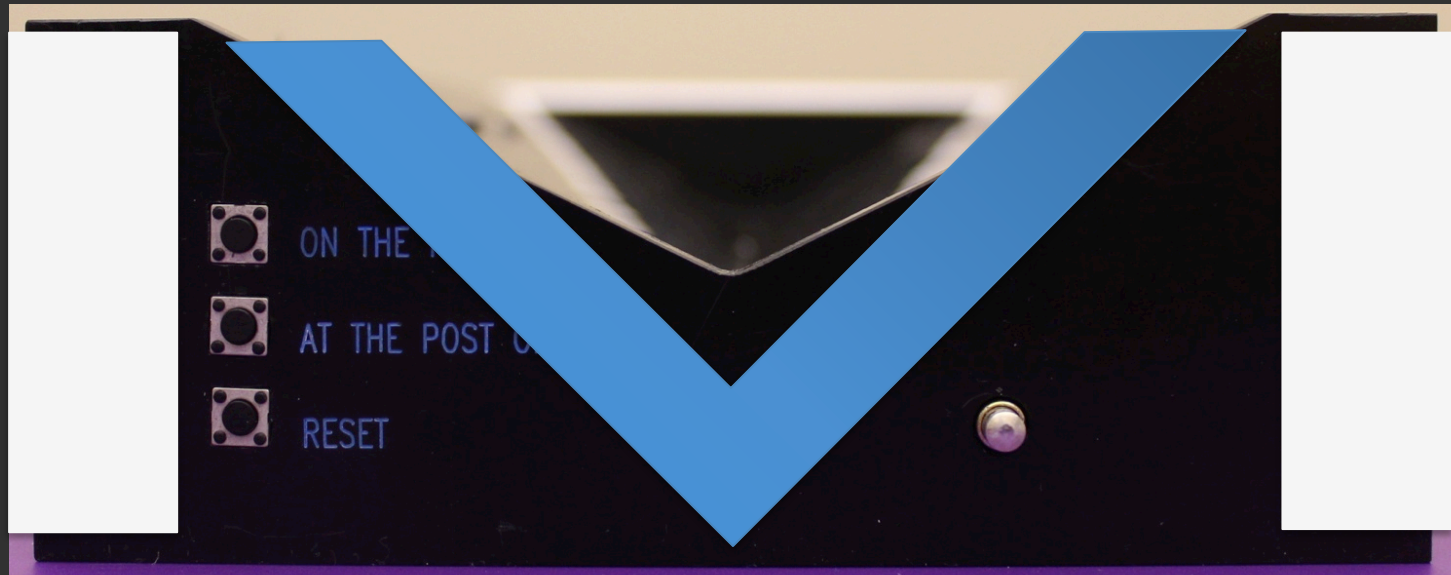


MAIL NOTIFICATION SYSTEM



ECE 445 SENIOR
DESIGN PROJECT
SPRING 2013
TEAM #9

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RYAN PARK
DICKSON SALIM

AGENDA

- OBJECTIVE
- FEATURES
- IDEA SKETCH
- BLOCK DIAGRAM
- SYSTEM OVERVIEW
- OLD DESIGN vs. NEW DESIGN
- SCHEMATICS
- REQUIREMENTS & VERIFICATIONS
- SUCCESSES
- CHALLENGES
- RECOMMENDATIONS
- QUESTIONS



OBJECTIVE

- To make our lives more convenient by providing an efficient mail notification system
- To reduce time and energy wasted by checking an empty mailbox
- To pick up expected items as soon as they arrive

