

# Location Tracking

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# Concept

- A self-contained device for long term location tracking
- Existing trackers:
  - Short battery life/Poor power management
    - Prevents long term monitoring
  - Large form-factors
    - Unreasonable to carry on a belt or in a bag
  - Difficult/Limited interfaces

# Competitive Analysis

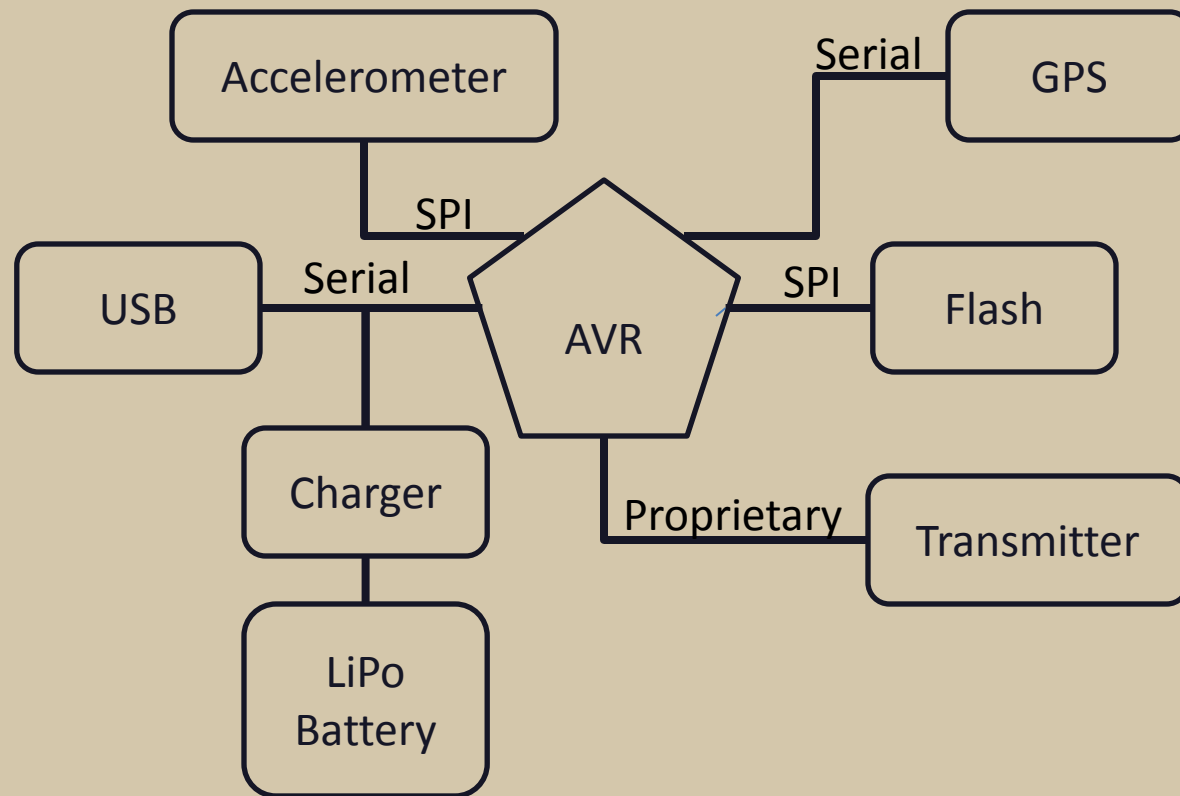


- Byonics Micro-Trak AIO
  - 10 Watt output
  - 8 AA Batteries
  - 8 Days @ 2 Min
  - Standard: \$260
  - High Altitude: \$300
- Rtrak-HAB
  - Works past 60,000 Feet
  - External power
  - 0.35 Watt output
  - \$235
- TinyTrak3
  - External GPS
  - External power
  - External radio
  - \$42

