Drill Motion Assembly

rack

pinion gear

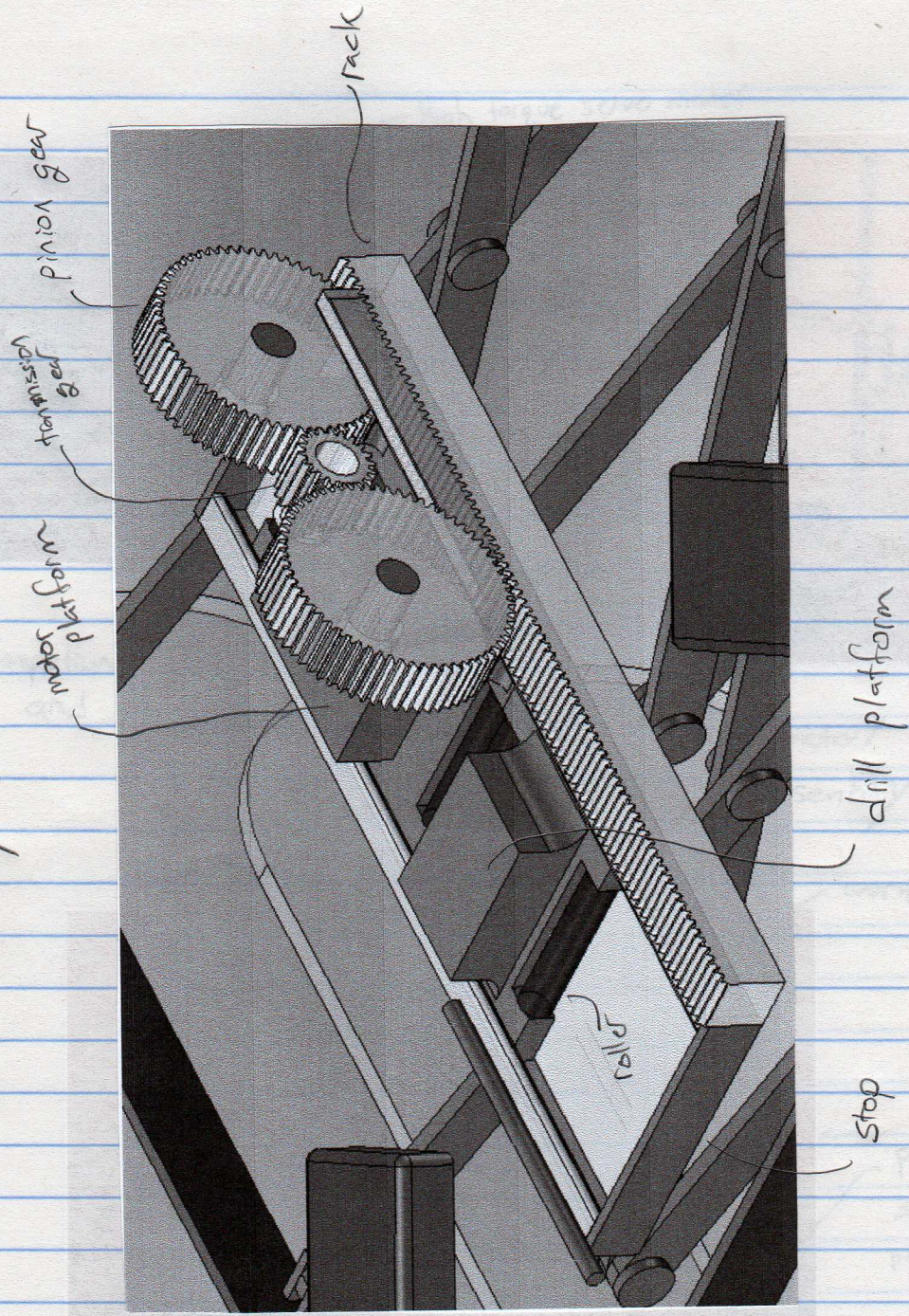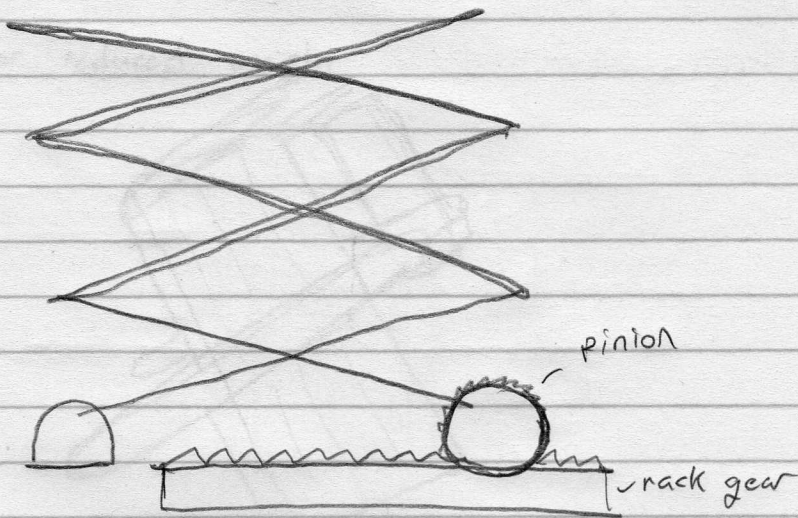transmission gear