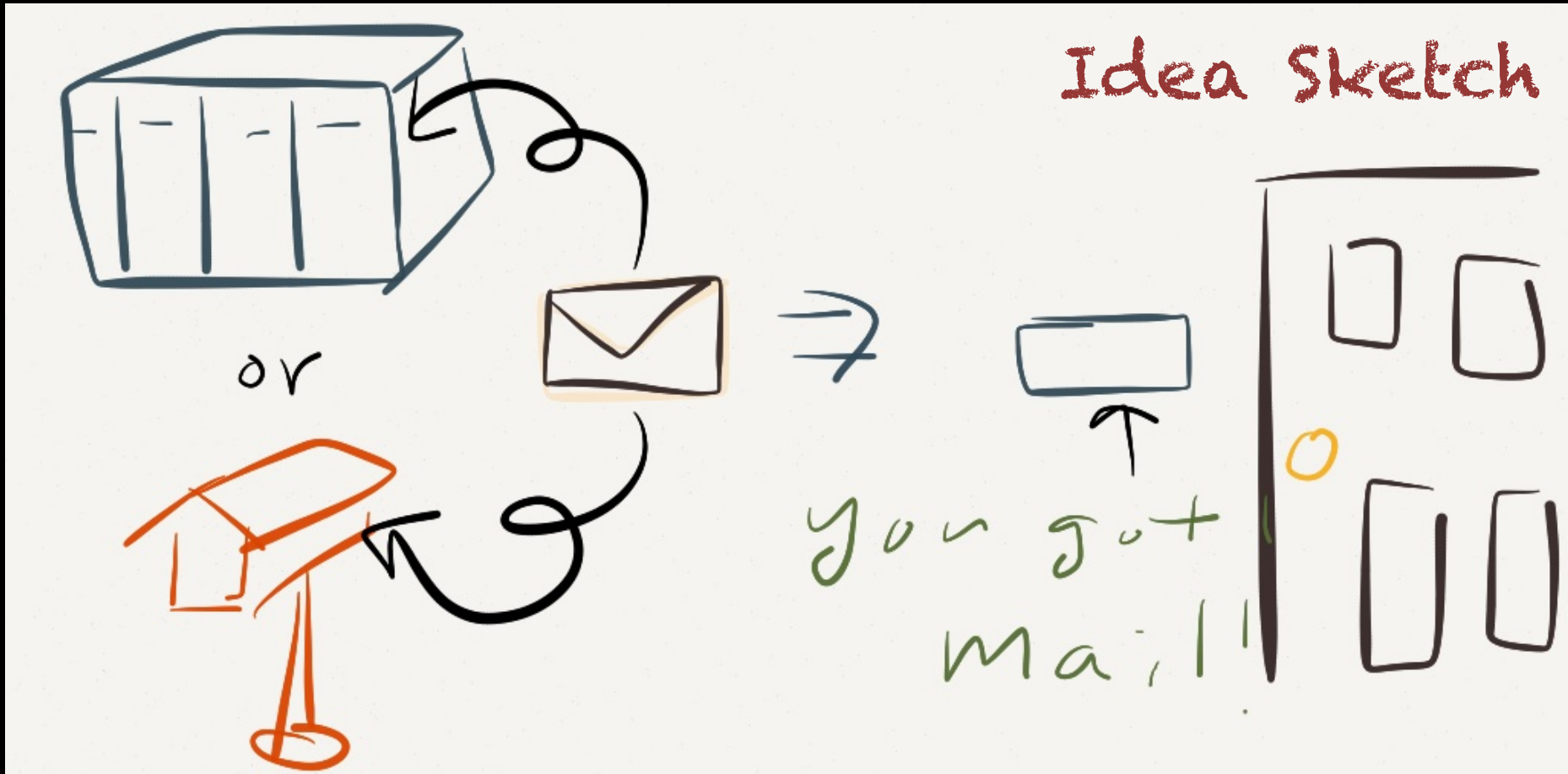


FEATURES

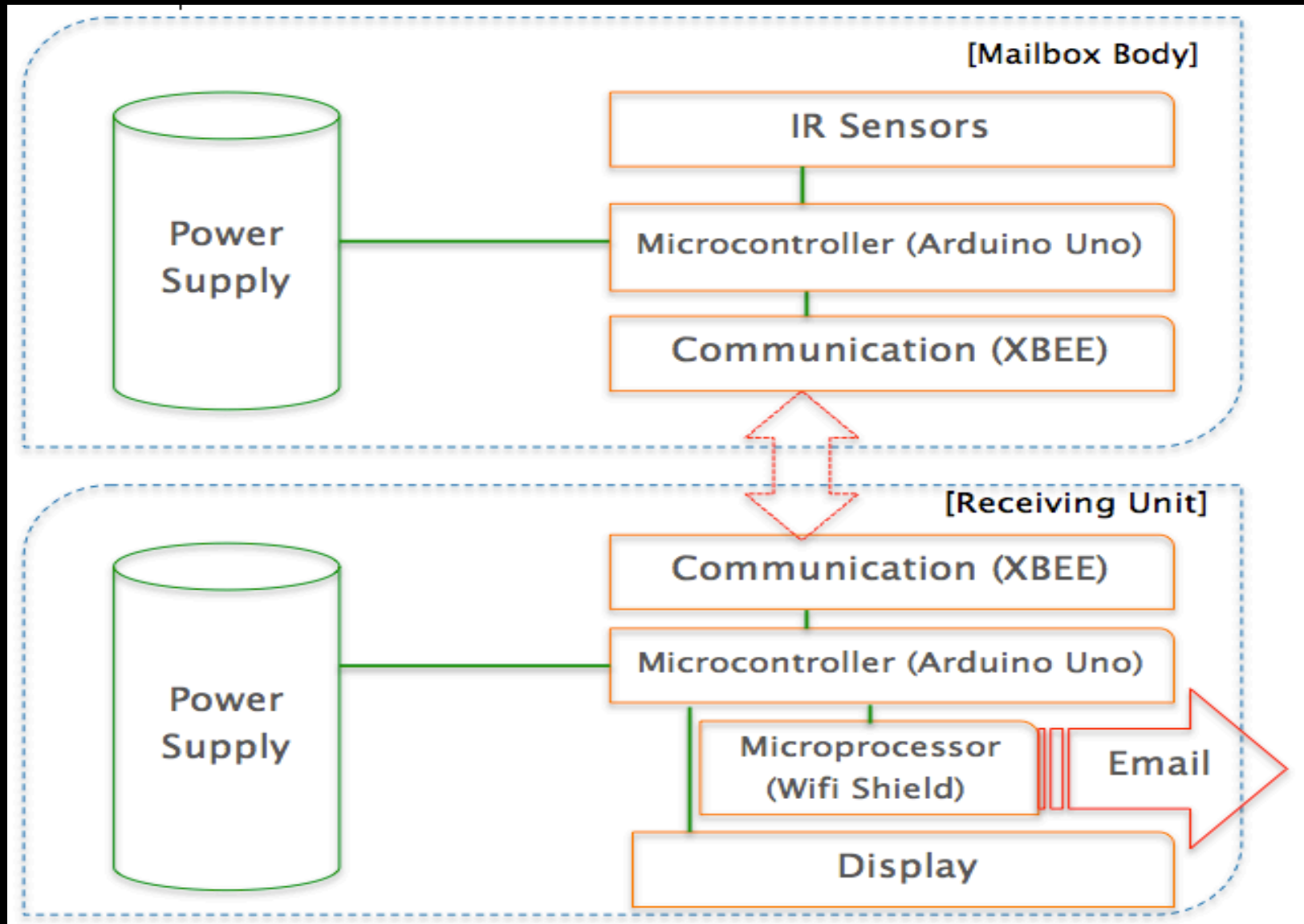
- Instant notification on home display and email
- Easy Installation
- Durable
- Lightweight and portable



