Top Dog Technologies

Territory Tracking and Restriction System

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Problem Background

- Track and control pet whereabouts when humans are absent
- Protecting indoor furniture and belongings

Needs Statement

There is a need to have a pet deterrent system that tracks pet movement throughout the house 24/7 by monitoring and documenting when a pet enters off-limit areas and deters the pet when needed.

Goal

Create a network of receivers and transmitters that can record the general location of a pet and deter it from the off-limit areas.

Requirements

- The system must cost less than $500 to be competitively priced based on the quality level it provides to the consumer.
- The system must use a power source accessible to the public, such as a battery, and the power source must last at least 1 month without being replaced.
- The system must not harm animals or people.
- The system must function well in a typical indoor environment.

Requirements

- The collars should be light, less than 1 pound, and comfortable for the pet.
- The system must be easy for the user to set up which is defined as the set up time taking less than 30 minutes.
- The system must be easy to use and adjust, any adult with basic computer knowledge should be efficient with the system after 1 week.

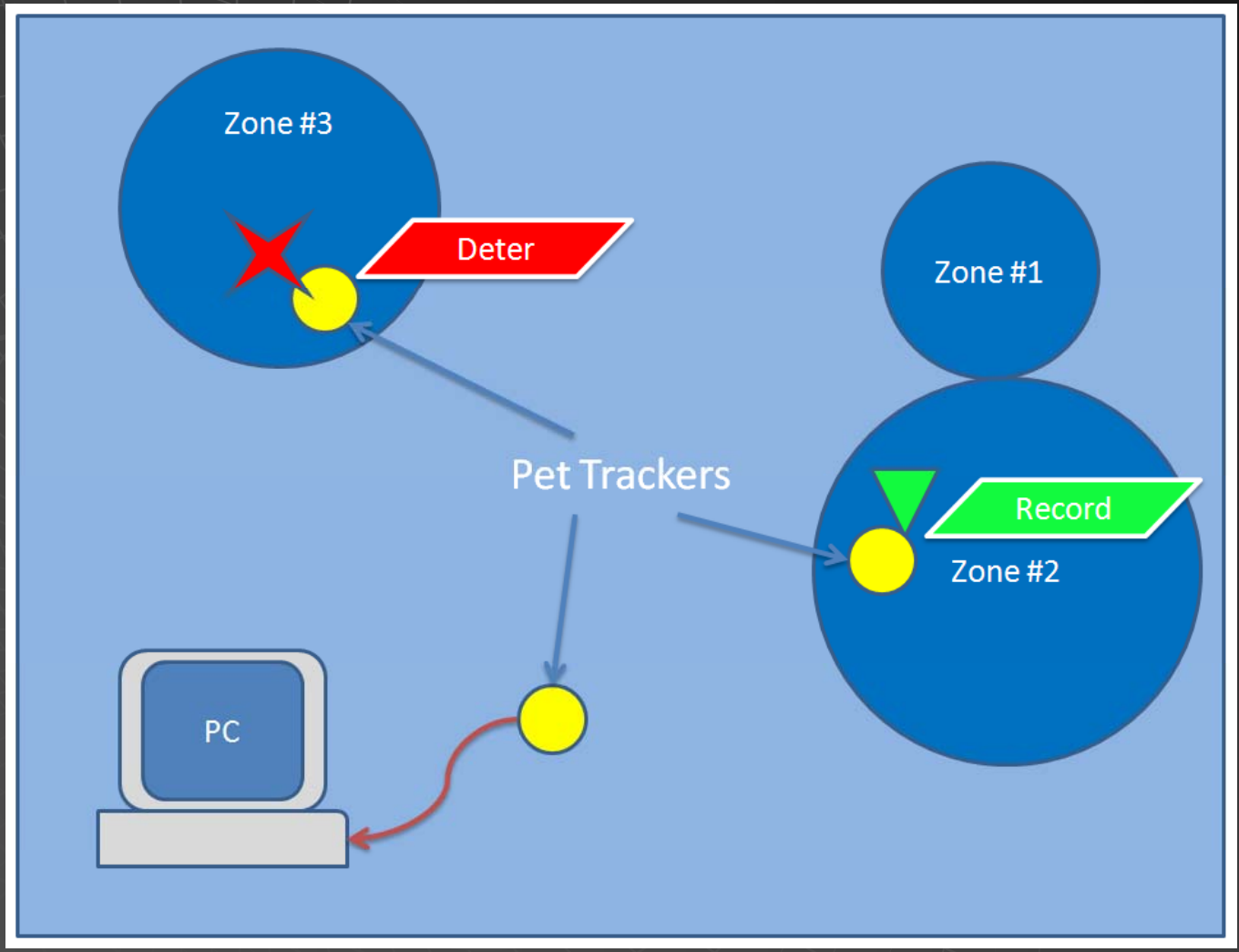
Requirements

- The system should have a variable range that covers an area with a 3 foot radius to an area with a 20 foot radius.
- The system should document the zone and time when a pet violates a restricted location.
- The recorded information should be displayed to the user in an organized and understandable fashion.

