Main Control Board

P5

Power Supply

P1

PWM_Solenoid1 — PWM_In

Shunt_Sig1 — Shunt_Out

Solenoid Driver

P2

PWM_Solenoid2 — PWM_In

Shunt_Sig2 — Shunt_Out

Solenoid Driver

P3

PWM_Solenoid3 — PWM_In

Shunt_Sig3 — Shunt_Out

Solenoid Driver

P4

Shunt_Sig1 — A_In1 — V_Out1 — Current_Sig1

Shunt_Sig2 — A_In2 — V_Out2 — Current_Sig2

Shunt_Sig3 — A_In3 — V_Out3 — Current_Sig3

A_In4 — V_Out4

R1
10k

0

Current_Sensing

J15

1 RPi_In1
2 RPi_In2

RPI pins

P6 Button L — B — PJ0

P7 Button R — B — PJ1

PH1

GND-Connection for buttons

PK0 RPi_In1
PK1 RPi_In2

Here, a Microcontroller, like the Arduino Mega should be

PWM_Solenoid3 PH3
PWM_Solenoid2 PH4
PWM_Solenoid1 PH5

LDR_COL1 PB7
LDR_COL2 PB6
LDR_COL3 PB5
LDR_COL4 PB4

Temp_Sense1 PK3
Temp_Sense2 PK4

Current_Sig3 PK5
Current_Sig2 PK6
Current_Sig1 PK7
LDR_ROW1 PF0
LDR_ROW2 PF1
LDR_ROW3 PF2

T_Sensor

Temp1 — Temp_Sense1

Temp2 — Temp_Sense2

Temperature Sensors

LDR_COL1 LDR_COL2 LDR_COL3 LDR_COL4

J14

COL1 COL2 COL3 COL4

ROW1 — LDR_ROW1

ROW2 — LDR_ROW2

ROW3 — LDR_ROW3

LDR Matrix

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Norway

Title: Main Control Board		
Size: A4	Document Number: 1	Rev: JM
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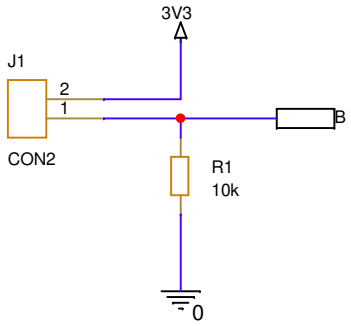

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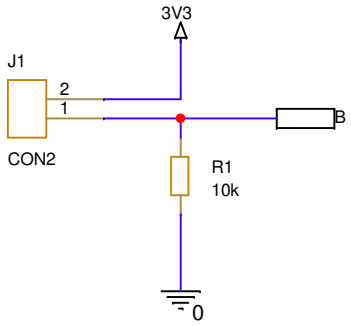
Title: Main Control Board - Button Inputs		
Size: A4	Document Number: 1	Rev: JM
Date: Monday, November 29, 2021	Sheet 1 of 1	