motor platform
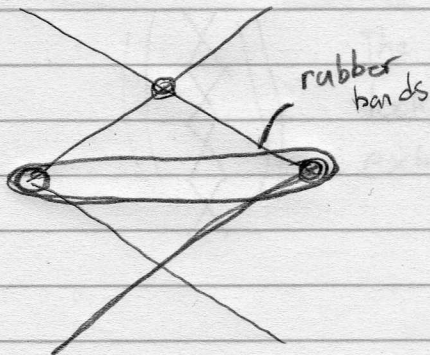
drill platform

rolls

stop

Lift Mechanism

pinion

rack gear

Prototype of this alignment requires far too much force to generate lift of the assembly from its fully closed position,

Attempted solution

rubber bands
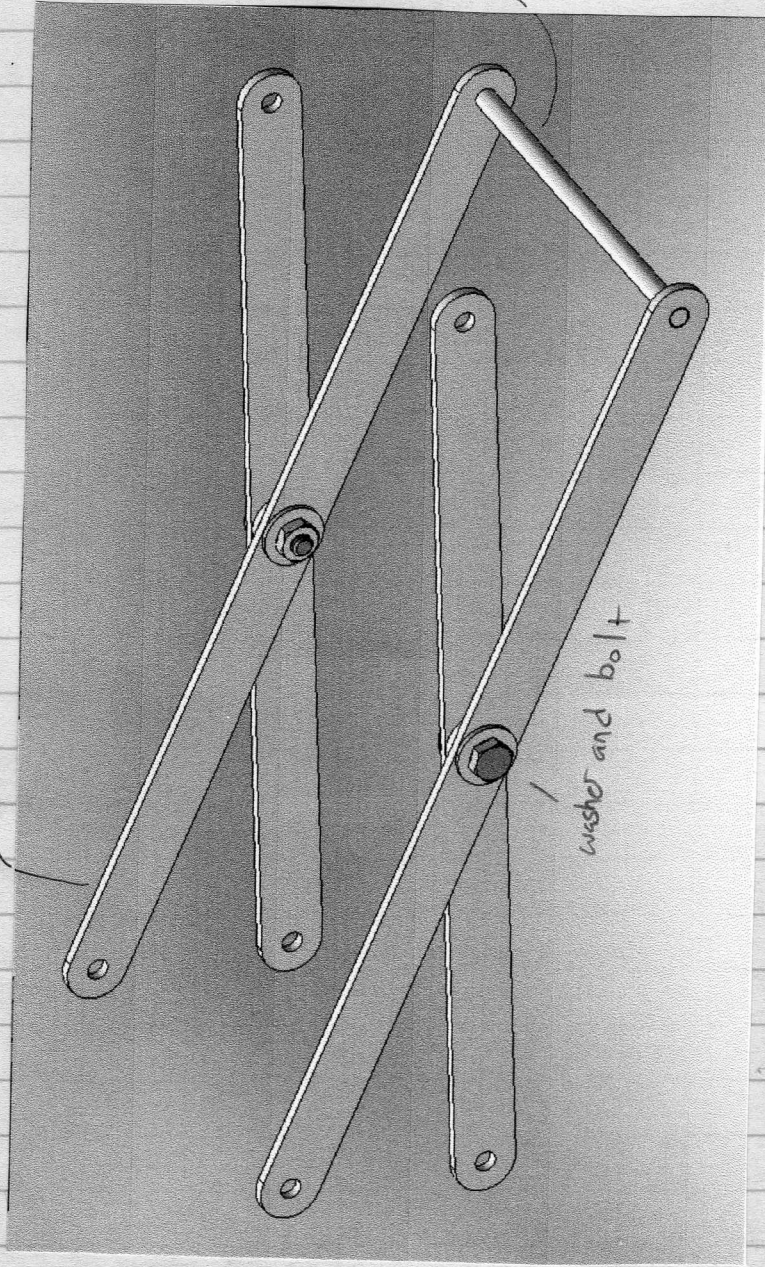
This arrangement greatly reduces force required along much of the lifts path but does not make initial lift any easier,