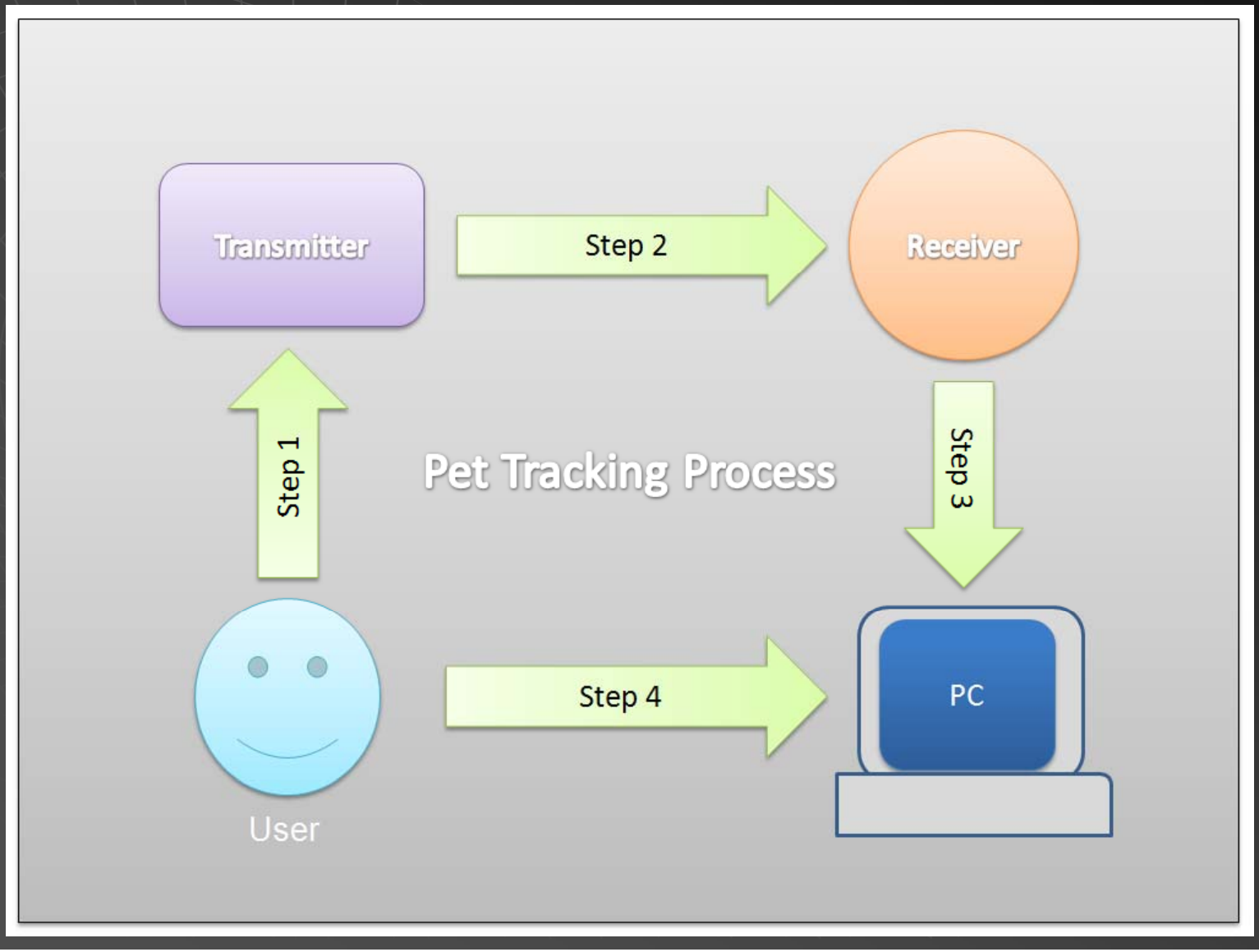
Design Alternatives

- Transmitter and Receiver Chips
  - TRF7960 from TI
  - ADF7020 from Analog Devices
  - CC1100 from TI
  - TXM-315-LR from Linx
- Deterrent Settings
  - Programmable
  - Hardware Switches

