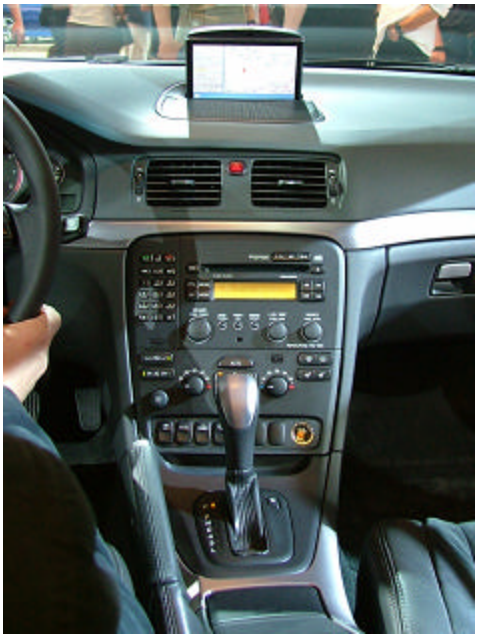
Telematics Intelligence Report
Telematics Summary from IAA (Frankfurt 2003)



Automotive Telematics is about enabling vehicles for wireless services, and nowhere is this catching on as fast as it is in Europe. From hands free interfaces to in-vehicle Internet access, European OEMs are deploying a variety of telematics systems, services, and concepts.

The following summary is a result of TRG's visit to the 2003 Frankfurt Motor Show (IAA) and includes a sample of TRG's latest report, *Concept & Production Telematics: Europe 2004.*

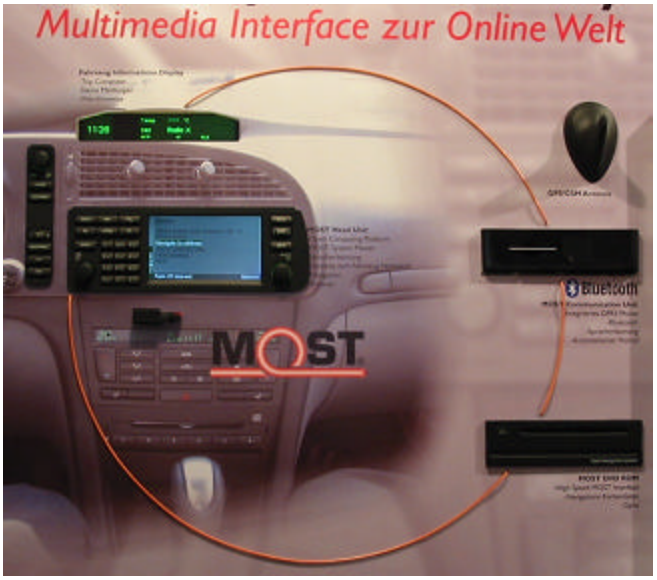
HFIs & the Impact on Telematics

The most widespread exhibit of telematics equipment at IAA included hands free interfaces (HFIs) that facilitate driver control of wireless services. Their popularity in Europe is largely due to high mobile phone penetration, restrictions on the use of handsets while driving, and the presence of a single network standard.

While most European OEMs now offer an HFI solution for phone control, the approaches vary. Some OEMs use Bluetooth while some use a universal handy interface or a combination of the two like the **Maybach** unit (pictured). Other solutions may opt for SIM access to an embedded unit used for telematics calls and an interface to a mobile device for personal calls.

Communication equipment plays a vital role, and companies such as **Peiker** and **Funkwerk** are leaders in this space. Both offer Bluetooth and universal solutions for OEMs and the aftermarket. **Parrot** also offers a Bluetooth OEM solution as well as Bluetooth car kits to be sold through the CE channels. Car kits are

not telematics because the HFIs are not interfaced to the entertainment network. Nevertheless, the outlook for car kits is quite good.

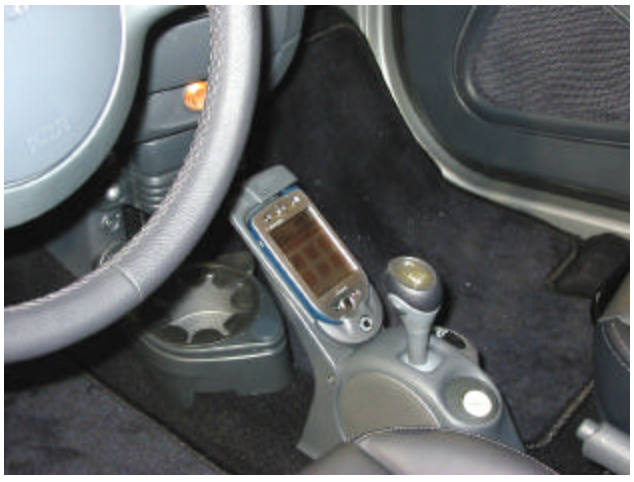


Delphi is deploying Bluetooth technologies as exhibited at IAA. Delphi's Infotainment solution used in **Saab's 9-3** has technologies that consolidate wireless services within the entertainment network of the vehicle using **MOST**. All units feature an embedded GSM phone and come with a Bluetooth-enabled headset unit. The headset uses Bluetooth to communicate with the embedded GSM module and facilitates a hands-free interface this way.