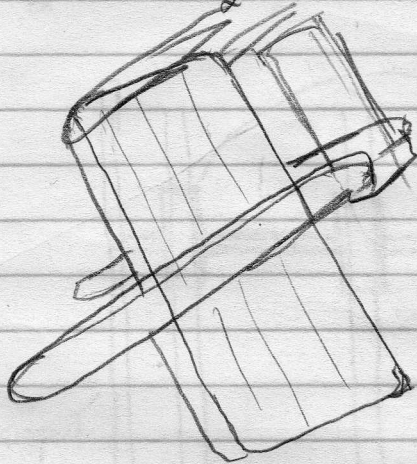
Scissor Lift Design

aluminum segments

machined
¼" shaft
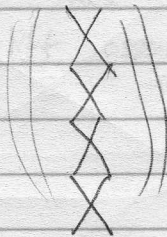for attaching
to pinion

washer and bolt

Altered lift mechanism
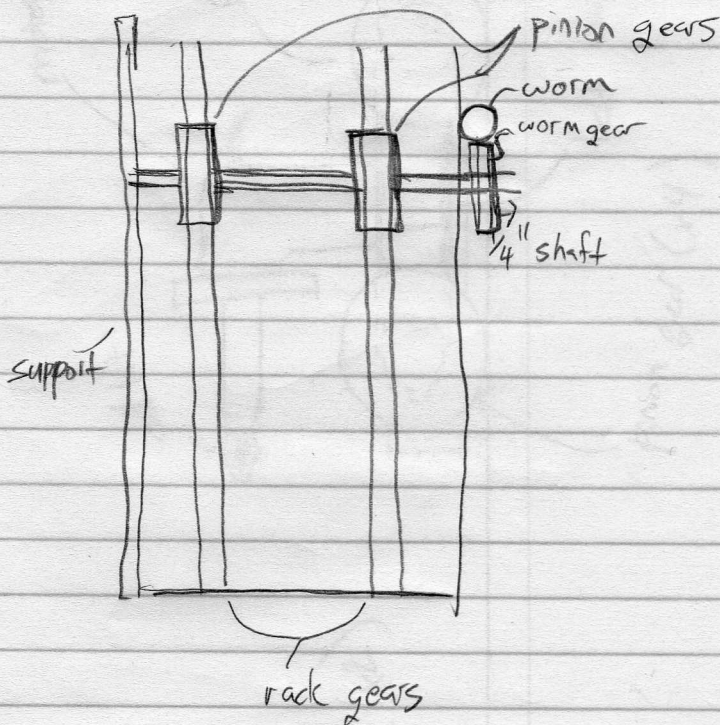
For reduced weight

This provides a more sturdy frame without
the need of doubling up the x-pattern assembly
on each side.

