "Ambeo 3D Audio Technology" with Continental's "Ac2ated" sound system. Door panels and body parts generate the sound themselves with targeted vibrations. This is expected to reduce the installation space and weight of a sound system by up to 90 per cent, and the two companies plan to develop a production version in the next few months. It's a potentially tough sell, though; automakers would rather avoid deliberate vibration of their body parts, and nobody knows how good systems like this might sound after years in use.

As autonomous vehicle technology evolves and as vehicle connectivity leads to diverse, upgradable infotainment options, an immersive sound experience is expected to assume increased importance, especially among premium automakers. In 2021, Dolby Atmos Music and Mercedes partnered to bring immersive audio to the S-Class and Mercedes-Maybach vehicle ranges. Immersive sound technology in vehicles offers automakers the chance to differentiate themselves from the competition and provide an audio experience for consumers who are demanding premium quality entertainment while on the road.

Individualized sound for each passenger is needed in the future, so there's a trend toward sound from the headrest. This means that the sound can always be played in the ideal relationship to the head, which for example is crucial when the front passenger reclines their seat or turns the entire seat toward row two during autonomous driving.

BMW IMAGE

Here are capsule descriptions of some key suppliers of premium automotive sound systems:

Alpine Electronics is a Japanese consumer-electronics subsidiary of the Japanese electronics component manufacturer Alps Electric, specialized in the production of car audio and navigation systems.

Bang & Olufsen (B&O) is a high-end luxury Danish consumer electronics company, founded by Peter Bang and Sven Olufsen, that designs and manufactures audio products, television sets, and telephones.

Harman International is an American company that designs, engineers, produces, manufactures, and sells connected products for automakers, consumers and enterprises across the globe. The product folio includes connected car systems and services, audio, visual products, and enterprise automation.

Bose is an American manufacturing company that predominantly sells professional audio equipment like noise-cancelling headphones, and automobile sound systems.

JBL is a unit of Harman International Industries. The company designs and builds audio equipment for the entertainment and automotive industry, including wireless Bluetooth devices, speakers and headphones, connected home audio solutions, in-car sound systems, etc.

Other major premium audio suppliers include include: Sony; Pioneer; Clarion; Panasonic; Naim; Denso Ten; Dynaudio, and Burmester.

According to a Market Research Report 2022 by Astute Analytica, the global premium automotive audio system market was valued at USD 11.32bn in 2021, and is projected to reach $27.81bn by 2030. The market is registering growth at a CAGR of 9.5 per cent over the forecast period 2022-2030. The report provides PESTLE analysis, which is a tool to examine the external market environment factors that have an impact on the industry. The PESTLE analysis examines the Political, Economic, Social, Technological, Legal, and Environmental factors.

The Asia Pacific region is the highest shareholder of the global premium audio system market in 2021. In the report the APAC region is estimated to continue its market dominance in the projected period. This is due to the increasing share of semi-luxury cars in countries like India and China, which holds the major share of the global electric vehicles.

Interior News

Cadillac Lyriq: Super Luxury With Super Cruise

INTERIOR NEWS

GM IMAGES

Cadillac's first electric car, the Lyriq, is expected to herald a turnaround at General Motors. The Lyriq is supposed to be something of a "game changer," as marketing strategists like to call those models that symbolize the dawn of a new era (on their own or with some coaxing from behind and below).

The electronic assistance system is something like a semi-automatic pilot. Press the Super Cruise button, and you can take your hands off the steering wheel on many roads while the car drives itself, maintains lane and distance, accelerates and brakes, and restarts independently in stop-and-go traffic. GM is the first manufacturer to receive approval for such a system in America.

The feeling of space in the Lyriq is exceptional, due to the flat floor without a center tunnel, which is characteristic of electric cars, and to the huge panoramic roof. The long wheelbase, also typical of electric vehicles, offers business-class legroom, especially for rear-seat passengers.

Materials are premium, and interior construction is done to a high standard of craftsmanship. In the cockpit, the wide and slightly curved display attracts all eyes. The displays behind the steering wheel can be shown in four different configurations, and the right-hand part of the screen is responsible for infotainment and navigation. Everything can be controlled intuitively via touch or by means of the rotary dial on the center console.

