KNIGHT WATCH SECURITY (KWS)

Initial Project and Group Identification Document

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I. Personnel

Group Members

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Sponsors/Significant Contributors

Progress Energy, Inc. (Pending)

II. Project Description

A reliable, home security system has been desired by humankind since the dawn of time. While many homes throughout the world have implemented various designs for home security, very few homes use an energy efficient system. If homes were to use an energy efficient home security system, it will ease their daily struggles with safety, security, and finances. In addition, previous security systems have limited connectivity. With today's technology and society's "Go Green" outlook, many homes and families should have a desire to implement a home security system that is dependable, energy efficient, and easy to use. With a system like this, homeowners will be able to live their daily lives reassured that their personal assets are kept safe in a resourceful manner. They would also be satisfied knowing this system was simple to implement as well as user friendly.

In order to provide homes with a better sense of protection and a more versatile structure, we are proposing Knight Watch Security (KWS). KWS is an autonomous, solar-powered security system camera with network capabilities. Our goal is to build a self-contained security camera that people will feel comfortable and satisfied installing outside of their homes.

Our security camera will be mounted on a pole that can be placed anywhere outside the user's home. The camera will have a wide viewing angle and Wi-Fi connectivity with a specific range, so the location of the camera is up to the user's discretion. The system will be powered using the solar panels developed by hand. Furthermore, the video being recorded will be transmitted via Wi-Fi to a specified computer and can be stored as well as viewed live. The user will then be able to pan and zoom the camera to desired viewing. Similarly, the video feed will be able to be viewed from a smartphone using an application that can stream the video feed.

Homes that desire a safe household or asset protection will want to use KWS. The amount of break-ins and robberies would decrease substantially. Users will be able to go on vacation and monitor their house from across the globe. They will even be able to have a good night's sleep knowing that KWS is like sleeping with one eye open. KWS is the future of energy-saving security systems.

III. Project Specifications and Requirements

a.) Solar-Sufficient (no outside power consumed):

i. Supply: 40W Solar PV panel
ii. Storage: Internal battery
iii. Data transmission (Router): 9.6W (12 Volt, 800mA)
iv. Video feed system: 9W (Max.)

b.) Solar powered:

i. PV panel 40W (Dimensions undetermined).
ii. Panel dimensions will be based upon power requirements.
iii. Unit's housing will incorporate our panel design.

c.) Internal battery:

i. Small application deep-cycle gel cell 6V (Qty. 2/in series).
ii. Power storage ability for 24 hours of self-sufficient function.
iii. At least one year of battery use before replacement.

d.) Interface capabilities:

i. Remote desktop access.
ii. Remote smartphone access (Android App).
    1. On/Off control.
    2. Zoom capabilities (Analog/Digital comb.).
    3. Default mode

e.) Portable (Fully wireless operation):

i. Solar powered, with power storage ability.
ii. Wi-Fi data transmission capabilities (20m range).
iii. Self-contained (weather resistant housing).
iv. Lightweight (under 25lbs.).

f.) Pan and tilt adjustments:

i. Pan – Unit can be manually rotated horizontally through 180° of vision.
ii. Tilt – Vertical adjustment has 45° of freedom.

