

FRIENDLY

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# EXCHANGE

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## Our Love Affair With CARS

HOOKED ON THE CLASSICS • ON-BOARD COMPUTERS  
CARS OF THE FUTURE • DESIGNER CARS  
UNIBODIES: A BOON • PICNICS: MOVEABLE FEASTS



# Shifting to Digitals

*Come ride with us in our futuristic, computerized and electronically controlled car that's not as far out as you might think.*

The sun is barely cresting the horizon as you finish your coffee, grab your briefcase and hurry out the door. You've a lunch meeting to make in another city, a good five hours away—if you beat the rush-hour traffic.

You head toward your car, pressing the button on a Laser Key as you approach it. The car begins to rise on its suspension, its driver's door swings open, and a dozen little motors whine softly as the seat, steering wheel, pedals, entertainment and climate-control systems adjust themselves to your pre-set preferences.

You slide into the seat and glance at the pop-up Systems Sentry as it runs a "pre-flight" check of all mechanical and electrical systems. After you close the door, the car settles down to driving height. A second touch of the Laser Key activates the rear-view TV and navigation screens; the Systems Sentry, its task done for the moment, drops out of sight.

Touch the Laser Key again to start the engine, and a small, "heads up" instrument screen rises from the base of the windshield in front of you. As in the latest jet-fighter aircraft, important instrument readings are reflected onto this screen from below so you don't have to take your eyes from the road to monitor them.

You load a map cassette into the navigation computer, touch a third screen, a multi-function "Command Center," to display the proper map and scale, then touch it again to link up with the NavStar satellite that will help keep you on course during the trip. When the satellite locks onto your present position, a blinking dot (cursor) appears on the navigation screen.

A touch-button on the steering-wheel hub shifts the transmission into gear and you're on your way, your progress mirrored on the video map and your heading displayed on an electromagnetic compass. Accelerating onto the freeway, you touch the Command Center screen to call up a larger-scale map. No accidents or tie-ups are indicated along the way.

The car's front suspension begins to settle and the rear rises slightly to a more aerodynamic "angle of attack." The front air dam and rear spoiler deploy to increase stability and lower wind drag even further as your speed increases.

Tiring of the radio, you touch the Command Center screen to call up an entertainment-system-control display, load a

disc into the compact digital audio deck and settle back to enjoy your favorite road music. This Command Center screen also displays and activates controls for the car's Trip Computer, electronic climate control, calendar and a number of other functions on demand.

After an uneventful hour or so, a buzzer suddenly interrupts your thoughts. It's the Traction Monitor, sounding and flashing a warning that the road surface is dangerously slick for the speed at which you're traveling. You slow until the buzzer stops, thankful for the warning, and notice a couple of cars off in the median. The outside temperature reading flashes 29 degrees, explaining why the few remaining puddles of melted snow are beginning to turn to ice.

You check the Trip Computer for a new ETA (estimated time of arrival), and it indicates a few minutes after noon. Oh well, better late than never. It also reports an average fuel economy of 37 miles a gallon for the trip so far, and seven gallons of fuel remaining (280 miles to "empty" at the lower speed), with just over 100 miles to your destination.

You decide to call ahead to report you'll be a little late. A touch-button on the steering-wheel pad switches on the voice-actuated radio-telephone. You request the number orally and, like a human operator, the computer acknowledges. In a few seconds you're talking with your party, with both hands still safely on the wheel.

Far out? Not as far as you might think. For the car already exists.

