Identify the need

- The situation: Our autonomous was ineffective
- Challenge statement: Create a dynamic program/thing that can track a robot's location and direct it on a $12 \times 12 ft^2$ FTC game field

Describe

Describe the need

- Can direct a robot to any arbitrary point
- Existing approaches: Time, accelerometer, light

Constraints

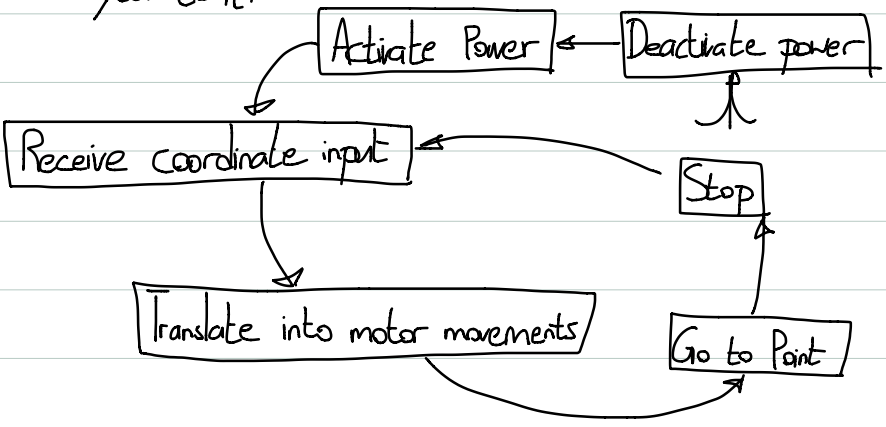
- Must use FTC allowed parts/materials only

Requirements

- Must be fast enough to complete an autonomous routine within 30 seconds
- Can withstand the occasional violent blow

Characterize and Analyze the system

- Produce a functional model - I didn't make one so, how would you do it?



Quantify constraints, requirements

Constraints

- See game manual

Requirements

- The robot cannot stop for more than __ sec between each movement and must travel at speed ≥ __ cm/s
- Can withstand ≥ __ N of force for ≥ __ s

Divide project into subsystems

- Hardware subsystem
- Software subsystem

Understand equipment available (Tetrix/RobotC)

- Encoders
- Axle stability
- RobotC
- Trigonometry

Generate

Set up demos

"Generated" Concepts – I drifted between research, generate, and embody

1. Accelerometer and Compass
2. Encoder and Compass
3. Encoder and $\frac{Arc}{radius} = \theta$
4. Encoder, $\frac{Arc}{radius} = \theta$, and absolute position

Concept Selection – my process was try the first thing that came up

How would you do it knowing some strategies?

Example Pugh chart:

1-5 rating x %

	5=	Weight	①	②	③	④
Physical Complexity	Not complex	10%	1	4	3	2
Physical robustness	practically indestructable	10%	3	2	2	2
Physical bulk	$\leq \frac{18^3 in^3}{8^3}$	15%	5	4	4	4
Software Complexity	Easily understandable	15%	1	2	3	3
Reliability	100% reliability	25%	1	1	3	3
Satisfies all con/reqs	Goes above and beyond	25%	1	1	4	5
Total		100%				