One appreciates the simplicity of the switches especially while driving in "one-pedal mode". To activate the strongest (regenerative) deceleration, it actually only takes a tap on an icon on the display. However, you have to find the right submenu first, which makes things a bit awkward. An automatic, adaptive setup based on camera and navigation data would be good. In the U.S., the first electric Cadillac is now going on the market, starting at USD $63,000.

LG + Sound Head = Voice-Driven AI

INTERIOR NEWS

LG ELECTRONICS IMAGE

LG Electronics will collaborate with Sound Hound Artificial Intelligence in the future. Together, the companies aim to develop advanced AI voice technology for the next generation of infotainment systems. Sound Hound's technology is expected to enable the supplier to integrate enhanced voice control with intuitive conversation features for drivers and passengers.

In addition, LG plans to leverage Sound Hound's voice commerce partnerships so drivers and passengers will be able to use the microphone and infotainment display to fill up their fuel tank; pay for a parking spot, and order food directly—all from within the vehicle. In this way, LG wants to offer automakers an option to tap into new revenue streams via their connected vehicles.

LG's infotainment systems will use a speech AI platform that leverages so-called "speech-to-meaning" and "deep meaning understanding."

Sound Hound, based in Santa Clara, California, develops AI-based speech recognition and natural language processing software. The company operates in a variety of industries, including audio, telecommunications, financial services and automotive.

BMW's Sustainability Plans

INTERIOR NEWS

BMW IVISION CIRCULAR (BMW IMAGE)

The goal is ambitious: In the future, new BMW cars are to be made from up to 50 per cent recycled material. There is still a long way to go, but the automaker already boasts about their sustainable production.

An important target component is the wiring harness, with 20-30 kilograms copper per vehicle. The excavator system with its total of 16 special functions for cannibalizing recycling material from end-of-life vehicles was invented at the RDZ, which is part of the BMW Group. In addition to copper, the main materials extracted there are aluminum, steel and—in the case of electric cars—raw materials for high-voltage batteries in a different process. BMW recovers 13,000 tons of material for production and 2,000 tons of used parts from about 10,000 vehicles every year. In addition, there is more and more recycling know-how.

A recycling rate of over 90 per cent is currently achieved for lithium; cobalt, and manganese for high-voltage batteries, for example. This is above the legal requirement of 85 per cent. The RDZ extracts values of between €4,000 and €15,000 per car, sometimes at great expense, which does not always pay off economically.

The BMW iVision Circular is an automotive vision in the dimensions of the BMW i3. The car is made of 100-per-cent recycled material and is completely recyclable. It is intended to show what is technically possible and to inspire people to find an economically viable way to get there. Series production is still a long way off.

BMW is also focusing on greater sustainability in primary materials and suppliers; they've made green power agreements with 427 suppliers, which saves 20 million tons of CO_2. BMW suppliers must commit to producing with renewable energy, suppliers must commit sub-suppliers. BMW buys critical raw materials such as cobalt and lithium for high-voltage batteries itself for its battery cell suppliers to ensure that they are not extracted in an environmentally harmful way.

Over the life cycle of a car, BMW aims to reduce its environmental footprint by 40 per cent by 2030. In 2019, a value of 54 metric tons of the climate-killer carbon dioxide per vehicle was determined from raw material extraction through production and the use phase of a car to its recycling. The supply chain accounts for 12 tons, BMW production for one ton, and use for over 40 tons. These values are heavily influenced by internal combustion vehicles, which explains the high values for use. With the advent of electric cars, this value automatically decreases. In the case of the new all-electric BMW i4, for example, it is still 28 metric tons with the current German electricity mix, and 13 metric tons if green electricity is used. In contrast, the footprint of electric cars increases along the supply chain without countermeasures. Nevertheless, BMW wants to reduce this footprint in the supply chain by 20 per cent by 2030. In its own car production, the goal is to reduce the footprint by as much as 80 per cent. BMW has gone furthest in this respect. The one metric ton of CO_2 in 2019 will have become 350 kilograms by 2022. In the use phase, BMW is aiming to halve its ecological footprint by 2030. By then, every second new car sold should be fully electric.

