



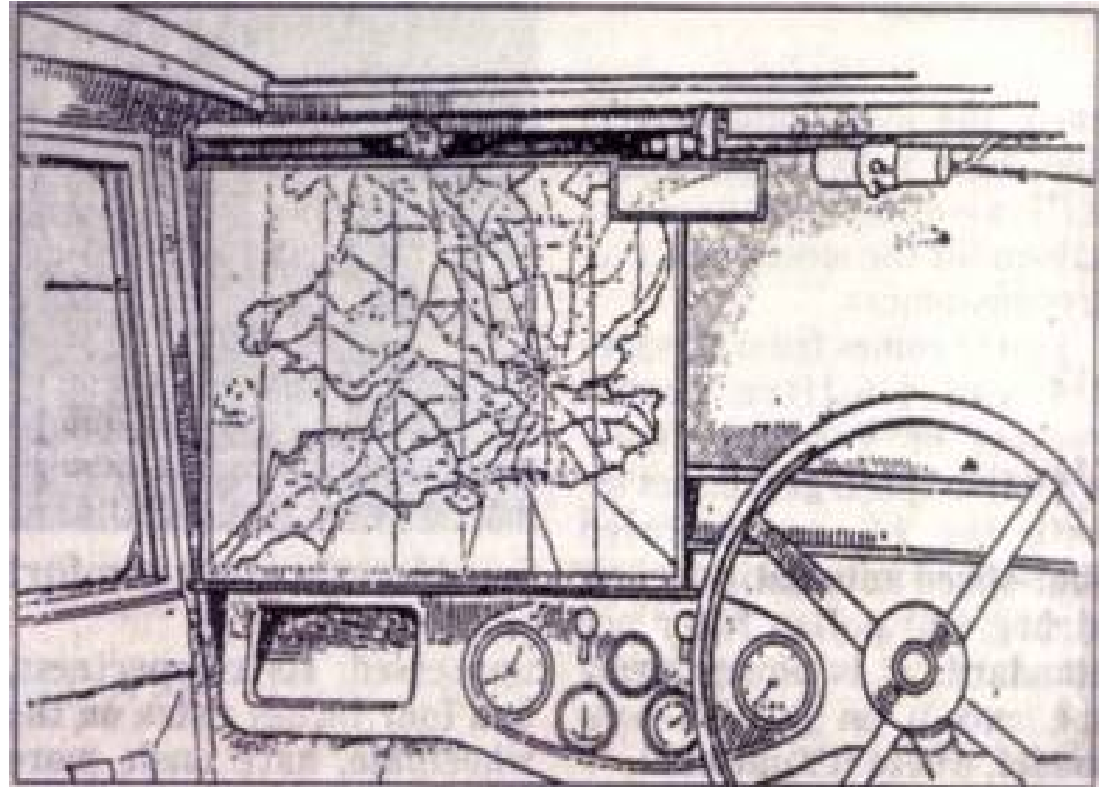
Technology and distracted driving: technology-push, demand-pull and the consequences of poor design

Andrew Parkes
Chief Research Scientist
4th October 2005

A good idea at the time!

DASHBOARD
information units are nothing new, though the practicality of the Whitehead & Mason 'Semper' map of 1930 was debatable.

The Semper was a spring-loaded roller blind overprinted with a 16-miles-to-the-inch of England, Scotland and Wales.



