

## **GPS (Global Positioning System): What is it all about and why do you need it?**

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### **The Background of GPS Technology**

GPS was first used by the Military for the purpose of determining the positions of vehicles and aircraft. By using Satellites in space which were uniquely positioned, locations of military vehicles could be determined and navigation for aircraft and ground vehicles was enhanced, enabling vehicles and planes to find their destinations or targets. The military eventually allowed the use of their Military Satellites for non-military purposes, spawning new consumer products and creative uses for GPS technology.

In order to better appreciate GPS technology, it is helpful to understand that to fix a position of a vehicle or object within 10 meters a GPS device ideally needs to get a read from a minimum of 3 Satellites, obtaining the co-ordinates of Latitude and Longitude, as well as the altitude above sea level.

GPS devices for the consumer were quickly developed; the first ones allowing one to retrace a route that was walked, driven or charted, and through the setting of “waypoints” one could find your way back to home base or mark favorite fishing spots. This original basic use of GPS has now been developed to a point that these positions and positioning activities have been integrated to a world map and also layered onto Street Maps and Waterways. Used in conjunction with other available technologies, audio and video directions can be provided on a “turn by turn” basis through the use of PDA’s, Notebook Computers and even Mobile Cell phones.

While it is not necessary to fully understand the GPS technology in order to enjoy the benefits of same, it is fascinating to know that the inclusion of cell phone technology within the GPS Black box gives one the capability to transmit various packets of information in both directions wirelessly to other telephones and computer servers. The results yield new products and new ways to simplify the manner in which we run our daily lives.

### **Basic Functions of a GPS Technology**

While the notes above have tried to simplify the understanding of GPS and how it functions, there is admittedly too much confusion relating to the various products which employ GPS technology that are available to the consumer.

So let’s first look at the most common way in which GPS is used today: For the Motorist and in the automobile.

## **WHY GPS FOR AUTOMOBILES IS GROWING IN POPULARITY**

By understanding the basic principles of the technology, the motorist can make an informed decision in regard to the purchase of a GPS that meets their requirements. Taking taking into consideration their main reasons for wanting to purchase this technology and product, no one wants to risk getting confused or overwhelmed with a product too complicated to use.

Most of us have heard of “On-Star”, “LoJack”, “Magellan” and perhaps “Garmin”. Other brands and products are promoted in direct mail and at retail chains including The Sharper Image, Brookstone and others. What DO these GPS units do and what benefits do they provide to the consumer?

Most of the technologies employed in the products above, (except for LoJack) use the satellites in Space to provide a position of such device on earth with Longitude and Latitude co-ordinates to provide a “fix” that can be layered onto a map which then provides a position such as a street address. The device or a person who is with the device knows exactly where they are.

## **USING THE INFORMATION YOU NOW HAVE AVAILABLE**

Such data can help to navigate the best route to a specific location or plan an entire trip with specific directions on your holiday or business trip. In fact those with GPS devices seem to have risen in popularity with friends who are looking for assistance beyond what “Mapquest” could provide through a computer. This information is being provided to family members and friends who want to insure prompt and efficient travel to planned destinations.

## **LOCATING THE VEHICLE AND PERSONS WHICH HAVE A GPS.**

(This in fact is where the communications technology really gets to impress)

While GPS is used proactively by those who want to get directions or locations, the greatest comfort provided by GPS is the ability to be found or located by friends and family should it be necessary to get action or help. In this case, the GPS product uses mobile phone technology to communicate with other cell phones, land lines, text messaging or TO A PORTAL THAT CAN BE ACCESSED THROUGH THE INTERNET.

**SIMPLY PUT:** A GPS unit can provide a location to many of you or your vehicle as well as receive and act on commands that will disable the engine, unlock doors, setoff panic alarm or even start your vehicle. But in order to do this, GPS needs to be able to send valuable location information back and forth via communication networks. We will discuss in simplest terms the various modes and methods of communication to provide you with the best option to meet your specific needs. We will, in the process, provide you with an overview of the most popular of GPS systems.....UNTIL NOW!

