

RF & GPS Tracking



European Sales:
Ahventie 4a7
02170 ESPOO
Finland

American Sales:
150 S. Adkins Way, Suite 100
Meridian, ID 83642
United States

www.trackersecurity.com
sales@trackersecurity.com
+1 (888) 633-7985

Table of Contents

<i>INTRODUCTION</i>	<i>1</i>
<i>RADIO FREQUENCY TRACKING</i>	<i>2</i>
<i>GPS LOCATING</i>	<i>3</i>
<i>SELECTING THE BEST TRACKING METHOD</i>	<i>5</i>
<i>SUMMARY</i>	<i>6</i>
<i>ABOUT TRACKER SECURITY</i>	<i>6</i>

INTRODUCTION

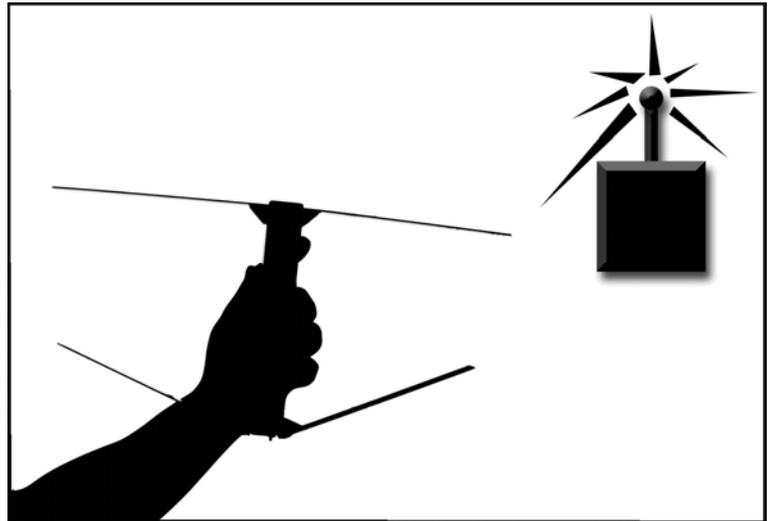
RF and GPS both have their own strengths when it comes to tracking items. Depending on the situation, you may want to use one, the other, or both. This document will not present one technology as the “best” for any or all purposes, but rather will provide you with information to decide which option is most appropriate for your current need.

Radio Frequency Tracking

Radio frequency (RF) transmitters emit a short pulse of energy in the form of a radio wave on a specific frequency. A receiver is programmed to detect an electromagnetic pulse and transforms it to either an audible beep or flash of lights. Using the series of beeps or lights as a guide, the receiver operator is able to hone in on the exact location of the transmitter.

Radio waves spread in all directions from the source of the transmission, similar to the ripple effect of a drop falling in a pool of water. The strength of the signal depends on amplitude of waves detected by the receiver. As with a pool of water, waves closer to the source will be closer together and stronger, weakening as they travel away from the source. The antenna's function is to pick up the radio waves such that the receiver can determine the direction of the strongest signal.

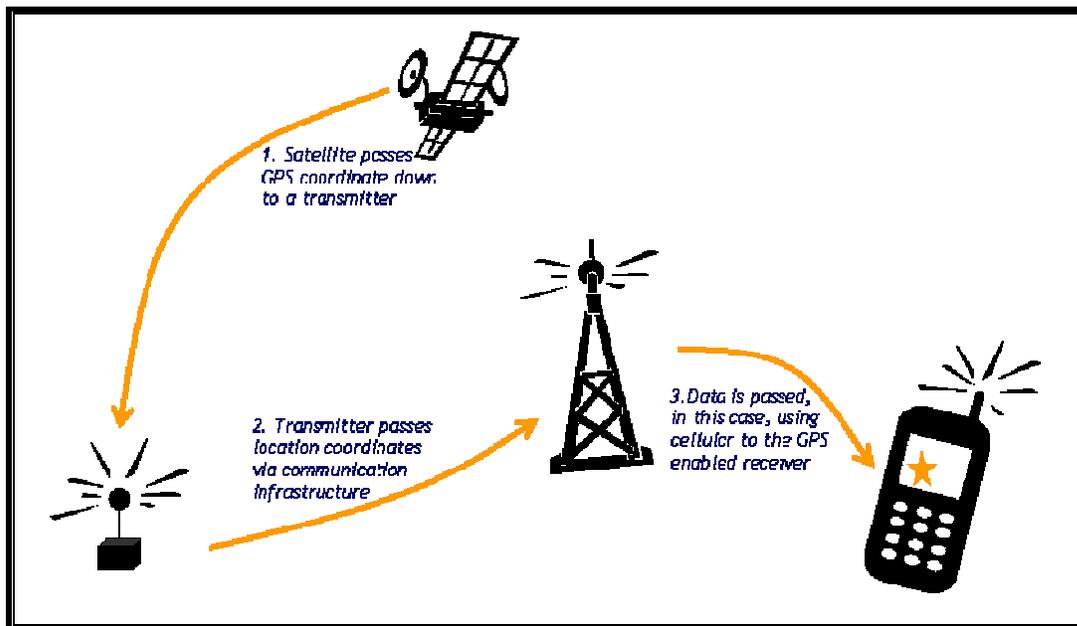
Tracking using RF is active and reactive. When you begin tracking you don't know exactly where you are going to end up. As the "Tracker" you are constantly taking readings, identifying obstacles that may be affecting your signal strength and changing your approach to the transmitter. Based on the information gathered at one "listening" point you may adjust a receiver setting or change the direction that you were headed.