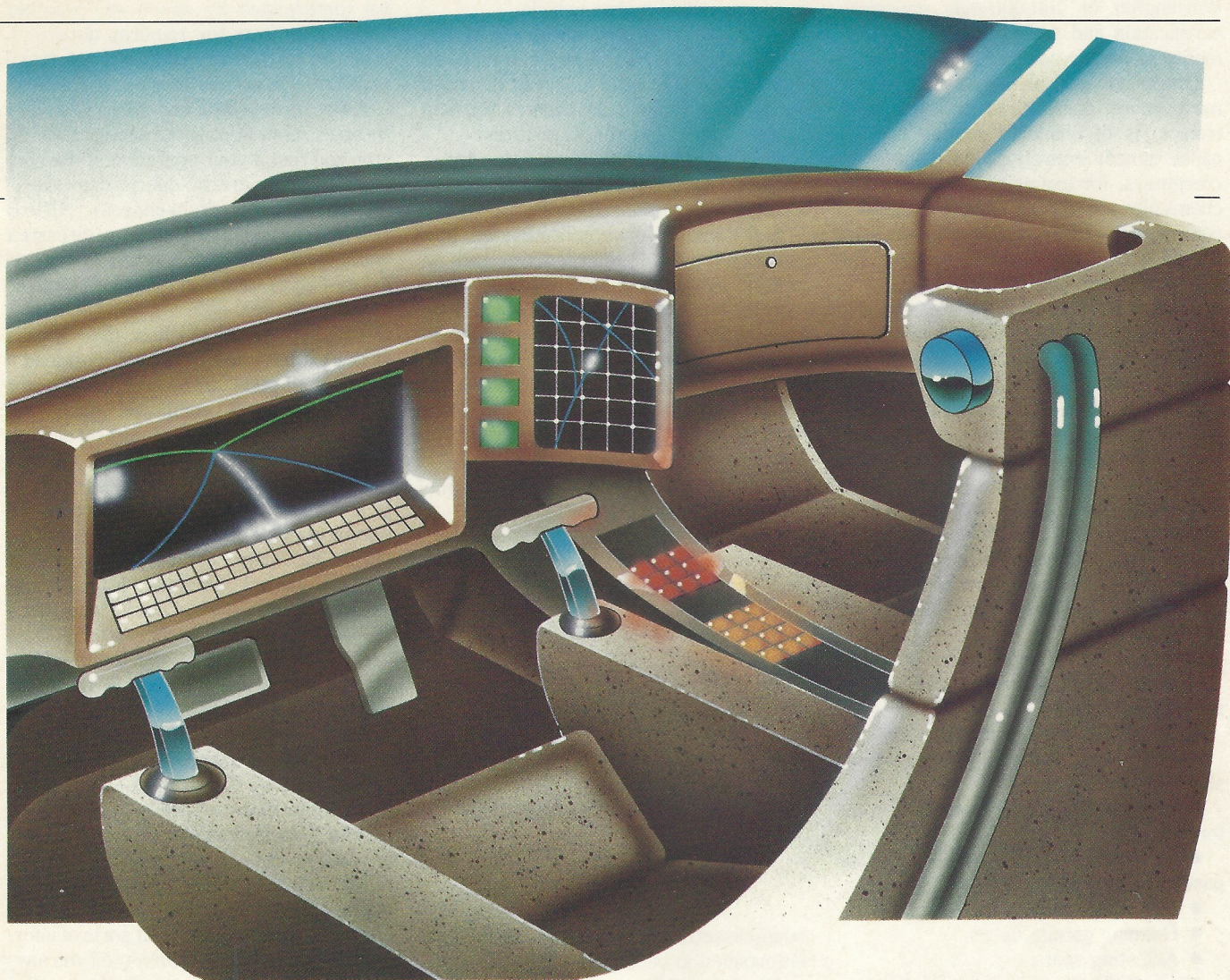
Called the Buick Questor, the futuristic concept sports car was introduced at the 1983 Detroit Auto Show to demonstrate some of the thinking and capabilities of the talented group of electronics engineers at General Motors' Buick Division. The Questor had no engine or drive-train, but its wondrous electronic systems are very real and achievable in the not-very-distant future. Some, in fact, are already available.

It's hard to say who has the lead in automotive electronics at any given time.

Chrysler introduced electronics ignition in 1970, and "led the way with computer-controlled engines," says Chrysler Corporation spokesman Tom Jakobowski, referring to computerized engine controls in many 1975-model Chrysler cars.

By GARY WITZENBURG





Electronic fuel-injection and instrumentation (both with diagnostics capability), electronic Navigator, Voice-Alert and electronically tuned radio are standard equipment in the 1984 Chrysler Laser XE turbo sports car.