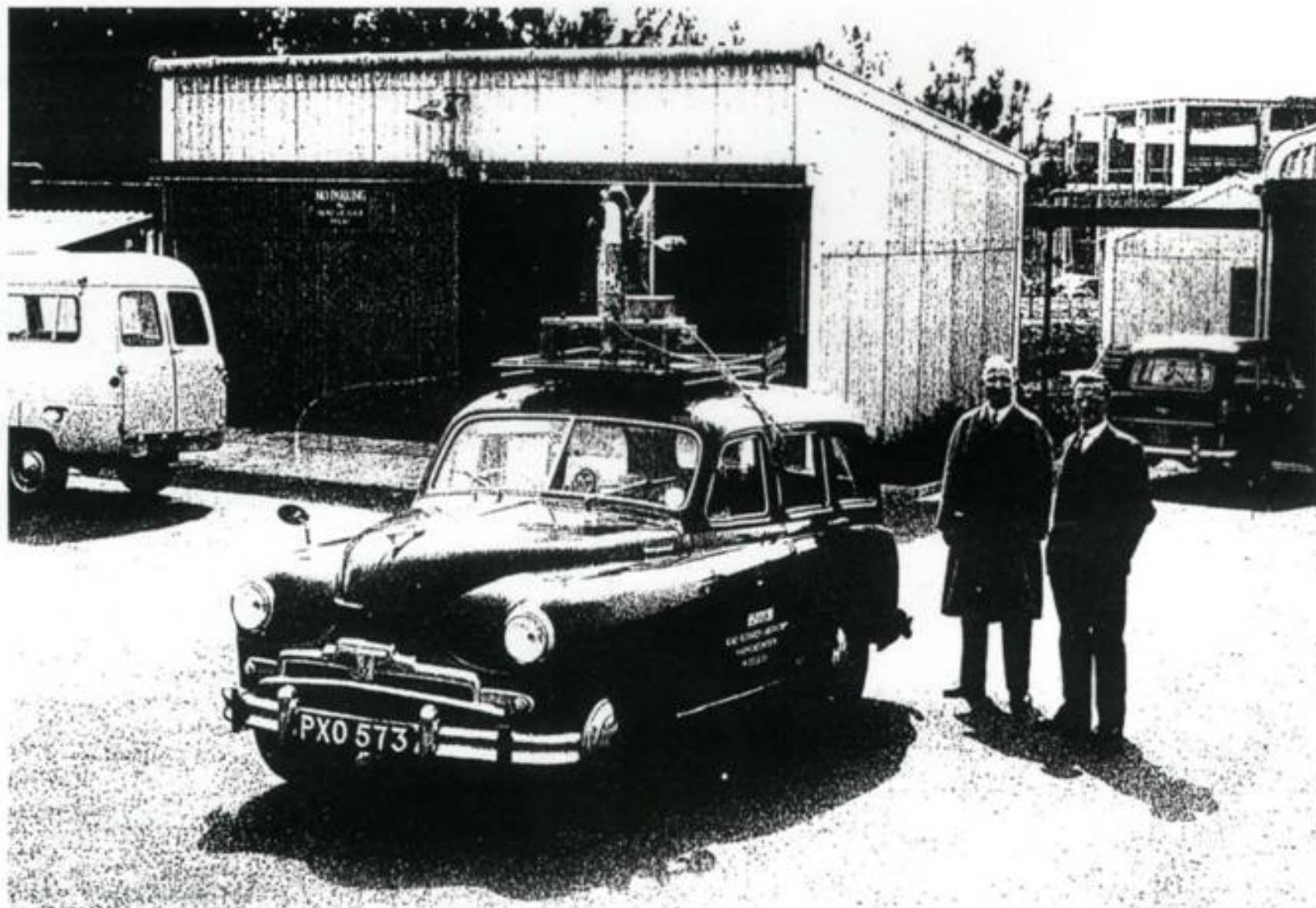


Figure 1.6 Prototype distance sensing equipment at the Road Research Laboratory (U.K.).









A SELF-TUNING RADIO SOUNDS A LOT BETTER THAN HOSPITAL RADIO.

Just imagine it. You lean across to tune to a traffic report and bang you end up causing one.

Tony Gilcor (I was trying to get Radio 1).

Thankfully it's one sticky moment you'll avoid with Panasonic's latest car stereo, the RB15.

Thanks to the CONTOUR circuitry, this revolutionary device is actually *easy* to tune, itself.

Easy it being you, at the car. It auto-tunes. Automatically.

And then, leaving thoroughly depressed you with the stick-up on the roads, it does something even

more remarkable. It finds a station playing your taste in music. Jazz, rock, classical, whatever tickles your fancy.

And if the signal starts to fade, the busy RB15 re-tunes to a stronger one. Automatically.

It's probably the best car radio that actually improves your driving. Call us on 0344 8530928 to find out more about the RB15. It's 15.

