

Target Lifter and Turner Bracket



Team 16

Variable Angle Target Training System (V.A.T.T.S.)



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Background

- SITs (Stationary Infantry Target) are used to train military in combat situations
- SITs include many features that help provide a more realistic experience
 - Muzzle Flash
 - Hit Detection
 - Friend/Foe Identification
- Flips up and down to present targets
- A variety of targets can be used with the SIT
 - Ivan
 - Figure 11
 - Figure 12
 - E-Type



Figure 1

Scope

- The team needs to design a new lifter arm bracket
- A new innovative design that allows for quick change of targets
 - Must be able to accommodate provided targets
- Implement a system to turn the targets to a specified position/angle

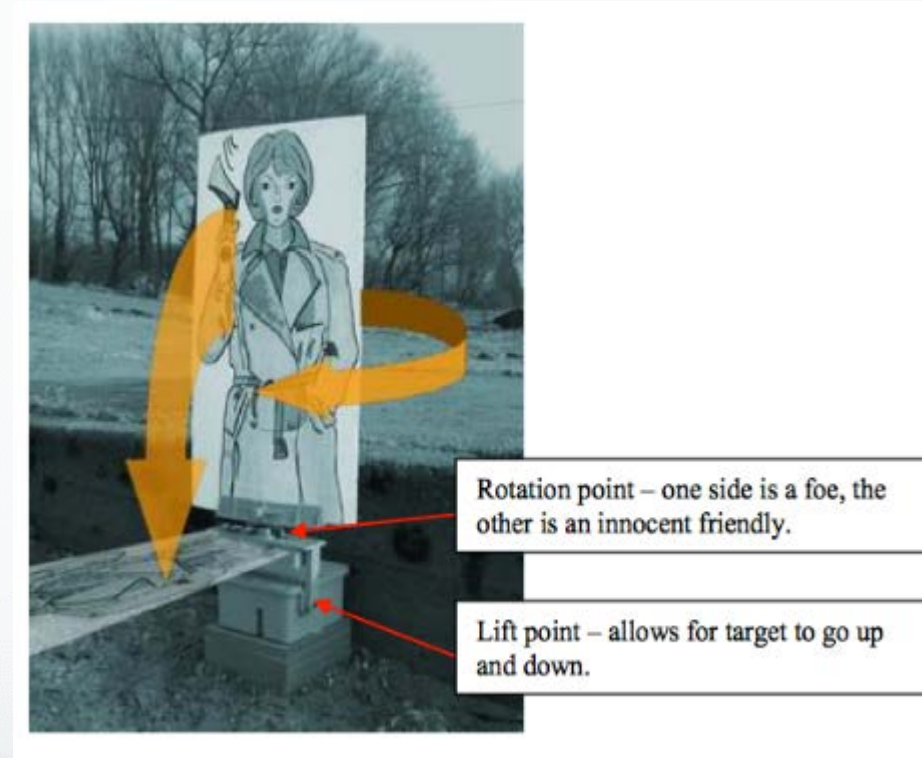


Figure 2



Objectives

- Lift and rotate targets on command
- Firmware interface with FASIT 2.0
- Create a universal mount for variety of targets
- Easily attach and detach various types of targets
- Withstand 35 mph cross winds
- The motor may not be back driven
- Motor will be unaffected by heat, sand, dust, and rain
- Use Figure 11, Figure 12, Ivan, “E” type and “F” type targets.

