Cover page

Thursday, December 2, 2021 4:57 PM

Sweet Dreams

Senior Design 4871 & 4872

Katie Roberts (Co-Group Leader & Financial Manager)

770-733-5539

Group Members:

Katie Weatherwax - katie.weatherwax@gatech.edu (Expo coordinator)

Elizabeth Henerson - ehenerson3@gatech.edu (Co-Group Leader)

Christin Sau - csau3@gatech.edu (Software Lead)

Hubert Elly - helly3@gatech.ed (Electrical Lead)

Lara Kassabian - lkassabian6@gatech.ed (Head Engineer)

Radha Chanzela: rchanzela3@gatech.edu (Documentation)

Table of contents

Thursday, December 2, 2021 7:08 PM

Initial ideas

Friday, August 27, 2021 12:19 PM

1st idea: Life alert style necklace for girls
- be able to notify loved ones that the girl is in danger
- also notify police
  - GPS tracker
  - heart monitor

  > Fitbit/Apple watch style
- camera in the necklace in order to catch attacker
- necklace connects to phone (Bluetooth)

2nd idea: self defense jewelry
- a taser ring
  - when the woman punches the attacker he gets tased by the ring on her wrist
- chain saw ring/bracelet
  - girl can click a button causing a mini chain saw to pop out and help her slash her attacker.

  Far Fetched
- multiple wrings that all extend into little daggers allowing the woman to cut any ropes she may be tied up with

3rd idea: self defense + life alert
- bracelet and ring duo
  - ring:
    - will be a taser and is connected to the bracelet
  - bracelet:
    - will have the fitbit/life alert components

Product Design Brainstorming

Friday, October 15, 2021 3:14 PM

We know we want a taser circuit.

Implementation:

- Use a capacitor that charges when the woman feels unsafe and then uncharges when she punches her attacker
  - can use the punch to switch/unlatch the circuit making it open and allowing the capacitor to discharge

Triggers:

- button on the side of the bracelet, woman presses this when she feels unsafe
  - notifies 5 pre chosen contacts
  - latches capacitor circuit
    - then if she reaches a certain acceleration (punching) [measured via accelerometer] the police will be notified and sent her GPS location
      - on contact of the punch the circuit is unlatched allowing charge to flow from the ring to the attacker

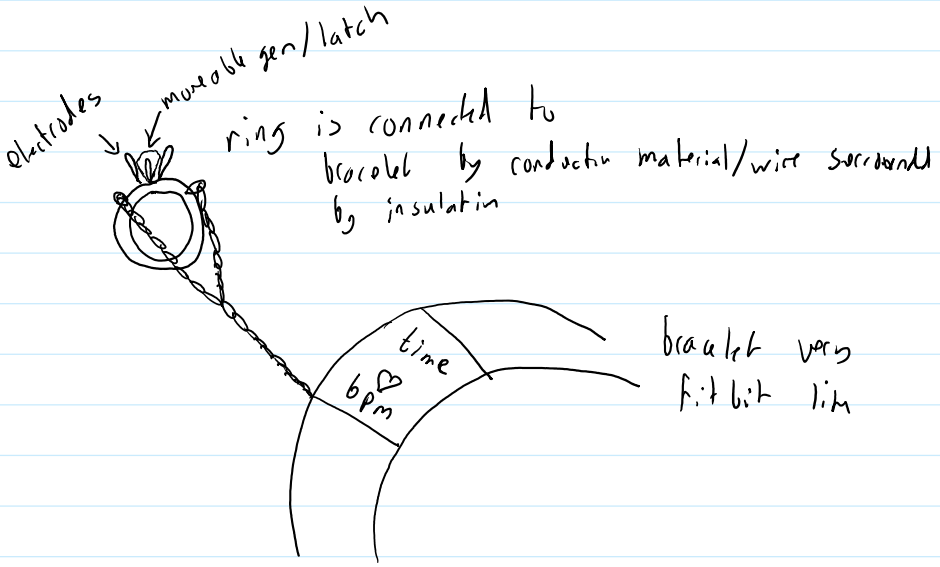
also if the ring reaches a certain acceleration (punch) before the button is pressed the capacitor is charged and discharged on punch

- concerns:
  - will the capacitor have enough time to fully charge?

- What do we do if the woman gets knocked unconscious and can't push the button how will we notify police?
  - if her position over goes from standing to the ground or her heartbeat drops due to being unconscious then notify loved ones & police
  - What if she wears the jewelry to bed?
    - The woman will be advised to not wear it to bed but if she does she can set safe areas where her jewelry will never be triggered unless she presses the button.

Initial Sketches

Friday, October 15, 2021 3:36 PM



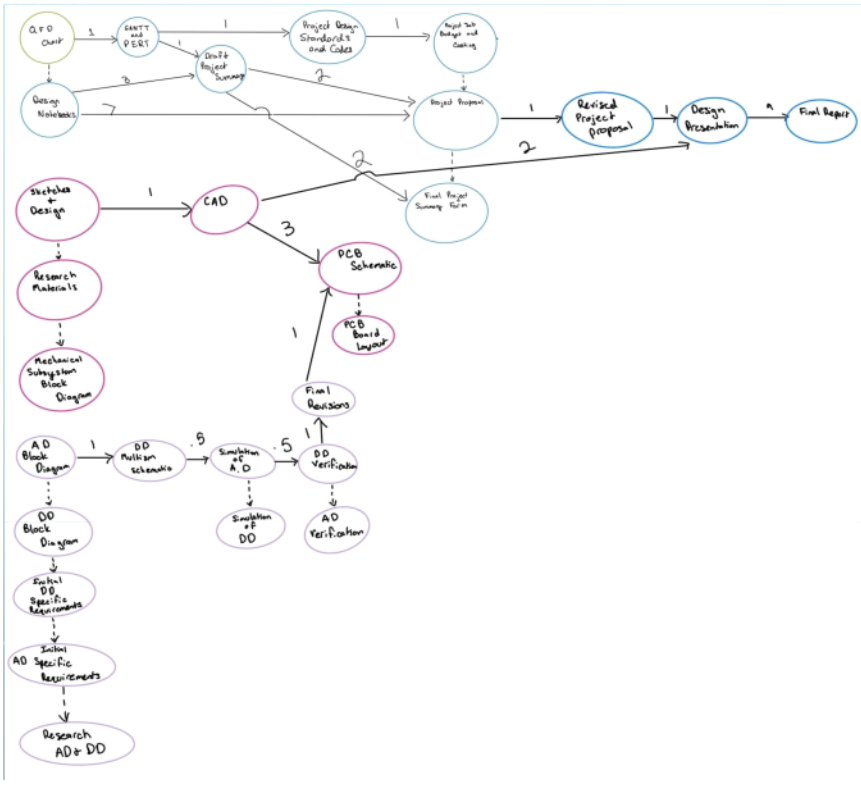
The bracelet component will be band off of a fitbit with added circuitry for the stun. The discharge of the stun gun circuit is carried to the ring

Sweet Dreams Updates - 10-22-2021 (1)

Thursday, December 2, 2021 4:50 PM

Sweet Dreams Updates - 10-22-2021 (1)


PROJECT DESCRIPTION
• Wearable self-defense weapon:
• Main components:
• Shock perpetrator
• Ttrack GPS location of device,
• Identify if user is unconscious, and monitor other health stats possible
• Concealable, affordable, durable, easy to use, and adjustable for each wearer
• Bluetooth, network, and power usage and consumption capabilities
• External USB-C port for recharging



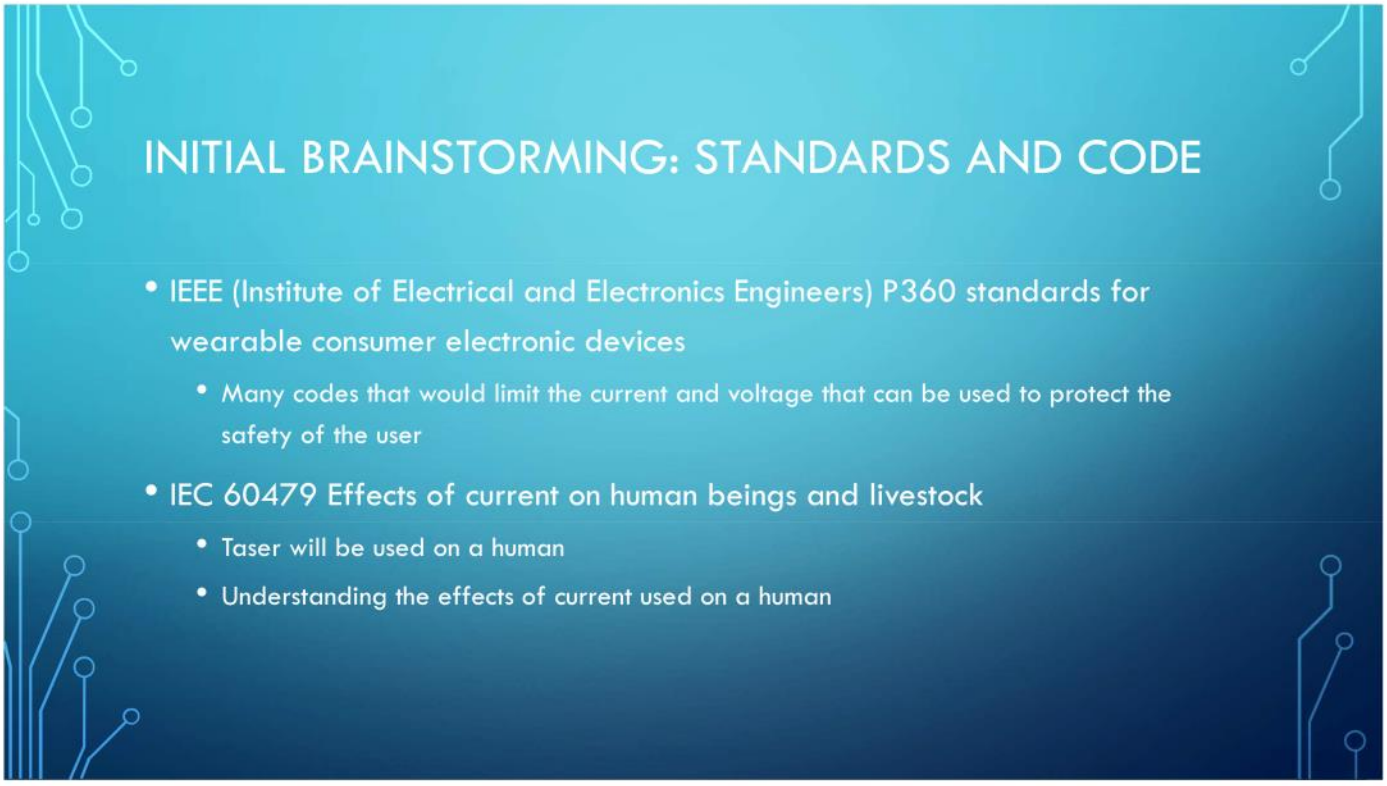
GANTT CHART

- Here is our projected timeline for working on the project: https://sharing.clickup.com/g/h/12at8k-80/b4e8c6b082e4483
- We also worked on our PERT chart (shown on the left)

INITIAL BRAINSTORMING: DESIGN CONSTRAINTS

- Size and weight of a piece of jewelry
  - Bracelet
    - Main source of power and electronic storage
    - Electronics must be small and light
  - Ring:
    - Will act as the taser
    - Must have sufficient insulation so not to shock the user