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Title: Main Control Board - Button Inputs		
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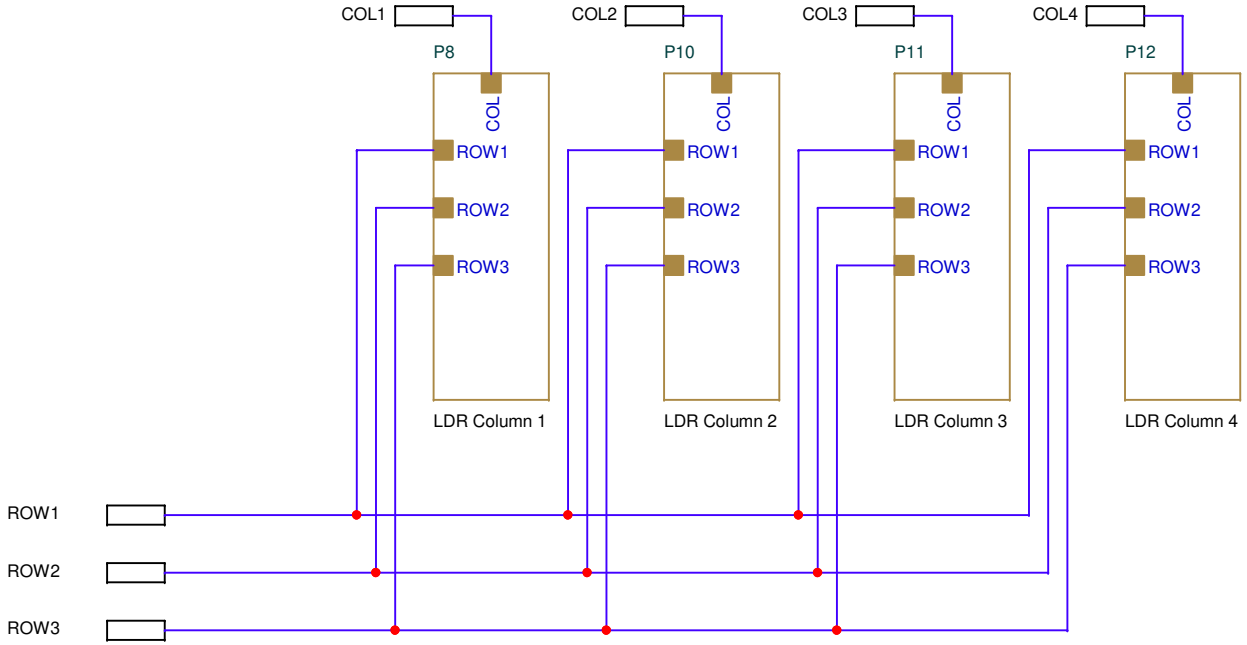

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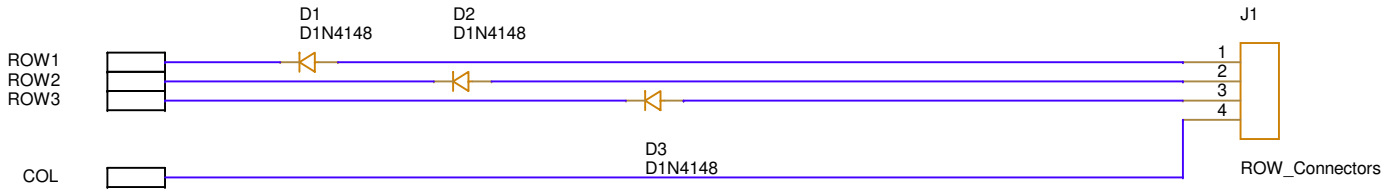
Title: Main Control Board - LDR Matrix		
Size: A4	Document Number: 1	Rev: JM
Date: Monday, November 29, 2021	Sheet 1 of 1	



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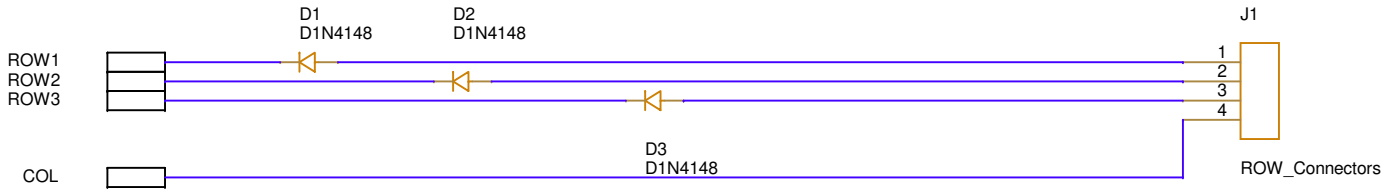
Title: Main Control Board - LDR Matrix unit		
Size: A4	Document Number: 1	Rev: JM
Date: Monday, November 29, 2021	Sheet 1 of 1	



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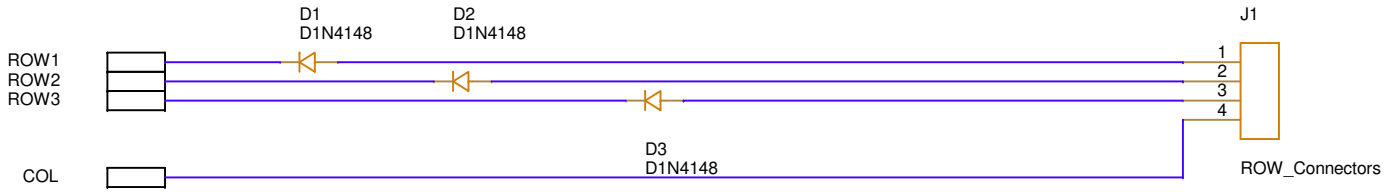

