Active Ankle Foot Orthosis

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**Concept of Operations**

REVISION – Draft

3 September 2018

Concept of Operations

for

Active Ankle Foot Orthosis

TEAM P.A.C.T.

Approved by:

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T/A Date

**Change Record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rev.** | **Date** | **Originator** | **Approvals** | **Description** |
| **-** | 9/03/2018 | Tyler Pierce |  | Draft Release |
|  | 9/25/18 | Chris Galik |  |  |
|  |  |  |  |  |

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# Executive Summary

We are designing an Active Ankle Foot Orthosis to aid in the movement for patients with impaired muscular control or an asymmetric muscular condition. The question for our design will be “can we make an active AFO that can cooperate with the ankle extensor/flexor muscles to produce optimal ankle-joint movement?” We will accomplish this by processing electrical signals from muscles and sensors to initiate motors to aid in the movement.

Needs further revision

# Introduction

We are designing an Active Ankle Foot Orthosis to aid in the movement for patients with impaired muscular control or an asymmetric muscular condition. The question for our design will be “can we make an active AFO that can cooperate with the ankle extensor/flexor muscles to produce optimal ankle-joint movement?” This is a proof of concept project.

## Background

Include in the background any system or systems that your proposed project will enhance or replace. Include details as to why this will enhance or replace any existing system.

## Overview

We will accomplish this by processing electrical signals from muscles and sensors to initiate motors to aid in the movement.

## Referenced Documents and Standards

# Operating Concept

## Scope

Provide detail on the scope of your proposed project.

## Operational Description and Constraints

The AAFO will need to be able to operate from 30 minutes to one hour.

## System Description

Movement will need to be able to have the users intent behind it by sensing a human signal as well as be able to generate a sufficient torque to flex or extend the ankle joint during walking without any assistance from the ankle extensor/flexor muscle.

## Modes of Operations

The AAFO will function using two signal modes: EMG (human) signals and sensor (mechanical) signals. We will prove that these modes can work separately and then incorporate them into one another.

## Users

The AAFO can be adjusted to fit 90% of the population. The AAFO will be used to aid movement for patients with an impaired muscular control or asymmetric condition.

## Support

Provide detail how support would be given to users. User manuals, tech support, etc…

# Scenario(s)

## Scenario Name #1

Describe the use case scenario for your project. Use a separate subsection for each scenario.

# Analysis

## Summary of Proposed Improvements

Describe/list the improvements that the proposed system will provide.

## Disadvantages and Limitations

Describe/list any disadvantages and limitations that the proposed system will have.

## Alternatives

Describe/list any alternative solutions and what any trade-offs may be to contrast your proposed project to the alternative.