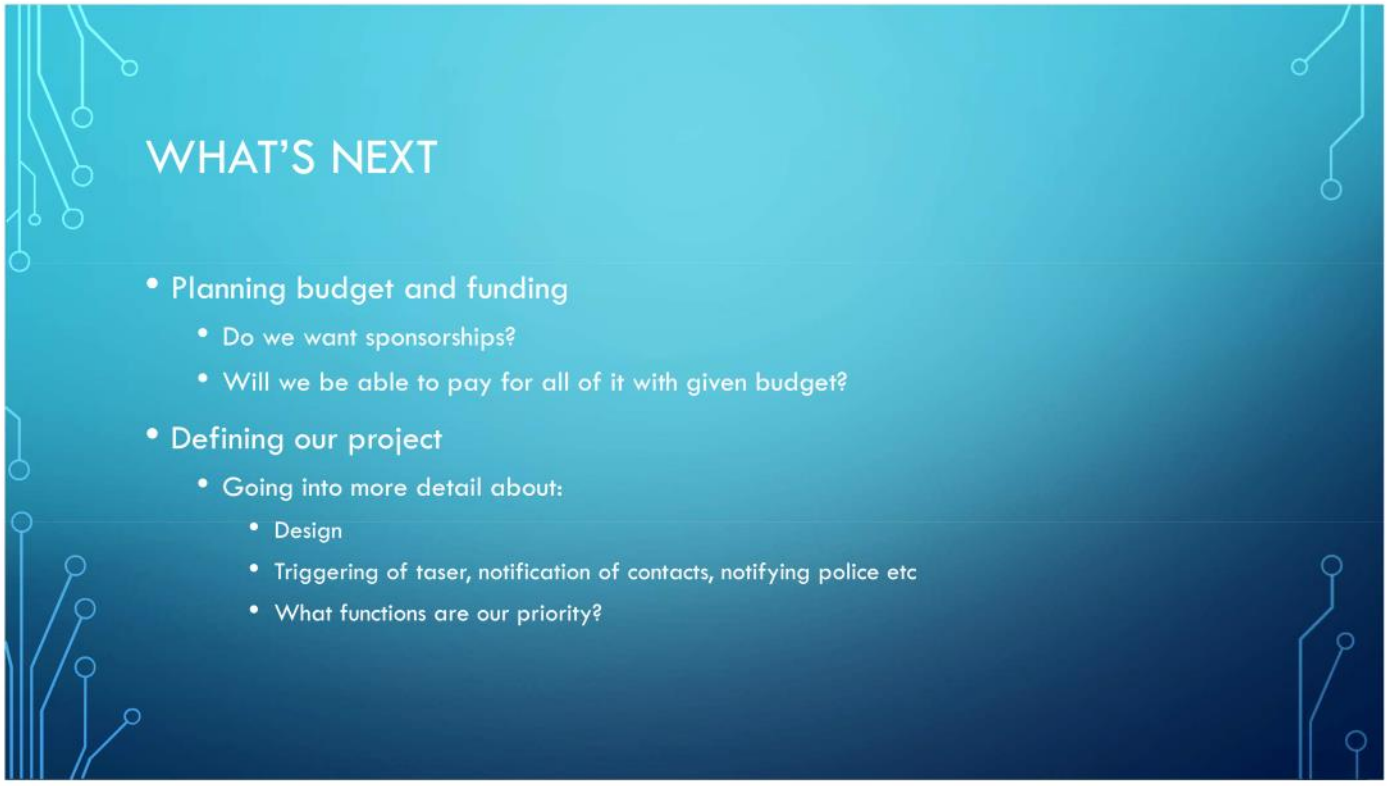

INITIAL BRAINSTORMING:
BACKUP PLAN
• Flash gun
• Design will stay the same (ring connected to a bracelet)
• Allow for a lower voltage with a smaller battery
• Ring will emit a bright light temporarily blinding the attacker
Godox


INITIAL BRAINSTORMING: STANDARDS AND CODE
• IEEE (Institute of Electrical and Electronics Engineers) P360 standards for wearable consumer electronic devices
• Many codes that would limit the current and voltage that can be used to protect the safety of the user
• IEC 60479 Effects of current on human beings and livestock
• Taser will be used on a human
• Understanding the effects of current used on a human


INITIAL BRAINSTORMING: SOFTWARE
• GPS tracking
• Software-Hardware interface
• Hardware must detect position and acceleration
• Software keeps track of location in order to notify contacts of location
• Heart rate detection
• Hardware-software interface
• Hardware must detect the microscopic pulsations on the surface of the skin
• Software must calculate the heart rate
• Triggering of the taser
• App/Phone to jewelry Bluetooth connection


INITIAL BRAINSTORMING: TRIGGERING
• External gem acts as a switch discharging capacitor to shock attacker
• Device tracks the acceleration and pressure
• Device emits a charge (insulation will protect the user from shock)
• When the user triggers the stun gun feature, the app will notify the emergency contacts with the time and the location of use


TEAM BREAKDOWN
• Decided on leadership/ specialization:
• Webmaster: Hubert Elly
• Expo Coordinator: Katie Weatherwax
• Documentation: Radha Changela
• Electrical Lead: Katie Roberts
• Mechanical Lead: Lara Kassabian
• Software Lead: Christine Saw
• Leadership Coordinator: Elizabeth Herrejon


WHAT'S NEXT
Planning budget and funding
Do we want sponsorships?
Will we be able to pay for all of it with given budget?
Defining our project
Going into more detail about:
Design
Triggering of taser, notification of contacts, notifying police etc
What functions are our priority?

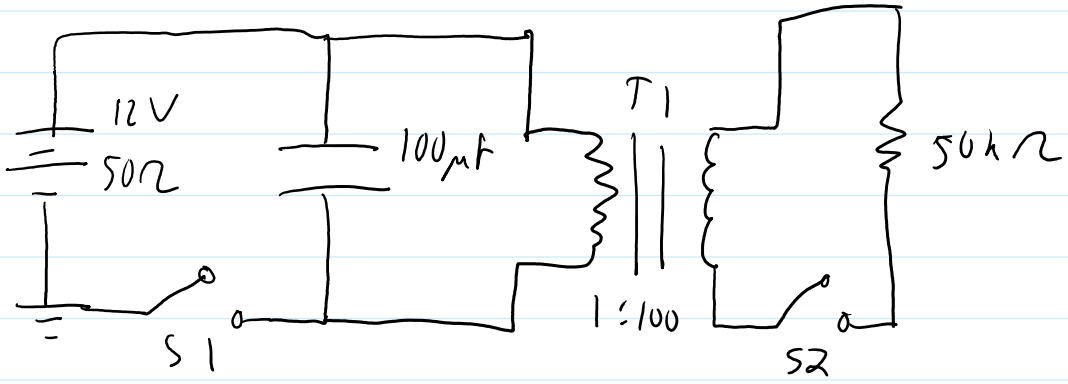
Technical brainstorming

Friday, October 15, 2021 3:36 PM

Resources:

1) https://www.microcontrollertips.com/inside-fitbit-charge/
2) https://circuitdigest.com/electronic-circuits/diy-stun-gun-circuit

Shocking gun circuit:



Materials:

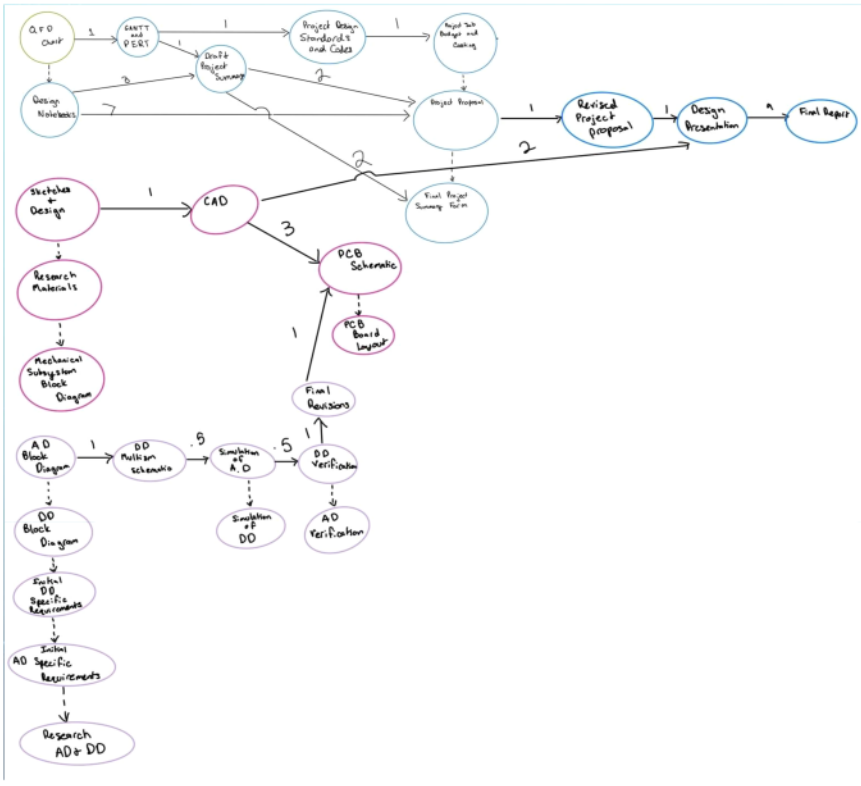
PTF coaxial cable
- this will connect the bracelet to the ring
- can either buy or try and create our own to make it look like jewelry
- need the wire to carry charge to ring's electrode but also need insulation so the user isn't shocked with the attacker

Sweet Dreams Updates - 11-17-2021

Thursday, December 2, 2021 4:50 PM

Sweet Dreams Updates - 10-22-2021


PROJECT DESCRIPTION
• Wearable self-defense weapon:
• Main components:
• Shock perpetrator
• Ttrack GPS location of device,
• Identify if user is unconscious, and monitor other health stats possible
• Concealable, affordable, durable, easy to use, and adjustable for each wearer
• Bluetooth, network, and power usage and consumption capabilities
• External USB-C port for recharging
2



GANTT CHART

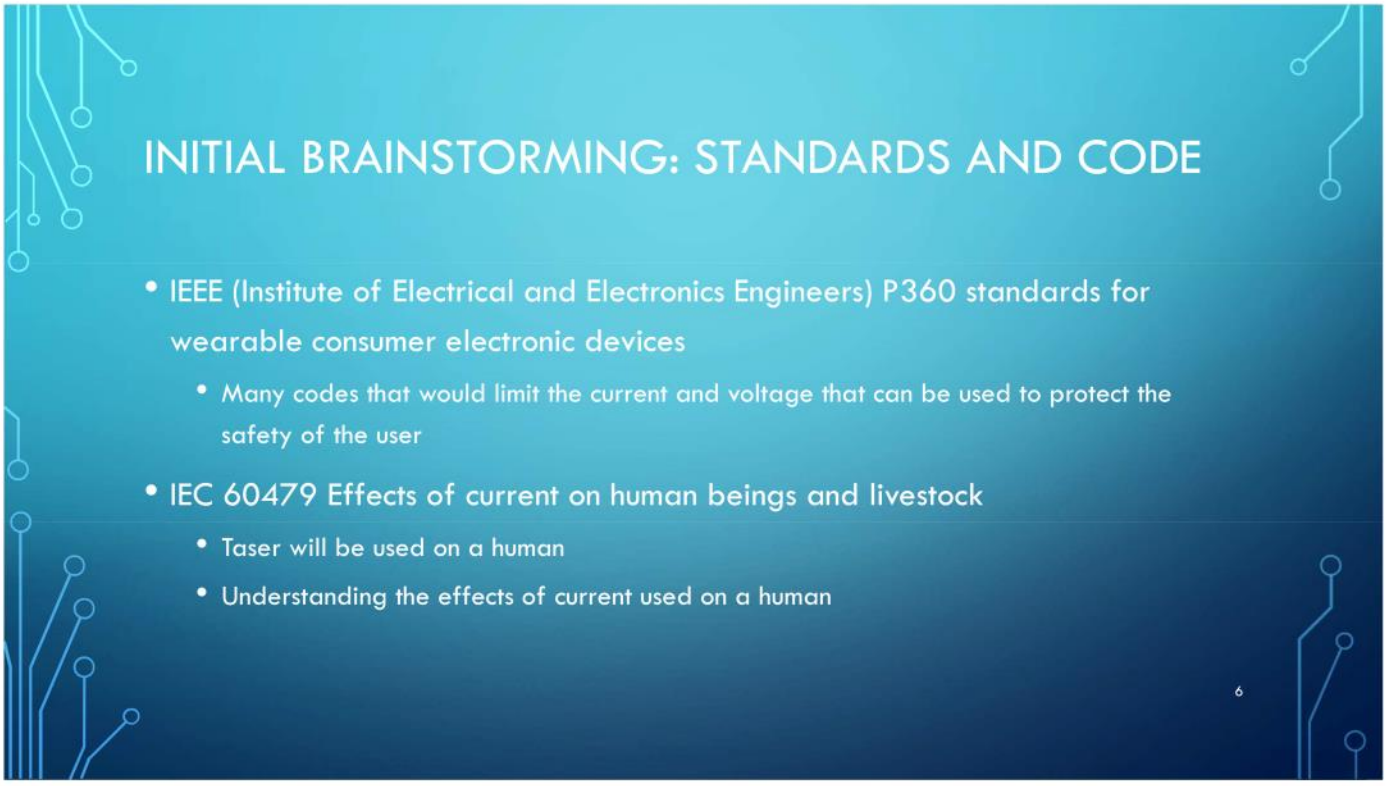
- Here is our projected timeline for working on the project: https://sharing.clickup.com/g/h/12at8k-80/b4e8c6b082e4483
- We also worked on our PERT chart (shown on the left)

INITIAL BRAINSTORMING: DESIGN CONSTRAINTS

- Size and weight of a piece of jewelry
  - Bracelet
    - Main source of power and electronic storage
    - Electronics must be small and light
  - Ring:
    - Will act as the stun gun
    - Must have sufficient insulation so not to shock the user

4


INITIAL BRAINSTORMING: BACKUP PLAN
Godox
• Flash gun
• Design will stay the same (ring connected to a bracelet)
• Allow for a lower voltage with a smaller battery
• Ring will emit a bright light temporarily blinding the attacker
5


INITIAL BRAINSTORMING: STANDARDS AND CODE
• IEEE (Institute of Electrical and Electronics Engineers) P360 standards for wearable consumer electronic devices
• Many codes that would limit the current and voltage that can be used to protect the safety of the user
• IEC 60479 Effects of current on human beings and livestock
• Taser will be used on a human
• Understanding the effects of current used on a human
6

INITIAL BRAINSTORMING: SOFTWARE

- GPS tracking
  - Software-Hardware interface
  - Hardware must detect position and acceleration
  - Software keeps track of location in order to notify contacts of location
- Heart rate detection
  - Hardware-software interface
  - Hardware must detect the microscopic pulsations on the surface of the skin
  - Software must calculate the heart rate
- Triggering of the taser
- App/Phone to jewelry Bluetooth connection