Unfortunately at the maximum end 14" the
lift is very unstable unless the middle piece
is widened. This still results in significant
weight issues.

The assembly also
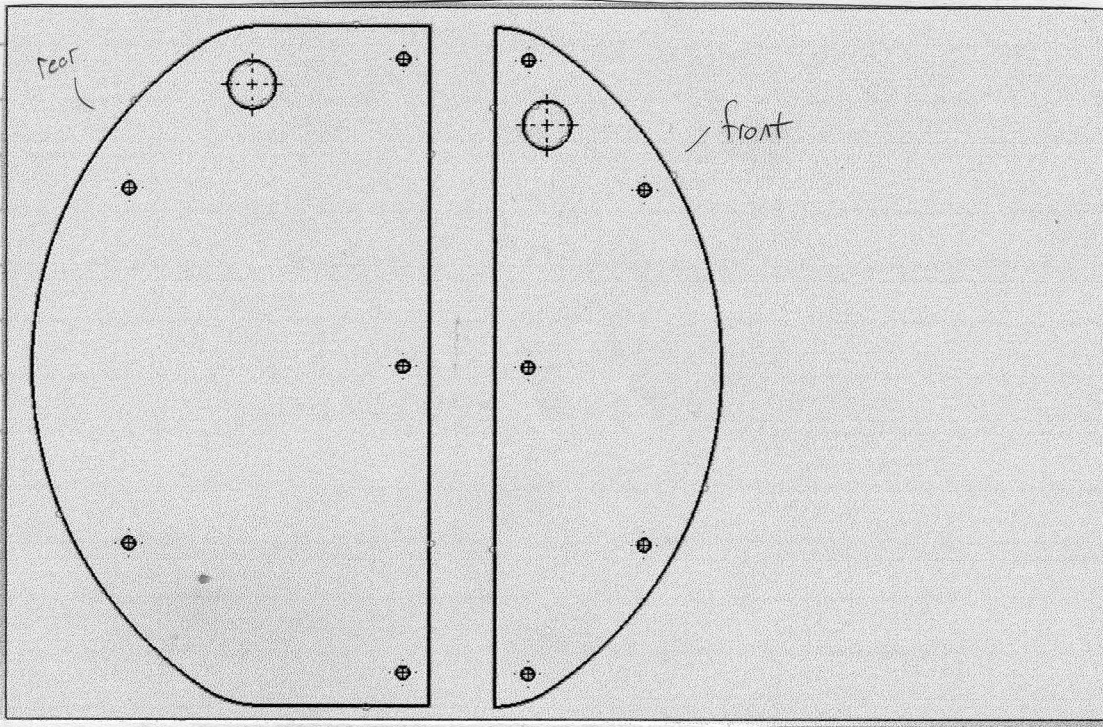locks up at both
extremes of travel.

