"Short circuit current"

@ 9V out setting

Input V	Output I
9.96	3.97
8.99	3.17
12.16	3.17
13.41	3.17
15.27	3.17
15.27	5.30
11.16	3.21

In V 18V set V 9V went out at ~ 5-6A

In V 22.4V set V 18V out I? 6A b/f screen shut off

CC CV Converter Validation w/o battery

	Input V	Input I	Output V	Output I
No load CV	12V	0A	1.2V	0A
	12V	0	11.8	0
	12V	0	5.04	0
	11V		5.04	
Voltage MM	10V		5.04	
	9.1V		5.04	
	7.95V		5.04	
	7		5.04	
	6		5.04	
	13.1		5.08	
	14.2		5.08	
	15.12		5.06	
	15.12		6.05	
	15.12		14.98	
	11.16	0A	7.02	0A
No load CC Current MM	11.16	0.14	0.45	1.0/1.07
	11.16	~~0.95~~ 0.34	0.95	2.03/2.14
				2.84A/
				@ ~~9V~~ max (7
@9V	11.16	0.02A	9.05	0
				~~2.84~~ 2.84A again
	11.16	0.56	1.35	3.02
	11.16		0.55	3.04/3.21
	11.16		0.80 9.05/~~4.78~~	4.16 max @ 9V

Bring everything to ground first
Full saturation, Tof gates high voltage

H-Bridge Validation

Truth table

	EN	1A	2A	Function
①	H	L	H	"Right"
②	H	H	L	"Left"
③	H	L	L	"Stop"
④	L	X	X	"Stop"

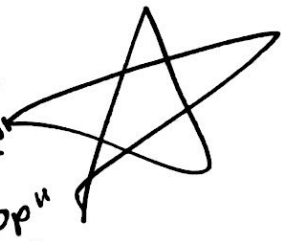
when switching will "overload" (PS) & cause amperage to drop to ~0.5A, is this a problem w/ just power supply?

0V power supply

Function	Output
1	-0.954 mV
2	11.39 V / 11.46 V
3	11.46 V
4	-6.4mV

12.04 V power supply w/ H-bridge gates 3 & 4

EN	4A	3A	Function
H	L	H	-11.46 V "Left"
H	H	L	11.46 V "Right"
H	L	L	0.07 mV "Stop"
L	X	X	-6.6mV "Stop"



12.04V P.S. w/ 9V converter (CV) w/ H-bridge 3/4

EN	4A	3A	Function
H	L	H	-8.5 V
H	H	L	8.5 V
H	L	L	0.08mV
L	X	X	-6.2mV

12.04 P.S. w/ 1A conv(
w/ H-bridge 3/4

EN	4A	3A	Func
H	L	H	-1.06A
H	H	L	1.03A
H	L	L	0.0007mA
L	X	X	0.0001 mA

$0.25W = (9V) \times I$

$V = IR$

$\frac{9}{0.33} = R$

$R = 27\Omega$

180Ω

★ No switching problems (w/ voltage)

