Barnesville 2022 Dump

Wednesday, October 19, 2022 3:39 PM

Dump ya shit here

Barnesville Notes Dump:

Andrew Thomas

- Since we do a checklist to ensure everything gets to the track safely, we need to do the same checklist for leaving the track. Thankfully it was only a rear wing and not a monocoque
- Need to have a radio on the Ecar when its running. Potential damage to the precharge may have been prevented.
- Steering effort on the Ecar is fine until you reach the wall and then it becomes numb and hard to feel the car. I asked John what to do when the car continued to understeer after rear toe out and he suggested less steering angle. It was hard to find that limit due to the steering effort. In general, need more grip and easier steering
- We should do an autocross test day with different throttle maps. I preferred linear over exponential, but maybe there's another that feels better.
- Ecar floor is very weak. I hopped into the car and the floor cracked and pulled out. Should probably be like the IC one where you can nearly stand on it.
- Ecar seat isn't stiff enough. Seat was never in the same place after removed due to it flexing and going in sideways.
- Harness couldn't get tight enough for optimal lateral support. I was sliding left and right in the seat while it flexed.
- Need to maybe look into the angle of the driver's neck when they're sitting in the car. The seat back being aligned with the headrest is painful after a while.
- Ecar felt great under braking and accel, very stable with minimal locking into T1 and stable enough through the front straight kink.
- We just need more drive time. I was gaining confidence throughout the day.

"Joint Host Event"

Heily Ovalle

https://kennesawedu-my.sharepoint.com/:x:/r/personal/hovalles_students_kennesaw_edu/Documents/temp%20and%20pressure%20data%20Barnesville.xlsx?d=w9c5389bac3744617b719174004e0e599&csf=1&web=1&e=sYkEsb

- Make a template for data
- Invest in a pyrometer
- Invest in another tough book
- Invest in a fluke meter (what kind?)
- Day 1
  - Unpacking and setting up was handled well
  - If we are not going to enforce tech, we should establish it as a learning opportunity for new members to all teams
  - We should get more tape measures…
  - Maybe should have had a team meeting about game plan next day
  - Should of had more new members involved in tech process from our team if they werent doing anything productive
  - Should of used the opportunity to get some sort of data out of the practice runs… idk what kind
- Day 2
  - People should get into habit of writing down changes made to car and reasoning and then note car response to those changes

Camp Setup

- More tables
- Sink
- Stay on top of cleanup
- Food announcements would be nice. Missed several rounds off munitions coming off the grill due to being with the car or other.
- Bring cash to buy last minute items (i.e. ice)
- Get nitrogen for minikeg
- Enforce entry and exit
- Shorter official run times (9-5)

Cars

- Tune car better and fix obvious issues early
  - Alignment
  - Brake bias (this needed fixing way earlier than it got fixed)
- Have data teams per car, double tools, double data sheets, etc
- Get cars out and running test days again.
  - Tune cars
  - Track tires
  - Get driver seat time and spread time around between cars
  - Contact areas around us that have flat areas. Maybe test on Friday afternoons? Definitely not weekend or in the middle of the night (weekends are for projects, middle of the night data is not helpful due to ambient and surface temps?)

General

- Paddock lighting?
- New air compressor (for tires)
- Trailer air compressor system (not for shifting)

Car set up was ok, screwed up ic fornt cuz ignorant
Mixed shim sizes in shim bag
Confusion about toe adjustment made to e car - need common channel to document state of each car and driver feedback
Missed checking camber in shop beforehand
Lots of tire wear on inside of outside (right) tires
Not a ton of stuff to do

-nate

Matthew
next year let's make sure to swap to a bigger fuse before going out.
If we had a proper serviceable accumulator we would have been able to fix the fuse fast and keep going
Hopefully the fuse was the only issue
350 volts plz □

Brenden Mitchell

IC Car Notes:

- Brake pedal has side-to-side play, and we did not have the tools to tighten it, plus there was a leak in the master cylinder.
- Oil leak at the crank cover that got worse as the engine got hot. Likely the bolts are over torqued
- There were several small coolant drips that occurred as the engine got hot that could have been fixed prior to Barnesville had we checked during testing.
- Burst placed was used successfully twice as the car was cranking. logs revealed that the pressure was higher than atmospheric at the MAP sensor , and the ECU lost sync both times.
- Brake bias is easy enough to change, so we should be more willing to experiment with bias based on driver feedback.
-

Grayson

- Bring some composite repair materials like 5-minute epoxy
- Inspections of composite parts needs to be done to fix any problems that may arise before they happen
- Spare parts list needs to be run over several times to be sure we have any fuses, wires, tools, and materials that we may need for repairs

Mihai Burghelea
Event:

- Don't "host" with Clemson again
- Food was good
- Needed more help with cars on Friday
  - Was better on Saturday after assigning/giving people jobs
  - Need to assign jobs when cars go out
- Need better way to log changes
  - One for issues
    - Able to look back through changes to see what went wrong
    - See what fixed issue for future reference
  - One for performance/data collection
    - Note changes for run
    - Run time
    - Tire pressure
    - Tire temp
    - Driver Feedback
- Suspension tuning
  - Done some in past for accel and skid
  - Need to practice for autoX
- Need pyrometer
  - Analyze tire temp for suspension adjustment
  - Clemson let us borrow for a bit
  - 139 F hottest measured
- Need Fluke meter/nicer multimeter
- Need better tooling in trailer
  - Either bring red toolbox with us or need to better equip trailer
    - Trailer needs its own tools?
    - Pack green toolbox better before leaving?
- Trailer Pack-Up pre check
  - Green toolbox was not strapped in before leaving
- Need a new compressor
  - Pancakes is dying
  - Carrying the small generator around to fill tires is annoying

John McCrary

Food:
More prep
Was bussin
Need a untinsle kit for team

More tables
Camp sink?
More utensles

Team
Did aight
Run plans need to bee more clear:
What drivers to run and when
How hard to push and when
What setupchanges to conciter and when
When to push a car out vs when to allow change
Keeping on top of change

Car
Tune it
More telemetry
Faster data retrieavl

Know more about ware items

Event
Setupday:
We could have planned setup to be faster
Bring more fire extinguishers

Flag station was bussin
Keep 2 people on flag station
More radios would have been chill
More instructions on car queing would be coo

Tech inspection was as effective as the government.

More clear start and end times with a osted schedjule.

Info to teams:
More details sooner
More details on camping

Saturday:
Plan awards ceramoney
More MC shit to hype people
Post times in a baord some where
Take trophey picture in the day.

Smhoney:
Chasheeers check was bussin
Carry more cash foo

Justin Bechet

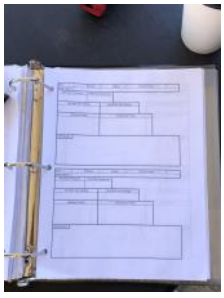
No pocket knives after 10

Val

Look at EV car log for the Car changes and problems

Food .
John cant cook
Slander- John

Sam Yang
• Drive the car more before • One meal with the other schools



Bailey

EV:

- Need better EV Diagnostics
- Powertrain Telemetry Spotty
  - Large Range missile strike?
- Car needs easier HV Maintenance
- Mark Phase Leads
- Don't cycle start after 15 faults
- Positive Camber Cringe
- Driver knowledge of car states

Setup:

- Radio for drivers
- Bring wireless soldering iron
- Insulated probes
- Better multimeter
- Need fancy run charts
  - Clemson's
  - Should not just relegated to suspensions inputs like PSI and Tire Temp only
- Have ToughBook for each Car for Log reading
- Regulate number of changes per run
  - Sensitivities?
- If running both cars have one chief per car to oversee setup changes
- Teams per Car
  - Needs same equipment for run checks
  - "Race team"
- Full Tool Kits for trailer

Event:

- Optional Rain Test
  - Teams be scared
- Official IMD Tester
- Real E-Tech

Barnesville 2022 Debrief Notes

Wednesday, October 19, 2022 3:40 PM

This is for group refinement

Notes from Debrief:

General Event Notes:
- "Joint" host event
  - Don't host with other teams
- Plan jobs better
  - When to switch
  - Excel sheet of when to swap
- Limit # of people on track
- Use track exit
- Bring more than 4 fire extinguishers
- Cashier's check was easy
  - Paying for track and EMT
- Communicate better when a car needs to be stopped
- Better Award ceremony planning
  - Earlier
- Too much official run time
  - End earlier then have free run after
- Announce times more
- More details given to teams earlier
  - Tell about camping
- Decide what to do with tech sooner
  - Trial runs confusing
  - Enforce tech if you're going to enforce it
- Need Drivers meeting
  - Entry and exits
  - Where to go
  - Number of laps
- Consistent flagging
- Designated work areas
  - Keep cars out of staging area
  - Diff exit may have helped
- Comms between timing tent and staging
- Make sure bathrooms are open past 11
- Sign on entrance to lead trailers
- Charging
  - All teams couldn't charge at the same time
- More AUX variety
  - Not sad jesus cowboy
- More respectful of track
  - Cars speeding through gravel
- Better Parking layout?
- No running in paddock
- No alcohol in staging and on track for all teams
  - Not just us
- Response time for event on time
- More radios
  - 2 separate sets
- Scheduled breaks
- Better enforce wristbands

Food:
- Plan food better
  - More detailed plan
  - More prep
  - When cook
  - Meal prep
  - More tables
  - Utensils lacking
  - Few braincells
  - Extra food
- Hose water filter
- Pack list for coolers + Gatorade containers
- Knowing how many people to cook for
- Announce when food ready
- Better food than other teams
- Needed more ice
- More drank
  - Non-alcohol
- Joint meal with other teams
  - Collab on meal

Car:
- Pack-up check list
- Radio on car when running
- More telemetry
  - Visualization
  - More information
  - Diagnostic info
- E-car floor broke
- E-car seat flimsy
  - Causes harness to not tighten properly
- Seat alignment with headrest uncomfortable
- We need more drive time
- Learn how to tune cars
  - Read RCV racing book
- Faster data retrieval
- Run cars more before
- Flow chart of changes prior to running
- Burst plate used twice
- More DAC
  - On car
  - Tire temp
- Tires
  - More
- Documentation of changes
  - Issues
  - Performance changes
- Running 2 cars at once is tough
- Pancakes is dying
  - Extra charge tanks?
  - Air chuck leaks
- Race team
- New packing list
  - Group made
- Electronics toolbox is shit
- For EV issues check car log
- Scale levels
- Can't check camber
  - Not level surface
- Checklist of wear items
  - Blew e-car main fuse
  - Need extra fuses for IC as well
-

Friday:
- Leaving on time
- Need plan for once we arrive
  - Jobs
  - Goals for when to start tech/running
- Get new members to experience tech
- Check telemetry ranges before running
- Charger Damaged during travel
  - Had to fix before charging
  - Candapter wire broke

Saturday:
- John was bored
- Have jobs before hand
- Opening ceremony
- Printed data sheets rather than hand written
- Give driver time collector a radio
- More tough book(s)
- Toolbox
  - Either need a specific set for trailer or bring red box

Design End Brief

Wednesday, December 14, 2022 8:13 PM

Buckets:

(to address in order)

To address forward with current cars

Team to address:

Design review

To adress forward:

CAD:
Old items not transferred
Fix computers

Update CAD (At new year)
LAN in mach shop

CAD completion
Cad training (new year)

Gonn help make COST

Car carcass storage

Old car weights
-break in to subs

Tests on current cars:
Make the parts & weld (ev)
Throttle cable repair (ic)

Manufacturing of cars
Man check list screen shot
Put legend on list (colors)

JLC PCB stuff

Testing:
Car test plan (w/ deadlines)
Go over test goal, ensure group understands
Discord testing channel
Test setup sheet prior to outing
Car test schedules
(running schedule)

Track setup guides

Teach people car setup

When to start and end statics:

Need crimpers (total to bailey)

More detailed assembly schedule

Man prep meetings

Get ya stuff reviewed.

Ordering meeting.

Organize circuits:
Budget says cardboard boxes

Design:
Plan and do in segments
Review with outside people
Weakness review
Binder ideas
Carryover

Energy drinks

Team to adress:

Communication
- Design and manufacturing
- If you have an issue talk to the source
- Come up with solution
- Communicate sponsor emails
    - Sponsor list

Monday meeting power points:
Every time look at calendar
Force feed calendar

More statics meeting earlier

Budget
Blocking out costs

Timeline:
Yearly
Well communicated
12>6

Monthly review meeting:
Car progress
People progress

Position transition process:
What be happening.
Help the people
Ok if they fail

Shop org
Cleaning days
Lab space vs garage
Improve part storage
Org bolts

People leaving:

Wiring documentation
Rapid Harness

Keep leads in the loop on work going on in group
Update meetings

Videos or docs.

@9:50

Design End review:

New member:
Wall an people through a full proposal process
Critical doc training
Make part of training
W/ examples
Lead with issues not description

Time line:
Priority items and time
Splitting reviews
Start earlier (march 31st)
Ensure there are beginner projects
Tests separate?

Presentations:
Should be posted a set date & time prior too
Note end dates at teach presentation

Presentation order / Given with priority
Speak to chiefs - listen to leads and discuss about priority

Documentation:
Goals in step one should be reviewed in step 4 not changed.
Clarity of decision (more clear in the meeting)
Post pass list
Conditional acceptance
Note in feed back.
Test proposals need a conclusion.

Part writeups

Test in pp system need to be tracked

Step one:
Rough order of mag of time and Cost
List in step one times and dates of the other steps

PDR CDR near sub system ends.

Present during sub team meetings

Wiring review:
Code/firmware reviews:
Tune review:

Car goals

Prez of points goals

Lap sims:
Non definable improvements
-polar moment
-CG
-unsprung mass
-center of pressure

Investment in lap sim?

Discussion

Anti own formulas

Come together after ranked lists

Budget blocking

June meeting recap in june

23 New year Leads meeting

Friday, January 06, 2023 7:57 PM

Open Subgroup Lead Positions -

- **EnD**
  - Brenden will be captaining the ship
- **VD**
  - Sam is studying up to take the reins
- **EV Powertrain**
  - Bailey will be working at Tesla in California
  - Jonathan has stepped up to fill in
- **LV**
  - Val will be taking over for Mathew

Monday Meeting Revamp -

- We will be discussing solutions for issues outlined in the Design End Brief.
- Would be useful for members to bring ideas to meetings to add to the discussion.
- The first two columns are the main topic of discussion.

02/06/2023 Tesla Meeting Notes

Monday, February 6, 2023 6:01 PM

BM Notes

Introductions:

- Ian Dreward
  - FSAE Judge
  - Solar vehicle team
- Pedro
  - Chassis department
  - FSAE – Mexico

Presentation

- Team Goals
- Accumulator Flow
  - CFD – cant help
- Module Redesign
  - Not interested
- Circuit redesigns
  - Interested in changes in chipset and communication.
  - Asked about the specifics of the relays and their changes.
  - Suggested having simpler accumulator boards so that the debugging and show problems in the mechanical bring up of the accumulator.
    - I assume this would include not nessicarly rules legal boards just to make sure the pack work.
    - Dedicated testing boards
    - Decouple board bring up from mechanical bring up
    - Bench testing
- Ian Circled back to passing tech
  - Asked what we are doing to make sure we pass tech.
  - They asked about having someone come in and checking to make sure there are no interpretation issues
    - Brought up the timing of having the car ready and bringing people in
      - Suggested Face time
- Asked if we had a way to rank projects so we can sacrifice some projects, to advance the timeline.
- Asked if we were where we wanted to be in the late timeline
- Asked what the hold up with the timeline
  - Brought up IC car
  - Asked what was carried over from IC car
  - Asked if we want 2 ok cars or 1 good car
    - Brought up funding and income that IC bring in
    - They stressed the difficulty of trying to build 2 cars instead of 1
    - Duh

Testing / Validation:

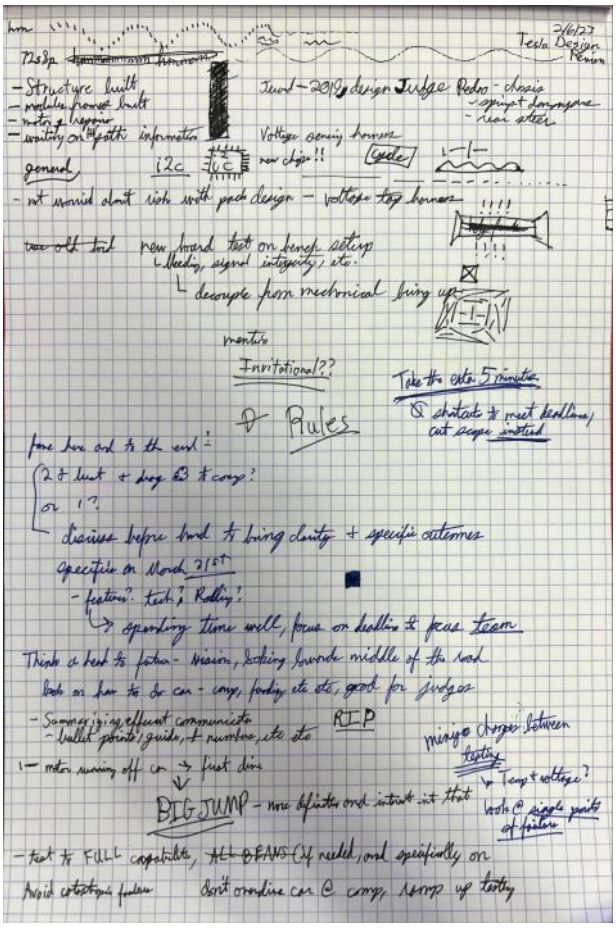
- Focus more of testing between motor running of car and first drive.
- Worry less about regen and other niceties.
- Worry less about cooling capability as you can run quarter power and finish endurance and get further than most.
- Put endurance capability after the first drive.
- We asked if there was anything we should test before mounting the motor
  - Test Voltage sensing and other rule capabilities before adding motor to car.
- Don't take shortcuts
- Fast Car = Good wiring

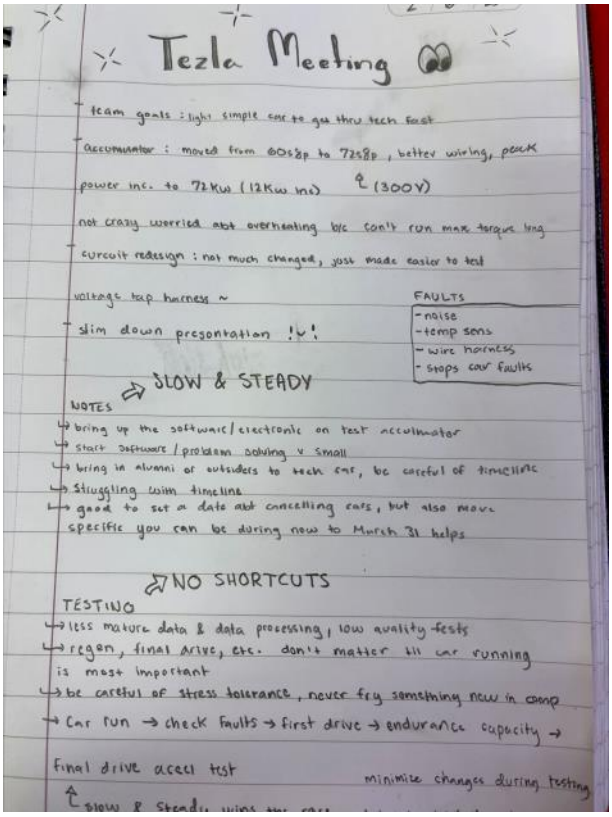
End Notes:

- Summarize the presentation.
- Want to listen to more of the presententers
- Contradicts the email sent

Pedro's PM Book:
https://www.pmi.org/pmbok-guide-standards/foundational/pmbok

- His team had a PM whose sole role was keeping up with team documentation
  - Binders that told all future members the process to building the car





Tesla design meeting
Letting them lead (worked out well to hear there expectations)
^presentation skill **

Critical risk and planning

Was brief pause (presentation skill issue)
Transition good
-MB

Bales-
Addressed previous issues very comfortable with materials. Honesty reliability of batteries.

