Remote Asset And Person Track Reporter

Andrew Hillenius, Allan Wang, Chris Perrone, Derek Kozel

Introduction

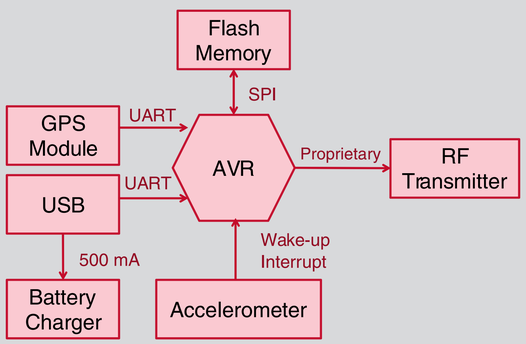
RAPTR is a self-contained position broadcaster.

Using GPS it obtains location coordinates which are then broadcast over a multi watt VHF radio. This allows an individual to share their location with others in the surrounding area or for an object to be tracked remotely.

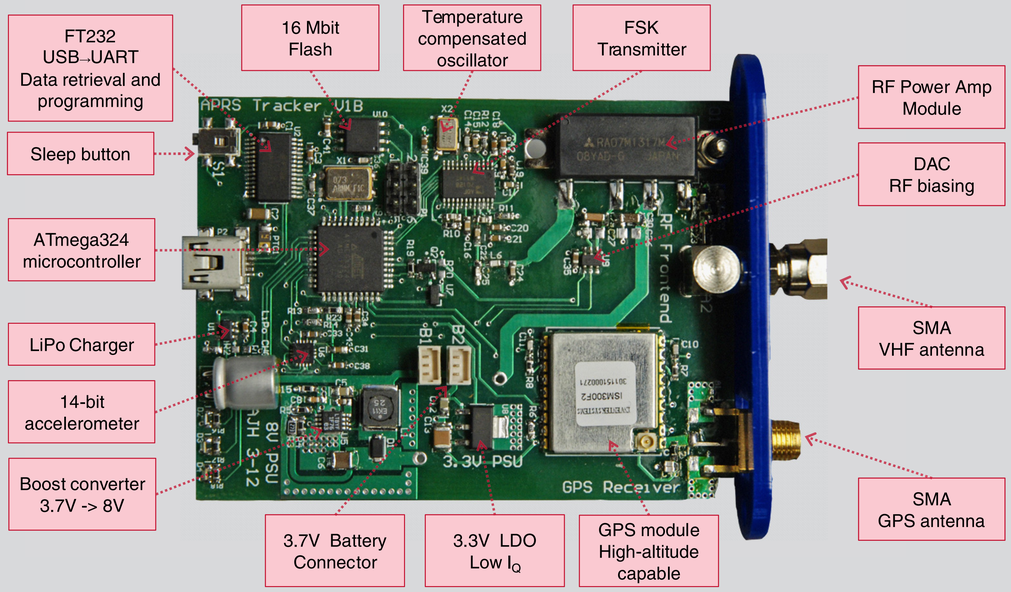
Motivation

	Smart-phone	EPS2 Microtracker	Byonics Micro-Trak AIO	RAPTR
				
Battery Life (2 min/TX)	2 days	7 days	8 days	22 days
Batteries	LiPo 5.2 W·hr	3x AA 9.9 W·hr	8x AA 26.4 W·hr	LiPo 8.1 W·hr
Vol. (in³)	4.1	14	33	8.8
Transmit Power	1 W	2 W	10 W	2 W
Protocol	GSM	GSM	APRS	APRS
High Altitude Capable	Not really	No	+ $40	+ $30
Price	$300 + $30/mo.	Unknown + $15/mo.	$260	$150