After a good deal of frustration with the scissor lift assembly I began working towards the design of a forklift prototype assembly.
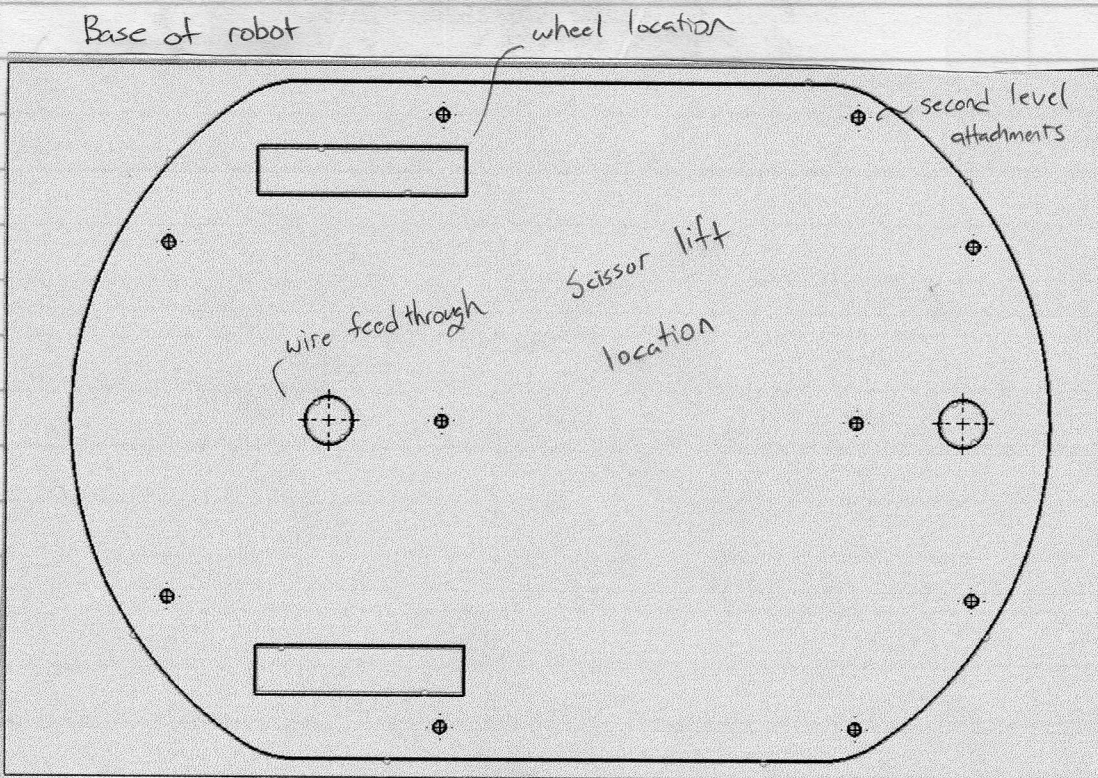

pinion gears

worm

worm gear

$\frac{1}{4}''$ shaft

support

rack gears

This assembly would have the advantage of using all of the gears and parts that I already ordered and recieved for use in my scissor lift assembly

Parts for T-tech

Top of robot (second level)

