Wireless Telemetry + CAR

Argus 682

"We watch so you don't have to."
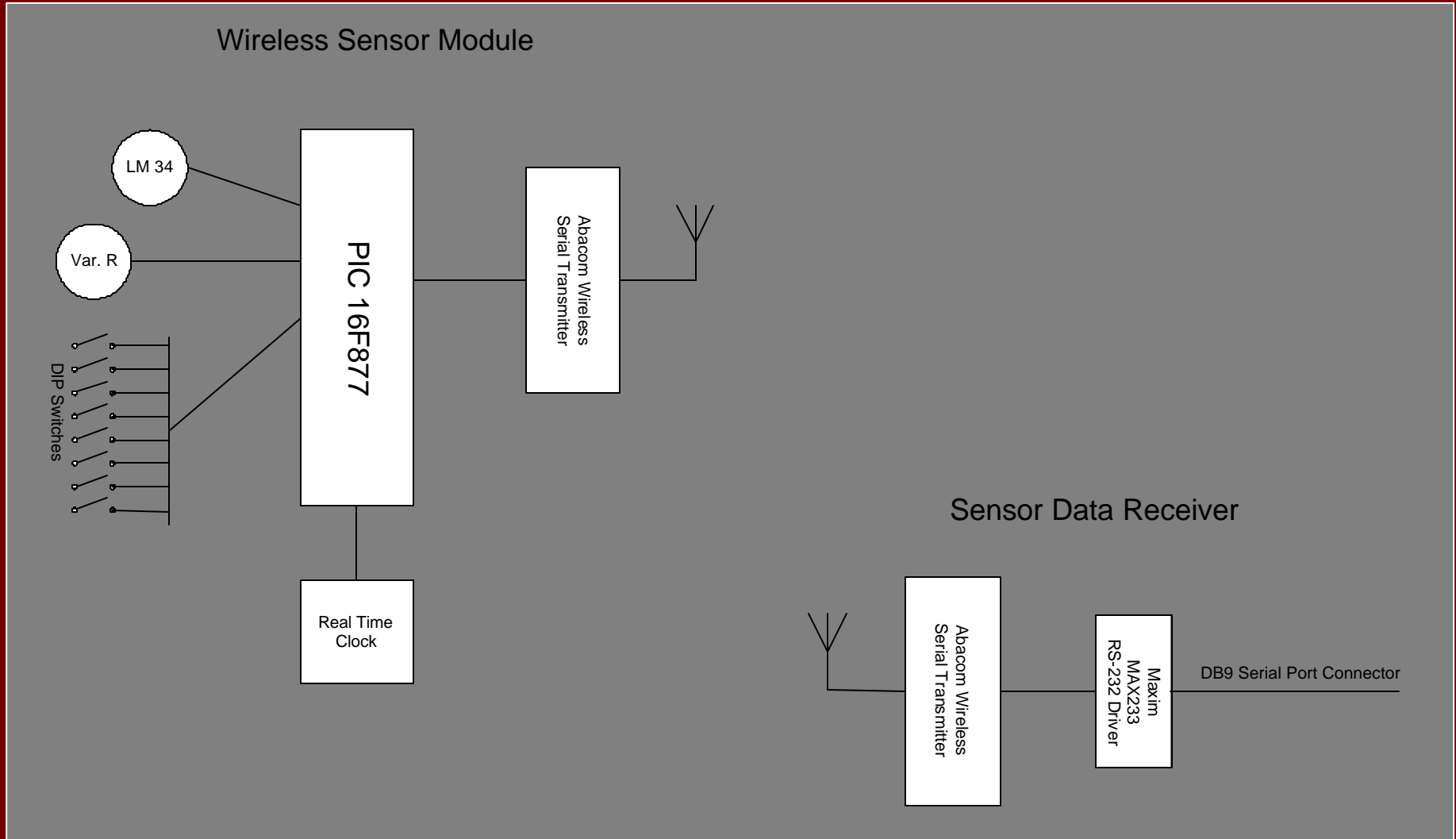
Midterm Presentation

Tuesday, February 05, 2002

Who are we?