Was a brief pause they had a question spoke out (during his talk)

Another pause (No practice issue)

Another question due to pause

They kinda driving the boat
They can't help with CFD

Val-
Not mentioning design process

Speaking about changes
(Presentation skill issue)

Need more practice

Bales had to hop in

Still no mention of design process and testing sheets while assembling

How are we integrating all the new changes at once

Not a sufficient answers

Jonathon mentions test sheets
Good presentation skrill 😎😎

Eye roll- val

Do we have function test boards??-T😎

New boards using old Acc/ Beamer pack -T😎

Voltage sensing, signal integrity, valid connections, proper software, ULV OV, -Tezla 😎

Brief mention of test sheets- MB

Brief pause

They taking boat again

Test test test - MX 😎

How we ensuring passing tech-😎

Stopped presentation at circuit slide no real presentation plan

Bales-
Rules check sheet mentioned and design process explained

Mentioned design review

Alum screening -😎

Mihai- mentioned alum screening

But 😎 was talking abt design process screening
How are we catching up- 😎

Hales- talking abt scheduling
Started late?
But question was how are we catching up

Priority ranked list of action items or what can be cut

Woman was to stunned to speak

MB- asking clarifying question
Talking abt essential projects
Ranked priority list 👉👈

Reusing old designs or Shrimple designs- Jonathon

Still haven't answered his catch-up question 😲

Was talking abt performance but answered abt delays?

Now talking abt design not actual action

Talked abt combustion test bed and how that would work on both cars- 😎

Decision matrix

1 good car vs 2 mid cars

Goals of team are in question 😲😲😲😲

Need to have a 6 pack 🤢 and discuss

IC placement is money maker (Cool car noise) 🏎️🔊

Biggest issue passing tech?

Advice
Decide before 2 am before emotions are high

Make a map planning wat we want to do

With decision priority

Plan can change but need to have clear

Clarity

Prioritize, agreed upon

Deadline-MB

March 31- Jonathon

What's been proven, how many people will see it through, be specific, what needs to get done and when

What needs to be there how we gonna meet them? Which priorities

Kill cash cow

You will go we're you see yourself going

A bike looking twords a cliff will fall off cliff
A bike looking ahead of road will look ahead

PM Stuff
Get book of thingy of PM and IE

Project plan and coordination
Efficiencies

Projects always change need to keep track of them

Summarize info

Too much text

Time management for presentation MX

Was open for questions

EV 2022 Competition June

Wednesday, June 22, 2022 5:05 PM

New lads did nto understand rush
Do it or get out the way
If you are unproductive remove toure self

Note what skills you lacked, enagae in how to aquire them

Trailer prep was OK due to list.
We lack process on how to pack electornices
Electronics are NOT kitted
Electornics car is good but not mature

Part kits need to exits per sub assembley
Including LV and HV

Think about removal of red tool box

Driver gear needs more of a home

Cost event:
More conciterations than preformance
Make more of a proez
Make charts more clear
Have better flow chart to talk through

Auddit:
Fuking wings
Cheese more
Was rarded bc they cant chack shit

Drive up was fine, good job for no time off.

Arival at hotel was a tad rockey getting car checks going again.
Need to have a talk before rolling in to hotel

Good job on day 0 getting document made and working
Did not see any slackers, though we could have been more efficent
Team handled IMD fault well.

Day one is ina similar boat, beter schedjuleing would have allowed us to do early drop but if acc is not perfect this would have been an L

Team did well to aquire any missing items, early crew did well

Day 2 onsight,
Good job on regrestration, 5 am put us 2nd in line. Team did great getting onsight and in.
3 way split was perfectly executed, could be cleaner but not required.

A small prob skeeping 4 people with car at all times

Don't fiuck up doc sub and we will not be 77th

Gear check can be faster if we do it in order.

Acc tech was well prepaired, could use the electonices tool box near by and spares ina container. Good crew enterd, we need a detailed acount here.

Day 3:
Team did well for design as we knew we were unpreped

Good job in cost for what we did - see seprate cost notes
Where the fuck were our people during this, I did not enjoy fishing fucks out the sight.

Tech went ok, need more poket tools
New fellas did well with getting us through
Fix shit as they ask, do not preimptvly with in reasion
Read sheat ahead of them, know what to expect
Know were certs are loacted
Keep ya temper in check, no stray words in tech
Remove anyone going aganst the meta to get in clean
Fuck the last station, pay it more attention.

Combined:
Be more familiar with tests.
Went great.
Check ranges settings prior
Turque lock on free spin

Wire energey meeter right lol

Day 4:
Rain was coo
More attention is design would help here
Build our own rig
Fix was cool
Good crew

Brakes:
Idk prep car more and we good
Need hatch

Cheese needs to be a minum
Woot woot slow laps
DO the job and bring her back
NO attitude on radio

Don't be a jackweed at night and come in tired. If ya want to hang out do it not at comp.

Day 5:
Woot woot slow laps
Good shit
No changes day of with out CE permission
Risk Vs reward needs to be CLEAR here.
Good team work

We celebrate as a team.

Drive back was ok. Car clean up was Ok.

Cost event:
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Make charts more clear
Have better flow chart to talk through

Auddit:
Fuking wings
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Do it or get out the way
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Car:
Acc mounting was lest than ideal
Rear CA forward moutns lack atriculation
Need hatch, would have saved body off 3x
Need more attention toHV routeing when making
Need more attention to LV pathways when making chassis
Wireing has some rookm for improvement.
TSAL lil sus
Need more attention on 200nm pull test
Need more attention on HV lugs

Design:
LOL

Trailer prep was OK due to list.
We lack process on how to pack electornices
Electronics are NOT kitted
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Think about removal of red tool box

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COMP DEBRIEF Dummpy

Wednesday, May 25, 2022 8:02 PM

FSAE MAY 2022 Debrief

Joshua Morrison

Infinitely better weather than Vegas

Infinitely less borked tires than Vegas

Infinitely less borked engines and transmissions than Vegas

Don't be a goon – both in hotel & the track

This result is currently not the norm, lets make it the norm without having an inflated ego towards being in the Top 25.

Don't leave only one person in the trailer

Double check it is not ***in*** the Pit Cart before asking for it

We need more chairs during downtime (Akron had sweet Summit ones)

Pit Cart is not a closet

Pit Cart is not infinite space

Pit Cart needs to lose two of its castors in favor of actual wheels

Don't touch other cars

Yield to cars in traffic

Ask before sneaking photos of cars

Don't ask dumb questions

Teams can lie

Other teams are in different situations are their designs should not be gospel because they said so or because it looks cool and quirky

We need to buy Tent Weights.

From what I heard Initial Tech went smooth ™

Brakes was a meme because engine stall

Tilt was a meme because they thought the car was leaking

Sound was a meme because 111 is technically more than 110

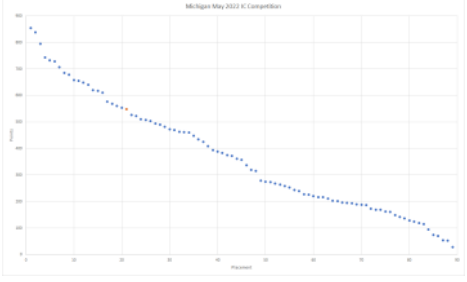
Should have taken accel slower – done Andrew's first two runs, exited queue – reconvened as a team / small group to determine what/if all to change before Mehai went. Probably could have gotten top 5 if we spent some time discussing a better technique at the comp etition setting

Same with Skidpad, should have pushed it harder

Their setup was wider for some reason, probably wings but whatever they should enforce it or change it

Autocross we have little experience in. I think everyone on the team should become acquainted with oversteer, understeer, and the millions of things that can affect and change those properties before becoming holier than thou

We finished Endurance



Wake us time was adequate.
Team did well to arrive on time with wristbands.
Waiting for 7:30 is a questionable act
Being in line first was bussin. Being out at 7:30 got noticed by all.

Plan for gear check was baller, crew needs more linkage of sheet and how to guide inspectors.

Initial tech started great. Our own gauges and tape measures were baller.

We got hit on items we were concerned, overkill fire wall was baller

Chain guard
Fuel firewall
Nose radius
Panel gaps
Control arm weld

Battery recept
Sis size

To fix
People talking about others
Acting like goons

Sound:
Have multiple contingency plans
Document how all cars were checked in sound

Goon squad:
More rotations
Keep radios on
Don't move in large groups
Pit car & car got left alone a lil too much day 1 & 2
Don't fuck up showers

Andrew:

Comp debrief (a lot of this is just nitpicking.)

- Great job to everyone. IMO, this went amazing.
- Thanks to everyone's hard work and effort, what we did looked way easier than it usually goes. Keep up the effort, don't get complacent and then it'll be this easy every time.
- Rooms felt VERY cramped with that many people in one. I couldn't walk from my bed to anywhere without stepping on someone or waking someone up to move.
- Lunch was great.
- We should probably pick up another set or two of fireproof underwear. Having to switch back and forth felt like it slowed us down a little.
- I really think getting there and being first in line was great. We got our faces out there for people to see and remember us.
- Time to test a couple extra teeth on our sprocket?
- Loved the wing holder in the front of the trailer. Never feared it was going to get damaged from the drive.
- Definitely need to practice in a mock design presentation a few times before comp.
- Business was a bust again, maybe reach out to Sarah or someone else for another set of eyes next time.
- Bussin job on cost.
- Do they make non swivel version of the pit cart wheels? If so, it would make it easier to control.
- Loved the tire cart.
- Front radaii needs to be fixed for next body designed

Steven:

- I needed to seal the food better, I could have saved more money
- Water needed to be stocked better, also me
- Better shift rotations for trailer watch. Having a stable pit crew is fine, but leaving the same one or two people in the trailer everyday should be avoided.
- Getting there early Helped a lot
- Leaving in the morning was kinda sketch
- We need a way to get data from the car. Either A data aq setup or just a gopro or cell phone.
- Trailer should be kept clean
- Water bottles should be drunk, not sipped and left
- Diffs need to lose weight
-

Dynamic days:
Ensure car can warm up
Have tem targets includeing oil temp
Have run plan with car changes between events
Have listed time targets W/ plans

Check setup inbetween if possible

Travel:
They have lost the ability to slect any restrants
Call restraunts ahead

Endurance:
Seal up the drex shit
Fuel baffles
Driver change was aight
Engine Blanket?

Judges feed back:
No BC
BC at nodes
Looooonh bolts
Perpendicular toe
Pushrod in line with joint
FEA chassis with a sldering force
Strain in wiring
As we go documentations
More sound reasoning

Cost:
We close to winning
Look at jigs
Look at more drawing
More pics bro

Real case:
Less cheese

Jesse- Overall points
Overall awareness- aka don't stand in front of car or hit wing

Know the overall goal of where we are going and the objective - if egress know we need driver gear etc

Taking naps at comp = not the best. Naps can be needed but make the most out of the day. Will learn the most at comp for the whole year

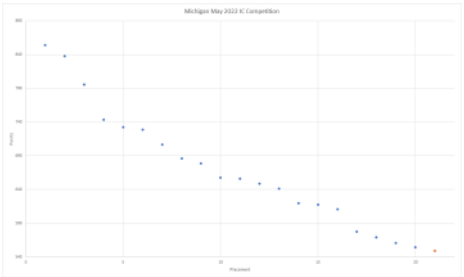
Talk to judges when they come around

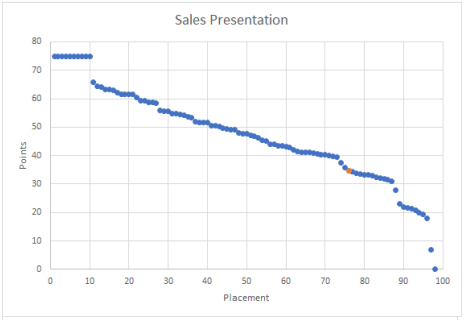
Lol no tire squeals in rental cars

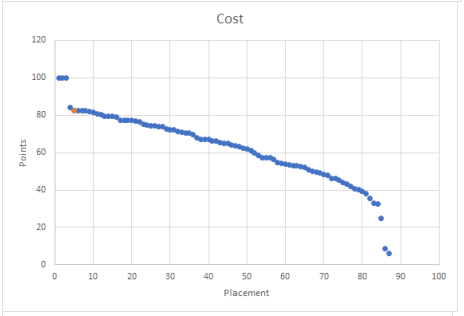
Don't trash the pit cart. Great size but got trashed on

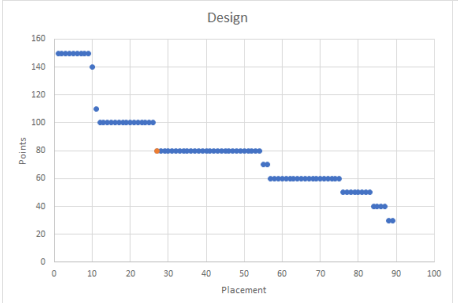
Hotels good- more Febreze and deodorant

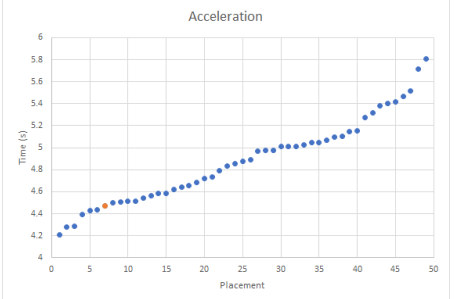
Heily-
- Email sponsors, haven't gained any new sponsors this year
- get freshmen involved in design prez or at least prepare them with a proper answer about knowledge transfer and role in team
- start design planning for the 6 and submit, then take notes of changes made to the design throughout the year with valid reasoning backed up with data and present it in the prez
- We need to have valid design drawings to put in prez
- What should be in a design prez (proposal, why it's the best design, testing through simulators or test runs, collect data, have reasoning that is based on data)
- we're well prepared in terms of having all tools and materials needed at site
- Well prepared in early registration and setting trailer early and having car ready to go
- Need to do better with our time management… in terms of when projects are done, presentations for comp, I feel like sometimes it's procrastination… but also delay in having things come in on time
- things can get done if planned out accordingly. It's understandable that school is the number one priority but being in the team you should know what is expected to be done. If things get done little by little before the deadline there isn't so much stress about getting it all done last minute
- We need to figure out a plan of having things come in time with factors that delay timeline in mind
- Radios at comp should only be used to communicate about necessary and important things…
- Scores and placements in comp should be discussed at an appropriate time and not during comp/busy hours
- Tracking… I'd like to have a weekly meeting at least twice a week on updates for needed things to complete projects and progress for each subgroup. Some people wouldn't take this serious but it is necessary to make sure we are all on track so neither project won't delay another subgroup (I'll go more in detail on what is expected from each subgroup in another meeting)

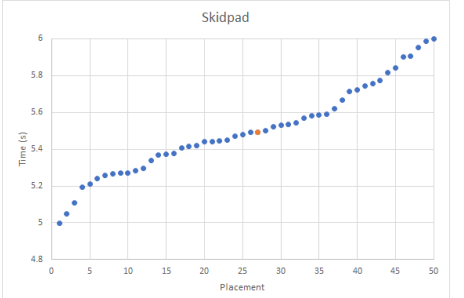












Tech:

- Fix nose (tough)
- Muffler solutions
- More room for cockpit template
  - Better firewall
  - Slight frame change?
- Bulkhead rule change lol

Design

- Fix ergo issues
  - Easy points
- More Data
- Even more visuals
- General clean up
  - Wiring
- Work on design presentation year round rather than the weeks before
- Need heat in tires
- Steering fix
- Weight loss
- Take in Claude's issues with the car
- Camber adjustment fix