7

INITIAL BRAINSTORMING: TRIGGERING

- External gem acts as a switch discharging capacitor to shock attacker
- Device tracks the acceleration and pressure
  - Device emits a charge (insulation will protect the user from shock)
  - When the user triggers the stun gun feature, the app will notify the emergency contacts with the time and the location of use

8


TEAM BREAKDOWN
• Decided on leadership/ specialization:
• Webmaster: Hubert Elly
• Expo Coordinator: Katie Weatherwax
• Documentation: Radha Changela
• Electrical Lead: Katie Roberts
• Mechanical Lead: Lara Kassabian
• Software Lead: Christine Saw
• Leadership Coordinator: Elizabeth Herrejon
9


BUDGET
• Product can be built on Given budget of $1050
• Expense breakdown:
• Parts: $200
• Bracelet Electrical Components (power, heart rate, etc): $30
• Stun gun circuitry: $70
• Extra 100 for materials and designing the ring
• Testing Infrastructure: $200
• Budget for revising: $200
10

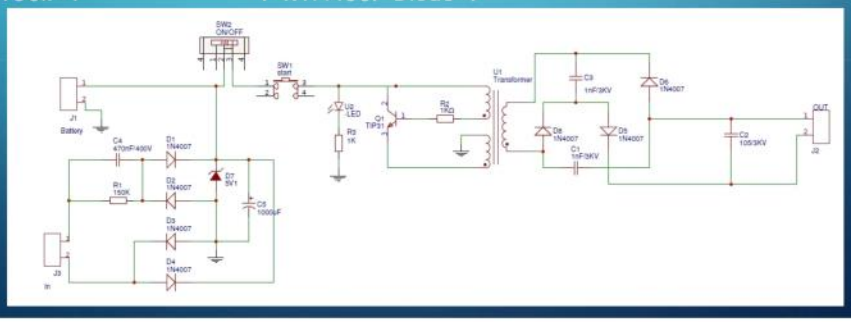
BUDGET – MATERIALS NEEDED : BRACELET

- Wristband A, 2-Shot Injection Molded Polycarbonate & Silicone Rubber - (Qty: 1)
- Enclosure, Main, Injection Molded Plastic, Clear Coat, Printed - (Qty: 1)
- Wristband B, 2-Shot Injection Molded Polycarbonate & Silicone Rubber - (Qty: 1)
- MCU, 32-Bit, ARM Cortex-M3, 32 MHz, 128KB Flash, 16KB SRAM, 24 Channel x 12-Bit ADC - MFG: ST MICROELECTRONICS - MPN: STM32L151C6H6 - (Qty: 1)
- Bluetooth, Single-Chip, V4.0LE - MFG: NORDIC SEMICONDUCTOR ASA - MPN: nRF8001 - (Qty: 1)
- Bluetooth USB Dongle - (Qty: 1)
- Charging Cable - (Qty: 1)
- Accelerometer, 3-Axis, ±2g/±4g/±8g/±16g, I2C/SPI digital output interface - MFG: ST MICROELECTRONICS - MPN: LIS2DH - (Qty: 1)
- Battery, Li-Polymer, Single Cell, w/ Solder Tabs & 2 Insulated Discrete Wires - (Qty: 1)
- Vibration Motor, Coin Type, w/ 2 Discrete Insulated Wires - (Qty: 1)

11

BUDGET – MATERIALS NEEDED: STUN GUN CIRCUIT

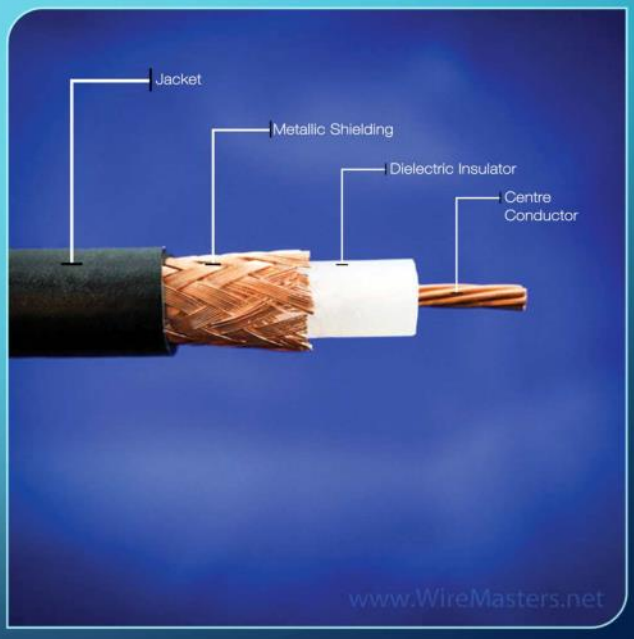
1. DS965 NPN Transistor -1
2. Fly back Transformer -1
3. Push button -1
4. LED -2
5. PCB (ordered from EasyEDA)
6. Terminal Block 2 pin -3
7. Resistor 150k -1
8. Resistor 1k -3
9. Capacitor 1nF/3KV -2
10. Capacitor 1000uF -1
11. Capacitor 470nF/400V -1
12. Capacitor 105/3KV -1
13. Power Supply 3v-12v -1
14. 1N4007 Diode -7
15. Zenner diode 5.1v -1
16. On/off switch -1



12

BUDGET – MATERIALS NEEDED: CONNECTION

- The connection between the bracelet and ring is a crucial part
  1. Carries the discharge from stun gun circuitry to ring
  2. Must be conducting in order to carry charge
  3. Must be insulated to protect the user from charge
- Solution: PTFE dielectric coaxial cable
  - Pros:
    - Conducting wire in the middle allows for charge to be carried
    - Double layer of insulation on outside protecting user
  - Cons:
    - Not aesthetically pleasing
- Options:
  - Can buy it off market and have it look not as pretty
  - Fabricate it ourselves in hopes to make it blend in with jewelry



13

WHAT'S NEXT

- Project Proposal
  - Getting all the ideas onto paper
- Beginning Prototyping
  - Start getting circuits simulated in Multisim
  - Begin pseudo code for software elements

14

Budget

Friday, November 5, 2021 12:44 PM

For bracelet probably model it after the fitbit which costs about $20 to produce

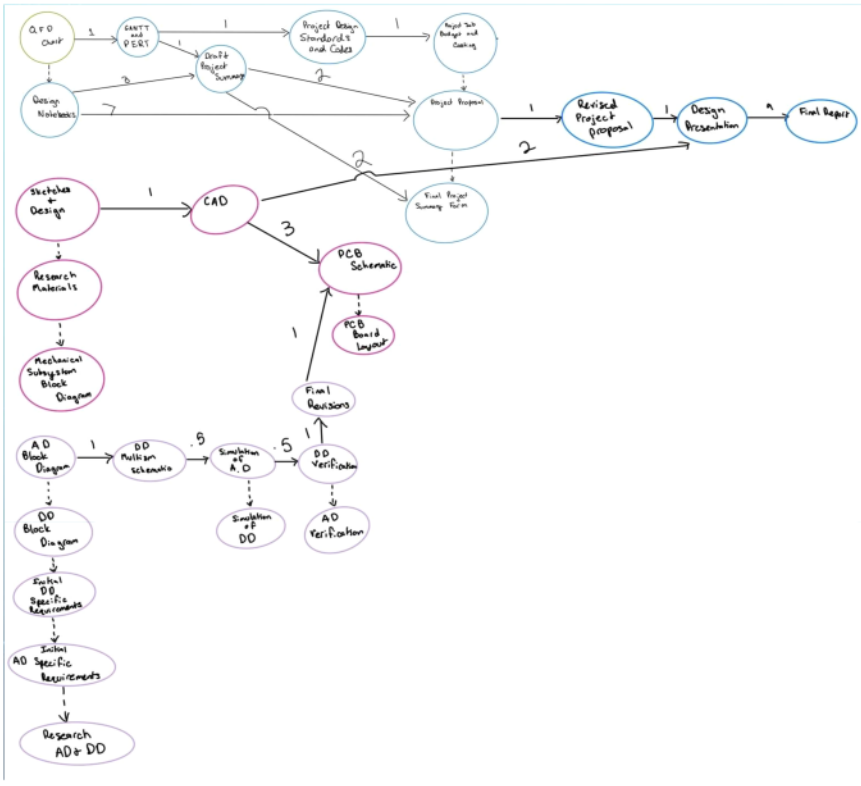
https://electronics360.globalspec.com/article/3128/teardown-fitbit-flex

Sweet Dreams Updates - 12-2-2021

Thursday, December 2, 2021 4:50 PM

Sweet Dreams Updates - 12-2-2021


PROJECT DESCRIPTION
• Wearable self-defense weapon:
• Main components:
• Shock perpetrator
• Track GPS location of device,
• Monitor health stats such as heart rate
• Concealable, affordable, durable, easy to use, and adjustable for each wearer
• Bluetooth, network, and power usage and consumption capabilities
• External USB-C port for recharging
2



GANTT CHART

- Here is our projected timeline for working on the project: https://sharing.clickup.com/g/h/12at8k-80/b4e8c6b082e4483
- We also worked on our PERT chart (shown on the left)

3

INITIAL BRAINSTORMING: DESIGN CONSTRAINTS

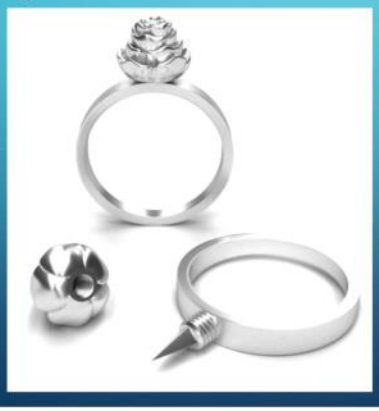
- Size and weight of a piece of jewelry
  - Bracelet
    - Main source of power and electronic storage
    - Electronics must be small and light
    - Molded after a Fitbit
  - Ring:
    - Will act as the stun gun
    - Must have sufficient insulation so not to shock the user

4


INITIAL BRAINSTORMING: BACKUP PLAN
Godox
• Flash gun
• Design will stay the same (ring connected to a bracelet)
• Allow for a lower voltage with a smaller battery
• Ring will emit a bright light temporarily blinding the attacker
5

INITIAL BRAINSTORMING: MARKET ANALYSIS

- Similar Products on Market:
  - InvisaWear
  - Defender Ring



6

INITIAL BRAINSTORMING: STANDARDS AND CODE

- IEEE P360 standards for wearable consumer electronic devices
  - Many codes that would limit the current and voltage that can be used to protect the safety of the user
- IEC 60335 Household and similar electrical appliances
  - sets a limitation on the maximum rated voltage of our stun gun
- IEC 60479 Effects of current on human beings and livestock
  - Taser will be used on a human
  - Understanding the effects of current used on a human
- IEC 60601 Medical Design Standards for Power Supplies
  - Bracelet will be monitoring certain health stats
- UL 69 Standard for Electric-Fence Controllers
  - This standard is used to verify safety of Conducted Electrical Weapons (CEW)

7

INITIAL BRAINSTORMING: SOFTWARE

- GPS tracking
  - Software-Hardware interface
  - Hardware must detect position and acceleration
  - Software keeps track of location in order to notify contacts of location
- Heart rate detection
  - Hardware-software interface
  - Hardware must detect the microscopic pulsations on the surface of the skin
  - Software must calculate the heart rate
- Triggering of the taser
- App/Phone to jewelry Bluetooth connection

8

INITIAL BRAINSTORMING: TRIGGERING

- External gem acts as a switch discharging capacitor to shock attacker
- Safety button hit
  - triggers the software to start charging the stun gun circuit and notify the emergency contacts the user is feeling unsafe
- Device tracks the pressure
  - Device emits a charge (insulation will protect the user from shock)
  - When the user triggers the stun gun feature, the app will notify the emergency contacts with the time and the location of use
- If the user heart rate drops below a given threshold (knocked unconscious), this will also trigger the app to notify emergency contacts

9


TEAM BREAKDOWN
• Decided on leadership/ specialization:
• Webmaster: Hubert Elly
• Expo Coordinator: Katie Weatherwax
• Documentation: Radha Changela
• Electrical Lead: Katie Roberts
• Mechanical Lead: Lara Kassabian
• Software Lead: Christine Saw
• Leadership Coordinator: Elizabeth Herrejon
10

BUDGET

- Product can be built on Given budget of $1050
  - Expense breakdown:
    - Parts: $200
      - Bracelet Electrical Components (power, heart rate, etc): $30
      - Stun gun circuitry: $70
      - Extra 100 for materials and designing the ring
    - Testing Infrastructure: $200
    - Budget for revising: $200

