

**Building A Digital Map of the Nation  
for Automated Vehicle Navigation**

by  
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ABSTRACT

A navigation computer with a moving map display is now commercially available at less than \$ 2000 for cars and trucks, and this places extraordinary demands on digital cartography. First, the equivalent of two paper maps must be squeezed into a single digital cassette. Then, the map data must be placed on the cassette tape arranged so the computer can stay ahead of the driver, regardless of speed. Also, coordinates must have a relative accuracy of a car-length. Finally, vast coverage --- the entire U.S. --- is needed by the end of 1986.

To meet this challenge, we have embarked on the largest digital mapping project ever undertaken. A key element of the project, perhaps the most important, is the mathematical basis of the system for digitizing maps and constructing cassettes. This basis facilitates chaining for data reduction, makes organizing cassettes by neighborhood possible, and helps to control the tremendous digitizing effort.

The presentation of this paper will include a short film of the Etak Navigator in operation.