IV. Project Block Diagrams

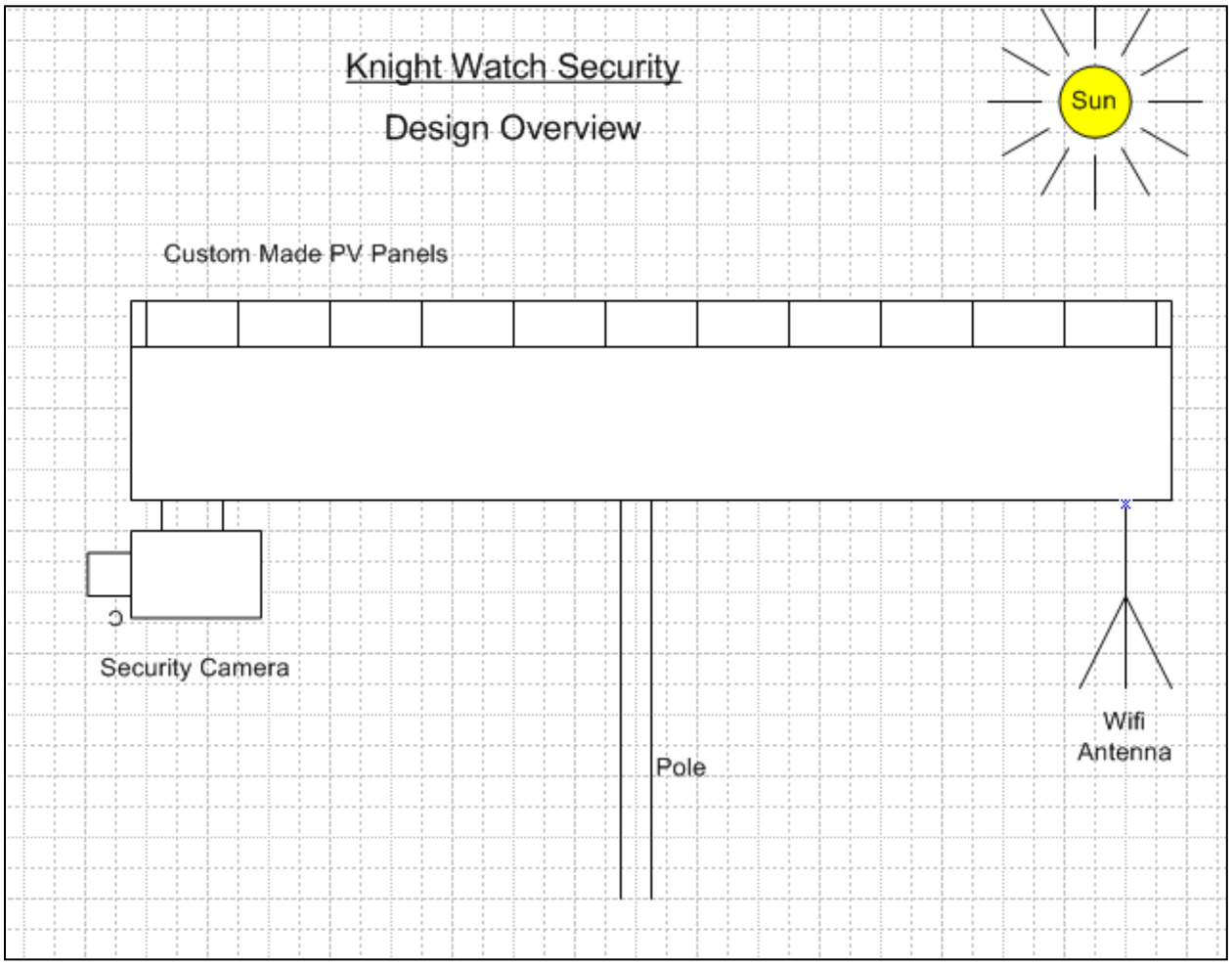

Figure 1: Design Overview

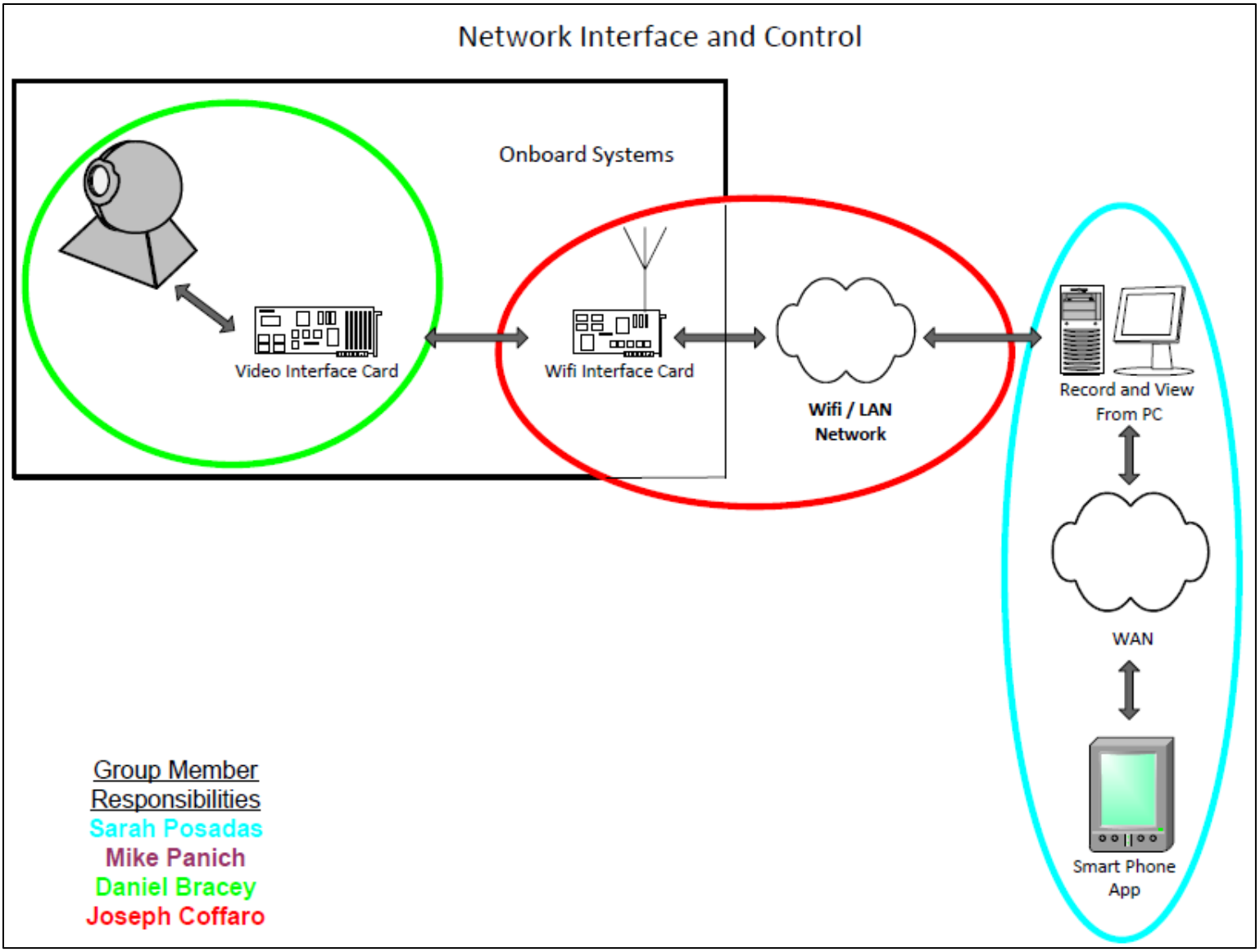

Figure 2: Network Interface and Control

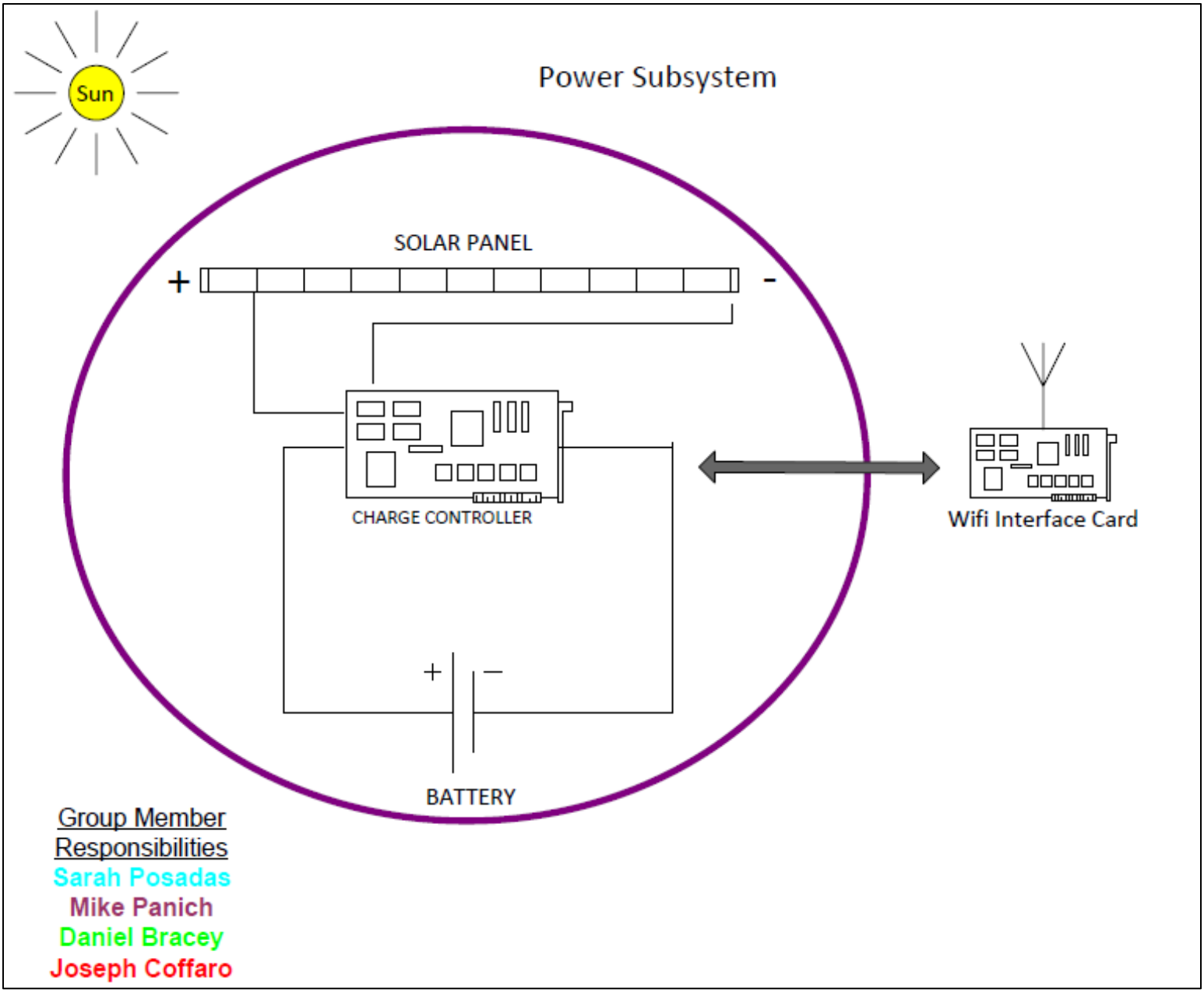

Figure 3: Power Subsystem

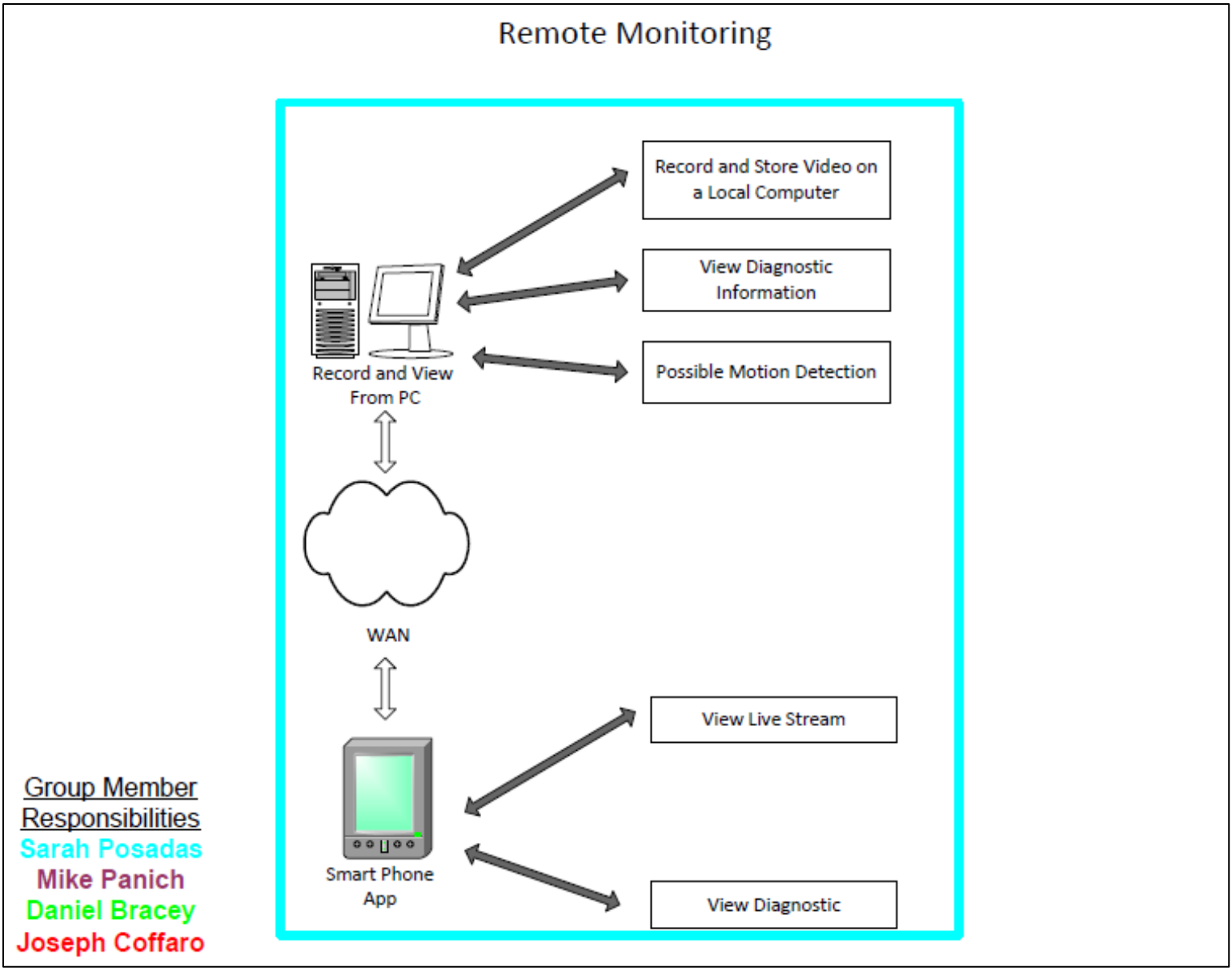

Figure 4: Remote Monitoring

V. Project Budget and Financing

(All costs are estimated and subject to change)

Part	Part #	Cost
Logitech Webcam	C500	$79.99
NPower 40 Watt Amorphous Solar Panel	24559	$199.99
