



# WIRELESS DOOR OPENER



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## Our goal

To develop a system that serves to open a handicapped door without any human interaction, thus eliminating many issues which plague the current handicapped door system.

The door opens when a wheelchair is in close proximity; but only when opening the door is actually desired.

## A little history about us

### •The birth of the project

It was brought to Colorado State University's attention a few years ago that there was a student on campus who had been disabled, and who considered opening a door one of the most difficult and inconvenient tasks of his day, juggling books and other items as he tried to free himself to push the button that would open the door, then having to maneuver around the door as it opened. Thus our project was born.

### •Previous achievement and problems

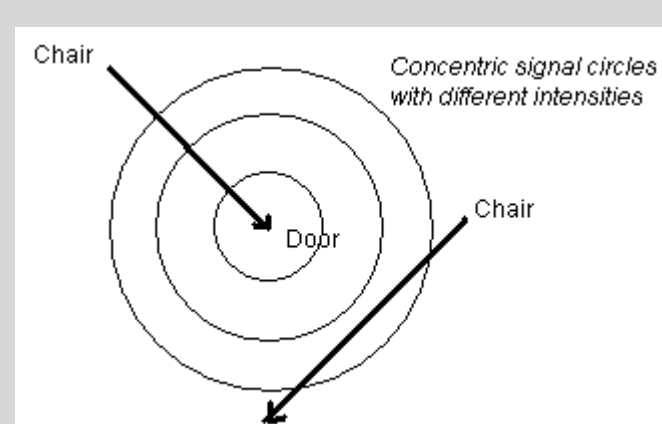
Last year, this project managed to access opening the door without human interaction. However, it appeared to have two major problems:

1. High power consumption on the chair end.: batteries only last for half a day.
2. No direction detection: the door would open even when the person didn't intend to but get close to the signal range.

## Core Technical Innovations

### • Directions detection

Sense and determine the speed and direction of the transceiver on a wheelchair using a group of concentric circles produced by a radio transceiver that varies its strength by a microprocessor on a door.