## GPS “Satellite” vs “Triangulation Location” technology.

**LoJack** has positioned themselves primarily as a company which uses technology to recover stolen vehicles, yet uses police departments in the recovery process. Instead of using Satellites in space to pinpoint the location of a stolen vehicle, the LoJack product system takes a read from as many as three Cellular Transmission Towers (triangulation) to help find the vehicle. This technology limits the features and benefits of LoJack to just a recovery system. Should your car or motorcycle be missing, you need to call LoJack at which time the device in your missing vehicle is activated and starts sending a beacon to various police cars who have equipment that can receive the signal. The signals then need to be followed by the police which increases in strength as the proximity to the missing vehicle decreases.

There are limitations to this technology beginning with the inability to accurately locate a stolen vehicle in less populated areas. When the system gets a read from just one Cell Tower, the unit can only give an approximation of the location which is generally an area of 100 square miles. Yet with true GPS technology getting its position from a number of satellites allows for accuracy within 10 feet.

Further limitations of the LoJack occur due to the fact that the product requires that the police need be involved in the recovery process. For this reason, as well as the fact that cellular towers are not yet ubiquitous, LoJack is said to function in only 20% of the areas within the United States. It cannot be a practical answer to vehicle theft in rural and less populated centers.

**OnStar (General Motors)** is a subscription-based communications, monitoring, and tracking service provided and supported by General Motors. As of 2005, it was installed in a number of General Motors vehicles, and should be standard on all new GM vehicles sold in North America by 2007. In order to use the OnStar product, the service needs to be activated for a fee, and is available for all vehicles that have the factory-installed OnStar hardware. It consists of both communication, through mobile phone networks, and tracking by GPS technology. Drivers and passengers can use its audio interface to contact OnStar representatives for concierge-like and emergency services; representatives can also initiate contact when vehicle telemetry indicates an emergency (for instance airbag deployment).

OnStar was originally developed from the work of Blue Octane, an IBM ExtremeBlue internship team.

OnStar advocates tout it as an essential safety tool. GM commercials have compared it to seatbelts and airbags, as the next major technology for safe driving. The benefits, they say, include its ability to aid police in tracking down stolen vehicles, to contact emergency medical services in case of an accident (should the driver request this or be non-responsive), to notify drivers of potentially dangerous mechanical problems, and to unlock doors for drivers (after verifying authorization over the phone), should their keys be misplaced or locked inside their car.

On the other hand, critics are wary of the possible privacy implications of OnStar and other similar and related technologies. They raise questions about whether police or others could make use of OnStar's tracking, whether legally or illegally, for surveillance or stalking. They cite cases where evidence collected by OnStar has already been used in court and where OnStar has contacted the police, against the driver's wishes, in the course of incidents such as hit-and-run accidents. Privacy advocates worry that innocent citizens may be hassled by the authorities due to false alarms. Concerns are also raised about what might be done with the data collected by the vehicles' event data recorders, which are analogous to those on airplanes but not as sophisticated and do not currently function as voice recorders.

For example, they say, insurance companies or auto dealers could use data suggesting reckless driving as the basis for denying claims or warranty service. Some critics compare OnStar with "Big Brother," from George Orwell's *1984*. OnStar maintains that it is committed to maintaining the privacy of its customers.

Many consumers are concerned with the fact that a Call Center staffed by individuals is needed in order to obtain assistance in emergency situations. And as with LoJack, one needs to notify On-Star if you find that a vehicle is missing. OnStar uses Satellites to pinpoint vehicle position and precise location of your vehicle can be obtained as long as one can call the GPS unit by Cell phone to get the GPS co-ordinates from the unit. Despite these limitations, it is much more reliable than LoJack.

On-Star also has additional features consisting of "accident notification" when airbag is deployed, "door unlock feature" by the GM call centre and concierge services to assist in locating restaurants or other points.

NOTE: A thief can quickly determine if the GM vehicle has On-Star installed. This can serve either as a deterrent or facilitate the theft process since the thief will try to deactivate the system by cutting the power to the unit. LoJack on the other hand hides the unit so no one even knows that it is installed in your car. (This is called covert installation).