OK if you want a car stereo that's

approved by the Highway Code



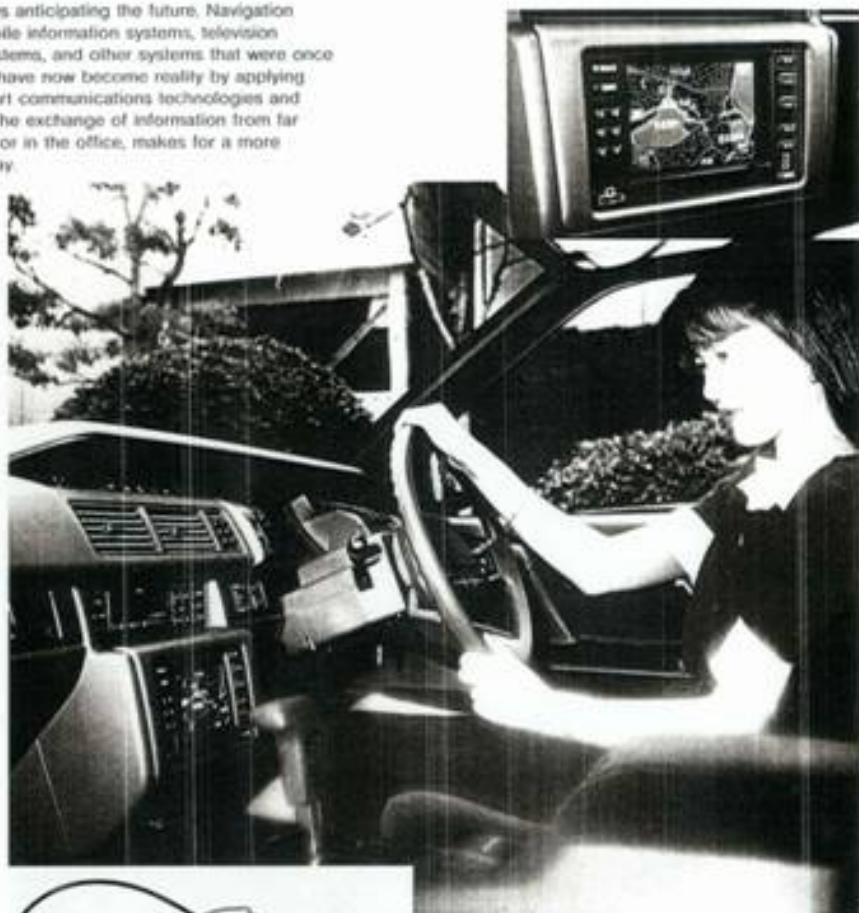
© 1994 Panasonic UK Ltd. Model RB15. Price £149.95.



Panasonic
Car Audio

PRODUCTS FOR THE FUTURE

We are always anticipating the future. Navigation systems, mobile information systems, television education systems, and other systems that were once only dreams have now become reality by applying state-of-the-art communications technologies and electronics. The exchange of information from far away, the car or in the office, makes for a more productive day.



Navigation/Vehicle Location

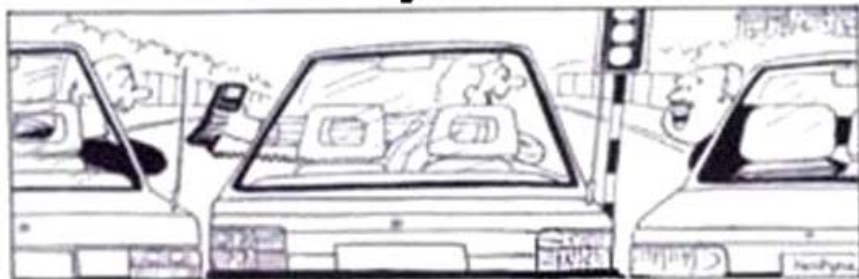
Many drivers have wanted for a machine that would tell the correct route to their destination — the "locator" is the first step in that direction. Using built-in digital maps, the locator is an independent position-detecting device capable of compensating for cumulative errors in the system sensors (wheel sensors and direction sensor). Applications include stand-alone navigation systems and vehicle location systems in which a central dispatcher can keep track of vehicle locations.



Circa 1995 UK



HOW TO TALK TO TWO PEOPLE AT ONCE WITH JUST ONE PHONE



Drive closer together

OR

MAKE A THREE WAY CONFERENCE CALL

Imagine the scene. You're on the cellphone when you need to check some figures you've discussing with a client. Do you hang up on your client, ring a colleague, then redial your client — a tedious and time-consuming process when you could lose the thread of your conversation — or lose the client.