DMS Boom Brings Business Opportunities

INTERIOR NEWS

HARMAN IMAGE

According to Technology Intelligence firm ABI Research, shipments of vehicles featuring camera-based DMS (driver monitoring systems) will jump from 8 million in 2022 to 47 million in 2027, more than half of global new-vehicle sales. These systems offer reliable real-time driver distraction monitoring to prevent accidents. Mostly spurred by regulation, they also enable a range of infotainment-related features that will provide automakers and suppliers with opportunities to recover their investments.

As DMS become mandated, automakers were initially interested in systems meeting the minimum EU GSR (general safety regulation) requirements, or the minimum requirements on the North American regulatory island. However, standard mandated ADAS features drive an additional cost into the vehicle that automakers cannot quickly or easily recoup. "Envisioning additional use cases that use the available sensor technology has become imperative. With the realization that monetization opportunities could be realized with the same DMS hardware and minor incremental software investment, most carmakers' DMS RFQs now request two to three features beyond driver attention monitoring", says ABI Research smart mobility and automotive industry analyst Maite Bezerra.

As DMS safety-related detection capabilities include drowsiness, distraction, seatbelt use, smoking, driving-under-influence and phone use. However, DMS can also support several convenience features. For example, driver's head position and gaze direction input can enable AR-HUDs and 3D dashboards to provide information about points of interest (e.g., Mercedes' MBUX Travel Knowledge) or to highlight or tone down information in the cockpit, decreasing energy consumption in EVs. Advanced cognitive load detection capabilities can be used by personal assistants to measure the driver's stress level, mood, or even health, and make suggestions or take actions accordingly. Examples include Cerence Co-Pilot, Nvidia Concierge, and Nio's Nomi. "There is also interest in using the driver's medical status, such as heart and respiration rates, to determine stress level and medical condition after accidents," Bezerra says.

Expanding the DMS scope to OMS (occupant monitoring systems) within the same camera is another clear trend due to the broad range of monetizable use cases enabled by camera-based OMSs, such as detecting children or pets left behind. It can also detect incorrect use of seatbelts, and the occupant's position in the car can be used to regulate airbag deployment more effectively. It can also integrate convenience option, such as selfies, video conferences, remote vehicle motoring, and multi-user in-cabin and media content customization.

"Moving forward, DMS and OMS will be critical sensors enabling next-generation automotive HMI and UX. Machine learning, artificial intelligence, multimodal input and output channels, and unprecedented integration with vehicle sensors, domains, location data, and other IoT devices will be combined to provide an intuitive, humanized, and seamless in-car user experience," Bezerra says.

Car Interior Safety Features Trigered, Occupants Unhurt

INTERIOR NEWS

IMAGE: LINKEDIN POST

New vehicles are designed to build confidence in more ways than one. The New Ford Maverick enters in this target. Ford's smallest pickup boasts several standard and available safety features to better protect drivers and passengers; standard features include pre-collision assist with automatic emergency braking; rearview camera, and automatic high beams. Available features include adaptive cruise control; blind spot monitor; rear parking sensors, and lanekeeping assist. When so many safety features get along within the same package, one could wonder if the vehicle performed exactly as designed to provide the needed help as and when needed.

It is amazing and brilliant to know that all this tech is built in, ready and waiting to "save" you with a fraction of a second's notice. These technologies are available in most of today's modern vehicles. The picture at the top of this article was taken recently in a rural US area, when a deer jumped right in front of the car. All the ADAS features and passive safety features kicked in; the automatic emergency braking; the seat belt tensioners, and—as you can see—all of the airbags. Then the car automatically called emergency services. Occupants walked away with a couple of minor scratches, though the deer and the vehicle were not as fortunate. Good to know the state of today's safety technology is really protecting…even if flying objects remain contending!

Business Model for Upgraded Cockpit UX

INTERIOR NEWS

ISTOCK IMAGE

According to a Qualcomm communication about their Snapdragon Digital Chassis™, automakers are taking certain actions to monetize vehicles now and into the future. Thanks to electrification and connectivity, today's vehicles are evolving rapidly. The result is tremendous opportunity for modernizing automotive architecture and the driver's experience in the cockpit.

These always-connected vehicles are becoming continually upgradable platforms that can be customized throughout their lifecycle. This shift allows consumers to make their vehicle an extension of their digital life and personalize the driving experience. It also sets automakers up for a new realm of ongoing revenue opportunities.