- Nate Distel: MCU, Sensors
- Solomon Gibbs: Linux, Net Code
- Max Vilimpoc: Serial Code, Linux
- Aravind Mikkilenini: Linux, Serial Code
- Rich Fouts: Wireless Comm.
- Mike Volkerding: Sensors, Power
- Pat Stemen: MCU, Organization

Graphical View:

Wireless Sensor Module

LM 34

Var. R

DIP Switches

PIC 16F877

Abacom Wireless Serial Transmitter

Real Time Clock

Sensor Data Receiver

Abacom Wireless Serial Transmitter

Maxim MAX233 RS-232 Driver

DB9 Serial Port Connector

Project Basics

- **Start With Basics:**
  - Use PIC MCU with onboard A/D
    - Temperature, Resistance sensing
  - Use Digital I/O on PIC
    - Digital On / Off – different uses depending on platform
  - Simple Wireless Interface
    - Abacomm 433Mhz Wireless Modules (9600bps / Simplex)

Project Extras

- Use basics to develop unique features
  - User Interface Development for various platforms
  - Work with unique sensors (accelerometers)
  - Real-Time Clock Module
  - Variable-Length Packet Data

User Interface
## Runs Under GTK, Motif, Win32
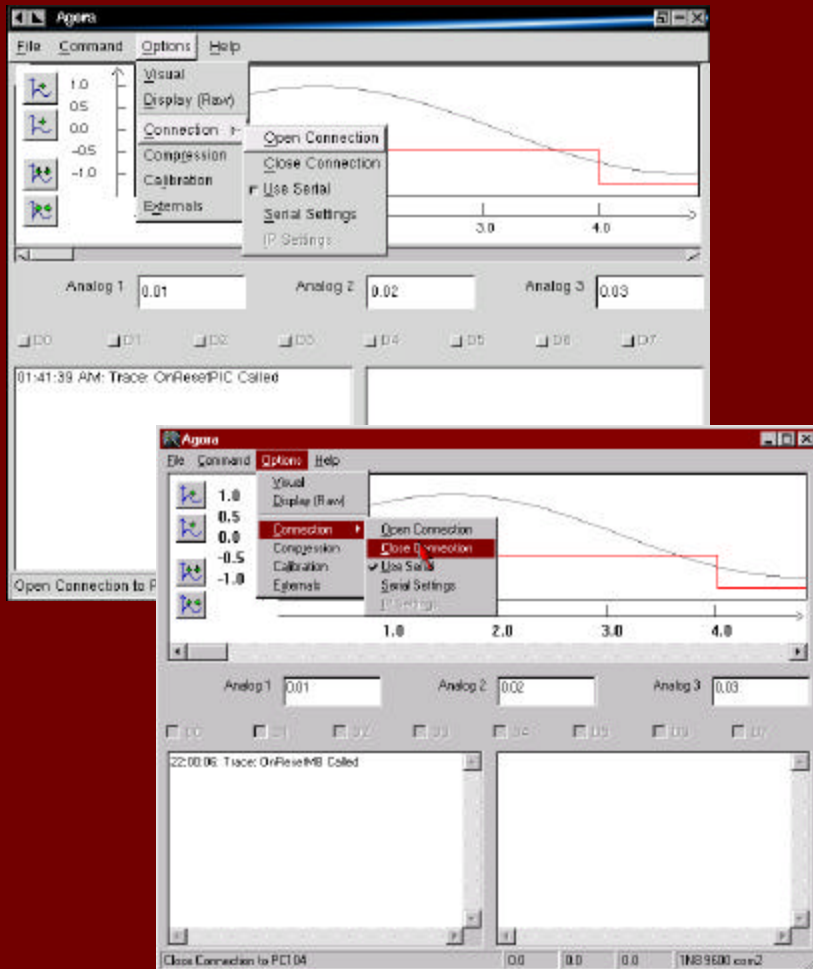
- Written in Cross-Platform C++ (wxWindows)
- Connects to Remote host via Serial or IP
- Currently Working on:
  - Improving Parser
  - Writing a Custom Data Plotting Widget
- Plan To Add:
  - Remote Control Functions
  - Data Logging