Johnson Controls is a supporter of Bluetooth as a means of bringing wireless into the car. Having developed UConnect for the North American Market, Johnson Controls offers a "black box" solution that integrates voice recognition and the Bluetooth control.

The Role of Smart Mobile Devices

Another form of Device Integration seen at IAA utilizes a PDA as the user interface for the telematics terminal. These devices offer the advantage of being able to provide telematics services to the user even when they are outside the vehicle (such as riding the train or while traveling by motorbike).



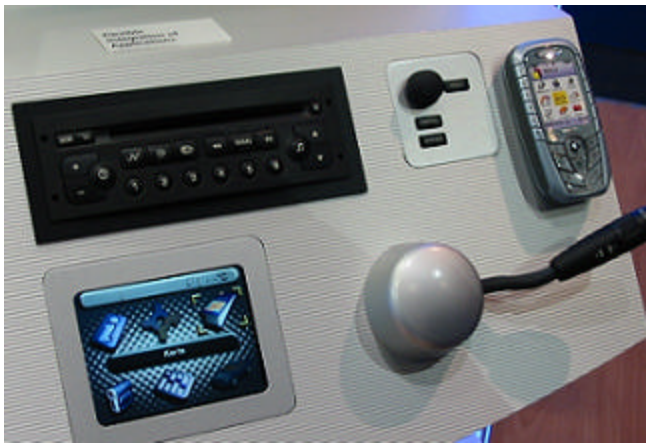
In general PDAs can serve as a practical telematics terminal because they separate the computing technology from the vehicle. This is a plus from a mobility standpoint, but PDAs struggle to match the HMI requirements of the auto environment. Nevertheless, PDAs will find a use inside the vehicle because the costs of these telematics solutions are generally less than embedded solutions. Furthermore, the versatility of these devices will appeal to certain demographic customer segments.

Smart, a **DaimlerChrysler** company, is among the latest to implement a PDA user interface for access to telematics. The Pocket PC–based unit provides access to **Smart's Webmove** – a clever on-line service hosted by **Mercedes-Benz.** This service provides off-board navigation and layers it with traffic data. The resulting information is delivered using the display and voice.

Mercedes has expanded the availability of the Mercedes-Benz Portal to support multiple devices in addition to the PDA. Depending on the vehicle, the MB Portal now supports the **Compaq iPAQ**, the **COMAND APS** navigation system or the **Sound 40 Pro** Navi radio. Telematics data is dynamic (off-board) so POI data can be chosen for navigation, routing, or reservations.

Like a PDA, smart phones may serve to meet the computing requirements of a telematics terminal and offer the advantage of "go anywhere telematics." But here too, the user interface is less than desirable for in-vehicle use. But when coupled with voice recognition and audio output, these solutions may also meet the needs of certain customer segments.

A clever approach by **Siemens VDO** addresses this need by using an auxiliary screen in the dash or head unit. Using Bluetooth, the Siemens unit can display the contents of the smart phone onto the dash or display within the vehicle.



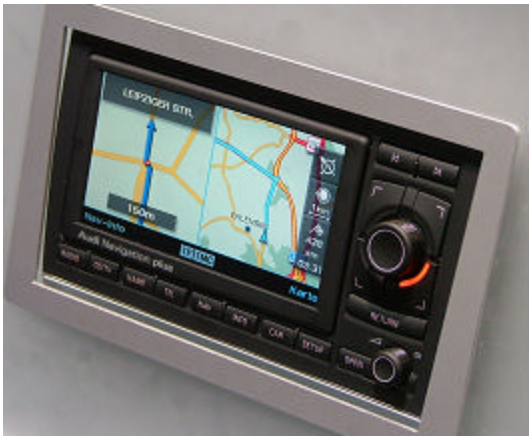
With all the buildup associated with mobile devices and their impact on telematics, this leaves one to wonder what the future holds for embedded solutions?

IAA helped sort this out, at least from an OEM perspective. What TRG learned is that mobile devices do not replace the need for embedded telematics. At a minimum OEMs may enable a vehicle with a wireless interface so that one can use their mobile device while driving. This puts control of the wireless profile in the hands of the consumer, while an embedded profile may be necessary for emergency services or ACN (automatic collision notification).

