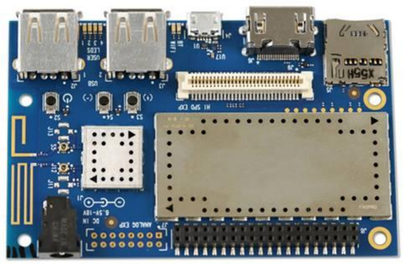
VoiceBox: Head Unit and CAN Bus

Infotainment System

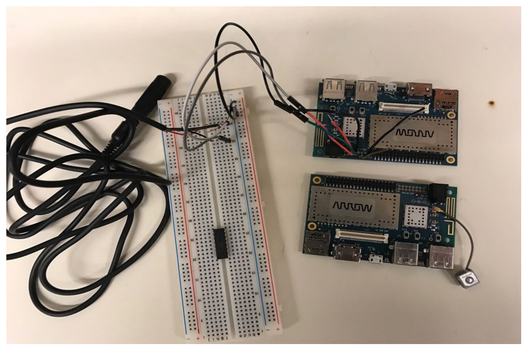
An aftermarket head unit featuring voice control and multiple connectivity technologies such as GPS, cellular, radio, Bluetooth, and WiFi. The Infotainment System will remain unfinished.

Hardware Development

- DragonBoard 410c
- Passive GPS Antenna
- Rtl-SDR Dongle
- 3.5mm Audio Jack
- 7” Touch Screen



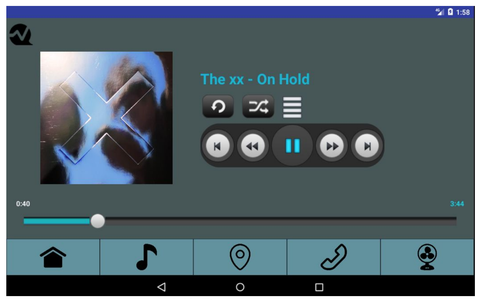
DragonBoard 410c



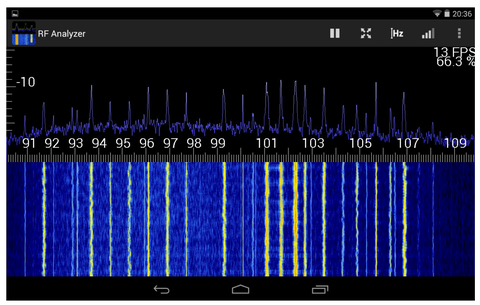
External GPS Antenna and Audio Jack

Software Development

- Android User Interface
- Wifi Connection
- Kernel Modification for Bluetooth Connection
- Android SDR Radio
- Android Naviagtion System
- Voice Recognition



UI Design

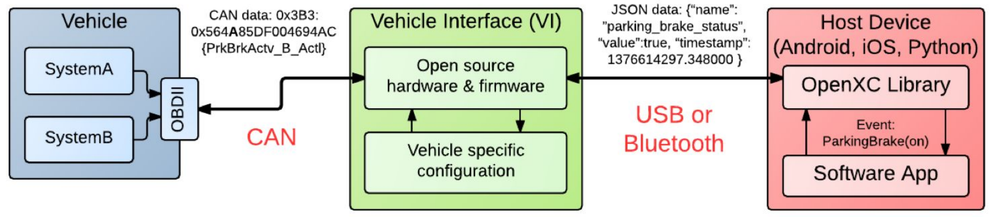


Radio Implementation

CAN Bus Bridge

An interface between standard Application Level Android and the CAN bus inside modern cars. Uses OBD-II to connect an aftermarket head unit to the CAN bus, allowing more integration and control of the car with Android applications.

OpenXC



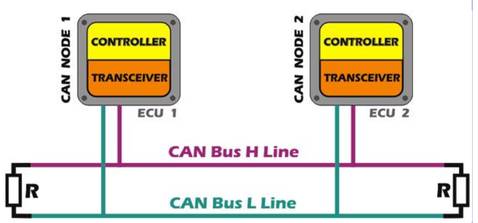
OpenXC Solution Flowchart
http://openxcplatform.com/vehicle-interface/concepts.html

- Developed by Ford
- Open source
- Flexible hardware interfaces

CAN Bus

- Universal CAN protocol
- Manufacturer specific identifiers and bit encoding
- Custom dictionary required for each manufacturer
- OBD-II interfaces with CAN bus
- HS-CAN bus and MS-CAN bus

CAN Bus Protocol
https://www.linkedin.com/pulse/automotive-can-bus-system-explained-kiril-mucevski



Outcomes

Due to internal restructuring and infeasibility, the Infotainment System project was discontinued by VoiceBox. After cancelling the Infotainment System, we began collaborating on a new project with VoiceBox: the CAN Bus Bridge.

Final Implementation

- Allows car control through Android
- Future development opportunities
- Flexible, modular design
- Allows multiple car manufacturer integrations