



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 2)

Available online at: [www.ijariit.com](http://www.ijariit.com)

## GPS and GSM based geo location guide using RF with emergency alert via SMS

Veena V

[veena2733@gmail.com](mailto:veena2733@gmail.com)

Panimalar Engineering College, Chennai, Tamil Nadu

Vidhiyalukshmi G

[vidhiyagnaapandithan@gmail.com](mailto:vidhiyagnaapandithan@gmail.com)

Panimalar Engineering College, Chennai, Tamil Nadu

Rajalakshmi R

[rajalakshmi081997@gmail.com](mailto:rajalakshmi081997@gmail.com)

Panimalar Engineering College, Chennai, Tamil Nadu

Dr. S. Leones Sherwin

[sherwin\\_leo@yahoo.com](mailto:sherwin_leo@yahoo.com)

Panimalar Engineering College, Chennai, Tamil Nadu

### ABSTRACT

*The people entering a theme park are provided with a small unit called as RF receiver which contains an emergency button. Whenever the person enters a ride or a game in the theme park, they will be intimated with their location in an LCD receiver, this is done by an RF transmitter kept in various location with fixed IR sensors, which senses the person and the signal is transmitted to the receiver. In the receiver, a programmed Arduino decides the location based on the received information and it is displayed in the LCD display. When there is an emergency they can push a button present on the receiver unit and the information goes to security as well as controller of the game in the form of the alert message along with the location of the person using GSM module. Here the location of the person is found using GPS tracker.*

**Keywords:** RadioFrequencyRF, InfraRed IR, Sensor, GSM, GPS.

### 1. INTRODUCTION

Theme parks/ national parks as well as other huge tourist attractions need directional guides to inform the user about his location in the area. To solve this issue we here propose a park guidance system using RF technology that works wirelessly to guide user about his current location. This proves as a very handy and convenient medium for guiding tourists through the park.

This system proposes to replace the “you are here” boards mounted through such parks. Our system uses an RF receiver circuit in order to track the user. The user may carry the circuit with him. It then consists of RF transmitters placed at various locations across the park. These transmitters constantly emit RF signals. When the RF receiver circuit carried by user comes in range on an RF receiver it detects that the user is in range of that particular RF transmitter. This signals it to display the location of the user. Each location area is identified uniquely by an RF transmitter. When the user enters the area the circuit reads the transmitter code and displays the location on an LCD screen

The global positioning system has become a common functionality in hand held devices, and therefore, several location-tracking applications have been developed including continuous location-tracking of elders and children for safety reasons or to prevent them from being lost, car monitoring and tracking, and intelligent transportation systems.

The GPS is used to obtain the location information of a target. However, most of the above-cited works used either an 802.11 wireless network or the short message service (SMS) to transmit the location information of a target to a tracker. The global system for mobile communications (GSM) modem and a GPS unit is used to track the location. In this project, we have used this GSM to communicate with the security in case of an emergency.

Wireless communication is a transfer of information or power between two or more points that are not connected by an electrical conductor. The most common wireless technologies use radio waves with radio waves distances can be short such as a few meters for Bluetooth or far as millions of kilometers for deep space radio communication. Here we have used RF transmitter and receiver. The range of RF frequency is 20 kHz to 300Ghz. It can cover up to a distance of 2 km.

## 2. SYSTEM REQUIREMENTS

### A. HARDWARE CONFIGURATION

- RF transmitter
- RF receiver
- GSM module
- GPS
- Power regulator
- Power supply
- LCD display
- IR sensor
- Bridge rectifier

### B. SOFTWARE CONFIGURATION

- ARDUINO IDE
- PROGRAMMING LANGUAGE: EMBEDDED C

## 3. EXISTING SYSTEM

This system tackles an RFID based location finding and tracking system. The system is an integral part of navigation aid being developed for people in a store. This system interacts via wireless communication to locate the position of the user and it informs the user where he is. It consists of a simple RFID tag which the user has and a fixed transmitter which transmits the location name and the LCD will be there in the transmitter part. , when the receiver is moving to another location the transmitter in the other part will intimate the user where he is present. It is used in large public spots. But the user has to notice the location by going near to the transmitter.