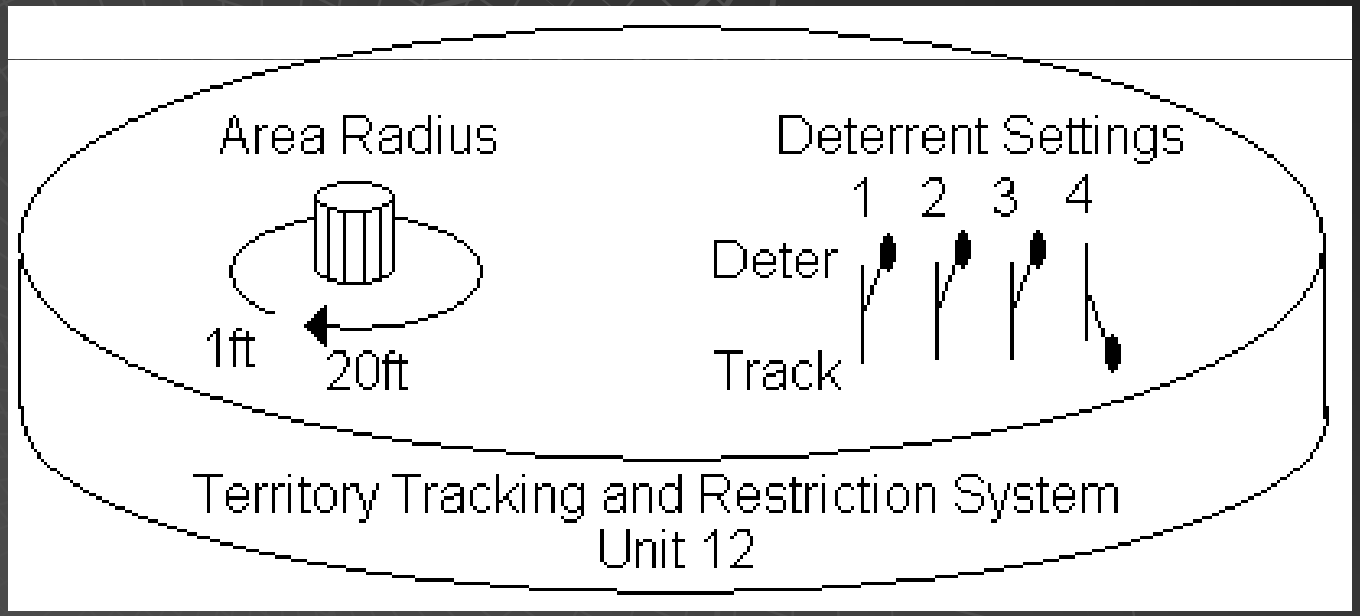
System Level Description



System Level Description