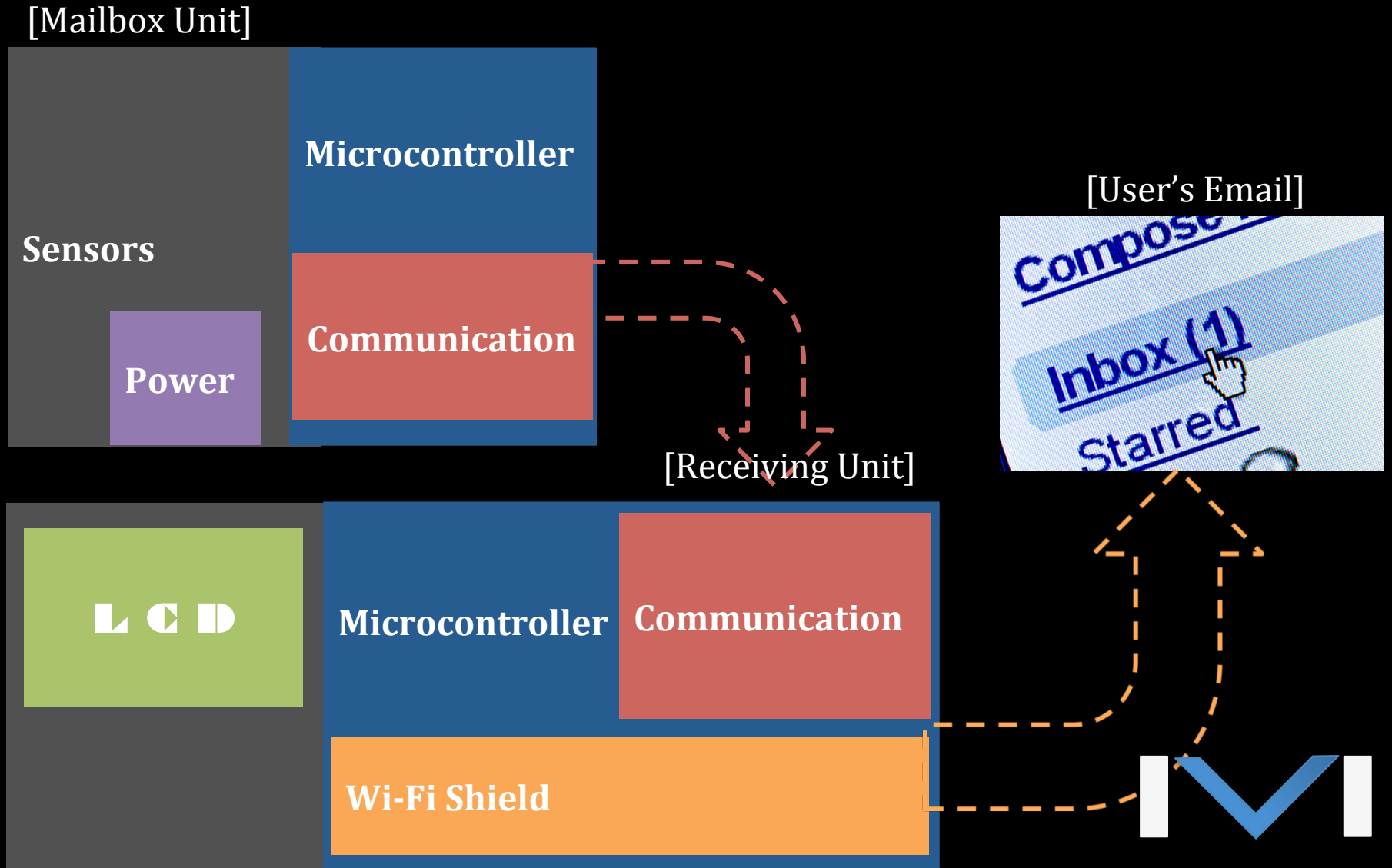
IDEA SKETCH



BLOCK DIAGRAM



SYSTEM OVERVIEW



SYSTEM OVERVIEW

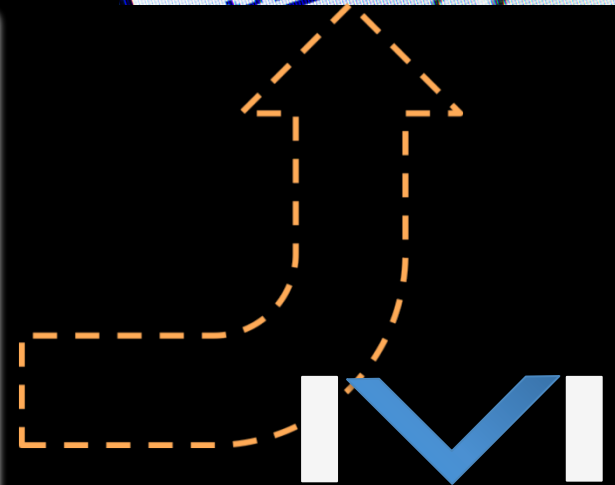
[Mailbox Unit]



[User's Email]



[Receiving Unit]