rear

front
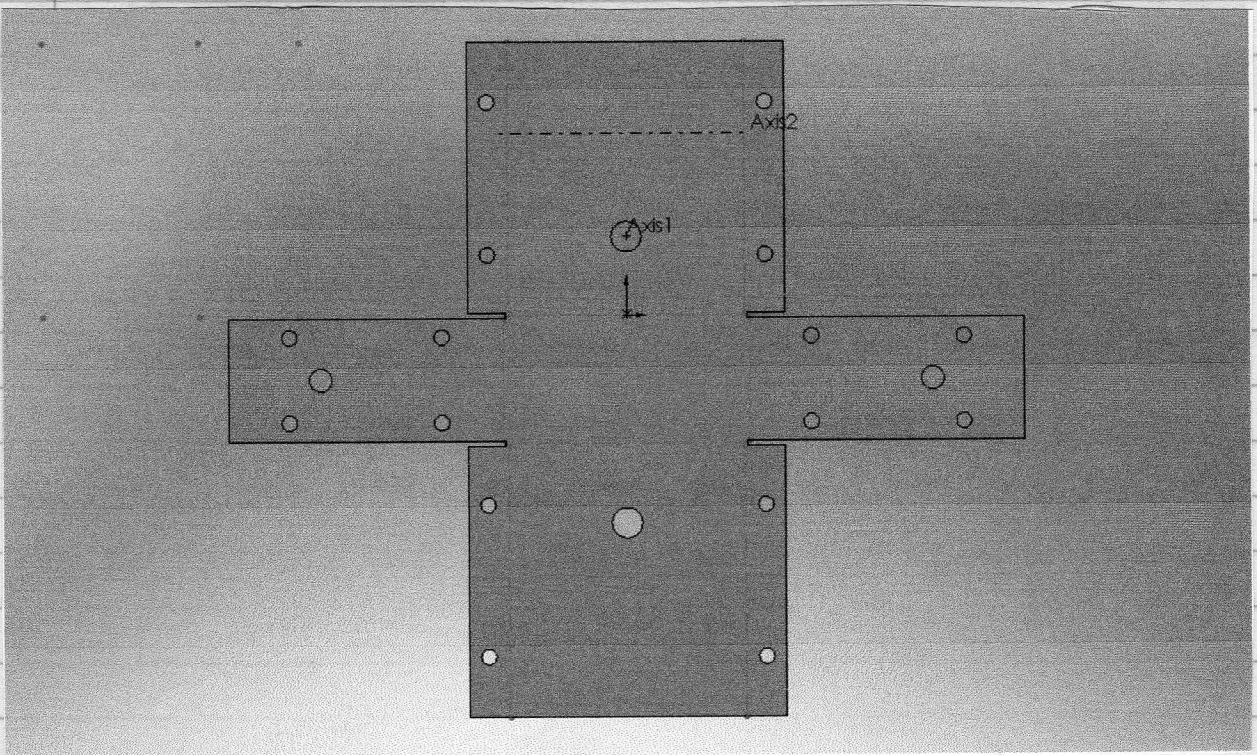
Base of robot

wheel location

second level attachments

wire feed through

Scissor lift location

Aluminum Sheetmetal Gearbox

sheetmetal

through
hole bolts

worm
shaft

worm
gear
shaft

Sheetmetal cutouts (pre bends)

Axis2

Axis1

Gear Box Assembly

servo/shaft coupler

worm

servo motor

$\frac{3}{16}$" shaft

worm gear

$\frac{1}{4}$" shaft

pinion

Gear Box Assembly (Non-Transparent)

Sonar Distance Values

The sonar arrangement for wall following

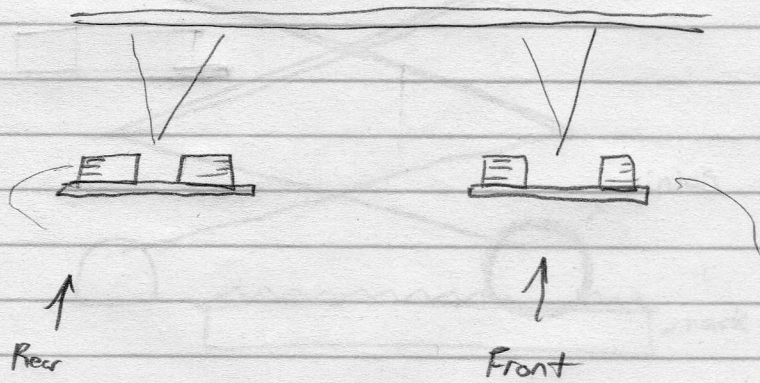Rear   Front

Right Sonar Val	Left Sonar Val
Close Range	
181	185
Medium Distance (0.3" from wall)	
192	198
Boundary Far Distance	
198	205

The changing light conditions in each room of my house and the difference between the ambient light of the lab and the new engineering building have a tremendous effect on the accuracy of my lift's height sensor.

Taking measurements of ambient light for different lighting conditions might help me to figure out a correlation that I could build into my programming logic.

Ambient Light Values

Vertical Encoder Status	Low	Medium	High
		Light Conditions	
LED ON	8	9	13
clear	13	15	29
Black	36	49	116
clear	16	12	26
Black	31	42	112
clear	10	13	26
Black	36	48	110
clear	10	13	25
Black	36	48	118