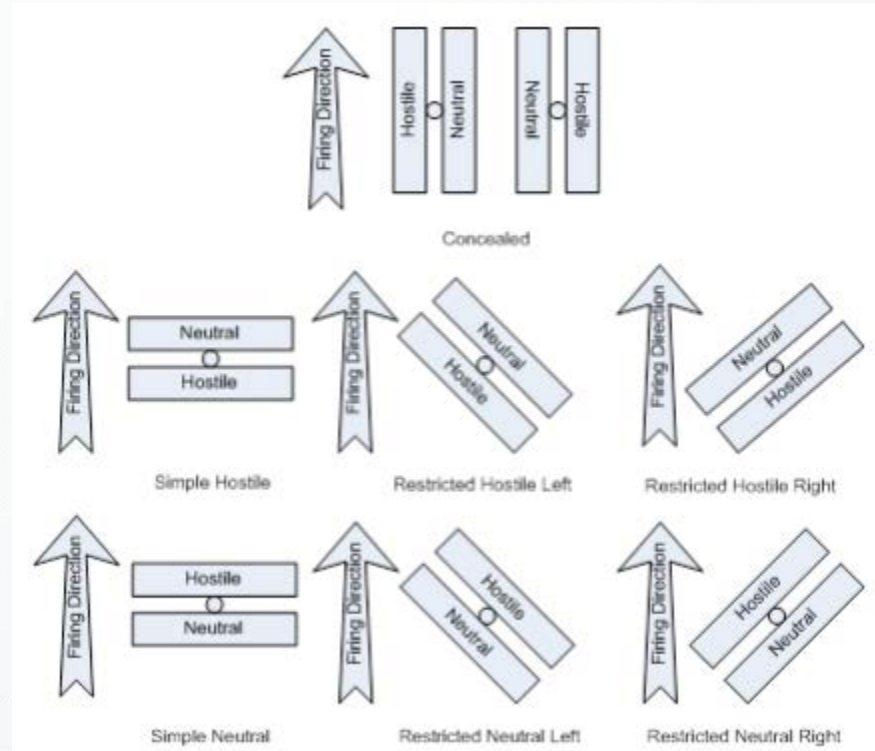


Figure 3

“Lockheed-Marin’s current Stationary Infantry Target does not allow for suitable target presentations.”

Concept Selection

Design Matrix

Target Bracket decision matrix								Decision based on a 1-5 scale
	weighted	Design A	Design B	Design C	Design D	Design E	Design F	
Simplicity	5	3	4	4	4	3	4	
Cost	3	4	2	3	3	4	3	
Size	1	4	2	4	4	4	3	
Weight	2	4	2	4	4	4	3	
# of parts	4	1	4	2	2	3	4	
Loading time	4	3	4	4	2	3	4	
Reliability	5	2	3	1	2	2	3	
Total point value		65	79	70	67	73	85	

Table 1

Design E (split)

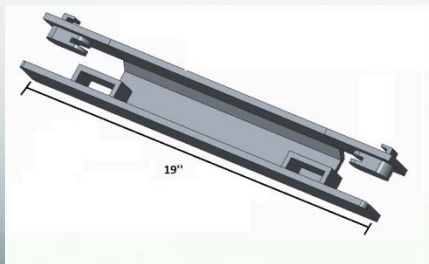


Figure 4

Design F (Gate)

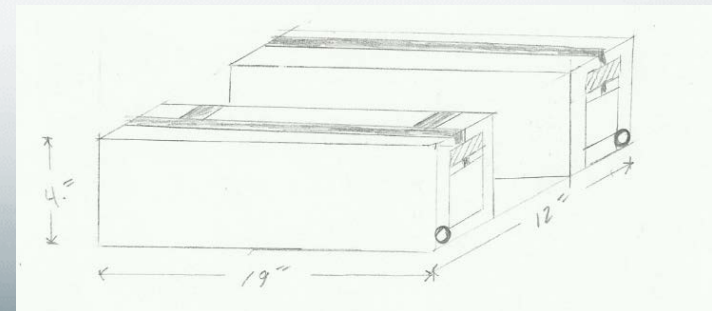


Figure 5

Design E (Split)