Illinois - UC	T&AM	Kansas	Maryland	BC Vancouver	UTA	Waterloo	Minn State Mankato	UTETMC	Ohio State	Lehigh	ET	Kettering
UMD	Ottawa	TS Berlin	Purdue	ISU	RPI	Mich State	Akron	Cal S Full	W St. L	NDSU	Tenn COle	Columbia
Syracuse	Missouri - Columbia	Nandy	Binghampton	Rose - Hulman	Lawrence	ETD	US Navy	SD Mines	Penn State Harris	Kansas St	Tenn Tech	Duluth
Villanova	CMU	Central Florida	NDSU	Cincinnati	New Bern	Miss S&T	BC Okanagan	Wisconsin	Ohio State	MTU	RPI	Virginia State
South Florida	Florida	Wayne State	Nebraska	Embry - Riddle	Villanova	Tempe	Clemson	Purdue NW	Alberta	Kentucky	Alabama	Saskatchewan
UNC Charlotte	Northwestern	UCONN	UAB	Penn State - AT	WMU	JSU	Delaware	N Florida	OSU	Lakehead	Carleton	FAU
York College	NDSU	Oakland	Penn State	A A&M	Univer MI	UND	FIU	Tex Tech	Clarkson	F A&M	Hope	Midwestern State
UMDM	Hartford	US Air Force	Brown	Howard Community	Duke	Wash State	Saginaw	Ill Chicago	Pacific	MSI		
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40	40	0	70	0	60	20	70	60	90	40		
72.5	78.75	66.25	67.5	60	75.75	51.3	72.5	66.25	83.75	66.75	85.71429	76.28571
82.85714286	78.75	90	90	80	89.28571	60.71429	82.85714286	75.71429	95.71428571	76.28571	85.71429	78.28571

Comp Debrief Combined

Wednesday, May 25, 2022 8:07 PM

Competition:

Bis
-sarah design prep
-start when prompt drops

To take with:
-mo stock

Pit cart:
- Wheels bro
- Keep on cart
- Bags my guy (gear bags)
- Wireing diagram
- Have setup sheet
  - Pressure
  - shims
- Be a hydro hommie (mobile)
- perhaps

Food:
-bussin

Paddock day:
- We like our spot
- Check right entace
- 50amp 220

Timing:
-7 am at time
-eat soon, nap later

Trailer at:
-shifts
-Leave one persoon
-give trailer more updates
-organize radios
-Put clips on radios
-fix trailer power fan

Use of test area:

Day 1:
- Prep is coo
- Don't be complacent
- Stay around car
- Keep cart damd close to car
- Chads

Day 2:
- Prep car for dynamics at EOD
- Larger margin of error for tech (sound)
- Bull shit fuel cover

Day 3:
- Sprocket
- More clear strategy
- Setup swap
- Less talk about scores on radio

Day 4:
- Tyre choice
- Check voltage sag
- Mo endurce tests
- Body ckeck more short people
- Don't yell score
- Talk to sponsors
- Rivian liked Ratty
- Sling shlong at design judge

Prep:

Design presentation prep
-lack of outside review meetings
-full group practice prior
-underclassmen need prep as they were targeted
-understand type of presentation & prep for both
-change of format perhaps
-clarity of photos
-Make binders prior
-index and tabs for binders
-more test logs
-living document
-more high level decision flowcharts
-prep for more lenth
-reorgnise for judges specfic roles
-more optanable tests
-bring car log

Other:
More fire undies
Simpler push bar
Team uniform
Less tolorance on car prep
Compare to actual rule

Trailer:
-good additions to hold wing
-pit car coo
-wire welder in trailer
-Add more hooks

Travel:
-reserve hotel throu school sooner
-good with enterprise
-apply for GM award
-take radio away from Noah!
-More rooms

Week prior:
- Rigid schedjule
- Order more tools
- Tent check
- Gennie rebuilds were coo

Prior prep meeting:
-what to bring bring was dope

Car:
- Lose weight

Body:
Paint was toast
Side body tabs in diver way
Seat slides down
Seat belt tabs are stabby
-frond radi
Skins delam on swan neck
Get turke tool for FW bolts
Alu bolts in FW
Seat padding, more options
3x3 seat belts

Accel:
-sprocket ratio
-acheave a higher warm up temp

Adjusting shims were hard?

Heat in tires:

"FH"uel baffles
-only used 6lbs
-

Rectafier is stupid
-we drink apms
-Better Mounting

Stearing effort
- lil high

VD:
No AN bolts yet
Camber adjust ran out
Camber adjustmet less than ideal
Clean up brake lines
Upper SIS
Stear wheel angel
Toe jam nuts being lame
Fix camber tool
Make scale platform
CA lil bent

Bat lable
Small rad

Ed:
Drexler leaks
Tuning Improvements
- Cranking times less than 2sec
- Air filter mounting better

Air filter no louse
- ECU control of w pump and fan
  - Off untill warmup
  - Indicator light to show car ready to go-up to temp
  - Add oil temp gauge

Drif chunkc
Muffler
Car was thicc
Engine mounts loose
Throttle wheel require safety wire
Less throttle travel
We could remove fuel pressure
Check watter pump mounting
Lower point of car is rad tube
Fule sight line is close to not visable
Drain plug
Fuel pressure sensor
Improve fuel rail
Air tank volume was bussin

Lv:
Wiring
- Proper Strain relief
- Purposeful wiring
- Sleaving wires in group
- Bat location
- Wheel quick connect

Dac on car

Battery spot accss

Body/ aero:
Wing has to be off to jack
-Hatch rivet a little scary

Car Design:

Brakes:
They did not line zip ties to mount

VD
No arb
Toe perp to long axis
Larger toe base
BC not on node
Dif lower to no node
Spherical in axis of pushrod
BC wabble
Needle bearing on springs

Bell crank vs no bell cranks
EnD:

LV:
- Shift lights

Overall:
Screw lenth
Screw head direction
Sholderbolts

Internal engineering report
5 year plan

Cock pit adjustable brake bia

Aero cut offs for porject managemt

Clutch lever placement

VD people

Adjustable aero

More go pro
Mo string

System sensitivity

Ried and roll explaned

Sub group communcats

Anti slip on petals

Phat petals

EnD:

- Move to using lamda instead of AFR, more variable in sense and applicable across the board
- Take into account or prove otherwise of different fuels at comps. -Know the fuel sheet at comp beforehand
- He liked the al intake. Lots of teams struggle with backfires. Intake should be as reliable as currently, if going to carbon.. prove it is as tough
- Fuel injector data is def worth getting. Set up test rig, test. Also to find deadband, decrease PW until hardly any fuel comes out
- Need to look into calculating AFR targets better. Also test, so lots of dyno work seeing which afr is best suited.
- Different tunes for events. IE eco mode for endurance
- Have actual tests to test to for reliability, IE cranking less than 2 seconds, idle less than 1500 rpm, etc.
- More tuning work. Have car up to temp, this should be the baseline. Then work backwards to adjust WUE AE and such accordingly
- Log headers help with sound
- Closed loop fuel is good, but takes some work to have it not be a pain
- Solve for gearing, need diff final drive. Take gear curves, along with torque curve and match the two. Not using other 4 gears is very inefficient.
- More math for cooling system
- Dry sump can be good, but balance weight and CG, judge thought less weight is better than lower CG to an extent.
- Test more shift times, improve and know the shift time.

EV Comp Debrief Dumpy

Wednesday, June 22, 2022 6:07 PM

hall balls

Andrew Thomas

Prior to showing up

- Would it have been better to delay our departure a little so we can run the car on dyno to ensure any faults?
  - Could've maybe gotten an accel run in

Prep

- That delay in ordering really screwed us over, hopefully we don't have that issue again. How can we ensure it doesn't happen again?
- Having the constant tech sheets really helped us pass mechanical tech relatively easy
- Even though acc got finished last minute, good job on passing accumulator tech.

Design

- Putting the accumulator in seemed clunky and cumbersome
- Need to ensure the front end of the chassis is the same as the 5 if we are gonna use the same front wing. This one was shorter and thus made the wing illegal with the old mounts.
  - Need to come up with a better way to jig the welded mounts to reduce any alignment issues there.
- Judges still don't like how taller people fit in the car due to the pedals.
- Need to make sure the body mold is symmetrical
- Aero wise, we think the judges prefer the May version of the design presentation instead of the honest version. Make sure you can explain every picture and what it means if it's in the binder.

Car

- Good job finding the issues we had and fixing them in a timely manner.
- Suspension supposedly bound if the car is raised too high, but the drivers floorpan scraped the ground when pushing around the paddock. Wearing a hole in that floorpan during endurance could cause a fail in post tech.

- We learned the importance of static events. Passing tech and making dynamic runs doesn't ensure you'll finish ahead of others who didn't pass tech.
- Some people were disappointed that we didn't finish endurance even though our goals were met when we passed brakes. Morale was high after autocross and then dropped after endurance.

Mihai

Prep

- Need better trailer organization
- Need better put together design presentation
  - Easier to do when car is not being built
- Make sure car is fully ready for tech before going in
  - Combined tech^
- Have E-car specific binders for design
- Do cost before leaving for trip
- Judges like props, they want to see
- Design review, want real world physical testing
  - Make a part and then break it
- Need data backing up decisions
- Sims need validation
- Don't let EV be limited by parts we already have
  - Cost should be considered
  - If a part is reused it should still have reasoning behind it
    - "It's what we had laying around" doesn't cut it

Competition

- Don't make Dave mad
- Keep initial competition goals more in mind
- Let people know that they can watch the cost event ahead of time
- Good use of practice area
- Food was good again, make sure everyone has something to eat
- Better pit cart, keep blowing out tires
- Better charge cart, no wheel barrel plz
  - Larger cart that we make ourselves maybe
- E-Car may need 2nd pit cart for electronics
- Track workers ignorant about EV rules
- Long tech line

Car

- Fix issues that held us up in tech
  - Covers on the motor wires
- Steering feels heavier than the 5, might need more run time to see if it's an issue
- Run the car and get data out of it, find any other issues that might pop up
- Need to sort out cooling
- Get car running at full speed
- Fix issue that put us out of endurance
- Throttle pedal is soft as shit
- Wiring diagram/label wires
- Better LV battery or DCDC
- Jam nuts come loose, both cars
- Weight loss
- Seat Belt tabs
- L paint
- Broken body tab
- Gauges
  - Voltage was good
  - Need temp
  - Keep a car state indicator
- Change out boat lights
  - Brightest lights on the track
  - Did not blink during endurance
- Change out water pump

Car Design

- Finish accumulator design before chassis
- Better accumulator mounts
- Improve overall accumulator design
  - Separate components in lid into a different box
- Fit all 8 modules into the box
- Have few design improvements due to no run time
- More thought into water proofing
- Firewall
- Seatbelt bar bracing?
- Fix/optimize cooling
- Optimized brakes
- Lighter brake pedal
- Carbon push/pull rods
- Fiberglass body instead of carbon?
- Simpler car may be a better performing car

Mukund:

Good

Prep

Day 0 was just working outside a bit and getting some sleep in

Day 1 for the non-drop off crew was also chill, just work on the car and other

Stuff for a bit.

Matthew:

- Trip prep was great
- Trailer/comp material prep was rough because I had very few pcb spares so just brought all the parts, boards, and lots of through hole stuff to bodge just in case-- ending up not using any which is good, LV was more reliable* than I thought
- Running through combined tech was great because it went the same way. We were very vigilant with grounding shit and they turned out to barely check which was good
- For literally months I wanted to put the car on Dyno Or sc00t in the lot using the BMW packs. This would have saved us that time in brakes, could have not ran super limp mode for skid/autoX
- Put my all the whole semester into having the LV side of the car ready to not just pass tech but also race. Seriously disappointed that the accumulator ended up being the limit
  - Making an ecar scoot is (supposed to be) easy
  - Making an ecar pass tech is hard
    - Clearly my goals/expectations did not line up with the "team's" here
    - Don't feel like my effort was matched until the last minute
- Should have given the charger more love before we left, though the acc wasn't ready, could have improvised means to test it if I really wanted
- Good stuff:
  - Stuff in the lid worked almost perfect
  - Outside lid worked pretty much perfect?
    - No canbus issues, shit that popped up was solvable, no serious design flaws
  - It was all good enough to pass tech! Woohoo!
- Tidbits
  - Making stuff like the indicator lights an afterthought was dumb
  - Keeper resistors on RTD were sometimes too much for it to work, initializing as "INPUT" vs. "INPUT_PULLUP" fixed it
  - DC-DC wouldn't be necessary if we had good batteries(featherlites held little charge), but LV power draw can be optimized easily
    - Each AIR draws 1.5ish amps because they don't have economizers, so get AIRs with economizers(.25a)
    - Cooling draws a lot (unavoidable?)
    - TSAL draws more than it needs to (custom TSAL)
  - AVI blinking is an issue that needs investigating
  - The TSAL needs external blinker circuit
  - Can the pedalbox be designed so the sensors don't walk? Add code to support pedal calibration on boot-up, or do it manually each time it goes out
  - Diagnostic logging
  - *the temp boards are not reliable & definitely need the most attention wrt redesign
  - A real dash solution (didn't expect i2c display and neopixels, so they were bodged into VCU)
- Design event woes can obviously be attributed to the rush to build the car
  - Guy was in favor of stuff like launch control, regen.<
  - He also asked me if I knew the half shafts wouldn't break or something
  - IMO these> are low hanging fruit if the next car is executed properly

If new ecar happens, would like to see acc design&manufacture happen much earlier.

Right now: I just want to start running the car

Bailey Graham

Prep

- Need EV Packing List
  - Kitting for car (replacement parts, required tools)
- Accumulator video helped in tech and should not be an after
- Need to run through all Tech in the weeks prior
  - Acc
  - Mech
  - Combined
- Re tech on arrival was good
- Accumulator tech during drop off gives a leg up on starting day
  - Might have hurt us this year since acc was not ready
- Duplicate and accurate tech binders for both mechanical and electrical tech
  - Some information was wrong in binders
  - Should be organized based on tech sheet and then default to source document (ESF, SES, Tech Sheet)
- Showoff module for tech was extremely helpful in tech and design
- ESF printed was not useful
  - Laptop or phone was more useful for showing judges
- Need design prep
  - Binders or laptops with information
  - Validation is not all that is necessary
    - Need baseline theory and math(FBD and calcs) before creating design before validation.
      - This will create a complete design cycle per part and apply to full car
  - Show off parts could help
- Knowledge spread
  - Everyone needs to be more knowledgeable on the electrical
    - This can be fixed by better classes in the fall
    - More project spread for baseline knowledge
    - More people should be involved on working on these components so more than two people can effectively maintenance them
- Need better acc cart for tech
  - Two carts
    - One for charging and carrying w/ Deadman switch
  - One for all accessories
    - Tools, ppe, charger if reasonable
- People
  - Do not just hand tasks you believe are below you off
  - Do not snap at those who are helping
  - Please get out of the way if you cannot help
    - Teaching is mostly impossible at comp
  - Do not yell about car problems in dynamic areas
  - Durning the last few weeks we are rushed and cannot give reasons and teach about decisions. Things that are asked should be done

Comp

Day 0

- Retech began quickly
- IMD Fault dealt with well
  - Others need to be more familiar with HV if they want to be active in these fixes
- Mechanical Retech should have continued while acc was being worked on

Day 1

- Check gate time slots for early drop next time
  - Was in our favor for acc tech passing the next day
  - Good work was done that day
    - Lot of steady hands

Day 2

- Early paddock crew did create
- 3 way split for tech and registration went perfect
  - Timed well as it allowed us to beat many teams into accumulator tech
- Mech tech was an L
  - Try for earlier tech number next year
- Needed more carts/tools for ACC tech
  - Runners were great, should have more with us next time
- Dave sucks

Day 3

- Design went well for zero prep
- Need better documentation for design
  - Full reports/ reviews for all major and minor car changes
- Extra module was somewhat useful here
- Mech tech was slow but had very little hiccups
  - Better wire planning for HV and Lv lines
  - Don't fix in Tech line without being asked

John McCrary

Drive up was fine, good job for no time off.

Arival at hotel was a tad rockey getting car checks going again.
Need to have a talk before rolling in to hotel

Good job on day 0 getting document made and working
Did not see any slackers, though we could have been more efficent
Team handled IMD fault well.

Day one is ina similar boat, beter schedjuleing would have allowed us to do early drop but if acc is not perfect this would have been an L

Team did well to aquire any missing items, early crew did well

Day 2 onsight,
Good job on regestration, 5 am put us 2nd in line. Team did great getting onsight and in.
3 way split was perfectly executed, could be cleaner but not required.

A small prob skeeping 4 people with car at all times

Don't fiuck up doc sub and we will not be 77th

Gear check can be faster if we do it in order.

Acc tech was well prepaired, could use the electonices tool box near by and spares ina container. Good crew enterd, we need a detailed acount here.

Day 3:
Team did well for design as we knew we were unpreped

Good job in cost for what we did - see seprate cost notes
Where the fuck were our people during this, I did not enjoy fishing fucks out the sight.

Tech went ok, need more poket tools
New fellas did well with getting us through
Fix shit as they ask, do not preimptvly with in reasion
Read sheat ahead of them, know what to expect
Know were certs are loacted
Keep ya temper in check, no stray words in tech
Remove anyone going aganst the meta to get in clean
Fuck the last station, pay it more attention.

Combined:
Be more familiar with tests.
Went great.
Check ranges settings prior
Turque lock on free spin

Wire energey meeter right lol

Day 4:
Rain was coo
More attention is design would help here
Build our own rig
Fix was cool
Good crew

Brakes:
Idk prep car more and we good
Need hatch

Cheese needs to be a minum
Woot woot slow laps
DO the job and bring her back
NO attitude on radio

Don't be a jackweed at night and come in tired. If ya want to hang out do it not at comp.

Day 5:
Woot woot slow laps
Good shit
No changes day of with out CE permission
Risk Vs reward needs to be CLEAR here.
Good team work

We celebrate as a team.

