

~~files~~ ~~tools~~

files.1ofarolabs.com/mis/V56

CD Rom dir:

- ① 1 satas / Has220 6
- ② 6 BD @ default

did a swap  $\updownarrow$  via "+"

L==2 v.s. 2==L  
spits an error from compiler

mount # to check

sudo dd if=input.iso of=/dev/sdb

① name of iso ; ②  
bd #  
[sync]

wires diffband, serial data

twisted, noise acts equally on both  
EM effect induces

ghetto going [fling], bigger part on wire coat

flux - cleans & accelerating the tinning process

flux - do not touch skin.

fussy/white mesh bind.

can bus  $\frac{H}{L}$ , darker color is typically low

wire gauge, how many of threads can fit into  
"standard" wires.  
cut off bumps

PCAN USB Pro - Controller Area Network // a serial interface.

// so we can test program w/o running robot

Josmi name = ambiguous

// we soldered wires on to ~~DB9~~ ; (2L; 7Hi) ? not sure if std.

military? Aviation; hi. alt. flying -> 'fingers' short

It so they wouldn't be really compatible.

Q: why do we use serial vs parallel int.?

A: Less wire, ~~can~~

post solder - tin your tip.

2017/10/20

Virtual Studio 6?

files...

"Always make your robots look good  
When people take pictures of your robot  
make sure you're standing by your robot.  
that way people will start to associate you w/ robot"

e-type. lose usb terminals → do not short.

-Dr. Dan

Imb is normal in can-bus

w/o hard → 30 PUF

each Motor driver has id.

\* Juhub, left hand is broken

When you do something on robot, write it down

[0.112 1.11x] ex... try to std. everything

Dr. Oh's cousin design HUBO

Rob & Dan did PhD together

Saemi's hoist is a medical hoist.

bar work around to ctrl. leg was ~85.

hoist battery  
his

\* Don't jump over wires.

head comp's name? take off fan before remove hard drive.

// remove screws so they don't fall & short.

// The Korean guys are really good @ English  
but they're too proud of it to speak it since (92)

\* encourage 'em to speak it more often.

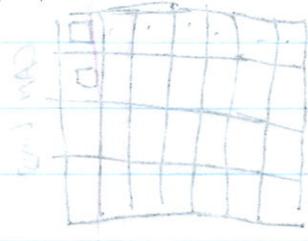
It's been talking in  
Lab all week,  
(CarbineLabs)

Power supply  
Mobo.

PC 204 stack, standard form factor  
" hole size

we pushing comp into push on front + pcs.  
before turn off comp. turn fan on

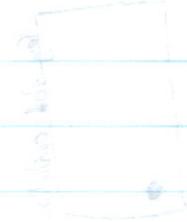
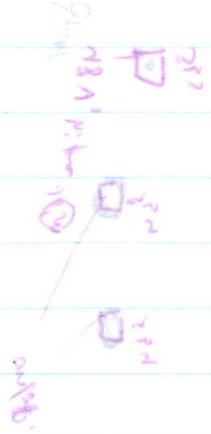
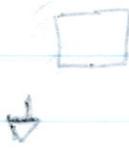
cover of the case  
Mobo. in the case  
fan on



Draw ~~back~~ back

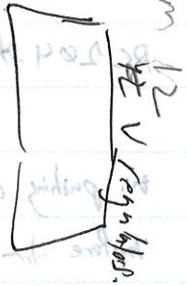
normally remote desktop into comp.

obtained winXPSP3.iso from Maria,



Main Power board

12V regulator



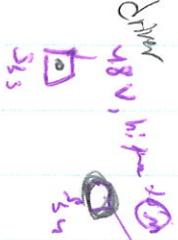
off board. turn for on  
 dropping cost into board on front + back  
 12V regulator  
 12V regulator



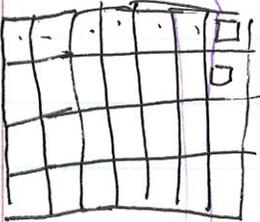
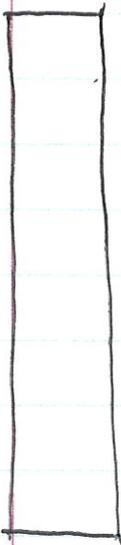
main plug  
 main power  
 main power



S11  
 S12  
 S13  
 bidy main comp.  
 head comp. on 2 floors



S13  
 18V, hi power  
 S14  
 S14  
 on/off



CAN Lines

All in same column  
 connects to each other

Some rows  
 23 Jumper  
 under jumper 1.

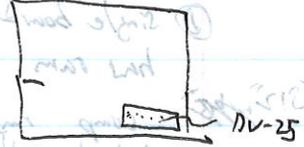
12V regulator



Tue.

CAN - <sup>Controller</sup> area network }  
2 cable network diff.  
motors connect to it.

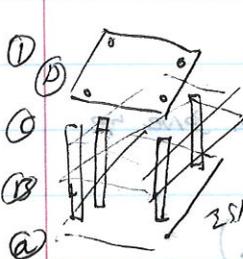
if we have another comp w/ can comp  
DRC-Huaso uses same comp



- ② make adapter for DRC-Huaso
- ① take apart PC 204

PCI 204  
PCI express 104  
PCI 2 form factor.

not in amazon  
indy level not common.



take off from t top.  
heat sink comes off.

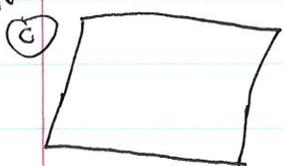
[ex ?? JSA A2' USB] / connect by pins not mounting points.  
"You be jinger"



Q: CAN bus, how many channels?  
# 2 channels

have to set the IRQ, should already be set.  
typical don't go bad

middle set



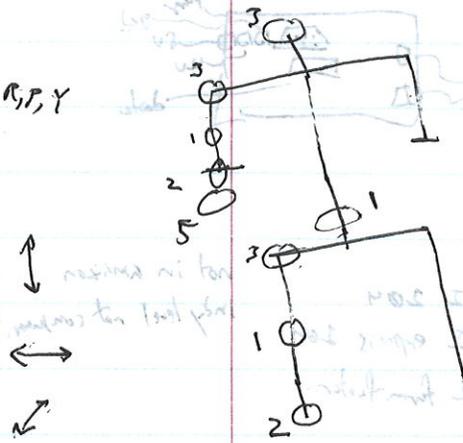
~~PCMCIA~~ PCMCIA adapter, ext. PCI book up.

40 Pin HD.  
removed so we can access to power.  
Also has IRQ, can not have same value on it.

① single board computer  
has ram

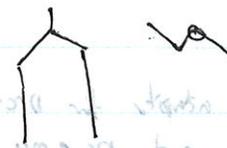
"S12" comp. rny 200 Hz loop.  
What does this comp. do?

Handwritten notes in the top right corner, including "CAN" and "linear actuator".



why do they exist on same joint?

wrist (linear actuator)  
smaller fit in form-factor



head had a ram & same act. as in wrist.

servo - relative anything you can serve up

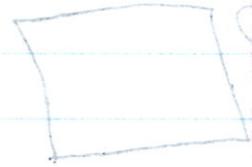
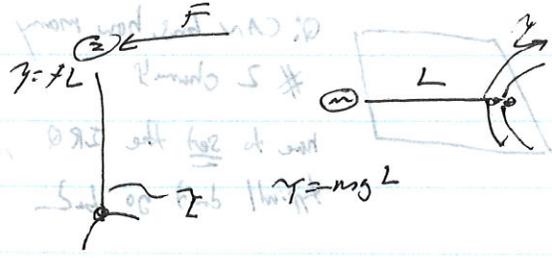
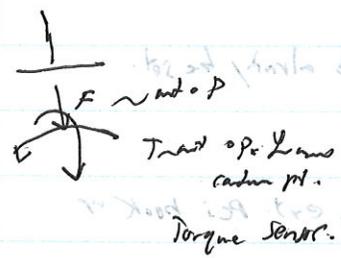
feedback  $\epsilon$  (thermostat)

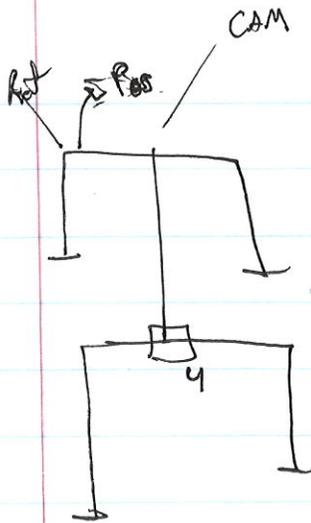
3 DoF  $\rightarrow$  1 servo (underactuation)

depend kinem. end of j. legs

sensors.

load cell on foot.





4-axis IMU Tilt  $\rightarrow$  pitch not yaw  
 @ center of body.  
 in our heads, our ear used for balance.

True nature thing that D. predators  
 do for us to compute.

same concept as optical flow  $\Delta$  between frames.

this robot has encoder feedback  
 1000 dir ??? on quadrotor



in our heads + get direction  
 $1000 \times 4 \rightarrow 4,000$

this robot does not have current sensing

$\&$  wrist have force & torque sensors  
 to give feedback on

phone can't go to moon.

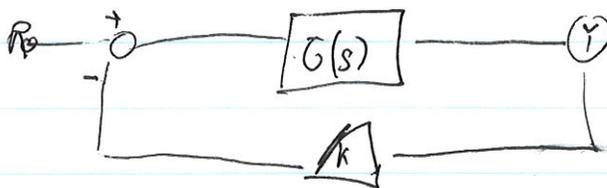
comp. just gets feedback  $\xrightarrow{\text{math}}$  ZMP

Zero moment point theorem.

$\&$  majority of time comp is spent sending/receiving data

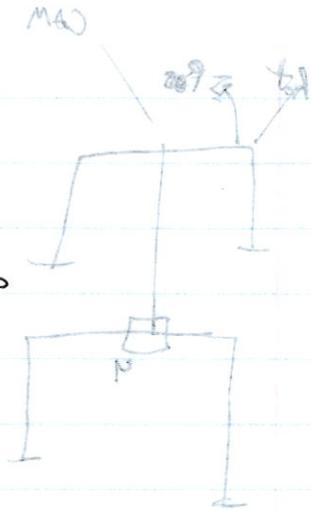
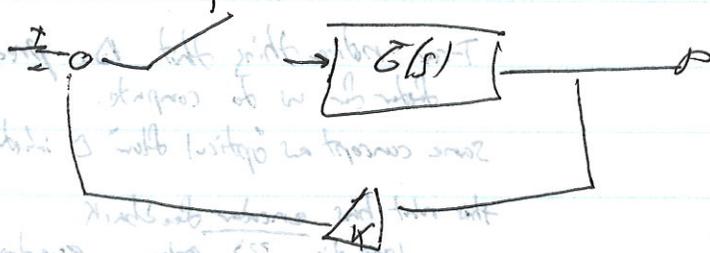
comp runs @ 200 Hz (hard real time)

2nd comp 50



Not what that does.

Comp. ctrl sys is not continuous



soft real time a loop  $w(1) \{$

Get  $x$

where does it come from?  
wall-clock  
because time.

Get  $T$

$$T_2 = T_1 - Z$$

step  $P(T - T_2)$

hard real time.

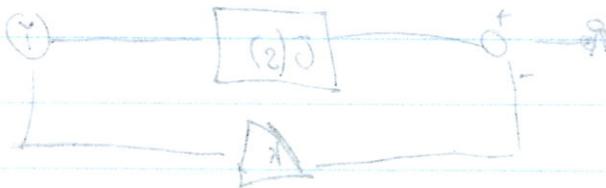
Do RTC ( )

from a hardware clock

2.2 comp. so we don't give it a lot of load.

ctrl sys  $\hookrightarrow$  nise

"robot handbook"



CAN wires convention (center one is low)

diff. sys. H L DV

one on 2019 core wire  
other on 2018 core wire



subbus

DB-25, remove wires

PEAR project - do document all info about AUBO lab.  
put that stuff on DASL wiki.

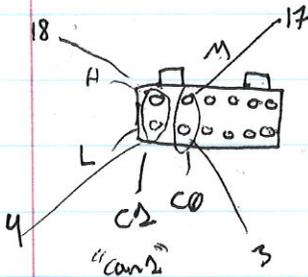
Singer -> frame & leads.

Heat sink - a - oh wire  
wipes clean out debris.

RAM - 012 SD

Left 2 sets, stop all;  
buddum Low.

CAN bus, DRC controller



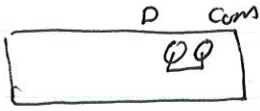
on org. dit -> Low, C1, L  
"OD"  
white dit -> Low, C0, L  
"WD"

DV-25  
part box  
tail box for Jaemi

to be non-invasive

cpu-comp. overhending consobly?

(will it work) (power) (wire)



use a solid core wire  
or get a switch

where does it get power from?

its 5V rail → has much higher current capacity  
according to power box.

winXP, has RIX installed

22MB..... 20K\$

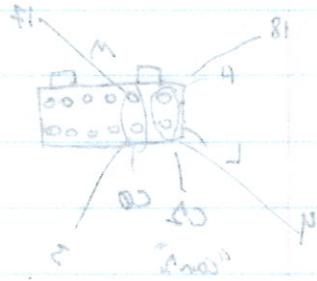
runs parallel to win  
if win crashes, RIX still runs?

single hard comp. o'droid.

"in everything you do, don't show someone something you haven't tested before!"  
blackbox: usb don't supply much P, embedded sys. supplies a lot less.

//white old man, car towed? button on street looking for parking.  
reunions for information

(my CF) VS 670  
MSDN



to be in - not at of

2-5-VA

not frog

insert of red lot

com-comp. overwriting capacity?

cleaning the board

Alcohol Prep Pad 70% iso-OH, (65x30mm 2ply)

also try compressed air

show ipd ←  
-not llw  
foot

compile for x86 side first → RC → set as act. proj

clear, build, 8.1 yields a linking error

then win chss → build → RC → set as act. proj

get these files from github jaemi hmbro

github.com/the-can-complex/

hubo-rainbow-windows

git clone it

set as act. proj

2 diff process talk to each other via 'shared memory'

on the win side 'the app. m p ShareMemory' → " " = True

this is also how we send data to win side

SharedMemory.h, place to share memory

other side "RHY" right hip yaw

pSharedMemory → Motor -> State [RHY] = ch[i];

troubleshooting notes at the bottom of the page

→ it alg. works.  
call func.

~~set boot~~

namespace mems categorizing, use to make readable

bool cart\_gain\_tent1

bool cart\_do\_walk\_flag;

→ core.cpp

void main(void)

{

pSharedMemory → cart\_do\_walk\_flag = FALSE;

// 100 Hz timer interrupt.

in core.cpp there's a loop.

a few time handlers

~~Red~~ FTS\_Tily

FTS → force tongue sensor

~~L = True~~  
~~True = L~~

L = True

True = L

; it's good practice to set the boolean first.

// comments are also in Hungarian

we have to check what else the robot is doing

check all the other flags to check that you're in the right mode.

an easier way to tell it to go forward?

Call entire frnt. to call forward.  
to stop → in GUI press "stop"

unassemble & log.

when turn off, still has charge wait until hoist v-meter.

use precision flat head to remove cast cables

only use supplied power supplied.

left hoist leg: by front, lock hoist when done. return backward

Pad below back panel.

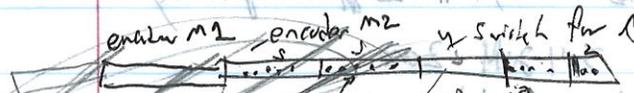
Hubo allen key set, this robot is metric

Shells, bits all go in a specific amount. If one seems to stick cut → wrong or.

Lower leg.

motor. ctrl Jmc joint ctrl.

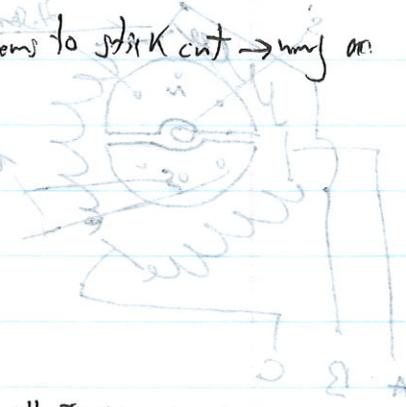
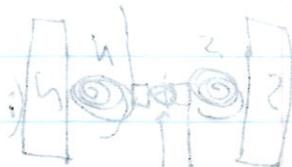
"Series 2"



recheck

HALL effect sensor for 02  
switch for 2nd 02 ctrl

one all & any, do & only



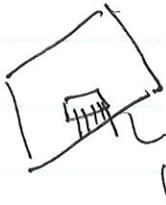
encoders -



internal 5KHz loop.

5KHz loop of it to tell it how many no

sum of 110 of . limit with 110  
"stop" stop stop ... ← 90% of



repres  
(j-tay)

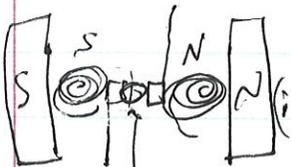
H-bridge → stator

12-12V are 12V devices,

HE-S measure where magnets are

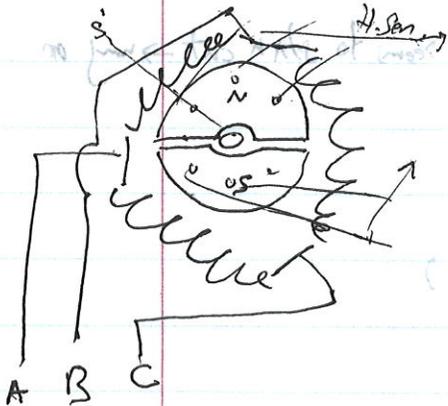
(hands & wrists) 3-phase brushless

brushed motor



tipper?

brushes in hi. Alt. spark  
wear out.