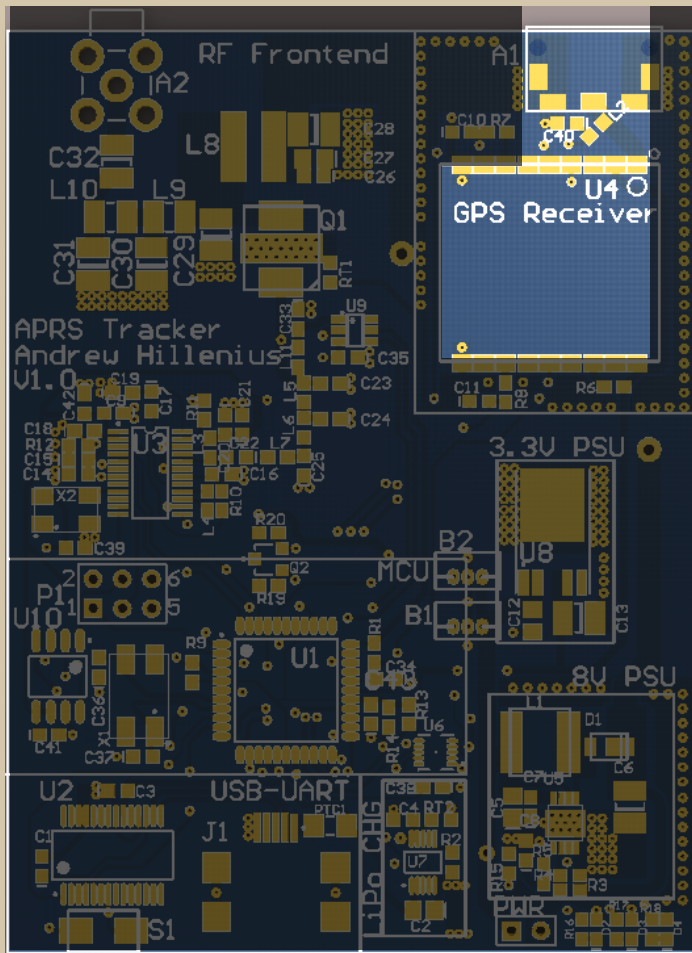
# Requirements

- Deck of cards form factor
  - 3 x 3 x 1 inches
- Long Battery Life
  - Configurable update frequency
    - 1 day @ once per 30 seconds
    - 1 month @ once per 15 minutes
  - Multi month standby with wake on motion
- Local data logging
- PC based software
  - Configuration
  - Offline data viewing