Transmitter Design



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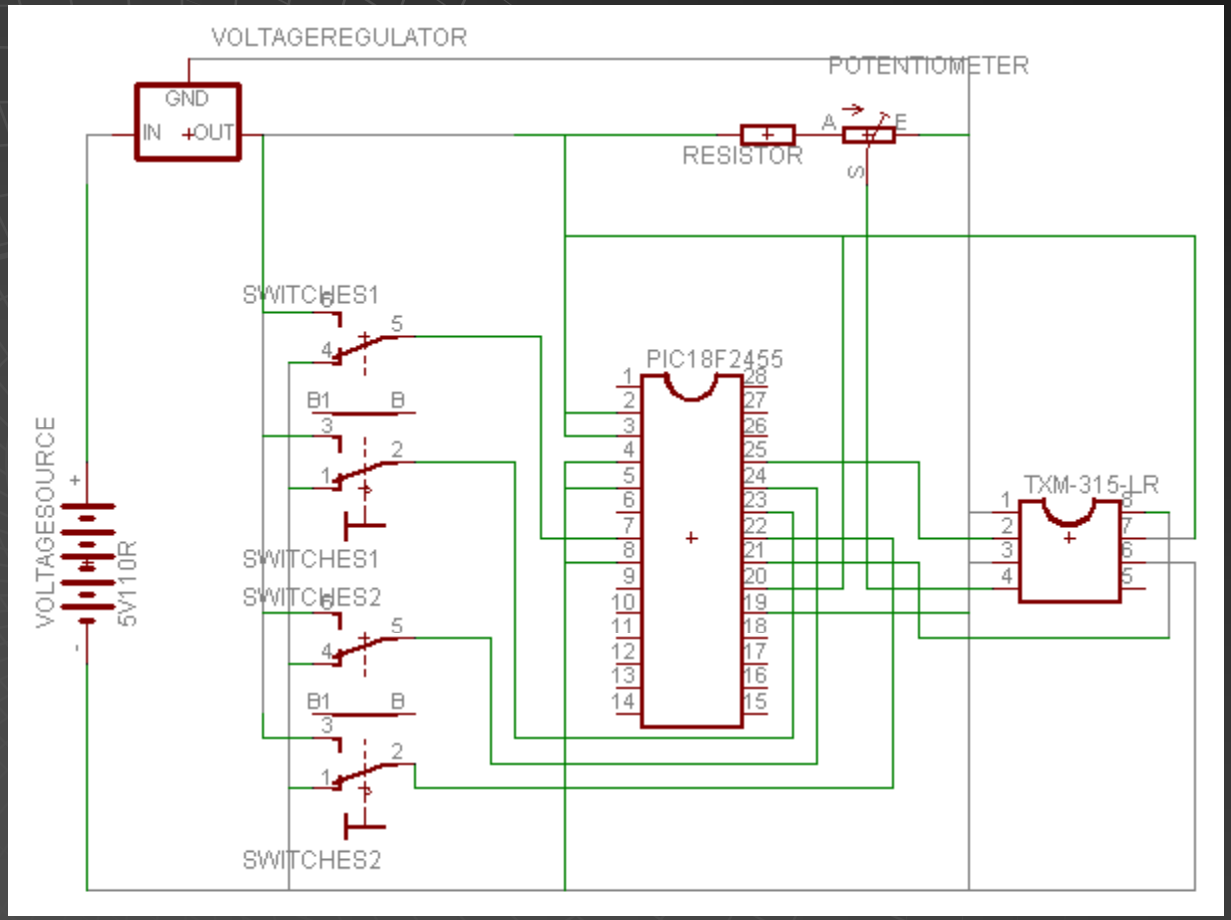