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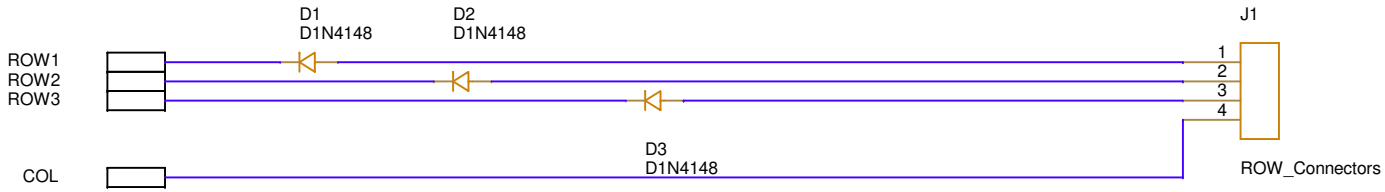

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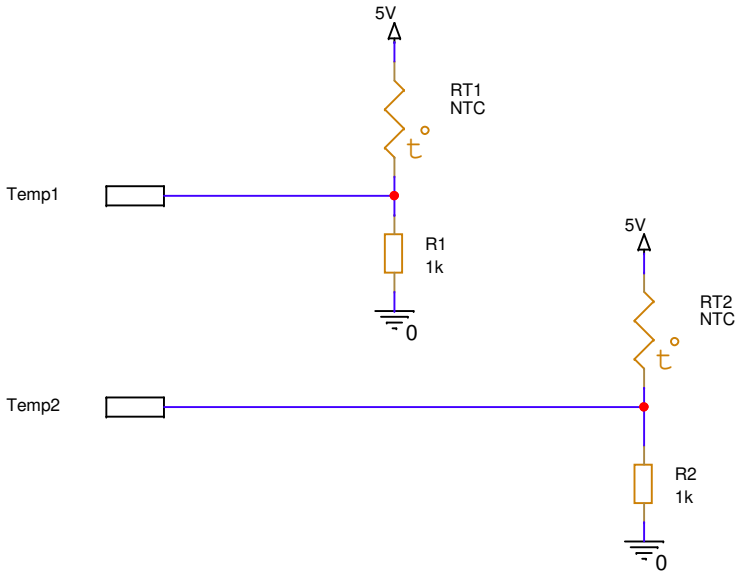

