

Motorola's Intelligent Vehicle-Highway Systems' ADVANCE Project

Project: 1991-92. I worked for Aaron Marcus and Associates (AM+A), of Emeryville, CA, a design consultant for the project. One of the main components of the system was an in-car, touchscreen, GPS navigation assistant, for which AM+A was retained to design the user interface.

Role: My title was Designer/Analyst, and I was the lead designer for AM+A on the project. I collaborated with Aaron Marcus, Greg Galle, Director of Design, and Todd Blank, a freelance Visual Designer. AM+A split the project into two segments: Features and Setup, and Route Guidance. I was individually responsible for the Route Guidance segment.

Motorola also retained The American Institutes of Research (AIR) for requirements gathering before approaching AM+A. AIR remained involved as a participant in client meetings after AM+A joined the project, but we did not collaborate directly.

Information Architecture and Mental Model

Visual Display of Route Guidance Arrows: Flat vs Perspective

Three Formats of Route Guidance

Accolades

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Information Architecture and Mental Model

When Motorola approached AM+A they already had an interactive prototype developed by AIR, and a rough prototype of the route guidance mode of the system developed by Motorola's engineers. Motorola initially only requested AM+A design better icons and arrows.

The prototype by AIR was designed to prioritize speed of access to system features. Its hierarchy was broad and flat. The opening screen was a tiled layout of icons with no spatial or visual hierarchy and no text other than the icon labels. It probably was the most efficient design for quickly accessing a deep list of features, but it was also confusing, disorienting, and an unpleasant experience.

I pointed out that the design prioritized speed at the cost of comprehension, and authored a report to Motorola that won AM+A a six-month contract to redesign the system model before designing the look and feel. During that phase I made hundreds of sketches of wireframes, flows, and hierarchies, and several trips to Motorola's headquarters in Illinois for design meetings, before we arrived at the revised model.



Click image for PDF.

<http://www.gletzdesign.com/motorolaNav/images/motnavScreens.pdf>

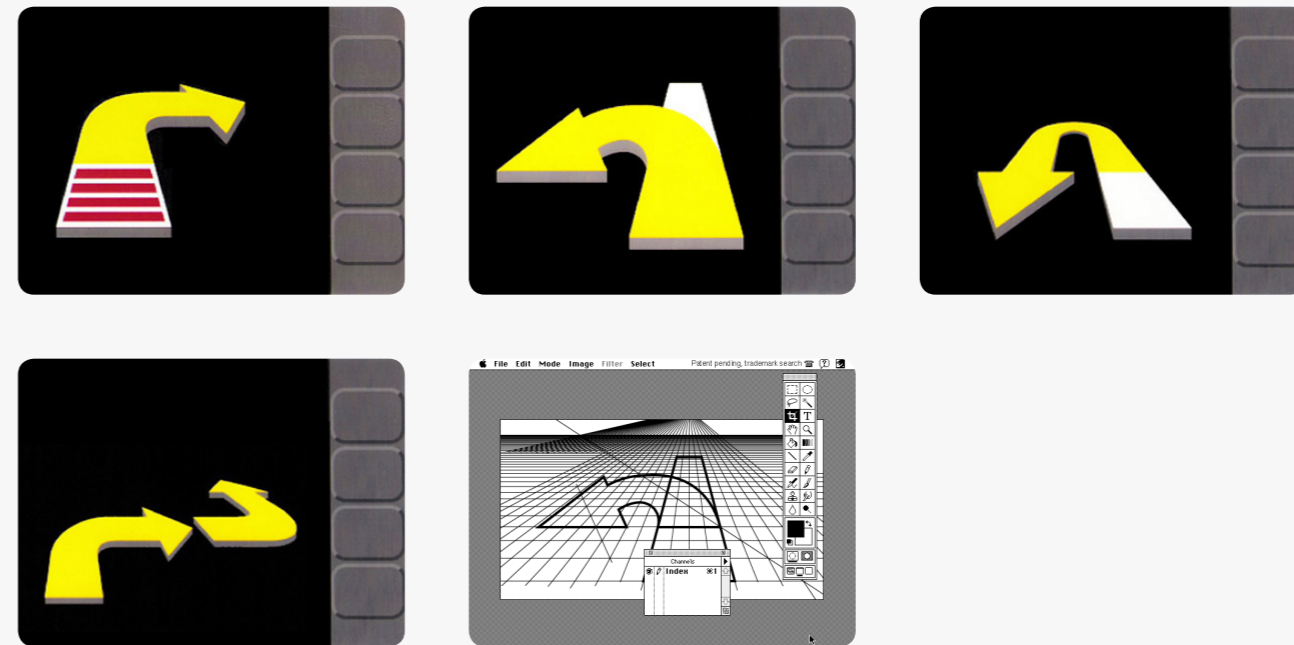
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Visual Display of Route Guidance Arrows: Flat vs Perspective

The client envisioned the route guidance mode of the system with large 3D arrows to indicate upcoming maneuvers. They had a rough prototype with four red bars on top of the arrow that would disappear one at a time as the car approached the maneuver point.