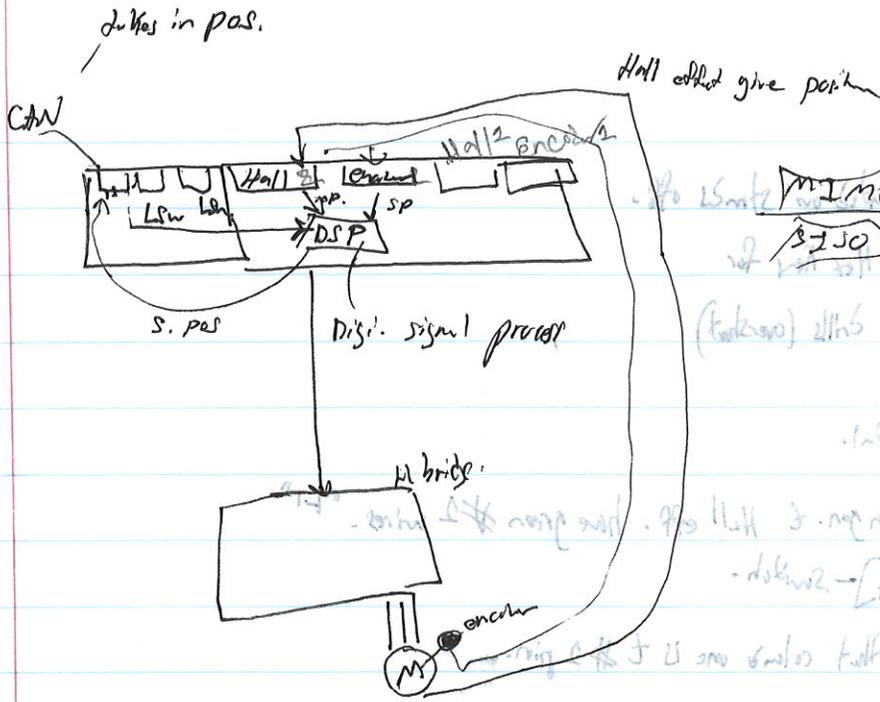


if magnets on t inside  
coils on the outside, 120° out of phase.

if S, then it'll align w/ N  
when it gets there, it'll Δ coil polarity.

broken into 3-4 diff zone.

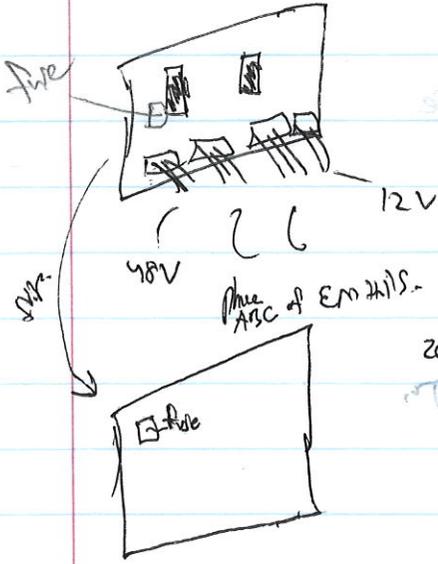
Hall E. detect orientation of t mag.



motor Ctrl.

MIMO

SISO



text = field effect transistor

$$P = \frac{3}{5} = VI$$

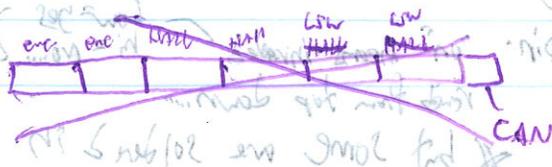
when you ask for too much power then volt goes down

then brown out.

6 caps give it more power when needed.

in a blue room, the caps blow out → resolder new caps

\* press 5 times  
it'll blink  
comp. power on  
1/2 dm  
multibeam



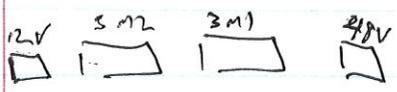
① chl mounted on stands off.  
 2.5 mm Hex Hex for  
 \* don't use drills (overshot)

three (M) chl.

"7-2" in gen. to Hull eff. have green #2 wires. "21"

4 pins 2 wires - Switch.

"comm" that colored one is to #2 pin.



12V is one 'wing' to & fuse, / 48V new fuse

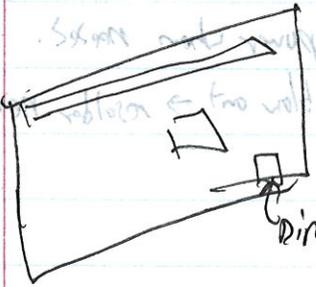
// size of cable 48 should be bigger

stand offs for mech purposes.  
 they have pads,

fine is on wire that melts after a certain T,  
 or conductivity test.

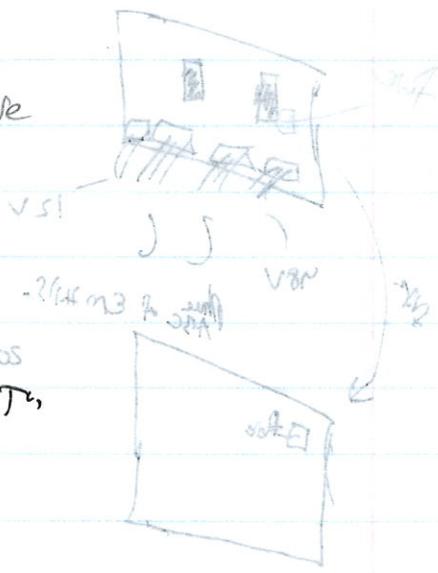
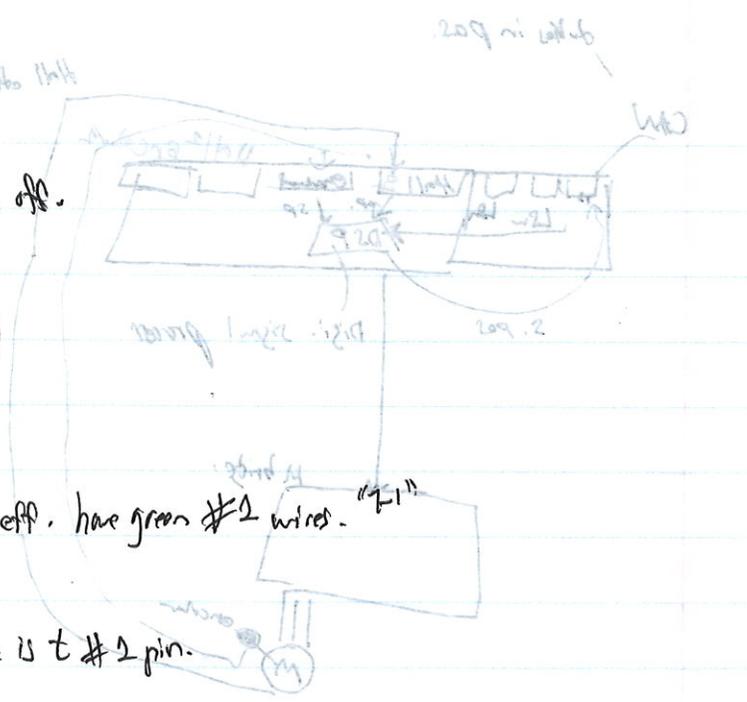
(Dip switch switches)

AOS S-6ix



"un" means inverted, reads from top down... Low = yes, hi = no... } - if inverted

\* but some are soldered in backwards???



# of pins 2 range #  
 will pick  
 no range on  
 of pins

↳ DIP is a name that is transmitted over a CAN bus (not program) switches. resistor.

on 245

1111

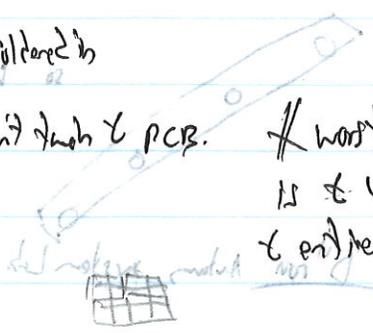
↳ some of these DIP switches are soldered to

2345

pins are on there so bolts don't touch the PCB.

↳ soldermark??

↳ worst case is a 48V shock to entire bridge.



index  
simon  
exp/corner

initial state → home to limit switch, know where it is w/in 1 rev. encoders, will have it until limit index pulse. if top to read itself → limit switch is broken.

tp

DSP → digital sig. processing → micro-processor designed to do signal processing  
FPGA → field programmable gate array.

↳ HW computation.

few things x

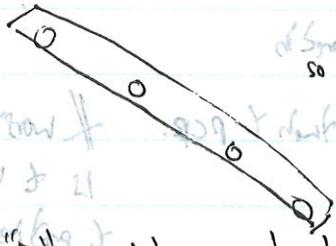
may need limit switch a little bit.



flaw in design: tab switches can click in extreme for positions, but we don't usually move them that way.

longer time  
function

CCW → look up i CW.  
"buy me a S&P screw"



know  
short V80  
pin

"D" run. Autumn system Lab.

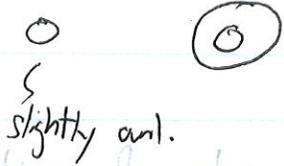
so holds don't gear shear  
2000 of force  
shear

remove while foot

1 these 'black feet' are not printed they're air molding  
don't unscrew all @ the same time, he loosens them first.

accidents on foot so they are fine quality → level foot.

harmonic drive gear box  
harmonic drive is a gear box.



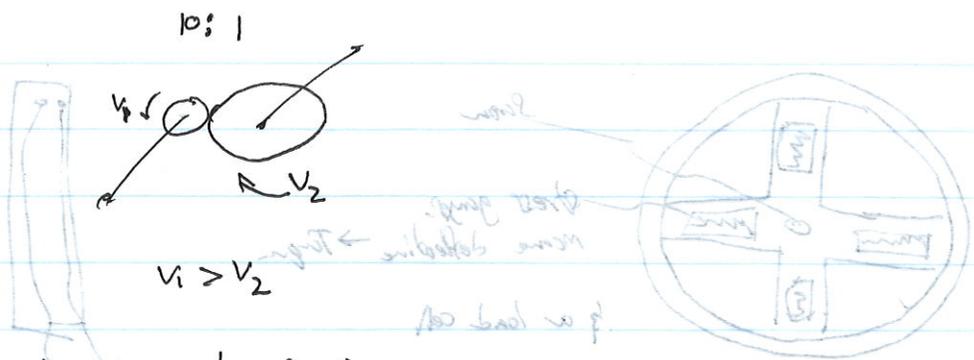
slightly anal.

1 tooth does not fit

100:1 gear ratio

120:1 on floor.

gear ratio is gears in mesh  
you have more teeth than that



downside ~~is~~ ~~that~~ ~~it~~ ~~is~~ ~~not~~ ~~clear~~

no control feed back... (does not work...)

if encoder wire breaks it will hurt you // respect you

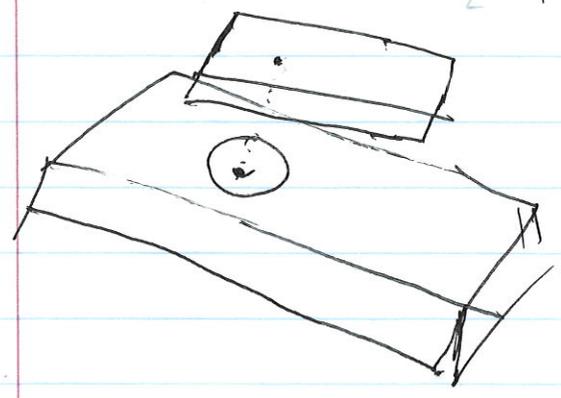
~~tabular~~

Shawn mason & Alex alparak

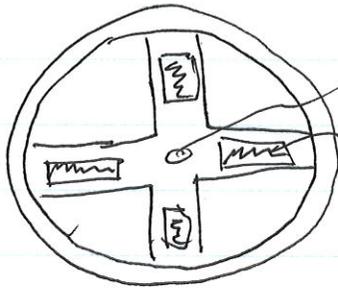
how to put together Hubo 2 + ~~Hubo~~ ~~1~~ ~~+~~ ~~Hubo~~ ~~2~~ ~~+~~ ~~Hubo~~ ~~1~~  
 similar for Jaeger.

lessen all bolts first, then remove → helps so that we don't wedge

load cell outside of human error, compliance intake to help walk  
 but..... ~~we~~ made it worse.



Hubo 3 - Small  
 Hubo 2 - Small  
 1 - girl

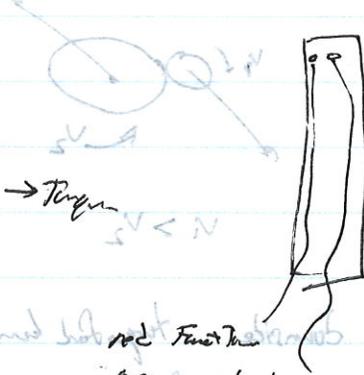


Screw

stress gauge

membrane deflection line → Tension

to a load cell



red function

green actuator

just gets stuck...

there do not have dip switches  
if replace look for id or get dimensions & reprogram id.

hot glue was so that you can't keep ten together in storage.



tighten one then diagonal one in star pattern.

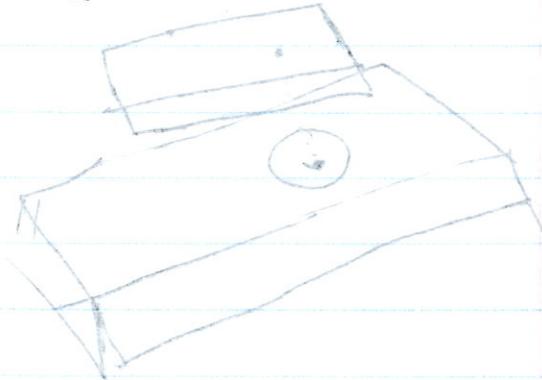
// to make sure it's flat level & doesn't wobble.

on feet single motor ctrl only

head - 3 @ ctrl

hand - 5 @ ctrl

hip - 1



in this



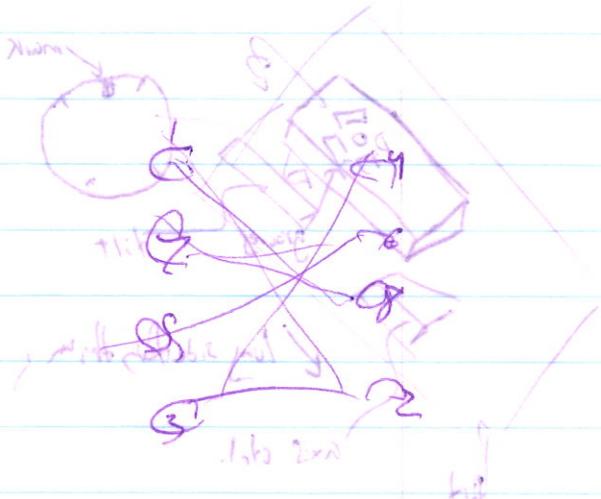
part of the sensor array  
pitch has 2

...with opt-... (opt array) ...

✓ Knee has 2 motors.

// will call it a night

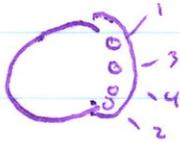
OTX? this night.



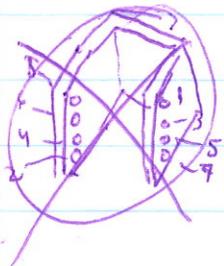
Jan. 14

put leg back on.

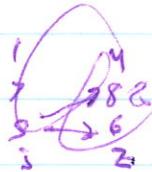
start 10:20



"opp. side built in first so it goes in that"

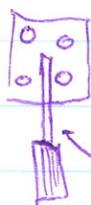


do exact opp.



reassemble from bottom up

foot, use one of sensors.



on other side use hex

flat head to prevent rotate

most common way to strip heads

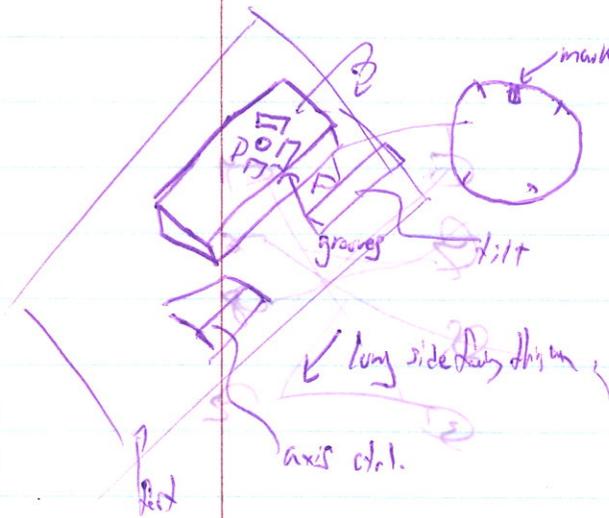
putting it in partially

using diff. std. metric on uses, a size below partially studies  
tables → stripes

digits in



duct tape has residue, try (paper tape)? e-tape also...