11

BUDGET – MATERIALS NEEDED : BRACELET

- Wristband A, 2-Shot Injection Molded Polycarbonate & Silicone Rubber - (Qty: 1)
- Enclosure, Main, Injection Molded Plastic, Clear Coat, Printed - (Qty: 1)
- Wristband B, 2-Shot Injection Molded Polycarbonate & Silicone Rubber - (Qty: 1)
- MCU, 32-Bit, ARM Cortex-M3, 32 MHz, 128KB Flash, 16KB SRAM, 24 Channel x 12-Bit ADC - MFG: ST MICROELECTRONICS - MPN: STM32L151C6H6 - (Qty: 1)
- Bluetooth, Single-Chip, V4.0LE - MFG: NORDIC SEMICONDUCTOR ASA - MPN: nRF8001 - (Qty: 1)
- Bluetooth USB Dongle - (Qty: 1)
- Charging Cable - (Qty: 1)
- Accelerometer, 3-Axis, ±2g/±4g/±8g/±16g, I2C/SPI digital output interface - MFG: ST MICROELECTRONICS - MPN: LIS2DH - (Qty: 1)
- Battery, Li-Polymer, Single Cell, w/ Solder Tabs & 2 Insulated Discrete Wires - (Qty: 1)
- Vibration Motor, Coin Type, w/ 2 Discrete Insulated Wires - (Qty: 1)

12

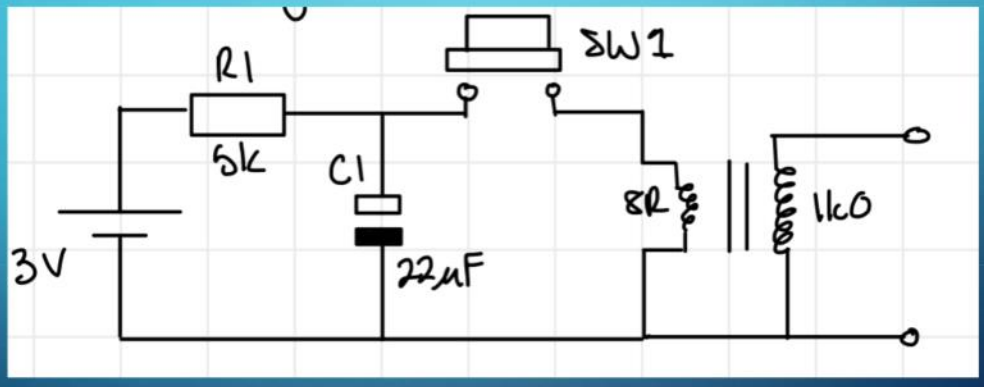
BUDGET – COST ANALYSIS: BRACELET

- Cost breakdown on bracelet based on Fitbit Flex

Item	Manufacturer	Quantity	Cost
2-Shot Injection Molded Polycarbonate & Silicone Rubber	Healthy Metrics Research Inc.	1	$20.00
MCU, 32-Bit, ARM Cortex-M3, 32 MHz, 128KB Flash, 16KB SRAM, 24 Channel x 12-Bit ADC	ST MICROELECTRONICS	1	$6.44
Bluetooth, Single-Chip, V4.0LE	NORDIC SEMICONDUCTOR ASA	1	$5.61
Bluetooth USB Dongle	RoHS - TP link	1	$9.99
USB Cables / IEEE 1394 Cables USB Cable, Type A Plug to Type C Plug, USB 2.0, 28 AWG	CUI Devices	1	$5.82
Accelerometer, 3-Axis, ±2g/±4g/±8g/±16g, I2C/SPI digital output interface	ST MICROELECTRONICS	1	$9.97
Lithium Ion Polymer Battery Ideal For Feathers - 3.7V 400mAh	Adafruit Industries LLC	1	$6.95
Vibration Motor, Coin Type, w/ 2 Discrete Insulated Wires	Adafruit Industries LLC	1	$1.95
			$66.73

13

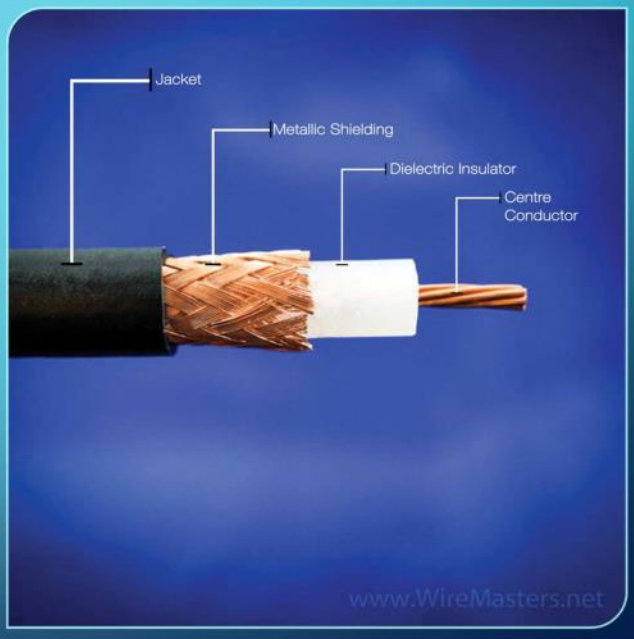
BUDGET – MATERIALS NEEDED: STUN GUN CIRCUIT



14

BUDGET – MATERIALS NEEDED: CONNECTION

- The connection between the bracelet and ring is a crucial part
  1. Carries the discharge from stun gun circuitry to ring
  2. Must be conducting in order to carry charge
  3. Must be insulated to protect the user from charge
- Solution: PTFE dielectric coaxial cable
  - Pros:
    - Conducting wire in the middle allows for charge to be carried
    - Double layer of insulation on outside protecting user
  - Cons:
    - Not aesthetically pleasing
- Options:
  - Can buy it off market and have it look not as pretty
  - Fabricate it ourselves in hopes to make it blend in with jewelry



15

BUDGET – DEVELOPMENT COSTS

Project Component	Base Cost Year 1 (USD)	Total Cost Year 1 (USD)
Production		
Parts	17.00	$17,000.00
PC Board	8.00	$8,000.00
Assembly	10.00	$10,000.00
Packaging	1.00	$1,000.00
Testing	10.00	$10,000.00
Packaging		
Per/Unit	1.00	$10,000.00
Marketing		
Non-Engineering	30,000.00	$2,500.00
Sales		
Non-Engineering	30,000.00	2,500.00
Distribution		
Shipping Per/Unit	1.50	$1,500.00
Shipping		
Non-Engineering	30,000.00	$2,500.00

	Base Cost Year 1 (USD)	Total Cost Year 1 (USD)
Parts	$89.52	$120,312.50
Overhead	$47.00	$180,468.75
Adjusted Cost		$300,781.25
Cost/Unit		$120.31
Total Profit/Year		$-20,312.50
Total Profit		$373,137.50

16

PRODUCT TEST PLAN

- Testing the shock circuit:
  - The voltage and current will be measured across the electrodes when a button is pressed to close the circuit.
- Testing the heart rate monitor:
  - Person A will wear the device prototype while Person B counts Person A's heart rate using their fingers and a stopwatch. The prototype's display should match up to the calculated heart rate. Another method includes Person A wearing the device prototype while staying connected to a heart rate monitor and comparing both devices' final heart rate values, checking if they match.
- Testing the GPS:
  - Person A will move the prototype to various locations and ask Person B if the GPS display shows the correct locations. Another method includes Person A comparing their location displayed from the prototype with another smartphone's GPS map tracking their location.
- Testing the alert system:
  - Person B will enter their phone number into the software. Person A will press the alert button on the prototype circuit and Person B will verify that they received an alert message.

17

WHAT'S NEXT

- Project Proposal
  - Completed and Submitted
  - Begin editing/updating based on feedback from Professor Frazier, Professor Milor, and Professor Hasler
- Beginning Prototyping
  - Start getting circuits simulated in Multisim
  - Begin pseudo code for software elements
    - Group needs to decide on coding language

18

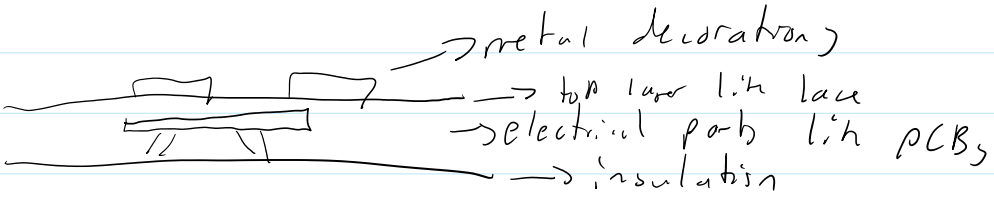
finalized Idea

Thursday, January 13, 2022 3:38 PM

Over winter break the team expressed concern of fitting all the necessary electrical components in the given surface area.

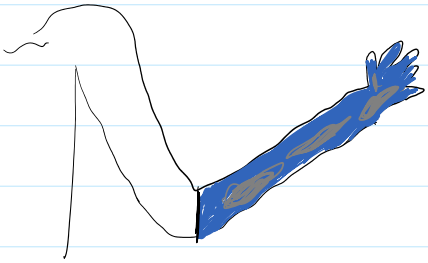
Therefore we decided to change the design to a fashionable glove

There would be 3-4 layers of the glove



This new design will protect the user more as there will be a layer of insulation and it gives us more surface area to work with.

The glove will go from the fingers to the elbow.



The grey spots are metal decoration on the glove hiding the electrical components. They will also act as our electrodes as the metal will be charged with Electricity

As the arm is less flexible than the hand many of the electrical components the battery, GPS, Bluetooth and stun gun circuitry. The top side of the palm will have the metal decorations for defense & offensive attacks.

Future considerations

Tuesday, April 26, 2022 10:24 AM

stun gun considerations:
- take it off bread board and put it on flexible bread board or flexible pcb
- select smaller components
- add safety features like pressure sensor

Bluetooth considerations
- have it connect to the App
  - be able to send notification that the stun gun was used

GPS
- actually have GPS or simcard on glove to be able to send glove location and not just the phone's GPS

App
- connect with Google maps or set own maps API
- connect to bluetooth
- register our own line/#

Expo Thoughts

Tuesday, April 26, 2022 9:19 PM

Everyone really liked the design and wanted to have one for themselves
- girls & guys wanted one

Going forward things to consider:
- dimensions
  - make the glove smaller this can be done by using smaller electrical components, flexible pcbs
  - maybe instead of a transformer just do more voltage doublers to get the voltage up
  - consider doing different colors like skin tone colors so it blends in with arm or match with a jacket.
- different version
  - so the glove works in the winter and colder climates but need a different design for hotter places like the beach
    - go back to bracelet & ring design

Meeting #1

Friday, October 15, 2021 2:57 PM

Meeting Minutes #1

Meeting Minutes – Sweet Dreams

Location: Molecular Science Building
Date: 9/17/2021
Time: 1:15 PM – 2:00 PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Christine Saw

Radha Changela

Hubert Elly

Lara Kassabian

Agenda Items

1. Introductions
2. Team Name decision
    a. Sweet Dreams
3. Need to get an advisor (does anyone know anyone?)
4. Team Skill Matrix (due 9/24/2021)
5. LettuceMeet for availability

Action Items

1. Fill out availability I everyone I 9/18/2021 ☑ 9/17/2021
2. Skill Matrix I everyone I 9/22/2021 ☑ 9/20/2021
3. Review Skill Matrix I everyone I 9/23/2021 ☑ 9/22/2021
4. Submit Skill Matrix I Katie Roberts I 9/24/2021 ☑ 9/24/2021
5. Make a list of availability I Elizabeth I 9/20/2021

Other Notes

General discussion of product and expectations for this semester. → ring & bracket combo

Already planning subteams based on availability.

↳ use skill matrix to determine subteams
aka software, hardware, testing etc

Meeting #2

Friday, October 15, 2021 3:15 PM

Meeting Minutes #2

Meeting Minutes – Sweet Dreams

Location: Virtual (Bluejeans)
Date: 9/24/2021
Time: 1:00 PM – 2:00 PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Christine Saw

Radha Changela

Hubert Elly

Lara Kassabian

Agenda Items

1. Team Skill Matrix review
2. Advisor Decisions Dr. Haslor
   a. Emailed Professor
3. QFD

Action Items

1. QFD I everyone I 10/1/2021 ☑ research competitors 9/26/2021
   a. Research engineering targets
2. Gantt Chart I Lara I
3. Form Teams channel I Katie I 9/24/2021 ☑ formed teams 9/24/2021
4. Send email to professor about advisors I Elizabeth I 9/24/2021

Other Notes

Team Skill: reviewing sub teams (deciding leaders, project managers, etc) each team will have a team lead who reports to group lead

Advisor: waiting for response from

Wanting a Teams channel for communicaiton and have all our files in one place

QFD: Elizabeth made the chart

- General discussion of engineering and customer reuqirements
- Potential Competitors:

- https://hypebae.com/2020/12/personal-safety-self-defense-jewelry-rings-knockout-brand-kate-davis-founder-interview
- https://www.defenderring.com/
- https://www.invisawear.com/

Meeting #3

Friday, October 15, 2021 3:15 PM

Meeting Minutes #3

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)
Date: 10/06/2021
Time: 5:30 PM – 6:00 PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Dr. Jennifer Hasler

Radha Changela

Hubert Elly

Lara Kassabian

Agenda Items

1. Introductions I Elizabeth and Dr. Hasler
    a. Project Introduction
    b. Member Introduction
2. Project Discussion I everyone
    a. Goals
    b. Application
    c. Testing

Action Items

1. Biweekly PowerPoint for Dr. Hasler I everyone I 10/22/2021 ☑ created powerpoint 10/21/2021
2. Discussions I everyone I 10/20/2021
    a. What is our project? What does it do? self defense so must be comfortable and protective
    b. Flush out ideas
    c. How are we going to test it? bench equipment
3. Write down explorations/design notebooks I everyone I 10/20/2021
    a. Get all ideas and drafts down