The rich geographical information and high-definition displays we're accustomed to today weren't available for this project. It couldn't show landmarks or lane information, and it could only represent general types of maneuvers. I made 3D studies in Adobe Illustrator of a variety of maneuver types that helped push back against the perspective view. I was concerned that a perspective view of maneuvers could be misleading because it implied a degree of fidelity with reality that the system was incapable of providing.

The limited resolution of the display was also an issue. The images shown here are scans of high resolution prints of PDF files. The same images would have had very jagged, pixelated edges on the target display for the system.



Click image for PDF.

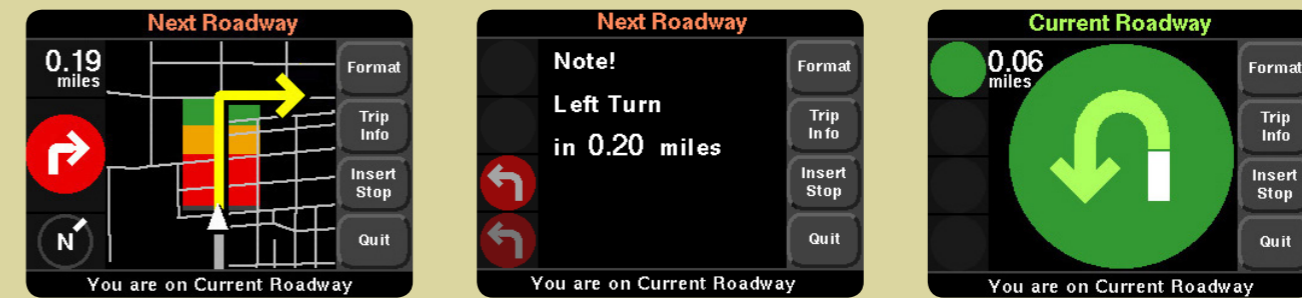
<http://www.gletzdesign.com/motorolaNav/images/arrows3D.pdf>

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Three Formats of Route Guidance

AIR's research had shown that Route Guidance should be provided in three formats: text instructions, on a map, and with large arrows. I created animations with verbal and tonal audio cues, about 90 seconds in length, of a variety of types of maneuvers in each of the three formats. They were to act as a visual spec for the route guidance mode of the system. The original animations were created in an early version of Director on a Mac Ilci. I've recreated abbreviated versions of each here. The audio tracks for the videos were lost.

One of the main challenges was to determine how the same types of information should be displayed across the different formats while emphasizing different visual aspects for each format. Also, I showed that the scale of the geographical area to be shown on a map view of an upcoming maneuver should be variable based on the speed of the vehicle, the type of maneuver, road and traffic conditions, etc., and that this area in map view corresponded to a time variable in both arrows view and text view.



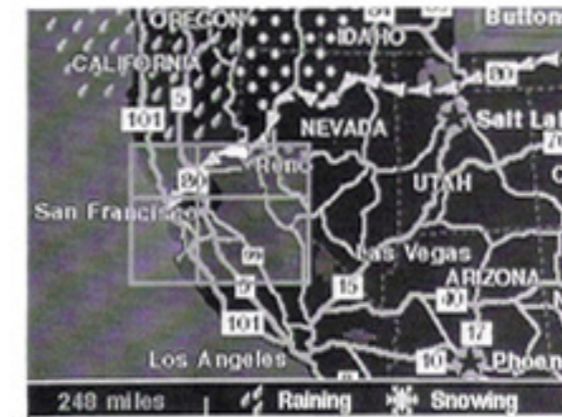
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The work was selected for inclusion in ID magazine's 39th Annual Design Review.

Motorola In-Car Navigation Assistant
A combination of hardware controls and "soft" controls that appear on a 4-by-5-inch color touch-screen LCD, the Motorola In-Car Navigation Assistant, designed by Aaron Marcus and Associates of Emeryville, California, includes zoomable and pannable maps, global satellite positioning and two-way radio frequency contact with traffic information centers. "Although the idea of in-car navigation is hardly new," said Buchanan, "this concept is boldly resolved."



"Although the idea of in-car navigation is hardly new," said Buchanan, "this concept is boldly resolved."



Designs for Motorola In-car GPS Device Were Included in I.D. Magazine's 39th Annual Design Review