Drive back was ok. Car clean up was Ok.

Cost event:
More conciterations than preformance
Make more of a proez
Make charts more clear
Have better flow chart to talk through

Auddit:
Fuking wings
Cheese more
Was rarded bc they cant chack shit

New lads did nto understand rush
Do it or get out the way
If you are unproductive remove toure self

Note what skills you lacked, enagae in how to aquire them

Trailer prep was OK due to list.
We lack process on how to pack electornices
Electronics are NOT kitted
Electornics car is good but not mature

Part kits need to exits per sub assembley
Including LV and HV

Think about removal of red tool box

Driver gear needs more of a home

Car:
Acc mounting was lest than ideal
Rear CA forward moutns lack atriculation
Need hatch, would have saved body off 3x
Need more attention toHV routeing when making
Need more attention to LV pathways when making chassis
Wireing has some rookm for improvement.
TSAL lil sus
Need more attention on 200nm pull test
Need more attention on HV lugs

Val

Prep

Day 0 was just working outside a bit and getting some sleep in

Day 1 for the non-drop off crew was also chill, just work on the car and other

Stuff for a bit.

The schedule was followed very well, happy that it was kept simple

Food schedule was bussin, going out was bussin, no complaints from me.

Thank you Steven

Design

Overall good

Judges were pretty receptive. It seemed as if people could get their

point across without forcing it too much

Multiple times the 5 was "validation" and the judges ate that shit up

Car Related

Mechanical aspects were good because same on other car

We done passed tech!!!!!!!!!!!!

We put down some times

The reaction of other teams when we told them it was out first year and we passed

Long tech, maybe the strat was a little poopy with our number

Not so Good

Prep

Def needed some nos

Wish I had a heads up on cost

Trailer org

Need data validation

Design

The speed of speaking was sometimes rushed

Good lord I did the same in cost, I was unprepared to shit

Morrison needs a little protoge

We should have brought the pit car

Would be better with some data

Car Related

Aboomulator

Maybe the resolver etc could have been tested with the bmw packs?

Don't know how that works, but it would have given us a fighting chance

Don't fuck with dave

Heily ovalle

Steven:

Car Stuff (Problems and Future Fixes)

1. Calibrate and tune the car
2. Safety systems can be programmed with as much leeway as possible without breaking rules
3. Get some valid test data from the car
4. Attempt to remedy the LV power drain on the system
5. TSAL stopped blinking during endurance

Networking

1. Contact the lead design judge about getting him into the shop
2. Follow up with skidder
3. After we get more run time on the 2E contact schneeb

Trailer Prep

1. More coat hooks in the trailer
2. Utilize more storage space in the trailer
3. Insulate the roof of the trailer???
4. Hotel rooms worked really well again
5. Discontent about the number of room keys???
6. Possibly complete the last driver bag???
7. Rack for sunscreen in the trailer
8. Secure fasteners for equipment while we travel

- Design went well for zero prep
- Need better documentation for design
  - Full reports/ reviews for all major and minor car changes
- Extra module was somewhat useful here
- Mech tech was slow but had very little hiccups
  - Better wire planning for HV and Lv lines
  - Don't fix in Tech line without being asked
  - Do Not talk about problems you see
    - Make note and fix later
  - Do not get flustered at other members
- Did not see much of cost
  - No wings lol
  - Could cheese more
  - Powertrain hard to mess with as scaled
  - Real case needs prep
- Slipping into Combined was Good
  - Be familiar with how tests are run
  - Don not mention the funky light while being teched
  - Get face known to continue getting into things late

Day 4

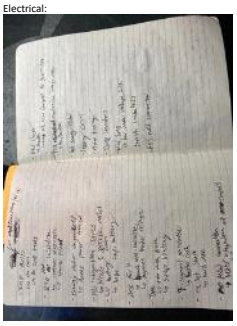
- Tilt was smooth
- Rain was spooky
  - Need rig at home
  - Rain proof to small degree before
- Brakes went well once car was running
  - God bless the lady letting us do flying laps
  - More car tuning before brakes
  - Its just the wing
- Slow laps lol
  - Less radio chatter during event
  - Every event goal should not be argued
  - Workers need to no touch an active car
  - Remember we have a day after normal dynamics
  - Cheese to a minimum next time
    - Can be checked/re teched at anytime

Day 5

- Practice went well
- Endurance strat is not an open forum
- LV battery change went in our favor
  - Other last minute changes could not
- Don't be bummed the car did not finish endurance. It well exceeded its goals
- Do not mention the illegality of the car out loud

Car

Electrical:



Mechanical:

- Acc mounts need redesign
- Firewall needs to be one piece
- HV routing need to be better
  - No 5 foot tsmps
  - Better phase connection routing
- Lid opening/closing was clunky
- Steering was hella wobbly
- PDU cover needs to be COTS Case
- Inertia switch mount fatigued when punched

Jesse:

Prep

Have better storage for HV tools, Electrical components, etc in trailer

Need better organization of trailer, better and more shelves, not everything just thrown in (I understand why this happened this trip)

Understand more EV systems and controls, never got around to that meeting.

Pedals- failure of planning and management when building. Because people don't like feel, change it, to illegal, then causes more work to fix because old hardware cannot be found in a mess of a shop. No clear cut plan

Design

Information is not spread across various groups of team

Did not know various simple reasons and numbers why of certain design items. Mainly due to components coming from the 5 "because they worked". Not having the reasons and math follow is a huge pitfall

Knowledge lacks a lot, by having a fundamental understanding of the systems and math

Not having subgroups well established and a younger member that knows the basics to step in caused great falls. Should not have to rely on 1 person to do 3 groups.

Car

Floor pan = jank, pulled out bolts. Don't know why it was moved to 1 piece from KS5. But having other set of bolts was needed.

Firewall removal is time consuming- want to see more implementation of push buttons

Pedals- need major improvement to be able to easily take out- Have to remove whole assembly to remove gas pedal. Brake cylinders are in rough spot, Lines hard to route, pedals way too far forward (per judge)

Steering wheel- LOTS of slop, bushing got wrecked. Need to fix. Steering retaining screw stripped

Wiring- I would say decent for a first year ev that was rushed. But lots of room to grow and improve to be up with the top teams. Not multiple looms of wire, ONE to front of car. Better color coding, Label everything. MAKE A WIRING DIAGRAM PLEASE, No one else can understand system without it.

Front wing- lol rip, need better jigging and take note of rules when jigging. Need to fix flexing in mounts

Rear wing- Holes is ovals, Whole thing sags on car. Simple stuff like hardware was not 2 threads showing, got lucky

Accumulator – Make the mounts where you can actually get a socket or wrench in there. Go measure our tools pls

Modules, not properly fastened first round- Not tightened to full torque and lots were loose. Was fixed before comp

HV tools- need a crescent wrench

Nuts on HV Contactors were wrong thread, got lucky we didn't break anything

HV cover make it very difficult to work on stuff, Make it easier to remove next time

Driveline- Held up good, need to fix cad interferences and having the uh oh not happen again.

Axles were too short and had to do band-aid, need to fix

Val

Prep :

- Trailer was not well organized and EV components felt (well was) thrown in
- Need to bring broom
- Know who is bringing laptops and make sure they have the programs and backup docs
- Make sure drivers r resgustured (app being dumb)

Food was great, happy for the peanut butter switch

Day 1:

- Missed the accumulator tech window and traler drop off
  - Times were wird need to have printed out schedugal proaoleb
- Saw the cool lake house hytech was at.
-

Day 2:

- Soon as we got there went strate to accumulator tech
  - Us getting there early let us move up in Q
- Need to add High voltage stickers on charger
- Tool cart/ Hv tool cart needs some work
  - Maybe 2 carts if we doing the split everytime mech and accumulator?
- Don't piss off dave john
- Data sheets need to be checked/ made accurate by another set of eyes
- Bring modugal to acc tech and charger
- Sliped in to mech tech at end (it sucureeed us a spot)
-

Day 3:

- Had cost times wrong
- Went to get free things but was dragged back into cost
  - Wasn't able to get the free stuff L
- Design:
  - besides us going there with it not a priorety I think we need to make sure all the judges have someone to talk with instead of them waiting.
- For Mech tech need to take pic of bolts/ connections
- Was wable to do combined last min W

Day 4:

Tilt

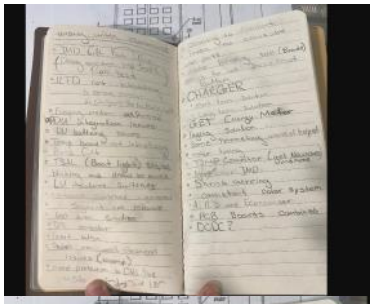
- Don't slip past gate keeper
- Have all drivers there

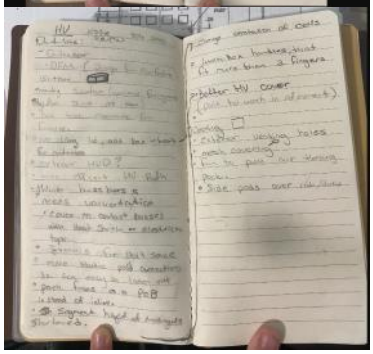
Rauin was scarry

- Lot more water then thought
- Need to seal up things
- Dumb connector
-

Day 5

-

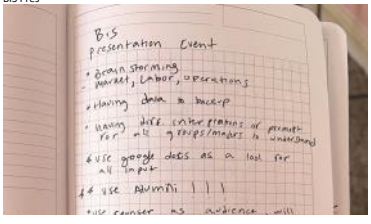




Heily

-need more sponsorships!!! Helps with materials and shmoney & maintaining sponsorship
(Plan to take it to business and schools)
-need to priorities static events… can be worked on on test day with car
-collect data and have a dedicated sections on one note
-have a dedicated person for data collection ? (Mihai & a buddy?) it's help him understand the car better in terms of design not saying he doesn't ….
-business pres can be overlooked by a judge
-buy an extra serial male adapter cable
-really liked going to eat right after comp and then meeting
-color code wires & label?
-keep it simple
-make a binder of design feedback from judges and make copies
-knowledge transfer: show freshie a documentation(design changes,reasoning, data correlated)
-having storage containers for ev commoners such as wires resistors and so on and labeling instead of cardbored boxes

BIS Pres



Assemblies- Make the models where you can actually get a socket or wrench in there. Be mindful of our tools pls

Modules, not properly fastened first round- Not tightened to full torque and lots were loose. Was fixed before comp

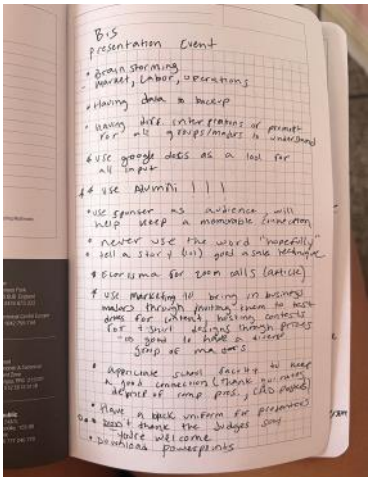
HV tools- need a crescent wrench

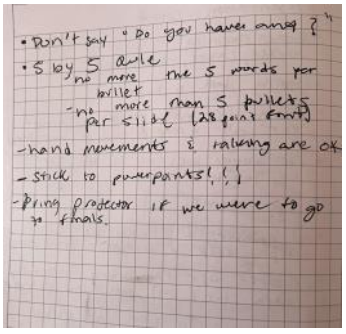
Nuts on HV Contactors were wrong thread, got lucky we didn't break anything

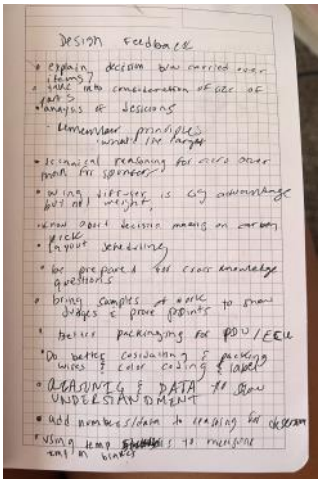
HV cover make it very difficult to work on stuff, Make it easier to remove next time

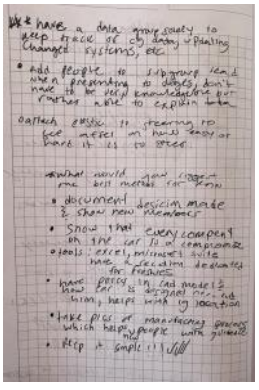
Driveline- Held up good, need to fix cad interferences and having the uh oh not happen again.

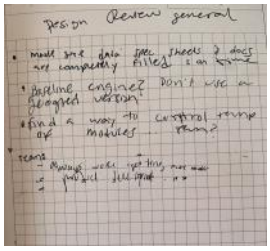
Axles were too short and had to do band-aid, need to fix










Review general

EV Comp Debrief Combined 2022

Wednesday, June 22, 2022 6:07 PM

Prep:

- Better trailer organization
  - Have better/more storage for HV tools, Electrical components, etc in trailer
  - better and more shelves
  - EV Kitting
- Would departure delay help? *
- Lead up to comp, better tasking
- Trailer packing list for EV specific
- More time for static
- Tech binders made ahead of time
  - More organization in the binders
  - Missing components
  - Organize by first page of tech sheet
- Laptops for tech
  - EV and mechanical
  - Pre-loaded with SES/ESF
- Multiple Pre-Tech good
- Plan for integration/putting it all together
- Make push bar earlier
- Bins falling off shelf
- Beef up pit cart – spare tire = good
- How to deal with E-Car
  - Rules and safety
- Be first/earlier with docs
- Do accumulator video
  - Do more of it
- Driver sign up

Competition:

Day 1

- Go through tech on arrival
- Car in the paddock good
- Better trailer organization to work in trailer instead of hotel
- Plan arrival better (acute)
- Bring printer good
  - Need paper
- Better accumulator travel method
- Dividing people out into separate tasks

Day 2

- Better scheduling
  - Drop off closed on us
- Day 1 tech would have been nice
- More mechanical tech

Day 3

- Don't make Dave mad
- Having trailer there earlier was good
- Cycle trailer people out
- More comprehensive electrical cart
- Keep 4 people with the car
- Gear check, hand in order of tech
- Good radios
  - Make sure they're spread out
  - Don't say dumb shit
  - Trailer runner need one
  - Clips
- 3 way split in the morning went well
  - Helped get everything ready
- 2 ESOs helped
- Listen to teammates and trust
  - Pushing car
- Tents
- Accumulator tech went smooth
  - Extra module helped in tech
- Temp sticker early
- Get our own energy meter
- Charger is part of accumulator tech
- Too many things in accumulator tech
  - Don't ask just tell

Day 4

- Barely got into combined tech
  - Talked to Dan to slip in
- Time for events
  - Print out schedule put on pit cart
- Static events important
- Make sure car is ready if worked on between events
- Cycle people through tech
- Don't touch something unless its called out
- Don't be upset at how something gets fixed
  - Judges are watching
- Pictures for tech, show bolts that may be hidden
- Body tab broke
  - Stud
- Prep for rain
- HV connections need shielding
- Accumulator in car in tech??
- Rain test at home?

Day 5

- Early tilt test dub
  - Tilt while IC do fuel
  - Find gatekeeper before entering
  - Picked direction
  - Choosing driver
  - All drivers need to be there
- Rain proof car
- Dry car off after rain
- Finding short after rain
- Tool cart closer to car
  - Trash bag on cart
- If something is wrong with car don't say it out loud
- Hatch helps for brakes
- Portable tools/ cordless
- Car did autocross and skidpad
- Protest is Chief Engineers call

Day 6

- Good use of practice
- Don't leave tools in car
- Anything after brakes was dub
  - Keep goals in mind
- Risk management
  - Changes need to be known
- Consider meeting times
- Track workers don't know EV rules well
- TSAL no blink
- Power management
  - LV
  - Used tech's battery
  - Fans were on
- 1 ESO plus 4 passes for dynamic
- Duplicate tech binders

Car:

- [x] Accumulator lid removable
- [ ] Charger needs more thought
- [ ] Weather proofing
- [ ] Wiring
  - [x] Single main loom
  - [x] Color coded/labeled wiring
  - [ ] Comprehensive wiring diagram
  - [ ] Better layout of connectors
- [ ] Floorpan strength
- [ ] Firewall removal is time consuming- want to see more implementation of push buttons – Need work
- [ ] Firewall needs work
- [x] Accumulator mounting
- [x] Pedal soft as shit-- need major improvement to be able to easily take out- Have to remove whole assembly to remove gas pedal. Brake cylinders are in rough spot, Lines hard to route, pedals way too far forward (per judge)
- [ ] Pedal soft as shit
- [ ] Wing jigging
- [ ] Wing fitment issues
- [ ] Hatch
- [ ] Front wing removal a pain
- [x] Different LV battery
- [ ] Avoid nuisance trips
  - [ ] Fall back values
- [ ] Make sure body mold symmetrical
- [x] Nose Radius
- [ ] AVI Blink
- [x] DCDC on car
- [ ] TSAL EMI
- [ ] Broken body tab
- [ ] Rear wing- Holes is ovals, Whole thing sags on car. Simple stuff like hardware was not 2 threads showing, got lucky
  - [ ] The two thread rule is only for critical fasteners, it should be fixed, but they shouldn't call us on it. -AT
- [ ] Steering
  - [ ] Stripped bolt holes
  - [ ] Steering is tough
- [ ] PDU
  - [ ] **Better enclosure**
  - [ ] Panel mount connectors
- [ ] Suspension binding?
- [ ] TSMP connector
- [ ] Axles too short
- [ ] Accumulator plug in connector list
- [ ] Dash
  - [ ] Status light for driver was nice
- [ ] Read data sheets
  - [ ] Energy meter needs power
- [ ] Steering wheel compliance

Design:

- [ ] Not enough done for design
- [ ] Cross pollination
- [ ] Make sure you can explain all pictures

Accumulator Cart:

- [x] Need
- [x] No more wheel barrel
- [x] Different cart
- [x] Different wheels
- [ ] HV Tools
- [ ] PPE
- [ ] Solder and heathshrink
- [ ] Accumulator securement
- [ ] Teams had multiple carts
- [x] Better solution for key placement, it floated around too much

I would say decent for a first year ev that was rushed. But lots of room to grow and improve to be up with the top teams. Not multiple looms of wire, ONE to front of car. Better color coding, Label everything. MAKE A WIRING DIAGRAM PLEASE, No one else can understand system without it.