Other Notes

- Christine Saw could not make the meeting due to a class conflict.
- Project ideas: simple circuits
- Research: microprocessors, how we are dealing with charge and clothing resistance
- Dr. Hasler: really liked the project idea but thinks we need a better description and better thought ideas
    - Flush out specific subsystems
    - Start working on technical aspects this semester
    - Do not leave coding till the end
    - Keep a PowerPoint of the design up to date: Use images and tables to show the design and the design updates etc.
        - Will help with the writing of the final proposal
    - Start thinking about how you are going to test it
        - Demo Videos
        - Reach out to ROTC trainees and ask for volunteers for product testing
    - Have shocking circuit trigger when it connects with a body (i.e. punch) and when it reaches a certain acceleration
        - Accelerometer

Meeting #4

Friday, October 15, 2021 3:15 PM

Meeting Minutes #4

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)
Date: 10/15/2021
Time: 1:00 PM – 4:00 PM

Attendance

Elizabeth Herrejon (left at 1:30) (returned at 2)

Katie Weatherwax (left at 3)

Katie Roberts

Radha Changela

Hubert Elly (left at 1:30)

Lara Kassabian (left at 1:30)

Agenda Items

1. Gant and Pert chart
    a. Breaking into subteams and deciding on schedule
        ↳ Simon hardware and Shana

Action Items

1. Biweekly PowerPoint for Dr. Hasler I everyone I 10/22/2021 ☑ created powerpoint 10/20/2021
2. Discussions I everyone I 10/22/2021
    a. What is our project? What does it do?
    b. Flush out ideas
    c. How are we going to test it?
3. Write down explorations/design notebooks I everyone I 10/22/2021
    a. Get all ideas and drafts down

Other Notes

- Use this semester for research and brainstorming. Start prototyping and testing next semester

↓
how are we going to create this? put that into action next semester

Meeting Minutes #5

Thursday, December 2, 2021 4:46 PM

Meeting Minutes #5

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)
Date: 10/29/2021
Time: 12:30 PM – 2:00 PM

Attendance

Elizabeth Herrejon (joined at 1 pm)

Katie Weatherwax

Katie Roberts

Radha Changela

Hubert Elly

Lara Kassabian

Agenda Items

1. Standards and Codes

Action Items

1. Discussions I asap I everyone
   a. What is our project? What does it do?
   b. Flush out ideas → no one is really trying to finalize the idea which should be concrete for strategic research
   c. How are we going to test it?
2. Budget Proposal I 11/12/2021 everyone ☑ 10/30/2021 made budget template

☑ 11/05/2021 put my projects materials in binder

Other Notes

Just worked on the assignment

Meeting Minutes Template

Meeting Minutes #6

Thursday, December 2, 2021 4:46 PM

Meeting Minutes #6

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)
Date: 11/19/2021
Time: 12:30 PM – 2:30 PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Radha Changela

Hubert Elly

Lara Kassabian

Christine Saw (left at 1)

Agenda Items

1. Project Proposal
    a. Discussing Demonstrations
    b. Deciding on final ideas
    c. Clarifying roles
    d. Finalizing budgets
2. Discussing topics, we want to bring up to advisor

Action Items

1. Project Proposal I11/22/2021 I everyone
2. Meeting with Advisor I 11/19/2021 I everyone
3. Final Summary I 11/22/2021 I everyone

☑ 11/11/2021 wrote my part of proposal

☑ 11/11/2021 wrote my part of summary

Other Notes

Just worked on the assignment

The vibe right now is most of the team doesn't care about the project & just doing this to graduate as my assignments are done day of with little effort.

Meeting Minutes #7

Thursday, December 2, 2021 4:50 PM

Meeting Minutes #7

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)

Date: 11/19/2021

Time: 4:15 PM – 4:45 PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Radha Changela

Hubert Elly

Lara Kassabian

Dr. Jennifer Hasler

Christine Saw

Agenda Items

1. Discussion
    a. Discussing Demonstrations
        i. How to go about in testing
    b. Deciding on final ideas
        i. Specifically stun gun circuity

Action Items

1. Project Proposal I11/22/2021 I everyone
2. Final Summary I 11/22/2021 I everyone

Other Notes

- For stun gun circuit:
    - Instead of focusing on discharge current focus on charge and voltage
    - What should the voltage be (probably around 100 V)
    - Add a clearer circuit
    - Research what capacitor rating we will need
    - Desired current range: 1- 3 mA
- Testing

- Start with lab bench testing
- Then find volunteer to test on (military, Elizabeth's dad?)

- Things to consider
  - Resistance of the human body
    - Sweaty vs dry
    - Fat vs skinny
    - Skin vs clothing

We did do some testing on us with a trend of guys having lower resistance than women. Clothing made the multimeter thing it was an open circuit so we might have to focus our stun gun on vulnerable non clothed parts of the body when attacking

Meeting Minutes #8

Thursday, December 2, 2021 7:22 PM

SWEET DREAMS - DEC.2 Meeting Minutes

Meeting Minutes – Sweet Dreams

Location: Virtual (Teams)
Date: 12/2/2021
Time: 7:00 PM – 7:45PM

Attendance

Elizabeth Herrejon

Katie Weatherwax

Radha Changela

Lara Kassabian

Dr. Jennifer Hasler

Hubert Elly

Agenda Items

1. Discussion
    a. Discussing Project Proposal
        i. Feedback for proposal
    b. Deciding on final ideas
        i. Specifically stun gun circuity

Action Items

1. Add feedback to Project Proposal I12/10/2021 I everyone ☑ 12/10/2021 submitted proposal

Other Notes

- Too many words on the slides --> on software slides put more pictures
    - Maybe draft an app GUI
- Focus on standards that allow users to not get in trouble
    - Think about insulation and charge going to other person
- Break apart fitbit to use pieces, what microcontroller in Fitbit? Or hack into fitbit software (or fitbit knockoff)
    - Use an actual fitbit or knockoff
        - Easier approach since they do a lot of what we want to be done
    - Look for open source fitbit/knockoff code over making our own embedded system

- Expand on our test plan for actual shocking part
    - Build the circuit and test it soon (by 1st week of January)
    - Get actual measurement, needed before working on the rest of the project
- Finalize design concept
    - Pretty bracelet vs fitbit
- Half Glove design? Making the connection between wrist and ring flush/flexible
    - Consider possible materials
        - Must be insulated and safe for wearer
- Rest of the materials on slide deck looks good and is useful, just focus on concept first
- What are the questions we don't have answered?
    - Design
    - Circuit - start breadboarding soon
        - Think ahead so we do not fall behind

Over winter break I hope to do more research & figure out if this design is actually feasible.

Meeting Minutes #9

Thursday, January 13, 2022 3:38 PM

Meeting Mintues #9

Meeting Minutes – Sweet Dreams

Location: **CULC**

Date: **1/12/2022**

Time: **12:30 PM – 2:30 PM**

Attendance

Elizabeth Herrejon

Katie Weatherwax

Katie Roberts

Radha Changela

Hubert Elly

Lara Kassabian

Christine Saw

Agenda Items

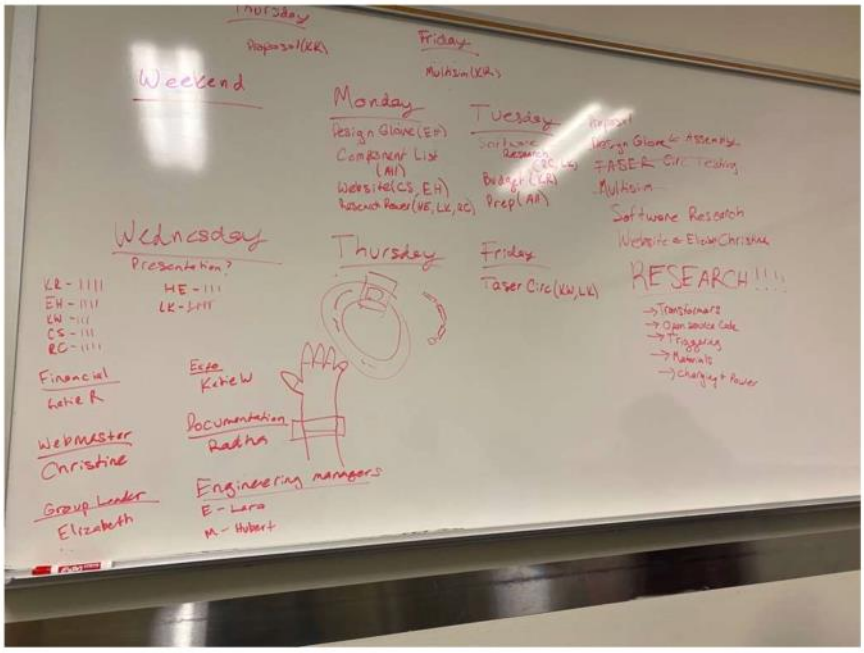
1. Discussion
    a. Introducing new design idea
        i. Glove only
    b. Deciding on final ideas
    c. Timeline
    d. Oral Presentation

Action Items

1. Oral presentation availability email |1/12/2022| Elizabeth
2. Weekly update email |1/13/2022| Radha
3. Student continuation form |1/12/2022| Radha
4. Proposal resubmit I1/13/2022I Katie W.R. ☑ 1/12/2022 rework proposal
5. Budget I1/18/2022I everyone
6. Research |1/17/2022| everyone *see image below for research topic division
7. Oral Presenation|1/19/2022| everyone

Other Notes

- Finalized leadership role *See image on last page
- Finalized design
    - Glove design
    - Ring backup, Elizabeth looking into only ring design by 1/17
- GET MORE IMAGES for proposal



The team is divided with Elizabeth still wanting to explore the ring but everyone is on board for the glove idea I proposed.

Meeting Mintues #10

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #10

Meeting Minutes – Sweet Dreams

Location: **Virtual**

Date: **1/18/2022**

Time: **9:00 PM – 9:35 PM**

Attendance

Katie Roberts

Radha Changela

Hubert Elly

Lara Kassabian

Christine Saw

Agenda Items

1. Discussion
    a. Oral Presentation slides
        i. Send it to Dr. Hasler soon so we can set a date for the presentation
        ii. Decided who is presenting what slide
    b. Overview of research done since last meeting
        i. Finalize parts and design
    c. Timeline

Action Items

1. Weekly update email |1/19/2022| Radha
2. Finalize Budget and Materials needed I1/18/2022I everyone
3. Oral Presentation Slides |1/19/2022| everyone

Other Notes

- Lara researched software and finalized microcontroller
- Lara and Katie W. will meet Thursday to build 'shock' circuit
- Hubert researched transformers and found one that conserves space

→ simulation outputs 7.83 KV so current is around 5mA which is perfect for hurting but not causing damage

- Katie R. created simulation of 'shock' circuit
- Katie R. updated project proposal and submitted to Dr. Hasler
- Elizabeth designed glove layout/look and created the personal website
- Radha researched battery recharging and found a circuit
- Christine built the base of proposal power point and will talk to Elizabeth about website (updating)
- Katie W. researched and chose presser sensors and worked on the power point

Meeting Mintues #11

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #11

Meeting Minutes – Sweet Dreams

Location: **PG Library**

Date: **1/19/2022**

Time: **12:30 PM – 1:50 PM**

Attendance

Katie Roberts

Katie Weatherwax

Elizabeth Herrejon (virtual)

Radha Changela

Hubert Elly

Lara Kassabian

Christine Saw

Agenda Items

1. Discussion
    a. Oral Presentation slides
        i. Finalize Slides
        ii. Send it to Dr. Hasler soon so we can set a date for the presentation
    b. Finalize Budget
    c. Timeline

Action Items

1. Weekly update email |1/19/2022| Radha
2. Build Shock Circuit |1/21/2022| Lara and Katie W.
3. Practice Oral Presentation |1/26/2022| everyone
4. Research how to build a transformer |1/26/2022| Hubert
5. Pseudocode |1/26/2022| Radha and Christine
6. Research Bluetooth and GPS Circuit |1/26/2022| Katie R.
7. Researching Pressure Sensor connecting to circuit |1/26/2022| Katie R.