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Title: Main Control Board - Temperature Sensors		
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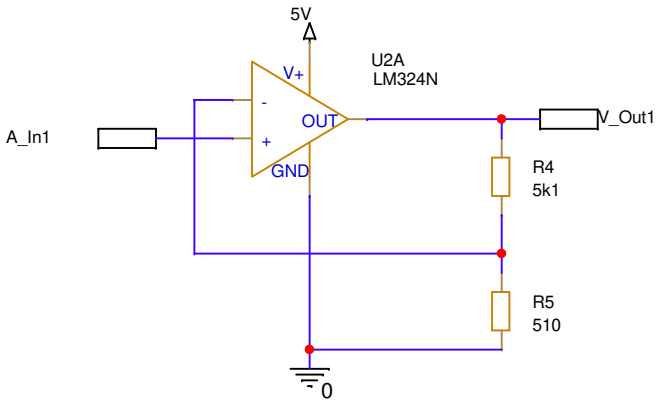
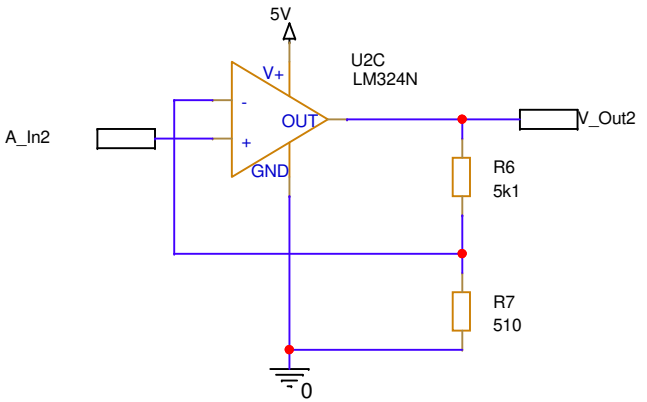
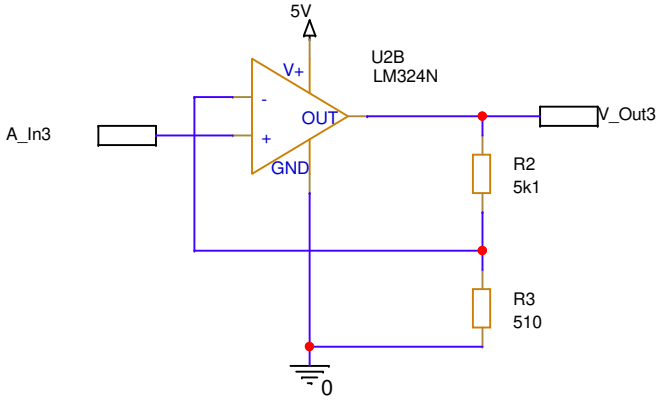
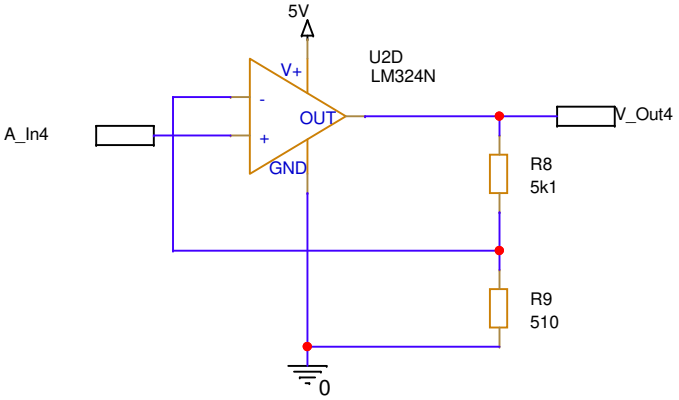
Date: Monday, November 29, 2021	Sheet 1 of 1	









gain calculation:

at 2.5A, 0.1Ohm Resisotr == 0.25 V @ 2.5A

gain of 11 is desirable:
a = 1 + R2/R1
picking R2 = 10k
R1 = R2 / (a - 1) = 1k

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Title
Main Control Board - Current Sensing

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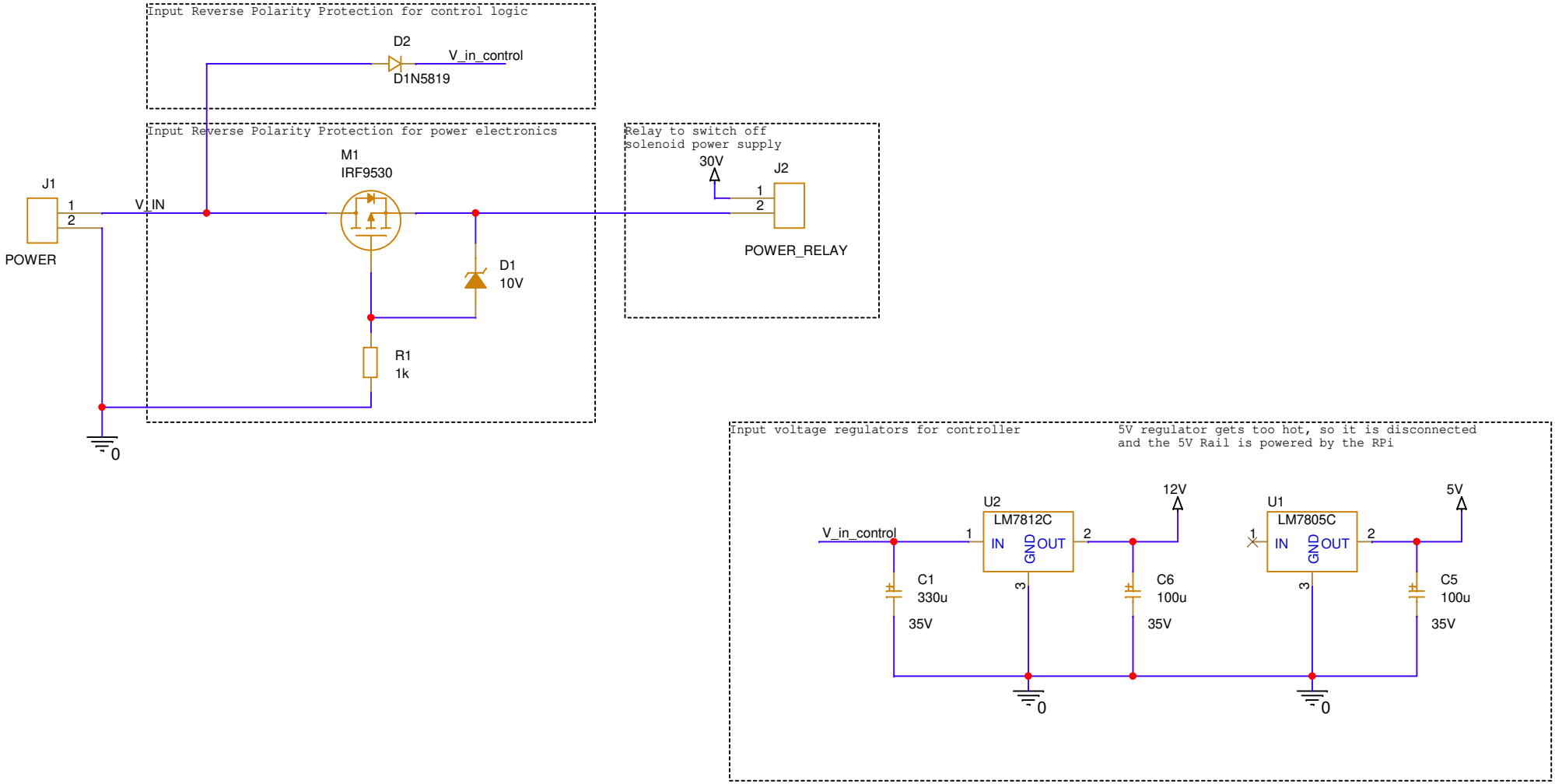
Date: Monday, November 29, 2021 Sheet 2 of 6



