E-BAJA ELECTRONIC DISPLAY SYSTEM

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CONTENTS

OVERVIEW

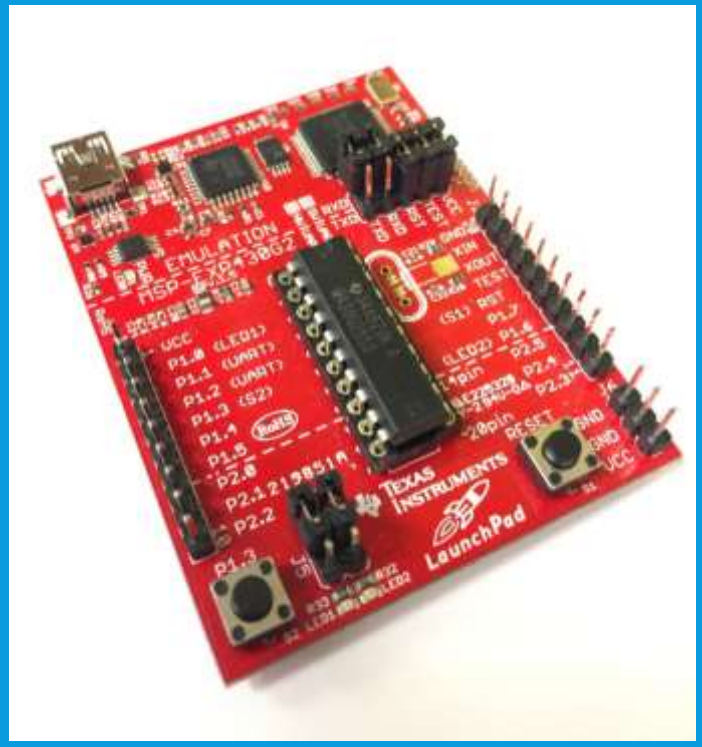
- Proposed by current E-Baja Team
- Collaboration with Mech. E.
- Requirements
  - Stand Alone System
  - Provide Speed, Pitch and Roll
  - Communication Capability with CANbus
  - Rugged Design

OVERVIEW (CONT.)