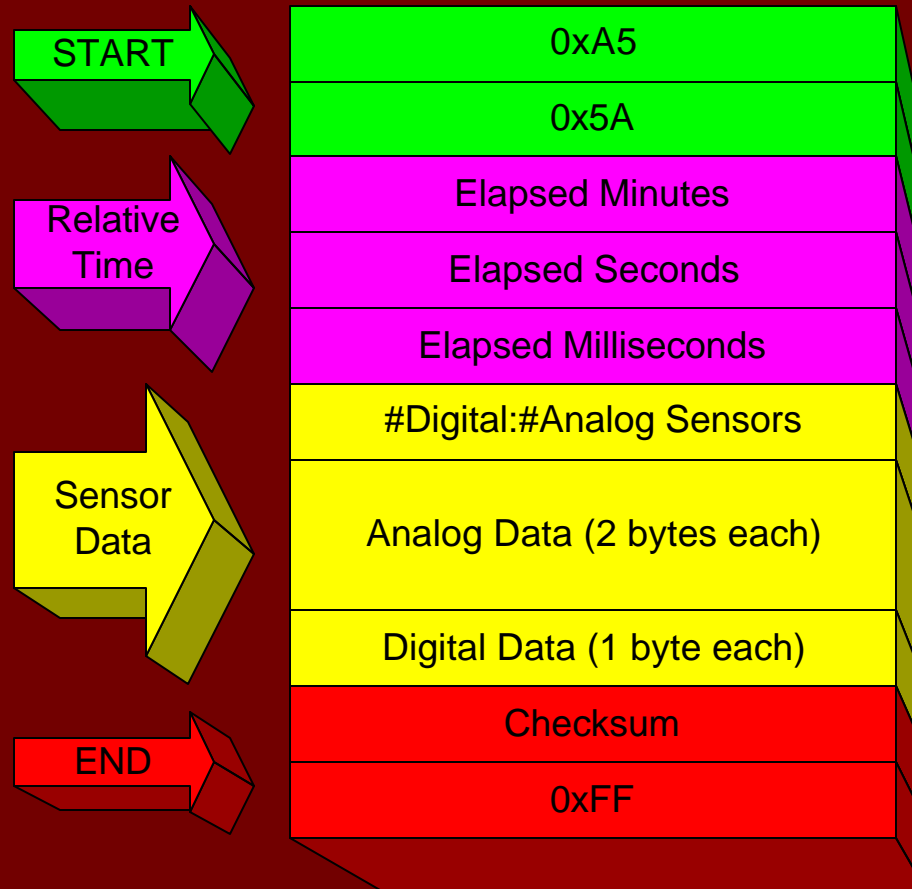# Sensors / Accelerometer

- **Analog Devices ADXL202**
  - 2-axis, ±2g sensor sensitive enough to measure gravity.
  - Integration of this module will provide:
    - Acceleration
    - Velocity
    - Position
  - Possible applications include:
    - Realtime mapping of operating environment relative to start position (Caldwell Labs)
    - Absolute position mapping with GPS interface for initial location reading

Figure 1. ADXL202EB Schematic

CL380

CL378
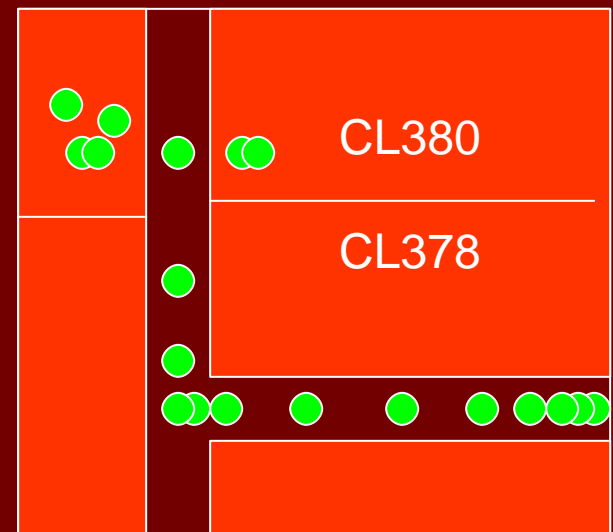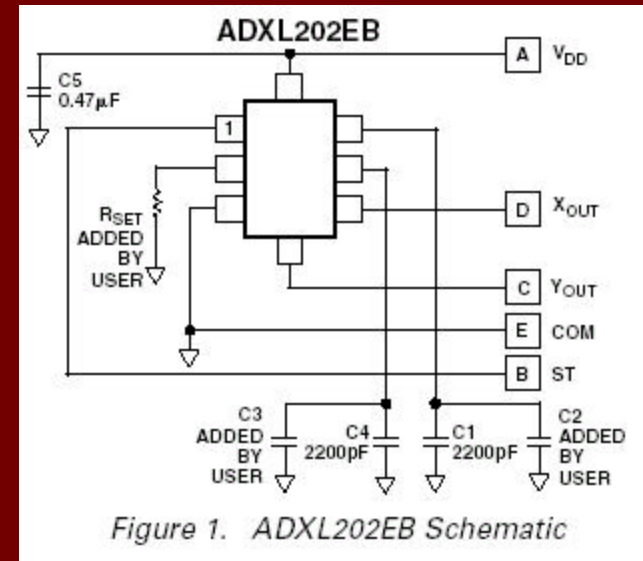
Wireless Communications

- TXM Series transmitter and SILRX Series Receiver
- FM Range
- 433 MHz
- Supply Voltage 4.5v – 9v
- Small Size
- Easy to use!!

Data Packets

START → 0xA5

0x5A

Relative Time → Elapsed Minutes

Elapsed Seconds

Elapsed Milliseconds

Sensor Data → #Digital:#Analog Sensors

Analog Data (2 bytes each)

Digital Data (1 byte each)

END → Checksum

0xFF

Moving Forward

- Integrate Accelerometer from Max's 683 Research Project

- Looking into solar based power supply
  - Use solar panel to charge batteries for constant power requirements

- Researching other methods to increase wireless range
  - Goal: Max range 250 feet