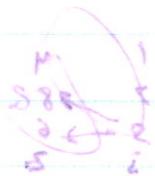
there are 5 marks  
tells which way you had it then

red. in make sure you know the plastic part.

high cut : XTD

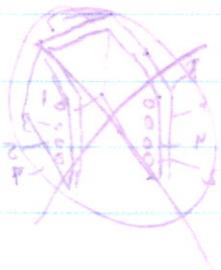
no hand get two M. next  
05:01 tube

left in comp. to use table in that side appo



appo bases is

qu. method next alternative



red. use the table in



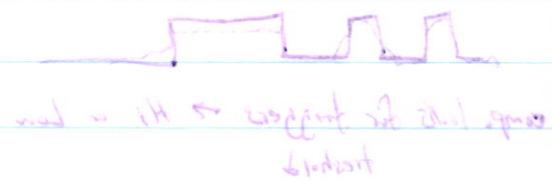
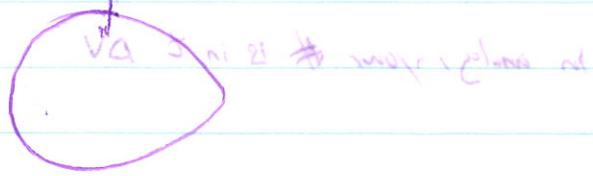
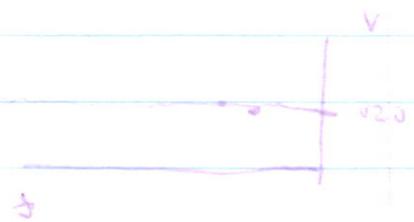
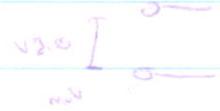
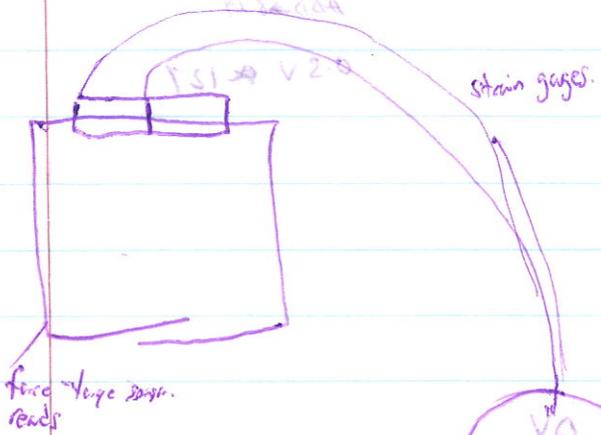
there is one set, test

sliter turning at last part

Foot

splitter 3 on 2 cables, wires here, less wires in body  
Jacks = esd  
V1 = 100

2ds = Ad 8  
112000



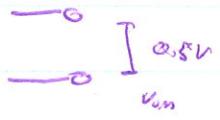
smaller job at times if hater, some prog

15% # job with about 5-10% of work per week

test

Analogy signal, data is in  $t$  width.

Ref = 1V



Opamp output

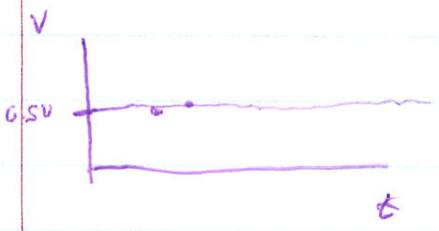
8 bits  $\rightarrow$  255

ADD  $\rightarrow$  8 bit

0.5V  $\times$  127



the output is 255



in analog, your # is in  $t$  DV

digital center



comp. looks for triggers  $\rightarrow$  Hi or Low threshold

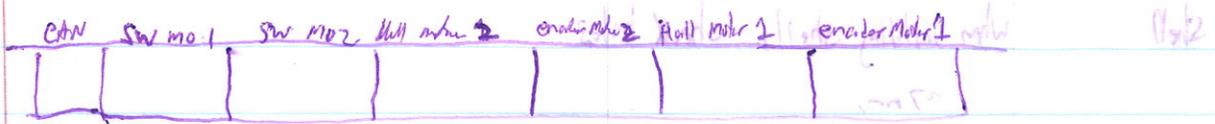


reference level

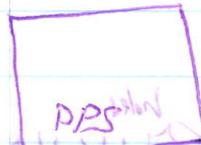
gray wire, short  $\frac{1}{2}$ , convert to digital right there.

(~~more~~ by wire by can? Juan. than by #...) ?

generator → encoder

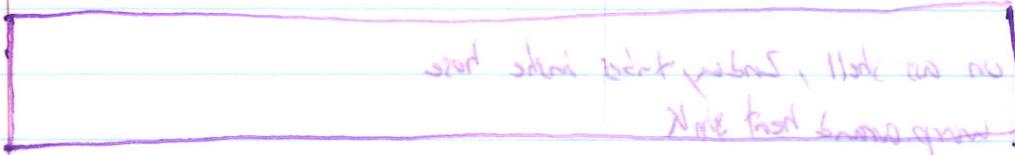


activity → = time (days)



power →

... but not ...



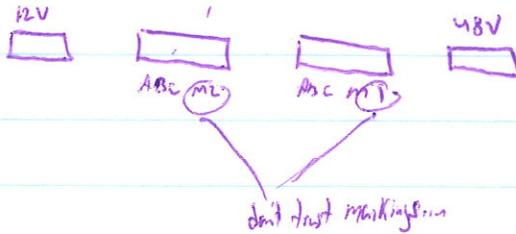
power side.

... that ...

while ... → 12V lines (should be)

should be on top of 48V

He will not explain things to people who are not around.



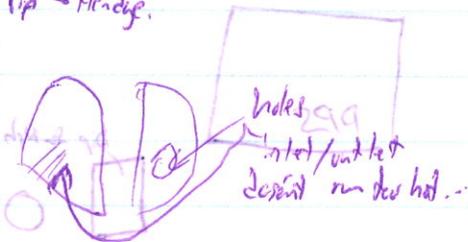
shell

When installing shell, check holes are  $\approx$  in all cases we 1 cm w2 w3

$\approx 7$  mm

shell must be plastic

Up  $\rightarrow$  Pledge



on ass shell, Znday tubes inside hose wrap around heat sink

Arms, shoulder shell - Fast back part.

at shell  
V210 to get no



(get shell) and V210  $\leftarrow$  V210 side



znd day tubes for this shell  
for one side slope of  
5mm

znd day tubes for this shell

✓ main par.

on 12V @ 2.

12V @ 1.

RDP → 192.168.1.129      192.168.1.129

usb problem?

MS.V, file copy etc. → Hubs 2.

① → set as act. proj.  
Build → rebuild

② → set as act. proj.  
Build → rebuild

"Conn. 23 vmm"

why? you don't know IP stuff. so you are ver. you need to be.

on Hubs

main par

2 - 12 volt to sum. (not job)

usb → on . 23 vmm

click on → set with sm -

on main. click on

on GUI

"CAN on"

... ..

Why wouldn't board cases not be com?

CAN plays in backward

Upper body will not run on lower body.

CAN own

with

All dip lines shall be for

C-S shoulder

Sarley

not

S20

S21

2 phase so cus

do home

hit low

↳ Search.

Right elbow, REB

do for every

Why fail?

① Does not hit Lim. Suckh...

Small DC.

- Slightly Pasthe

so check again

② moves in wrong dir

joint is back

③ Lim. done

④ Any/dip was not dip? it never proceeds

in 2 Phase set up  $\rightarrow$  Auto set up  $\rightarrow$  separate! . 5 out

PHYs  $\rightarrow$  calibration might be wrong,

LAP Maps failing.

@mist  $\rightarrow$  comment

Yow on mist  $\rightarrow$  lim sw.  $\rightarrow$  comment switch.

LWD - non

non

Left ankle pitch,

one "off" sw pane still has expansion

off 40V sw.

@ GUI encoder read.

angular resolution of encoder switch.

all calibration will be done in encoder switch.

// need access to left ankle pitch

(index base Hi low) / was get older.  
(le " Hi low)

HVISO 2. ! <sup>knowledge of go to disk</sup> ← go to disk

err...

if error + ctrl,

press de  
CAN off  
exit.

know go to disk ← 2 Y H 9  
ctrl on...

main Power on

12V MW

12V Sen.

48V

press "on" button

GUI → !

CAN on.

ctrl → ctrl

do not press enter  
maybe impeded to something  
not on GUI 'ok'

2 phase set

(home process)

So it knows mech. position within 1 rev of motor...

until it sees index pulse of the motor

so it goes to home where it is when 2 rev

home LAMP

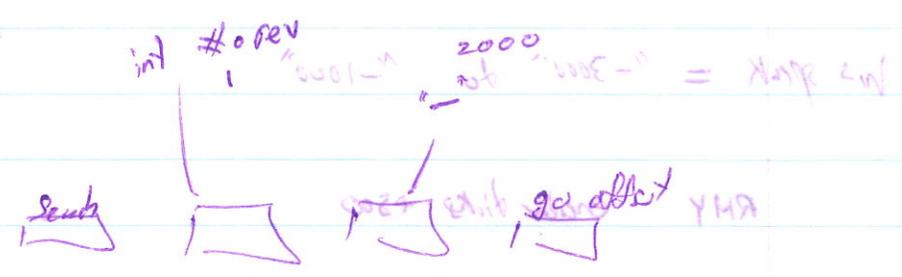
test line search

calibration

Why that order? you is dist. so that legend not mix each other.  
will send have the same.  
When done... exit

change ans @ 125°  
but less stable

how do calibration?



must have correct sensors.

some physical data from as part

$\begin{matrix} rev & - & dir \\ 3 & & 2000 \end{matrix}$   
 moves very slowly do what you're at  
 (not want) to figure out  
 figure out

3cm x 3cm bar



in you @ 4K ticks w/ example of 2 units

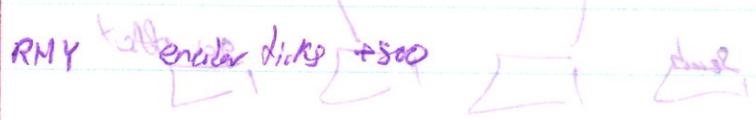
← → printed no other data other #

# Calibration

by class - 1. x 20000 feet ee. 2. 100 is wage. 3. 20000 half price  
 -

-10 , add, minus. 2nd @ 20000

his speak = "-3000" <sup>0000</sup> do "-1000" <sup>1000</sup> , for



they do not automatically same. several times and time

leg straight use laser level  
 line straight  
 3000  
 2  
 3

27/14  
 hark



-1 x 2 rev

is for @ 4K time of encoder @ 5 rev

# who wants to make our homing  $\rightarrow$   
 $\rightarrow$   
 $\rightarrow$   
 L machine voltmeter.

now pitch  $\rightarrow$  roll  $\rightarrow$  yaw  
pitch-axis is  $90^\circ$  from  $z$  roll  $\frac{1}{3}$  yaw.  
pitch-axis is  $90^\circ$  from  $z$  roll  $\frac{1}{3}$  yaw.

when using laptop -  
plug it into a power connection  
5 GHz network

never log into a robot unless you ask person using it  
permission -

on his comp, he got Mike & out.

// if you press "enter" in this GUI  
dim off Hubs

whenever you do something wrong,  
reset & start over.

When you turn off & reboot you lose all the calibration data  
extremely  
→ auto set off does not for you so you have to force  
very & that's what you do at 2120 - doing

reference view

dialogue

parameter range - output value range  
what is high  
lower connection  
lower set to

parameter.par

line 7

to give 3100 → 1500 → 900 1600 is also got range  
- minimum

if you get of one revolution?

-1600, ... 0

the 3rd bit top set, 4th bit no

LHR sin → file in ~~inter~~ file is "data" so set

LHR 5 -1000

centH the unit

There are no negatives in encoder tick resolution, the  
more resolution of way more ticks  
no - bit & better

How to calibrate → simple power sensor

Why was it out of calibration?

& mechanical shifting.

BRK "calibration is a loss of accuracy" also small scale in the kitchen

no field with voltage more than 2.0 V at 100 Hz

you the mechanisms of electromagnetic calibration

if lots of low level joints, can't see any calibration

new data will come

3 major sections: voltage, current, power

calibration work? or just right

oh

oh

Don says adjust. think about → relationship of a

BRK → ohm - amp - watt - error

MRS

new calibration values

oh

2.0 V at 100 Hz

relationship of error

T

T-regime (small) to calibrate antennas in order to find → errors

primary winding voltage errors.

calibrate your field.

before of laser.

HUBO - Laptop → disable touch screen.

LPR

How many cooks in the kitchen?

5. probabilities to fix hi to low value  
attach instrument 3

- silver leg is 1.5 ~~mm~~ mm shorter than black one

Basic geometry to mine side effect is ~~to do~~ ~~with~~ ~~data~~ ~~at~~ ~~all~~

HUBO's balancing plate → "prone" position but to get hi  
rotate bolts until even.

hated down. do feet touch @ same time? ~~yes~~ ~~no~~ ~~3~~  
pitch hip 3°? check bubbles.  
forward,

CS new calibration values.

to parameter ~~date~~ ~~time~~ ~~prob~~ ~~name~~ ~~year~~ ~~month~~ ~~date~~ ~~time~~  
name - year - month - date - time  
C ~~by~~

5:43 Looking @ <sup>2</sup> files.

harmonic → geometry of data.

encoder → amt of disks in encoder ~~no~~ stability of (name) ~~input~~  
basically moving variables around.

keep w/ stability

power of laser

Oussama Khatib

reading from parameter  
k, new params in file.  
rebuilding hierarchy.

not find  
the same

for this this GUI  $\equiv$  FIG

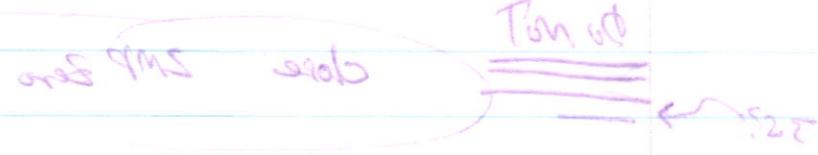
No, then, no way, I will

FIG, to you are first, then ~~at the~~ home... left to right

now she's @ 0 position.

position to ground  
RAP out? (lit)

nxsp



Q: how did you calibrate hip? → rule FT

exit, not x out (scales Phys... out/pt) FT

back RV sensor Swc ... FT

lower Hubo on a flat ground. (e.g. plate)

give it slack

wait 10s (make sure not moving)

turn sensor Swc on.

S. ZH

this @ sensor IMM / tilt sensor  
this is what it views as flat plate

25

0222200

wait 100,  
Lift Hub up,

moving with robot  
slit in lower part, it  
probably (multiplier)

then !, can on, wait, ok

ZMP Zero Set in t main menu. = cut off with it

FT null... small (force torque mid), to // when hanging & nothing  
is standing

nothing - 0 & @ 102 was

Do NOT  
===== close ZMP Zero Single Box =====  
3.5? →

FT show FT sensor Read

if Right Foot FT (left with 0.2) too x too, too

Mx is as not around 0 ...  
My  
Fz

Just click 'close' (wait for sensor) 100 times  
click 'Hide' . NO one sensor not

5.35

more lift / more sensor @ mid  
but if lift is more to back is off!

5.2

8.36 You H into robot could sooner

on main menu  $\rightarrow$  Tilt show # show diff between groups  
it well  $\rightarrow$  start compensation

hide in diff red box // not clear

@ Zmp set box  $\rightarrow$  click start // will miss the more by, when more ahead a bit's feet.

ZMP  
zero moment  
point

or  $x-zmp$  10mm  $9.5m$  so no miss  $5-10$  min.  
 $9-zmp$  @ mm  $\pm$  stand is bigger  
/ ground  $\frac{1}{2}$

// stroke bound ? good spot for balance

/t stage. 1  $\rightarrow$  15 in of room so you can go both ways as  
only 4.

once  
 Kick walking  
 prefer to have failures on a VR than not  
 walking phase,

6:43 id list

10:47 you never leave robot running unintended

Main Pan.  
 12 M/S  
 48V. on  
 48V M/S  
 Main Pan.  
 MPan  
 12V M/S → lights + fans turn on  
 48V Right  
 on sw.  
 → cont

if comp. on

# off, bigger up one

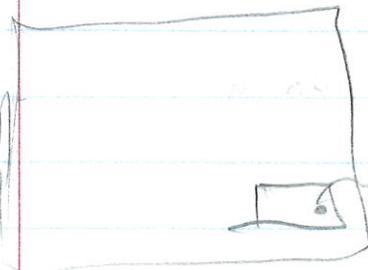
① on

cuts power to 48V (relay)

1 sw. for comp. need to be turned on.

low. or power rel. comes from comp.

// to ③ button does nothing.



Key fob  
 Jaemi Hubo.

# press 5 times to reset will blink back @ you saying yes I heard it.



9MS  
 camera  
 through

!, CAN on  
z-phase

// D rshn. close out of remote desktop,  
open it up again for conn.  
show opt. → display

// lights are on? reprog. for remote ctrl. resolved py

to close program CAN off 3, exit (not 'x')

/Dan usually has higher soln. screen so he doesn't really run into  
these issues. (Mac...)

o - - -  
z-phase but // in CAN → just click ~~exit~~ do stop.

do we need to calibrate it?

when you roll bar, ⊕ go a few revs off.

z phase, auto set →, now they're straight. why? lim. sur. Aren is  
very small Aren

\* but when she kinda homes  
just re-define bar again

to give good ref. → use balance plate.

When lower H diam. part hand on should be to make sure the  
(and's purple).

now op. tilt w/

pitch vs roll, pitch is easier to fix.  
re robot.

Zero-phase set

When ~~altitude~~ ready

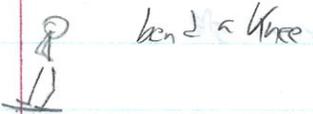
lower.

70 \$ 100

// when low joint, give her some data

problem w/ tilting & robot?

\* one leg is bigger than & robot.



gear ratio of hip:

variable values in para meter, pw ?

edit -> find in files

what else is in the gear ratio?