RF transmitters are small, lightweight and extremely durable making them a good solution when the tracking system needs to be as covert as possible. For the most part, RF tracking systems provide excellent short to medium range tracking and locating.

GPS Locating

When tracking using Global Positioning Systems (GPS) the transmitter identifies its latitude and longitude coordinates using satellites. These coordinates are either stored in the transmitter, or are passed to a centralized receptor such as a computer, cell phone or handheld device using an integrated cellular, RF or satellite modem. In most circumstances, these GPS coordinates are mapped on a street level or topographical map.



GPS systems gain their latitude and longitude coordinates using data from satellites. The GPS transmitter then needs a communication link to relay that information to the system operator. This can be done using several communication methods.

GPS/Satellite: *The device sends these coordinates by initiating a call using a satellite modem.*

Pro: Nearly ubiquitous global coverage when outdoors

Con: Expensive monthly satellite contract required. Calls can only be completed when the transmitter is outside and the device has a clear connection to the satellites. Additionally, significant signal power is needed often requiring a large battery.

GPS/Cellular: *The device sends these coordinates by initiating a call using the integrated cellular modem.*

Pro: Data is passed reliably and inexpensively.

Con: Requires monthly cellular contract and only operates in areas with cellular coverage.

GPS/RF: *The device sends these coordinates using radio frequency.*

Pro: No additional communication infrastructure needed. Works 24/7 regardless of location or external factors.

Con: Short range system, generally one mile or less. Receiver must be in very close proximity.

GPS locating systems can map, within a few meters, a transmitter down the street or around the world. Thus, if you want to know the location of an item that you may not be in direct proximity to, GPS is the best system.

Selecting the Best Tracking Method

Unfortunately there is no set rule of thumb for selecting RF or GPS for each possible tracking application. Use the information below to evaluate which tracking system is best for your application.

RF	Deciding Factor	GPS
Pulsed signal on a specific frequency	Data Form	Packet data with coordinates. Data can be sent "real-time" or stored and sent on a scheduled basis.
Motion sensor, transmitter ID, light sensor, low battery, tilt switch	Data Options	Date, time, signal strength, direction of movement, speed, positioning satellite data, signal strength. Other telematic data: heart rate, temperature, etc. Geo-fence.
Up to 12 miles Line of Sight. 100 miles from the air.	Range	Unlimited for GPS/Cellular and GPS/Satellite, provided communication coverage. About 1 mile GPS/RF.
Within 1 meter	Location	5 -10 meters under best circumstances.
None needed	External Infrastructure	For GPS/Cellular and GPS/Satellite, external infrastructure is needed.
Can be up to 5 years. Typically 1 to 6 months.	Duty cycle with attached battery	Several days if not attached to external power source such as car battery or AC line.
Signal strength on the receiver	Display	Coordinates displayed on a map on a computer, internet site or cell phone.
2 grams to 400 grams	Weight	More than 200 grams
Very durable in wet environments, G-Force crashes and other challenging conditions.	Durability	Device is complex with higher failure rates in challenging environments.
Practice and skills required to be proficient with receiver.	User Friendliness	Simple, once user learns commands.

Summary

RF is the best fit when the transmitter needs to be small, covert, with long battery life and require no communication infrastructure.

GPS is the best fit when you need to track great distances, transmitter size is a minimal issue, and there is access to accessory power.

Situations may arise that require some features from both systems. In that situation you can use a hybrid system that uses both RF and GPS technologies.

About Tracker Security

Tracker Security is a solution/technology provider that offers "state of the art" tracking and monitoring solutions of people or high value items to B2B and B2G customers.