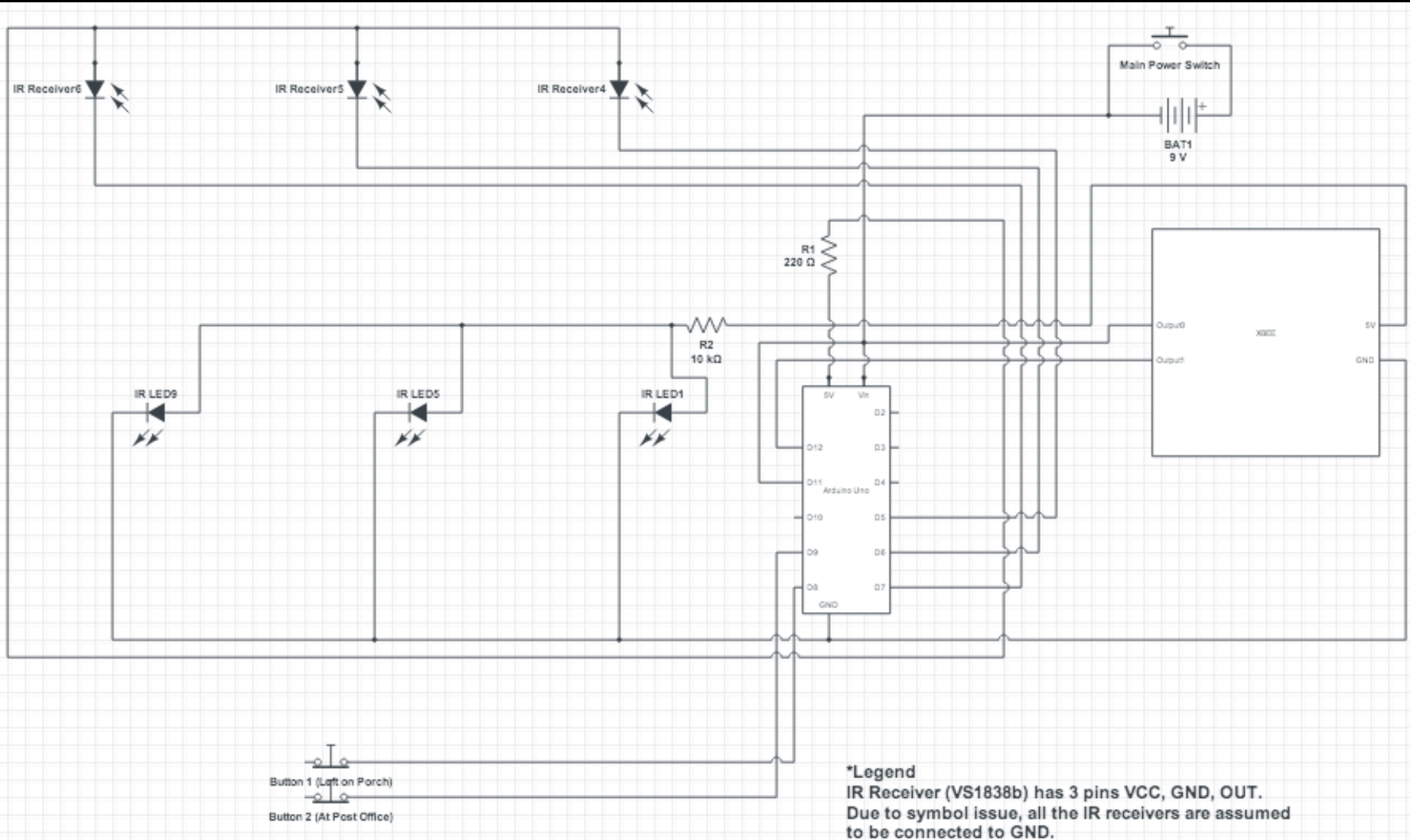


OLD DESIGN vs. NEW DESIGN

	Old Design	New Design
Sensor	Reflect	Block
Case	Flat	V-Shape
Power	Mechanical Switch	Mechanical Switch+ 555 Timer
Communication	nRF24E1	XBEE
Email	LABVIEW	Web Server



SCHEMATICS



REQUIREMENTS & VERIFICATIONS

- Continuity Test (Power, Sensors, Buttons)
- Analog to Digital Conversion
- XBEE Synchronization (Mailbox & Receiving unit)
- Proper message display on LCD unit
- Email Notification