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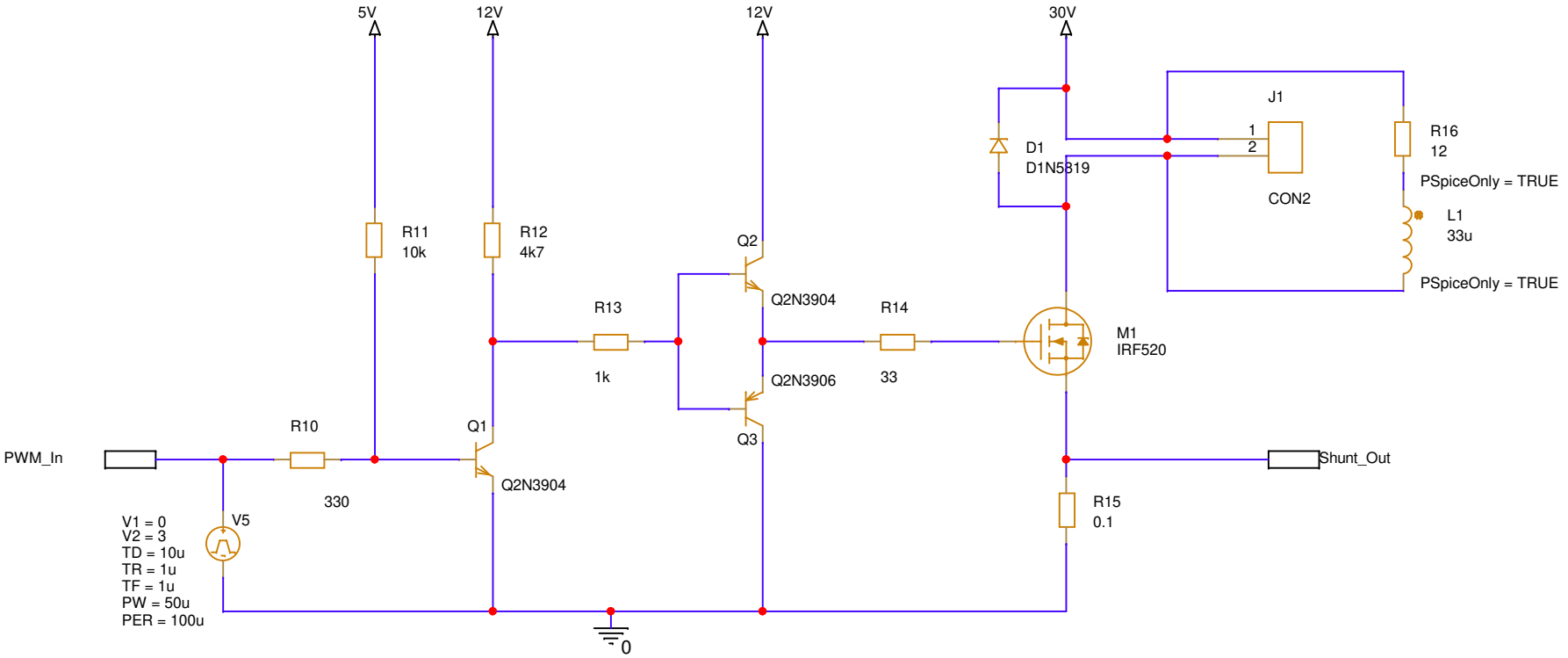
Title: Main Control Board - Power Supply		
Size: A4	Document Number: 1	Rev: JM
Date: Monday, November 29, 2021	Sheet 3 of 6	