Design Review Debrief

Tuesday, July 5, 2022 7:18 PM

Prep
- Mock design review
- More documented testing
- Project proposals
- Mock design with alum and judges
- Partner with leads
- Tools to take car apart
- Continue with current binder don't start over
- Retain binders from previous years
- Print binders ahead of time
- Update/check over old binders
- Make sure you can explain your binder
- Document submissions
- Powerpoint needs to be more flushed out and comprehensive
- Intro poster?
- Bring more props to show
- Quarterly design reviews and presentation practice
- MTS testing
- Leads should know more about other subgroups
- Cross-Subgroup review
- Prep non-lead members watching

Intro
- Ensure it matches design direction
- Layout car goals
  - Subgroups should relate back to overall car goal
- Numerical goals for top 30
  - Points values
  - Time differentials

Overall
- Be more assertive
- Learn how to speak
- How to address knowledge transfer

Frame/Body/aero
- Hatch
- Make sure you can explain aero graphs
- Aero test days and sweeps\s
  - Strings
  - Stockpots
- Why are we not utilizing all of the aero box
- Tilt sweep
- Expanding more on the drag budget
- Use lap sim to see if we are power or grip limited
  - Point mass in optimum lap
- See if it is more beneficial to reduce top speed but increase lateral grip.
- More full vehicle data collections
- Skidpad time delta from autocross with and without aero
- AERO AND VD
  - Spring rates
  - Aero wants the car to stay parallel and flat
- Prove what COP does when the car is rolling/pitching/yaw.
- What should a test day look like?
  - Have something that you can look at
    - Yarn tufts
    - Flow vis
  - Have tuning nobs
    - Change AOA
    - Change locations
  - Driver feedback
  - Force data (if possible)
  - Lap times
- Good timeline to develop aero. Good stopping point for manufacturing the wings in CFD
  - Depends on the team
  - Depends on the part that either aero depends on or things that are affected by aero
- What are you looking for in the design event?
  - Split between multiple categories
    - Most focus is on design and analysis
  - Cannot fit a whole years work in a 45 minute discussion
  - Make the design evolutionary
  - Balance of design and testing
  - "here are our goals, here is how it did, heres why"
- Fuel efficiency question
  - How much of your drag is eating into fuel capacity?
- No body questions

- Rad/cooling questions

Chassis
- Shocks at nodes
- Bell cranks at nodes
- Rear Engine mount not triangulated
- Adjustability
  - Sims
  - Match with car
- FEA
  - Engine
- Did not like rear wheels being constrained
- Need better notes
  - Wanted data for graphs
- CG needs specific number

Powertrain

IC
- Wanted final drive graph per torque output
- Tuning
  - Setting idle
  - Warmup enrichment
- Switching to Lambda
- AFR goals
- Need a shifting time
- Poor fuel understanding
  - Consider fuel impurity
- Went too much into muffler design
- Fuel datasheet
- Fuel injector data
  - Test rig
- Need numerical test for reliability
- How quick motor cranks from cold
- More math for cooling
- Warm up procedure

EV
- Understand math behind drivetrain
- Explain parts that carryover between cars
  - Cooling
  - Motor
- Could utilize space better
- Regen
  - Powertrain
  - Thermals
- Airflow to accumulator
- Optimize CV sizing
- Prioritization of activities
  - Show analysis of activities
  - Cost analysis
- Show off the shelve part vs custom
- Regen
  - Do the analysis
- Traction control
  - Explain the points gain vs development times
- Conductor sizing
  - Thermal
  - Current
  - Need more analysis
- Good BMS and Busbar analysis
- Pedal mapping
  - Consult VD guys
  - "Simulations"
- Show air cooled vs liquid cooled
- Correlation of models is key
- Liked that car could limit itself and not driver
- Half-shafts?
- Analyze pedal equations
  - Ramp
  - Regen

Cockpit Controls

VD/Brake/Safety/Controls
- Good use of FEA
- Shark good
- Need to transfer knowledge
- Likes gillespie
- Heavy on subjective evaluation
- LCD sensitivity
- Operating temps
- TTC longitudinal braking data
- Different master cylinders
- Redline
- Don't like arm and leg room
- Driver adjustability
- Too much pedal travel with little feedback
- Brake too far backwards
- Shift light
- Pedal bore documentation
- Hard lines on tubes
- Dash lights ambiguous
- Pads
- Dampener testing
  - Set to zero
  - Do runs
  - Adjust
- Steering force

Systems management and integration
- Strain relief
- Color coded wire
- Thermals in wiring
- PDU water proofing
- Want to see data and how subgroups utilize it
- Dirt in the pneumatic shifting
- Utilizing driver aids

Manufacturing and Serviceability
- Brake light mounting
- Cables hanging
- Hatch
- Front end cleanly packaged
- Bulkhead passthrough w
- PDU Enclosure

Ascetics
- Clean and simple
- Sexy

Barnesville Shakedown Dump (03/05/2023)

Monday, March 13, 2023 5:35 PM

- Copy Paste your notes here

John
Grill was good
5 buck was a stretch
Food option were coo
Pie twas intresting

Tow down in the wee am's was nice
Bring a wench....
& boots

15.5 gallons of oga booga was adequate.
Team did well camping.

Remember to pay the 2 Benjamin's for bathrooms.

Andrew

- Very concerned why there was consideration in bypassing the BOTS so it would be non-functioning when we had such a focus on making the car rules legal pre-barnesville
- Lowe the feel of the pedal box being further away
- Food was bussin
- Chain slap sounded horrendous from inside the car
- Dyno tires didn't seem too bad to drive on
  - How does this work when we have both IC and EV running?

Marco

Mainly going to be timing stuff
Timing sheet was easy to implement and easy to use
Recorded the data we wanted to see and functions worked
Nice breakdown and spread looks good

Mihai
Car Issues:

- Shifting
  - Struggled shifting up a gear
  - Would shift down but felt rough, rear wheels would lock for a split second
    - Could be due to rear brake bias
- Chain Slapping
  - Chain too loose
- Brake Bias
  - Set too far to the rear
- Brake Fluid Leak
  - Leak from what seems like the master cylinder fittings
  - Topped up fluid after every run
  - Need to find which fitting and tighten (or fix if)
- Electronics
  - Issue causing main relay to blow still unidentified
  - Routed Power through shutdown loop instead in order to run
    - Ran thicker gauge wire to take the load

Mihai
Non-Car:

- Ran out of room for all the boxes in the trailer
  - Couple more shelves would be nice
  - Need a space for the nice tools, pyrometer, chamber gauge, pressure gauge`; did not enjoy having them just thrown in somewhere,
  - Forgot about the large generator when packing up, didn't leave room for it in the trailer
    - Probably good to have a pack up check list
  - Toughbook didn't have a good spot and was stuffed into a drawer in the toolbox
- Everything was strapped down when coming home this time
- Should bring back the subgroup kit boxes
  - Box that holds tools and supplies specific to each subgroup
  - For example, EnD toolbox with drexler tools, USB cable for ECU, etc
- Green tool cart is not well supplied
  - Need to make sure it has a full range of tools, hex sizes, sockets sizes, etc.
- Food was good
  - Good job making/saving food for people working on car, helps keep things with car moving
  - Small gap around lunch where food was not available
  - Please don't bring pre made mac n cheese

Val

Prep

- we took the car out that one night but we should of taken it out much before hand
- we didn't finish the current testing. The decision was made by the chiefs to take it out how it was
- there was talk about not taking the Electrical tool box. We def should take it and not separate the tools out further into other boxes.
  - It does need to be organized and remove the junk in there
- DT, and electrical container boxes could not fit in the trailer holder
- Need to pack thicker wire
- Assign roles for the event ?

Moring of

- Should think about doing shopping at the ingles day of ?
- Taking the trailer down that early was actually nice. Early but nice

Car

- The car had issues with the PDU (listed it out in the car log) if we wanna go thu it more on the issues the car had we can look thu that log
- Trying to fiuure out how to make the car run with out over rideing the SDC is what took the most time
- After applying the fix, SDC wire has full car current and the BMRS 18 AWG wire isn't rated for that.
- If we ran it like that the wire would fail and said "the BOTS switch proable isn't rated for that and the failer would occur there.
- There was talk about jumpin the switch. That very much wasn't a good idea. With how new the car was.
- Battey was dieing
- Car was running tho and the "fix" is legal

Event

- Food was great. Need to set plates aside for those that are working tho.
- Neeed to figure out better water system
- Radios (when car would go off had to walk out every time cause no communication)
-

Steven

- No timing issues, gates and excel worked great. Some visual and UI changes are necessary on the excel side for easier and smoother data collection.
- Need a way for the pit hands to see times without using a radio or runner. Auto-updating excel link like what we want to use for invitational?
- Train more goons on timing setup and usage. Pretty straightforward and easy to use.
- Recommend corner worker training. How to react to stopped vehicles, what to look for in certain conditions, flag color meanings, when to approach a car vs wait, fire extinguishers, EV procedures, etc.
- The pics and vids from running were very nice.
- GoPros and their telemetry was super helpful. Planning on trying to do this again in the future.
- Food was bussin, good variety and quite delicious.
- Track rental policy has changed from last year and we will need to get in contact with Bob to figure out what changed and how it affects us for next year.
- Trailer tires went skirt skirt.
- PDU bonked, need to diagnose and fix before running car more.

Jonathan
Better diagnostics, taking it step by step with what's known, lay out thought process while working through problems- whiteboard, paper, etc?
Better timing for dispersing food/unified eating time? Idk tho

Barnesville Shakedown Brief (03/05/2023)

Monday, March 13, 2023 5:35 PM

- Here we'll note what is discussed during the brief

- Prep:
  - Better prep for food
    - Costco cheaper
  - Don't schedule meetings for during event
  - Ran out of space for boxes
  - Need rachet straps
  - Pelican case for pyrometer, camber gauge, etc
  - Subgroup boxes would be nice
  - Water hose filter
  - Green tool box needs organizing and replenishing of tools
    - Tough book needs a spot (shelve)
  - Taking trailer down early was nice
  - Bring test binder to write stuff down (sussy)
  - Train people on timing gates
    - Using excel sheet
  - Forgot to bring track flags
  - Corner worker training/practice
  - Charge radios before hand
  - Above ground firepit
  - Electrical Power map of car

General Event:

- Track rental policy change
- Bathrooms, tower, lights separate
- Food good
  - More burgers
  - More bacon wrapped bell peppers
  - Saving food for team working on car good
  - Smore sticks
- Pictures/videos nice
  - Renting Go pros were nice
  - Get tube mount
- Bathrooms worth the price
- Start earlier
- Timing sheet worked well
  - Add notes section
- Better diagnosis
  - Place to write down thought process
    - White board/touchscreen tough book
  - Car log
- Better idea of event objectives
- Check trailer jack
- Lift up trailer down after event is over
- More lights for nighttime
- Bring more trash bags
- More tables/room for activities
- Keep trailer clean/organized
- Area to clean stuff
- Bring a winch
- Bring 2 pairs of shoes in case it rains
-

Car:

- Pedal box feels good
  - Little leaky
- Dyno tires surprisingly good
- Chain slappy
  - Diff carrier
- Sprocket bolts
  - Loose after event
- Battery
  - Was not being charged
  - Pulling more than rectifier can do
- Ringing in muffler
  - Internal perf-tube
- PDU
  - Concerning considering bypassing BOTS
  - BMRS wire not rated for 20 amps, ran new wire for shutdown loop
  - Pulling over 20 amps through relay
  - Main relay cutting causing ignition cuts
  - Fuses blown and changed
    - Shutdown and Ignition
  -
- Starter wire needs to be covered
- Cooling switch zip tied to car
- Lack of dash
- Calibrate oil pressure sensor
- Loud pop, pneumatics?
  - Engine not on
- Shifting issues
  - Struggling to shift up
  - Locking tires when shifting down
  - Bottle being scratched by mounts
  - Bottle/housing threads being messed up
- Brake bias set to rear
- Sat on solutions for too long
- Oil and drexler leaks
- CV grease slinging
  - Need new boots
- Idle screw doesn't work
- Diff spacers falling out
- Time stamps in car logs
- Figured out how to remote access time sheet

'23 Invitational Debrief Dump

Wednesday, April 5, 2023 4:48 PM

Sam:

Event Wise:
- More judges for tech inspection, especially if we have higher attendance of teams in the coming of years which should be expected
- For timing, need to work on the sheet. All adjustments have been currently made to the sheet which now accommodates for comp scoring.
- Timing needs one more person, two people total. Mainly as a runner, maybe another computer? So data is always backed up. As well if we need a runner ready to go at track we have someone.
  - From Seth: I dedicated one goon per event to help with timing, maybe that didn't happen? Need consistent goon so I don't have to retrain every rotation ~ Sam Yeah I agree ~ Seth
- Need flag person to be the one queueing as well, the end of an event should be the queue for another to line up and get ready
- Drivers either need to do egress first or register for wrist band first, having to constantly chase people was lame and was hard esp when we wanted to go crunch time

Heily
- Have a person dedicated for egress and have a separate station for it
- Heard teams were complaining about endurance or autox track?
- Will do better on walking teams through tech sheet… my b I get zoned in
- Have a list already made for endurance order
- Have formulas already in for excel sheets
- Track workers did a great job
- Brakes test was a lil sus.. Should be more clear on what is passing and not passing
- Get a mic for annoucements and annouce sponsors more
- Food was good
- Have a copy of time for events per team
- Have drivers practice all events prior day of fs
- Should of managed time better for more car shakedowns… rip

Grayson:
- Food ran out pretty quick, so we might want to get a little more next go round.
- Put cones from event exit to paddocks entrance
- Mark off where people can and can't sit with stakes and rope
- Test the eye gates beforehand with the cars to be sure they work properly
  - Don't know if we tested them the night before or not
- Go ahead and pull extra stuff for events out (ex: cones) in case we need them
- Maybe do driver color helmet stickers instead of wrist bands
-

Seth
Event
- More time for tech, maybe start earlier? It threw some of our events behind
- Formulas for score calculation the day before, wasn't a big deal, but would have been nice.
- Definitely more food next time. It'd be nice to have maybe 2 or 3 vendors that sell there.
  - Also more water, cold water
- More space for team parking, the vendor area was taken up right?
- I should have sent the active schedule to the teams as well. Definitely will improve upon that system next time.
- Need microphone

Car (IC)
- Battery is probably overheating on IC, caused us to stop mid event multiple times
- Rear right pickup was rotated CW on upright, caused massive toe out. Bolts were loose when I adjusted
- Front left tire lost all pressure multiple times, Bray mentioned it was a problem in Endurance
- Body holes were a PAIN to cover with tape due to brake fluid leak on floor panel
- Not sure exactly the problem, or if it was fixed, but the pneumatic tank was not screwing out of the fitting, instead the tank was screwing out of the regulator.
- I want a push bar
- pneumatic splitter in box popped twice. Not sure why
- It looks like brake fluid is leaking from the reservoir/hose connection.
- Need guerilla tape

Andrew
Event
- Need a microphone for announcements
- Need some way to communicate times for runs.
- Need more people for tech with the increasing amount of teams.

Ecar
- Steering is extremely heavy compared to IC for being the same setup.
  - When turning the wheel, the steering bushing sometimes spins with the SPA spline shaft
    - Could just be a bushing ID issue
- Outer portion of steering rack pinched the suit sometimes between the stop and the main housing
  - Likely just need a small shield or something to cover them.
- Smashed the APPS board and messed up some wires. Would be good to move it higher up and out of the way.
- Body tabs need to be braced in some way. They're bending too easily
- Ecar gets speed wobbles

Brenden:
Event:
- Don't really understand why our gear had to be checked last, we were told to go to back of the line.
- Early morning was great, food was good and initial set up went smoothly
- Was disappointed in the lack of tours
- Need to specify a warm up area
  - We kinda just did anywhere in dynamic area
- Definitely need a mic for announcements

IC Car:
- The lack of proper coils is a concern, but seemed to hold up need to check current draw to be sure
- Starting the night before invitational the battery started to die rapidly, but no one seemed to be concerned about and ended up being a major problem the next day.
  - Need to run test to diagnose
- The regulator is cross threaded and keeps getting worse and worse.
  - The tank got stuck and the tank kept separating from the adapter
  - Had to remove mount to get the tank off
- Lost a good amount of bolts holding on the sprocket and was rushed to fix right before endurance
- The Pneumatic splitter that feeds the solenoids burst twice and had to be replaced
  - Apparently we run the pressure at exactly what the splitters are rated for
- I lack faith in the electrical system of the car. Majority of problems we have had with the car have been electrical
  - The PDU is shoddy at best. Before every event we need to double check that the voltage at the battery is the voltage the PDU outputs
  - We should go ahead and replace the rectifier wire with a singular larger gauge wire to ensure there is not voltage drop across the wire.
  - Need to current test to whole car before the start of the day to make sure we have not started drawing excess current
- Leaking brake fluid need new reservoirs/cap with seals to guarantee that is not the problem
- The Pickups need to be thoroughly inspected as they seem to be shifting and the toe is changing throughout the day.
  - Had to fix it during the event and the toe on rear right still became (positive?) throughout the day
  - Previously had problems with the pickup being pulled out.
- Seth did a good job of pulling logs, we need to go through and analyze the data
  - Should drop those in car log when we get the chance
- Team worked really well together
  - Would be nice to have a push bar as is got tiring after a while and we were the only ones without one.
- Lack of people working on IC legality and functionality week prior to event is concerning.
  - There were few people that helped prepare the car and even less that took initiative to find problems and address them
- The tip of first stage muffler fatigued and had to be welded because the oscillation of second stage broke the weld

John
-parking lot error was an joke, but got solved
-perhaps more water barriers?
-pre stage in dyno was rad, just like last time
-station locations were cool

-morning was clean
-could have been a bit smother in tech
-got caught 2 times were Cade and I were bussy and a team came back in.
-need to be clear with teams on enforcement, and if we chose to help em be ontop of it.
-catch can blunder with GT (took us 45min to gram em a st)

-morning events could have been more clear in start and end times.
-tbh smoother than expected
-auttox was bussin

Endurance
-setup excell for times prior, send ot team with equations in em.
-fucktards don't know flags
-plz make a doc of flag rules ahead. People are reateded.
-some were pressed that we modfied lap count.
-not supper sure how to fix lap count
-perhaps calc lap count right before auttox ends
-I modfied entrance and exit with all the drivers. Made for a clean start but defently pissed some off that I changed shit in front of em.. Id bet if they had no clue they would have been fine.
-what to do with extended lap times in the event of stall. This changed top 3 placements.

