

FUNCTIONAL DESCRIPTION FOR **ANIMAL TRACKING SYSTEM**

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Using GPS satellites to relay latitude and longitude information to a tracking unit, an animal's location and movement can be tracked. Once the information has been sent to the tracking unit, the information will be transmitted by a wireless communication link to a website. All information, such as the location, warning level and path of travel, of the animal will be located on this website. Once a user has entered the proper user ID and password, he/she will then have the option of setting mode parameters such as tracking time, download time and adding / deleting new animals to name a few. Included within this functional description are all system inputs and outputs along with modes of operation and a block diagram.

DEFINITION OF SYSTEM INPUTS AND OUTPUTS

Inputs:

Animal Position

This is an independent variable that determines the location of the animal when it receives the GPS Signal

GPS Signal

This is the satellite signal that is received by the GPS receiver. Latitude and longitude is computed from this signal.

Desired User Function

These are functions that will set the mode of the motherboard (i.e.- autonomous mode, continuous mode, warning mode, status mode, and program mode).

Battery

Power supplied by the battery on the collar.

Outputs:

Animal Location

Latitude, longitude and time stamp accepted by the GPS receiver and computed by the motherboard. This information is then sent to the user via a communication link on a predefined time interval.

Warning Level

Warning that is triggered when an animal is within a certain distance from a predetermined boundary.

System Status

This indicates the battery life, communication signal level, and GPS status of the system.

MODES OF OPERATION FOR ANIMAL TRACKING SYSTEM

To access the Animal Tracking web page, the user must input an ID and password. The user will then have the option of selecting one of five modes of operation discussed below.

Autonomous Tracking Mode (ATM)

In the Autonomous Tracking Mode, the approximate position of the selected animal is determined by the GPS receiver at a given time and stored in the CPU. This measurement is made on a periodic basis with the time increment being a parameter set by the user. In addition, this location and time information is downloaded, via the communication link, to the user as an email and/or to the Animal Tracking web page, also at a time interval set by the user. The time periods for the position measurement and information download can be different. Once a user has exited the animal tracking web page, Autonomous Tracking Mode becomes the default mode of operation.

Warning Mode (WM)

In the Warning Mode, the system will automatically send a warning to the user if the animal crosses a user-defined boundary. The boundary and time interval for alert transmission is set by the user in Program Mode. Different boundaries can also be defined allowing different levels of warning. For example, a level 1 warning could be issued when the animal comes within 4 km of the park's boundary and alerts sent to users every 30 minutes. If the animal eventually comes within 2km of the park boundary, then a level 2 warning could be issued with more frequent alerts.

Real-Time Tracking Mode (RTM)

In the Real-Time Tracking Mode, the system will determine and transmit the location of the animal at the request of the user and display the location relative to the warning boundaries defined by the user for the Warning Mode.

System Status Mode (SSM)

In the System Status Mode, the user can obtain status information on critical system parameters of the animal unit such as battery power level, the GPS satellite constellation and signal level, communication link signal level and remaining memory in the CPU.

Program Mode (PM)

In the Program Mode, the user can add or delete animals. In addition, the user can set the parameters used in the ATM and WM. These parameters are as follows:

ATM: User can set time interval for determination of animal location as well as time interval for transmission of data to user.

WM: User can define boundaries for various warning levels as well as the alert period for each level.

BLOCK DIAGRAM FOR ANIMAL TRACKING PACKAGE