★ High power rating resistor - used to limit current through LED

★ can force current $\frac{1}{3}$ I pass power rating of resistors

30Ω

9V } $I = 0.3A$ $P = 2.7W$

7V } $I = 0.23A$ $P = 1.63W$

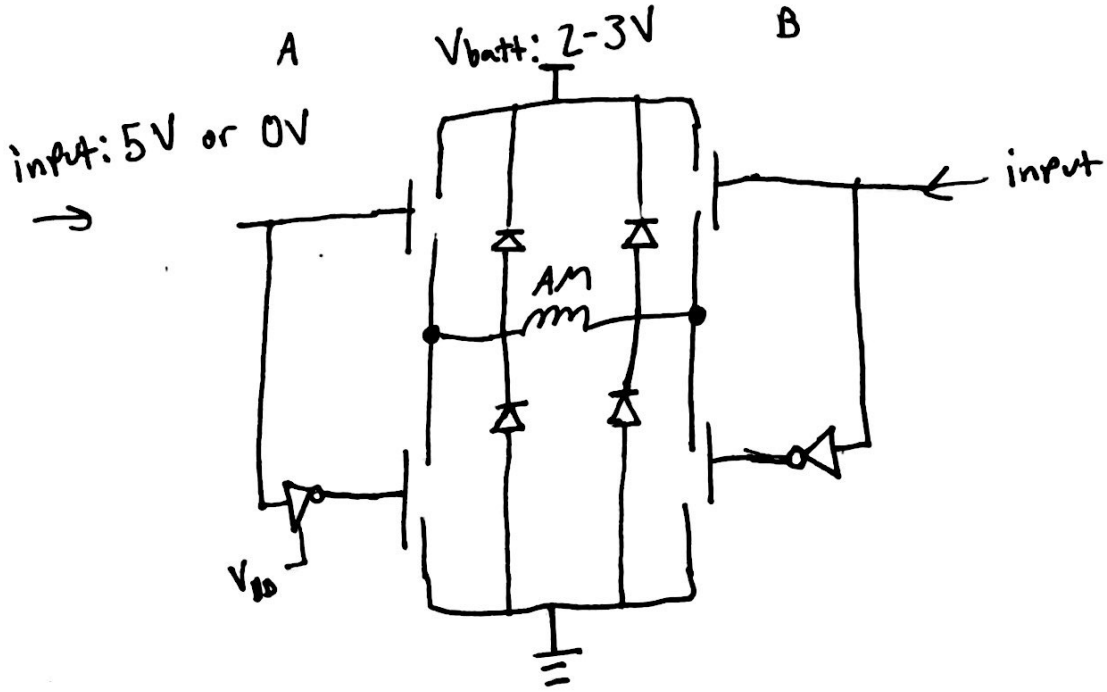
200Ω

$I = 45mA$ $P = 0.4W$

$I = 35mA$ $P = 0.25W$

CH1 (yellow - battery)
CH2 (converter output - blue)
CH3 (HA input - pink)
CH4 (H-bridge output - green)

1st - HA ↑ + out
2nd - HA ↓ - out
3rd - HA ↑ No output



A	B	Function
H	L	+
L	H	−
L	L	none

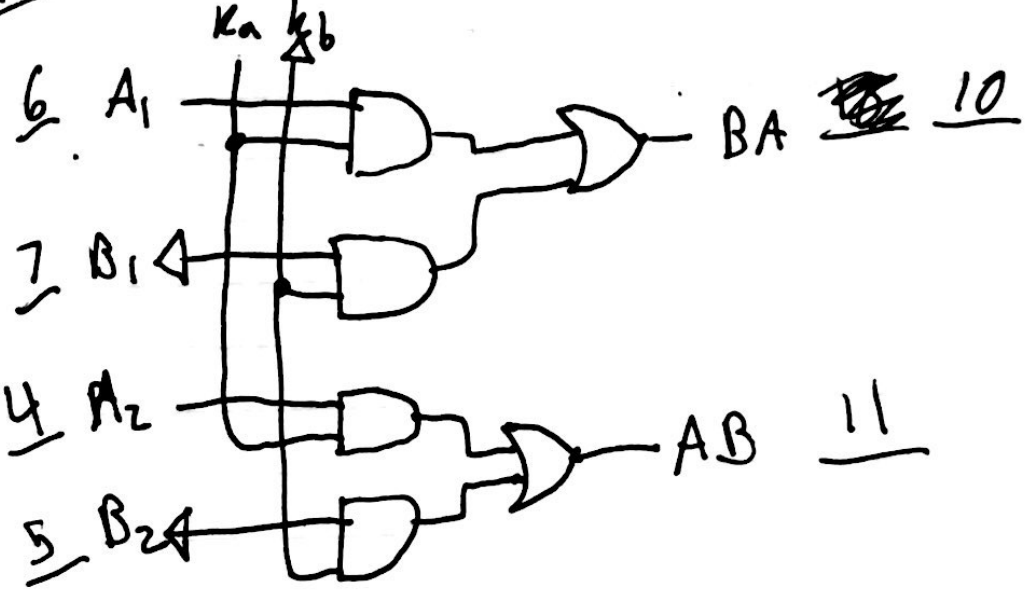
Vishay IRF510PBF $V_{GS(th)} = 2V$, $I_d = 5.6A$