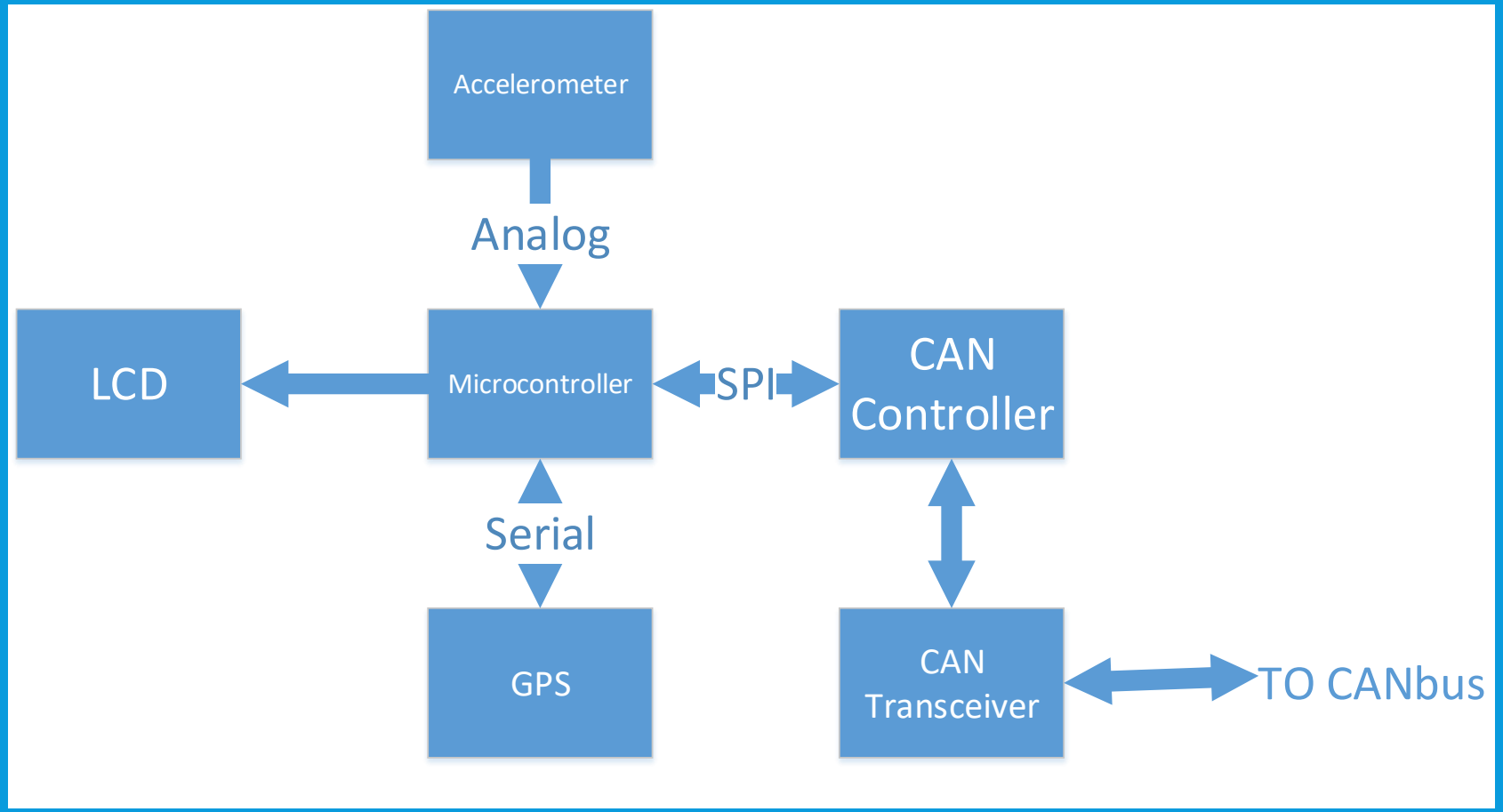
- E-Baja
  - Used Lead-acid batteries – Now Li-ion
  - Was 700 lb – Now 550 lb
  - Now has several nodes on a CANbus that control lights, signals, etc
  - Designed to be off-road capable
  - Travels 30 MPH

OVERVIEW (CONT.)