No. Simply hold a **CONFERENCE CALL*** Ask your client to hold on for a moment, then dial your colleague's number and press **END**. When he answers, you can have a private discussion, then press **END** again and have a three-way conversation.

If you want to continue the rest of your conversation with your client in private, you can end the call with your colleague at any time by



pressing **END** again. Or you can end the call to both parties simultaneously by pressing **END**.

Try it. It's simple, impressive and it means decisions can be made in one conversation rather than three.

Another facility enables you to answer a second call while talking to the first. You will hear a soft ring tone in the speaker; ask your caller to hold on, press **END** and you are then

talking to the new caller. Each time you press **END** you shuttle between callers, either of whom can end their call by hanging up.

You can then disconnect your remaining call (or both together) in the normal way by pressing **END** when you have finished your conversation.

These facilities are available on all Cellphones using the Cellnet network and Metrosia Communications Services airtime, they're just some of the features that make your Cellphone convenient, flexible and indispensable.

If you have any questions about making the best use of your Metrosia airtime, ring our AdviceLine on 0256 542444.

*The subscriber will be charged at the standard rate for both outgoing calls.

Lilburn
Rotheram
n London
your car
engine run-
honking
never ac-
ere.

G. Foster
Blyth

of bread,
into animal
hammer and
've thawed,
imal bread
e kids.

s. J. Crooks
Grantham

Watford
ANNOY neighbours by buy-
ing a TV set exactly like
theirs. Then, when they are
watching telly, stand outside
the window and change the
channels using your identical
remote control.

Leigh Drake
Portsmouth

MAKE people think you
have an expensive car phone
by calling them, asking them
to repeat everything they
say, then hanging up half
way through their reply.

Mr. I. Baxter
Exemouth

J. A
F
WRAP lightbulbs
tape to prevent them
ing in the event
should fall out
bayonette fixings
reason.

Wa
MUMS. Make me
by dipping potato
colouring before
frying. Hey prest
chips.

Mr



The new BT Azure - voice activated dialling for safer driving

Face facts. Dialling on a carphone can be a risky business. Even with "hands free" systems, you still have to take your hands off the wheel and your eyes off the road to dial.

But not with the BT Azure. It's the only truly reliable - truly voice activated - car phone. Just tell it the number you want and it will confirm your instructions before dialling. You can even programme it to respond to a name for up to 20 of your most frequently used numbers.

BT Azure can respond to any voice, not just a single user, and it can answer automatically too, without you having to lift a finger. In fact, the hands free and eyes free BT Azure offers an outstanding range of road safety features.

And as with all BT cellphones, the Azure comes with:

- Top quality coverage from the Cellnet network
- Callback - the ultimate answering service
- 12 months Supercover maintenance and free 24 hour Customer Service Helpline
- Now Nationwide Dealer Network

So don't be a reckless dialler. Try talking to the BT Azure. To find out how the BT Azure can meet your company's requirements, call us now on 0800 232 020. Be Mobile. Be Sure. BT.



Recommended
as an aid to Road Safety

TRADE
ENQUIRIES
WELCOME



Anglia Telecom

CALL FREE 0800 232 020



cellnet

Cellular Division

powered by

BT



WARNING! BLACK
ICE AHEAD!!!

ATTENTION! INCOMING
FAX MESSAGE!!!