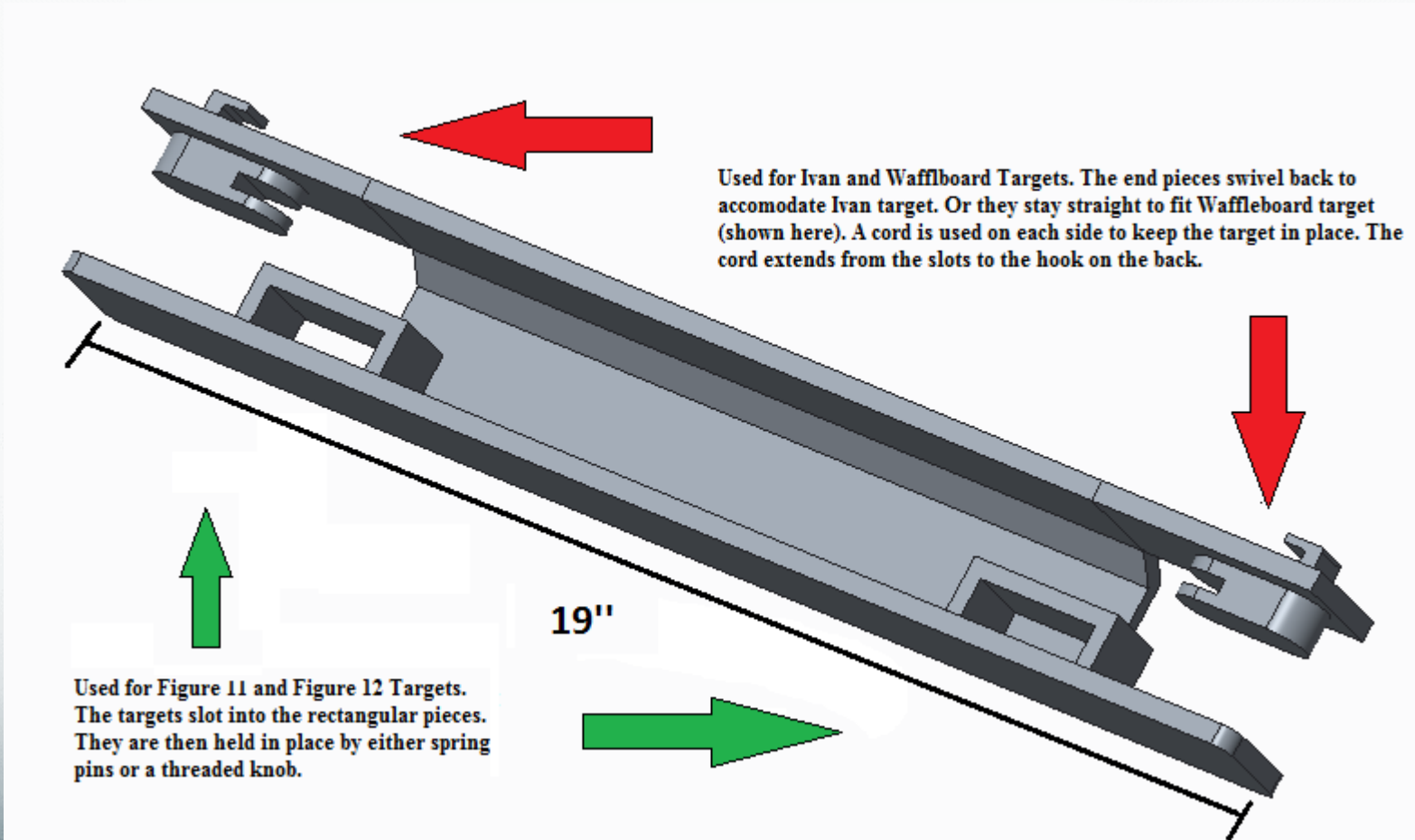


Figure 4

Design E (Split)