TI CD4069UB inverter → TI CD4019B

74AUP1G885DC

Input			Output	
PWM/EN	DIR	Z	BA	AB
H	H	L	L	H
H	L	L	H	L
L	H	L	L	L
L	L	L	L	L

Pins 9 14



Kb	Ka/EN	4A/A1	3A/A2	B1, B2	BA	AB
L	H	H	H	L	H	H
L	H	H	L	L	H	L
L	H	L	H	L	L	H
L	H	L	L	L	L	L
L	L	X	X	L	L	L

Oscilloscope debugging

SS2 → video base mode - pulling

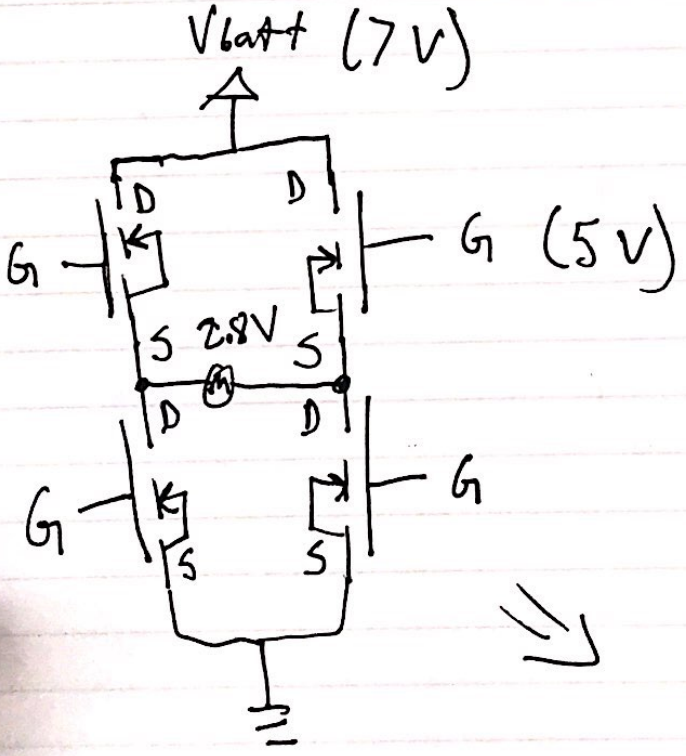
CH1 - 3A
CH2 - 4A

25 ms range

5-6 V range, vibration starts, ~ 5.2 V

H-bridge debug

(G) Logic V↑ → voltage output ↑
(D) batt V↑ → max 2.8V @ 5V logic / batt ≤ 2.8, output decrea



