

ITS Field Operational Test Summary

Herald En-Route Driver Advisory System Via AM Sub Carrier, Phase II

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Introduction

The Herald En-Route Driver Advisory System Via AM Sub Carrier, Phase II (Herald II) ITS Field Operational Test evaluates the utility of providing traveler information in rural areas. The Herald II system employs a subcarrier on a commercial AM radio broadcasting to remote areas in Colorado and Iowa. The project proposes to test the feasibility of generating, transmitting, and receiving messages over a large geographic area. The test assesses the use of AM subcarriers as a reliable, low-cost medium to communicate traffic messages in the challenging terrain of Colorado and the potentially interfering environmental conditions of Iowa.

Phase I of the test occurred from October 1995 to December 1995. Phase II began operation in 1996. A final report is expected in the second quarter of 1998.

Project Description

The Herald project is being conducted in two phases. Phase I of the test consisted of a communication technology feasibility study funded entirely by the ENTERPRISE group. [See the Test Partners section for a description of the members of this group.] Activities in Phase I included a literature search to help determine the design approach, the development of specifications, data requirements, and simulation models, the development of a prototype system, and the performance of pilot tests.

Phase II is the actual field test and evaluation and is supported by the Federal Highway Administration. This Phase consists of developing the prototype mobile receivers, modifying and installing the transmitter sites, developing message formats, and collecting, analyzing, and evaluating data. The project will assess the performance of an AM subcarrier as a basic data communication channel. The project will also assess the impact of the AM subcarrier's channel characteristics on the channel's ability to disseminate traffic messages reliably and efficiently.

The project will provide two types of services: en-route driver information and traveler services information.

Herald consists of components that will address message generation, transmission, and reception. Figure 1 shows these components. The message generation component formats the traveler information. The message transmission component translates the formatted messages for transmission. The message reception component (in the vehicle) receives, decodes, translates, and presents the data in a format useful to the traveler.

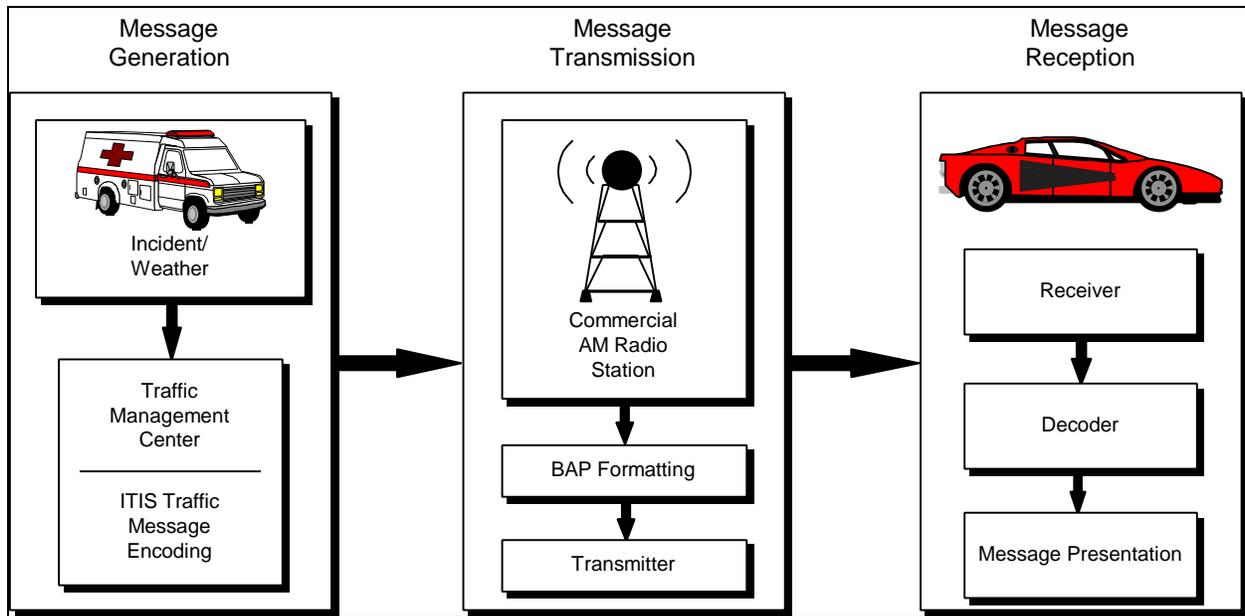


Figure 1: Components of Herald Design Concept

To test the system in the field, test personnel are setting up the transmitters and installing receivers and measurement systems in test vehicles. These measurement systems will assess the AM subcarrier performance. The testing proceeds incrementally, gathering a small data sample and analyzing it before collecting more data. Test personnel start sampling the transmission at points close to the transmitters. As the test continues, testing will occur at greater distances from the transmitters and at varying times of day. While messages are being broadcast, test personnel will measure the signal strength according to standard criteria. Test measurements will eventually be taken in all planned terrain types and times of day.

The evaluation of the project will address two significant research questions about AM subcarrier modulation technology.

- Can it provide adequate signal coverage in a rural or rugged terrain?
- Can it provide accurate traveler information?

Test Status

Test personnel are currently analyzing the initial data collected. Additional data collection is tentatively scheduled for six weeks, starting in April 1998. The evaluator will analyze the data in parallel with its collection.

Test Partners

Federal Highway Administration

Modulation Sciences, Inc.

Mobile Data Systems

The ENTERPRISE Group (Departments of Transportation from the states of Arizona, Colorado, Iowa, Michigan, Minnesota, North Carolina, and Washington, plus Maricopa County,

Arizona, Dutch Ministry of Transport, Ministry of Transport Ontario, and Transport Canada)

References

None published.