Multifunction and Multimedia Systems

Telematics from an OEM perspective requires a closer look into the entertainment network of the vehicle. The most elegant solutions are those based on multifunction head units or those that put information displays in or around the instrument cluster. These are often combined with steering wheel controls or other input devices to create a complete HMI package. These hardware solutions are multifunctional so that they control everything on the network including audio, environment, vehicle settings and so on.

The new **Audi Navigation System Plus** features a version of the MMI (multi media interface). This unit will be an option in the A3 and A4, and new A6 when it arrives.

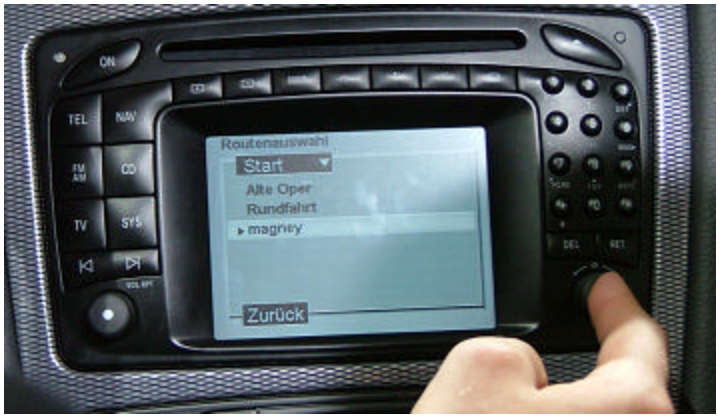


The Navigation System Plus is based on the same operating logic as the MMI used in the A8. Access to functions is available through a combination of hard and soft keys.

The unit features a 6.5-inch screen and a DVD drive. The display screen folds down concealing (2) SD memory card slots for external media such as MP3. The system also interfaces to a phone option that may be operated with the MMI interface or through steering wheel controls.

New Services, New Content Portfolios

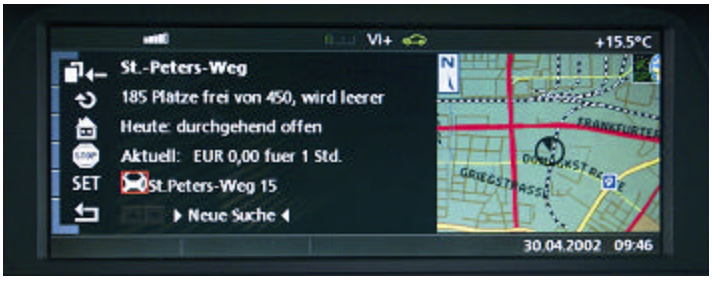
European OEMs have offered telematics services such as E-Call and B-Call for several years though take-up rates have been disappointing. To address this situation, some European OEMs have modified their services portfolio to reflect changing attitudes about what customers may be willing to pay for. Some have introduced content services on a pay-per-use basis on the premise that stiff annual fees may discourage enrollment.



With features like petrol pricing or parking garage availability, Mobility Portals claim to enrich the motoring experience. Now we are seeing an extension of off-board navigation with such services as “last mile” navigation. These services can guide you to the front door of your destination by transferring the navigation

instructions to your smart mobile device. Pictured is the **Mercedes-Benz Portal** through the **COMAND APS** head unit.

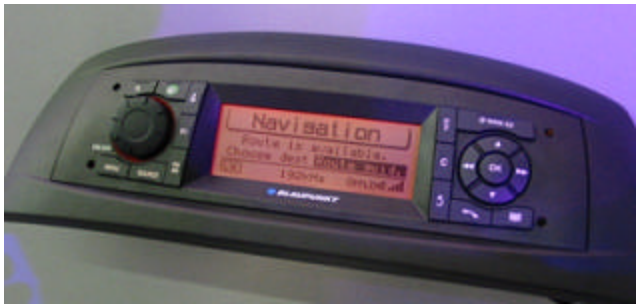
Off-board navigation is getting increasingly popular in Europe and may provide an economic model that is right for some consumers. Advantages are a lower cost head unit and access to the most up-to-date navigation and POI (point-of-interest) information.



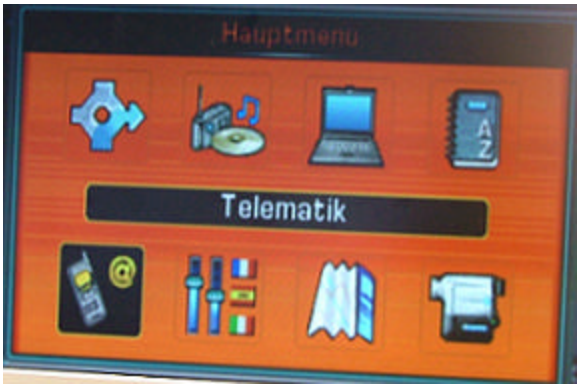
BMW Online, the company's mobile Internet portal now available in the 7-Series will soon be available in the 5- and 6-Series when configured with the Professional Navigation System option.