8. Glove Layout |1/26/2022| Elizabeth

Other Notes

- Finished up budget and made budget summary
- Updated Gant Chart
- Finalized Proposal Slides

GPS circuit; found a github repository that tracks GPS using 3G cell towers so don't need service
- updates every 100ms and with 20ft accuracy

Meeting Mintues #12

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #12

Meeting Minutes – Sweet Dreams

Location: **Virtual (Teams)**

Date: **1/24/2022**

Time: **6:00 PM – 7:15 PM**

Attendance

Katie Roberts

Katie Weatherwax

Elizabeth Herrejon

Radha Changela

Hubert Elly

Lara Kassabian

Christine Saw

Agenda Items

1. Discussion
    a. Finalize Proposal Slides
    b. Practice Presentation

Action Items

1. Practice Proposal
2. Continue/finish assigned tasks from previous meeting

Other Notes

- Went through proposal slides and discussed comments
- Removed transformer slide
    - Will be using new turns ratio that exist
    - We will not have to make our own
- Break up design requirements slide into 2
- Update text Alert picture

    - Fix typo and add link/ mention live tracking location
- Divided up slides
- Lara and Katie W. gave update with testing
    - Took resistor mesasurement

I'm taking tech side specifically stun gun slide
- get picture of schematic (open circuit & short circuit)
- explain circuit & safety features

Meeting Mintues #13

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #13

Meeting Minutes – Sweet Dreams

Location: **PG Library 2216, Van Leer 363**

Date: **1/26/2022**

Time: **12:30 PM – 2:20 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Elizabeth Herrejon (joined at 1:30)

Hubert Elly (joined at 1:30)

Agenda Items

1. Discussion
    a. Finalize Proposal Slides
    b. Practice Presentation
    c. Test resistances

Action Items

1. Practice Proposal |2/2/2022| All
2. Schedule Proposal date/time and logo design |1/28/2022| Elizabeth
3. Finalize Stun Gun Circuit |2/2/2022| Katie R.
4. Software Pseudocode |2/2/2022| Christine and Radha
5. Design PCBs |2/23/2022| Lara
6. “Question Quarterback” and Finalize Proposal Slides |2/2/2022| Katie W.
7. Research Flexible PCB |2/2/2022| Katie W. and Hubert

Other Notes

- Edited Proposal with feedback from Dr. Hasler
- Decided to use lipo battery charger form sparkfun instead of assembling our own PCB
- Edited slide 7
    - Break into 2 as per Dr. Hasler's suggestion
- Recorded resistance of our bodies
- Decide to have switch to turn stun gun on and off
    - Push button and pressure sensor will trigger SMS message

Dr. Hasler confused on circuit so must sure to explain the difference between Open & complete circuit

Meeting Mintues #14

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #14

Meeting Minutes – Sweet Dreams

Location: **Virtual**

Date: **2/1/2022**

Time: **8:00 PM – 9:00 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Elizabeth Herrejon

Hubert Elly

Agenda Items

1. Discussion
    a. Practice Presentation

Action Items

1. Practice Proposal |2/2/2022| All
2. Finalize Stun Gun Circuit |2/9/2022| Katie R. start ordering parts
3. Software Pseudocode |2/9/2022| Christine and Radha
4. Design PCBs |2/23/2022| Lara
5. "Question Quarterback" prep |2/9/2022| Katie W.
6. Research Flexible PCB |2/9/2022| Katie W. and Hubert
7. Breakdown Animation |2/16/2022| Elizabeth

Other Notes

- Elizabeth talked over her mood board
    - Product name decided: "Nemi"

I don't know how I feel about the name Nemi as I feel like it doesn't have much to do with the product, personally I thought about looking up to Greek goddess of self-defense,

Meeting Mintues #15

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #15

Meeting Minutes – Sweet Dreams

Location: **Virtual**

Date: **2/2/2022**

Time: **12:30 PM – 1:00 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Elizabeth Herrejon

Hubert Elly

Agenda Items

1. Discussion
    a. Practice Presentation

Action Items

→ sent circuit to Lara for layout

1. Finalize Stun Gun Circuit |2/9/2022| Katie R.
2. Software Pseudocode |2/9/2022| Christine and Radha
3. Design PCBs |2/23/2022| Lara
4. Research Flexible PCB |2/9/2022| Katie W. and Hubert
5. Breakdown Animation |2/16/2022| Elizabeth

finalizing the presentation I am in charge of the circuit slides so make sure to go over safety features, technical details and the diff from between open & closed voltage

Meeting Mintues #16

Tuesday, February 22, 2022 3:47 PM

Meeting Mintues #16

Meeting Minutes – Sweet Dreams

Location: **Flag Building**

Date: **2/9/2022**

Time: **12:30 PM – 1:30 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian (virtual)

Christine Saw

Elizabeth Herrejon (virtual)

Hubert Elly (virtual)

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

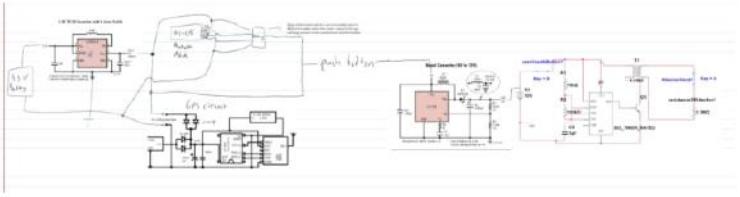
1. PCBs Design layout (Meet with Katies) |2/16/2022| Lara
2. Continue working on app and animation |2/16/2022| Elizabeth
3. Pseudocode |2/16/2022| Christine
4. Fitbit open-source code research |2/16/2022| Radha and Hubert
5. SIM Chip research |2/16/2022| Radha
6. Final Report Outline and app research |2/16/2022| Katie W.
7. Bluetooth research and finalizes circuits |2/16/2022| Katie R.

Finalize circuits 2/16/2022

Other Notes

- Software

- Christine broke down pseudo code into sections
- Radha looked into connecting sim chip to microcontroller

- Flexible PCB
  - Katie W. found a company that's makes them
  - They must approve our time, but it will take about 21 days of ordering
  - OSH park website
  - Hubert looked up flexible breadboard as another option
    - Will buy for testing
- Website and App integration
  - Elizabeth made flow diagram for app (user side)
  - Look up fitbit open source to get hoe glove will integrate with app
- PCBs
  - Lara designed PCB, and it about 1sq inch for stun gun circuit
  - Also made a block diagram for electrical system
- Katie R.
- 

complete schematic for stun gun glove

Will give schematic to Lara so she can begin layout

Meeting Mintues #161

Tuesday, February 22, 2022 3:49 PM

Meeting Mintues #161

Meeting Minutes – Sweet Dreams

Location: **PG Library**

Date: **2/16/2022**

Time: **12:30 PM – 2:00 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Elizabeth Herrejon (virtual)

Hubert Elly

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

1. PCBs Design layout |2/23/2022| Lara
2. Continue working on app and update website |2/23/2022| Elizabeth
3. Pseudocode block diagram |2/23/2022| Christine
4. Fitbit open-source code research |2/23/2022| Radha and Hubert
5. Research Brain stuff and PCB coverings |2/23/2022| Katie W.
6. Bluetooth research |2/23/2022| Katie R.

Other Notes

- Updates:
    - Katie W.

        - Need to do more research on voltage to brain (brain damage)
        - Sent app research to Elizabeth
    - Lara
        - Continue layouts
    - Battery Charger is here
    - Design notebooks due on 25th (first round)
    - Email Hasler about update presentation and notebook submission
    - Radha
        - Has layout of SIM chip hook up
        - Still doing research on fitbit opensource code
    - Hubert
        - Still doing research on fitbit opensource code
    - Elizabeth
        - Writing update email to Hasler
        - App design and integration/layout
    - Chrstine
        - Needs parts to continue pseudocode
    - Katie R.
        - Finalized circuit schematic
        - Order more parts

> ordered all electrical parts

The fact that it is February and we don't have any of our prototype built is a little frightening.

Meeting Mintues #17

Saturday, April 16, 2022 10:12 PM

Meeting Mintues #17

Meeting Minutes – Sweet Dreams

Location: **PG Library**

Date: **2/16/2022**

Time: **12:30 PM – 2:00 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Elizabeth Herrejon (virtual)

Hubert Elly

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

1. PCBs Design layout |2/23/2022| Lara
2. Continue working on app and update website |2/23/2022| Elizabeth
3. Pseudocode block diagram |2/23/2022| Christine
4. Fitbit open-source code research |2/23/2022| Radha and Hubert
5. Research Brain stuff and PCB coverings |2/23/2022| Katie W.
6. Bluetooth research |2/23/2022| Katie R. 2/22/2022

Other Notes

- Updates:
    - Katie W.

        - Need to do more research on voltage to brain (brain damage)
        - Sent app research to Elizabeth
    - Lara
        - Continue layouts
    - Battery Charger is here
    - Design notebooks due on 25th (first round)
    - Email Hasler about update presentation and notebook submission
    - Radha
        - Has layout of SIM chip hook up
        - Still doing research on fitbit opensource code
    - Hubert
        - Still doing research on fitbit opensource code
    - Elizabeth
        - Writing update email to Hasler
        - App design and integration/layout
    - Chrstine
        - Needs parts to continue pseudocode
    - Katie R.
        - Finalized circuit schematic
        - Order more parts

research bluetooth
There are many repositories and development apps we can use to connect circuit & app
HC-05 seems like the best bluetooth app for our purpose
— this was ordered but never came in

Meeting Mintues #18

Saturday, April 16, 2022 10:12 PM

Meeting Mintues #18

Meeting Minutes – Sweet Dreams

Location: **Culc 317**

Date: **2/23/2022**

Time: **12:30 PM – 1:30 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Hubert Elly

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

1. PCBs Design layout |3/2/2022| Lara
2. Continue working on app and update website |3/2/2022| Elizabeth
3. Setting up micro controller |3/2/2022| Christine
4. Research Bluetooth data to app |3/2/2022| Radha
5. Research Mirco controller to Bluetooth |3/2/2022| Hubert
6. Taking apart stun gun circuit |3/2/2022| Katie W.
7. Layouts with Lara |3/2/2022| Katie R. ☑ 3/1/2022

Other Notes

- Updates:
    - Huber and Radha went over open-source app
        - Broke it up into two parts for Bluetooth to

- Lara designed PCB for boost converter, <1sq inch
- More parts came in!
- Katie W. looked up brain damage at high voltage
  - We are fine!
- Katie R. ordered more parts
  - Will be working with Lara
- Christine finalized pseudocodes and block diagram

Gave Mary different circuits to Lara

1) stun gun
2) bluetooth module
3) 3.3V to 5V gain circuit
4) 5V to 12V gain circuit

Had schematics in multisim

Then found a list of parts so Lara could have accurate layouts

Meeting Mintues #19

Saturday, April 16, 2022 10:12 PM

Meeting Mintues #19

Meeting Minutes – Sweet Dreams

Location: **PG 2217**

Date: **3/2/2022**

Time: **12:30 PM – 1:30 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Hubert Elly

Elizabeth Herrejon (virtual)

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

1. Finalize boast converter layout and submit stun gun PCB |3/9/2022| Lara
2. Continue working on app |3/9/2022| Elizabeth
3. Micro controller set up research |3/9/2022| Christine and Hubert
4. Research sending GPS location via text to multiple people |3/9/2022| Radha
5. Look into surface mount on breadboard |3/9/2022| Katie W. And Lara
6. Order through hole parts |3/9/2022| Katie R. D ordered parts 3/10/2022

Other Notes

- Updates:
    - Christine and Hubert meet to talk about the micro controller

        - Heavy research this week, will begin testing next
    - Radha found how to set up Bluetooth with an app
        - We can use Android Studio to build an app
        - Will send stuff to Elizabeth
    - Lara finished PCB board layouts
        - Will send it to Elizabeth next week
        - Will finalize boast converter
    - Lara and Katie W. took apart the stun gun to see and understand circuit
    - Katie W. looking into getting a locker at the Hive

Simulated multiple circuits in multisim but the original circuit is the only one that works

Meeting Mintues #20

Saturday, April 16, 2022 10:12 PM

Meeting Mintues #20

Meeting Minutes – Sweet Dreams

Location: **PG 2217**

Date: **3/9/2022**

Time: **12:30 PM – 1:10 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Hubert Elly

Elizabeth Herrejon (virtual)

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered

Action Items

1. Email Dr. Hasler and get test subjects to sign waivers |3/16/2022| Elizabeth
2. Testing attiny |3/16/2022| Christine and Hubert
3. Adding multiple phone numbers to text alert code |3/16/2022| Radha
4. Work on schematic and look for parts for redesign |3/16/2022| Katie R. And Lara
5. Order new parts |3/16/2022| Katie R.
6. Pickup studs, testing them and possible slide updates |3/16/2022| Katie W.

redesign schematic 3/15/2022

order through hub parts 3/14/2022

Other Notes

- Updates:
    - Elizabeth recruited test subjects and finished a new power point templet

- Katie W. coordinating with testing time, and made a skeleton timeline on expo requirements
- Lara looked into redesigned stun gun circuit with a capacitor bank
  - Based on a lot of DIY stun guns online
- Radha looked into multiple phone numbers for sending text alter to, will continue and build off code to do so
- Christine researched attiny set up

Lara talked to people saying we need to redesign circuit took updated design & simulated it in Multisim
- the new design did not simulate it kept breaking
- the old design however gave desired results

Meeting Mintues #21

Saturday, April 16, 2022 10:14 PM

Meeting Mintues #21

Meeting Minutes – Sweet Dreams

Location: **Hive**

Date: **3/16/2022**

Time: **12:30 PM – 1:30 PM**

Attendance

Katie Roberts

Katie Weatherwax

Radha Changela

Lara Kassabian

Christine Saw

Hubert Elly

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered
    c. Testing

Action Items

1. Working on app |3/30/2022| Elizabeth
2. Software and attiny testing |3/30/2022| Hubert
3. Adding multiple phone numbers to text alert code |3/30/2022| Radha
4. Get breakout boards ready to test |3/20/2022| Lara
5. Testing breakout boards during spring break |3/30/2022| Katie R.
6. Start expo PowerPoint and poster |3/30/2022| Katie W.