Joey
Setup:
- Morning went smooth just tech just took longer with the increased teams and compressed the schedule a bit
- Probably should have assign and chalked out paddock for trailers teams before hand
- Work on track marking earlier
- Check for chaulk earlier before setup
- Seth's general meeting (Friday) probably would have been better earlier instead of 3 hrs later after we were sitting around for a while

General:
- Need to set hard limits on aount of peopleallowed with the cars to prevent the massive groups outside the paddock. Mainly an issue during accelration
- Scheduling for track workers was definitely annoying communication wasn't great past acceleration as groups kinda dissolved throughout the day
- should plan out entry and exit better and comminicate changes i.e. sending cars back in front of hot queue instead of through puts was changed without telling Emile
- did not need 8 people for skid pad so assigning 2 groups was unnecessary and just led to people standing around
- Marshall posts for endurance were pretty far away from the track making it hard to replace cones within a lap
- Should just draw exit guide with chaulk or use big cones to mark exit like acceleration because the waving the yellow flag wasn't too useful. I.e. make a hard guide they have to follow to exit
- Lack of walkie talkies made it a bit difficult to communicate
- Need a microphone for announcements
- Need someway to see times (bring back white board) or setup something on the site
- A live schedule on the website to see adjusted times due to delays
- annoying to figure out who goes where and what not for trackworkers due to hearing different stuff. Need one persondedicated to manage track workers. Seemed like Steven was running a bit thin at the end trying to manage everything (Seth's schedule was not followed and was vague)
- Tell teams to go back to the puts to diagnose their car. Don't need a group in the hot queue/ pitlane trying to fix there (hytech new car)
- Get group picture with all the cars like last year as teams already packed up their cars
- Should put more signs up or post a map to the bathrooms
- Should have announced the tours, people probably didn't know
- Post clear rules and flags on site before hand(summing previous issues)
- Should clarify what happens when a car stalls or just completely messes up like hitting cones or leaving track for endurance swap outside of designated point

Car(ic)
- Front wing/front of the car needed to be raised to align with cad and reduce scraping
- Need to sort out corner weights vs aero level and height before fw is destroyed
- Rw drooped more and more throughout the day
- No one on ic crew switched the aero to accel configuration prior to accel
- Debonding of rw mainplane inserts was discovered when I was switching it over to accel. Could have led to rw falling off while car was running

JONathan

-work on prep slightly more before, attempt to get more sleep? Lol? Start time was good though

-cooking w/ pancakes was great, have someone occasionally check water/food table? Better labeling for items maybe..? Sandwiches were great though

-Having line with EV & IC on the side with charger was good, not too much trouble moving in and out

-Distribute the event schedule ahead of time to teams & spectators, also in our discord

-Speaker phone actually hooked up to speaker? Announcing events better?

-Better communication of areas/bathrooms

-Clarity on hot queue rules for all teams

-Having brakes/accel open was good, but hot queuing for skidpad AROUND brakes was poor. Would be good to swap the lanes if possible so they don't cross

-Having run orders better declared (at least for us) would be good, sandwich wasn't bad but was confusing initally

-Check cars running, i.e. mississippi revving car with wheels on ground facing track kinda ehhhhh

-Spectator areas and mix with pits was nice, good viewing areas and inclusion, but sponsor tents/areas might have been lacking some? Didn't get much a chance to walk though

-Rollin time schedule online/website… lol

-Having better prep for score calculation so wait doesn't take as long might be nice, but having teams clean up and relax a lil bit while waiting wasn't bad either

-Schedule for team photos? Some people were still working or hanging out on track, and thus we didn't get a team photo around the cars (minor thing)

-Photos were bussin

-Driver clarity on flags and events with track would be good, not pulling out onto the side and skimping the track (endurance)

-Keeping people limited with who goes with the car to the groups, wasn't too bad but there was a few that had multiple out

-CHECK THE FUCKIN TIRES & LUG NUTS LOL (all were loose when we pulled up in the morning…)

-Pull logs better throughout the day and label them as we go (growing pain and daq stuff tbh)

-announcement of the tours going around for spectators (may have missed this)

Steven's Dump:

- Need more tech inspectors. Slowed the schedule to a crawl.
- Need speaker for announcements. Contact Brian Kramer (bkramer4@kennesaw.edu) at UITS about acquiring one for AV Checkout.
- Had mic, cables, projector, and screen, but no speaker.

Val

Car
- Things failed in tech
  - IMD labeed and red
  - AIRS HV + - and LV all needs to be seperated from each other
  - holes on side of acc, needs fan mounts there.
- Pedal Apps issue, going out of range
- Pedal box pcb was getting hit by the new accel pedal face.
- Bent board out more
- Bent the accel peadl face itself casue was pressing break accendently
- Stearing is stiff
- Camber?
- Need charging connector
- Need to fit charge cart in trailer. '
- Chrging went well,
- Nice to knowcan charge car off jennie
-

Event
- Panckaes and baconn was amaznig in the mring
- Need a better way to direct cars coming out from lot to reuning. Puiing thu pits was a lot of waling back and forht
- Flags seemd to have miscommunication
- Skitpad move the ting gates little farhter out
- Hot cues??
- Bruh endurance
- Need more food/ snack later in the day. Got hungry angain
- Saw some squad members woundeering and drifetedd over to the cars
- Neeed somenone to cmmunicate if a run was not counted/get a rerun
-
- With the talk with skitter,
  - Dash endurance tracker
  - Driver training
  - VD

Prep
- Nex time for trailer
  - Need to put soldering iron,
  - Wire
  - Heatshrink
- Charge cart

Event:
- Have EV specific mech tech as well as, Hindsight 20/20
- More pre-event tech inspection or more inspectors to speed up tech
- Better explanation of flagging for driver change in endurance
- Set out rules for walking through dynamic zones and for people running around in general
- Megaphone/speakers so Stephen doesn't have to yell
- Better planning for 2nd runs and prioritizing driver 2nd runs similar to comp
  - Going through pits every time was time consuming, also causing a lot of walking for those that had to push their car
  - Better mapping of hot queues
- Make a chart/calculator of time remaining in event vs # of laps of endurance
- Layout cones more similar to comp style
  - We don't need that many cones
  - Fewer cones = easier set-up
- Idea of parking and pit layout was good, needed better execution, too much space in between trailers
- Never used fire cabinet, could have been bad if safety man actually looked inside

EV:
- Throttle pedal contacting APPs board caused APPs plausibility fault due to connector being jostled
  - Bent board out of the way
  - Will need to relocate
- Would be nice to have toe setup for E-car like IC has, need more testing
- Airs HV lv connection needs a separation wall
  - HyTech pointed out proximity of HV to HV and HV to LV
- Need connector for charger
  - It's bad when parents can tell how jank it is

IC:
- Batteries keep dying, electrical issue
- Wing endplate de-bonded
  - Converted to bolt with washer
- Front wing scraping the ground
- Pneumatic shifting issues
- Battery location confirmed illegal

    - Need to support the second stage muffler
- Launch Control did not work all day

Emil:

- Properly setup cars before event (setup check list possibly?)
- Too many cornerworkers on track at once
- Brief drivers on flags during drivers meeting
- Chalk lines to designate exit off course, drivers often were unsure where to go once they completed runs even when being flagged down
- Loudspeaker/Mic/Megaphone for announcements
- More time for tech?
- Make it clear that teams can't mob the track during accel/brakes
- Scoreboard (teams kept asking for fastest times, multiple previous times, etc.)
- Go over cornerworking in more depth, people had no sense of urgency in resetting cones when track was hot
- Somewhat convoluted work schedule, confusion with what people were meant to be doing on track

'23 Invitational Brief

Monday, April 17, 2023 4:03 PM

Prep (Weeks prior)

- Make sure the car works
- More testing
- Mock event?
- Run during endurance conditions again
- Reserve lot day earlier
- Use the June comp tech sheet instead (For EV)
- Start designing tracks ahead of time
- Scoring sheet setup and testing
- Increase urgency/priority to small issues on both cars.
- Volunteer/tasking schedule should be made earlier
- Better mapping of hot ques
- Warmup area
- 2nd run policy?
- Walking to the pits
- Skidpad setup with requeue was jank
- Brekfst planning
- More food later in the day. Snacks.
- More vendors?
- Cones were bussin

Prep (Week of)

- Rigorous teching of the cars
- Do rundown tests 2 weeks ahead
- Dedicate Thursday to cars and Friday to invitational
- Distribute the schedule to everyone
- Handout schedules
- Send more detailed tracks out to teams. Specifically include hot ques, warm up areas, and restricted areas.
- Announce Pre-tech better
- Make sure to put out the sun
- Final go-no-go check on our cars. Bolts tightened checklist
- More clarity on when it is appropriate to be first.
- Make sure laser gates are farther apart.
- Better training
- Define clear limits and how may are with a car
- Plan powered movement areas
- Check all flags

Friday Setup

- Track setup was bussin. Went great.
- Earlier lot closure
- Start track setup earlier
- Check for chalk before we start
- Look into comp/scca cone layout
- Clearly define entrance and exit before comp
- Use big cones to mark entrance and exit
- Make a better skidpad rope

Saturday Morning Setup

- Setup went well. Tracks were easy. Skidpad needs new rope.
- Parking went well
- Checkin tent needs to open earlier
- Driver registration at checkin?
- Better location for checkin
- Signage. Lots and lots of signage
- Charge cart, need better transport
- Better trash can dispersal

During the morning

- Brief drivers on flags
- Procedures for events. Specifically endurance
- Last minute running and setup.
- Moved tents from checkin to sponsor tables
- After the designated tech times, move tech inspections to the team's pits. Saves space and hassle
- Never used the fire cabinet. Was a pain to move.
- Fire extinguishers were required. Make sure it is explained and enforced.
- Driver registration should take place before egress.
- Lots of issues would be solved with mic
- Hard cutoff for events like accel and skidpad.
- Reque for accel and skidpad
- Loop all traffic through one 2-way entrance
- Scoot the timing gates back to inside of concrete
- Center accel
- Be more away of where spectators sit
- No spectators past this point signs

Lunch

- Good
- Yummy
- More water
- Food lables
- Free game signage
- Tell teams to bring their own water
- Food trucks?
- Uneven breaks
- Give Justin more free time

During the afternoon

- Autocross hotques signage or colored markers
- Dynamic que for autocross worked well
- More walkies. Ear pieces?
- Make sure teams understand that all sponsor presences must be approved before event and proper procedures are followed
- Write initials on water bottles. Sharpie would work great
- Sharpie on a string
- Endurance went great - Andrew
- Scoring finalized and clearly communicated to teams
- Not enough time for tours. Spend van money on something else
- Dog collars to be addressed later
- Corner workers put cones back immediately if safe to do so.
- Team photos should be announced before hand
- Cars would be nice
- OXOS asked for photos of car. Were given.
- NDT didn't see their logo at first.

Cleanup

- Good
- Fast
- Nice
- Monkey make pile
- Pile go on truck
- Truck go bye bye
- Basic trash pickup
- Rental van return
- Two more trash cans from the shop

Post-Event

- 2 people on timing
- Good
- Fun - sam
- Need more sleep
- Marble go brrrrrrr
- RIP jerry

Prep (Week of)

- Rigorous teching of the cars
  - What more would you tech?
- Do rundown tests 2 weeks ahead
- Dedicate Thursday to cars and Friday to invitational
- Distribute the schedule to everyone
  - Whom lacked the schedjule?
- Handout schedules
  - No, treat like comp
- Send more detailed tracks out to teams. Specifically include hot ques, warm up areas, and restricted areas.
  - Yes, procedjures like warm up practices
  - Could mark dynamic zone.
- Announce Pre-tech better
- Make sure to put out the sun
- Final go-no-go check on our cars. Bolts tightened checklist
- More clarity on when it is appropriate to be first.
- Make sure laser gates are farther apart.
- Better training
  - Training on what? Please expand
- Define clear limits and how may are with a car
- Plan powered movement areas
- Check all flags

IC Comp 2023 Dump

Monday, May 22, 2023 3:04 PM

Andrew
Went good
Good job new people

JHNH
Comp:

Real case:
Need over all effects fincinal and otherwise

Travel:
Trip up was good.

Monday:
Team did ok

Tuesday:
Load in was good. Do it like that, 11am was good timing.

Wednesday:
Do more to ensure early ntech number
Team did well to get in line early.
During tech keep a fucker on the pit cart, this got slipped.
Keep youre mouth shut and move fast when something is sketchey.

Thursday:
We need to be mone confidant in brakes
Fuel tilt and sound were great

Tech shit:
Seat need to be adressed.
Aero box need to be watched. Don't cut so close.

Change seatbelt bar brace (too much about it)
Move FH endges down (2in rule)

All for one
People need to be yes men.

Design:
Binders need contents tables

Speak louader in the intro ***lol cope***

Force feed the people
Need a story fomr each member
Practice with the binders
More steering of the convo

Helpful for EV comp:

Fuck the door drop, roll out

Nathan

Comp was overall very smooth

Prep and drive was smooth, due to powder coat,
Was unable to rest undertray and had failure right before Comp

Don't like idea of acc in a car full of ppl, fuk the trailer, people More important

VAL
- Leaving early/ ontime was greart
- Zoomed up with time to fuck around
- Always over pack snacks
- Hole in the wall breakfast place pls go again
- Teching in lot helped
- Pre pack the driver gear. Don't loose the rist restraints
- Bathroom van for load in good
- Cost senero not in hetel????
- Design was a L
- Enduro was 1/2 an L
- Tesla Pizza dam u
- Email drove good
- More clear endurance prep
- Mkar EV good so no blue hair
- Teching EV there was nice
- Funnel for oil not what ever iv jank bag we made
- Everything is a race
- stop mentioning the cheese so loudly

MIHAI

Prep:
- Update packing lists
- Driver gear shelf only good for 2 bags
- Again need more/better tooling for pit cart
- Fix trailer lights power
- New tent bag would be cool
- Would be nice to be done with packing earlier
- More people need to know how to tech the car
- Trash bag with pit cart

Steven:

- Went very well
- Food side was easy
- Veggies and ranch were tasty
- Trailer crew was bussin
- More communication on radios
- Don't turn off your radio
- Airport was better than last year
- Hotel was bussin
- Brekkie was bussin
- Coffee was bussin
- Dinner was bussin
- Drive up and down was bussin
- Later breakfast in Ohio was great

Event:
- Careful what is said
  - Don't be loud when we're pulling cheese
- Write names in your jacket and store on hooks in trailer, not pit cart
- Paddock spot perfect
- Use of practice track was good
  - Presented cooling issue that caused rpm cut, quickly fixed and moved on
  - Got drivers warmed up before going out for events
  - Scrubbed tires a bit

Tech:
- Seat slipping on chassis tube caused concern from tech judges
- FHB distance to top of hoop borderline, welding error causes left side to not meet
- Aero
  - Rear of UT too long, had to cut in parking lot
  - Front wing out of box, had to adjust ride height to make work, negating corner balance
  - Aero very close on box in general
- Seatbelt bar not braced in middle of bend
  - Argued that brace location is better at reacting the moment
- Could use a little more space for chassis template
  - Judge did 1st try with no issue through miracle

Design:
- Actually finish car early so that we don't have to do design binders in the hotel
- Binders looked good and uniform this year
  - Create binder format template
- Create standard for part design/machining
  - List what machines are available
  - List of tooling available
  - Fastener sizing standardization
  - Features and sizes able to be made with tooling at hand
  - Best practices for composite parts
  - Joint clamp load calc
  - Tolerances to expect
- Add failure reporting process to design process
  - Car log nice but would be nice to have it all in one place with project proposals
- "Closing the loop"
  - Validation and data to backup designs
- Mass Tracker
  - Designed weight vs. actual weight of part

Car:
- Toe pickup cracking + Upright Cracking
  - Forces unaccounted for in upright
  - Camber adjust. Teeth not ideal
- Drive sprocket nut came loose ending endurance run
- Front sprocket bossing teeth
- Drexler leak again
- Looked clean due to powder coat
- Control arms need replacing
- Air filter flew off in practice
- Pneumatic tank pump needs help
  - Water-Air separator
  - Won't pump past 3k psi
- Shift light very noticeable during accel
- Accel times slightly slower than practice

Marco:

Trailer and Car Related:

Trailer prep went well. I like that we had red toolbox available and just strapped it up. Makes it one l thing to worry about and makes load in and out bussin. Not sure if ideal tho?

Drive up went well felt like adequate stops

Love that man Jeff from Ohio

Unloading when we got to hotel went well

Starting tech that day def Bussin

Pack in felt well. Any notes from people who cheesed load in?