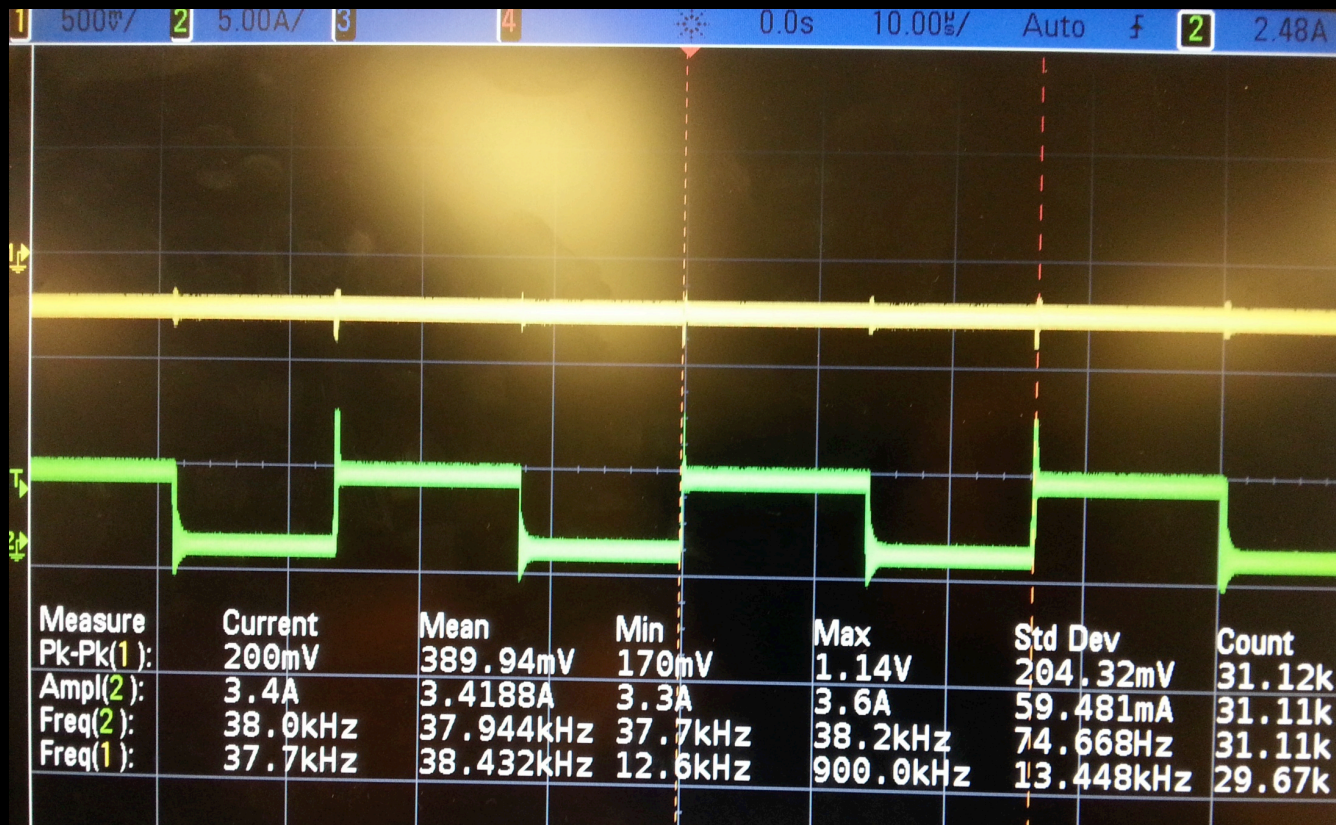
SUCCESS

- Mail detection using IR sensors



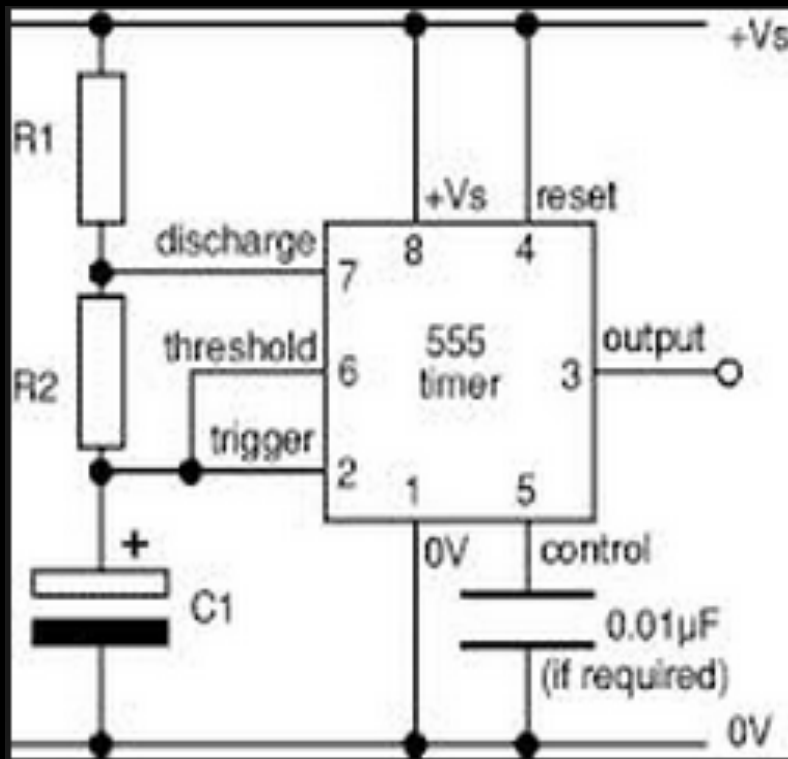
SUCCESSSES

- Sensor modulation (38khz)