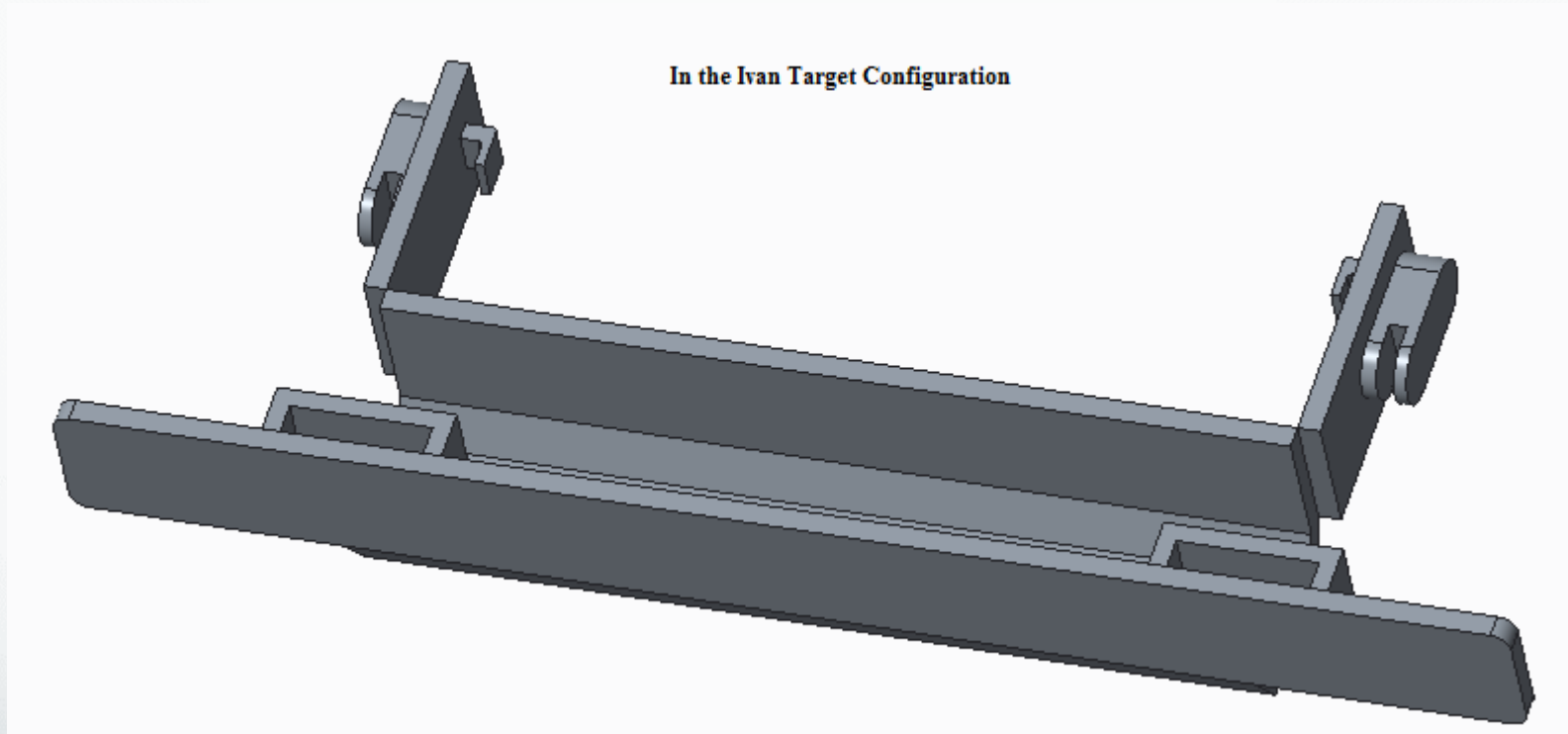


Figure 6

Design F (Gate)

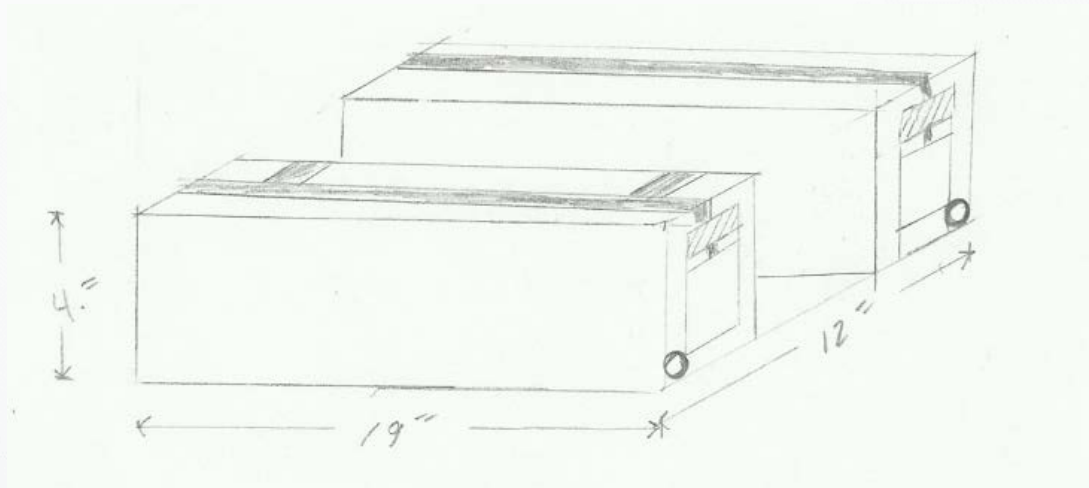


Figure 5

Design Evaluation

- Durability of the target bracket
- Securing the target
- Different rotational speeds
- Choosing the best locking mechanisms
- Pinching