Wish We could grill more):

Wednesday: Damn teams actually making us get on our grind. Pre-Registration Bussin
Didn't see anyone being pressed about unloading in paddock as soon as we got in

Walkies went well in the AM

Can't say anything bad abt Wed

Thursday: Early mornin tuff but worth

Charging Air tank before heading out pretty shrimple and helpful but it looses pressure through day
Organized bolts would be bussin

Friday: Glad we got done before rain. Goin to the statics debreifs are
RIP UGA

Saturday: RIP us

Statics

Business: Went better than before but could keep doing better. Rebecca likes the jeopardy board ide Q&A. They want to see reasoning behind why you made your choice for your company (IE Choice Matrix). The format worked well and appendix def the meta. Make it memorable.

Cost: Need to focus on finance and engineering. Use COST REPORT STUFF they like seeing it online. Do Real Case and Cost Audit parallel. They Like the visuals.

Design: Have Story and Decision Matrix for components. They like validation.

Grayson:
- Organize bolts and nuts better. Takes too long to find what you're looking for unless it's something we have a surplus of.
  - maybe a little shelf with little cubbies labeled would be nice
- Veggies were bussin
- Rooms need to figure out showers a little better. All at night was bussin and worked well.
- Did a lot better on trailer rotation this year at least from my perspective
- Give a chance for anyone that doesn't wanna go to dinner to go to the hotel.
  - Just swing by hotel for 5-10 min max
-

Jonathan
Trip:
Solid, quicker than expected in a way, sleeping is rough

Monday:
Having to do a bunch of stuff immediately after getting out & waiting a while to sleep isn't super fun, but not much better solution because of hotel check in times

Tuesday:
Good day off & prepping for design binders

Wednesday:
Getting early ✔
Would be good to have everyone on board who is with the car what we're doing with tech, but it worked well

Thursday:
Smooth going through tech once again ✔

Friday:
Putting car in practice was sick
Having Steven watch other events was also cool
rain sucked but all events got done + wasn't there for some of it so 👍
did miss lunch sandwich but that was my own fault lmao

Saturday:
I was ded in hotel

Sunday:
drive back was nice, no issues there

General:
Having clear idea of where car is going next and having 2 people on each side + leader is shmeta
Leaving early is cool, but reteching/going over the car more thoroughly each day would also be cool- however this does eat into dinner/sleep time so idk
Having snack bars, veggies, & waters is great
Hotel breakfast & sandwiches & dinner were great
Cloning the hotel key cards ourselves & keeping them away from phones would be good… lol
Getting a cleaning rotation for each room for fresh towels/sheets might be neat?
4 rooms > 3 rooms perhaps but that does mean more $$$
CRAZY 8
Radio banter in cars kept the drive interesting as well as the stops
Staying out of shop/track while sick □

Overall: not as crazy as expected, went smoooth from newb perspective

Heily

Prep:
- Make sure we get practice in with push bar… people were struggling to use it
- Get 4 rooms next time……

Design Feedback:
- Close the engineering loop
    - Include actual examples

Suspension
- Steady state corning analysis

EnD
- Tuning changes over the summer?

Aero
- Balance and simplicity is good
- Drag not being consider in Autox lapsim was not clear as to why
- Weight analysis… How does it impact other compnents

Frame
- Touch on the basics
- Local impact on chassis stiffness
- Accessibility was good to mention
- Understand tolerance on suspension points better

Wiring
- Judges don't like exposed pcb or wires

PM
- Lap sim: justify aero & suspension w/ lap sims & goals
- Include statics within overall goals…. And if not explain why they were not accounted for
- More data acq to pp & analysis
- For goal validation (pp 4) show data or analysis of how goals were met… I need to look over this to see if we alreay do this how we can improve this step
- Documentation for engineering/design standards
    - Proccesses
    - Best composite practices
    - How are we sizing fasteners or joints
    - Component sizing
- In terms of being well prepared for car testing… why are we well prepared?
    - Simple system?
    - No need for complicated tools
- Bring and showcase broken parts
    - Why did they fail, how was it fixed, or what was the decision
- Having a "successful" team does not define the teams understanding on designs
- Go into deeper level goals in terms of going into subgoals per subgroup and how they connect to general goals…. Flow chart include in binder
- Real case analysis
    - Justify cost of subsystem
    - Manufacturing solutions to reduce cost
- Design Philosophy
- Timeline
    - Judged seemed to like timeline due to "150 testing hours"
    - PM needs to understand critical path interns of leads times
    - Buffer deadlines
    - Give projects to members that are dedicated to meeting deadlines
    - State critical milestones during meetings and timeline
    - Prob gonna make a gannat chart for PM sake… and make teams own system of timeline
- Team cohesiveness
    - Communication
    - Transperency

Controls
- Controls on dash don't have labels=bad

Overall teams design feedback
- Whats our design philosophy
- Plan
    - Theroy
    - Design
    - Build
    - Test & Validate
    - Refine… add to pp system
- A test plan:
    - Test goals- intended learnings
    - Whos doing what
    - Baseline for comparision… uuuhhh idk what this means
    - Planned vehicle changes
    - Evaluation criteria
- Data orientation & management
    - Whats being collected and by who
- Post session & data review

IC Comp 2023 Brief

Wednesday, May 24, 2023 1:33 PM

Prep:
- Testing after day
- Like red toolbox rachet strapped rather than turning it
- Nothing fell over
- Teching there good
- RainX good
- Timeline fell behind
- Make Design binders before hand
- Grill people on design
  - Bring judge out
- More rooms?

Competition:

Day (Sunday) 0:
- Left early, good, had time
- Got to Cincinnati breakfast too early

Day 1:
- Everyone got to work
- Stressed out other teams there by teching
- Use hotel meeting room more

Day 2: Drop off Day
- 2 pm to 3 pm no piss, piss van good
- Hard to get straps off due to wrapping
- Getting there early was bussin
- Walmart pickup order good

Day 3: Tech Day
- Tech number
  - Ask about turnaround
- Good deflecting
- Aero blocks to check box
- Pit cart abandoned for a little
- Make sure radios on

Day 4: Dynamic Tech + Statics
- Check sound in parking lot before
- Do line of sight check before hand
- Subtle difference in tune
- Keep pit cart with car
  - 2 People with pit cart
- Bring tech binder into cost
- Mock design would be helpful
- Add finance for cost
  - Cost report helped
- Go through whole cost report before walking in
- Read name tags before going into design
  - Tell what company they work for
- Two people per judge nice
- Design judges wanted to see car on
- Brakes:
  - Be better
  - Launch better
- Don't be loud about cheese

Day 5: Accel, Skid, AutoX
- Good strat
  - Acel, Skid, AutoX, AutoX, Skid, Accel
- Don't walk in front of running cars
- We poor
- Shim bolts don't have room for rachet

Day 6: Enduro
- Tighten that nut, red lock tight
- Checklist of items to check car before running
- Show up a lot earlier
- Set up car before going into set up area
- Teching Ecar that day was nice
  - Pointed out a lot of problems
- Going into statics debriefs helped
- 3-View review

Day 7: Leaving
-

Car:
- Don't walk directly in front of car

Tech:
- Seat slipping off seat bar
- Seat belt bar brace angle, not to middle of bend
- Front wing distance to tire
- Filler neck line of sight
  - Neck ID slightly to small
- Wing trailing edges too sharp, had to tape
- Anti sub belts rubbing against each other
- FHB too close to limit to top of hoop
- Foot template needs more space
- Burst plate legality questioned
  - Make sure rules questions are recent
- Transponder mounting had to be moved
- Foot rest safety wire had to get taped

General:
- Take double connector off of battery
- Tool to check chain stretch
- Front wing mount break
  - Bolt also broke
- 2 Tension caps bolts sheared
- Clutch arm fell off
- Clutch cable came off in practice
- Hole in front wing from rubbing
- Coolant cap not all the way on
- Front sprocket
- Air filter flew off in practice
- Pnuematics bolt coming loose
- Need solution to pnuematics charging
- Unorthodox throttle spring
- Compliance in brake pedal
- Toe pickup and upright cracked
- Drexler leak
- Need new control arms and steering column

Design:
- Not enough narrative
- Not interesting in design in front of them
  - Had more theory based questions over component
- Tune per event
- Validation
- Failure analysis
- Descriptions for images in brief
- DAQ?

Design: Aero

Big fan of "grip limited"

Suspension - go back to basics, steady states, lap sims

Overboard in some areas weight and stiffness

Not caring about drag claim not fully substantiated – histogram for throttle map add speed

Focus on autox and enduro

Do lap and points analysis in all areas

More sensitivity

Some theoretical knowledge

Dont just say we are happy with serviceability, show why

Labels on dash?

Cla

Cda

More yarn tufts stuff

Less stall speed

More grip limited

Speed with throttle map

Ranked priority

1 lb lift = x drag

Dislike tape

Bargeboard

Mid front wing feeds coolinG

Fit and finish

Cantilever rw mount

Leading edges

Isolate engine wake

All 3 elements attached in adjustability

Rw divider

Change For EV Comp: What to do differently in next 2 weeks
- Seat rule
- Checking aero box
  - Make stick and block
- Checklist to check car before run
- Chain stretch gauge
-

EV Comp 2023 DumpEV Comp 2023 Dump

Monday, June 19, 2023 1:09 PM

Grayson:
-Check everything on trailer before leaving in either direction.
- If something looks like it might give out, change it or have part on stand by.
-Double check hours of restaurants
-Pack trailer for emergency repair
- Anything that might be used for fixing the truck/trailer should be a little more accessible
- Like jack for the trailer
- Creat a place accesse bel to the door
-Front wing mounts need to be able to handle impacts and be little less flimsy
-Stiffen wing elements
- Too much deflection
- More ribs? Add ply? Change material weave?
-Smoother leading edges and straighter/smoother trailing edges
- Overlap on wing mold?
- More precise cutting lines?
- Maybe a better way to adhere two parts?
- Change bonding spots
-Better bonding of inserts and top and bottom parts
-Need to have a better composites repair toolbox.
- extra fibreglass
- resin/hardener
- bowls
- brushes
- bagging
- breather
- peel ply
- small mirror for additional flat pieces if needed

Eddy:
-people doing specific jobs every time to install/remove acc from car was efficient.
-business presentation in front of members at hotel aided with last-minute feedback. (Would be good to do something like this earlier)
-now I understand the 5:30 am wake up. Being first gave us the opportunity to jump over people in tech and have more time for surprise adjustments/fixes.
-reorganize trailer to remove excessive weight on left side of axle, or remove weight in general.

Brenden:
Prep:
- Missing some tools in the trailer.
  - Only one of a certain wrench
  - Missing tap and die set
  - Missing crimps and connectors
  - HVD
- Maybe consider reorganizing the trailer to move some heavy items to right side.

Team:
- Everyone was great as far as team mentality

Car:
- Try to design around parts that can be found fairly easily and not a specialty order part.
- Or have backup of said specialty parts
- Should try and have toe and corner weighting done while still maintain aero box before comp, so we only have to double check in the paddock

Design:
Judges would like to see a deeper analysis of the car while understanding how we could be better if we were not constrained.

Other:

Steven:

Overall:
- Great comp
- Team was awesome all week with minimal issues. Focused and worked hard.
- A little crazier than last comp, but was handled extremely well.

Car:
- Acc in/out was bussin. Very fast and efficient.
- Charging times worked out well with minimal impact on other activities
- Tech had some snags but they were easily fixed and reinspected
- Minor communication issues for dynamic event setups. Need a better way of communicating that between leads and chiefs. Maybe a predetermined setup for each event before Friday.

Food/Dinner:
- Lunches were a bit weirder this comp because there were more last minute runs for parts throughout the week. Other team members stepping in to help when I was away was really great.
- More heavily reliant on snackage this time. Sunflower seeds, pistachios, and other quick eats really came in clutch.
- Dinner had a nice variety but the wait time for all the food was brutal. I definitely felt like we could find some quicker solutions to afford more time to work on statics and sleep.
- Snack wagon was bussin.

Hotel:
- Rooms were awesome. Having the connected rooms was a really nice plus.
- Kinda got stanky by the end of the week.
- Ran out of tp midweek
- Reserving the conference room came in clutch. Gave us space to store stuff and work on statics

Statics:
- Business presentation was great. Setup was a bit slow but that can be fixed pretty easy. Flow and pptx went well. Questions were on fire. Appendix slides came in clutch. Feedback was instant and detailed. Great information for building next year's presentation.
- From an outside perspective design went great. Everyone was talking strong and confidently. Yellow binders were clean. Cricut machine came in clutch. Get the pushbar off the car before design starts. It was in the way most of the time.
- I didn't personally see cost, but it sounds like it went well. 99.0 speaks volumes.

Travel Up:
- Went well. Quick and efficient. Drove a decent bit and felt like shifts were well spread between people.
- Brekkie was great. I'd like to go again next year.

Travel Down:
- Was great till we hit Dayton. Then leaf spring went bye bye. Great reaction to that and we managed to get it fixed and get spares of the part before leaving again. Second break was tough but was managed well again. If we smell or see something off then say something. Only complaint I had for the second break was using the hotels as restrooms. They were not happy that we showed up out of nowhere and walked in like we owned the place.
- Cincinnati got confusing. Truck took a wrong turn then we got separated.

Comp:
- Schedule for statics worked pretty well. Having both cost and design in the morning was a bit rough but worked out with tech inspection in the end. Biz guys did biz things after design was over.
- Radios were rough. Volume was turned down a lot and communication to the trailer was sparse.
- Sponsor visits were spread out and in small groups. Worked really well with the overall schedule.
- Trailer runners were well staffed all week. Let us be flexible.
- Reaction to the bearing scenario was top tier. We had an exact replacement and 2 backups in under 3 hrs. Team doubled down and got it done and worked together.
- Reaction to the "thermal event" was pretty good. Our team saw it, reacted, and got out of the pits without getting in the way of the responders. We stuck together and stayed to the side while it was being taken care of.

Jonathan:
Team:
Aspects to define beforehand & establish/communicate a good plan for:
-Corner balance/toe practice & procedure
-Prioritize ease of setup & consistency
-Establish a torque spec for major bolts (mainly to satisfy tech, but still think it's a good procedure elsewhere on the car)
-Ensure data logging is monitoring the important aspects (motor temp, cell temp) and don't let it fall to the wayside

Packing/items/prep:
Make a basic list of items to be on each cart & ensure they cover the basics- we had plenty of tools for the advanced items, but missed some simple things
- fuses
- wires
- soldering tool box is neat
- spare bolts & nuts, particularly for inside of acc
- HV tools for bus bars
- Have new lug nuts

Activities/other notes:
Dinner is tasty but can run long, extra sleep would be nice for important days.. Not sure the best balance on that
Excellent team work, little to no getting pressed when shit went south (that I saw at least), and continued effort from all without throwing in the towel
Acc drop out with team roles is super-efficient
Trackers (airtag, etc) for van keys and other important items may be good
Having the in with people and being early is still key obviously

Design:
-what's between ears, full story of choice, validation for large claims/items, don't pick specific item or aspect to dive down or will get caught in pointless hole, sales pitch of why car good, etc

Car improvements for next year:
Code:
-Mileage & time tracker
-Torque limit on derivative
-Dash lights for WIP code testing/board error ID
-Regen implemented
-Calibrate resolver & new resolver
-Launch control (well characterized, dynamic adjustment of aggressiveness but probably not pid)
-Telemetry (xbees?)
-Led lights for error codes physically on boards everywhere & visible
-Unfuck it and better comment/document?

Boards/wiring:
-Better connectors for daq/implementation on boards
-Hall effect pot for pedals
-Delete apps board
-Fix BSPD pots on VCU (or at least ensure they are correct & usable for next year)
-ENSURE SDC WIRES ARE SOLID AND ROBUST (better method of wiring than just the screw terminals failure on this for both IC & EV)
-Having serial/code access to boards inside acc without having to take apart may be cool (but like, you shouldn't need to touch this at comp so it may not be worth the trade-off)
-Better test energy meter LMAO
-Dash, like in general fix it all lol, appearance, functionality lacking for showing SOC and informing driver

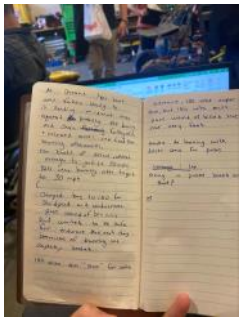
Physical:
-Smaller rad, tilt direction for water routing lines
-Make sure to ground fittings
-Fix steering effort and other aspects ?
-Extend switch panel for off switch label
-Unfuck the lid
- -ie. Serviceability
- -Having rivnuts and such for the top lid
- -Making maintenance disconnects actually be accessible
-Consider seals/water ingress when designing box
-Ensure inverter wires are properly sized when cutting and making
-Onex...ler...??

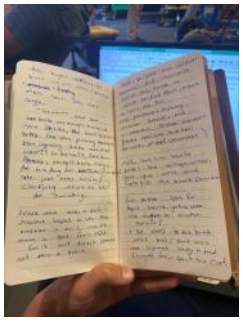
Tools:
-Proper banana jack plugs for HV testing
-IMD trip box?
-Organize shop lmao

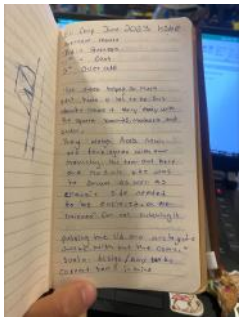
Other:
Wiki/website for systems and organization
Cell fuse testing & of our current cells
Give IC adequate budget to continue doing well
Better plan out financials & project
Vinyl subgroup hugely impacts team's appearance & impression, including with recruiters
Todo list and plan for what to get done to car to setup for next day

General:
Would like to take things slow and be deliberate and thorough with changes & testing. Focus on accessibility and reliability again, while gaining performance through controls. Ensure all testing and projects align with team/car goals. Do the best possible to ensure all systems and design decisions are fully flushed out before proposal cutoff date. Better lay out documentation for projects, and ensure it gets used. Maximize test day usage with planning/goals for each subgroup. Complete designs early and continue on the early manufacturing train.