Now, says Qualcomm, is the time for manufacturers to take advantage of growing consumer demand for next-generation vehicles and transportation solutions. Automakers with their eye on the future are following three basic steps as they navigate the transformation of their industry.

Digital Platform

Traditional vehicles include many options, but with software, a new world of differentiation opens to the industry. The digital chassis is at the heart of the software-defined vehicle allows them to customize as never before. Automakers can extend their unique brand identity into the vehicle and build deep relationships with customers long after the vehicle has left the lot. With 5G new services are possible like predictive maintenance, on-demand movie streaming, location tracking and alerts, and much more.

Permanent upgradability

Having the car connected to the cloud means feature potential upgrades throughout the vehicle lifecycle and reduce the pressure at the time of sale. Buyers pay an entry-level price to purchase a vehicle built with the hardware to provide all kinds of features and creature comforts—most of it disabled by software lockouts, hence not really belonging to the buyer. Then the 'owner' gets the opportunity to pay in perpetuity to unlock features temporarily on an à-la-carte basis. Rather than buying equipment, they're renting experiences. Once the car is sold, the car is locked back down to basic spec, and the new 'owner' gets to take on the perpetual-payment yoke. In this manner, a basic car can be specced up with luxury technology features and upgrades, as they become available, such as higher-quality infotainment, more precise positioning for premium navigation, and an upgrade from 4G to 5G for greater speed.

Ecosystem of digital services

Automakers want to retain control of the experience in the cockpit. The way to differentiate the cockpit experience and stay connected to customers is to work with partners who can bring new, cloud-connected apps and services into the vehicle. That is the key to unlocking new revenue opportunities and maintaining and increasing the flow of money from the consumer.

The Design Lounge

Cadillac Celestiq Shows Retro Design Direction

THE DESIGN LOUNGE

CADILLAC IMAGE

Cadillac has unveiled their Celestiq show car, which is electric and gives a preview of the upcoming flagship sedan. In developing the show car, designers took cues from pre-war Cadillac sedans and the hand-built 1957 Eldorado Brougham and further developed those designs.

CADILLAC IMAGE

Highlights include five high-resolution displays, including a 55-inch diagonal display, and the Smart Glass Roof. The glass roof allows the light transmission to be variably adjusted in four zones. In the case of the large display, which apparently extends across the entire width of the dashboard, there is an electronic blind on the passenger side so that the driver cannot be distracted by what is on the screen. There are also displays attached to the inside of the doors. These could also serve as exterior mirror displays.

There are no technical details yet on the electric powertrain, range or price of the luxury sedan from the manufacturer, which celebrates their 120th anniversary this year. Cadillac plans to announce more information about this new top model before the end of 2022.

CADILLAC IMAGE

2CV Revival

THE DESIGN LOUNGE

PROTOSTYLE IMAGE

The Citroën 2CV is immortal, and Jean-Louis Bui, designer at Protostyle, proves it with a new tribute: the 2 Deuche Concept. With its electric concept, it makes it a perfect mini car for sneaking around town.

Jean-Louis Bui already has several projects to his credit, such as the Citroën DS Revival concept in 2020 or the Citroën SM Revival presented for the 50th anniversary of the model. For this designer passionate about Citroën, it's just a styling exercise. Maybe it could become a "tuning kit" to add to a Citroën Ami, already **presented** in DVN Interior. He qualifies his 2 Deuche (Friendly nickname in French) Concept as a modern interpretation of the legendary Citroën 2CV. It is an urban vehicle driven by an electric motor and in order to be, like its ancestor accessible to the greatest number, classified in the category of vehicles without a license. With this in mind, the specifications impose the following technical constraints: less than 3 meters long; 1.5 m maximum in width and a capacity of two passengers, no more. The ideal use would be car sharing or self-service rental. If they had been designed in this way, the Parisian Autolib would undoubtedly still be around. In any case, its designer has already imagined the car as an ambassador for the Paris 2024 Olympic Games.

Under-Dash Record Player to Play Vinyl Discs

THE DESIGN LOUNGE

HISTORY COLLECTION IMAGE

COFFEE CORNER
DVN
Interior

In the fall of 1955 came the new 1956-model cars from Chrysler Corporation, designed by Virgil Exner. It was still a year before the 1957s—the pinnacles of his "Forward Look" design philosophy—took the industry and public alike by surprise with short decks and long hoods; soaring tailfins, and swoopy atomic-age style cues.