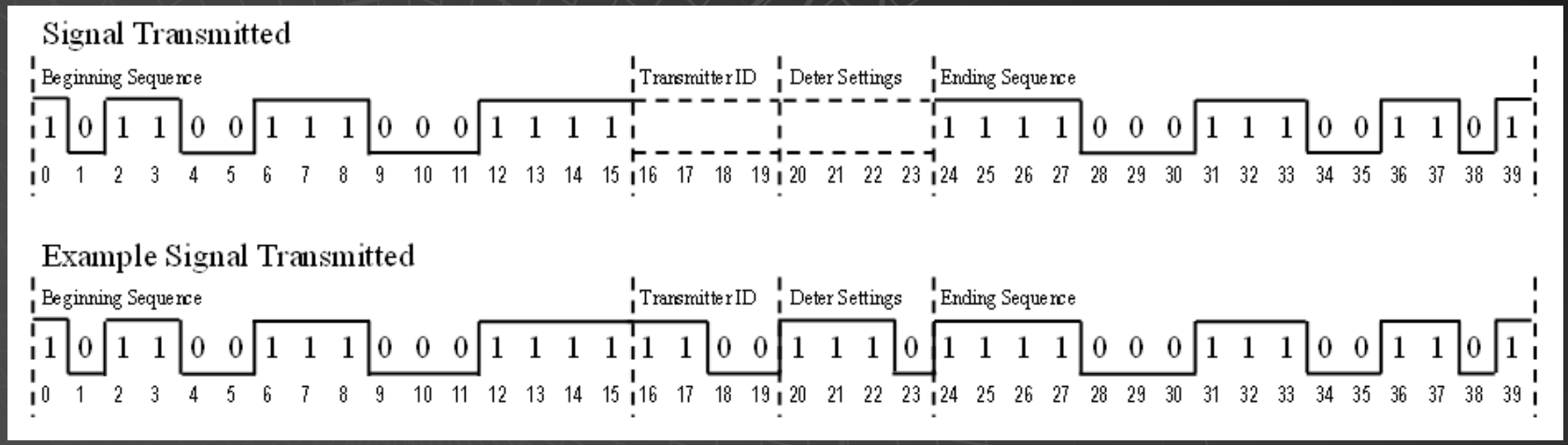
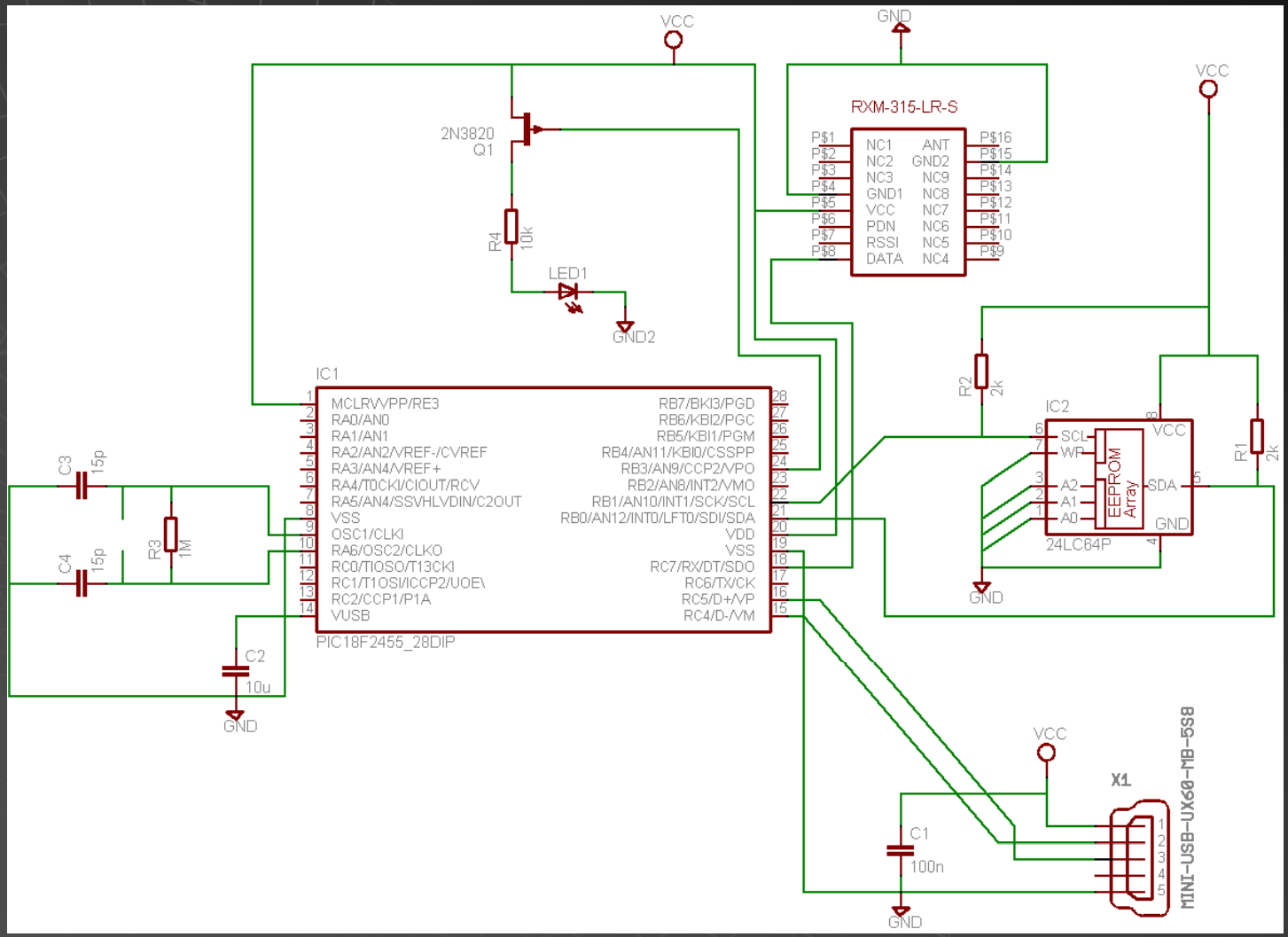