Ford Motor Company introduced its own Electronic Engine Control (EEC) in the 1978 Lincoln Versailles and claims its current fourth-generation system (EEC-IV) is the world's most advanced. In 1980 Lincoln Continentals and Mark VIs, Ford combined a trip computer and message center with its first electronic digital instrument panel.

General Motors introduced what it called Computer Command Control (CCC) in all of its 1981 gasoline-powered cars. GM's Cadillac Division marketed the industry's first trip computer as an option in the 1978 Seville.

That same year, Buick boasted the first electronic-touch climate-control system, which eliminated the troublesome mechanical levers and cables.

Japan's Nissan came up with the first primitive talking dashboard ("please turn

off your lights") in its 1981 Datsun Maxima, while Toyota pioneered the full digital/graphic instrument panel in its 1982 Celica Supra.

**B**ut who, outside of electronics wizards and video-game freaks, really cares? What does a computer in a car do for you and me? Weren't we better off in the good old days?

Taking the last question first, the answer is yes . . . and no. Yes, because those simpler cars of yesteryear *were* easier to diagnose and fix when they broke down. No, because if you really stop to think, you'll recall that they broke more often . . . and needed a *lot* more maintenance. Besides the usual oil changes and tune-ups and spark plugs every few thousand miles, there were clumsy ignition points to replace and adjust, cranky carburetors to clean and tune . . . you do remember all that, don't you? It was fine for those who love to tinker, but a royal pain for the rest of us.

There was a tough transition period—*after* federally mandated emission controls

made engines more finicky and *before* modern electronics began making them far better than they'd ever been. But virtually all of today's new cars are powered by computer-controlled engines, many with electronic fuel-injection as well, that meet the toughest-ever emissions requirements, give outstanding fuel economy and start, drive and perform better than just about anything built in the last decade.

"Look at what electronics has done for us in just the last 10 years," says Leonard Groszek, Ford electrical and electronics design engineer. "Electronic ignition, electronic quartz clocks, electronically tuned radios. . . . In all cases, reliability has been improved by several orders of magnitude. It reduces complexity, the number of parts and especially the number of moving parts."

Manufacturers didn't start putting computers into cars on a whim: There came a point where they just couldn't meet emissions and fuel-economy laws with the old conventional, mechanical equipment. Engineers saw electronics as the way to achieve more precise engine control.



There was even talk at one time in Washington of 100,000-mile emissions certification and sealed-engine compartments so people couldn't tinker at all.

One major goal of the manufacturers, made more possible by modern electronics, is to eliminate routine maintenance almost entirely. Future on-board computers, for example, may be able to chemically analyze oil, fuel and radiator coolant, detect wear and tear in mechanical parts and electronically readjust the engine to compensate.

Many major electronics systems now in cars are capable of diagnosing themselves, memorizing their own malfunctions and communicating with the service technician. At the moment, those usually reliable computers can be expensive to replace if they do go bad, but (like pocket calculators) they'll eventually evolve into cheap throwaway components, experts say.

Best of all, now that those black boxes are in our cars, they can be used to do a lot more than control emissions and improve fuel economy and drivability. Already they are capable of:

- Providing trip information.
- Warning of mechanical and safety-related problems.
- Giving routine service reminders.
- Controlling automatic-transmission-shift schedules.
- Keeping cockpit temperatures comfortable.
- Adjusting suspensions for varying passenger and cargo loads.
- Deterring thieves.
- Opening garage doors.
- Adjusting seats.
- Controlling interior/exterior lights.
- Giving concert-quality stereo entertainment, and a whole lot more.

Some of these systems are admittedly still in the gadget and gimmick category, but most can greatly improve comfort, convenience, safety and overall driving enjoyment. They are typically featured first in the more expensive luxury and sports models, but will eventually trickle down into basic family and economy cars.