## MODES OF COMMUNICATION FOR GPS SYSTEM (Amps vs. GSM networks)

### AMPS: Advanced Mobile Phone System

Advanced Mobile Phone System or AMPS is the analog mobile phone system standard developed by Bell Labs, and officially introduced in the Americas in 1984. Though analog is no longer considered as an advanced system, the relatively seamless cellular switching technology AMPS was the system that enabled the first mobile radiotelephone to be practical.

Since it has been around since 1984 coverage for GPS products using this mode of communications gives the consumer the best overall Map coverage both proactively and reactively for locating vehicles or locating family members. (90% or better coverage with the US). This service will not be supported in a year or two, therefore the GSM GRPS will be the only option.

### GSM: Global System for Mobile

The Global System for Mobile Communications (GSM) is the most popular standard for mobile phones in the world. GSM service is used by over 1.5 billion people across more than 210 countries and territories. The ubiquity of the GSM standard makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs significantly from its predecessors in that both signaling and speech channels are digital, which means that it is considered a *second generation* (2G) mobile phone system. This fact has also meant that data communication was built into the system from very early on. GSM is an open standard which is currently developed by the 3GPP.

From the point of view of the consumer, the key advantage of GSM systems has been higher digital voice quality and low cost alternatives to making calls such as text messaging. The advantage for network operators has been the ability to deploy equipment from different vendors because the open standard allows easy inter-operability. Also, the standards have allowed network operators to offer roaming services which mean subscribers can use their phone all over the world.

The disadvantage of GSM over the AMPS network is that coverage is mainly in highly populated areas and main highways and roads. Therefore if your unit is outside of GSM coverage area you would not be able to get a current location of your family member or vehicle. With time and installation of New Towers or equipment the providers will be motivated to enhance the coverage due to the phase out of the AMPS network.

## **CONCERNS EXPRESSED BY THE CONSUMER**

1. Map coverage of a device like this is very important. (need to get the message and location as soon as an event is triggered)
2. Will the GPS device drain your battery after extended periods of none use?
3. Is my information confidential and am I in control as to who sees it and am I in control who gets the notifications?
4. Is the GPS more than just a theft recovery system?
5. Is the GPS system pro-active?

## **CONCLUSIONS AND SOLUTIONS**

While I sincerely believe that the information provided above will answer and clarify both questions and concerns, The Real Security Company is proud and privileged to introduce the newest combination of technologies in one product that will deliver the features and benefits of a vehicle protection and recovery system not seen until the present.

In partnership with LunarEYE, The Real Security Company is the exclusive marketing and sales company that will sell the GPS device that addresses all issues and concerns in the most practical manner, and with Patent protection that will keep our Technology as the choice of both the present and the future.

1. The Eye On GPS device in sleep mode draws such small amount of current from your battery that it can go for many months before you need to have the battery in the car or Motorcycle charged. A slight vibration of the unit for a period of 5 seconds causes the GPS to fully power up and send out breach of security notification within seconds to pre-determined telephone numbers and e-mail addresses.
2. Your information is 100% under your control. You get your own login information and provide your own password to get on the Portal through the internet. The portal electronically manages all your notifications and information under your direction and control. There is no human intervention unless you as a consumer provides that authorization. (In the case of On-Star or LoJack police or GM's call centre has access to all your information.)
3. The EYE ON system is much more than a theft recovery system. It will provide you backup with notification of an accident, you can press a panic button to get help, unlock car doors, disable your vehicle if stolen, and much more. It will give you and your family the security of knowing you can be located.
4. Most systems are reactive; (meaning you have to take action after you determine your car or motorcycle is missing.) Our EYE ON unit will be calling pre determined numbers within seconds upon any action that reflects movement with your vehicle. You or chosen individuals will be advised immediately when there is an attempted theft. (This is being pro-active in theft prevention) instead of the

alternative of trying to recover your asset after it has been stolen, and which is the case with both “On-Star” and “LoJack”.

5. We have just recently completed development with LunarEYE and will launch an Amber Trak GPS system that can be used to track your children and be notified within seconds when your loved one breaches a Geo-fence or a Panic Button is pressed.