2N3904
hFE = 100 --> I_B = 2 mA

R_Bmax = 12 V / 2 mA = 6k



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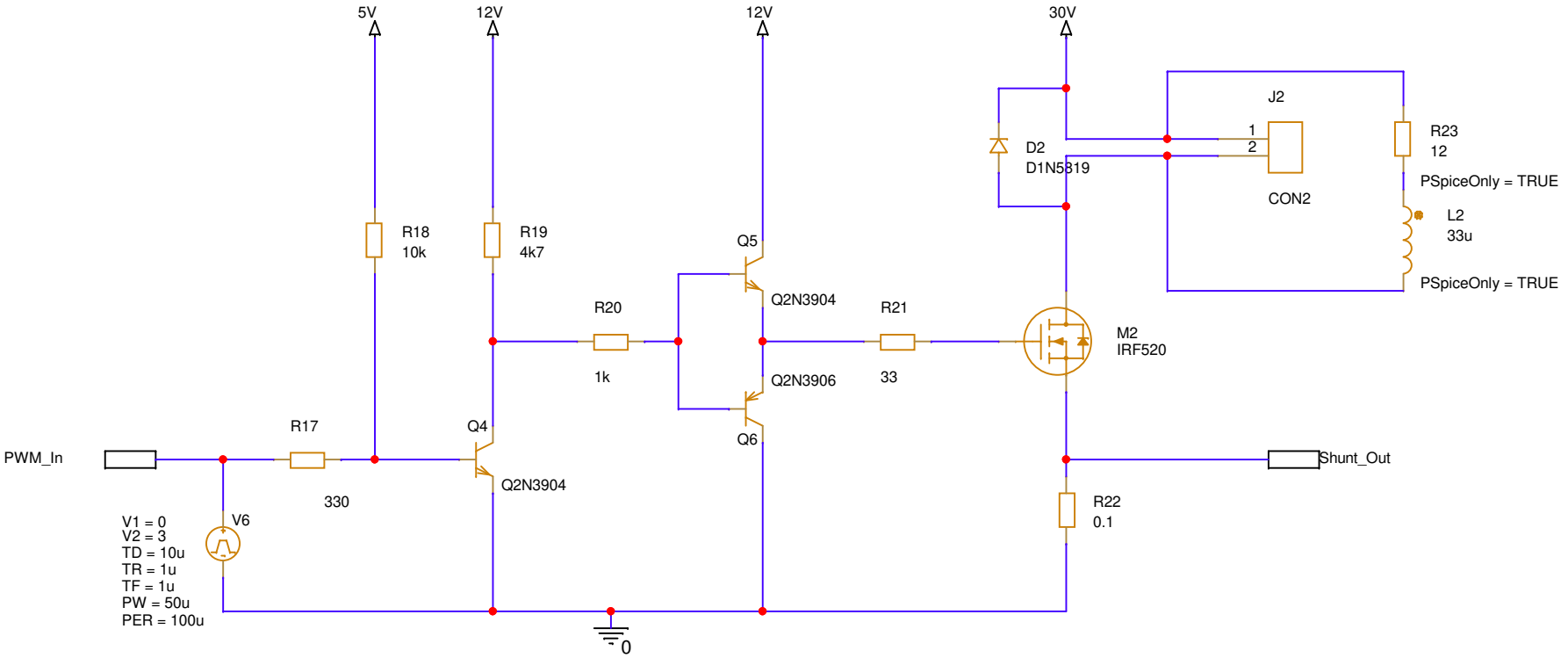
Title: Main Control Board - Solenoid Stage		
Size: A4	Document Number: 1	Rev: JM
Date: Monday, November 29, 2021	Sheet 4 of 6	