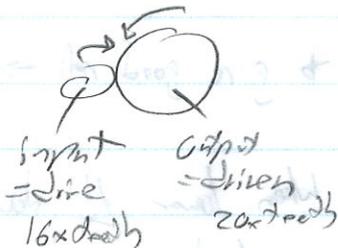
16 tooth drive }  
20" driven }

on RHP motor

16 teeth on & drive on & pulley

20 " " " on & output shaft

-> spin input shaft 16x so output spins 20x



16:20 output shaft only, rotates 270° / on which?

160:1 on harmonic



hip & knee are similar) not exact.  
foot/ankle not.

on ankle low gear ratio.

calibrating, you can do it exactly, but it's not easier to do it  
little by little.

This part does take a while. whole point here is to make one of  
the legs straight.

When loaded, the feet would be parallel w/ each other.

we just <sup>adjust</sup> calibration, same values.

hide, don't close

exit 2 - place

don't can off

exit.

TOTAL

~~12/12/12~~

Helped install 2x platforms.  
Ran  
\* Check tool to see if bubble is chisel  
Flash at edges connect  
locks but ~~1/30 s~~ 30 s  
off by 30 seconds is a  
common variance per project  
(not 32?)

Robot - started weirdly

Doc. played some near bed...

Turn dir for R. stroke might be to reverse dir.

Save copy, edit file

#

lost connection?

server/remote issue → check a random other page.  
erro...

fine off.

48v off.

go up do comp.

disc. wifi adapter wait ~ 20s.

plug in, try again

if more wifi dongle problems.

\* no mech. problem w/ emergency stop light  
but there is an electrical.

Ter H ~~main, sw~~  
~~TEMP~~

LSP (left shoulder pitch) → 20th line. check it wire.

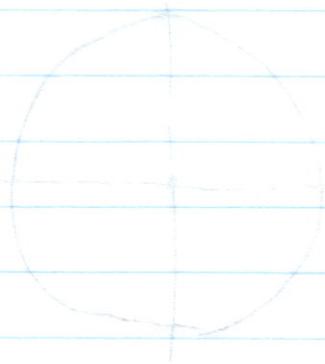
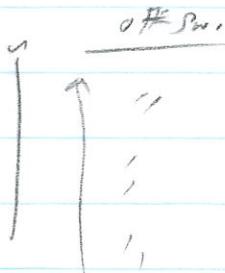
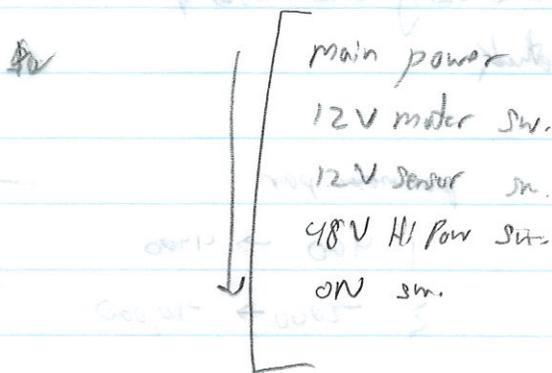
\* also Date & time stamp edited

1:13 AM

review turn on: power supplies (emerg.)

volt/amp meter. @ start  $V_0 > 50V$

$A = 0$



192.168.1.129

F-T sensor is broken.

502 indicates

MP.

Big  
one

12V m/p 12.5

48V

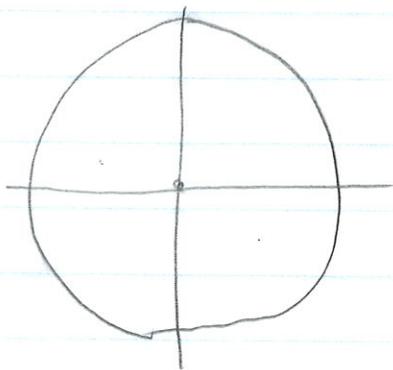
on

2:13

still calibrating  
a little lag, other people are using the network  
I like having a dedicated network

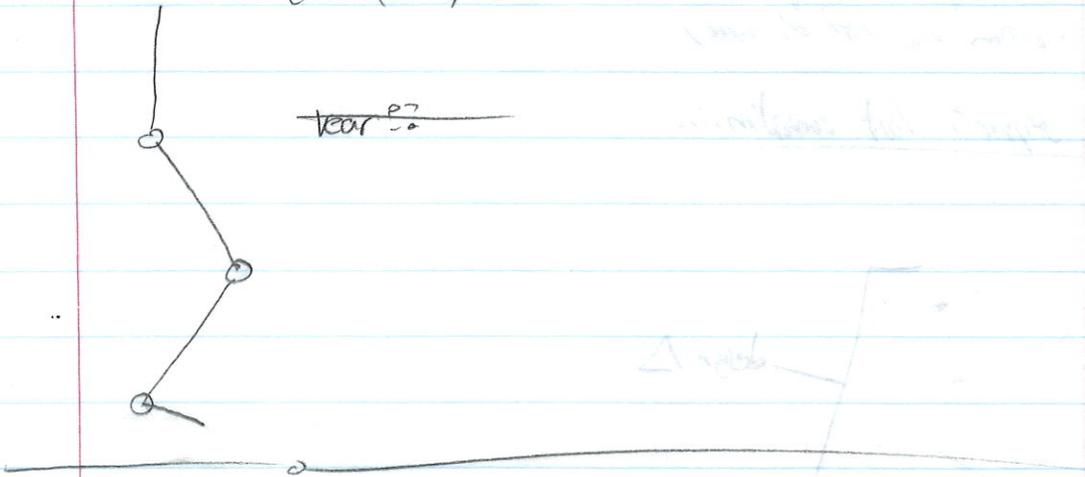
4:23p

back from break



//write comp. program that'll automatically control  
that for you.

calibrate w/ tilt read



Kick walking → 'home' // homes to default positions.

~~dit i one, copy, rev.~~

5:13 pm → click sound is one of the hips.

L<sub>241</sub>

F-T show v.s. tilt show)  $\frac{1}{2}$

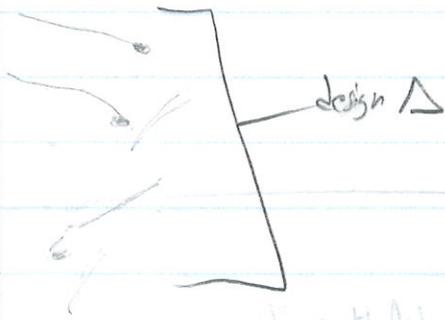
5:24 p -; calibration did not work.

// ~~to~~ go do settling, we won't have it walk, we'll now make it do gestures.

17-23

5:32 plastic shielding in RKP is misaligned?  
 want plastic compression sensor hit by shield  
 Do. Don say not do wire.

5:32 stepped? lost connection...



missed to check conditions // want to check conditions

uniform bar guide info.

// Kick walking

click

D walk

5:46 something burred out.

5:54 rem. shells in Rkg.

in 2 phase if it fails auto on lower body it'll rest itself.  
" " upper " you should manually rest it.  
ext.

Kick walking.

6:02p Another brown?

sandy in (L+R) - something was locking

"Right force-torque sensor → only up"

"hand (M) ctrl is broken..."

will be confident

Disc revu

when lifting, hold up.

grab by arm

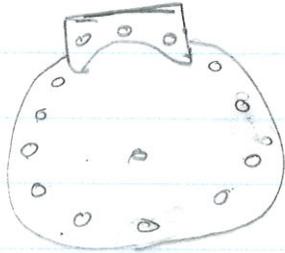
2nd person vintage book

↳



Right hip pitch is ~~the~~ roll

Pad



precision harmonic

"20-160 429529 6 ips"

gichang  $\Rightarrow$  "air port"; "chee-cang"

we weren't missing any, they just became unclipped

how? years of abuse...

~~X~~ wasn't ~~a~~ missing ball bearing

6:57

putting casing back

LAS  $\rightarrow$  DCA direct

US army

" "

Carroll

~~direct~~

gets clone url ~~and you can just copy / clone a repository~~  
https://github.com/ethersample/juice

github

-am // flag all message

bitbucket : github

git →

~ 11:14 = 9hr ago files updated.

green + Δ main & add

red - Δ subtrided

shell → cd ..

git home branch  
origin master

HUBU

home

Kirk walking

✓ walk test mode

// bug w/ force torque

func. → "no walk in place" / lifts leg by ~1.5cm.

→ gesture // button, adda (w/wing)

? Why does it go inactive? // prevents user from  
clicking it twice

human safety & features

C/ use / motion captures. // not in your VM.

you need to know when things are done  
it's asynchronous you need to set up flags so it knows  
do not click on other gesture while it's still active.

motion active button

Tap  
1  
2  
3 ] not safe.....

300ms delay  
300ms delay + 300ms  
300ms delay - 300ms

generate your own gestures.  
implement UDP

and from another comp.

when done click close (gesture)

to Kirkwalking → home

~~exit~~ can't

exit

gesture

gesture

gesture

gesture

gesture

VS

in GUI, when you double click on an icon when  
it's to add proj it takes you when it is in code.

do search both functions.

??  $\odot$   $a-z$  interpolation?  $(+0) ; (+2) \Delta$

this is a template for all t motion caption profile.

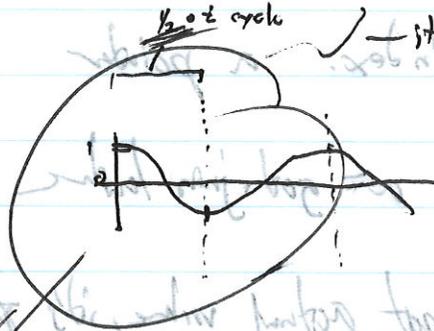
must be a unique motion number.

check to see if file

motion\_Flow / find where it is in t code.  
it'll only search in t active proj.

"like it"

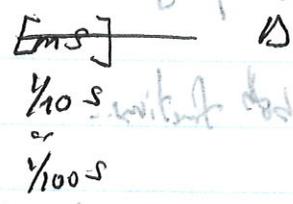
but none.



it starts off smoothly  
& ends smoothly

// this was done  
by t HUBO Lab group

magnitude time counter start time end time pointer



$D(x, t) \approx (Dt)$  // how long with us?  $\odot$

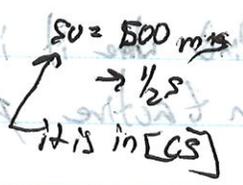
attempt to do one

arg 2

where we start.

Mag. (-, +) time  $\Delta$  time

width =  $\frac{1}{2}$  car



RSP is an index. a pointer

returning value a = god. jms. leader

a pointer... not actual value, it's <sup>address</sup> ~~ptr~~ in X memory where it is

sand's orbit address.

this is in degree.

~~of~~ newer software. is in red.

loop.

create a button.

point at your  
place hand down,  
then point w/ other  
place hand down,

11:58

install git on winxp

using git bash

git clone <https://www.github.com/the-dan-complex/jaemi-hub>

cd into desktop

op. vs.

open workspace

Left panel → resource view

Dialog → IDD-Dialog - gesture (Win)

// make a new gesture button

Goal

point  
new point  
complete C loop

... number list ...

... number list ...

... number list ...

# new button

copy button, paste, menu

... number list ...

\* when search name

for function

maximize 26 ->

... number list ...

New button

RC caption: (NewButton)

~~C\_Button\_Message~~

C\_Button\_Message

... number list ...

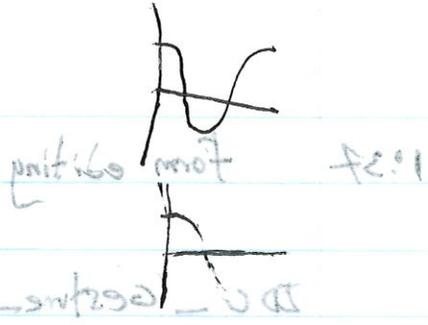
11:11

new task ✓  
 [15] 45°  
 [15] put it back down

right elbow pitch

wait 25

put it back down



@ 4p → after motion is done  
 create a separate branch

→ make udp send (255, 255) packet  
 it will run that for

// pick a port number 1000  
 (maybe have test feed back)

udp??  
 1029

udp send (255, 255) packet  
 it will run that for

my new system has the table  
 on R = 1029  
 W = client  
 it will be 1029

~~not~~

1:37

form editing

doing mod's right

that won

IDC - Gesture - RAISE - RIGHT - ARM

mod's right

del. jnew.

and is right with ← qn

change a servo

Caption: Joule Raise

ID: IDC\_GESTURE\_RAISE\_RIGHT\_JOULE

mod's right

ctd w/ server & client

0001, unless long a 1000

test those indy

make sure that's not

2 row w/ indy spec

1 client

1 servo

28 960

get msg client/srv

and ex code.

251

// Robot will send package over yrs

Robot = servo

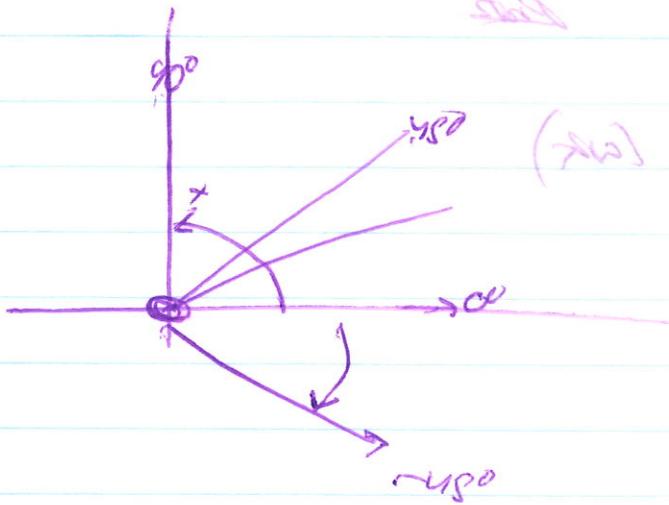
w = client, just listen for ZSS

if buffer = ZSS

~~how to~~

make a

- ① have github acc
- ② commit my as to my ghl acc.
- ③ fork new home in my git repo.
- ④ mk udp receiver why do up client/server so  
→ start so send clip into gesture.  
loop, constantly listening  
all in as address or ...



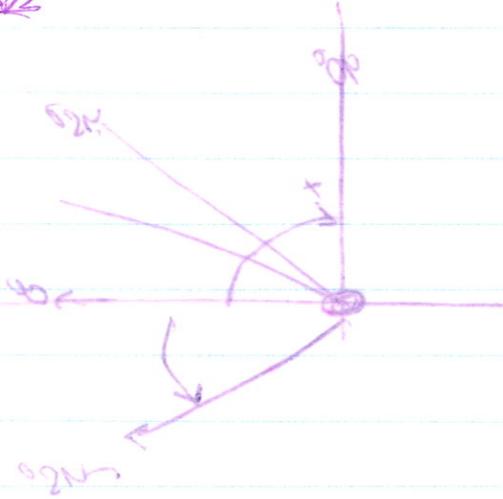
~~edit~~

make or

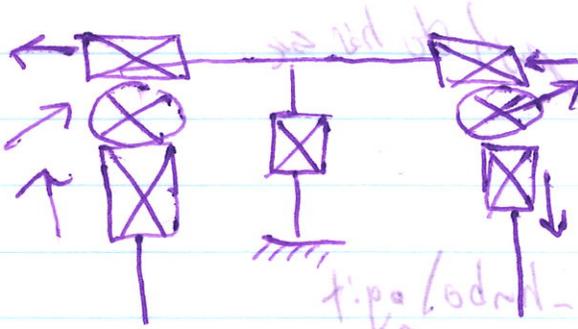
① use `atan2`  
 ② count of 02 & 01 off axis  
 ③ for use `atan2` in `atan2`  
 ④ use `atan2` to get angle of vector

do this header file  
 → edit → Motion Point ~~.cpp~~  
Protz

clean?? (avr)



ONLY

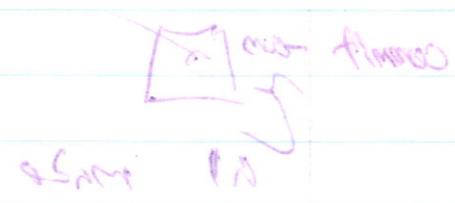


Handwritten notes above the diagram, including "20 17 11" and "5/11/11".