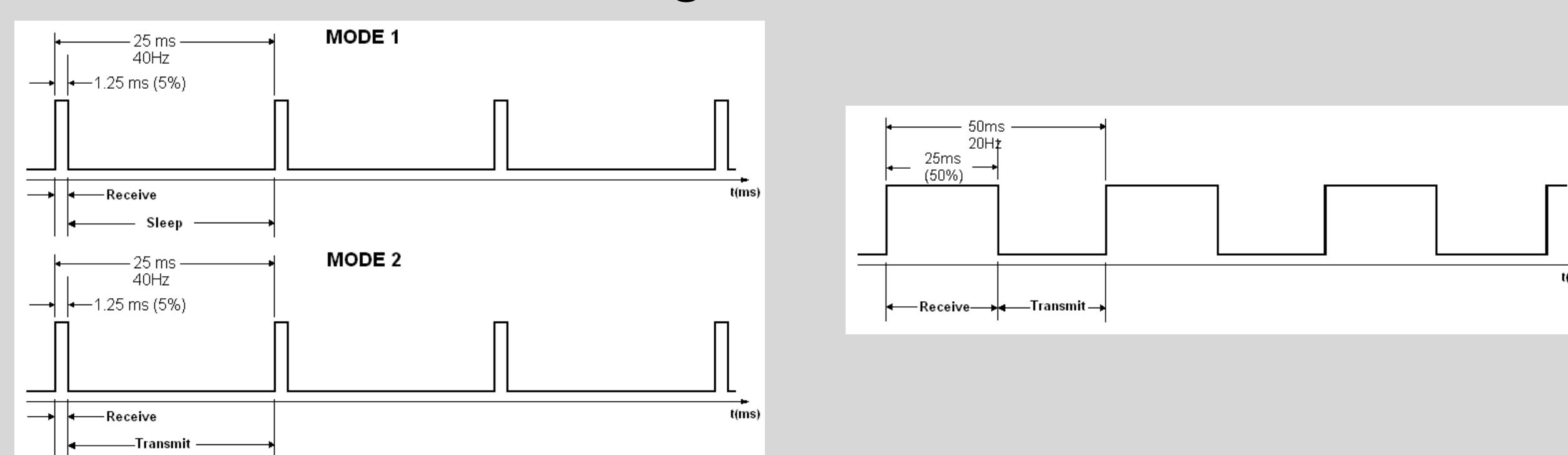


## Core Technical Innovations

### • Power consumption

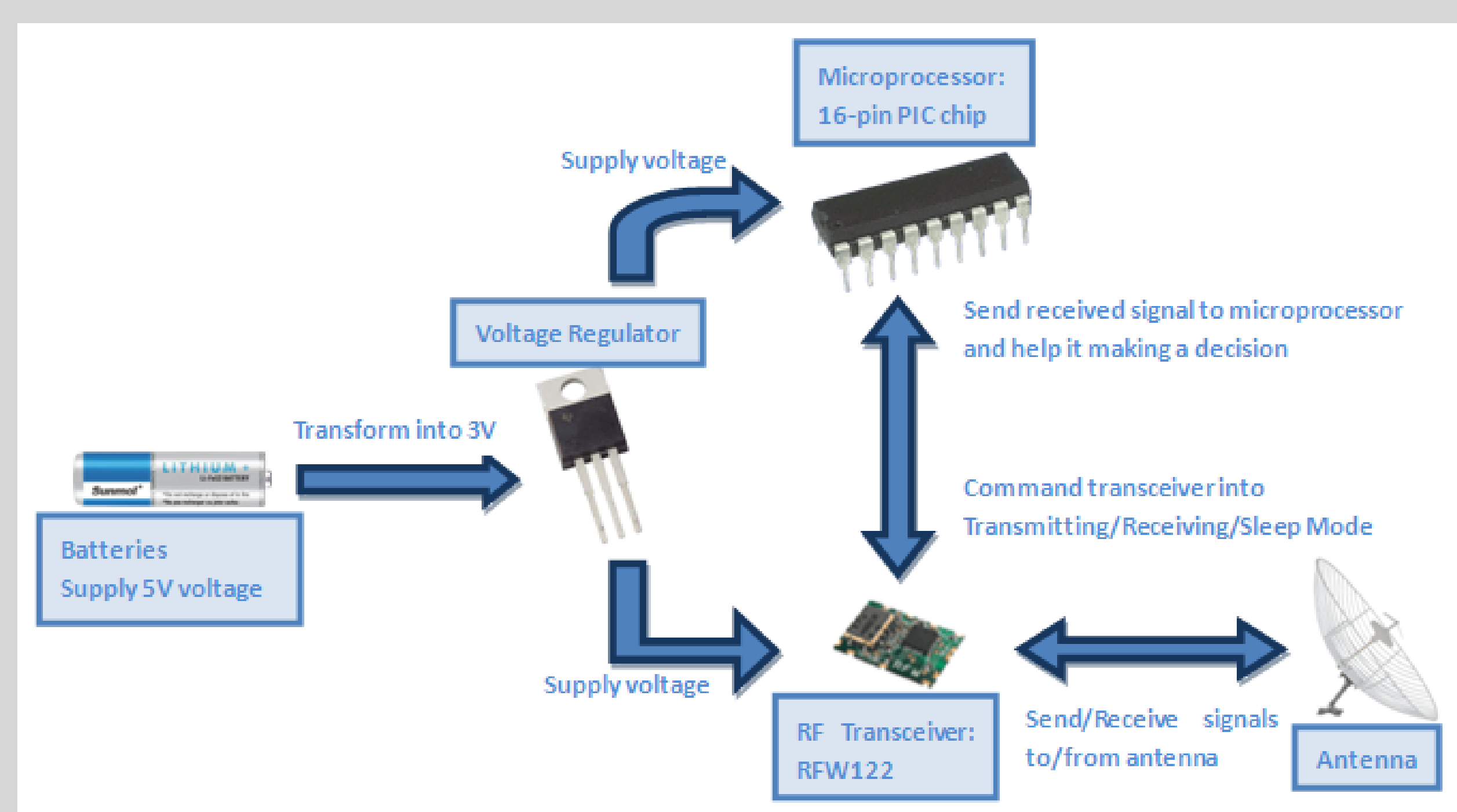
1. Save 99% of the power consumption of the transceiver at the wheelchair by switching it from the sleeping mode to the receiving mode for a spark of time in each time period.