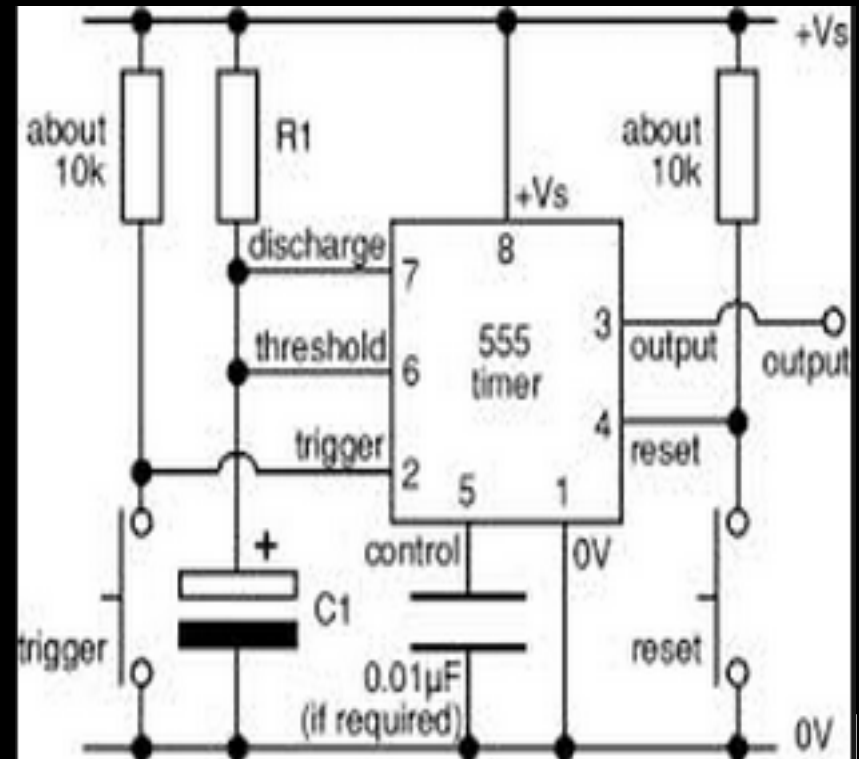


SUCCESSSES

- 555 Timer



Astable



Monostable

SUCCESS

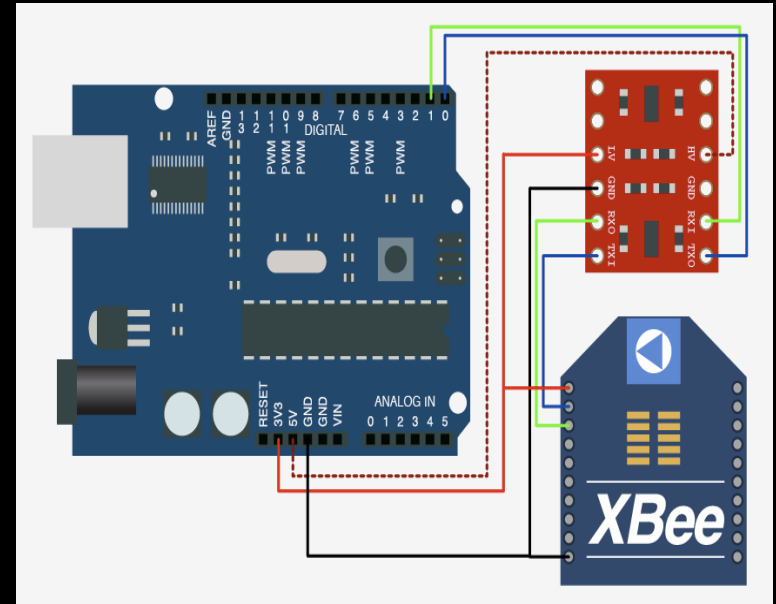
- Analog to digital conversion

```
int anaToDigital (int ana)
{
    int dig;
    int volt = analogRead(ana);
    if(volt <= 30)
        dig = 0;
    else
        dig = 1;
    return dig;
}
```



SUCCESSSES

- XBEE
 - 17 Bytes transmitted
 - Essential Data : 16th Byte
 - Coding to extract the essential



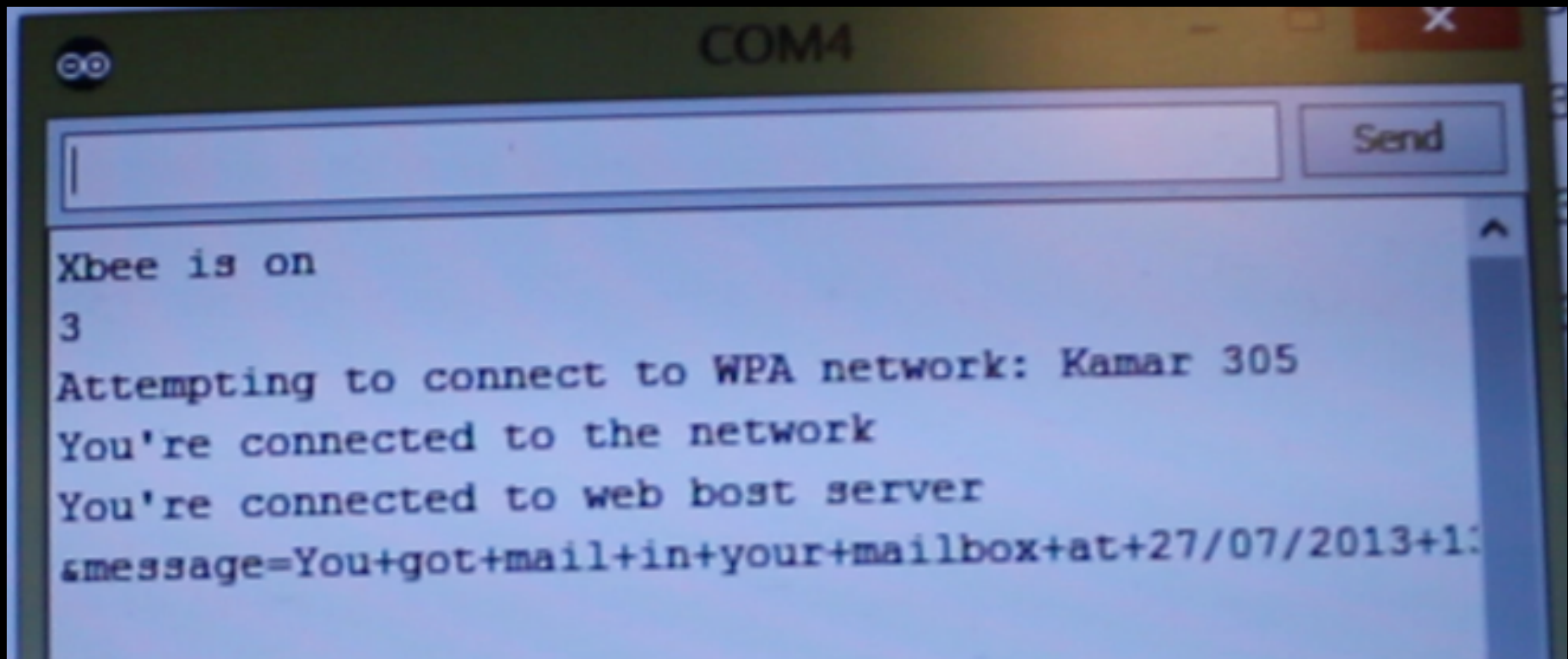
SUCCESSSES

- Display (message & time)