But the 1956 model year brought one of Chrysler's most remarkable innovations, and it related to in-car audio. Until then, the only alternative to broadcast radio was for the vehicle occupants to sing, whistle, talk, or listen to the engine. Chrysler's " under-dash record player, developed with Columbia (at the time, a major record label and maker of phonographs) allowed drivers and passengers to play special low-speed vinyl discs that turned at just under 17 rpm and could hold about 45 minutes of music or one hour of speech.

The Highway Hi-Fi, as it was called, would play music through the (usually one and only) speaker using the radio's amplifier; cars of that time were noisy enough, and speaker capabilities constrained, such that the sound quality limitations of the very low rotative speed were of no real consequence. The turntable; tone arm; sapphire stylus, ceramic pickup, and enough space for six records were all in an anti-shock housing below the center of the

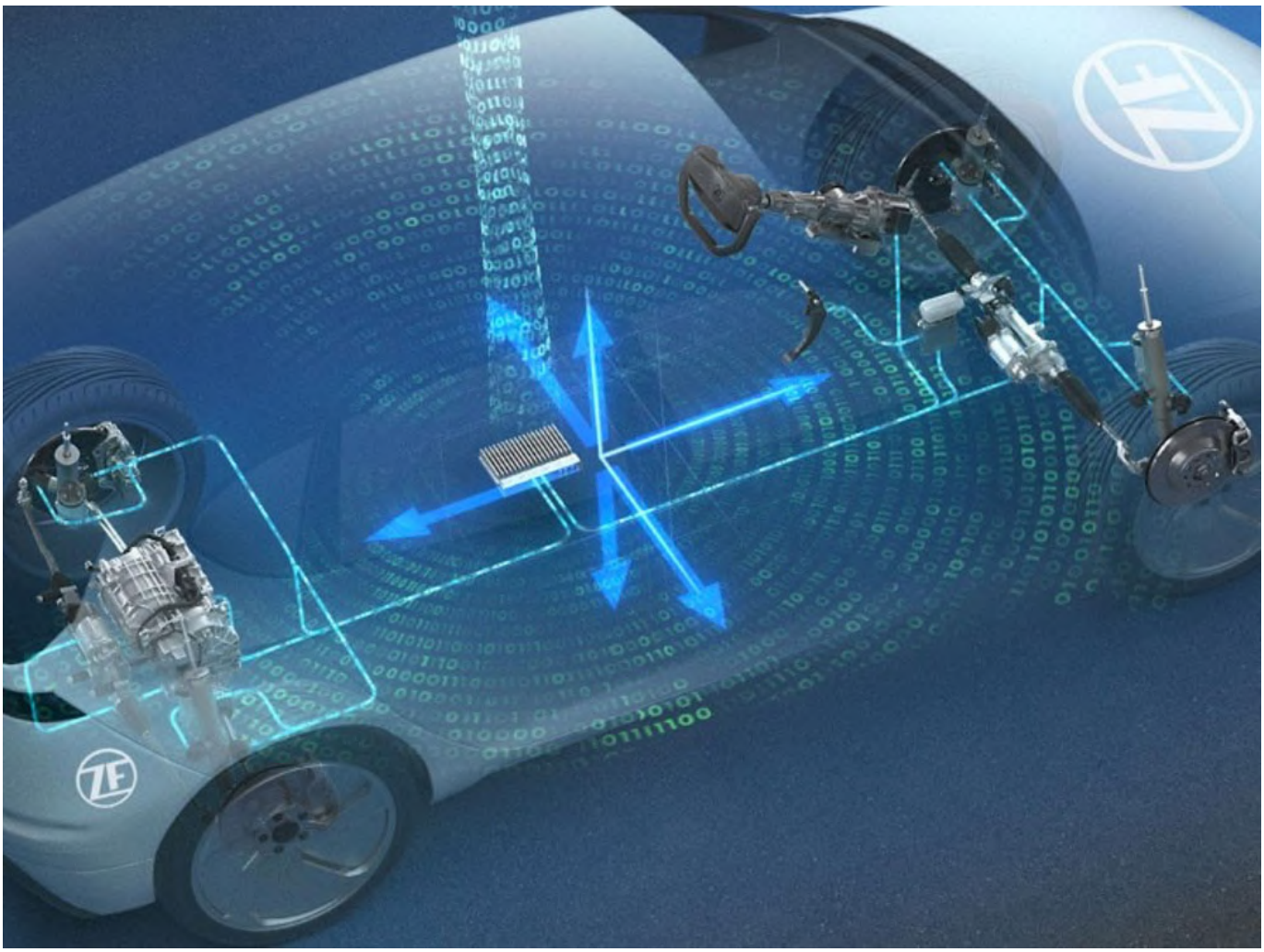
dashboard. According to **press releases and sales brochures**, the player and position of the stylus on the record were not affected by the angle of the car, nor its speed. The stylus would remain planted even during severe cornering—extensive tests were carried out in order to make sure the stylus wouldn't jump across record grooves.