# Architecture

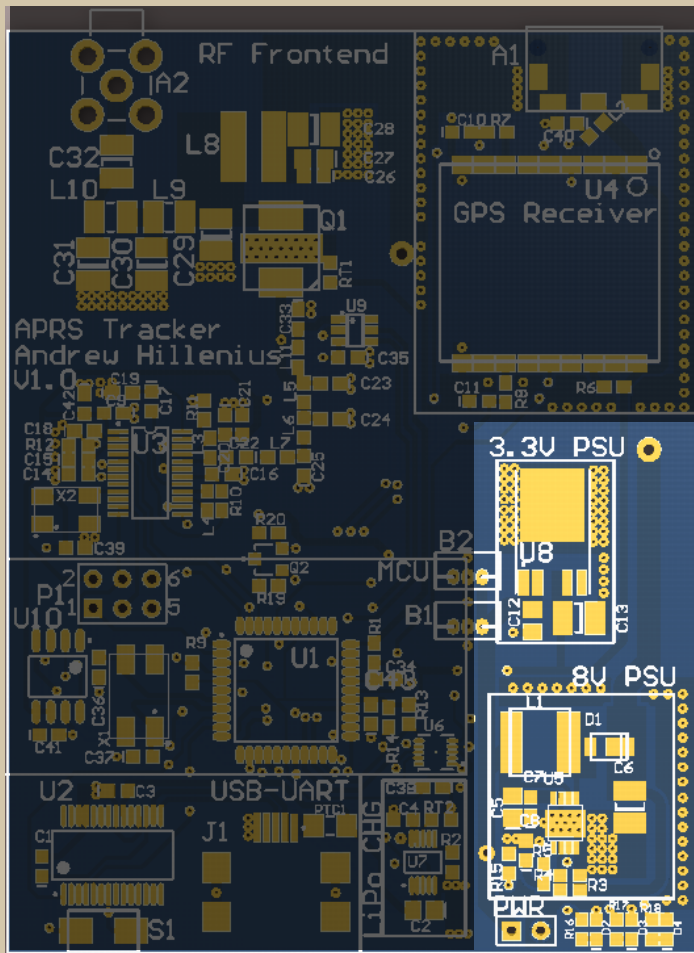


# Technical Specifications



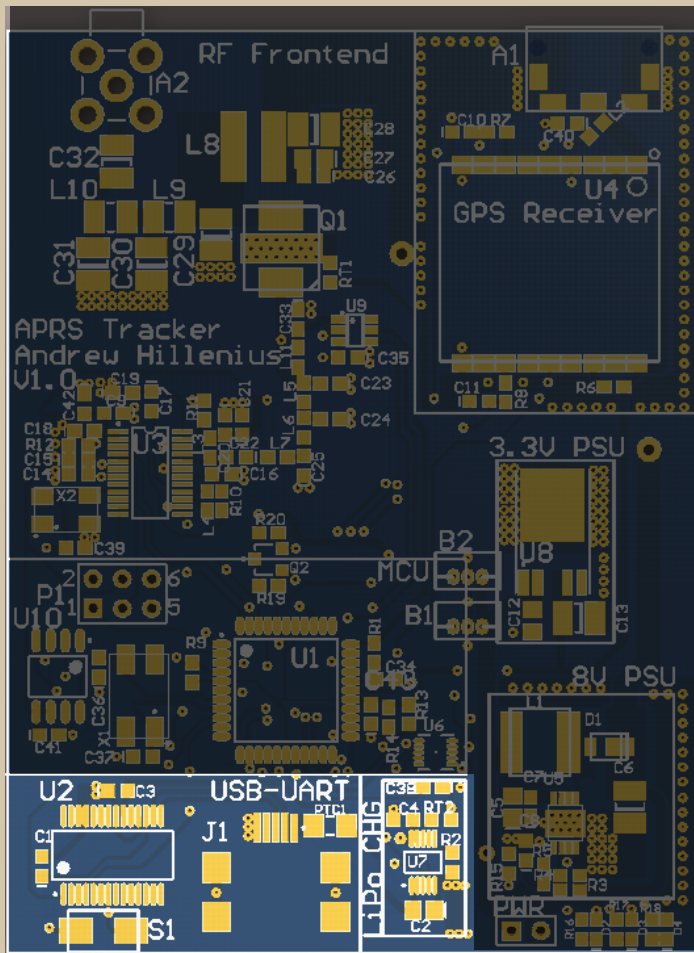
- Inventek ISM300F2
  - 20 Channels
  - High Altitude Capable
  - \$30
- AP.10D.01
  - High gain GPS Antenna
  - Built-in LNA
  - \$21

# Technical Specifications



- Power Supply
  - 3.3 Volt supply
    - Everything but RF section
  - 8 Volt supply
    - Powers RF amplifier
    - 1 Amp output
  - \$7