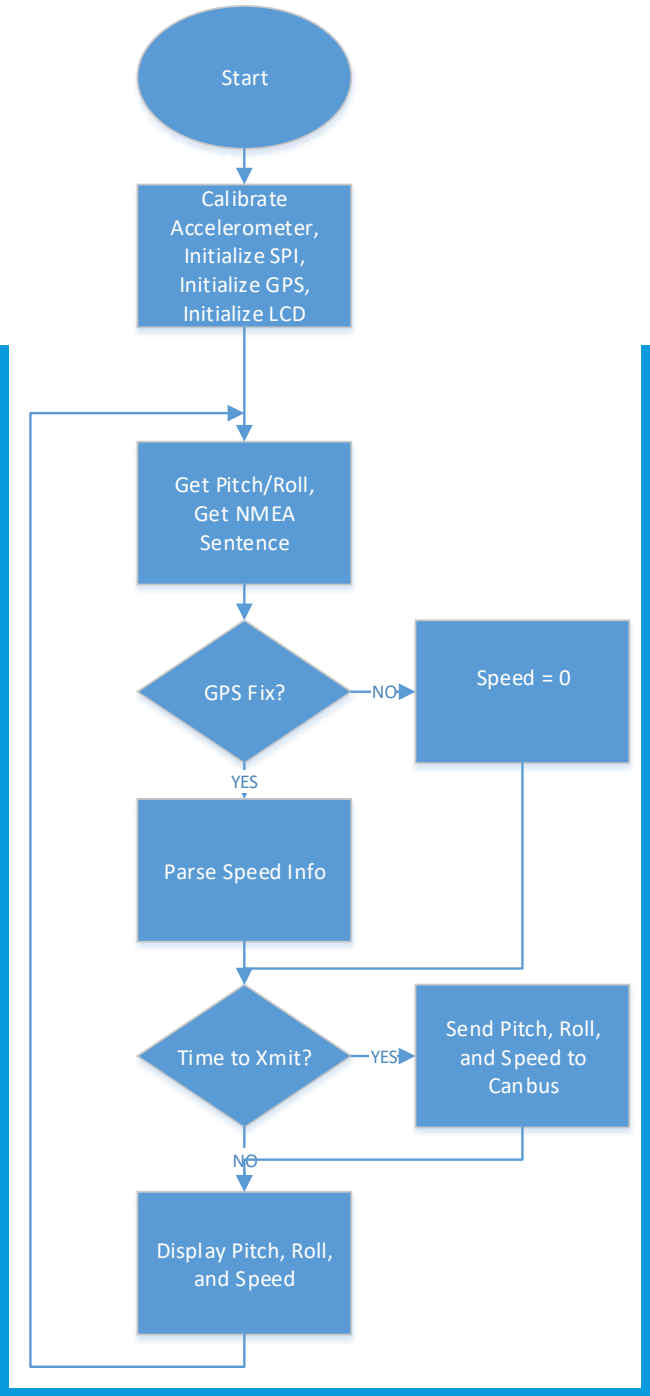
- LCD Screen
- GPS Module
- Accelerometer
- CANbus Interfacing Device
- Microcontroller



PROJECT DESIGN (CONT.)

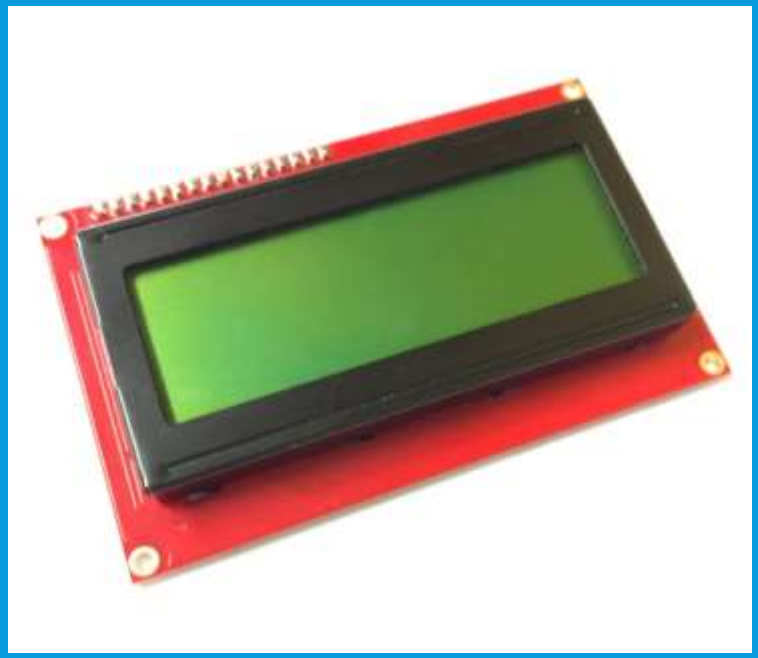


PROJECT DESIGN (CONT.)