Handwritten note: "tip of rod - in - out"

Handwritten note: "this type obtain a result"

Handwritten note: "You are making a"

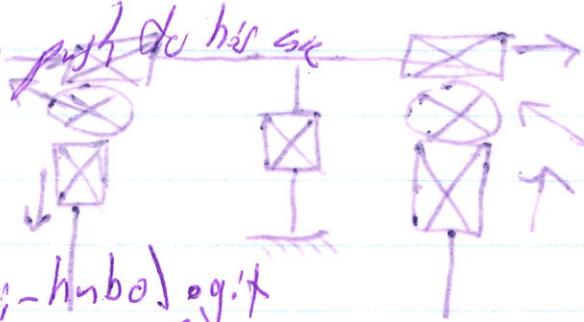


Handwritten note: "at least" and "at least 10"

pubs from Dan

so it'll definitely push the bias out

VJMU



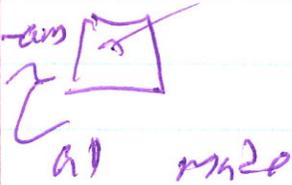
in Kurt Jaemi - hybrid logit

11th year project etc.

there's a hidden ag. & file

in v1 = " "  $\Delta$  don't name it  
(you are name)

cermsit



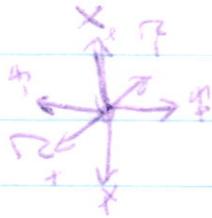
$v_i$  (v<sub>i</sub> vs. v<sub>m</sub>) diff. verloss  
v<sub>m</sub>

how to verify if your pushes push

clone  $\beta$  check out  $\beta$  push

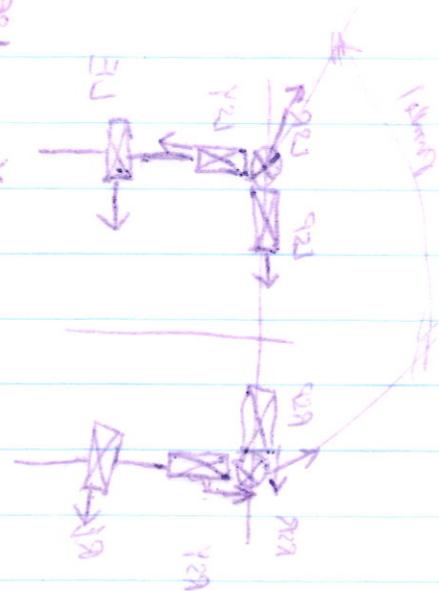
$$\begin{aligned} \Gamma_{20} &= 180^\circ \\ \Gamma_{20} &= -180^\circ \\ \Gamma_{20} &= 180^\circ \\ \Gamma_{20} &= -180^\circ \end{aligned}$$

resp  $\beta$  code on top that



$$\begin{aligned} \Gamma_{20} &= -90^\circ \\ \Gamma_{20} &= 180^\circ \\ \Gamma_{20} &= 30^\circ \end{aligned}$$

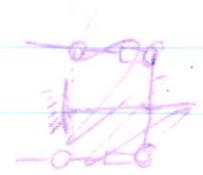
$\Gamma_{20} = -X$   
 $\Gamma_{20} = +Y$   
 $\Gamma_{20} = -Z$   
 $\Gamma_{20} = X$   
 $\Gamma_{20} = +Y$   
 $\Gamma_{20} = -Z$   
 $\Gamma_{20} = X$

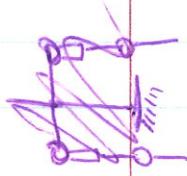


$$\begin{aligned} \Gamma_{20} &= 135^\circ \\ \Gamma_{20} &= -90^\circ \\ \Gamma_{20} &= -120^\circ \\ \Gamma_{20} &= 120^\circ \\ \Gamma_{20} &= 90^\circ \\ \Gamma_{20} &= 135^\circ \end{aligned}$$

$$\begin{aligned} \Gamma_{20} &= 90^\circ \\ \Gamma_{20} &= -90^\circ \\ \Gamma_{20} &= -90^\circ \\ \Gamma_{20} &= 90^\circ \\ \Gamma_{20} &= -90^\circ \\ \Gamma_{20} &= 90^\circ \end{aligned}$$

WUWU SHUW





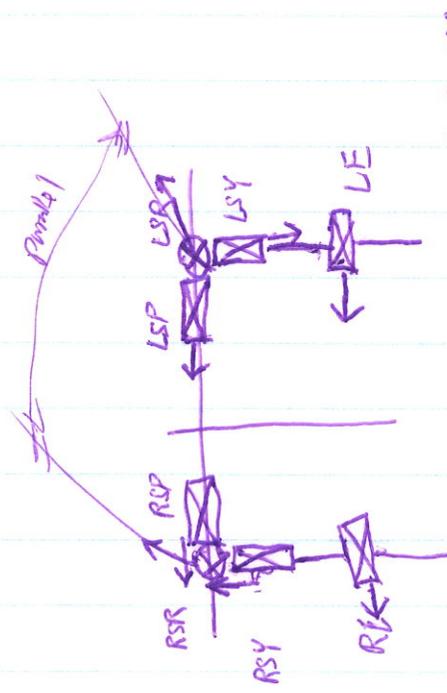
make UNW

- $RSR = 90^\circ$
- $RSY = -90^\circ$
- $RES = 90^\circ$
- $LSR = -90^\circ$
- $LSY = -90^\circ$
- $LES = 90^\circ$

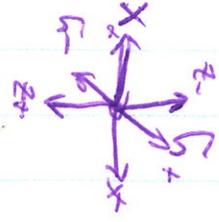
- $NSR = 135^\circ$
- $NSY = 90^\circ$
- $NEB = 135^\circ$
- $LSR = -45^\circ$
- $LSY = -90^\circ$
- $LEB = 135^\circ$

- $RSR = 30^\circ$
- $RSY = 180^\circ$
- $LSR = -90^\circ$

- $RSR = 45^\circ$
- $RSY = 180^\circ$
- $LSR = -45^\circ$
- $LEB = 180^\circ$



- $RSR, -X$
- $RSY, +Z$
- $RL, -X$
- $RSP, -X$
- $LSR, -Y$
- $RSY, Z$
- $LE, -X$



Close to back out in the  
 left part of the  
 how to verify if you bridge bump

team proceeding w/ uncv assignment  
began to run code on gizebo sim now

OpenRAVE 0.8.2 (stable Release)

instants  $\rightarrow$  ~~hubs.ach~~?

kinbody.cpp

//sim. made by someone @ cnu  
another model in gizebo  
but dynamics in openRAVE  
are better.  
Dan made the model for openRAVE

I do code anything?  
easy way to check that.

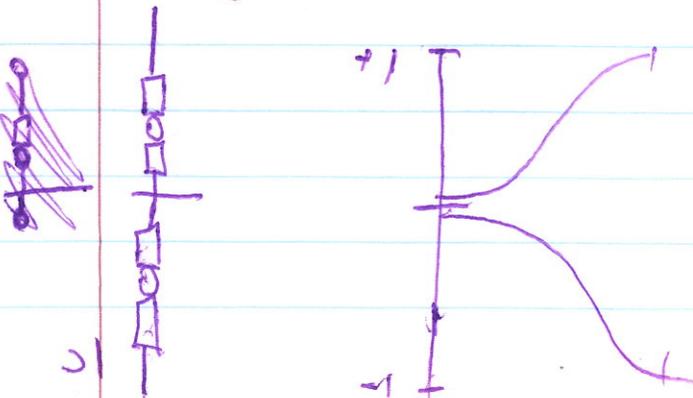
git status ???

git log

git stash

hubs.ach killall

drawing up outputs on the board,



//you need to make your graphs  
and do your math better.  
\* for each stage draw where  
it starts to, where it's

install simulator

transmission wave by processing next

more nice udrip no also may of myself

wiki: Jan Lake.com

Jan Lake.com

install by follow instructions

OpenOffice 3.5 (2006 Release)

hubo - ach

→ (also add) → instructions

add hubo ach

Kindergarten

sim - openhubo

// watch shi

Some  
Shell  
openBase  
cmds.

hubo

• sim hubo ach  
• hubo hubo ach ach

gub(1)

SSS gub(1) tip

DoF 19/20 does it point to a joint?

pol tip

// ~~what~~ what does "clean" do?

delete tip

↳ it deletes previously created .exe files.

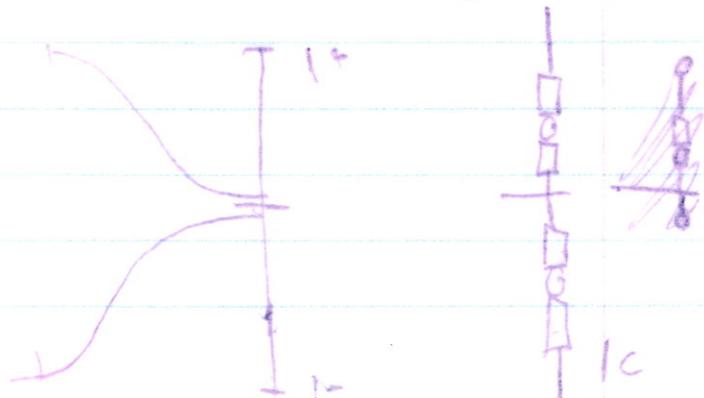
kill deleted

(10) L

(10° per axis)?

• break old no change no price is

if you need to make new program  
asked about new way of how  
make with gub ach tip  
if you want to gub ach tip



sample

// Right arm

// ~~HEB to 30 degree~~ RSR from 90 to 110 degrees

FIN-half - 1 - cos(2 \* OF, time, 1400, 1200, 0, 0, & result1[RSR]);

res[RSR] = (float)(110. - 90.) \* (result1[RSR] + 90.);

// (Desired degrees - original) \* result + original

VM ware?

VM 7 on dual

// install op. Rave by source.

[openvare.org/doc/latest-stable/corep/htm1/installation-linux.html](http://openvare.org/doc/latest-stable/corep/htm1/installation-linux.html)

VMware Fusion

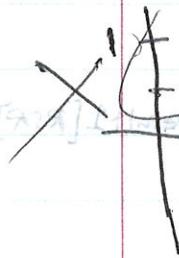
ifconfig -a // -a = all

Auto-eth Killall // if you have virus, it wipes e.v. down

// when 6 legs are off, Tai-chee won't move legs

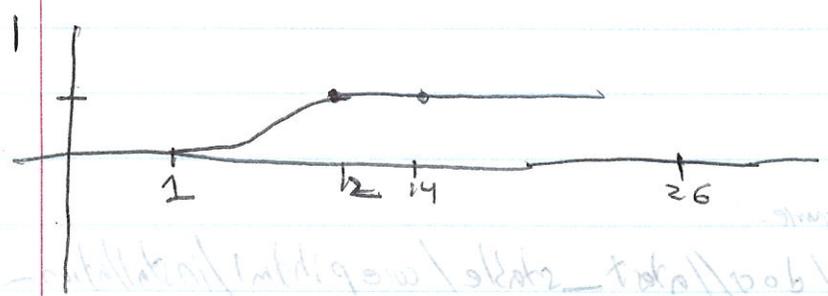
Normally, it'll move legs since, as it's moving its arms it's also moving its com.

Tai-chee, was actually motion captured by a tai-chee master



$$[RZR]_{200} = (100 - 0.11)(100 - 0.05) + (100 - 0.05)(100 - 0.05)$$

draw result 1



// (100 - 0.11)(100 - 0.05) + (100 - 0.05)(100 - 0.05) = [RZR]\_{200}

$$11 = 0 - 1$$

// if the three values it makes 0 or 1

// when I look at the first three values...

(in-ct) ystz

Dan uses FileZilla  
- business plan so up/so down

denke con. to HUBO's ~~at~~ can

↳ just shifts it out, 3, gives to simulator mode

had another sim.

RobotSim? (it's okay)

on vs.

↳ Δ values in ~~hrSwm-pls~~ Profile.cpp

ellat will leave.

so... push Δ to server.

/tugh mudder?

"juz"

# Study (tai-chi)

git checkout -b "name" // create a new branch

~~git add remote~~

or git remote add 'url' plou <str>

~~git pull plou <str> { "complet st" }~~  
git fetch plou

git merge plou/master

git merge

automatic merge fail

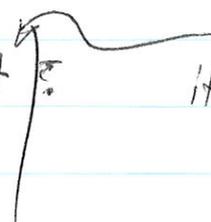
git commit -am "strng"

// that's how you commit someone else's branches to you

git push origin stemi:UNW

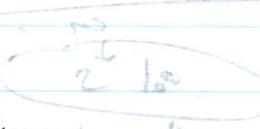
"a way"

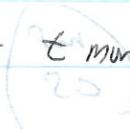
V  
FUN

git init  it makes  $\epsilon$  current a git folder.

git push origin master.

issues w/ going w/  $\epsilon$  conflicts?  
- just done out issues...

~~///~~ RDP = Remote Desktop Preferences  

color depth -  $\epsilon$  higher  $\epsilon$  color  $\epsilon$  more bandwidth you're  
going to use 

git clone "~~username~~/unlv ~~Joe~~  
Siem! UNLV

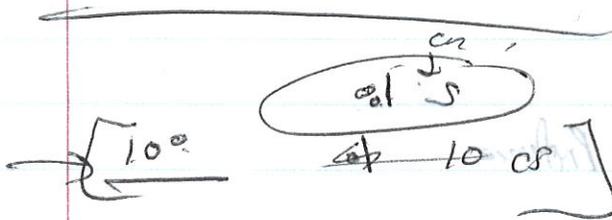
he doesn't like unforked clone

the share w/ other people; part of <sup>reason</sup> ~~reason~~ is that we keep  
a record of  $\epsilon$  chronology of it.

roll too high -  
shoulder ~~ride~~  
if ends are too high,

↑ front tip

stop using ~~shaper~~  
has to be pulled from someone else's  
or messed from someone



(ms)  
CS

7:15 pm

~~MS~~ / ~~MS~~

at the end of the class  
the space of the people, and of the  
a person of the class

27 + 12 = 39 ✓

add a remote & merge

git checkout "~~to~~ second commit"  
"that he added a ~~branch~~"  
"msg: work w/ no writing"

80ms

imp!!  
# get checkout to create a new branch >

how to vi. testing device

- ① CAN tester sits on z line reads comm. from body comp. to joints.  
Does not matter which plug is plugged into.
- ② plug USB into back of comp you're using  
the mac a vmware workstation i v-machine that's set up.  
& only work station on there.
- ③ Under 64-bit - Jreem: Hubo CAN reader v.m.  
pr. "student 1234" [Q yes] ← prompt.  
→ "ok"



SI = 51 + 75

terminal

④ ~~Left~~ right  
 USB buttons // connect USB drive come de host  
 check if config -a // check all connects all log  
 can 0 3 can 1

⑤ hudo -ads killall // reset -a do  
 sudo pw so you can log ~~start~~

⑥ hudo -ads sim openhudo\_nophysics jaemi ra

~~trans hudo~~ → read only  
 center > juwa  
 // this comp does not have virtualization  
 to take



U Shutter prob.

output

V rally fast

LR lens ✓  
46 use shb ✓  
surb ✓  
x200 ✓

how to run in simulator,

back to shell

201 time

gust()

// to close

intensity of ot mod up mod

2 function parameters

in laptop

mod() is ()

5 at this

made by

@ risk using → close

GAN off → exit

islandly -a

flug sup

① now so that comp

recompile every all the things

then bang

GAN ON

and ok

with walking

check walk's get me

walk

fly

no walk in a/c



LR

More = 23 y.o. old!!!

posture

doing what u

✓ LSR issue

✓ like some of it

test plan ✓

✓ it's good.

✓ crack.

wait 10s

intentional error of not

Am going down to @ position.

test at the

in old shell, @ shell in t ( ) is t bank.

sub // to test  
sub ← other way  
to ← the way

~~get~~

get pull

no photo

LSR

you talk us in @  
recalls end all the things

no way  
can on  
no line

with water  
good work get more

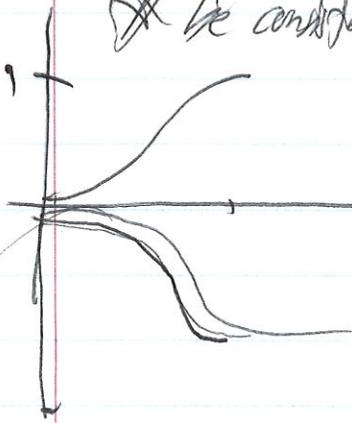


with water  
good work get more



9:10 P

~~is~~ consistent w/ neg sign



$(-1) \times \frac{1}{2} \times (-1)$

para?

$X(\sin(\theta) + \sin(\phi))$   
 $X(\sin\theta + X\sin\theta)??$

two cases  
 "d" is ok // two cases to make fig

// he sees  $(-)$  &  $(+)$  in both sets.

~~Find~~ a plug-in for parentheses, passing for v.s.

do properly be  $\sin + \dots$

V LSR

N ✓

L ✓ (RSK)

V ✓

ctrl+c to get out of  
to stop sim  
quit().

V ✓

A Arms too high up // looks for close to V

N ✓

L ✓

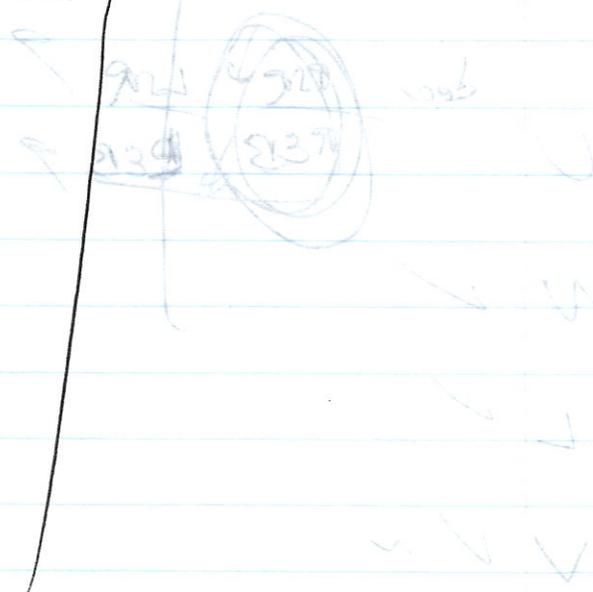
V ✓

So home  
create another result for all of 6 joints,

ⓐ Gap of func. it's a loc

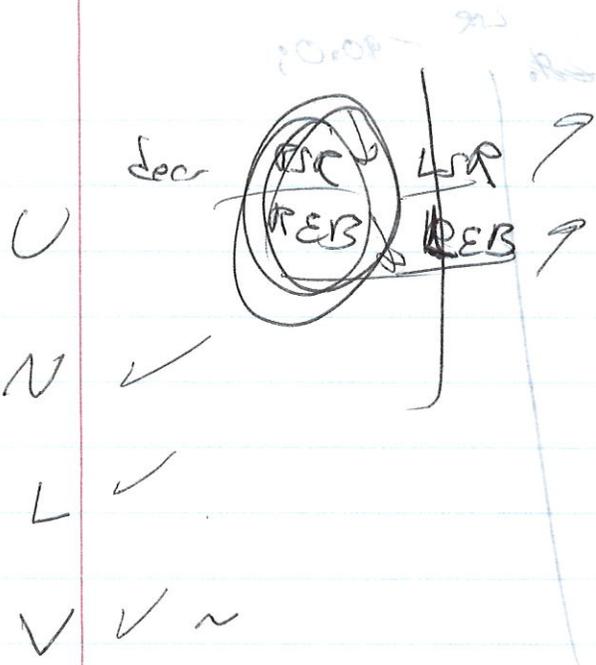
result 5

LSR -90,00;



0000 = TΔ

927  
837

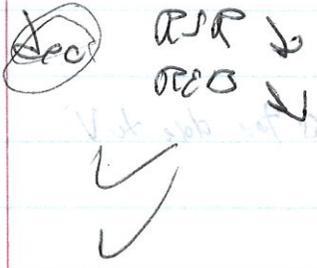


U  
N  
L  
V

✓  
✓  
✓ ~

$\Delta T = 8000$

U  
N  
L  
V



*(Faint mirrored text from the reverse side of the page)*



*(Faint mirrored text from the reverse side of the page)*



*(Faint mirrored text from the reverse side of the page)*

2H2021

lines

U	✓	✓
N	✓	✓
L	✓	✓
V	✓	✓
end	✓	✓

keep track of

When done, Home  
close  
CAN

it doesn't go "up and at 'em"

CAN lines

black " " " " end  
white can do it first

Make sure Paul gives you a/hu,  
do get mes...

result. that vert. is at left x1000

git commit push

bring everything you need

don't be lazy

don't take short cuts

Proc Comp do your supply

pull one connected to green,  
don't disconnect from grid

will turn back on

put between plastic 'sunder' of tracks to

505 ...  
tot 5 ab ...