AGM Battery - 12V 55Ah	40740	$123.96
AM335x Starter Kit	TMDSSK3358	$199.00
Processor For PCB	ARM-335x	$99.99
Wifi Shell	RN-121	$79.00
Wifi Antenna	12433921	$19.95
Wireless router	WNDR3400-100NAS	$79.99
MPPT Charge Controller		$149.95
Printed Circuit Board (2)		$148.95
Housing		$85.50
Wires and Terminals		$15.99
Total Estimated Cost:		**$1,282.26**

VI. Project Milestones

Fall 2012

	Task Name	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	Finalize project idea								
2	Get idea approved and find a sponsor								
3	Research video subsystem module								
4	Research networking subsystem module								
5	Research software development module								
6	Research power subsystem module								
7	Research how to integrate each subsystem into one								
8	Research parts (price, specs, etc.)								
9	Finalize expected design								
10	Finalize semester project report								

Spring 2013

	Task Name	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	Review and Confirm Designs								
2	Order and Receive Parts								
3	Build and test video subsystem module								
4	Build and test networking subsystem module								
5	Build and test software development module								
6	Build and test power subsystem module								
7	Combine all modules								
8	Verify and test combined system								
9	Modify system to resolve issues								
10	Finalize combined system								
11	Prepare final presentation and present								