E DRIVE STA MMI



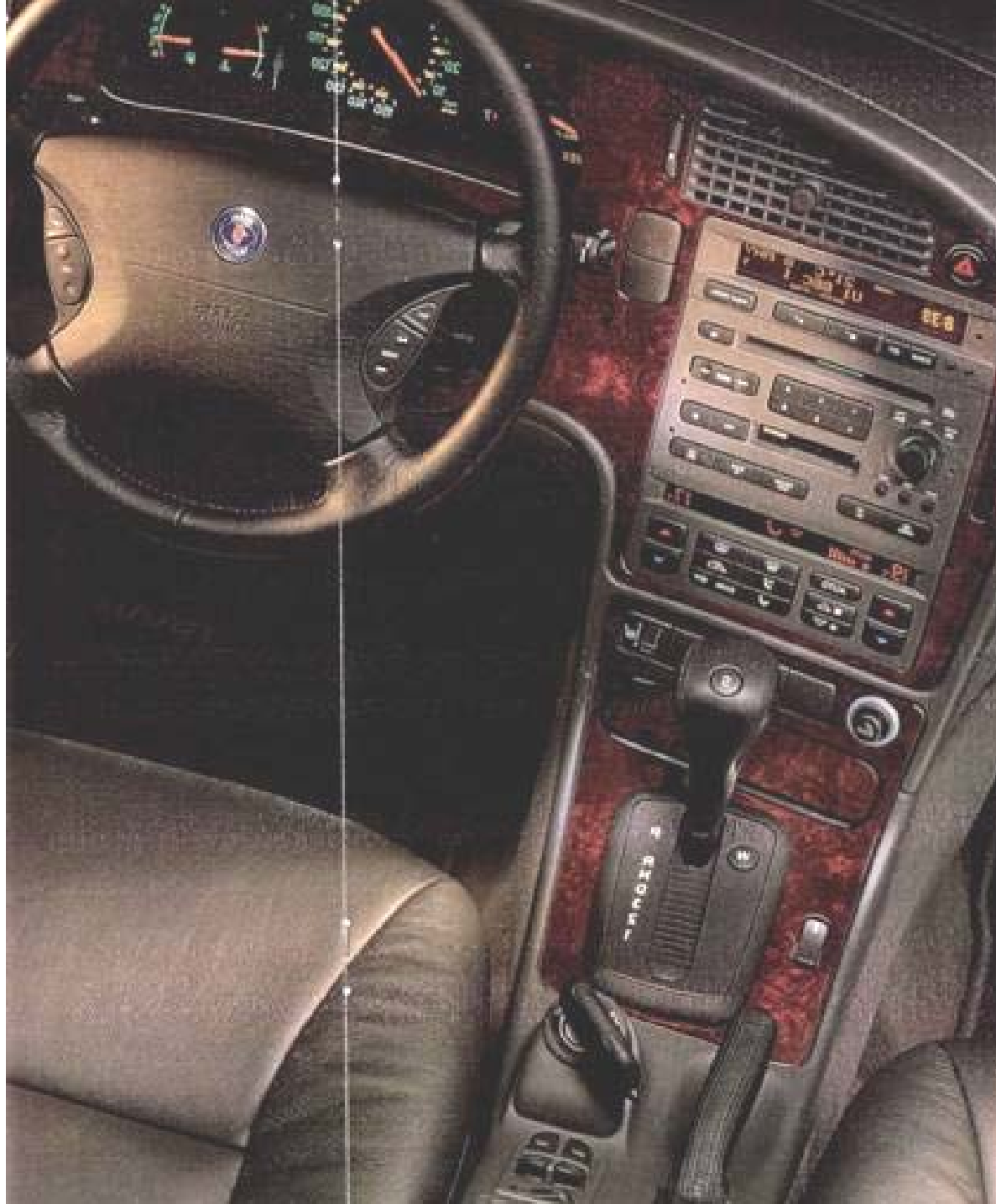


A revolutionary interior: Linked to drive-by-wire electronics, the central sidestick replaces steering wheel and pedals.