...  
... of

Google ...

~~by next Mon.~~

~~Full recovery self right algorithm?~~

Dr. Oh will ping of on fall injury prevention  
give status situation slides by next week

rule D is now may drop ~~the~~ things taken in.  
// verify where in rules working exist.

// problem, if hubs falls down on t sides, that's it.

Ki-won recommends air bags.  
Liz movie - robot was name 2 "airbag".

↳ Jen

// switches with likely to over bend

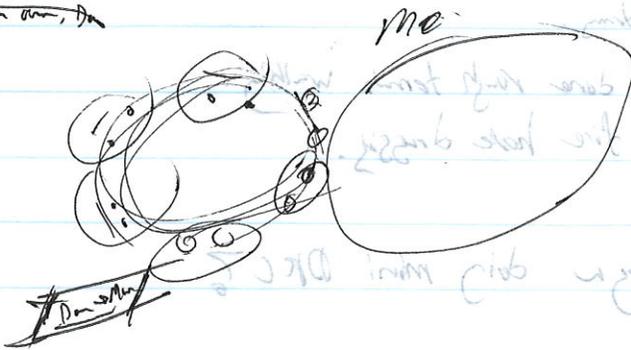
Q: Workshop exp:

~~and~~

~~the other one, the~~

- D:

W: Manly | Jan  
Markis  
Elliot  
Sungjin  
me



follow up ~~was~~ ~~not~~ ~~fall~~ ~~is~~ ~~not~~ ~~done~~  
two ~~of~~ ~~them~~  
vague ~~about~~  
final ~~of~~ ~~them~~



ask about ~~more~~ ~~on~~ ~~the~~ ~~topic~~  
before ~~meeting~~

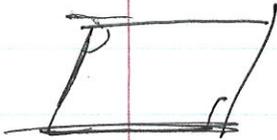
avoid ~~the~~ ~~topic~~  
avoid ~~the~~ ~~topic~~

visitors - they saw us working...

how to cont.

future → repair

classes → & limited



desk space (man's own desk)

looked needed

impact → position function

(under hand)

being here; & felt that I was here, I was given full runway.

redoing: undogged INDI - mini DRC.

all 8 events scaled for DarwinOP

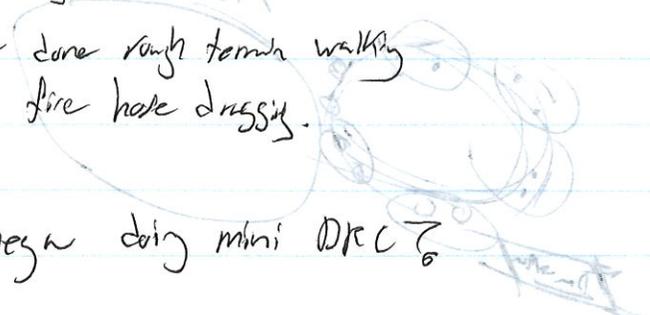
Index for DrcSim

↳ does value thing.

STL  
UBRF

new done rough terms walking  
fire hole dressing.

Value in omega doing mini DRC



10/11/04	W
10/12/04	
11/13/04	
11/24/04	
12/09/04	

3- 100

~~talk about it~~ ind ~~st~~ stly.

- ② driving
- walking through terrain
- depress clearly / lifting
- door opens
- using a tool to break out
- value time

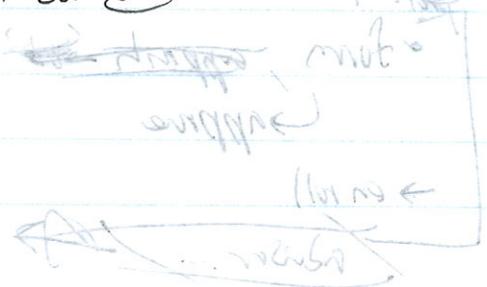
① ~~bladder~~ climbing  
fire hose connect

A. ~ / open loop. / no sensor dead break

add constraints (white car, black brick ground)

← generic door

~~manikin~~ / ~~climb~~ → crash course



491  
(ME)



Intro to C programming.

~~edge cam~~

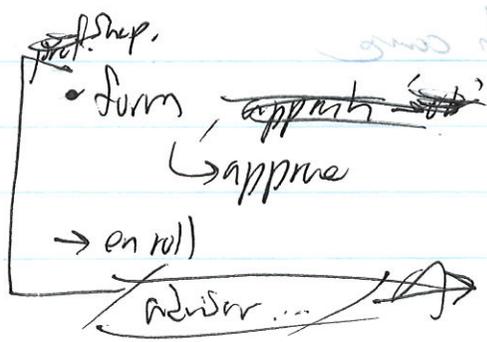
- crash course
- openCV installed

walking is a minimin  
 planned walking is planned feet placement problem

Mc = ladder climbing  
 + math terms

collected, -manin will see caution • mini-DRC mark-up.  
 Dan Labano best camp  
 ↳ an shomich, / drive.

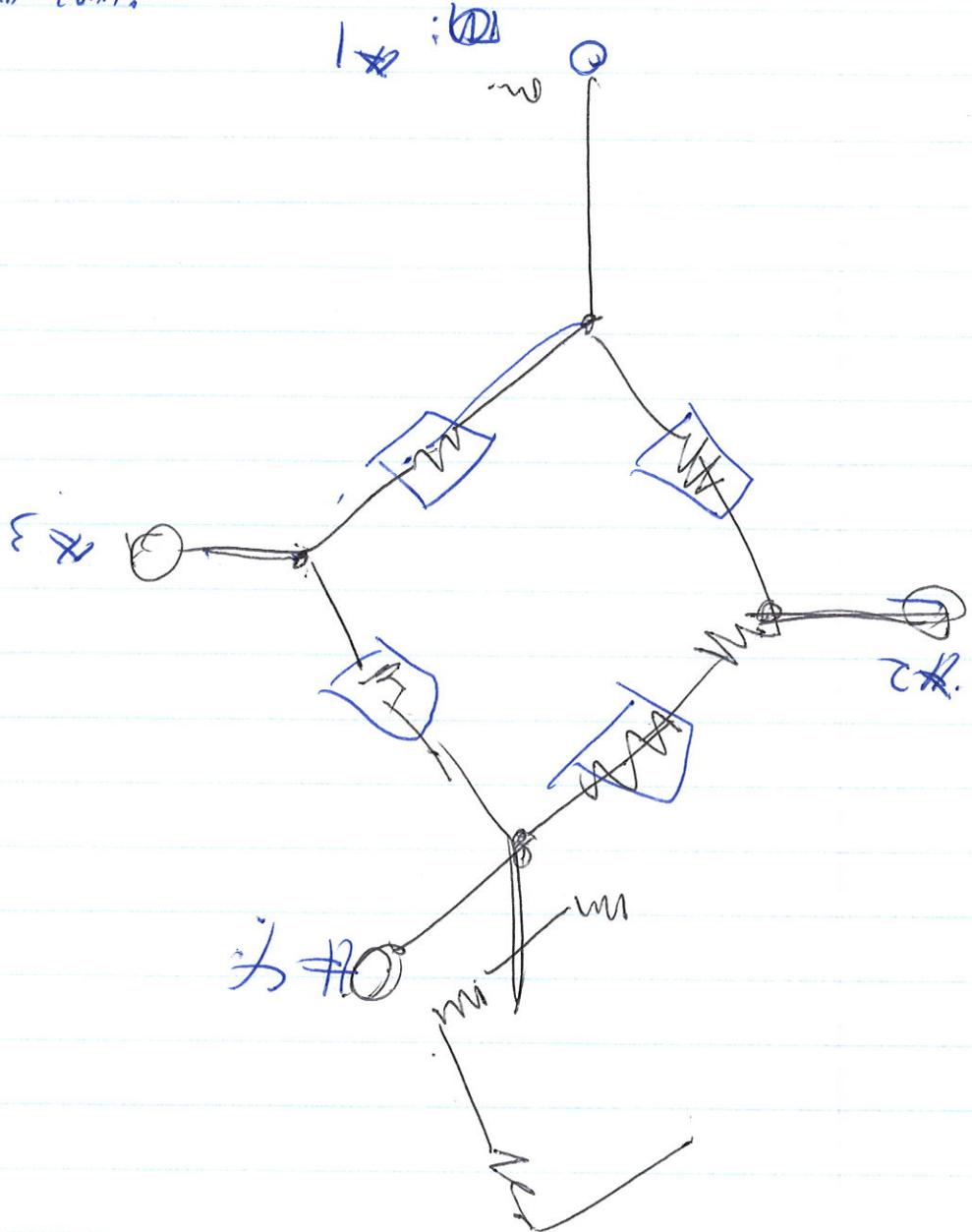
it some as my



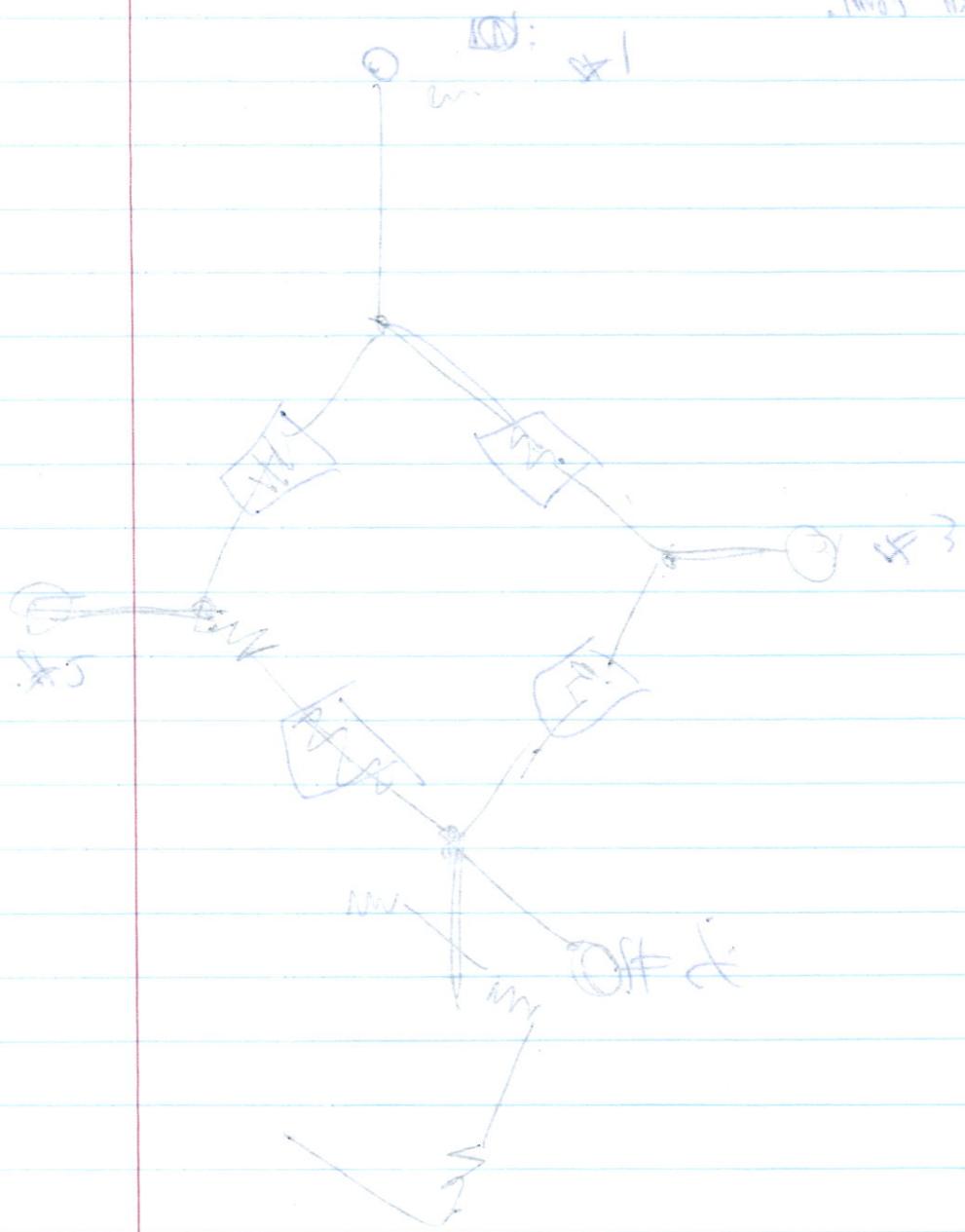
"par" - "esh"

FT sent

→ check all conn.



"120" "100"  
"100" "100"  
"100" "100"



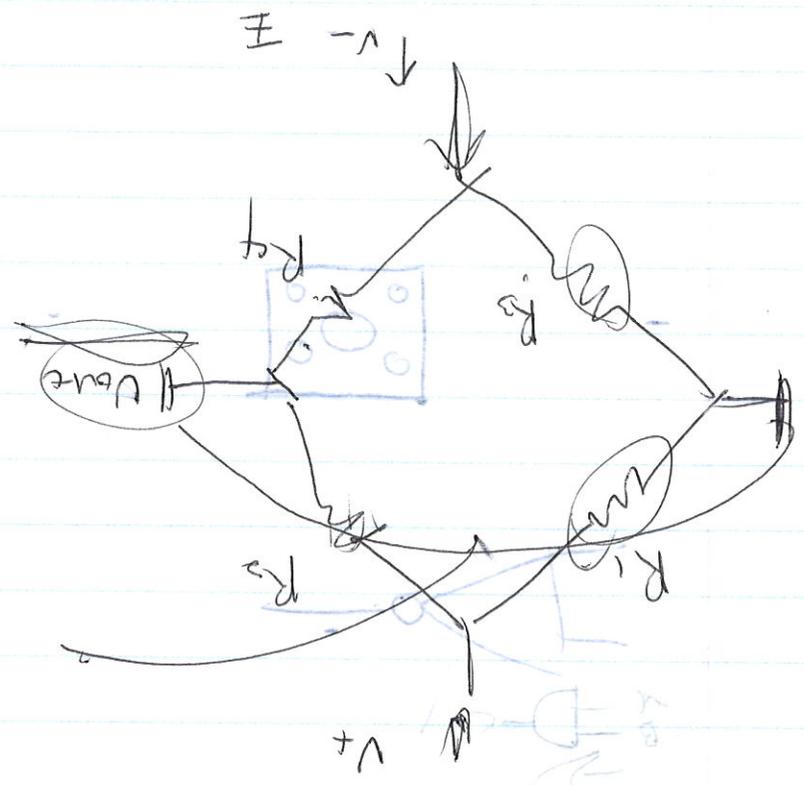
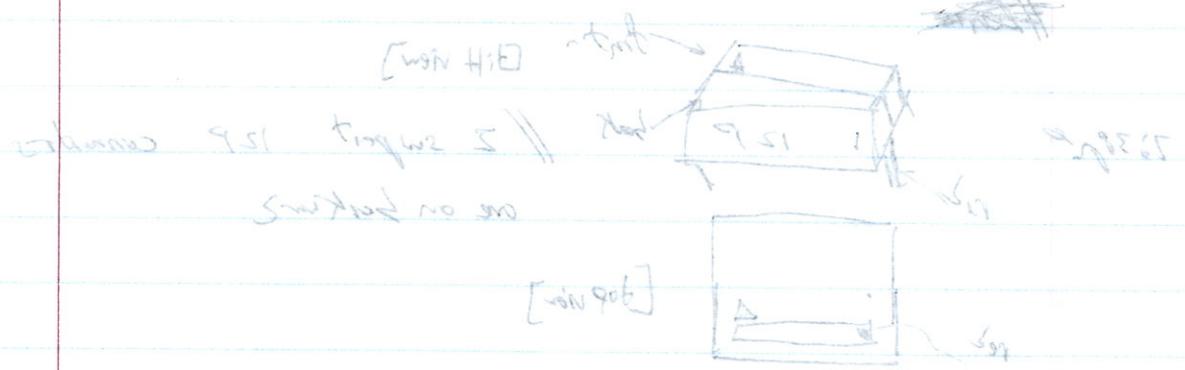
12.1.18