Switching orientation of D & S → overloa power supply

Switch

Vbatt = (5V) ' = 3V
' = 5V

G = 8V
then VM = 5V ' = 2.6

2.2Ω AM in series

separate: $B_{(Vixen)} = 1.08\,\Omega$ $A_{(Prancer)} = 1.16$

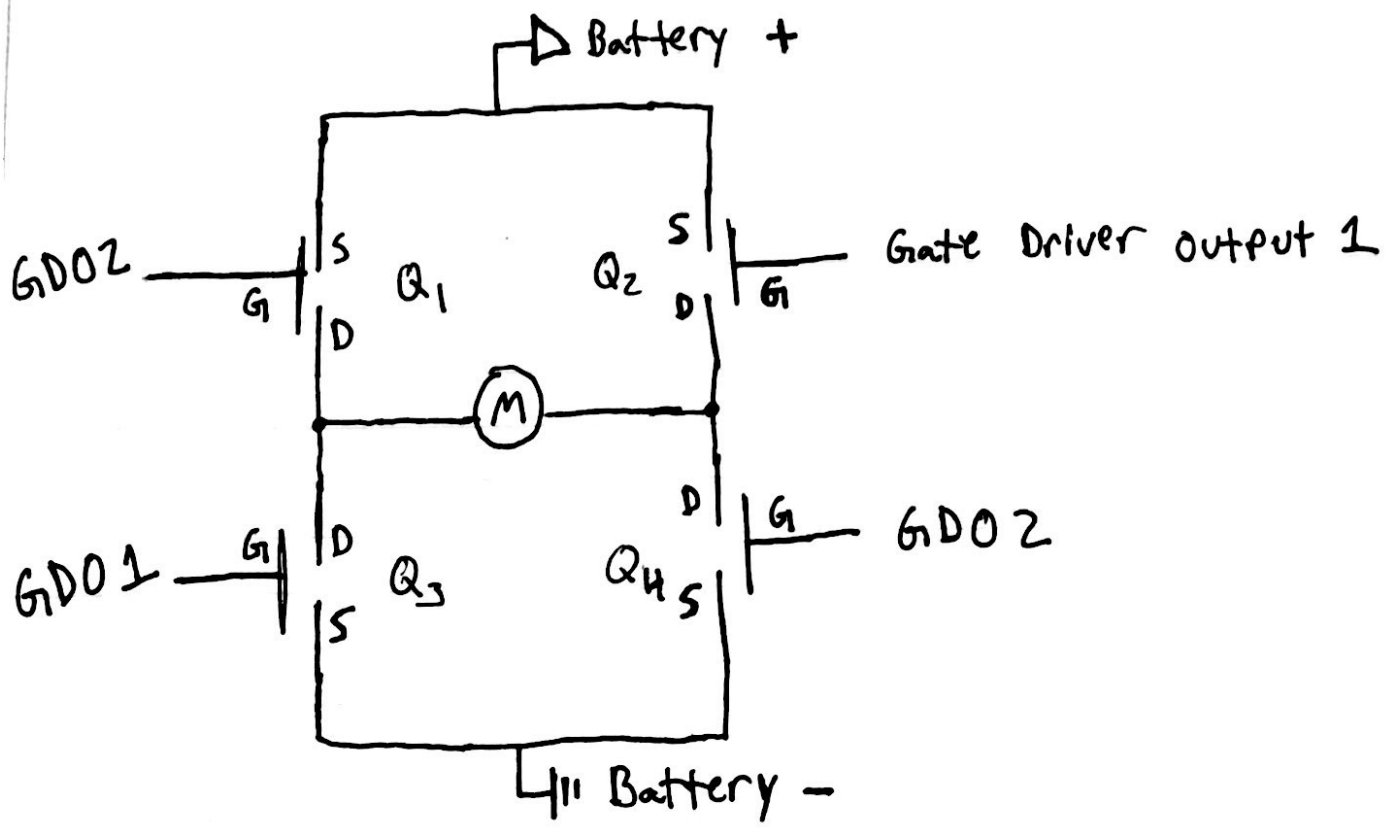
Prancer

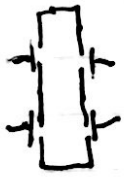
Current (A)	Force (N)
1	5
	6
2	7
	9
	10
3	10
	11
	11
4	11
	12
	15
5	14
	18
	18
	20

Vixen

Current (A)	Force (N)
1	5
	7
	9
2	9
	10
	9
3	11
	9
	14
4	14
	15
5	15
	18
	20

H-bridge (high current) V_2 debug





If P on when (+)

GDO1$^+$ GDO2$^-$

Q_1
Q_2
Q_3
Q_4

If P on when (-)

GDO1$^+$ GDO2$^-$

Only allowing 1.4 V above Gate Voltage to flow