D 3/20/2022

Other Notes

- Updates:
    - Katie R. ordered all new parts

    - Katie W. ordered metal studs and is looking ahead through at deadlines
    - Elizabeth worked on app and will continue to work on it
    - Lara, built new prototype stun gun crk
        - Needs to update it with the correct part
- Software team started to set up Attiny
- Hardware team started to test prototype crk with stunds

Tested circuits over Spring break
could not accurate test as could not get any voltage

Possible issues: transformer
bad breakout boards

Parts should come in after spring break and allow for easier testing

Meeting Mintues #22

Saturday, April 16, 2022 10:14 PM

Meeting Mintues #22

Meeting Minutes – Sweet Dreams

Location: **Hive**

Date: **3/30/2022**

Time: **12:30 PM – 2:00 PM**

Attendance

was not there due to interview

Katie Weatherwax

Radha Changela

Christine Saw

Hubert Elly

Elizabeth Herrejon

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered
    c. Testing

Action Items

1. Working on app |4/6/2022| Elizabeth and Radha
2. Software and attiny testing |4/6/2022| Hubert and Christine
3. Testing breakout boards |4/6/2022| Katie R. And Lara
4. Break down parts for poster and PowerPoint |4/6/2022| Katie W.

Other Notes

- Updates:
    - Christine finished setting up Attiny
    - Hubert looked into Attiny gps/bluetooth connection
    - Radha created word doc with individual parts for needed for app (ex how to set up bluetooth, how to read trigger, how to sent sms)
    - Katie W. started documentation for final documentation

    - Elizabeth worked on app
        - Can send text from app to phone
- Software team started to set up Attiny
- Hardware team started to test prototype crk with stunds
- Video should be done the Friday the week before expo
- Have to find new fabric from walmart to order

Met with Katie w & Lara to get updates & continued testing.

Meeting Mintues #23

Saturday, April 16, 2022 10:14 PM

Meeting Mintues #23

Meeting Minutes – Sweet Dreams

Location: **Hive**

Date: **4/6/2022**

Time: **12:30 PM – 2:00 PM**

Attendance

Katie Weatherwax

Kaite Roberts

Radha Changela

Christine Saw

Hubert Elly

Elizabeth Herrejon

Lara Kassabian

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered
    c. Testing

Action Items

1. Working on app (Texting) |4/13/2022| Elizabeth and Radha
2. Software and attiny testing |4/13/2022| Hubert and Christine
3. Testing breakout boards |4/13/2022| Katie R. And Lara ☑ Tested circuit on myselc 4/13/2022
4. Working on poster and PowerPoint |4/13/2022| Katie W. and Radha

Other Notes

- Updates:
    - Hubert looked into bluetooth connection with our temporary Bluetooth
    - Radha researched app sending text messages

- Katie W. started documentation for final documentation
  - Poster, power point, due dates
  - Will ask for specific specs from other sub teams
- Elizabeth worked animation video of glove

- Software team started to set up Attiny
- Hardware team started to test prototype crk with stunds → studs work & carry charge
- Video should be done by 22th the week before expo
- Have to fabric for glove, still needs to sew glove

The circuit does not output the necessary voltage so only a small shock is delivered.

Requirements aren't being met but does deliver some punch.

Meeting Mintues #24

Saturday, April 16, 2022 10:15 PM

Meeting Mintues #24

Meeting Minutes – Sweet Dreams

Location: **Hive**

Date: **4/13/2022**

Time: **12:30 PM – 2:00 PM**

Attendance

Katie Weatherwax

Kaite Roberts

Radha Changela

Christine Saw

Hubert Elly

Lara Kassabian

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered
    c. Testing

Action Items

1. Working on app (Bluetooth signal) |4/20/2022| Elizabeth and Radha
2. Test Bluetooth with app code and package subcircuit |4/20/2022| Hubert and Christine
3. Finalizing breakout boards |4/20/2022| Katie R. And Lara ☑ 4/14/2022 finalized circuit
4. Finish poster and PowerPoint |4/20/2022| Katie W. and Radha
5. Start sewing glove |4/20/2022| Katie W.

Other Notes

- Updates:
    - Radha worked on the document
    - Christine and Hubert got Bluetooth to work!
        - Will need to wait for Elizabeth to incorporate it into the app

- Material for glove prototype is here
  - Katie R.'s hand will be the model

Team's prototype is coming together although its crunch time

Glove is made (insulatory material) but need to finish circuit.

Meeting Minutes #25

Tuesday, April 26, 2022 9:30 PM

Meeting Mintues #25

Meeting Minutes – Sweet Dreams

Location: **VL Senior Design Lab**

Date: **4/20/2022**

Time: **12:30 PM – 2:30 PM**

Attendance

Katie Weatherwax

Kaite Roberts

Radha Changela

Christine Saw

Hubert Elly

Lara Kassabian

Agenda Items

1. Discussion
    a. Task Updates
    b. Parts Ordered
    c. Testing

Action Items

1. Prepare for Expo |4/26/2022| All ☑ got poster printed 4/22/2022
2. Record Video |4/22/2022| All ☑ recorded on 4/22/2022
3. Finish Glove prototype 4/21/2022| All ☑ finished beta glove model on 4/21/2022

Other Notes

- Updates:
    - Katie W. gave expo updates
- Our stun gun circuit discharged a very high voltage (20kV based on simulation, but voltmeter in lab cannot measure it)
- Updates need to be made to poster and will need to be reprinted

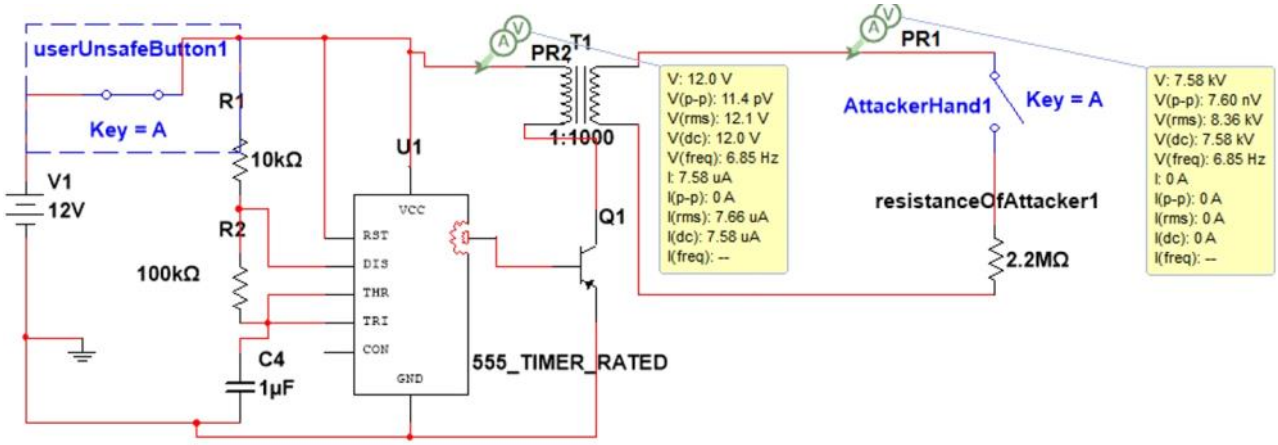
- Stared putting everything on final glove

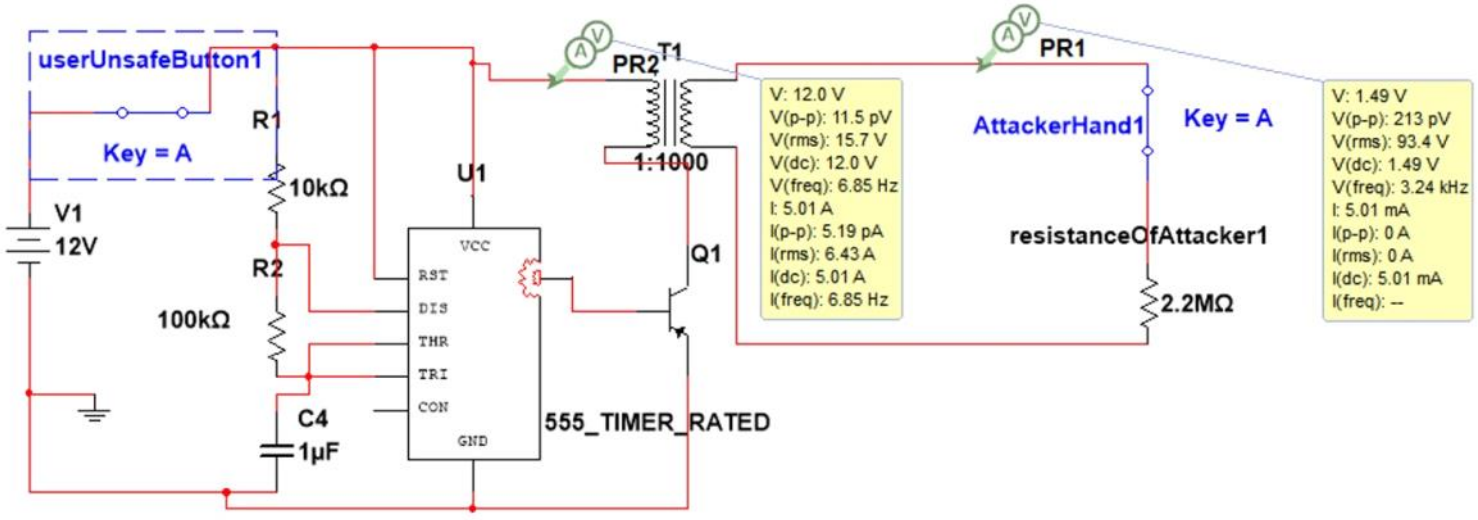
The glove after changing the circuit from a BJT to MOSFET now discharges 40hV therefore testing has become significantly harder.

I'm generally surprised we pulled it all together and it works. The app's bluetooth still need work but the stun gun works.

Stun gun circuit

Thursday, January 13, 2022 3:39 PM





Triggering Conditions

Thursday, January 13, 2022 6:56 PM

We need to put a lot of failsafes in our product to make sure the user doesn't accidently fire someone unexpectedly

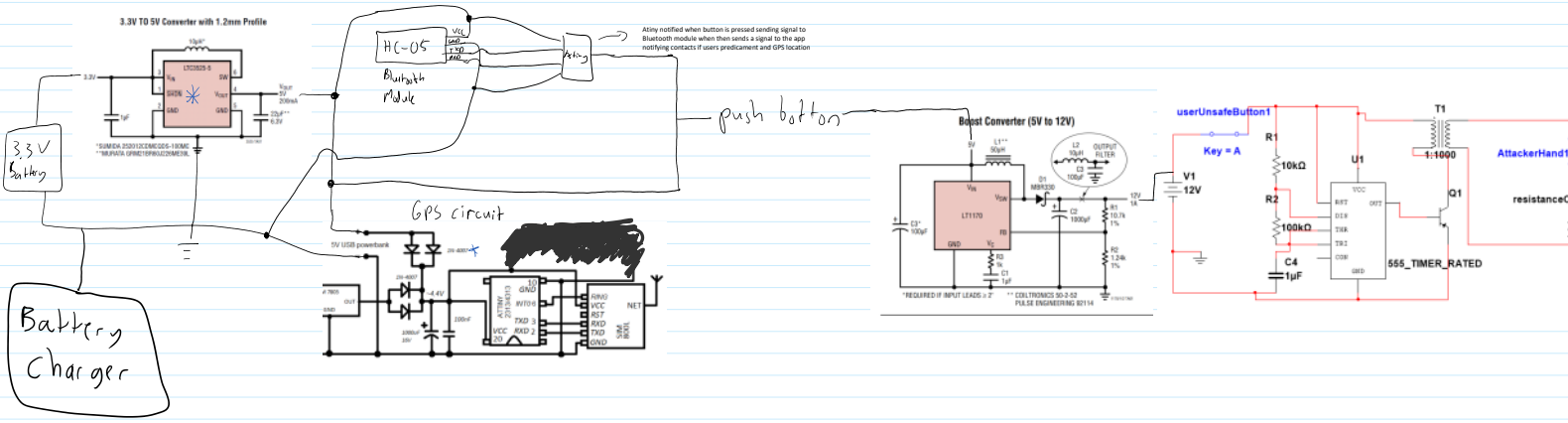
Therefore we came up with certain conditions that must be met in order to cause the discharge of the taser gun

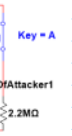
1) user presses the button this causes the app to notify contacts as well as charge the circuit
2) circuit discharges when enough pressure is felt on the metal plates & a certain acceleration is met with contact on the metal