Work + bus was on 5/11 server

if it all works

# how about coding

if the thought we all then already



7:31 pm 12.1.16

[Y13] \* check & hard wire on  $\Sigma$  F/T sensor

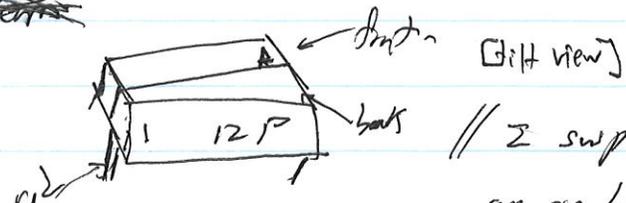
if it all works

# learn about config

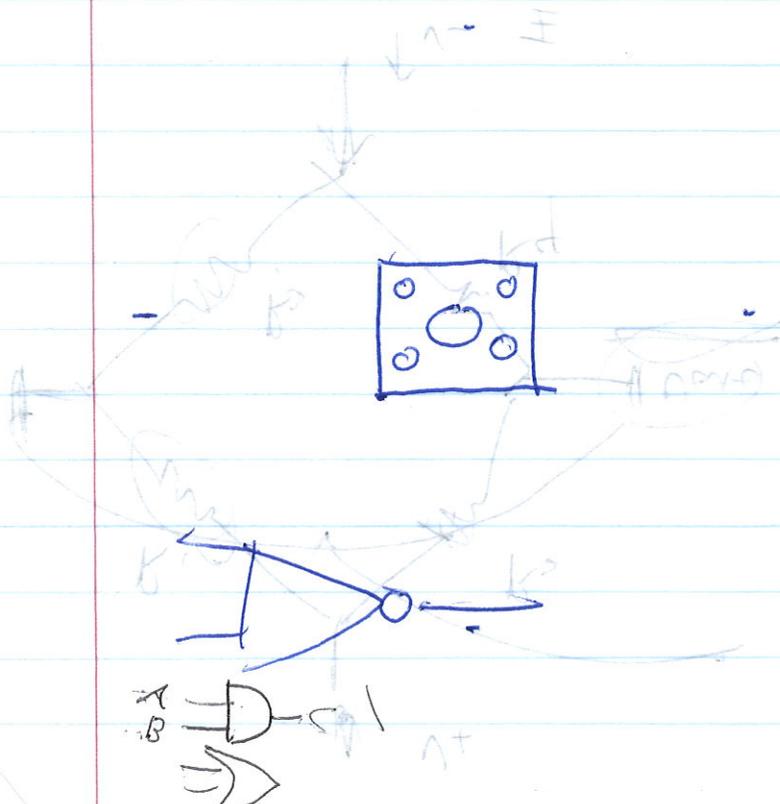
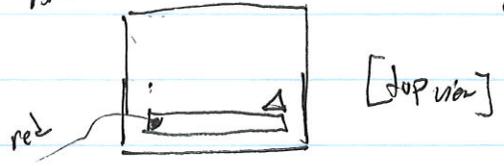
// he ~~was~~ thought we all knew already

~~# learn~~

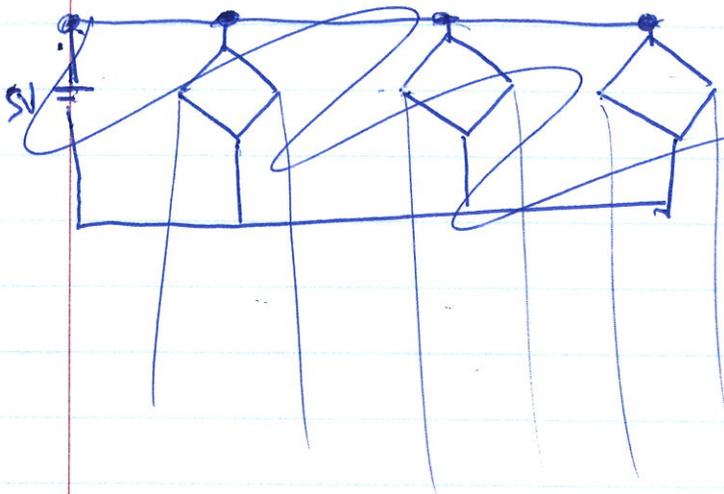
7:38 pm



// I suspect 12P connectors are on back



- // Don said it was firm ware [according to Parth]
- // JB will send F/T sensors back to Korea to have the refresh them?



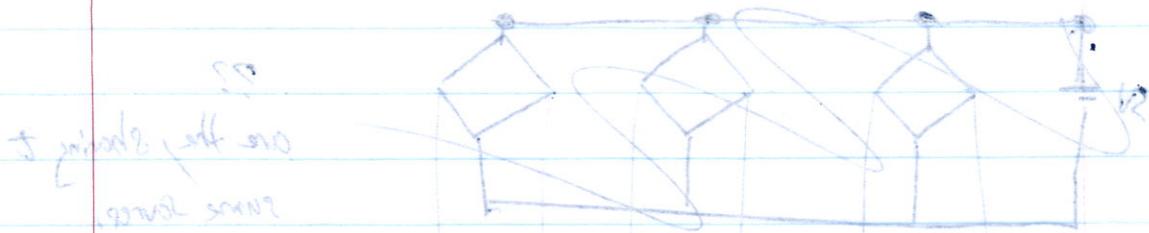
??  
are they sharing to same source,

$$\left( \begin{array}{l} 272 \\ 241 \end{array} \right) \approx 240$$

Strain gages  $\approx 263 \Omega$

472

// 20 will send the same back to know to have the right? then?  
 // Don't say if you want [according to group]



+ points off one of the other  
 some more

$$\begin{pmatrix} 515 \\ 515 \\ 515 \end{pmatrix}$$

$$\text{some more} = \text{some more}$$

515

W tok ni Xlog

Pos  
12.10.21

(GTA AU) . mpe'2 @wb; JOT 9011

• stat. Hlog / ; stat. substat. p. (k) tft @ stat ©

stat. Hlog ©  
stat. Hlog

© stat. Hlog - 02 stat. Hlog

stat. Hlog

stat. Hlog of stat. Hlog



stat. Hlog

stat. Hlog

stat. Hlog

Yes!!

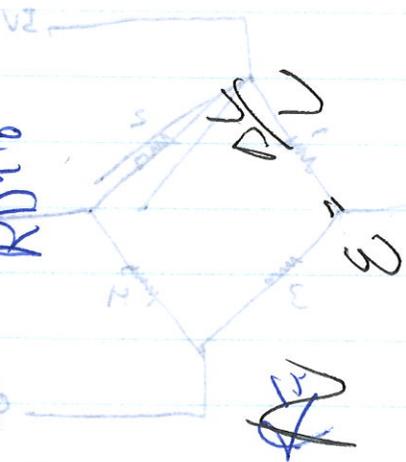


stat. Hlog



Jan. 16 RDK/6

Jan. 16



stat. Hlog

stat. Hlog?

Yes.

20%  
15.01.17

Park in lot U

1:30 p

TDL ; clw@ 5:30pm. (GUA AIRL)

① look @ foot / study whetstone bridges. f / Britl. study,

① full recovery  
/ follow leads

② DARWIN-OP set up!

// read up on turbo

/ let p. know when you're rdy to teach it

// Buy more notebooks

lanc@ 9:45 p.

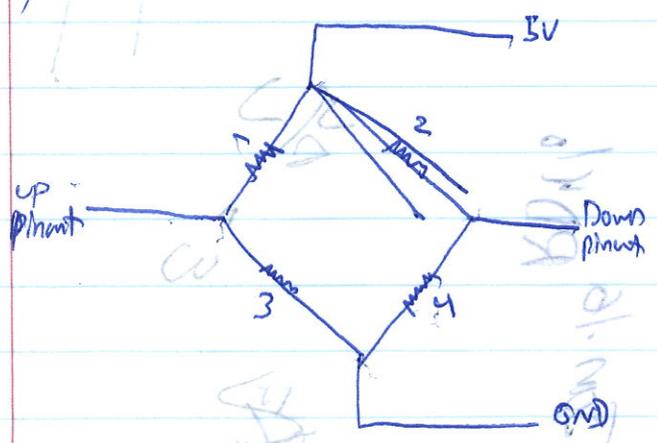
~2:4.

Whitney Killen, t1

Hysteresis

MachineDesign.com/archive/force-torque-sensor

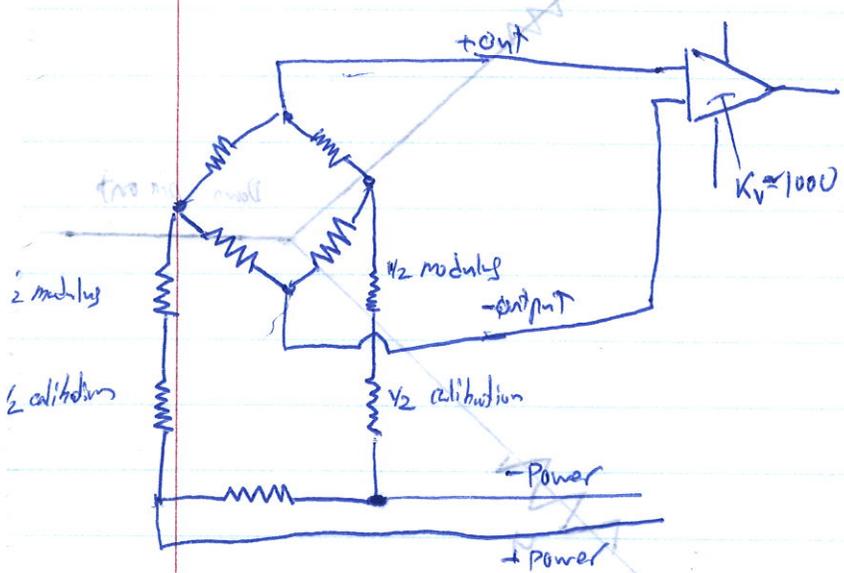
(TS62 L11)?





monolithic transducers

actix - i/a - com / supplier of things,  
 society of robots . com / sensors - force torque . shtml



// sample, not Hubo  
 X need to amp. 0V output  
 ~1K

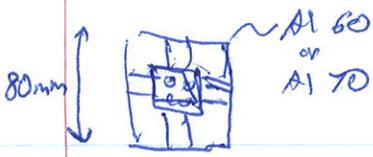
transducer should have spec sheet (certificate of calibration)

- Force overload
- measuring range
- safe load/torque limit
- safe side load

Damage

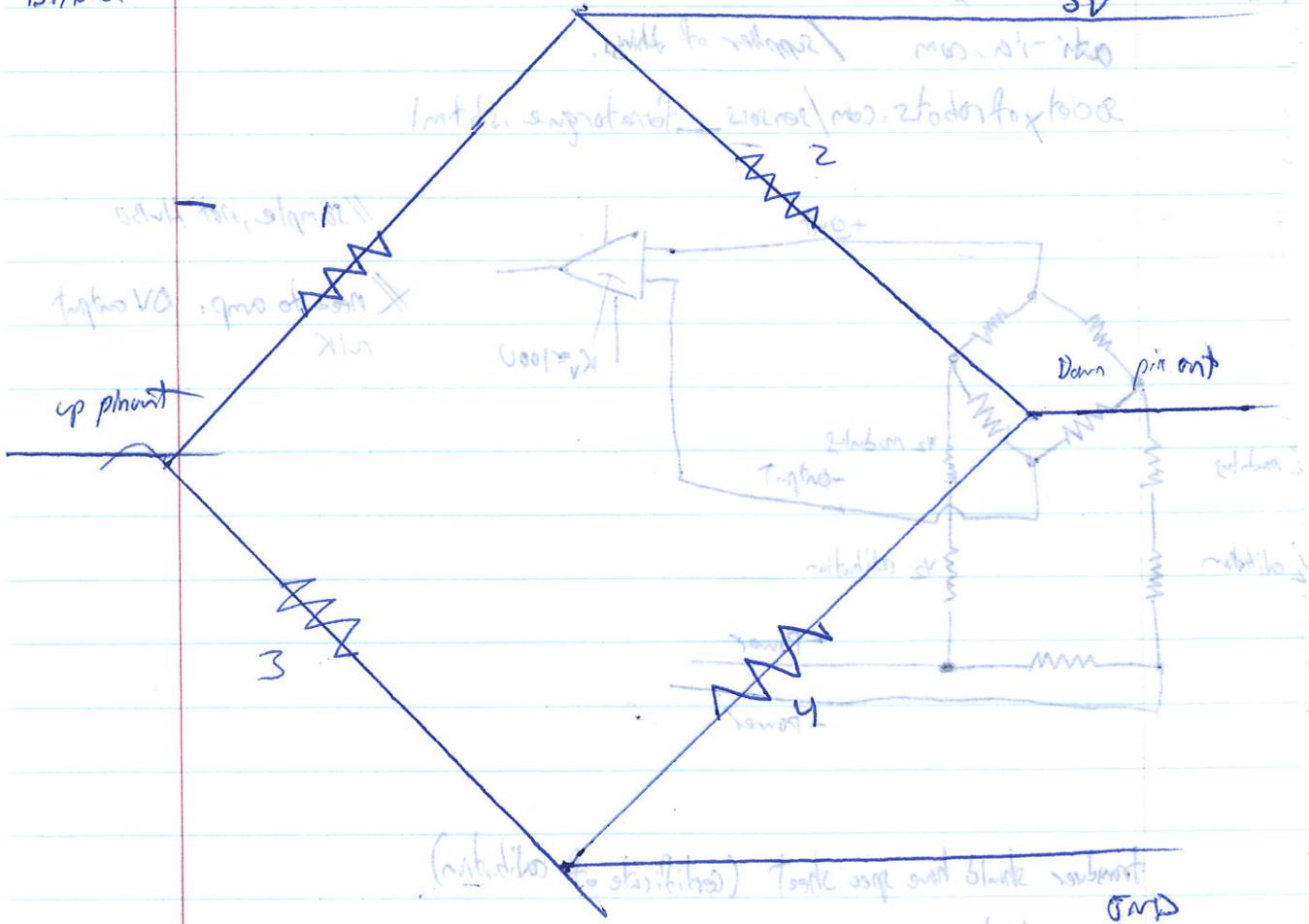
- Shock loading
- Dynamic influences (i.e. P, or etc)
- off center (offset)
- strain gauge / cable entry fatigue.

Jaemi by  
 // 263-Ω strain gages



Hubo of cable with

B. Kudo.



|| 5C325 200V 200V

200V 200V 200V  
 200V 200V 200V  
 200V 200V 200V

B144

each resistor is one of the strain gages

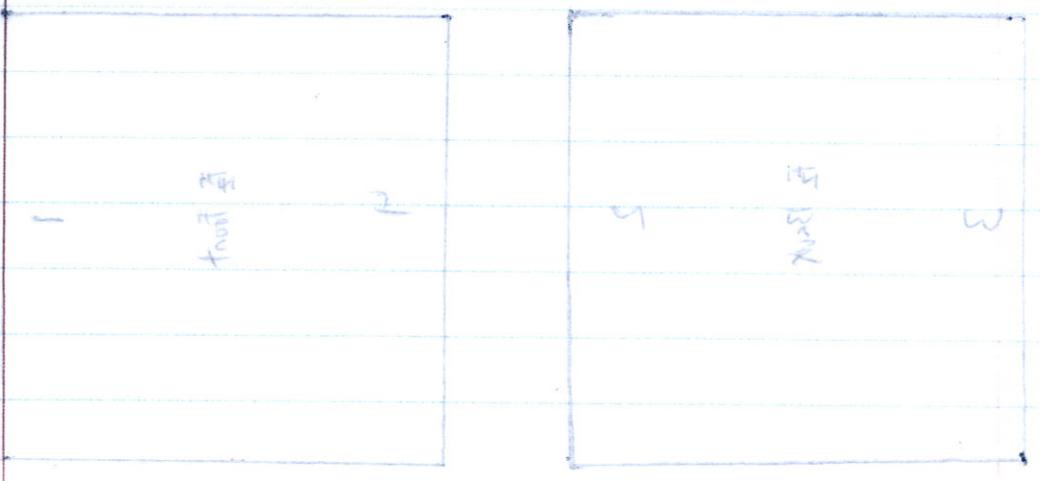
$$V_g = \left\{ \left( \frac{R_4}{R_2 + R_4} \right) - \left( \frac{R_3}{R_1 + R_3} \right) \right\} \times V_s$$

$V_g$  = voltage of <sup>up</sup> pinout ( $V_+$ ) relative to <sup>down</sup> pinout ( $V_-$ )  
 // or difference in voltage between up & down