Later versions played 33s or 45s, opening up the record selection beyond the small library offered by Columbia for the 16⅔-rpm early players (better have a co-driver to change 45s after every song…!). And other makers copied the idea and built under-dash record players, too. But the fad didn't last beyond 1961; it just wasn't practical. Looking at it now, most of 70 years later, one finds it difficult to choose between laughing at the idea of a roadgoing record player…or smiling at the ingenuity, determination, and chutzpah. **Read about it in detail** and **watch** a demonstration, and you'll probably agree the right choice is *both*!

News Mobility

ZF's Steer-by-Wire; U.S. OK Sought to Delete Steering Wheel

NEWS MOBILITY



ZF IMAGE

ZF has presented a steer-by-wire solution that is to be launched on the market next year. It is an important step on the road to autonomous driving and new safety and comfort functions.

The steer-by-wire technology from ZF represents a further development of electric power steering. Among other things, the steer-by-wire system enables fully autonomous vehicle control for shuttles and robotaxis. In passenger cars, retractable steering wheels can be implemented for fully automated driving modes, fully adaptable steering, and increased crash safety by eliminating the steering column. "ZF's steer-by-wire technology enables new safety and comfort functions such as autonomous evasive maneuvers or parking in tight spaces. It is a breakthrough on the road to fully self-driving cars and trucks by opening up new design and development freedom", says ZF CEO Wolf-Henning Scheider.

A major global automaker will use ZF technology from the Vehicle Motion Control division on an industrial scale in the course of next year. The company has also received further customer orders from all over the world for its steer-by-wire systems for series production. The steer-by-wire can also integrate rear-axle steering. Other by-wire suspension systems from ZF include brake-by-wire with integrated brake control and electronically controlled active damping. The electronic systems manage without direct physical connections and allow individual settings as well as, in an emergency, lightning-fast adaptation to external circumstances, for example, to increase brake pressure.

U.S. automakers GM and Ford plan to put self-driving vehicles on the road in the United States without human controls such as steering wheels and brake pedals. The companies have independently filed a special permit to deploy a limited number of autonomous cars, according to separate applications filed with NHTSA.

According to the documents, the automakers plan to deploy up to 2,500 vehicles per year for ridesharing and delivery services, which is the maximum allowed by law for fully autonomous vehicles in the United States. Neither manufacturer is seeking approval to sell self-driving vehicles to consumers, the applications say.

Approval by NHTSA would be an important step in advancing autonomous technologies and eliminating controls and displays - which are only useful to human drivers - a Ford spokesman said. He said the company plans to deploy self-driving hybrid electric vehicles "specifically designed and tailored for mobility services such as ride-sharing, ride-hailing and package delivery."

GM reportedly plans to launch an autonomous vehicle called Cruise Origin, a car with subway-like doors and no steering wheel. A prerequisite for the car to be put into service is that all passengers wear seat belts before driving, the Detroit automaker's application said. GM continues to work closely with NHTSA during the approval process to see the "fully autonomous Cruise Origin on the road in the coming years.

Pony.ai Robotaxi on Cao Cao Mobility's Platform

NEWS MOBILITY

PONY.AI IMAGE

Pony.ai has reached an agreement to provide robotaxi service with Cao Cao Mobility, the ride-hailing platform of Chinese automaker Geely.

Starting early this month, users in Beijing became able to hail a robotaxi autonomous vehicle ride via Cao Cao's mobile app. The service can be accessed through a designated "autonomous driving" portal on the platform. Users need to fill out the needed information about the number of passengers, place of departure, and destination. The ride and payment of the Robotaxi service are the same as a regular online ride-hailing experience.