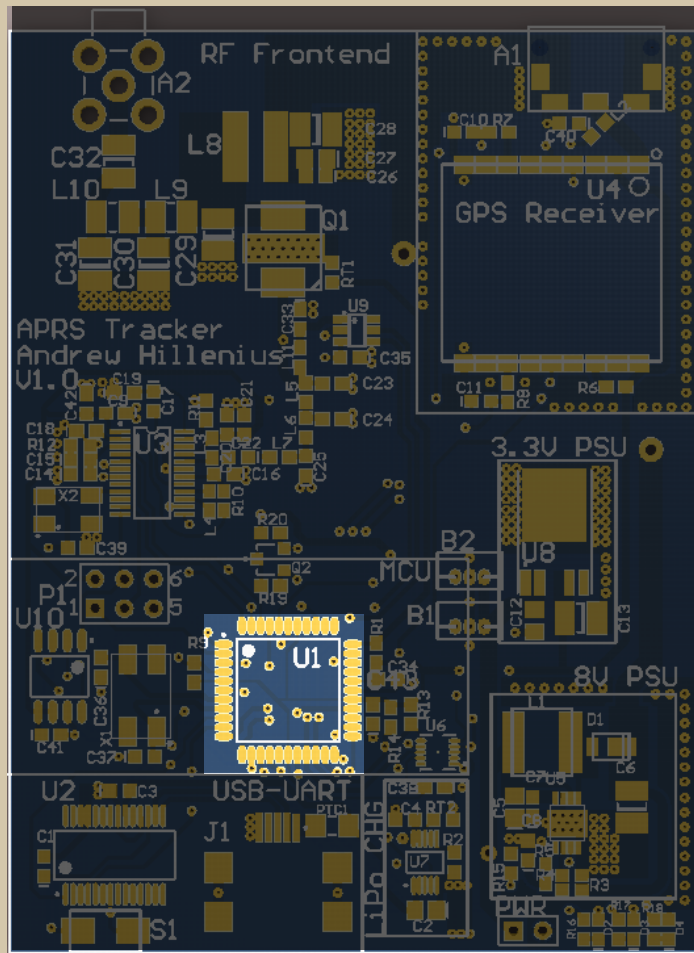
# Technical Specifications



- USB to UART Interface
  - High speed data transfer
    - 256 kb/s
  - Allows live programming by PC
- Lithium battery charging
  - Up to 500mA

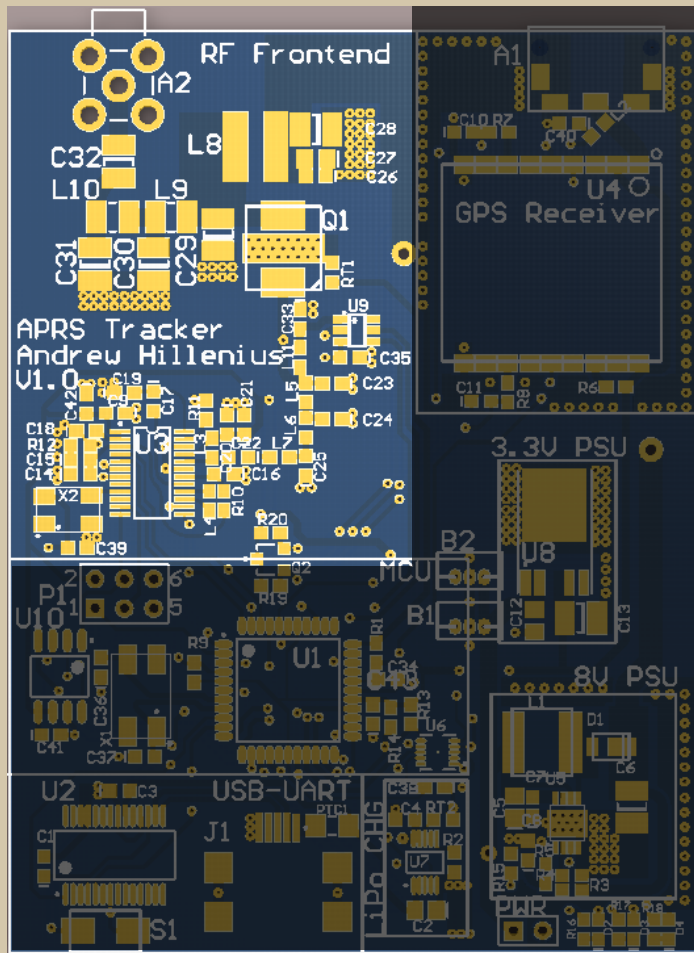


# Technical Specifications



- ATmega324PA  
– \$6

# Technical Specifications



- Transmitter
  - MRF1512 3 Watt Amplifier
  - ADF7012 FSK Transmitter
  - SMA Antenna Connector
  - TXCO High Stability Oscillator
  - \$25

# Risks and Mitigation

- RF transmitter circuit doesn't work
  - Can purchase prebuilt transmitter
- Switching power supply for 8 Volts
  - Use a two LiPo packs in series, charge off board
- Microcontroller not powerful/large enough
  - Upgrade to ATmega644P
  - Reduce feature set