Circuit diagram

Tuesday, February 8, 2022 8:13 PM

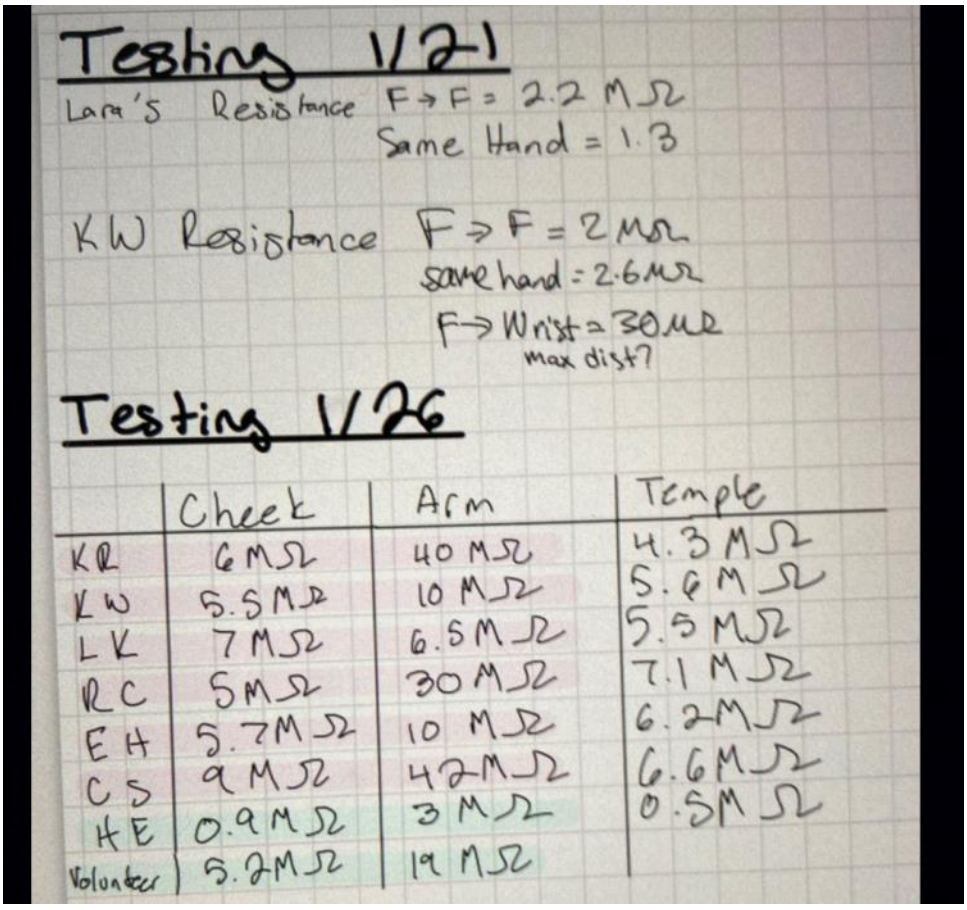
* still need to purchase




Key = A
fAttacker1
2.2MΩ

Testing: Resistance

Tuesday, February 22, 2022 4:10 PM



Testing 1/21

Lara's Resistance F→F = 2.2 MΩ
Same Hand = 1.3

KW Resistance F→F = 2 MΩ
same hand = 2.6 MΩ
F→Wrist = 30 MΩ
max dist?

Testing 1/26

	Cheek	Arm	Temple
KR	6 MΩ	40 MΩ	4.3 MΩ
KW	5.5 MΩ	10 MΩ	5.6 MΩ
LK	7 MΩ	6.5 MΩ	5.5 MΩ
RC	5 MΩ	30 MΩ	7.1 MΩ
EH	5.7 MΩ	10 MΩ	6.2 MΩ
CS	9 MΩ	42 MΩ	6.6 MΩ
HE	0.9 MΩ	3 MΩ	0.5 MΩ
Volunteer	5.2 MΩ	19 MΩ	

embedded_research

Tuesday, February 22, 2022 3:55 PM

embedded_research

Connecting button from microcontroller to Bluetooth, GPS and trigger stun gun

Initial setup ATtiny85 with Arduino UNO

https://www.instructables.com/Arduino-UNO-Programming-Atiny85/

Connecting ATtiny85 to Bluetooth module

https://www.instructables.com/ATtiny85-Bluetooth/

- Connect microcontroller to phone via Bluetooth and control components using Arduino app

https://create.arduino.cc/projecthub/Arnov_Sharma_makes/attiny85-with-hc-05-bluetooth-module-a36028

Sending GPS coordinates through SMS using ATtiny2313 and SIM800L GPS module

https://github.com/mcore1976/gpstracker

Connecting ATtiny85 to push button (go into sleep mode with single press or long hold for certain timeframe before sleep mode) - similar concept can be applied to triggering stun gun circuit

https://www.electronics-lab.com/project/attiny85-push-button-power-switching-software-solution/

http://www.bitbanging.space/posts/switching-on-off-an-attiny85-via-software

ATtiny85 with button to turn LED on or off

https://www.arduinoslovakia.eu/blog/2018/2/attiny85---tlacidla?lang=en

software_research

Tuesday, February 22, 2022 3:57 PM

software_research

Microcontrollers:

Name	Cost $/unit	Area cm^2	Features	Links
~~ATWINC3400-MR210xA~~ Stricken for being too excessive for our needs	~~14.01~~	~~3.30~~	~~Power Amplifier (PA), Low-Noise Amplifier (LNA), Transmit/Receive (T/R) switch (for Wi-Fi® and Bluetooth) and Power Management Unit (PMU)~~	
ATtiny20	0.51	0.02	In-system programmable, 2K bytes of in-system programmable flash program memory, 0.128 kb sram	digikey
PSoC 4000 –none in stock	1.78	0.02	Up to 16 KB of flash with Read Accelerator, Up to 2 KB of SRAM, i^2c	datasheet
KL03 - none in stock	3.17	0.03	32kb flash, 2kb sram,	digikey
Microchip PIC12LF1552	0.86	0.05	Self-Programmable under Software Control,	digikey
~~TinyZero~~ expensive	~~19.95~~	4	~~Like a small arduino~~	~~tinycircuits~~

Attiny comparison chart

What does the chip need to be able to do?

- What is input voltage? - depends on what battery we get
- Memory
  - Do we need SRAM? -- maybe to save SMS contacts?
- Communication
  - Serial
    - What type
  - How to send alert to emergency contacts?
    - Through phone? Bluetooth?
- Peripherals
  - Do we need an ADC? - if we pick only digital sensors- no
  - No need for encoders/PWM
- Power
  - Low power consumption

Open-source code (let's use C):

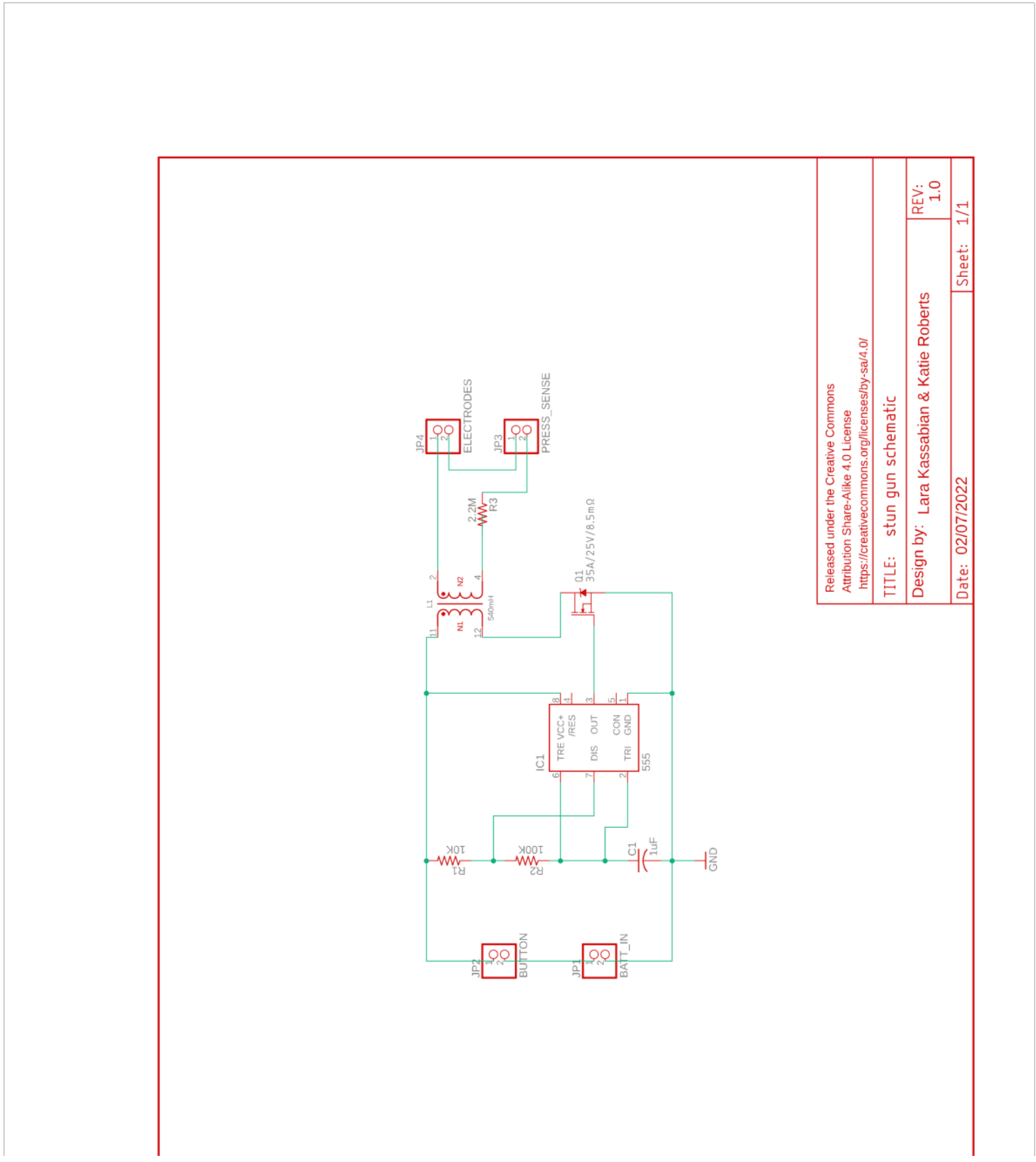
- GPS tracker for mini drones (10g weight)
  - Using ATtiny84A
  - Looks too big
- Sending SMS Text Message using PIC Microcontroller – Flowcode
- Implementation of Microcontroller Based Vehicle Location Tracker Using GSM and GPS

    - They used an arduino to send GPS info by SMS
- Security alarm using SMS messages.
    - Using AVR atmel
- Find a C compiler for attiny?

Stun gun layout

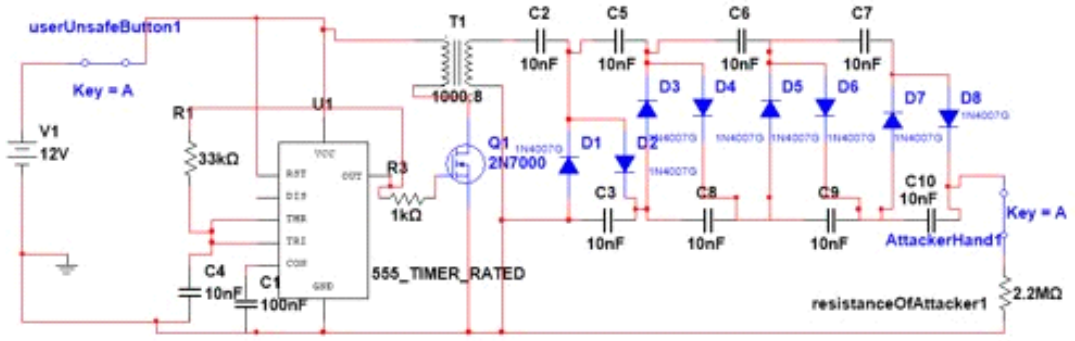
Tuesday, February 22, 2022 4:09 PM

stun_gun_schematic_V1.0

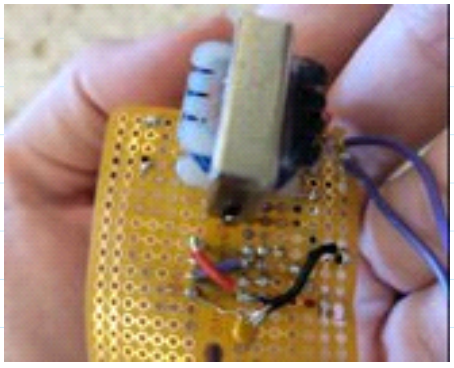


Final stun gun

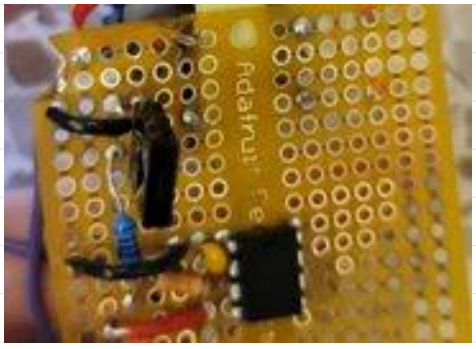
Saturday, April 16, 2022 10:02 PM



This is the final circuit of the stun gun, the actual design has 8 stages of doublers which 4 are only shown above, Also this was changed from the final design to get a higher voltage of 40kV and does not overload the transformer



This is a picture of our stun gun circuit without the voltage doublers on the flexible bread board.
This side specifically shows the transformer



This is picture of the back of the circuit showing the Mosfet and the 555-timer

This is the 8 stages of the voltage doubler daisy chained together in a capacitor lid bracket

This is [illegible] [illegible] stages of the [illegible] double
daisy chained together in a capoeira dish
bracelet

Glove

Tuesday, April 26, 2022 10:53 AM

This is the insulating material of the glove.

The components go on like this: