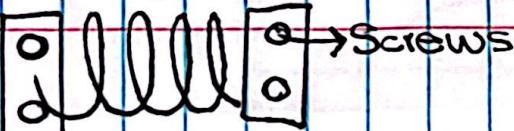
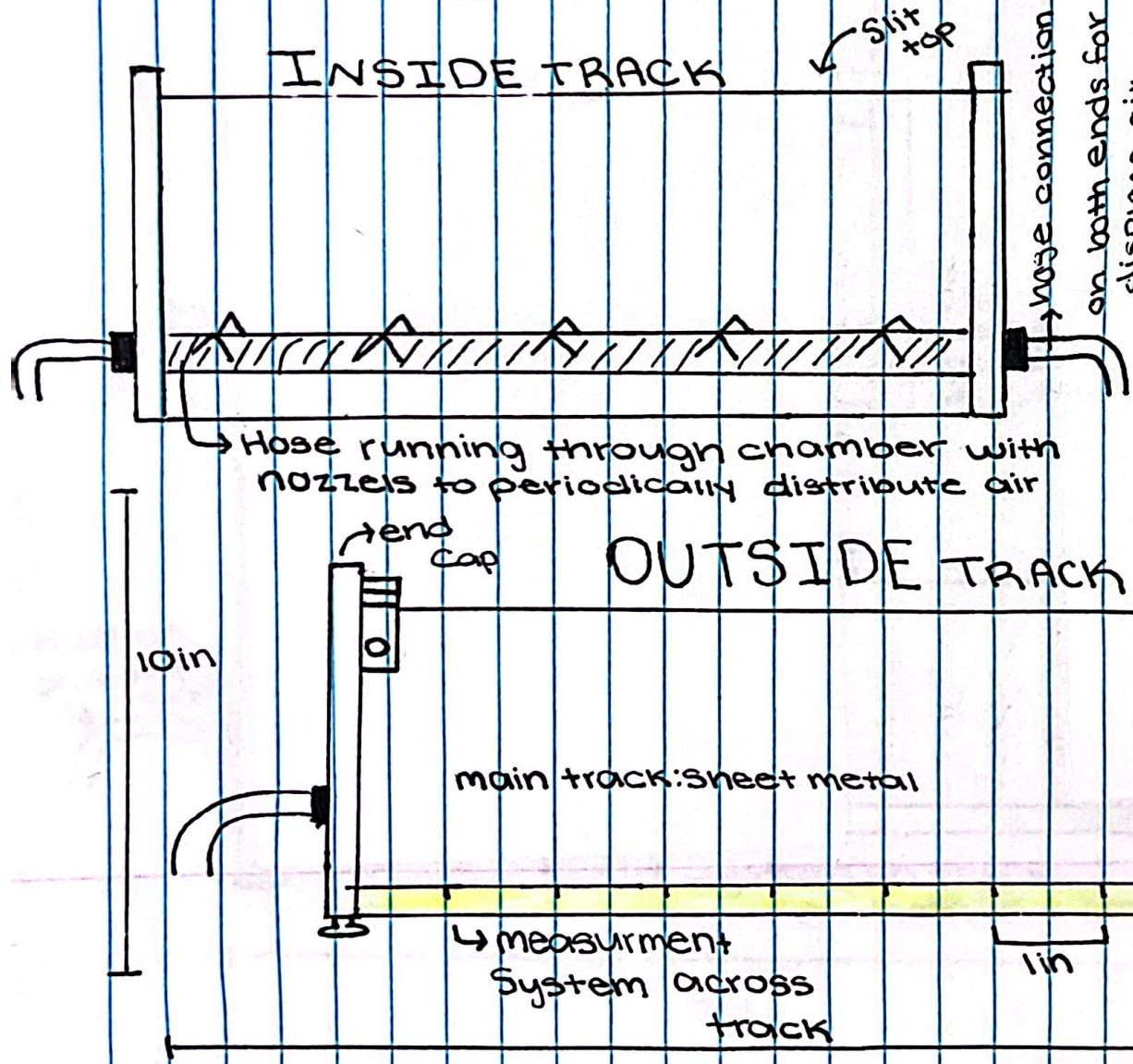


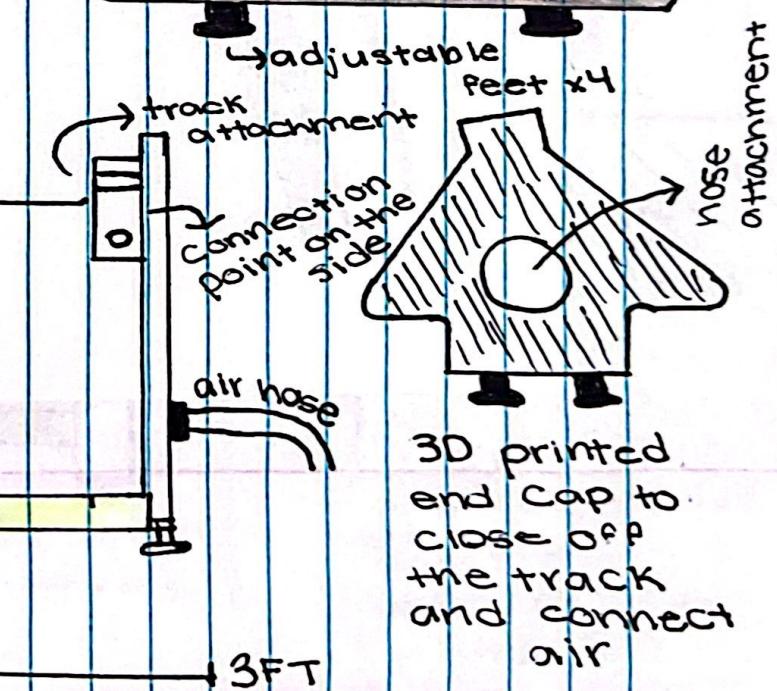
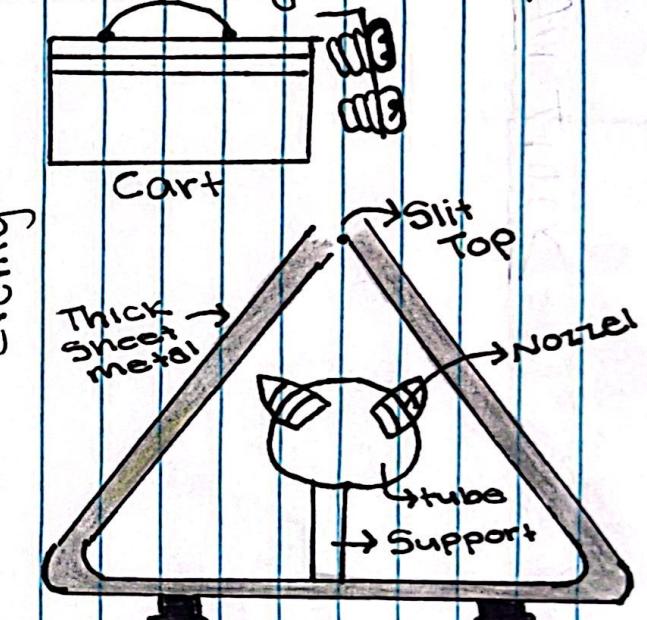
Spring Attachment

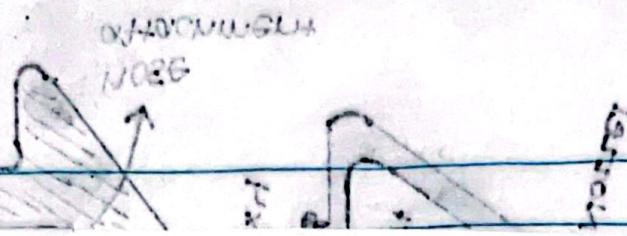


→ attaches to cart

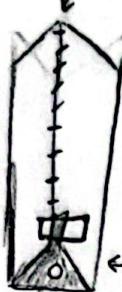


TRACK Design #1 1/10



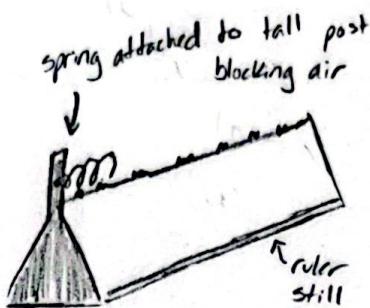


holes = distance away
) for air



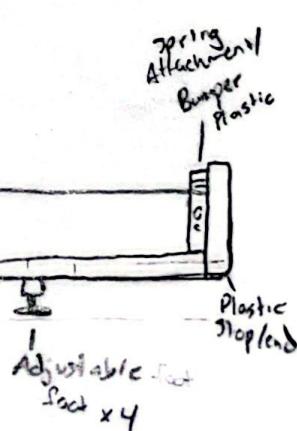
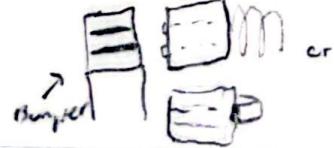
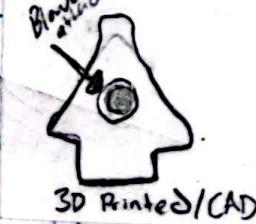
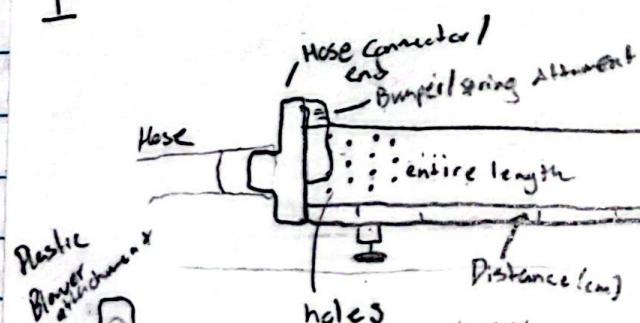
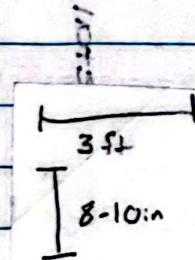
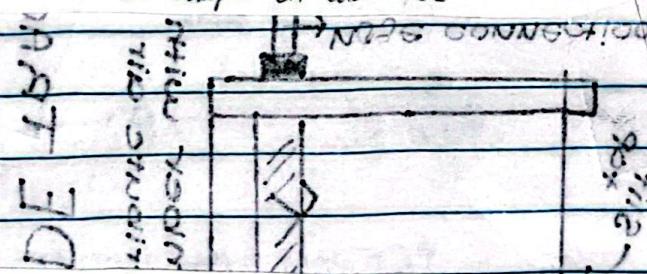
Also long post
for clock to see how
long it goes

↑
hole for tube
for air



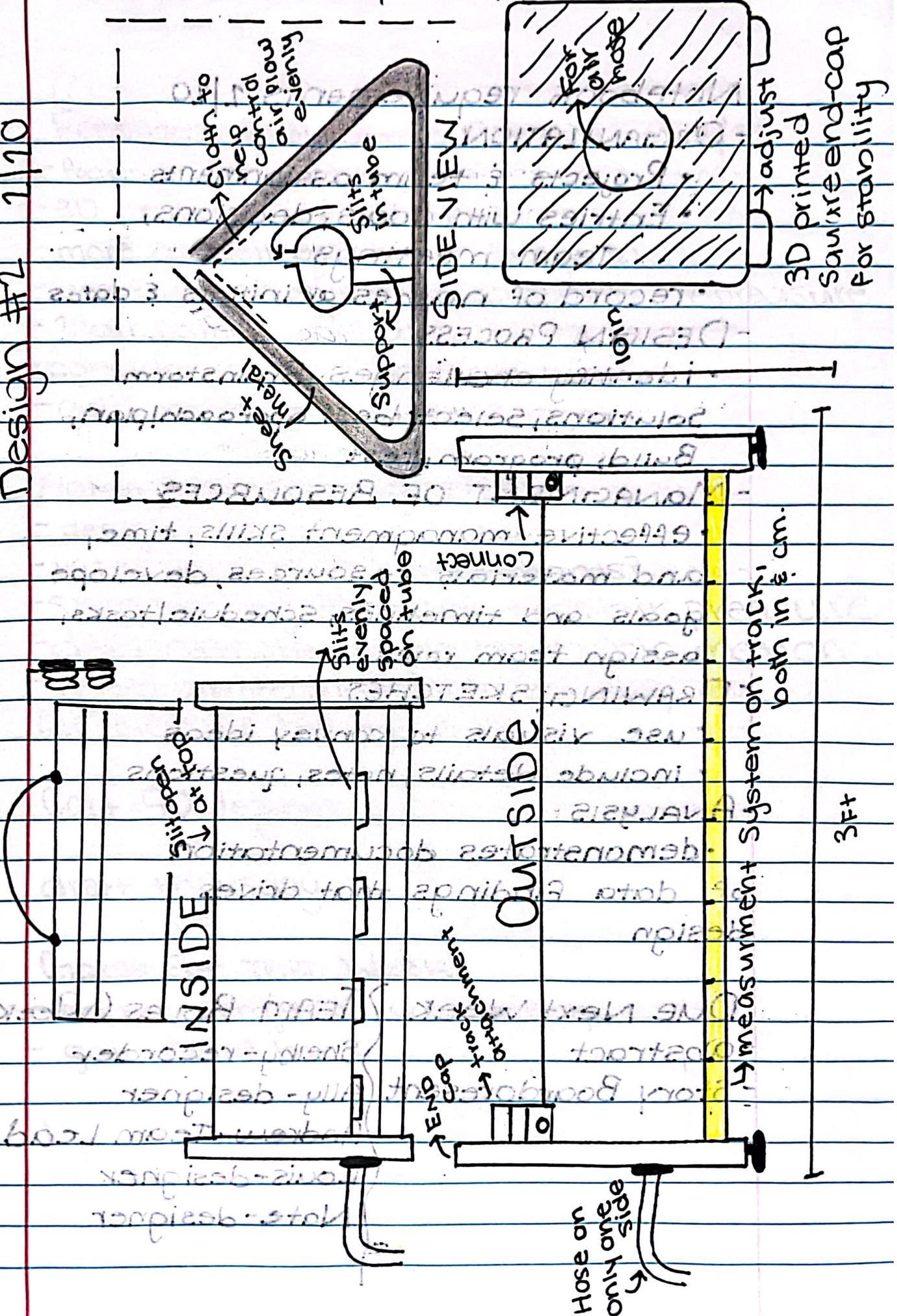
* length \approx slightly longer
than cart yesterday

* some sort of stopper
or bumper on each side



Design #2 2/10

square end cap



(F1 day 2 sub)

Feedback from Group Presentation 2/25

- focus on physics aspect
- 3D printed nozzle/pipes
- more air will escape in design #1
- use fluid analysis to calculate air pressure
- 2 air pumps was a popular vote
- consider air coming from bottom
- add more cart attachments

Notes From Tuesday 2/25

- design end cap
- interchangeable attachments?
- skip tubing form now, test air pressure
- demonstrate simple harmonic motion
- tested air pressure in circle tube, air pressure felt the same.

Cart: 90 degrees

draft: thursday

Goals For This Week

- Present Project successfully
- gain Feed back

1

Abstract design ideas (due Feb 27)

- square 3-D printed end caps
- fast compressed airline feeding to both ends of track
- single sheet of metal bented to form 45° 45° 90° degree geometry in between
- design of end cap attachment points designed the same as cart blanca attachment points (universal)
- powered by air compressor
- variable pressure integrated into air compressor
- measurements provided on track in inches and centimeters
- 3 justable feet for level
- 3ft by 10in dimensions (30in x 10in)

~~Engineering~~

EE/CS

- dimensions
- ~~top caps~~
- ~~bottom caps~~
- ~~solid drawing~~

Updated Prototype

based on Poster

presentation

- start with no tubing through track
- maybe test using fluid dynamics for air pressure
- confirmed have air from both sides

EE/CS

slit at top

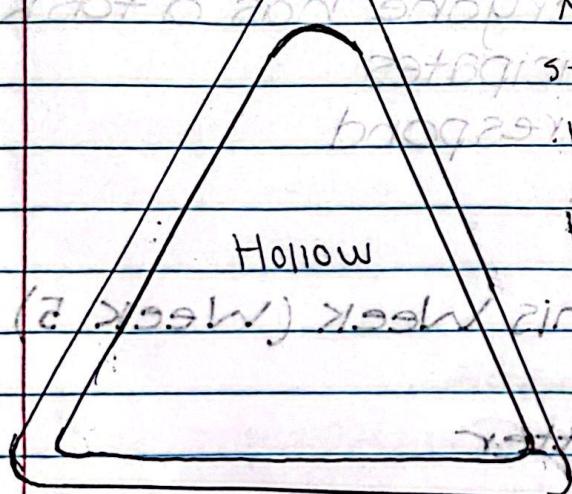
New start:

start with

bottle hollow inside

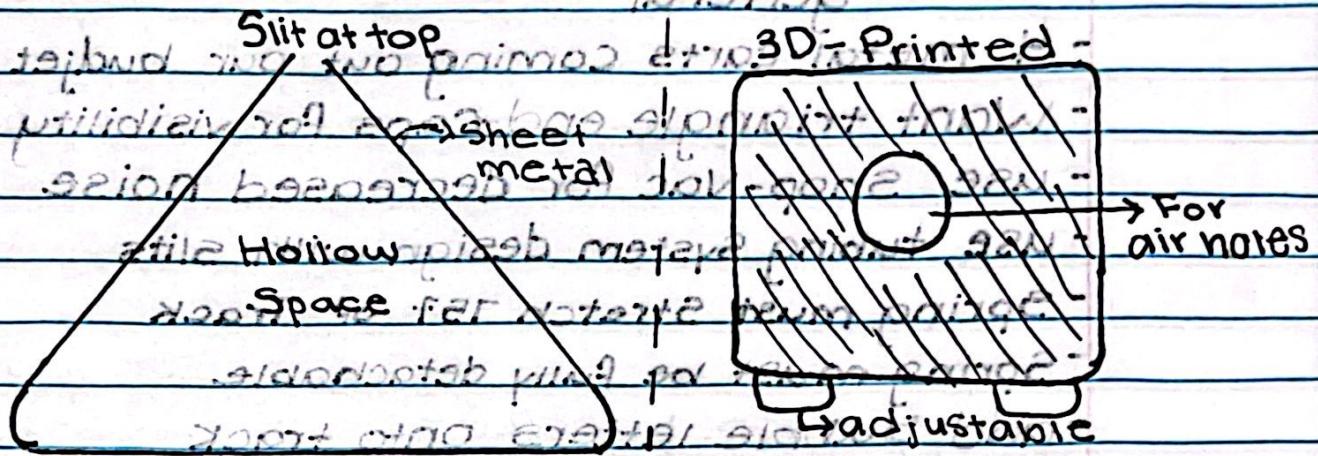
skirted

Hollow

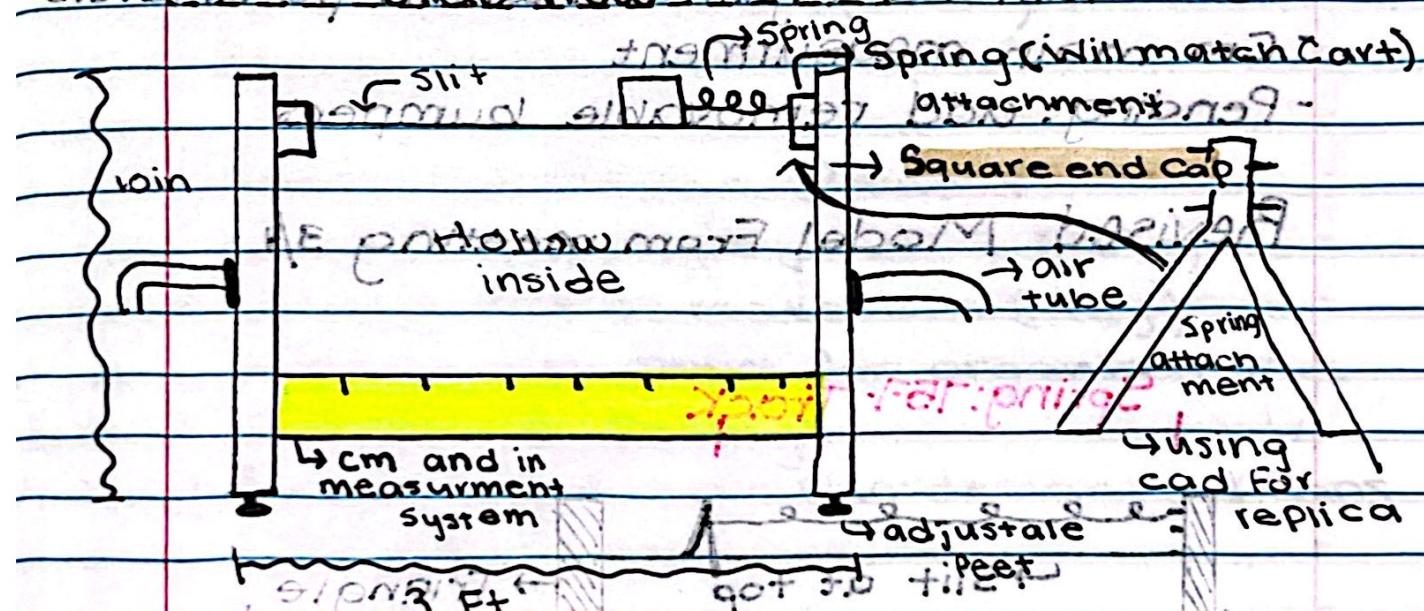


Inside with no
tubing system

mg0015 @ exobit7:apn1799m
Final Revised prototype from Presentation
at presentation of prototomab



extending Side View



UPDATES: Air from both sides, square end cap, hollow inside (if does not work, will insert tube with nozzle (slit)), use anti skid pads so it does split

meetings: Fridays @ 1:00pm

Notes From Customer meeting 2/28

- demonstrating 2 experiments:

• Harmonic Force

• general

- 4 metal carts coming out our budget

- Want triangle end-caps for visibility

- use Shop-Vac for decreased noise

- use tubing system design with slits

- Spring must stretch 75% of Track

- Spring must be fully detachable

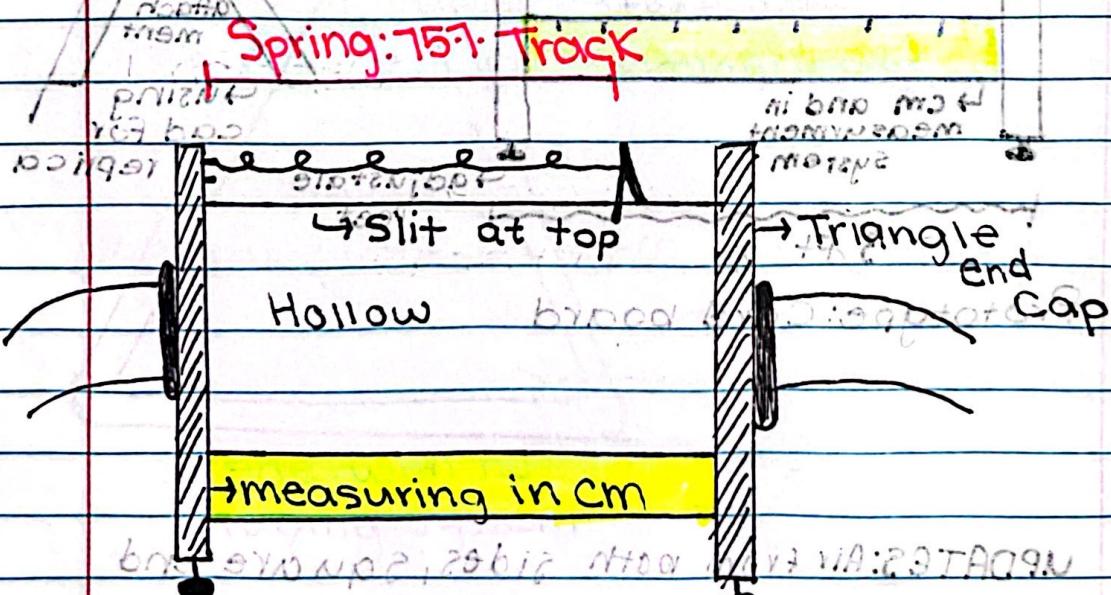
- add bubble letters onto track

- feet must be adjustable within parameters

- Cm main measurement

- Pending: add removable bumpers

Revised Model From meeting 3/1



Changes: Triangle end Cap

W/F: H/F: T: N.9.2.1.

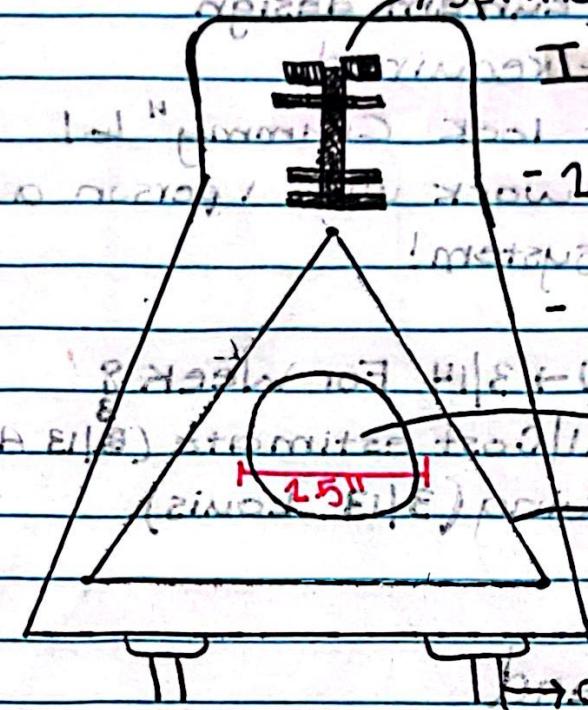
3/b End-Cap design ideas

- 3-D print end Caps
- Leave holes in print at the bottom to add adjustable legs
- have triangle inserts where track is sealed
- Have external insert for air source
- internal diameter entering track is smaller than external diameter
- Print material: PLA
- New List of materials
 - air: tube fan
 - 1.5 inch diameter tube
 - Clamps: seal air from tube fan to track
 - 3D printed end caps
 - track (sheet metal)
 - magnetic bubble levels
 - measuring tape
 - adjustable feet
 - adapter to tube fan (3D print)
 - springs
 - care (provided by client, pending)
 - 10/24 inch screws

END CAP DESIGN IDEA 3/10

Spring attachment

Internal View



2.5in diameter

air hole -

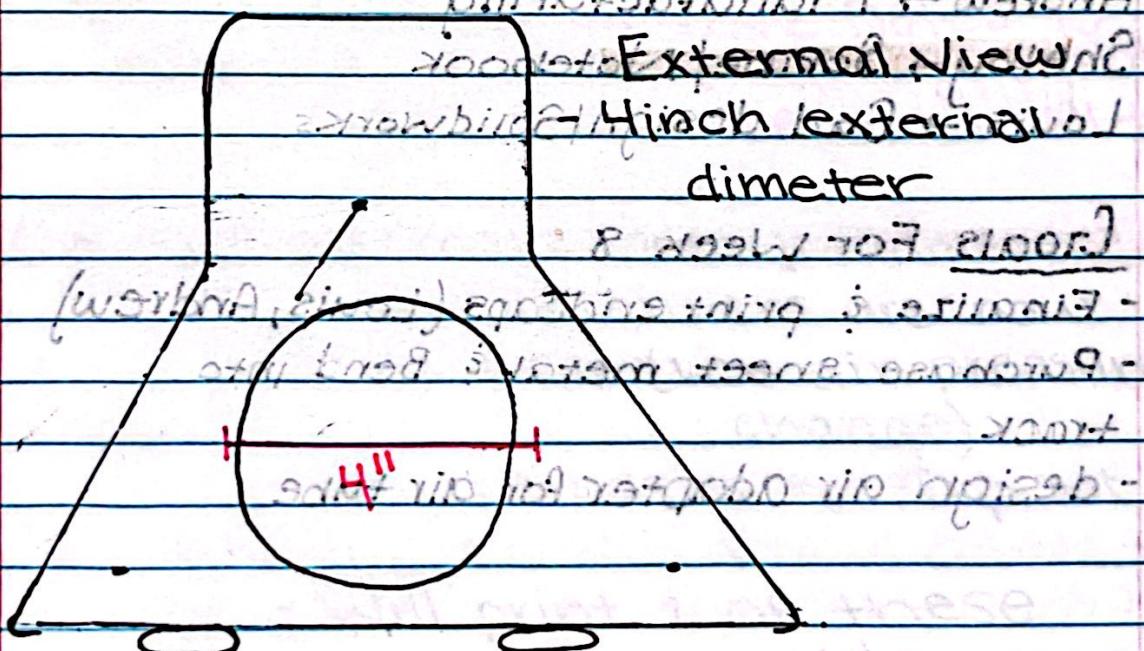
- PLA Print material

air hole 2.5" diameter

inserts for track

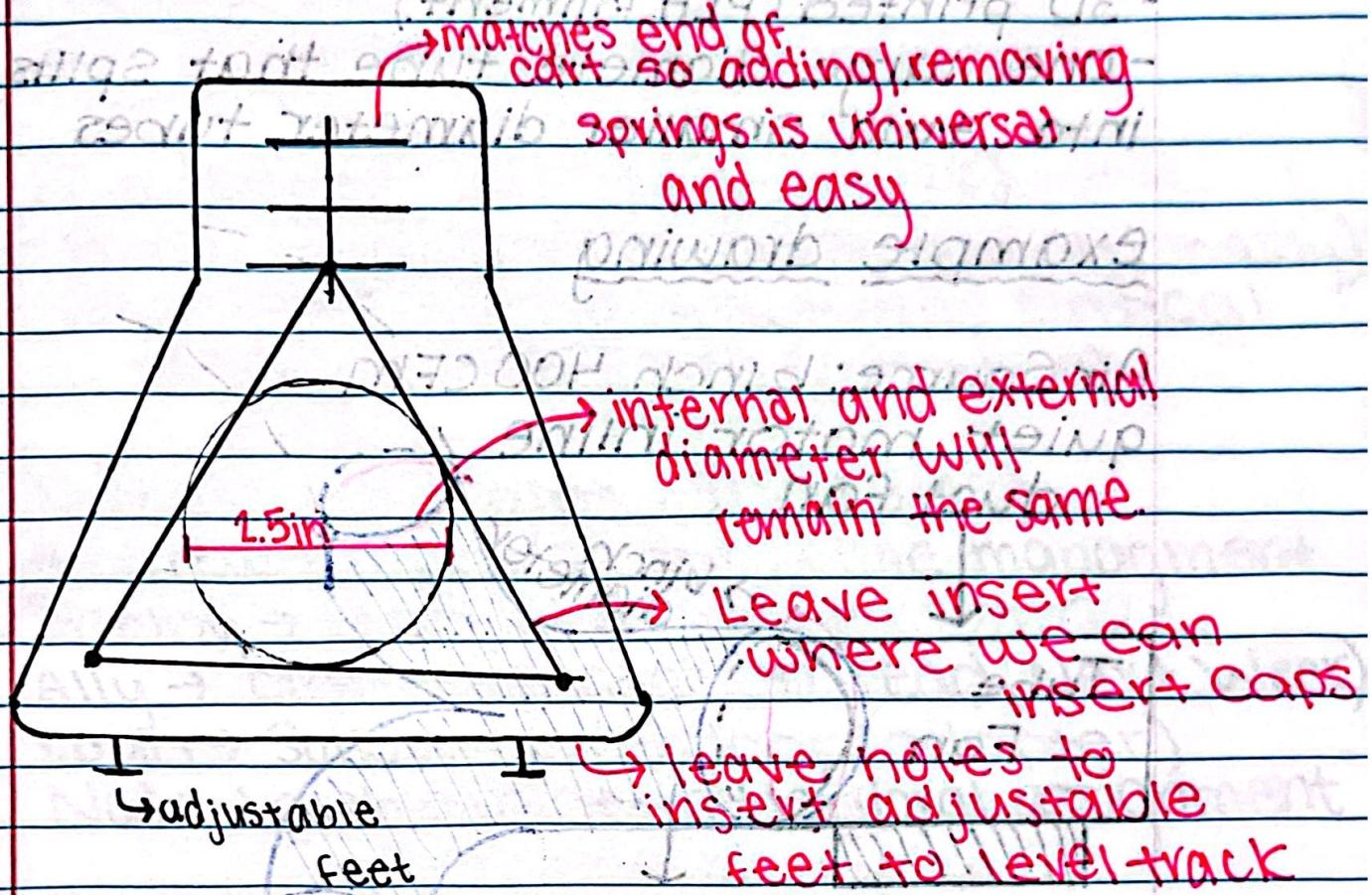
adjustable feet

External View



- The endcaps are where the air tube from the tube fan connect to supply air to the track

New design For Endcaps



Changes: external & internal diameter where air enters are now both 2.5in (less air pressure change)

- Will be easier to 3D print

- Will print 1 of these every 2 of track

- Will print 1 of these every 2 of track

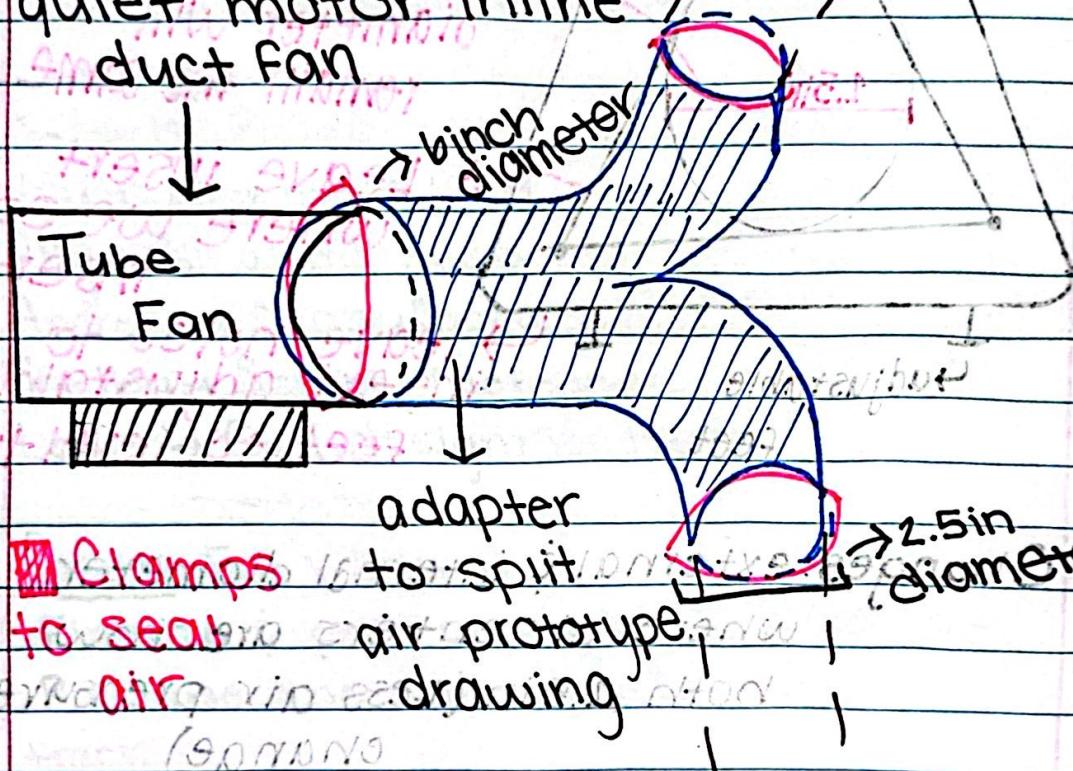
- Will print 1 of these every 2 of track

Brainstorming Air Adapter For Tube Fan

- 3D printed (PLA filament)
- one large diameter tube that splits into two smaller diameter tubes

example drawing

Air Source: 6 inch 400 CFM
quiet motor inline
duct fan

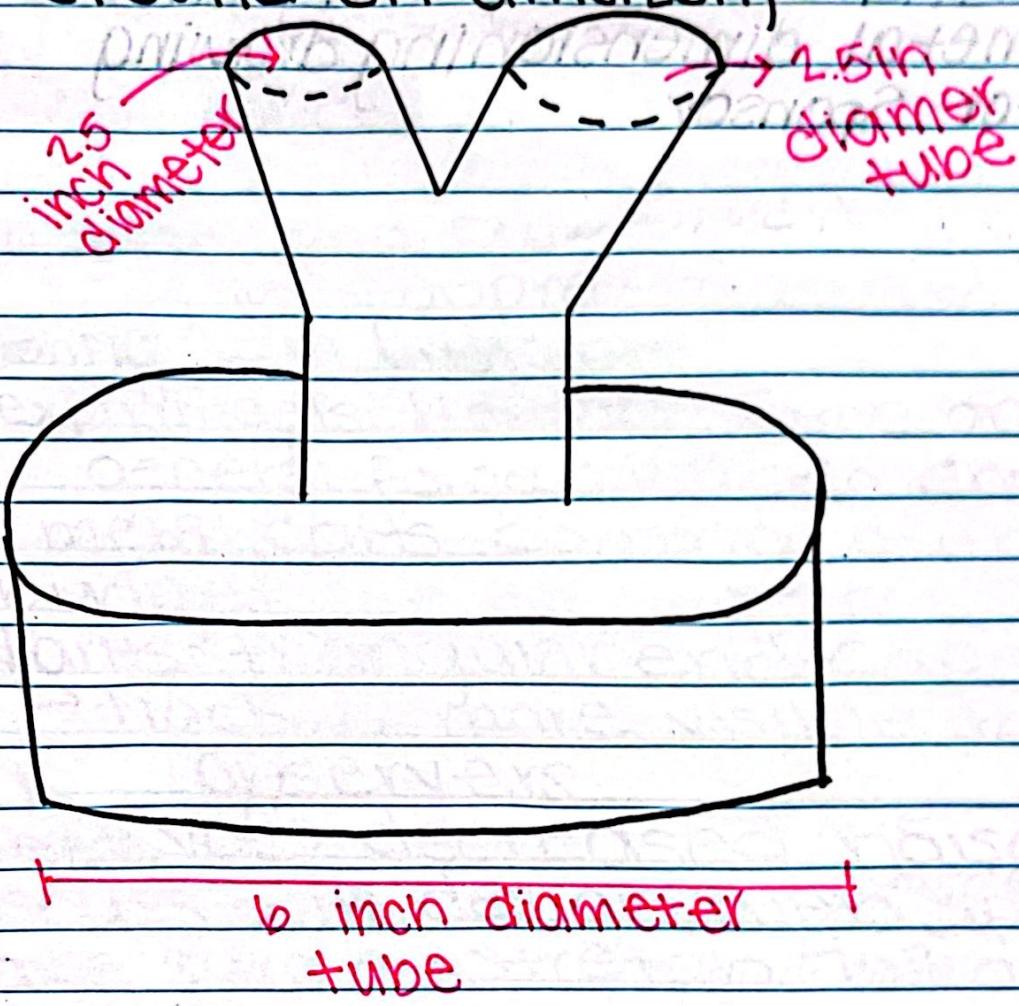


Notes:

- Need 6 inch diameter clamp
From tube fan to adapter to
Seal air
- Need 1.5in diameter
clamps to seal air from split
tubes to endcaps
- Louis|Andrew CAD drawing

OFFICIAL AIR ADAPTER DESIGN

- 3D printed (PLA filament)
- 6 inch diameter, split into 2.5in diameter
- use 6in diameter clamp to seal air
(Found on amazon)

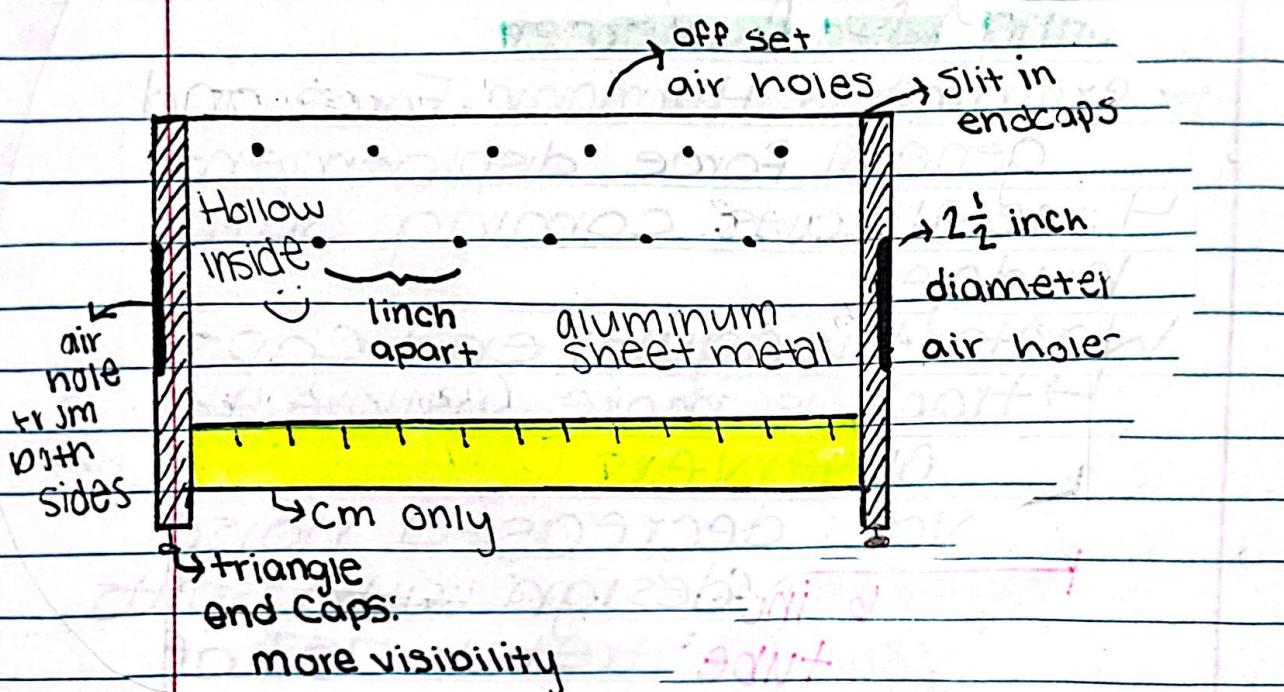


- 3D printing next week (Hopefully)
- Ordering 6in diameter Clamp (Shelby)

Week 11 (3/31 → 4/4)

- 3D printed adaptor has been printed
- endcap prototype #1 has been printed
- Andrew is beginning sheet metal dimensioning drawing for Sponsor

Revised model

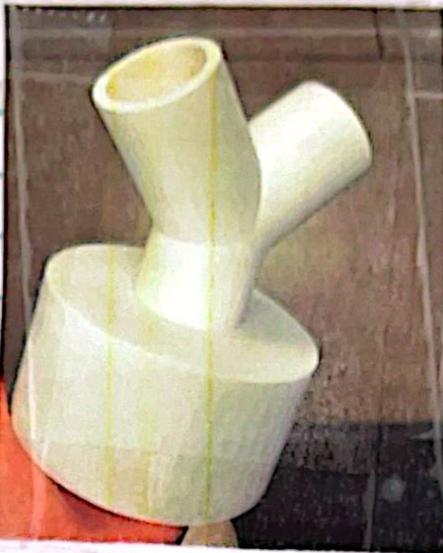


dimensions

→ 3ft x 10in

- Changes: Holes instead of slit at top

- Connected to endcap: universal spring attachment



Adapter

made +

done -

27 obt

longer +

is -

8 +

12. tank piping +

27.08.2019 8:10 AM +

Adapter and Clamp (4/11)

9/08/2019 8:10 AM +

Goals For Week IV

- Finalize endcap design, fix print (the 3D printer printed it weird)
- Test air splitter with tube fan in shop; feel air pressure
- Send Recia metals sheet metal dimensioning
- CDR Presentation (4/13)

Week team Goals

- discuss with team dynamic, make sure everyone is happy

Due next week

- Updated Gantt chart (Shelby)

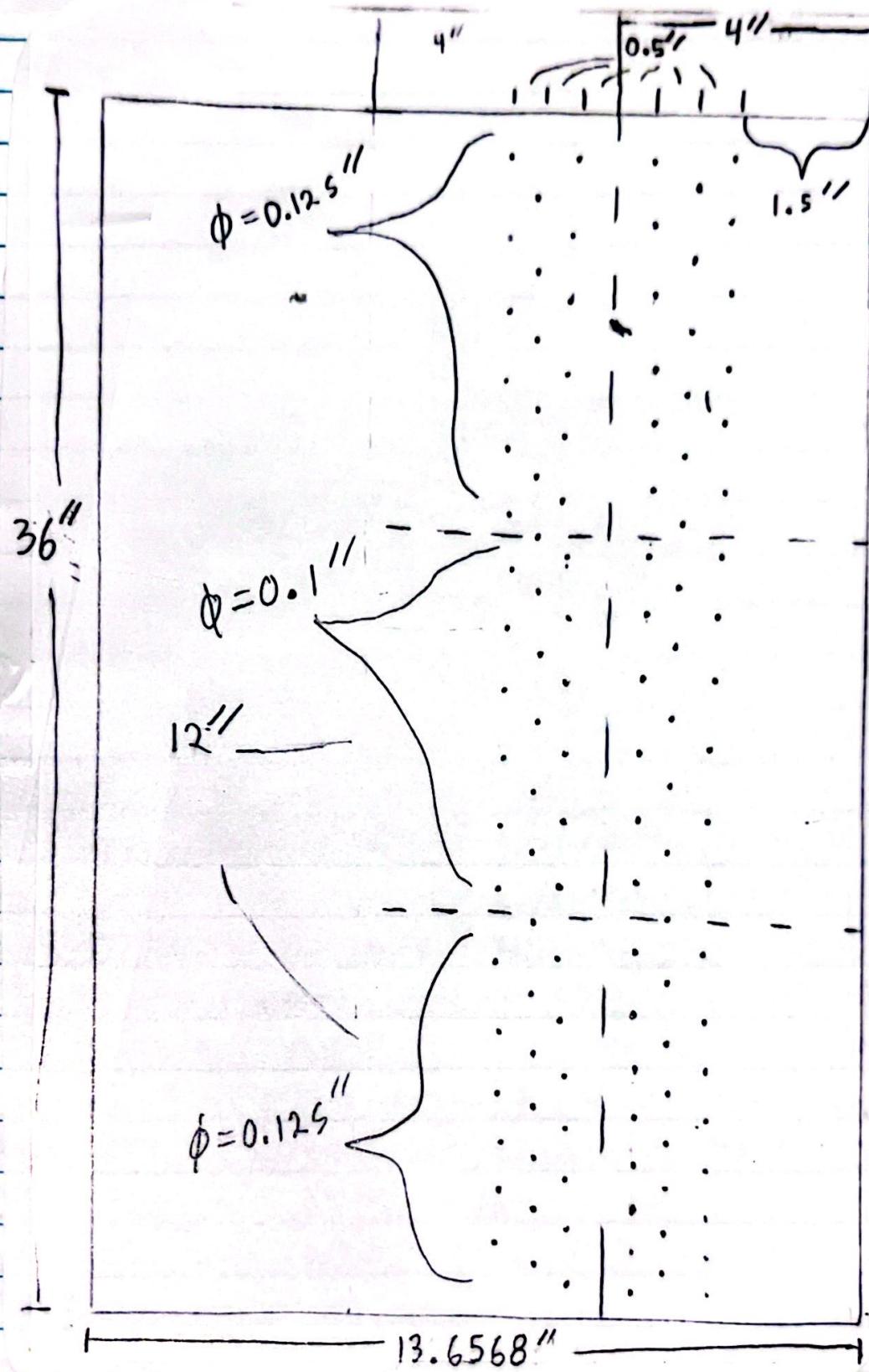
- Design description (Nate, Ally, Shelby, Andrew, Louis)

Notes From Client (From last week)

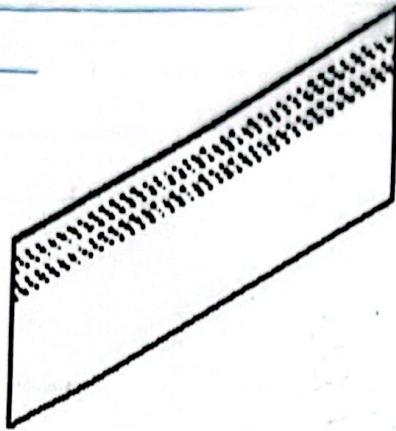
- Will buy "gliders" for us in trade of us buying air source

(Andrew Sent these Over)

Recia Metals: Dimensional Drawing

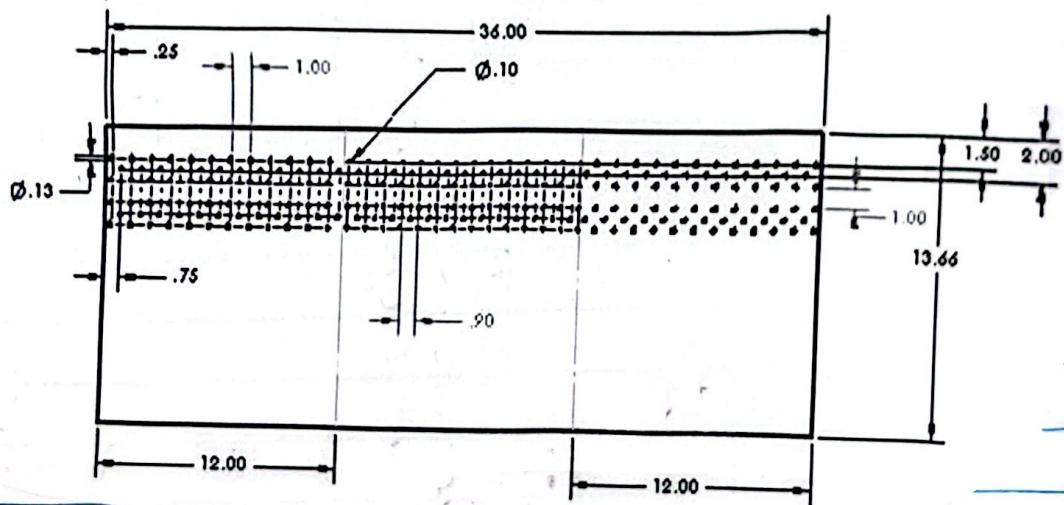


Sheet metal dimensioning (1)



Sheet Metal Dimensioning

- The first and last 12 inches have hole diameters of .125in (1/8) and horizontal spacing of 1in and there are 12 holes per section in each row
- The middle 12 inches has hole diameters of .1in and horizontal spacing of 0.9in. There are 14 holes in the rows 1,3,4,6 and 13 holes in rows 2,5.

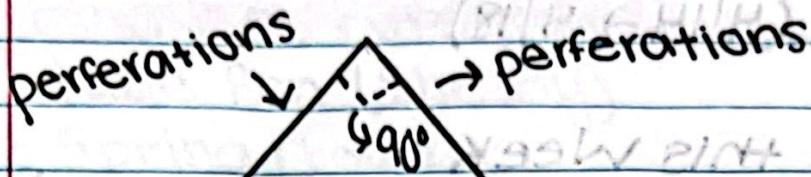


- Recia metals has confirmed these drawings...
- Will hopefully be assembled in the next two weeks

Week 11 Reflections

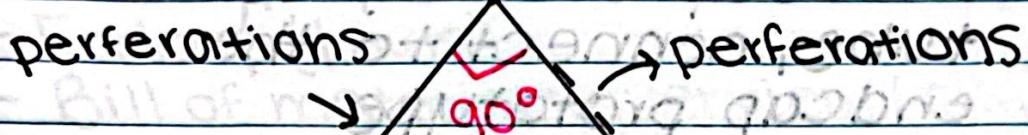
- group communicated and worked well.

Metal: Received



→ Need
to bend

How metal
was received
from recyclers



45° 45°
Weld Bend
together metal

Cut extra metal after bend

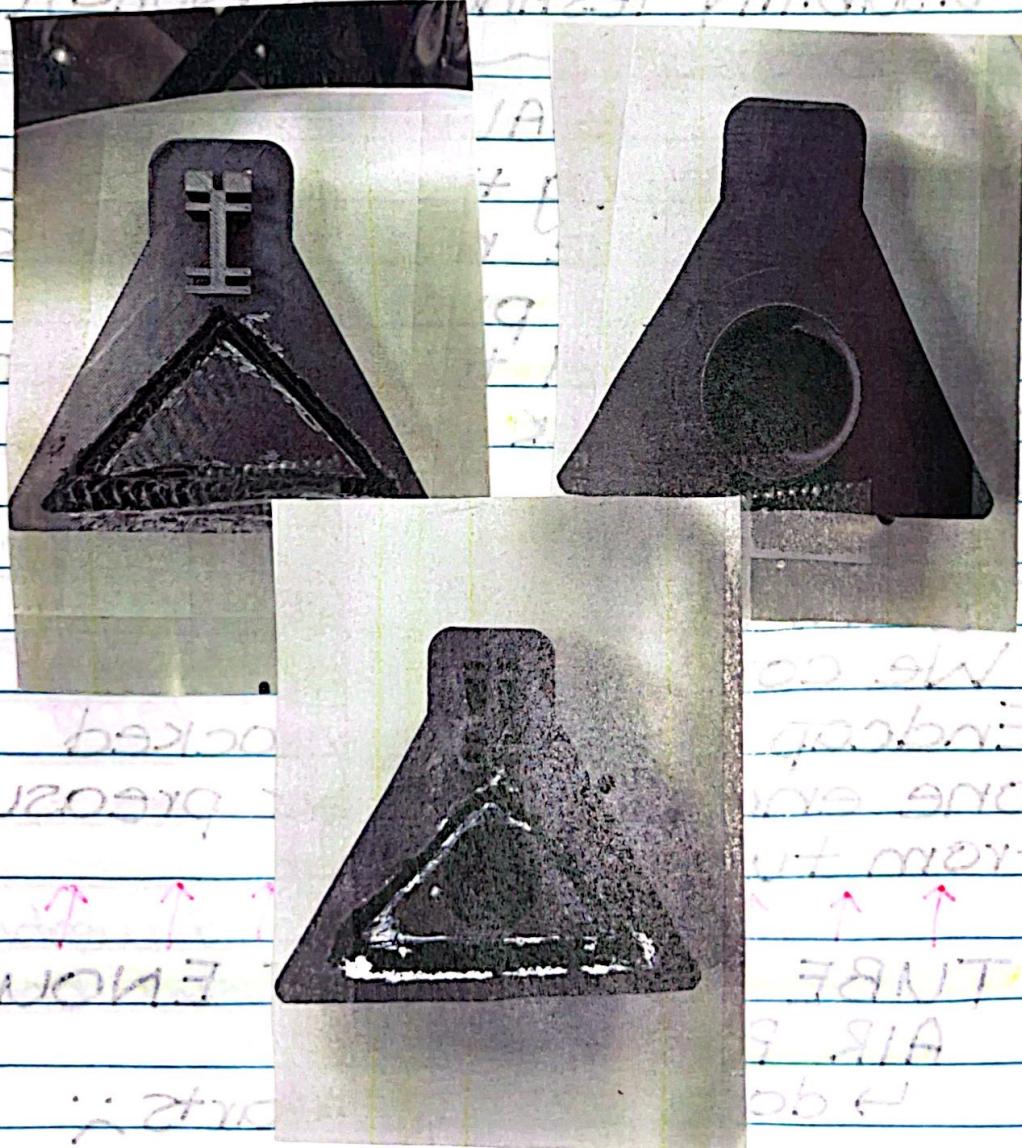
Andrew is cutting, bending,
and welding track

Week 14

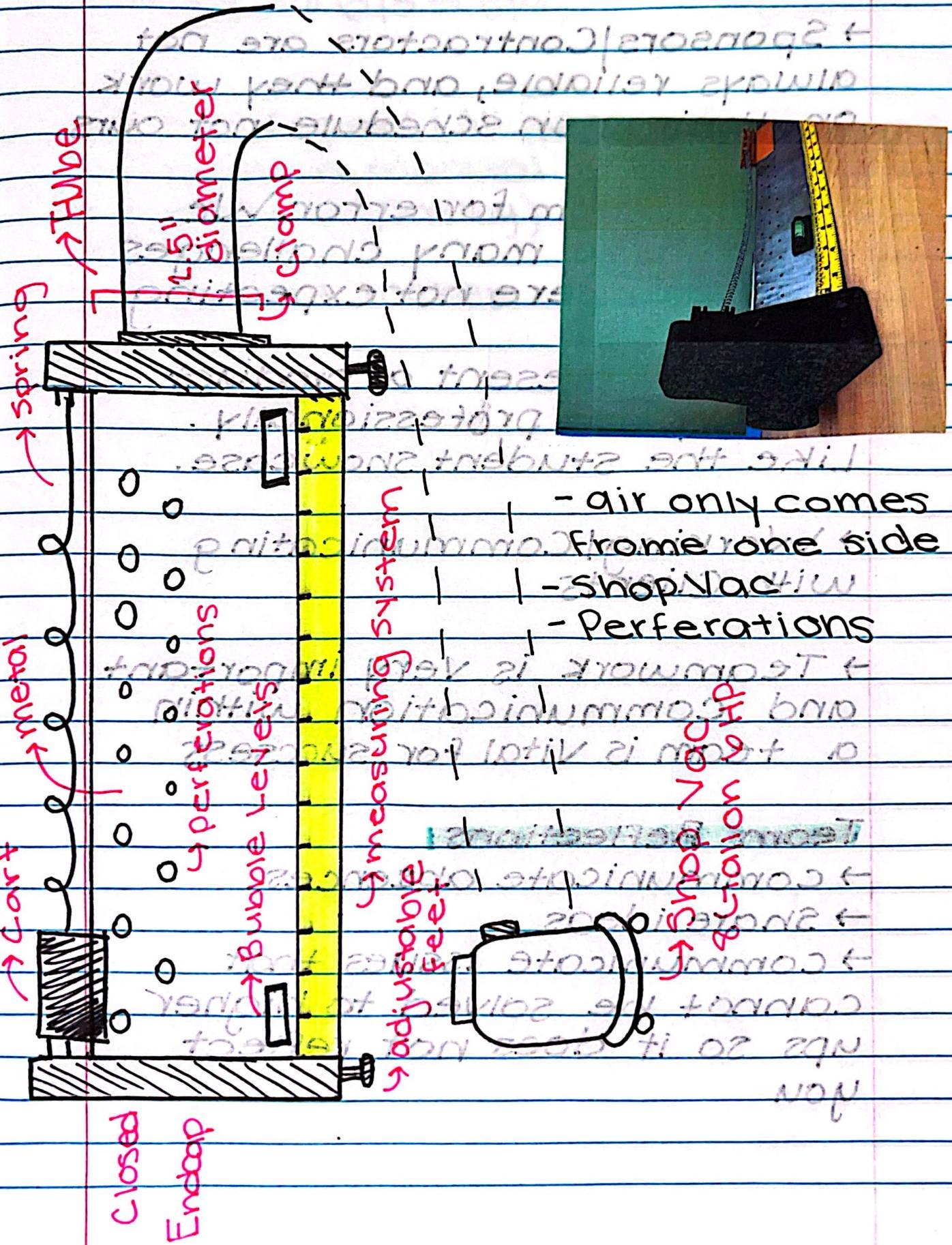
TESTING

- Shop-Vac from shop lifts carts with air only coming from one end
- re-design one side Endcap to be closed: only one air entrance needed.
 - ↓ - adapter no longer needed
 - Louis: edit CAD file

ENDCAPS



Final Design Drawing



Reflections From Project

- Sponsors/Contractors are not always reliable, and they work on their own schedule not ours.
- Leave room for error. We ran into so many challenges that we were not expecting.
- How to present a product shortly but professionally. Like the student showcase.
- Working/Communicating with Clients
- Teamwork is very important and communication within a team is vital for success

Team Reflections

- communicate absences
- Share ideas
- communicate issues that cannot be solved to higher ups so it does not reflect you