Architecture

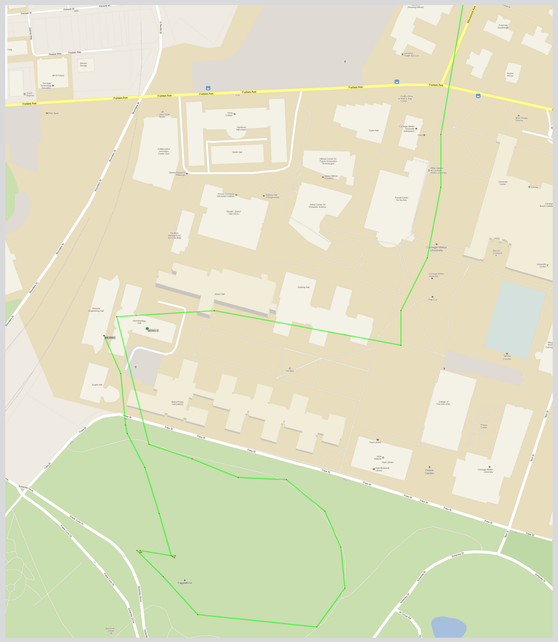


Hardware Description



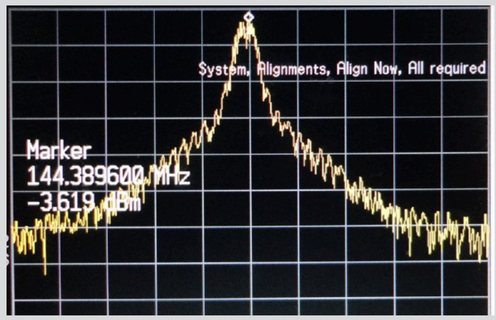
Map

Live output is viewable on a Google Map. Many users can be supported with a single receiver.

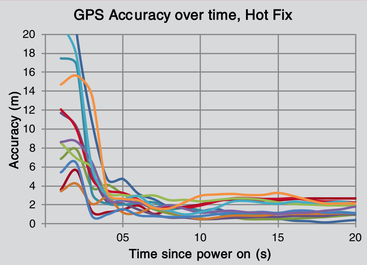


Transmitter

Output filtering and reliable clock produce clean output spectrum



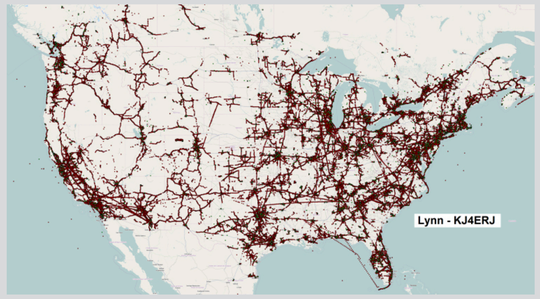
GPS



Tests indicate that five seconds is sufficient for four meter accuracy

APRS Network

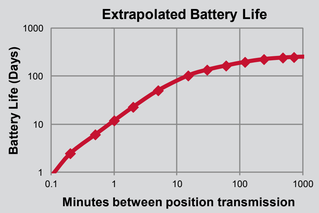
Compatibility with the Amateur Packet Reporting System provides nationwide coverage



Battery Life

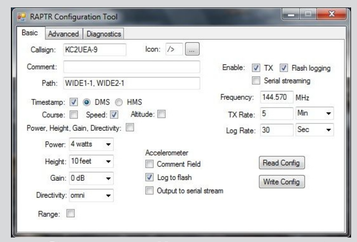
Mode	Current
Standby	0.35 mA
Active, GPS	50 mA
Active, Transmitting	850 mA

Extrapolated based on:
- 2200 mAh battery
- GPS hot fix time: 2 – 10 seconds (depending on last GPS fix time)
- Transmits for 0.4 seconds

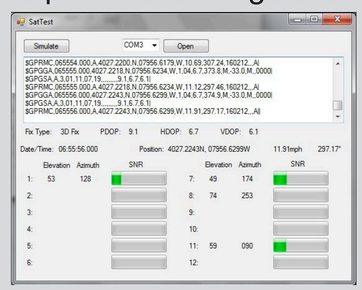


Transmission Interval	Battery Life
30 seconds	6 days
2 minutes	3 weeks
10 minutes	2.5 months
1 hour	5 months

Configuration Software



Simple software allows users to configure personal settings over USB



dkozel@andrew.cmu.edu, allanw@cmu.edu, ahilleni@andrew.cmu.edu, cfperron@andrew.cmu.edu
http://www.ece.cmu.edu/~ece549/spring12/team1/