There is no emergency alert in this system, the game controller as to manually check if everyone is safe. Due to the absence of an alert system accident occur.

### Disadvantages

- No security features.
- Location cannot be intimidated.
- Cannot be used in case of emergency.
- Ride controller may not monitor the ride passenger all the time.
- In high speed rides it is not possible to monitor the individual person.

## 4. PROPOSED SYSTEM

Some places need directional guides to inform the user about his location in the area. This system proves as a very handy and convenient medium for guiding tourists through the park. This system is to replace you are here boards mounted through such parks. It uses an RF receiver circuit in order to show his location. The user may carry the circuit with him.

It then consists of RF transmitters placed at various locations across the park. These transmitters constantly emit RF signals. When the RF receiver circuit carried by user comes in range on an RF receiver it detects that the user is in range of that particular RF transmitter.

This signals it to display the location of the user. Each location area is identified uniquely by an RF transmitter. When the user enters the area the circuit reads the transmitter code and displays the location on an LCD screen. Apart from the existing system, additionally we have added a global system for mobile communication (GSM) which connects the receiver to the security who will be receiving an emergency message from the user who uses the receiver.

We have also added Global Positioning system (GPS) which gives the latitude and longitude of the location where the user is present. This location will be transmitted as a link to the security who can view this through an internet connection.

### Advantages

- More efficient.
- Location can be intimidated if lost.
- Can be used in case of emergency

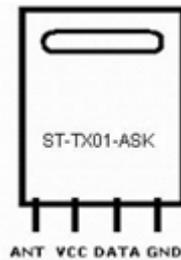
## 5. MODULES DESCRIPTION

### RF transmitter

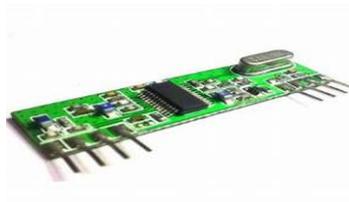


An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data. Transmitter modules are usually implemented alongside a micro controller which will provide data to the module which can be transmitted. RF transmitters are usually subject to regulatory requirements which dictate the maximum allowable transmitter power output, harmonics, and band edge requirements.

### Transmitter Module

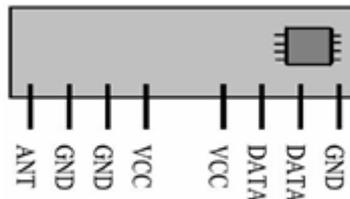


### RF Receiver



An RF receiver module receives the modulated RF signal and demodulates it. There are two types of RF receiver modules: super heterodyne receivers and super-regenerative receivers. Super-regenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage. Super heterodyne receivers have a performance advantage over super-regenerative; they offer increased accuracy and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in the past tended to mean a comparatively more expensive product. However, advances in receiver chip design now mean that currently there is little price difference between super heterodyne and super-regenerative receiver modules.

### Receiver Module





GSM (Global System for Mobile Communications, originally *Groupe Spécial Mobile*) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets, first deployed in Finland in December 1991.

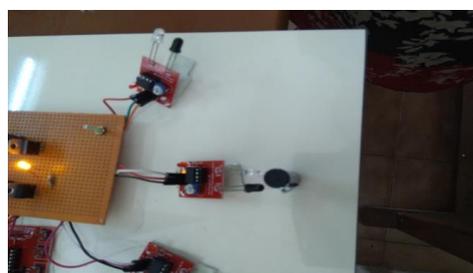


The Global Positioning System (GPS), originally Navstar GPS, is a satellite-based radio navigation system owned by the United States government and operated by the United States Air Force. It is a global navigation satellite system that provides geo location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. RF

### Transmitter and Receiver Kit



## 6. OUTPUT



## **7. CONCLUSION AND FUTURE ENHANCEMENT**

The geo location guide system using RF was implemented successfully which guides the user to track their location and can also provide help in the emergency situation. This can further be enhanced by converting the text message to speech in the module which can help blind people and to also make the user get attention when they do some important activities, like when they are driving in the road and if a speech signal guides them then it will be useful. This text to speech conversion can even be replaced by using a buzzer which would alarm whenever the user enters into a new location

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