SUCCESSSES

- Wireless communication



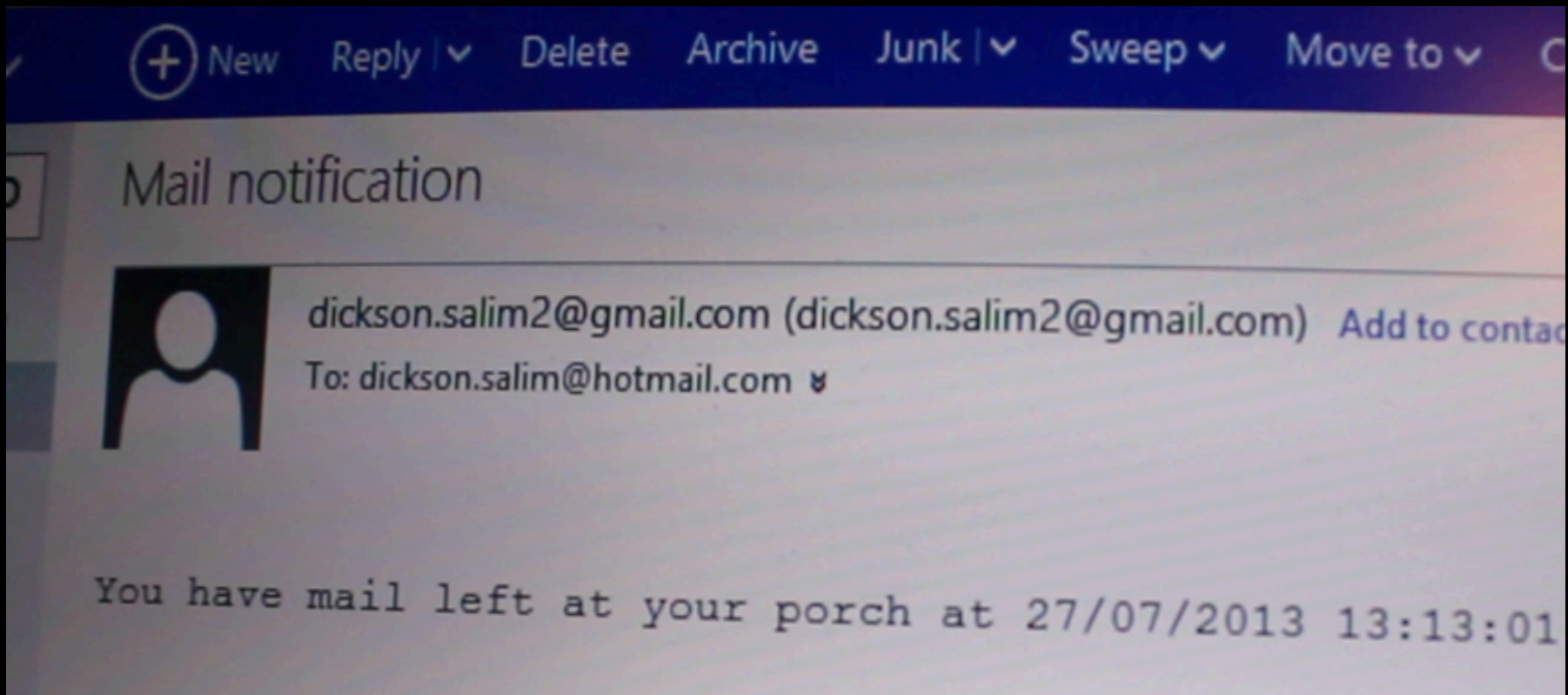
The screenshot shows a serial communication window titled 'COM4'. It features a text input field at the top with a 'Send' button to its right. Below the input field, the following text is displayed in a monospaced font:

```
Xbee is on  
3  
Attempting to connect to WPA network: Kamar 305  
You're connected to the network  
You're connected to web host server  
&message=You+got+mail+in+your+mailbox+at+27/07/2013+1:
```



SUCCESSSES

- Email (message & time)



CHALLENGES

- Detection mechanism (reflect? block?)
- Insignificant voltage drop
- Unstable LCD
- Network accessibility (School network)
- Multiple mail detection



RECOMMENDATIONS

- Sensitivity of IR sensors
 - Sensor emitting angle
 - MOSFET
- Synchronize functionality of reset button
- Mobile application



RECOMMENDATIONS

- Network security
- LCD button functions
- Low cost production



Thank You!

- Ryan Corey 😊
- Professor Carney 😊
- ECE Machine Shop (Glen Hedin!!)
- ECE Store



QUESTIONS?