BMW's Mobile Internet Portal utilizes off-board data. One such application is called **ParkInfo** -- a dynamic parking service that not only to finds a parking garage, but the availability of parking places and pricing at that moment! BMW's future telematics services support mobile devices including PDAs with such services as dynamic "last-mile navigation" to take you to your final destination.

Joining the fray of off board service providers is **Fiat's TeamSys** (a.k.a. Targa). The new service provides off-board navigation services through a **Blaupunkt** receiver that also provides MP3, telephone and e-mail capabilities.



This new service is available in the **Fiat Punto** and is priced on a pay-per-use basis or through a pre-paid plan. The new service does not displace Fiat's Connect brand of pan-European telematics services also available **Alfa Romeo** and **Lancia** brands.



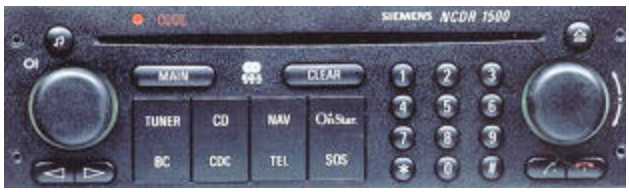
Citroen's NaviDrive is now available in Germany on the C2, C3, C5 and C8. The hardware platform is the RT3 configured with an elegant user interface and display screen on the C8.

Services are provided by Citroen **Telem@tik PLUS Call Center**. Pricing is on a pay-per-use basis and is provided via a live operator. However, POIs are

downloaded to the telematics terminal where the navigation system provides routing to the destination.

OnStar services for **Opel** brand vehicles in Europe are expanding to include new Personal Services that provide customized content perhaps similar to OnStar's Virtual Advisor in the North America. These services also include E-Call and B-Call as well as ACN when air bags deploy. And like OnStar in North America, the services in Europe provide access to a live operator for personal assistance and concierge.

Meanwhile, OnStar's in-vehicle PDA mounting solution is no longer supported although the Mobility Portal is still offered for service and can be accessed via PC, PDA, mobile phone, or desktop computer. In-vehicle hardware solutions include various **Siemens** and **Philips** receivers.

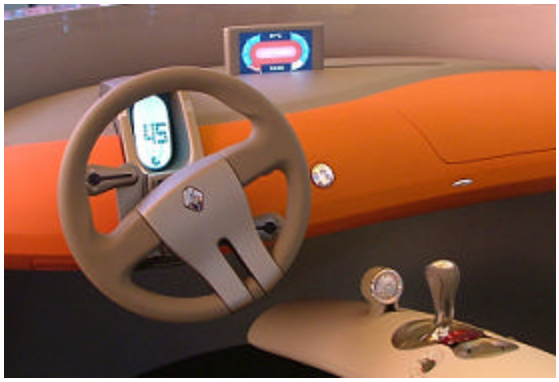


Concepts and Future Directions

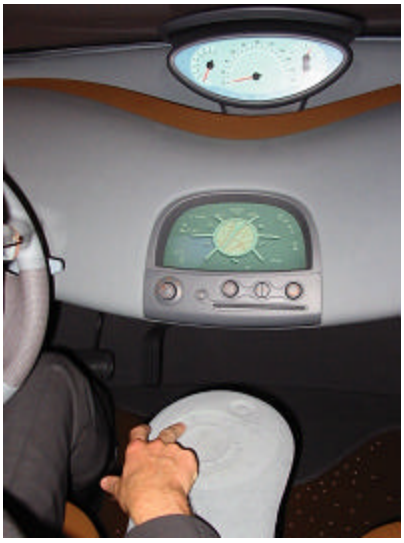
IAA makes a good viewing ground for concepts, particularly cockpit design trends. Here we see the latest thinking on HMI (human machine interfaces). Two years ago we saw the arrival of the haptic control interface. Now we are seeing the touch pad controller with character recognition.

Siemens VDO has an innovative solution that combines a touch pad with a rotary input controller. Called **EasyControl**, the touch pad allows for input recognition where you can enter characters or symbols. The input is than compared to characters stored within the driver information systems' memory.

Information displays are being shared for multiple applications including telematics. At IAA we saw several designs that position the display within the instrument cluster or on top of the dashboard and just about any variation is possible here. Many displays now emerge from the center console, all with the idea to limit the driver's visual movement from the roadway.



When is comes to displays and input controllers the **Be Bop** design concept from **Renault** (pictured last on previous page) may be the simplest interior design. Everything is consolidated into a main input device. Vehicle information is provided in the instrument display while telematics, entertainment and navigation appear on the display in the dashboard.



Johnson Control's is looking ahead with interior designs that make use of touch-sensitive materials. Called **Elek Tex** Controls, the material allows for a touch to the material instead of plastic push buttons. Johnson Controls is looking into future cockpit designs that incorporate these features.

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