The Cool Beans
Poor Man’s Lowjack

Bryon Wheeler
Philip Krebs
Gregory Beck
Simon Chulin
Feature List For Demo Day

- Start Car
- Unlock/lock Car
- GPS Tracking
- Car Status Report
Interfaces

User → Cell Phone → Arduino → Car Status → Car Controls → GPS
Hardware Block Diagram

- Car
- Relay Bank
- Relay Driver
- OBDII Interface
- Arduino
- Arduino Serial Interface
- Arduino Cellular Shield
- Cell Tower
- Android Phone
- Android Application
- GPS Antenna/Receiver
Philip Krebs

• Interfacing with the vehicle
• Pulling data from vehicle OBDII to the Arduino Serial port
• Research vehicle wiring and find needed signals in wiring harness
• Build Relay Bank for car interface.
• Power supply needs for hardware

Schedule (each Month)

1. Build Relay Bank for Car Interface
2. Setup power supply and full interface with vehicle
3. Arduino interfacing
4. Completing everything and getting it working
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OBD II Interpreter

- Supports all legislated OBD-II protocols and J1939 (heavily duty vehicles)
- Fully compatible with the ELM327 command set
- Extended "ST" command set for access to advanced functionality not available in the ELM327
- UART interface
- Boot-loader for easy firmware upgrades
- Large memory buffer
- Solid automatic protocol detection algorithm, connects to more vehicles reliably
- Smart keep-alive algorithm helps ensure a stable connection on ISO and KWP vehicles
Bryon Wheeler

• Head up coding on the Arduino
• Arduino cell network communication code
• Adapter code for Arduino that understands android interface
• Advertisement on network

Schedule (each Month)
1. Design and basic programming of Arduino code
2. Communication between cell phone and Arduino
3. Full testing of Arduino to Car and cell network
4. Completing everything and getting it working
Software Block Diagram

Arduino Environment
- LoJack MSG Based Controller
- GPS Rx Thread
- OBDII Rx Thread
- OBDII Tx Thread
- TCP/IP Packet assemble
- TCP/IP Packet send
- TCP/IP Packet Parse

Arduino Soft Serial Package

Arduino Cellular Library

Android Environment
- Android TCP/IP Library
  - TCP/IP Packet assemble
  - TCP/IP PacketParse
- LoJack MSG Based Controller

Car
- OBDII Interface
  - J1850 PWM Protocol
  - PID’s (Diagnostic Information)

Android GUI
Gregory Beck

- Android software
- Android cell network communication
- Android GUI application
- High level interface plan between car based unit and android

Schedule (each Month)

1. Basic Android App
2. Communication between Android and Arduino
3. Full testing of Arduino to Car and cell network
4. Completing everything and getting it working and clean android app
Simon Chulin

- Website & documentation
- Document interfaces and work to keep all coding parties in sync.
- Purchase parts
- Android – Arduino Networking

Schedule (each Month)

1. Purchase of parts & research TCP/IP networking
2. Communication between Android and Arduino
3. Full testing of Arduino to Car and cell network
4. Completing everything and getting it working and clean android app
www.GodImGood.com

- Project Description
- Member Pages
- Contact Form
- Documentation
- References

Week 1 - 03/09/2011

Discussed access to the CAN bus and ODBII sensors, decided that they have too many restrictions on them enforced by the auto manufacturers to deny non-certified companies access to the built-in features, therefore we should just work on getting the car started and doors and windows to open/close first.

Week 2 - 03/16/2011

Talked about the different possibilities for hardware, while we originally planned to use the Arduino board with a GSM shield, we found that perhaps an embedded computer board for a slightly higher cost would be easier to configure, and give us higher future potential if we decided to go above and beyond our project outlines.

Week 3 - 03/23/2011

SPRING BREAK. NO MEETING.
Bill Of Materials

Arduino Processor Card: Free - Check out from the U of U


Android phone: Already owned
Sim card: $5.95 - AT&T Store

Wires and cabling: $10.00? - Warnock Engineering Building Supply Shop


Lab Power Supply for testing: Free - Engineering Lab at U of U

ODBII Connector: $5.00 - http://www.carplugs.com/products.html

Project Boxes: TBD - To Be determined based on size of final project

Current Risks

- Shortage of ports or memory on arduino
  - Frugal use of ports
  - Expansion board
- Security systems disabling access
  - Car Selection
- Limited data communication between arduino and cell phone
  - Use shortened encoded messages

Security

- Communication Protocols
- Verbosity
- Caller ID?
Things we don’t know.

- How will we advertise or establish a connection over cell towers? IP, Text, Other?
## Schedule

**Team Cool Beans**

**Project Lead:** Team Cool Beans  
**Start Date:** 8/22/2011  
**Today's Date:** 4/4/2011  
**First Day of Week (Mon=2):** 1

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Questions?