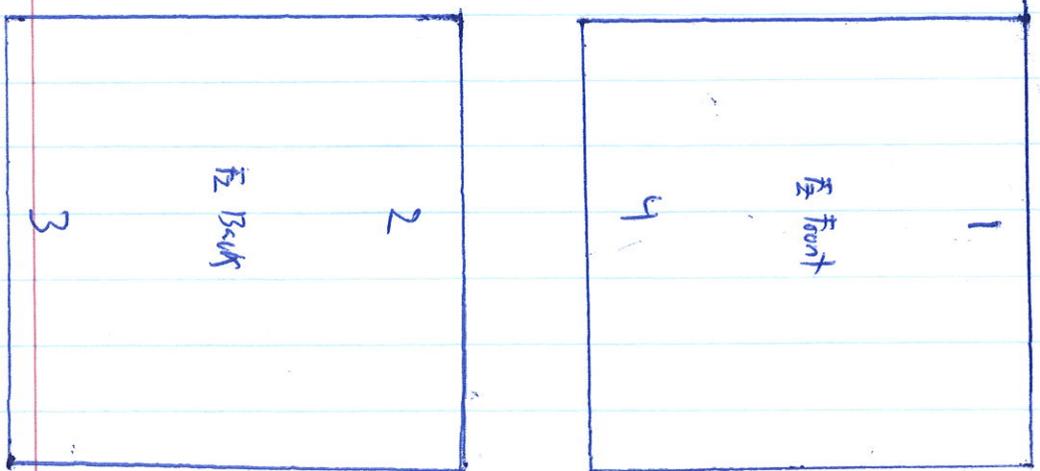
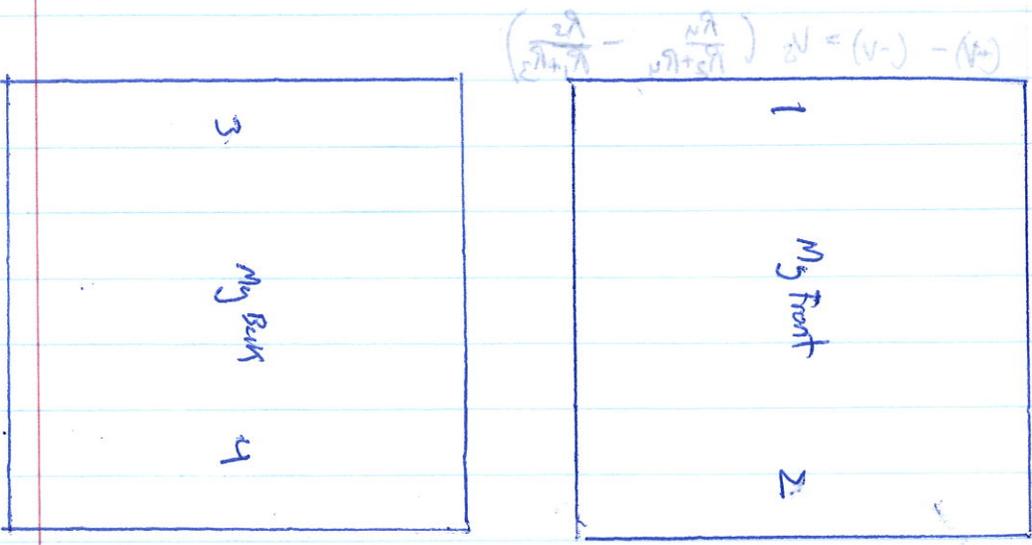
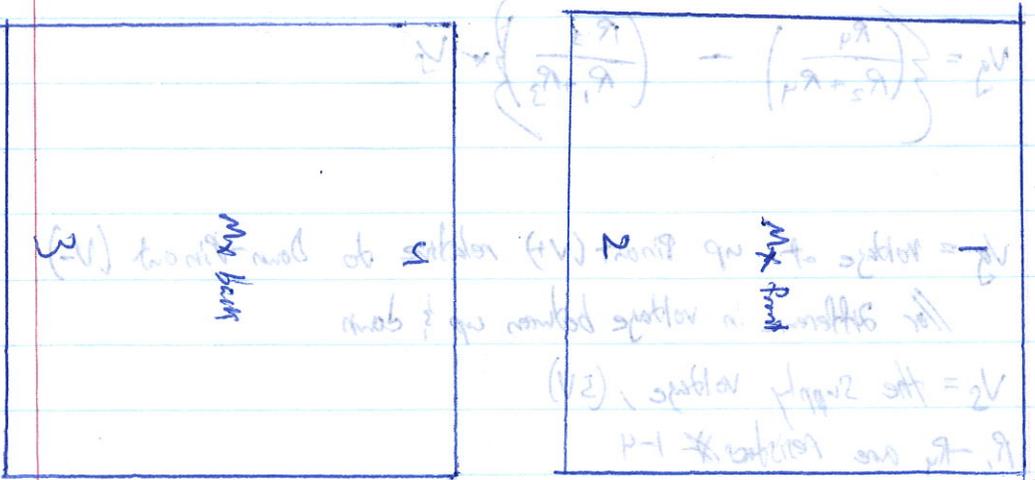
$V_s$  = the supply voltage, (5V)

$R_1, R_4$  are resistors # 1-4

$$(+V) - (-V) = V_s \left( \frac{R_4}{R_2 + R_4} - \frac{R_3}{R_1 + R_3} \right)$$



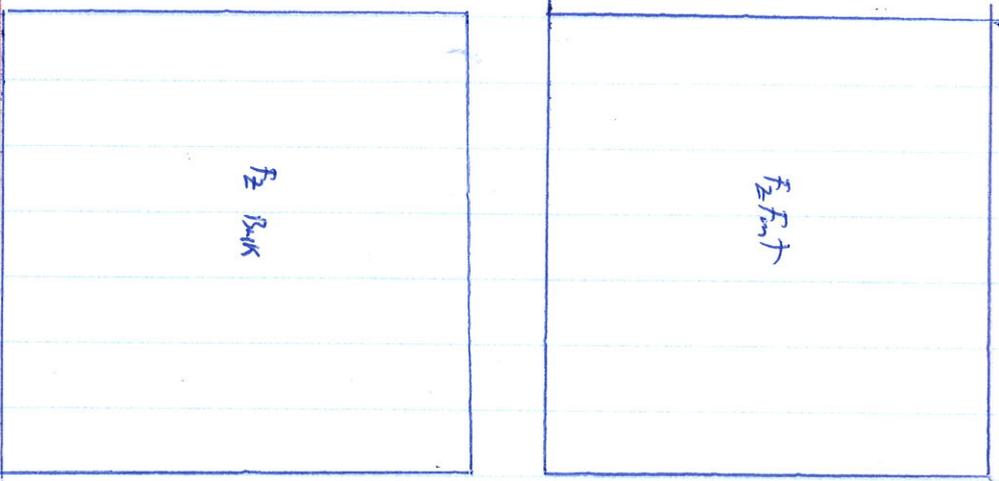
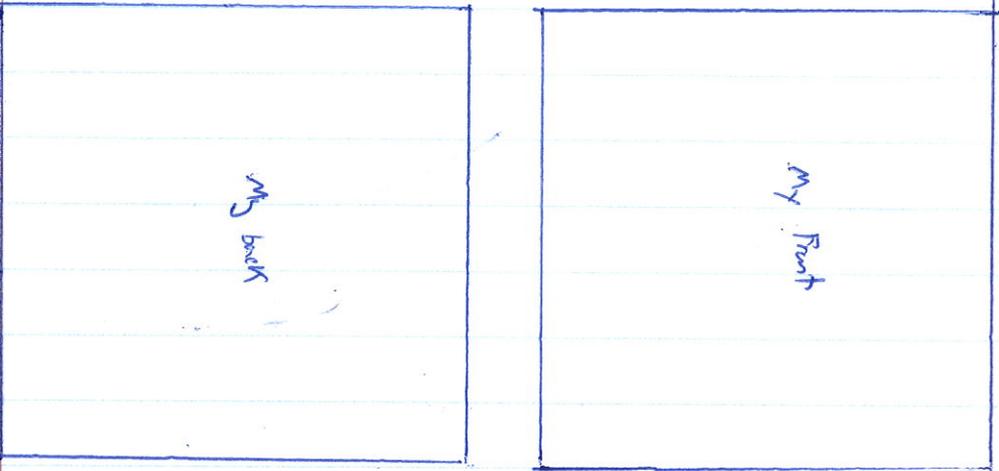
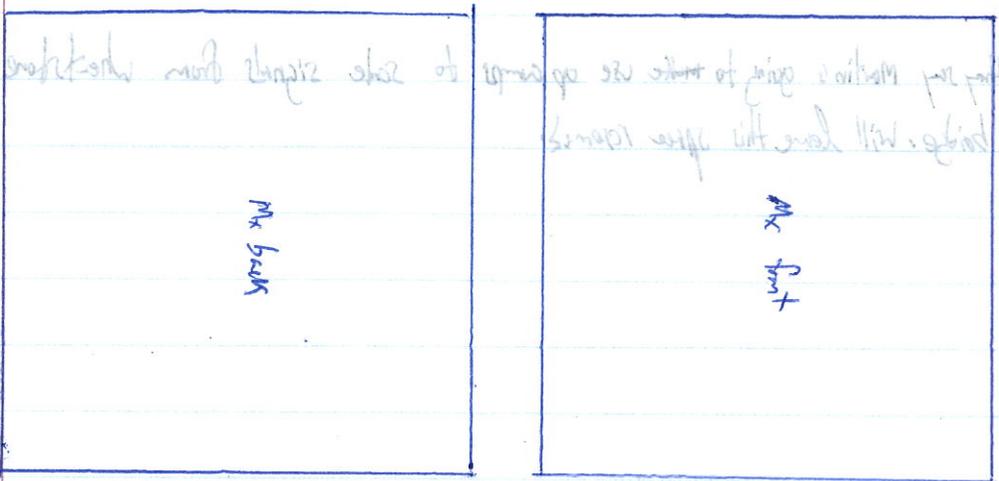
Keep center is one of the main center



Actual:  
Irene: Haha

12/20/21

TBC



15.02.21  
Luntz  
Cedric insouc

15.02.21

/ they say Martin's going to make use up amps to scale signals from wheelstone bridge. Will leave this space reserved.

up peak

up peak

up peak

up peak

up peak

up peak

10:30 AM  
CSC 2115

12.10.21

15:50 PM = [D]

DT (empty box) is multiple, internal form (at foot, 2ndly type) case is go  
full form

initial of DT, DT ~~some~~ and some more in it.  
The empty box on DT will be empty.

There are multiple forms of gas-filling process on its foot  
in one of the pink form + 5 other pink form of other form

1. Some other material used to be in it.  
2. Data in lower joint area to be replaced w/ other one.

1.5 m  
2.5 = 20%  
soft paper requires.

AC Adapter Model # AA-151000

# Will use DV in + case  
# when it's not plugged into power  
# 2500 mW

out: 15 VDC 1000 mA  
in: 150 VAC 50 Hz 50W

Product identifier (for 22/32 con)  
Model # Y1-00032

Product 32 Y120320HH  
1000 mW, 11.1 V (10C)

# ~~some~~ part for DV...

class @ 2:30

CBC A112

15.01.21

12:24p Darwin = [D],

D's ready pos. is unstable, lateral forces (@ feet, shaky table) cause it to fall down.

tinkering w/ D2, D1 ~~seems~~ not sure where it is.

// e-mail Santiago on when D1 will be assembled.

// there's a modified Darwin w/ force-torque sensors on its feet  
in one of black boxes + 2 other blk boxes w/ spare parts

// + notes from someone ① some ovrmt, motors need to be initialized  
② bolts in lower joint need to be replaced w/ silver ones.

12w 1.5w  
 $\frac{1.5}{12} = 80\%$ , 20% slower recharge.

AC Adapter model # AM-12100

in: 120VAC 60Hz 20W  
out: 12VDC 1000mA

\* still had DV in caps  
when initially plugged into charger  
Lee's lip.

Yuntong intelligent lithium balance charger (for 2S/3S cells)

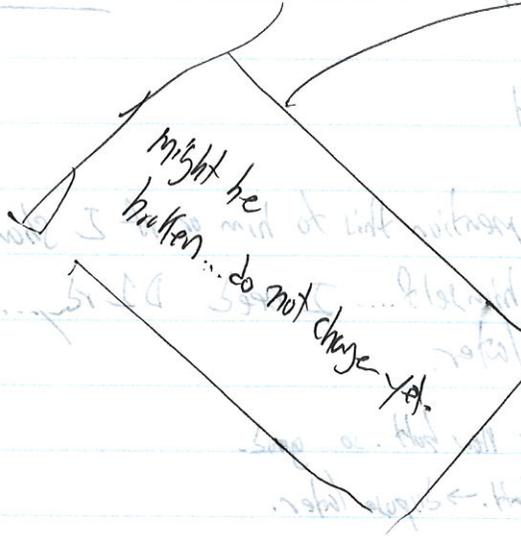
model # YT-0003P, # ~~charge~~

Yuntong 3S YT503560HM Lithium Polymer battery  
1000mAh, 11.1Wh (10C)

\* ~~Remove~~ host for Darwin?

// is batt. charging? the red light led on charger lights <sup>at</sup> ~~every~~  $\sim 60s$  (1/min 30)  
for a second, then turns off... is this considered 'blinking'? (at random times?)

/ pulling batt. terminal out of charger is a pain, use flathead



@ a22 links missing

/ ~~Darwin~~ Ra

~~Robot~~ R:

/ Robotis Darwin OP.

\* learn Wiki's syntax

// sanju + bro come for 215 min.

6:23pm 2mV 1.9mV ~~2.1mV~~ ~~2.0mV~~ ~~1.9mV~~ ~~1.8mV~~ ~~1.7mV~~ ~~1.6mV~~ ~~1.5mV~~ ~~1.4mV~~ ~~1.3mV~~ ~~1.2mV~~ ~~1.1mV~~ ~~1.0mV~~ ~~0.9mV~~ ~~0.8mV~~ ~~0.7mV~~ ~~0.6mV~~ ~~0.5mV~~ ~~0.4mV~~ ~~0.3mV~~ ~~0.2mV~~ ~~0.1mV~~ ~~0.0mV~~

6:44pm ~~1.7mV~~ ~~1.9mV~~ ~~1.8mV~~ ~~1.7mV~~ ~~1.6mV~~ ~~1.5mV~~ ~~1.4mV~~ ~~1.3mV~~ ~~1.2mV~~ ~~1.1mV~~ ~~1.0mV~~ ~~0.9mV~~ ~~0.8mV~~ ~~0.7mV~~ ~~0.6mV~~ ~~0.5mV~~ ~~0.4mV~~ ~~0.3mV~~ ~~0.2mV~~ ~~0.1mV~~ ~~0.0mV~~

6:53pm ~~1.8mV~~ or 1.7mV

Substituted on ring & it reports to two lowest. Not calling

X conclusion after 30min voltage across li-po batt. remains same as 11 batt. is below min. and.

2 After batts available, but they're rated @ 2.4? V

3S Y15035602121

I'm wonder if I should mention this to him or if I should let him figure it out by himself.... I need DZ rdg. sooner rather than later.

OK, told him. he'll use new batt. so... good.

// dispose of report old batt. → dispose later.

15.01.22

// read emails

sanju → link emanu → for [D]

manin → broke DZ....

DZ had Ubuntu 12.04 installed

he's unable to ssh into him.

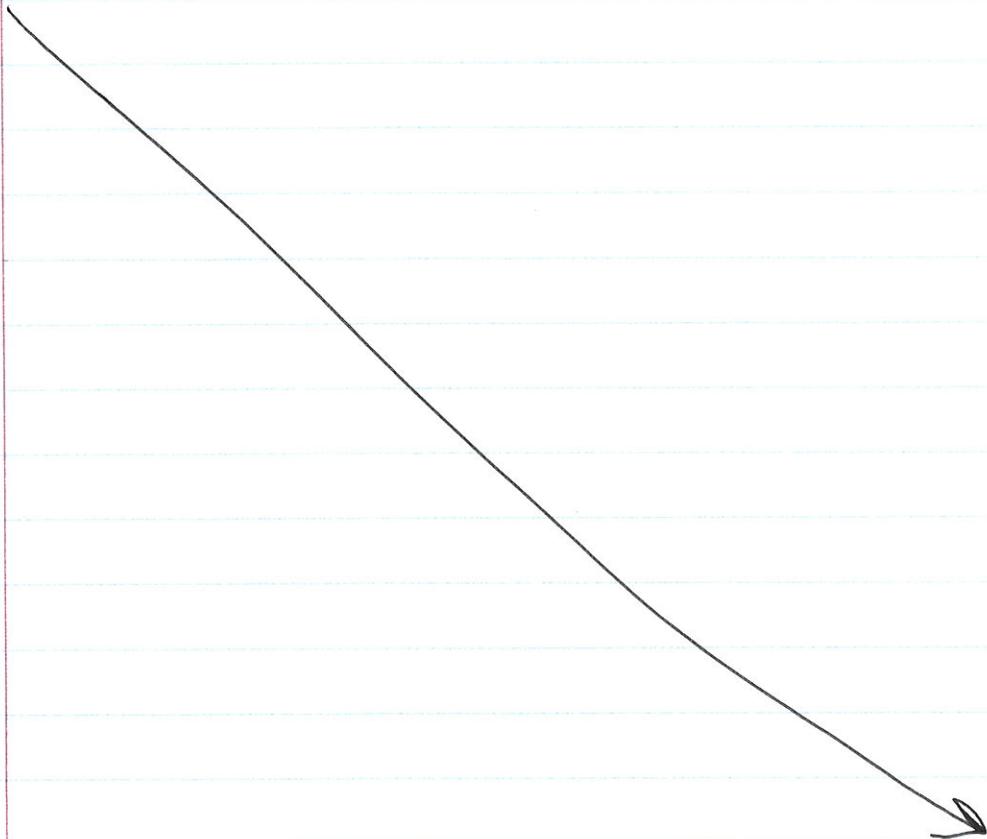
OS not booting?

// spoke w/ Kiran [KW] tomorrow afternoon will have discussion on what parts on Hubo ~~need~~ could be damaged during a fall.

/I'll prep questions on that. tonight  
/spent majority of lab time reading on how to keep a notebook.

files.eric.edu.gov/fulltext/ED344734.pdf  
~~ED 344734.pdf~~  
ED 344734.pdf

/Will leave this notebook as the one from Dan's Workshop  
and continue/transcribe new semester info to a new notebook.





U APRN / LSR 3 25°

N ✓

L ✓

V ✓

Start ✓

✗ When you get something working, do a video

✗✗ esp. if you vary? have a back log of vid.

✗ Jan

// remember to click

Motion Buttons on the GUI do

~~Admission~~

reset buttons

2 phase ✓

200 6000 / 19000 U

Kirk walking

U ✓

N ✓

L // birds seems do not hit strings  
125 g/hp.

V ✓

end ✓

end

dayle

rather than / birds of whorl //

1000000000