2. Used the "Buck" and the voltage regulator to achieve desired voltages.

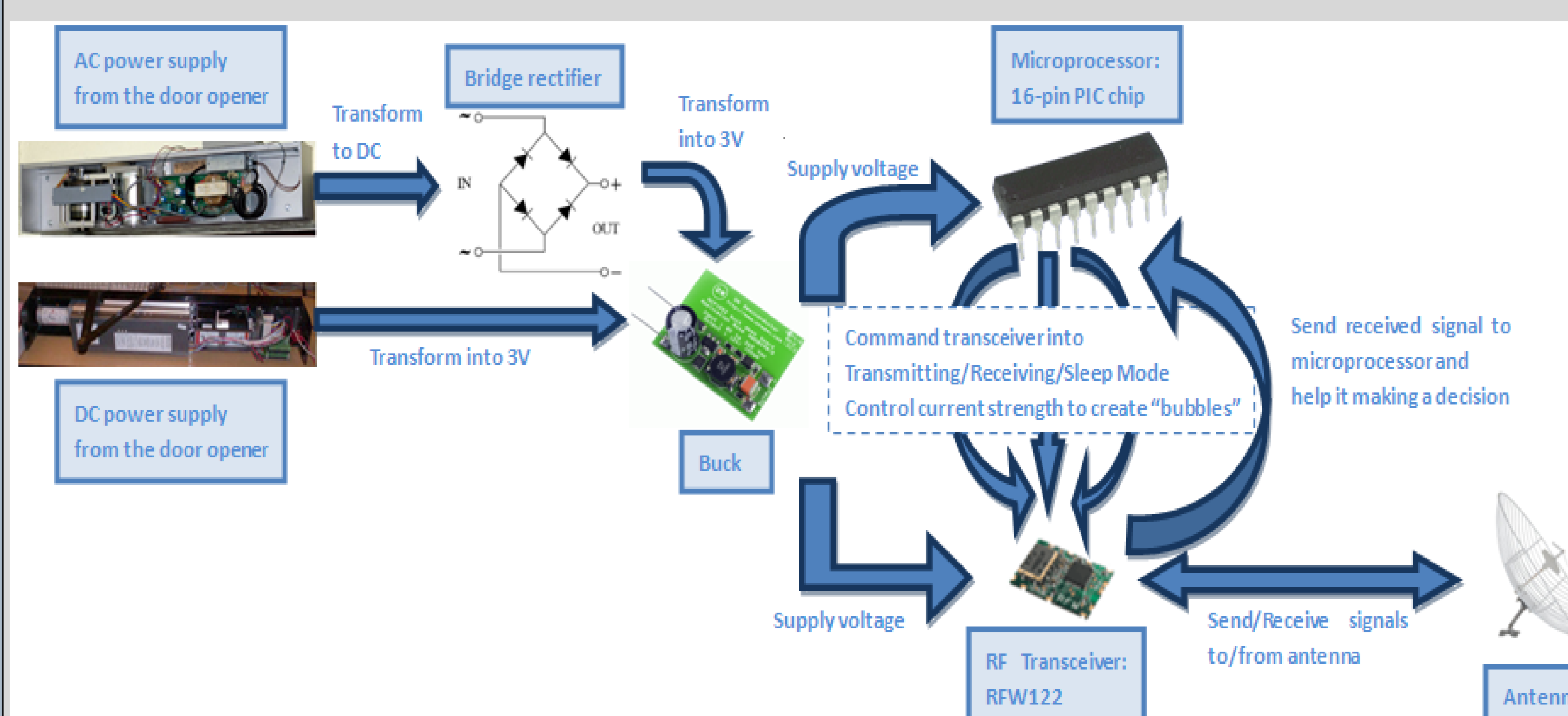


## Circuits

### Chair Circuit

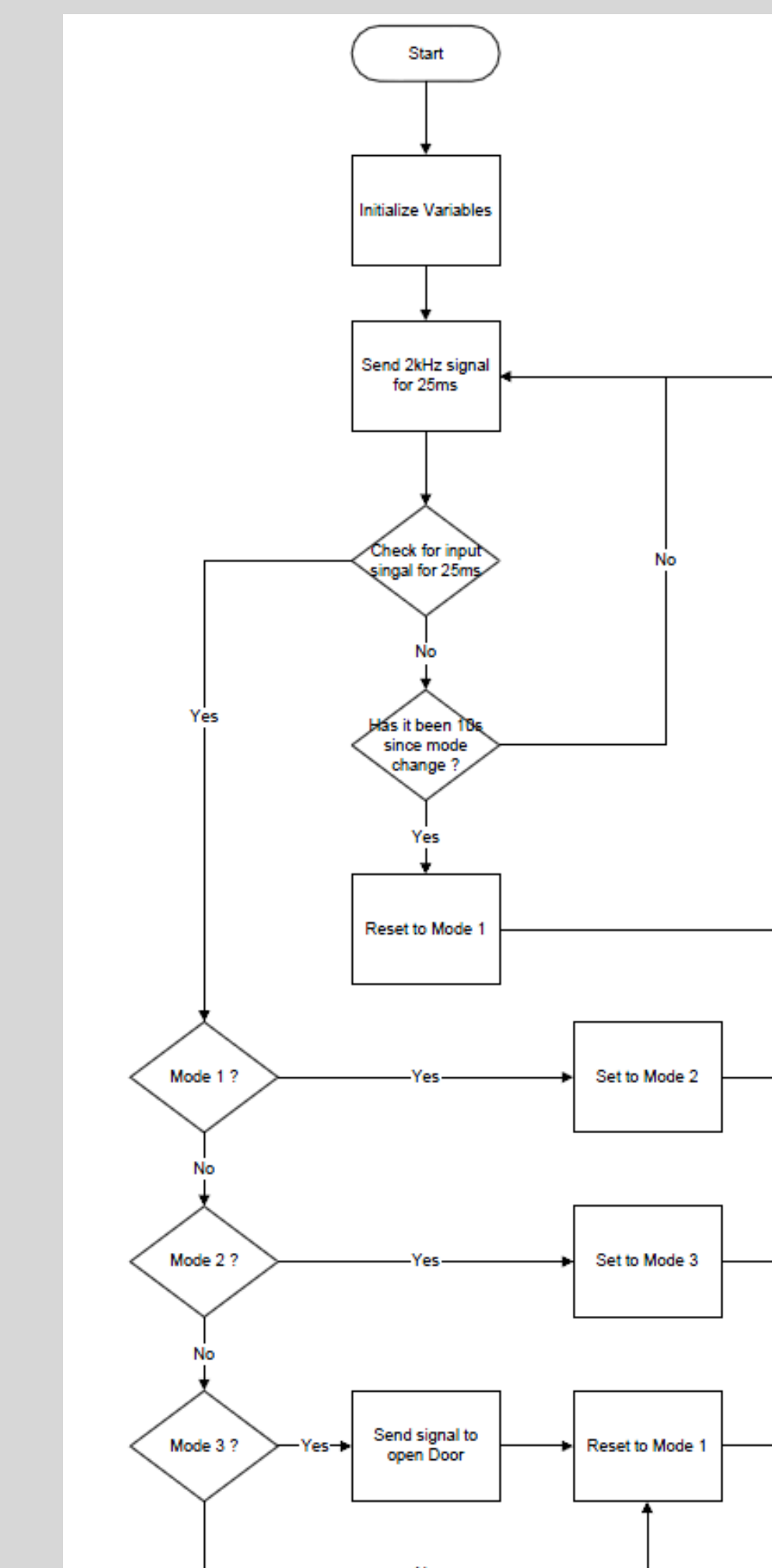
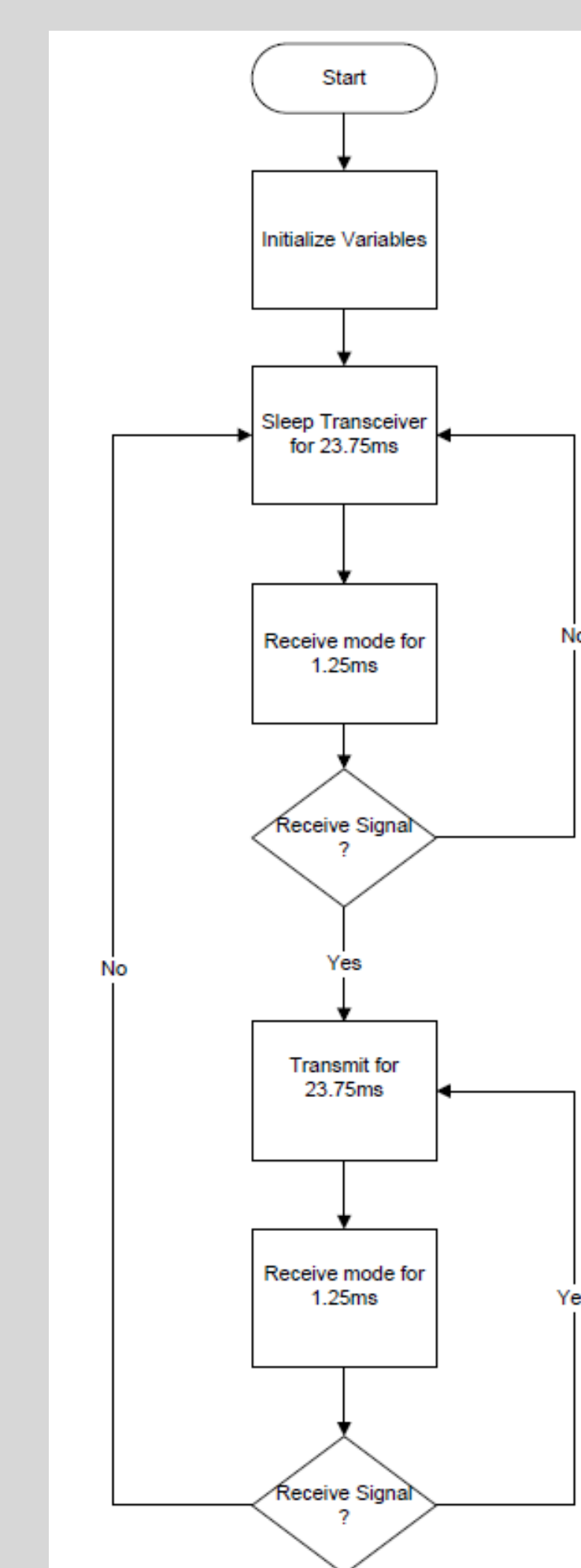


### Door Circuit



## Software

- **The Chair** : 2 Modes of operations saved 95% of the power consumptions.
- **The Door**: 3 Modes of operations, which generates 3 different strengths of current as the concentric circles.



## Outlook

• The project is currently in the testing stage. In the near future, we are going to install the devices on one of the CSU facilities and Terry will test the devices and give us feedbacks for further improvements.

• Our device has the potential to transform the accessibility of public facilities everywhere, and we are eager to adjust the design to maximize both ease for the user and universal installation possibilities for public buildings everywhere.

## Acknowledgements

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**Olivera Notaros:** Miscellaneous equipment and much time over the entire year

**Ashley Waddell:** For helping us to get donations from many different places. As well for her superb English skills.