Smart Truck Technologies: Truck Tracking Device

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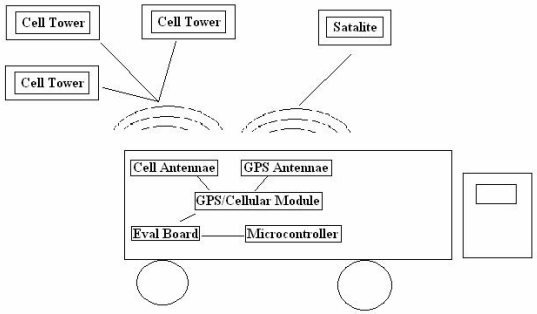
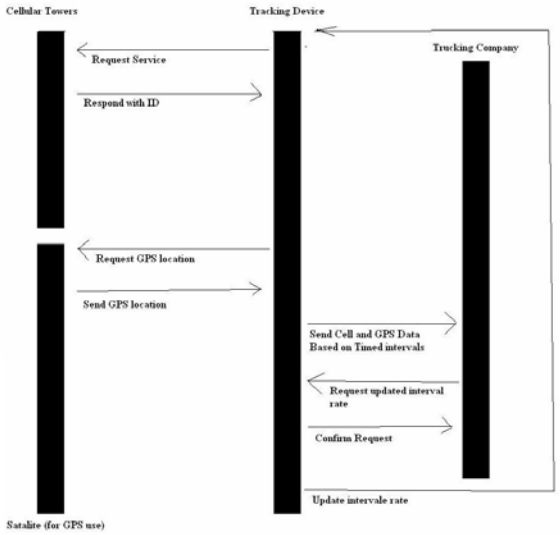
Motivation

The two primary realtors of truck security are LoJack systems and GPS system and Cell Phone Triangulation systems. LoJack is overpriced for today's market environment, and the GPS/Cell Phone systems inside the shipping container only returned about 12% and 20% of the desired level of information. With our system we will have a robust and ideally redundant system that will be cost effective enough to employ on a large scale.

Architecture





Development Environment

Hardware:

- **GM862 Cellular Quad Band Module With GPS**
- **GM862 Evaluation Board – RS232**
- **PBMCUSLK Prototyping Board with Microcontroller Interface**
- **MC9S12C32 Freescale Microcontroller**
- **Antennae (Cell and GPS)**

Software:

- **Codewarrior**

Protocols:

- **GPS**
- **SMS**
- **RS232 Serial**

Power:

-Sleep Mode to Conserve Power

-SMS Based Polling Updates

Reliability:

-Control of Polling Time

-Signals Amplified by Antennae

Caching:

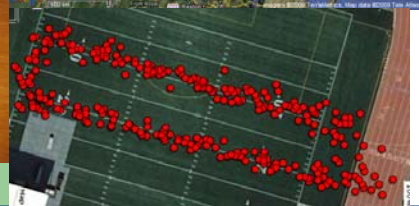
-Cache Current Known Position

-Data Preserved to Ensure That Last Known Location is always Able to be Obtained

Concurrency:

-Able to deal with and send Cell and GPS data at the same Time.

Results



Initial Tests:

-Conducted in a Car Trip to New York and Back.

-Showed Reliable Data even Encased in Shielding

Robust Tests:

-Under Shielding Comparable to a Trucks

-3% Variance of Outliers Deviating from Path

-6 Average Satellites Found

http://www.ece.cmu.edu/~ece549/spring09/team17/index.html