2N3904
hFE = 100 --> I_B = 2 mA

R_Bmax = 12 V / 2 mA = 6k



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Title
Main Control Board - Solenoid Stage

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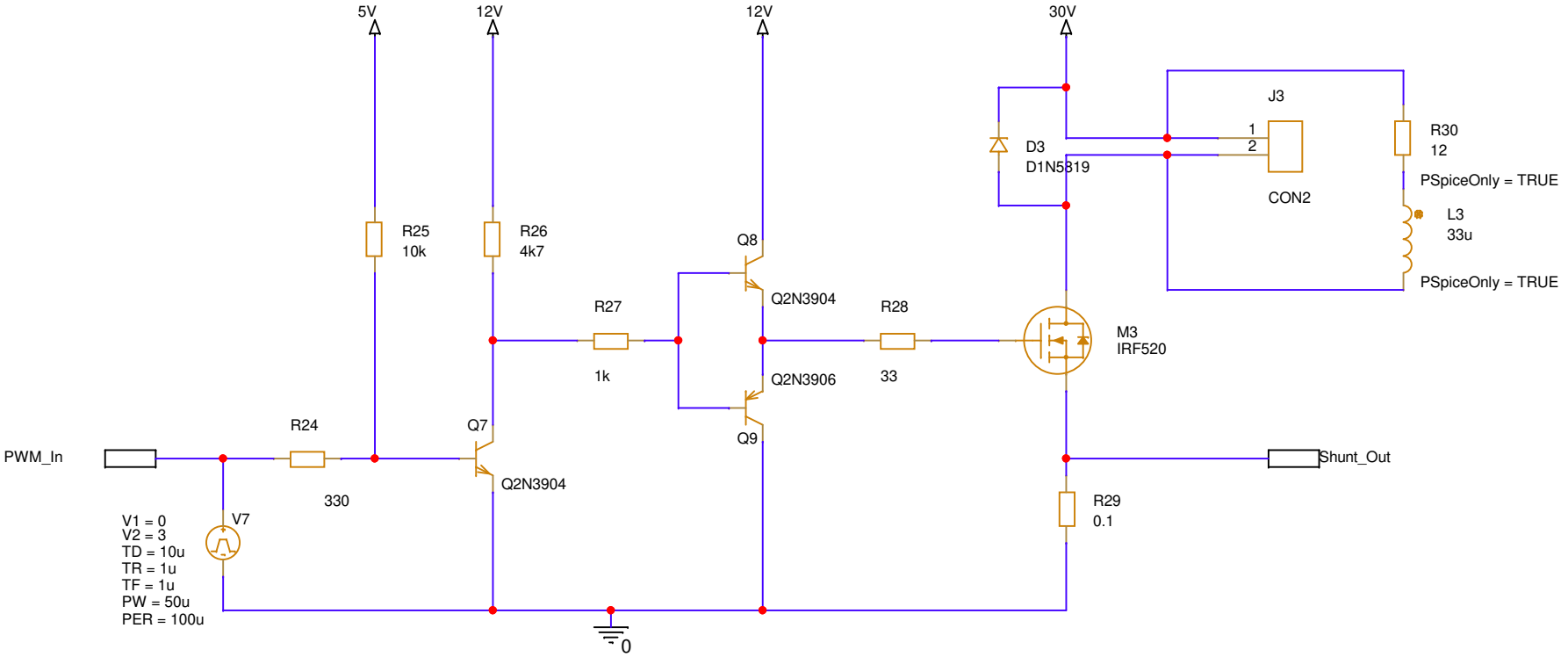
Date: Monday, November 29, 2021 Sheet 5 of 6

2N3904
hFE = 100 --> I_B = 2 mA

R_Bmax = 12 V / 2 mA = 6k



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Title: Main Control Board - Solenoid Stage		
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