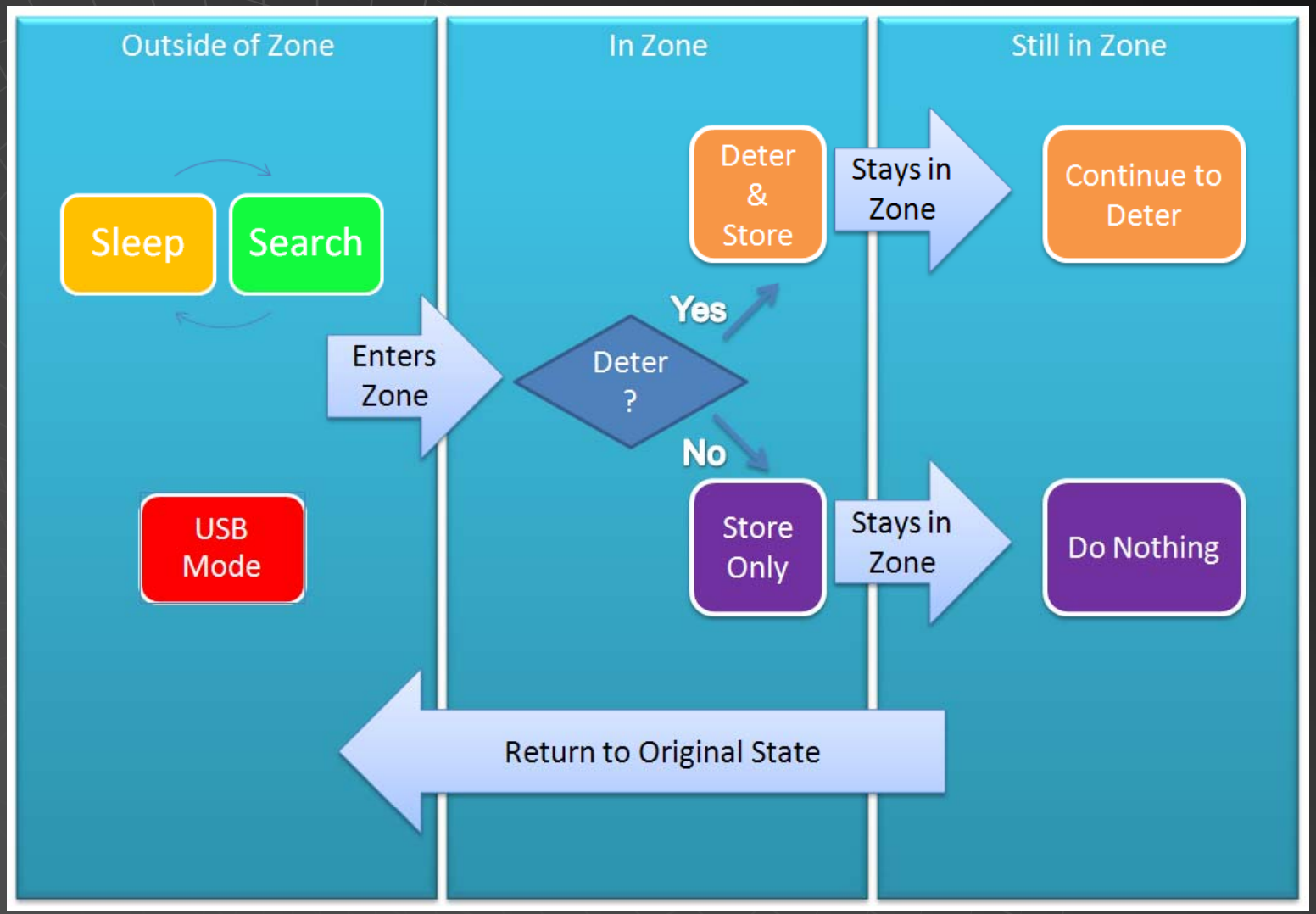
Transmitter Design



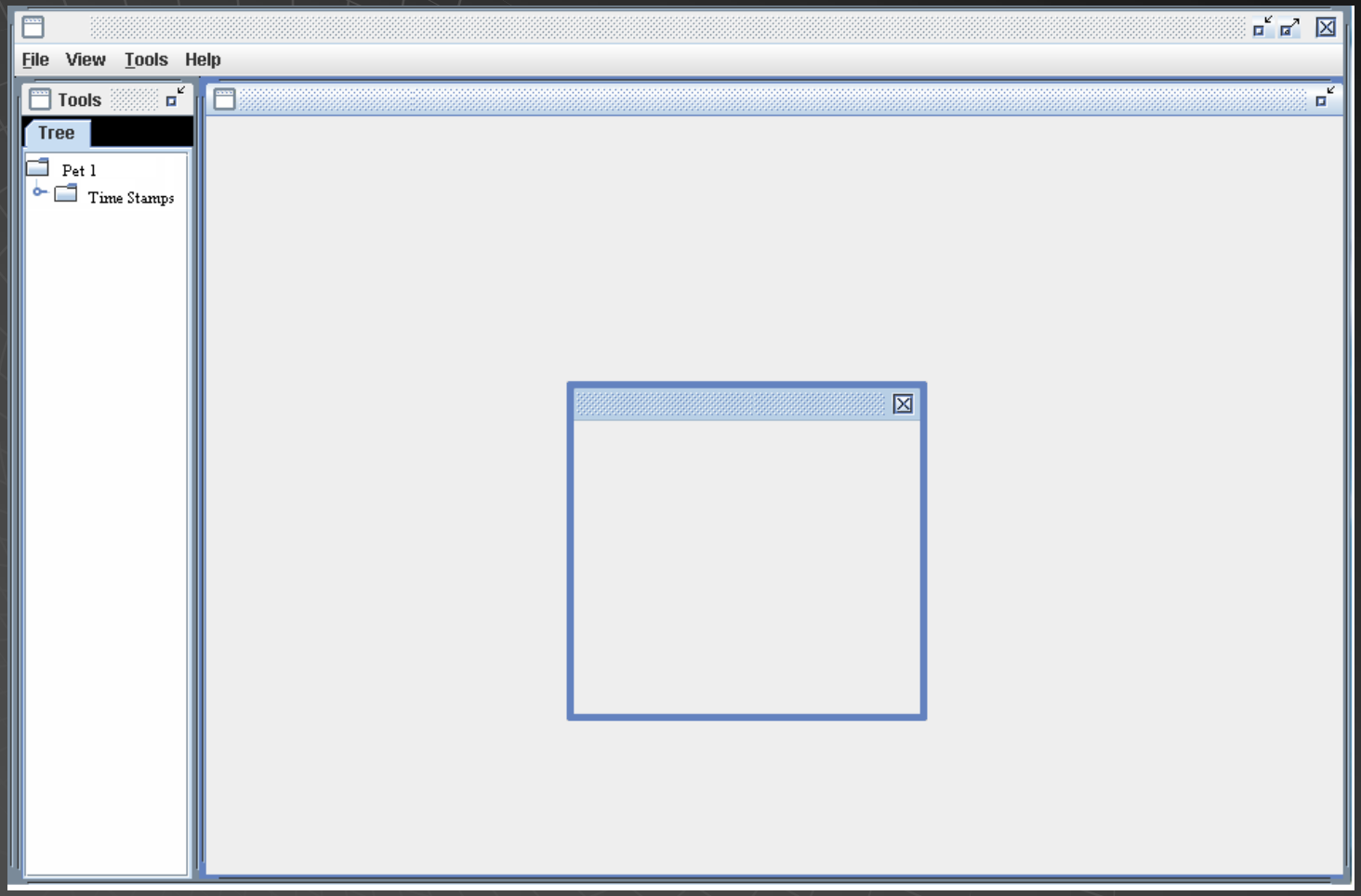
Receiver Design



System Design



Software Design



Project Scheduling

Weeks **Tasks**	7	8	9	10	11	12	13	14	15
Test Transmitter and Receiver Pair									
Create Software with Basic Functionality									
Test Storage System and Software Compatibility									
Build Transmitter Disk									
Build Collar Receiver and Deterrent Signal									
Build Storage System									
Perfect Transmitter Disk									
Perfect Collar Receiver and Deterrent Signal									
Perfect Collar Storage System									

Project Scheduling

Weeks **Tasks**	7	8	9	10	11	12	13	14	15
Add Functionality to Software									
Focus on Parts of the Project that Failed Testing									