PonyPilot+ autonomous mobility service covers the 60 square kilometers of core areas in Beijing's E-Town. There are 250 stations for picking up and dropping off passengers.

In an effort to facilitate the commercialization of its autonomous driving technologies, Pony.ai adopts two business models. It individually operates its own ride-hailing platform, PonyPilot+, while working with third-party mobility service providers to branch out to more cities. Up to now, Pony.ai holds relationships with Cao Cao Mobility, GAC Group-backed On Time, and T3 Mobility.

General News

Cariad develops Chips with ST Microelectronics

GENERAL NEWS

VOLKSWAGEN IMAGE

Volkswagen wants to restructure their electronics supply chains. Important components are to come from electronics suppliers in the future. To this end, the automaker's Cariad software division is working together with ST Microelectronics (STM).

The main focus is on processors and systems that will more closely integrate control units and complex control tasks. VW had announced its own chip design initiatives, but wants to develop the hardware together with industry experts. The automaker also has Bosch and the U.S. chip company Qualcomm as partners.

The cooperation with STM represents a partial departure from the previous way of purchasing chips. Volkswagen wants to source important components not only from traditional automotive suppliers, but directly from electronics providers. In this way, "we are actively shaping our entire semiconductor supply chain," said Chief Procurement Officer Murat Aksel. "We make sure that exactly the chips we need for our cars are produced and secure supplies of microchips in demand years in advance." The supply crisis for semiconductors had torn large holes in VW production as well. Up to 100 individual control units are currently used in higher-equipped cars. The aim is to standardize them in order to create technical standards and save production costs.

Coordination problems among the Group brands and delays in software development had recently slowed Cariad down. Until a uniform platform is completed, work at Volkswagen, Audi and Porsche is running in parallel.

Cariad CEO Dirk Hilgenberg considers the collaboration with STM important in this context: "The use of a uniform, best-fit architecture in all ECUs gives us an enormous boost for the efficient development of our software platform."

China Steps Up Game as Car Exporter

GENERAL NEWS

In 2021, China exported just over two million cars, according to customs statistics. That was almost twice as many vehicles as in 2020 (1.1 million). Last year, China still ranked third among the largest car exporting nations, after Japan and Germany. But this year, it will probably already be second place. Germany will then drop to third place after Japan and China.

From January to May of this year, China exported 1.1 million vehicles. For Germany, official figures are only available from January to April (800,000). And by April, auto exports from Germany, which had seen an increasing drop in production with Corona lockdowns, lack of chip stocks and "home office" periods at major auto companies, were down 94 per cent.

"Based on current export sales, China is expected to surpass Germany this year to become the second-largest auto exporter after Japan," writes the auto portal Chuxing Yike of the respected business magazine Caijing. Sorted by manufacturer, the top ten vehicle exporters from China for passenger cars and commercial vehicles in 2021 were as follows: SAIC (600,000); Chery (270,000); Tesla (160,000); Changan (160,000); Dongfeng (150,000); Great Wall (140,000); Geely (120,000), BAIC Group (80,000); JAC (70,000), and Sinotruk (50,000).

E-cars from China are selling particularly well and are giving the German and international competition a hard time in terms of price-performance ratio. Today, two-thirds of all cars sold under the formerly British MG brand are produced in China; the management is Chinese, and research and development now take place mainly in China.

In the case of cars with internal combustion engines, China's manufacturers had never really managed to seriously compete with European or Japanese manufacturers. But when it comes to electrification, many of them not only started earlier, but are now technical leaders. BYD's Blade Battery is one example; it's not just used in BYD vehicles, but is also sold to other manufacturers.

The range of Chinese electric cars is often already greater than that of e-cars from German luxury manufacturers. "Carbon neutrality has become a general trend, and this is an opportunity for China's e-cars and hybrids to tap into the global market," Zhao Fuquan, a Professor specializing in the automotive industry at Beijing Tsinghua University told Chuxing Yike. "At this stage, China's battery electric cars have competitive advantages abroad in terms of quality, performance and through scaling effects."

Another trend is that not only cars from China are being shipped abroad, but increasingly the Chinese auto industry itself. Geely, Great Wall and SAIC have already built their first factories abroad.