The future possibilities are mind-boggling. We've already taken a ride in the Questor, Buick's idea of the electronic auto of the late 1980s, but it has three features we didn't mention:

One feature is an infra-red, ultra-sonic theft-deterrent system. Others are headlamps that automatically aim around corners and adjust their intensity to conditions, and brake lights that flash brighter and faster the harder you apply the brakes.

Ford's concept car, the Continental Concept 100, was more impressive at its 1983 debut mainly because it was a fully drivable car (based on the all-new 1984 Continental Mark VII Luxury coupe), containing what Ford called "the greatest

array of *functioning* advanced electronics ever assembled in one vehicle."

In addition to satellite navigation and six other displays (available one at a time) on the same TV-like screen, and an advanced Voice Alert (talking dashboard) warning system, the Concept 100 features:

- Voice Command, letting the driver operate headlamps, wipers and power antenna with oral instructions.
- A Remote Convenience System that can open the trunk, unlock doors, turn on interior lights, flash the headlamps and blow the horn (to locate the car in a parking lot or scare off intruders) with a hand-held transmitter from as far as 200 feet away.
- A Sonar Detection System to warn of a person or object behind the car when backing (and to aid parallel parking).
- Keyless entry and ignition.
- Electronically controlled air suspension and anti-skid brakes.
- Even a rear-seat video game system (with earphones) and a separate remote

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microcassette tape deck to keep the kids entertained in back.

As you would expect, the Japanese are big on electronic gadgetry, and both Toyota and Nissan have advanced electronic concept cars to showcase the kinds of things they're thinking of for the future. Instead of satellites for navigation, Nissan's latest research vehicle (NRV-II) uses maps loaded into the computer on small "floppy discs" and a Verbal Dialogue System that lets driver and car communicate with pre-programmed instructions in any language. Once you plan the route and load your instructions into the computer, it follows your progress on the video screen, telling you which way to turn and when.

**T**he oral system also takes cruise-control speed commands, adjusts the outside mirrors and interior lights, and activates the hazard flashers. Exterior lights and wipers? They take care of themselves, the latter with an optical raindrop sensor that switches them on and off and adjusts their speed and interval.

An Auto-Cruise Radar system constantly measures and displays the distance to the vehicle ahead, sounds a warning and slows to that vehicle's speed if that dis-

tance decreases below a certain safe interval (determined by speed and weather information from the raindrop detector), then readjusts to the originally set speed once the slower vehicle is out of the way.

A Drowsiness Monitor warns you (gently once, more sternly the second time) to stop and rest if your operation of the controls becomes erratic due to drowsiness (or, presumably, drunkenness). NRV-II also has anti-skid braking, a tire-pressure warning device and a variable-tension safety-belt system that gives less slack as speed increases.

The purpose of much of this, Nissan says, is to reduce the "driver workload," which is all good, to a point. Satellite or self-programmed computer navigation seems like a great idea as long as it doesn't distract attention from the road. ("Looking at your map display while driving is probably safer than unfolding your map and putting it over the steering wheel," says Oliver McCarter, executive engineer at GM Advanced Product Engineering. "Voice Command would help, and that's the best argument I've heard for it.")

Anti-skid braking is one feature U.S. automakers hesitate to install; they fear the inevitable liability lawsuits should such systems ever fail.

As for talking dashboards, pioneered in this country by Chrysler, they are much more useful in its second-generation system for 1984. An even more elaborate one is available in certain 1984 GM cars.

The newer systems are more discriminating about when they open their little electronic mouths, and what sorts of information they offer. They don't tell you anymore that "your door is ajar" when you're stopped and someone has just opened it. They *do* remind you to turn off your lights or remove your key (if you've forgotten to) before getting out; they give you crucial operating information ("your engine is overheating"), and GM's will even tell you what to do about it ("please slow down and turn off the air conditioning") and what can happen if you don't ("severe engine damage may result").

Automakers today, particularly our own and the Japanese, seem to be going through a period of electronic one-upmanship, trying to outdo each other and be first with this and most sophisticated with that. It's a bit like the horsepower race of the 1960s, except that a lot more usefulness is coming out of it.

Devices that sell will be continued and improved. Those that don't will fade away like yesterday's political promises. □

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