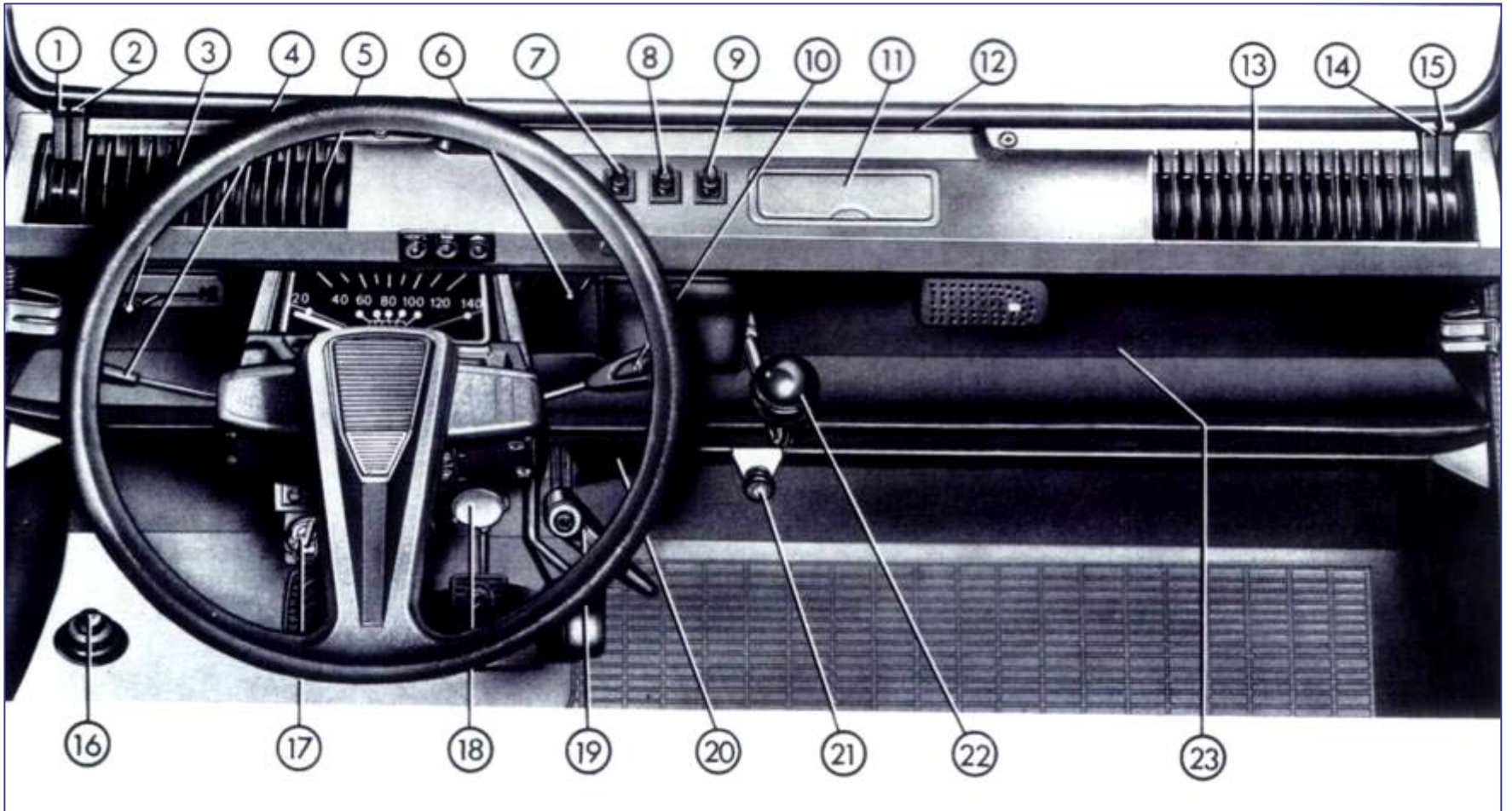






BMW: Dialogue Management





Level of control by car manufacturer changes with introduction of open and nomad systems



Microsoft comes to the market

In July, readers in the US will be able to buy an in-car stereo that can be controlled by spoken commands, offers navigation and can be linked to communications devices for real-time traffic information, at a starting price of US\$1,299.

Richard Scrase considers the implications for the ITS industry

WHEN Microsoft chairman Bill Gates took to the stage at the Consumer Electronics Show in Las Vegas last month, the anticipation in the crowd was phenomenal. The world's most successful software company had just unveiled plans to spread the use of its Windows computer operating system from desk top and lap top computers, to tiny palm top computers and even to computers in cars.

Many people attending the show were computer dealers, so much attention in the crowd centered on the so-called Palm-PC. However, Microsoft's Auto-PC plans are in many ways more revolutionary and promise to have a strong bearing on the future development of the ITS industry.

Spoken control

As ITS manufacturers first revealed in November 1996, Microsoft sees the in-vehicle market as a natural venue for the use of personal computers. The company has had to overcome the

The speech technology enables drivers to control most functions of the computer with simple voice commands, including the unit's digital radio and CD player. The computer can also give spoken instructions (such as navigation directions) or useful information (such as reading out e-mail messages) on request.