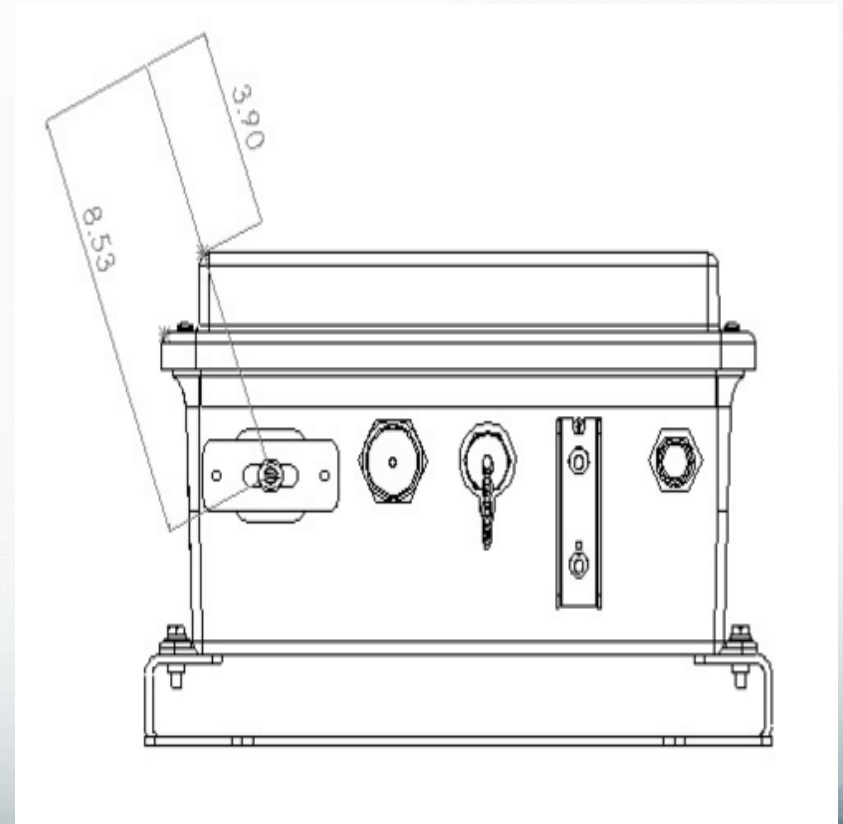
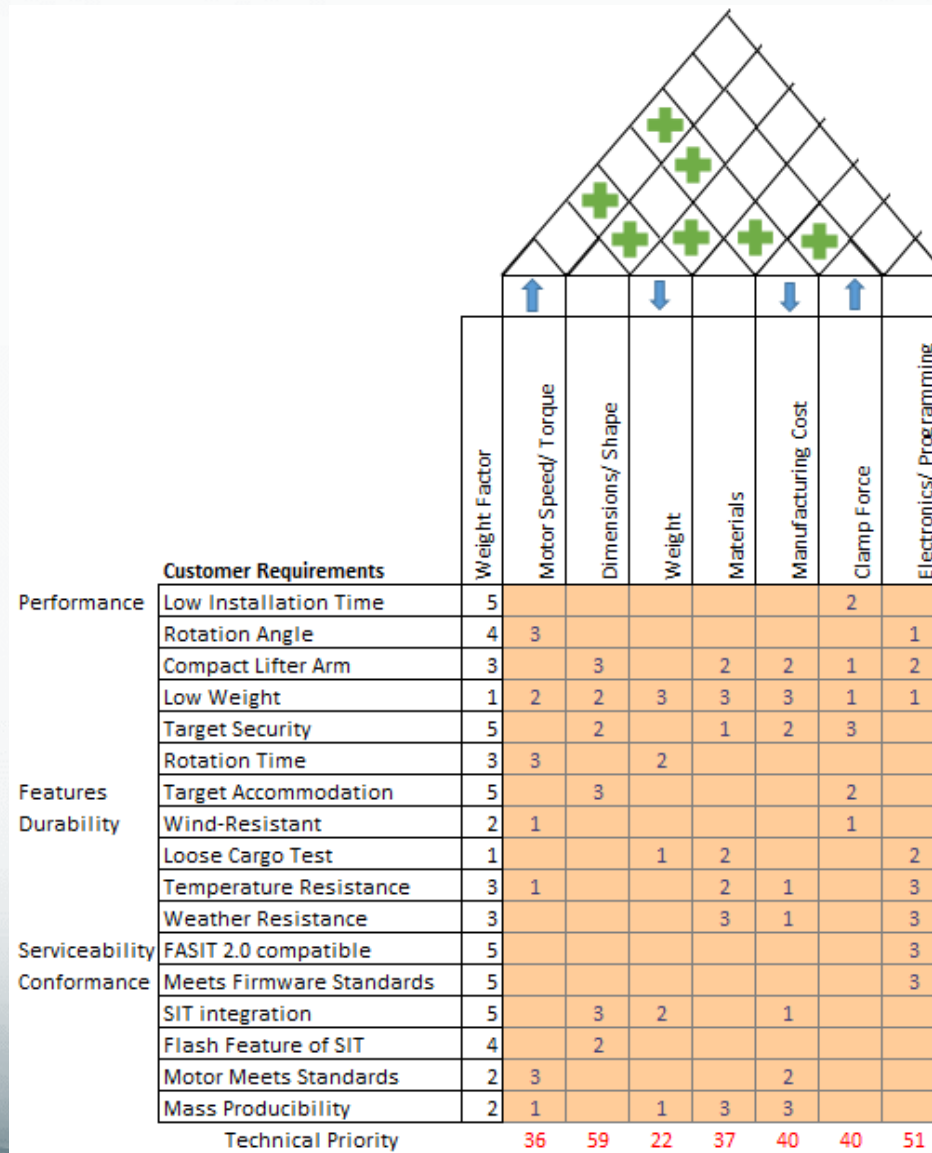