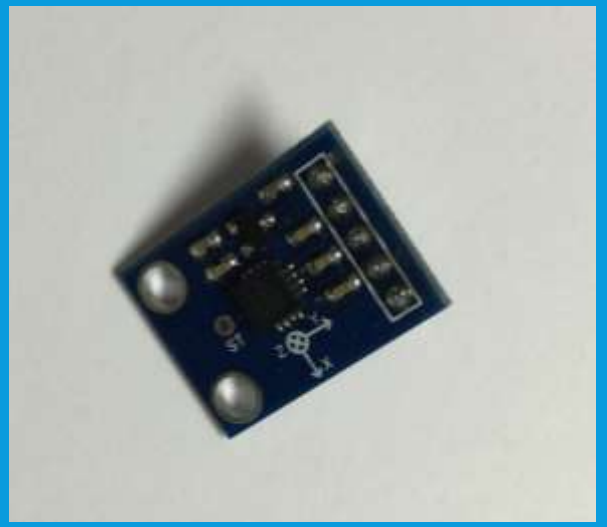
TECH. INFORMATION – LCD SCREEN

- HD44780 LCD Driver
  - 4x20 character segments
  - 5.5V
- Connected via Ribbon Cable
- Custom large characters implemented for easy viewing
- Intuitive organization of data



TECH. INFORMATION – PITCH AND ROLL

- ADXL335
  - Analog
  - 1.8-3.6V
- Using 2 of 3 axis
- Displayed intuitively



TECH. INFORMATION – SPEED MEASUREMENT

- Arduino Ultimate GPS Module
  - 3.3-5V
  - Built-in voltage regulator
  - More information for future
- Provides tons of useful information

COM10

Send

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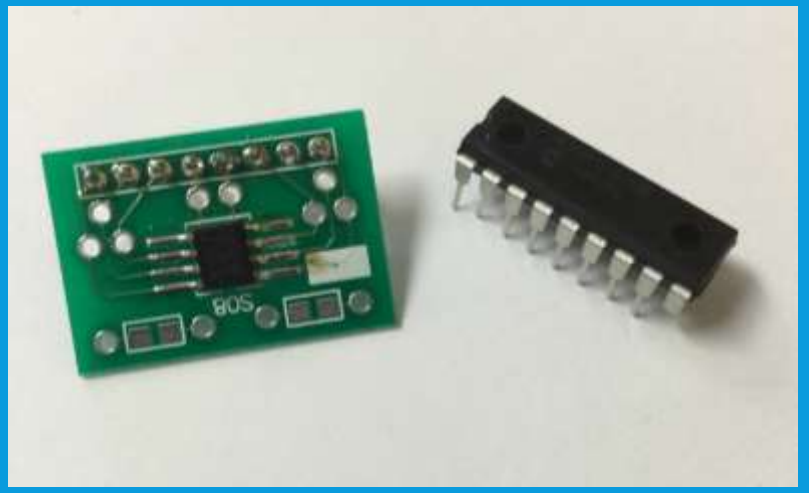
Autoscroll | No line ending | 9600 baud

TECH. INFORMATION – CANBUS INTERFACING

- Typical automotive network infrastructure
- MCP2515 CAN-Controller
  - SPI between MSP430 and MCP2515
  - Single node in multi-master network
- MCP2561 CAN-Transceiver
  - Interface between CANbus and CAN-controller
  - Creates CANH (3.5V) and CANL (1.5V) necessary for bus



COST ANALYSIS

Device	Manufacturer	Quantity	Price	Total
MSP430G2553 w/ Launchpad	Texas Instruments	1	10	10
ADXL335	Analog Devices	1	4	4
Ultimate GPS Module V3	Adafruit	1	40	40
20x4 LCD	Sparkfun	1	15	15
Ribbon Cable	Sparkfun	1	5	5
MCP2515	Microchip	1	FREE	FREE
MCP2561	Microchip	1	FREE	FREE
BOX	N/A	1	FREE	FREE
Total				$74

FUTURE CONSIDERATIONS

- Pitch and Roll
- Odometer
- Status of CANbus Nodes
- Optimized PCB and box design
- Update Obsolete Devices
- More advanced screen
  - Size
  - Color
  - Touch
  - Overlays with Google Earth

CONCLUSION

- Speed measurements are about 1 MPH below reference when tested
- Pitch and Roll Measurements are noisy, but acceptable
- Displays information clearly

QUESTIONS