"We anticipate Microsoft's pioneering use of interactive speech technology will become widely accepted as the primary way of interacting with automotive computing devices," says Craig Mundie, senior vice president of Microsoft's consumer platforms division.

"Our user interface is really key to what we're doing here," says Bill Gates, chairman of Microsoft. "Productivity is key, you want to be able to get messages, traffic reports, be kept very up to date, even when you're in the car. And you also want applications, navigation is probably the most important, but even things like letting you customize the way you use the radio, keeping track of names

What technology actually reduces distraction?

- Adaptive dashboards
 - Scaled speedometer
 - Infinite focal length
 - Selective information
- Infrastructure support
 - Navigation
 - Speed limits
 - Blind spot




Reduction of distraction by ADAS?

- Adaptive Cruise Control (ACC)
 - Intelligent Speed Adaptation (ISA)
 - Lane support
 - Collision Avoidance (CA)
 - Automated Platoons
-
- ...certainly have potential to improve safety...but is it by reducing distraction?

Can we remove
too much from
the task?

- Feet off
- Hands off
- Brain off?

A. H. PARASURAMAN



HFES 41st Annual Meeting
Albuquerque, New Mexico
September 22-26, 1997

Workshop 11: A Multimodal Perspective on
"Automation-Induced
Complacency"

John D. Lee
Battelle Human Factors Transportation Ctr.

Raja Parasuraman
Catholic University

John R. Bloomfield
University of Nottingham

But what is the way forward?

- Dialogue management?
- HUD's?
- Voice recognition and auditory displays?
- Tactile displays?



Dialogue management

- Long tradition of research in Europe – GIDS, GEM, HARDIE etc. from 1986 onwards
- Concept of the intelligent co-driver
- Much of effort seems to be to reduce interference of entertainment systems
- ...but is necessary, as personal communication devices are firmly established

Take two examples



What metrics can distinguish between the devices?

- Time off task?
- Glance frequency?
- Glance duration?
- Time to collision?
- Steering entropy?
- Lane change behaviour?

How to refine methods?

- Who can use the information?
- For what purpose?
- Very difficult to develop meaningful **standards** – performance, product or process?
- Promising approaches
 - Value of reference models
 - Occlusion, 12 second rule, LCT

How important to continue developing technology?

....to reduce risks of distracted driving

...would need to differentiate between technologies designed to **reduce distraction**, from those designed to **mediate the consequences of distraction**

Applying a strict operational definition

Carphones		No
Route navigation	Yes	
Adaptive Cruise Control		No
Lane support		No
Intelligent Speed Adaptation	Yes	
Blind-spot monitors	Yes	
Platoons		No

“Cars of the Future”

House of Commons Transport Committee
Seventeenth Report of Session 2003-04
Volume 1

HC 319-1

Published on 7 November 2004
London: The Stationery Office Limited

Contents...include

- The environment and car of the future
- Future fuels and technologies
- Incentives for low carbon and alternative fuel cars
- Vehicle safety technology
- Telematics for ITS
- Consumer awareness

Some assertions...

'half of all fatal and disabling injuries could be avoided if all cars provided the impact protection of the best cars in the same class'

ADAS

‘Although the Department for Transport’s research programme includes advanced technologies such as driver assistance systems, these evaluations have been aimed at single systems rather than the combined effect of various systems.

Yet it is quite possible that when a variety of technologies are introduced together in a vehicle, there will be negative effects on safe driving behaviour’

Technology (and the market) will not stand still



A revolutionary interior: Linked to drive-by-wire electronics, the central sidestick replaces steering wheel and pedals.

Onus of responsibility

‘Witnesses agreed that it was the role of the vehicle retailer to impart information about technological equipment before selling a car, and that the driver should take necessary steps to ensure they understood how to operate the vehicle safely’

‘Only car retailers are currently in a position to tell car buyers how to operate advanced technology properly. They should have a legal obligation to inform customers of the driver assistance equipment in a vehicle, and to explain the purpose, limitations and functions of the equipment.

*The Government should introduce a **formal process** for recording that a retailer has fulfilled this obligation’*

'It is clear that aspects of vehicle technology and design are advancing ahead of associated legal, policing and driver training considerations. The Department of Transport, Home Office and Police must close this gap.

It is in the interests of everyone to have liability and responsibility clarified'

'Intelligent' car insurance systems

Pay as you drive (PAYD)

...but, should this be a function of ADAS?