Val -Didn't feel like re writing







John debreif

Prep:
Need more people week prior
Plz push car ahead of time
We took it close on systems checks

Trailer pakc list needs to be updated for EV
GLV boards need more org or full function spares
Ev only pack list

We were way too soft on ourselves for tech.

Andrew:
- Acc in and out time is goated. Validated that project
- People started to rush when it got stressful and thankfully no mistakes happened
- Need adjustable wing mounts or something to solve the wing vs car being level
- Scale plates with a laser level would be bussin. Set up when you arrive, mark the ground where they go, and it's quickly repeatable
- Would be a good idea to give car a onceover close to comp and replace any wear items if money allows
- Design binders need to be fancied up before we leave and not in the hotel conference room at 2am

Day we left (and Monday)

Drive was ok
We made good time
Monday prep was good
More clear plan to rules check car
Aero box??
Car needs corner weights that can level
We forgot to orner weight when in lot
Packing was aight for comp drop off
Did we have charger tonubhi?
We need to orginise time more this day

Tuesday

Drop off time was rad,
Does not appear to be a ppl limit on Tuesday
Get box first
Have acc specs ready to fill out
We had good plan, was race to the line
Took pics of sight, good plan

Tuesday night was statics grind
Practice design more

Wednesday

Show up time is ok
Good jump on mech tech
Ac load in was dope
Goo idea on split people
No sighnout of acc
Tough break on acc mounts
Show skitter mounts ahead of comp

We were not as ready for mech tech as
See list of tech shit...
People were to slap dag in tech
We need ot learn more rules and how th
Learn how to push back

Welding was good, great job fixing list o
Good job entering EV active
Was cool to be design car we did lose ar
Failed ev active bc energy meter

Opend to fix energy meeter
See energymeter rant
Good job in acc hotw ork
I do take a few issues here
Tie in points were seeming not well und
Methiod of tie in was JANK
Plane needed to be discussed a bit more

Energy meter rant

Yo wtf going on in the baord
Need to direct tie out the acc
If powerd inside needs to
have a switch

Why do we struggle with thi
device.

Cost rant:
Real case was kiker
Hit all the points
Know and practive
Good split of finicanals and sales
Engineering data was coo

Report
Don't start autit by walking thme throu
Kinda gay
Carbon processes need hand trim
Need to reomve spare materieals

Car relatedthings

Rain sealing, was inadiquit
Mthigh busted acc for 3 days to make that happen
That design is not designed to be watter proof

Connectors lacked boots and pins
This is inexcuseable and must be acpounted for in planning
Connectors penetrating flat surfaces?
This needs to be mitagated,not a hard fix

Large flat things require lots of bolts to seal
Be an enginear make sealing fetures

SEALING CAN NOT BE AN AFTER THOUGHT, IT SHOWS

Wireing,
If we can afford get a smaller wires size
Need proper crimper
We need to kill all solder conections
Inside lid think of using a motheboard

On HV side think of planing wire runs

Upper to lower acc cmompartment connection is frankly shit
It is sad we must dissasemble all to remove some

Wireing harness in rear was steller, then we added a shit load of after thoughts
Fix this and keep the harness clean

Buy a cable for the resplver

Prolly time for the forward board to die

Diagnostics
Car needs a nicer can read out
Make an enginears pannel
Show B bit error for inverter and other faults
Have cann connection and RS232
CAN adaptor needs rework and 2 of em

Lid boards
Mounting plasics fails to serve any reasion.
Boards are too close to edges
Boards have connecotrs on edges
Welded parts warp, they need a safe xclusion zone
Need nicer standoffs
Boards should have keyed or collerd conecotrs is possible
LEDs not orented in way user can see em
LED need lables uyser can see and read

E meter hard to remove?

Talk about bus bars

Upgrade boards to not be sus

Dash
What the fuck guys

Rearsusensin
Make shcks plananr
Fix positie camber
Need a boots solution to make em nicer

Sus
Dirct fonrt shocks
Move rack to make forces cooler
Stearing quickconect mopunt?

Daq need a discussion

Chassis:
Acc mounts
Percy is a tripp

Pedal box streanth

Statics

People did not take em seriously
Team was scattered at times

Plan was good and orderd people just keep pusing off

On the bis side, would be cool to have team invloved

Suspension

Control arm syyle
Wheel ebarings
Hubs
Chassis mounts

ve could have been

ey are enforced

bad items.

hour

stood

Thursday

Morning was statics
Cost was rad
See cost rant

Design
Binders were cool
People did well here
Practice more
More story
Kill em

Afternoon was a good split

Diagnostics on this team suck

We need to discuss the panik
This team had a few panik events
One person talk to inspects don't tak over

Ran was rad
Tilt was rad

Friday

Breaings some times don't bearing
We need offline cad
No spare is not cash money
Pedal faults need tobe more well understood
Jackstands test first?

Recovery effor was rad
3 solutions was sweet, good team

Still made it to statics reviews, nice

Fixed and throu brakes
Nice wasy to solves brakes

Missed acceleration (sadge)

Need setup sheet

Team needs to comunacate
If car chages gonna happen need to be clear
Tools go in tool boxes
No pockets!
Hanges need to be written and clear
Was cool after e meter got read
Understand rules

Yeay charger

Saturday
Car prep was coo

Leveling was coo

Enduro needs trackside comm
Nee dmore ways to track energy

Good finish, almost got impunded

Most get regin working well

EV Comp 2023 Brief

Tuesday, June 20, 2023 4:50 PM

Prep:

- Service truck/trailer
  - Tires, wheel bearings and brakes
  - Consider moving weight to right side of trailer
  - Replace hatch
  - Roof leaking again
- Check car consumables
- Missing tap and die set
- Didn't bring materials
  - Update packing list
    - EV specific one
  - Missing electrical supplies: soldering station, acc organizer
- Better organization for radio chargers
- Bring composites tool kit
  - Add to packing list
- Week prior inadequate
- More detailed tech
  - Seat bar should have been done pre comp
  - Seat trimming as well
- Check e-meter
- Tool kits for each subgroup
  - Multiples of common tools
- Spare complete GLV boards
- Don't be up until late before day we leave
- Acc video was good and gave large advantage
  - Can turn in a little earlier
  - Add upon missing section for completion
- Aero on car earlier
- Nice binders for design
- Get color printer + more ink before leaving
- Talk to parking about parking for week during comp
  - Or talk to church to park there
- Track van keys
- Make comp dues due ahead of time
  - Take money out of paypal sooner
- Ensure trash bags for dirty clothes

Competition:

Day 0 (Sunday/Monday):

- Better distribution of weight in trailer
- Corner weight on Monday
- Full tech in lot good
- Rearranging trailer for drop off was good
- Call hotel ahead to reserve business space
- Written plan of what to check when arriving
  - List of what to check
  - When to check different parts of tech
- Make sure people charging acc stay awake

Day 1 (Drop off day/Acc tech):

- Any earlier than 10 am not worth it
- Very windy for registration
- Bring wristbands back to hotel
- Don't need acc ready to claim an acc box
- Didn't enforce people limit
- Vans allowed to park outside pits
- New SES data collection
  - Weight, acc dimensions, questionnaire
  - Found issue in acc mounts, tear out incorrect
- Acc handles nice
- Spare module good in tech
  - Didn't have to pull module out of acc in tech
- Good to walk around and take picture of things
- Taking bolts out night before good
  - Easier in tech
  - Design lid to get tools in
- Have spare bolts for inside lid/acc on charge cart
- Branch circuits argument
- Empty boards to show spacing in tech was good
- Don't use red bodge wire

Day 2 (Static Tech):

- Business practice good
  - Panel of questions for presenters good
- Make sure inspectors finish the section
  - Could have something small that is wrong to give them a win
- Steer inspectors more during tech
  - One person with each inspector
- Forgot transponder before going through
- Split for getting acc was good
  - Assign people for each task
- Practicing for EV active was good
  - Made it easy
  - Energy meter only thing we got stuck on
    - Did not provide proper voltage to meter
    - Inspect board
    - Reference Original fix
- Put ISO views in SES to help with chassis acc mount mix-up
  - Skitter was at invitational, have him look at car
- People should know what queues they're going in
  - Know the rules of that section
- Stick to 4 people in techs
- Be prepared with jacks stands, rachet, and power supply for EV active
- If you open acc you lose tech sticker
- They didn't put tamper proof

Higher placing

Car:

- Mileage and time tracker
- Instantaneous torque limit
- Hall pot for pedals
  - Inconsistent readings from pedal
- Need better access to boards
  - Could not work on boards without disconnecting disconnects
- Scale stands with level
- Voltage taps longer than 150 mm
  - Due to length of modules
- Rear wing bouncy/need stiffness
- Front wing mount broke at both comps
- Wing elements not very stiff
- Leading edges rough
- More attempt at water sealing
- Pedal box not strong enough
  - Bar bending
  - APPS board needs to move
    - Kill
- TSAL gets very hot
- Hatch to reduce # of times taking body off
- Aero inserts popped out
- Inverter mounting to acc
  - Bolt holes spot for water ingress
- More clearance for frame templates and
- Front wing adjustment for leveling wing without causing issues with weight balance
- Body tabs weak af
- Order interlock connector for HVD
- Design not adequate for rain
  - Connectors facing upwards on flat surface
  - Too many bolts on flat flange
  - Connectors need boots or pins or both
  - Design for rain
- Wiring
  - Smaller wires
  - Proper crimper
  - Eliminate soldered connections
  - Plan connectors better/motherboard
  - Better planning for rules required wire
  - Lower box to upper lid connection bad
  - Rear wiring harness is messy due to extra additions
  - Buy resolver cable
- Diagnostics
  - Need nicer readout
    - Diagnostic codes
  - Engineers panel
  - RS232 Connecter
- Lid
  - Mounting plastic does nothing
  - Boards too close to edges
    - Welded parts warp
  - Connectors overhang boards
  - Nicer standoffs
  - LEDS for shutdown circuit as well as others, not visible or labeled well
  - More people need to understand the lid
- Dash
  - Shit
  - Could be tested on its own
  - Label shit
- Rear Sus
  - Make shocks planar
  - Fix positive camber
  - Nicer boots
  - Toe pickups broke
    - Solve toe forces
- Front SUS
  - Fix play in steering
  - Direct mount shocks
  - Move steering rack
- DAQ
- Bearings:
  - Investigate selection
- Sprocket
  - Bolts interact with rear plate

Statics:

Cost

- Assigned most difficult que for doing well in audit
- Wanted us to walk through car, better to ask to walk through what they audited
- Two teams, audit and real case, good, more time for real case
- One issue in audit was trimming procedure of body work
- More people should work on cost
- Know sections for audit
- Pictures of car from invitational were used in audit
- Computers + Binder for real case and audit
- Addendums are nice & give a bone for them to chase
- Need more drawings

Design:

- Do binders ahead of time
  - Page tabs
- Judges wanted bigger design binders
- "Close the loop"
- Liked that subsystem goals looped back into car/team goals
- Steering the boat
- Liked narrative
  - Organize binder to follow
- Have everyone know the narrative
- Reinforce team/car goals throughout year
  - More clear goals throughout year
  - Investigate goal analysis

Business:

- More emphasis on cost
- Walk over 20min early at minimum.
- Bring 2-3 grunts to help with setup and take pics/videos.
- Team members are allowed to sit in and watch the presentation if they choose.
- Other teams are allowed to sit in and watch our presentation if we give them verbal permission in front of a presentation official. Would recommend taking advantage of this in the future and to continue allowing teams to watch ours.
- Brochure handout gave the judges something to read while we setup. It also conveyed that we had spent time and effort preparing for that presentation. Would definitely do again and try to find a way to make an infographic for the online presentation part.
- Slides were great. I put my laptop in offline mode to prevent any notifications from popping up during the presentation.
- Phones should not be in front pockets during the prestation. It is distraction for the judges.
- Blown up charts on 11x17 paper was great. Difficult to read in the slides but gave the judges a feeling that we thought of all aspects of our presentation.
- Didn't have to use the binder at all, but would still prepare it beforehand.
- Get a longer HDMI cord. I was not able to go very far from the TV without pulling the cable.
- Clicker was very nice. Need to

ratchet, and power supply for EV active
- If you open acc you lose tech sticker
- They didn't put tamper proof stickers or temp stickers in acc
- Gave up car for design

Higher placing Teams have them

Day 3 (Dynamic Tech):
- Arriving early was good
- Did statics first
- Car was shown early for cost
  - Gave more opportunity to find irregularities inspectors missed
- Same direction for every car in tilt
  - Very thorough in inspection for liquids
  - May check pressures in future
- Rain
  - Bring towels for after
  - Angled car with jackstands may have helped
  - Main IO connecter needed to be seal
  - Check that all seals are seated
- Have good plan for what to say when entering re-tech
  - One person talk to inspector at once
- Don't panic when something goes wrong
- Diagnostics need work
- Forgot HVD at hotel

Day 4 (Dynamics):
- Brakes
  - Use corner weighting to favor corners not locking
  - Enter at 20 psi good
  - 120 Nm need to pass speed
  - Be able to revert back to regular setup after brakes
- Immediate reaction for bearing good
  - Multiple solutions started at once good
- Read rules
- Still made it to statics reviews
  - Make sure someone can make it
  - Record videos
- Setup sheet for each event
  - When changes are going to take place
  - Don't put tools in pocket, keep in tool box
  - Conservative, neutral, aggressive
- Charging was packed and running out of spots

Day 5 (Endurance):
- Create list of what to check before going out for endurance
- If fire happens in pit, leave
  - Stay together
- Being able to level in G1 was good
- Scales connecter broke
- Regen implementation
  - Can keep higher pace in endurance
- Driver comms with strategy during endurance
  - Monitoring cell temps, SOC
- Need better driver information for endurance
  - When SOC is getting too low
- Can't do anything to fix car when impounded after enduro
- Practice:
  - Only thing people were doing was systems check
- DAQ
- Bearings:
  - Investigate selection
- Sprocket
  - Bolts interact with rear plate
  - Spline to take force
- Launch control
  - Investigate
- Upgrade resolver
  - May help with fault given when flooring car off line
- More space for stickers on switch panel
- Understand AERo keepout zone and ground

Tech:
- Bar under seat for seat rules
  - New rule requires seat to sit above lowest structure tube
  - PERCY was borderline
- Make sure to include plate in chassis acc mounts- double check SES, ISO views
- Would be good to get e-meter to check functionality before hand
  - Use to check power usage during practice
- Torque spec list
  - Answer questions in tech
- Front wing fitment
  - Over/Too close to box limits, rear, heights
- TSAL light cover melted
  - Removal made Tsal not as visible
- TSAL needs good ground
- Grounding boards through mounting holes bad
- Firewall extension not grounded
- Needed to trim firewall for seats
  - More space for belts
- TSMP wires was within 1 in distance rules to firewall
- Side of radiator had sharp points that had to be taped
- If seat is up too high, redirects shoulder belts
- Needed stop for accel pedal to stop from contacting wires and brake reservoir
- Have 3 threads for critical fasteners
- Continuity check AN fittings for HV grounding rules
- Need to find PERCY CAD used at comp
- PERCY
- 1 in from bulkhead is 1 in planer from AIP and 1 in envelope from cross brace

beforehand.
- Get a longer HDMI cord. I was not able to go very far from the TV without pulling the cable.
- Clicker was very nice. Need to practice with that farther in advance to make the flow more seamless.
- I would look into official dress uniform requirements for next year. We made it work with what we had, but the overall dress code was very lax. They seemed to want a professional presentation being presented by professionals. We can do that very easily with minimal cost and effort so we should do so. A clear list
- Practice presenting with interruptions for remaining time. The current speaker mentioned getting thrown off when one of the judges raised their hand for the one minute warning.
- Practice with linked appendix slides more. We added them last minute so it wasn't possible this time, but we can make switching appendix slides more efficient if we can preload high-importance slides.
- Have a final script a certain amount of time before the presentation that cannot change. Last minute changes to a script can affect the speaker and the flow from that speaker to the next. Big changes are especially detrimental to the memorization factor and overall presentation timing.
- There is no bias for the number of presenters. Some teams had 1-2 people and others had 9-10. 5 was a good number for the style of presentation we gave.
- Making the linktree and adding it to the brochure was a brilliant.
- Review and revise the brochure with all presenters and some outside eyes to prevent data overlap, spelling errors, or miscommunications.
- Teams are required to bring their own presentation equipment. The rules and finalist notification contradicted each other. For ease of setup a TV makes more sense. The dean came in clutch for this one.

Energy meter problem:

Original symptom:
Energy meter connector showed 2.6V on the 12v - GND
Did not communicate with laptop

Original fix:
Provide new 12v from the acc to the energy meter
-Cut connection from energy meter to ACU, and ACU out to connector, bypassing the ACU
-Connected CAN H/L directly from energy meter harness
-Connected 12V & GND into pin 7 (12v) and pin 2 (ground), connecting the energy meter constantly to the main 12v line for the accumulator

Results:
-Energy meter still only had 2.6V on the 12v - GND

New fix:
Isolate the energy meter entirely from the accumulator connector
-Undo the bodge, leave 12V for acc connected as usual
-Remove energy meter 12V from acc wiring and directly connect it to energy meter connector

Results:
-Energy meter now talked over CAN when provided 12v externally via a power supply
-Needed to connect 12v constantly to e-meter when turned on still
-Needed 12v while charging

Outside of acc fix:
-Splice 12v source
  -brake light first (this did not really work)

-Needed 12v while charging

Outside of acc fix:
-Splice 12v source
    -brake light first (this did not really work)
    -took power from fans
    -need a dedicated 12V rail next year
-Added a 6pin deutsch for energy meter to change from car harness to charger harness- would just have 2 connectors for the energy meter connection going to acc ideally next year

As an aside- the tractive system would not enter HV because the HVD interlock wire got knocked/pulled loose when performing the first fix