Figure 7



Review

- We identified the largest concern for our sponsor
- Produced multiple design concepts
- Identified what immediate problems we will face continuing the build
- Created a schedule to continue the design process

In the Future

- Finalize the target bracket selection
- Bracket and Motor Connection
 - Pin & Collar
- Motor and Board selection
 - Meets industrial standards
- Target Arm

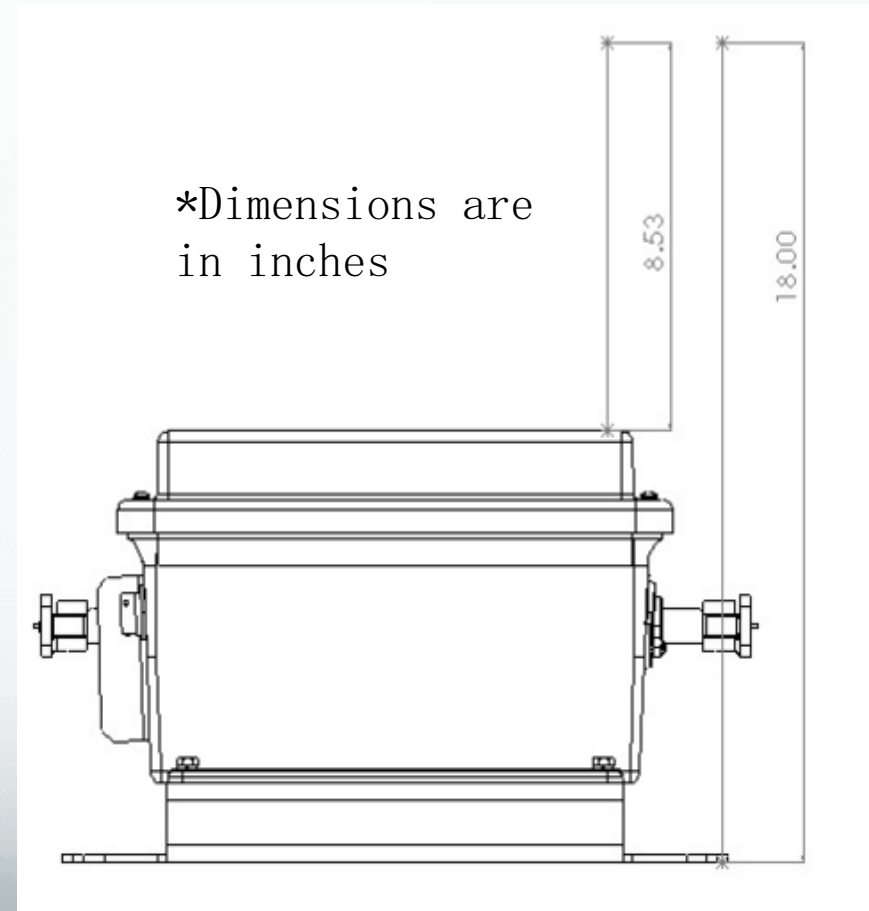


Figure 8

References

- [1] Infantry Squad Battle Course, Army Engineers

- [2] Meggitt MF-SIT Specification Document

- [3] MS Instruments Stationary Infantry Target Specifications

- [4] Theissen GSA Federal Supply Schedule Price List

- [5] Future Army System of Integrated Targets: Presentation Devices Interface Control Document 2.0