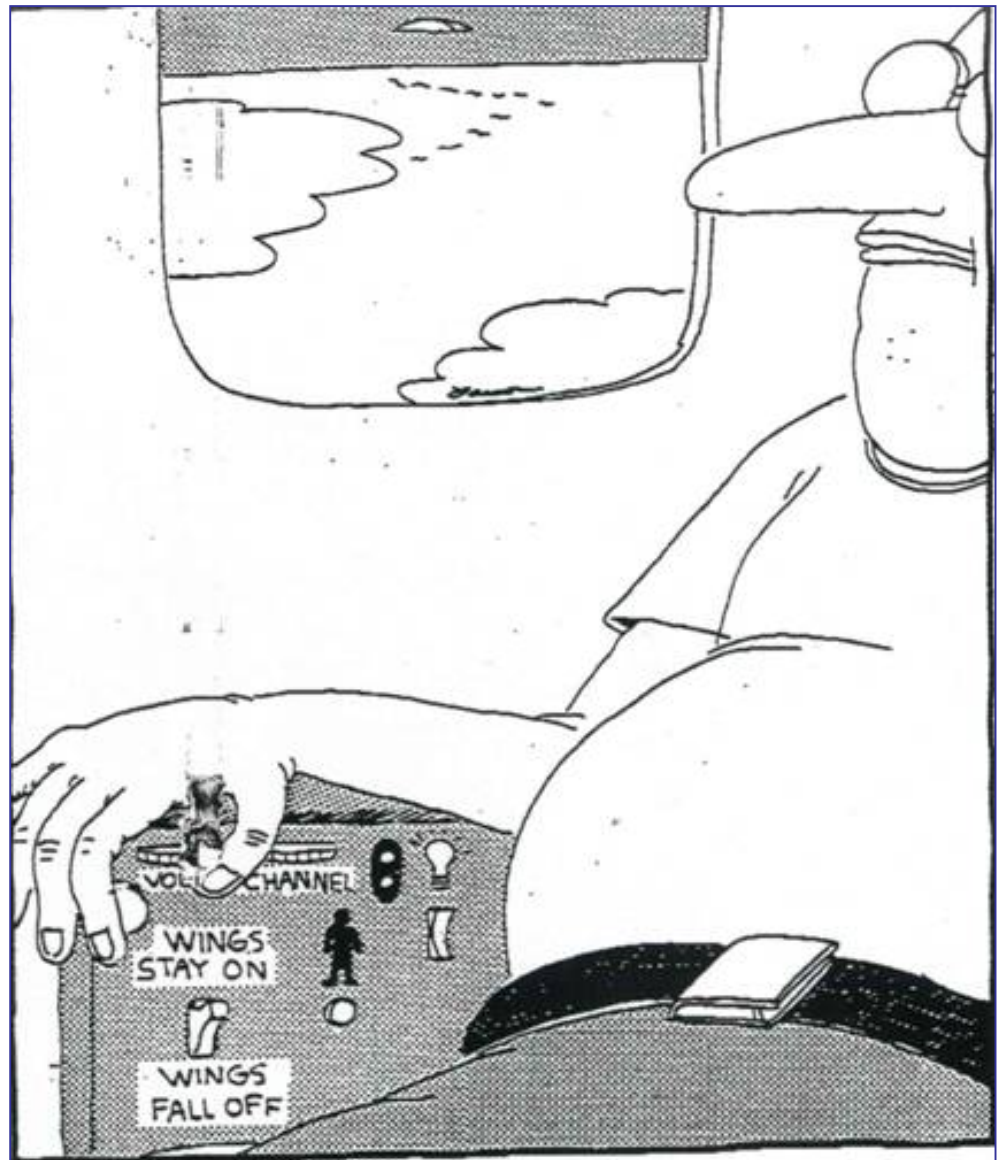
...and should it be mediated by Continuing Skills Development Training (CSD)?

Training?

RAC reported 'most drivers supported the idea of periodic refresher training for all drivers, typically every 5 to 10 years'

N.B. EU Directive on Compulsory
Professional Driver Training

It is possible
to provide too
much
functionality!



Fumbling for his recline button,
Ted unwittingly instigates a disaster.

The end