Test and Correct all Aspects of the Project									
Develop Final Report									
Develop Final Presentation									

Design Validation Plan

- Range Test
- Deterrent Test
- Power Test
- Software Accuracy Test
- Accuracy Stress Test
- Software Suite Test

Design Demonstration

- Have transmitter and receiver active
- Bring receiver into range at various times with different transmitter settings
- Connect receiver to software suite and demonstrate the accuracy of the information

Team Management

- Michael
  - Team Leader, Head of Finances and Purchases
  - Working on receiver hardware
- Chris
  - Head of Software Design, Head of Technical Reports
  - Working on software suite
- John
  - Head of Systems Design, Head of Documentation
  - Working on of PIC programming
- Denise
  - Head of Hardware Design, Head of Project Validation
  - Working on transmitter hardware

Health and Safety Concerns

- Verify that the transmitted signal conforms to FCC regulations
- Design the collar and deterrent method to not harm or hinder the pet

Social, Political and Ethical Concerns

- The Territory Tracking and Restriction System runs in the privacy of the user's home
- The user chooses to run the Territory Tracking and Restriction System

Manufacturability, Sustainability and Economics

- Manufacturability:
  - Can be created in mass quantities
  - Information programmed on PIC
- Sustainability:
  - Battery can be replaced
  - Information can be stored on the computer
- Economics:
  - Low material cost

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Any Questions?