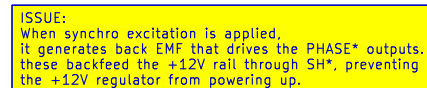
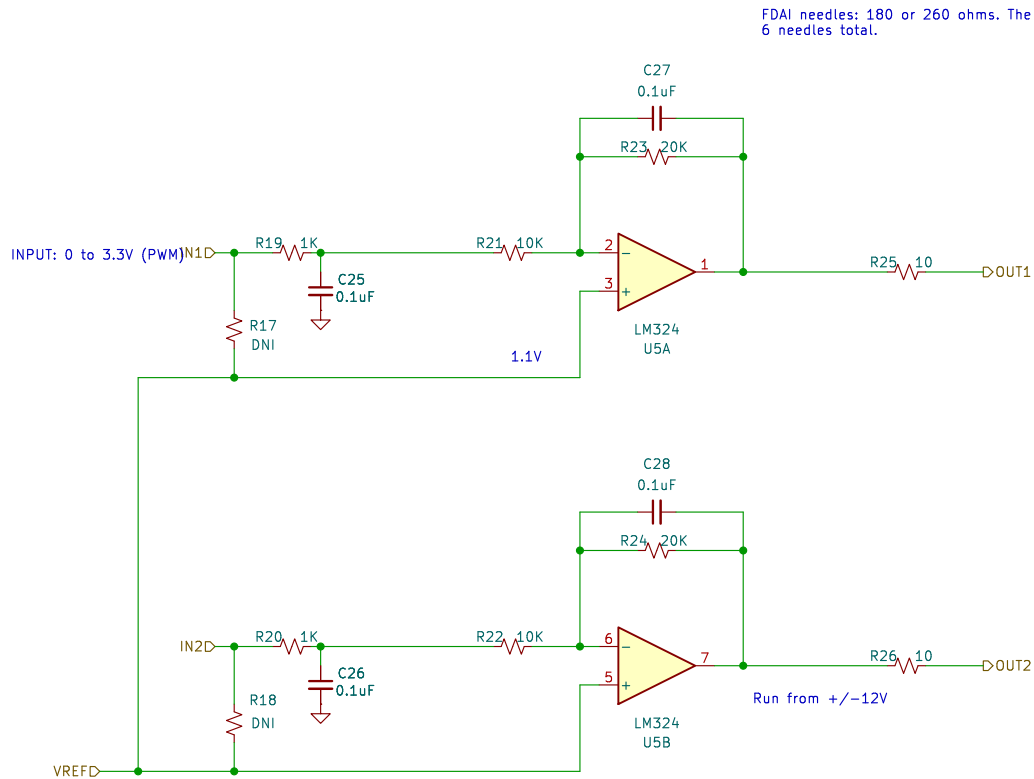


DV_BSTX = VGDD - VB00TD - VBSTUV
 VGDD = 12V
 VB00TD = 0.85V (DRV8300)
 VBSTUV = 4.5V (DRV8300)
 DV_BSTX = 6.65V
 Qg=8nC (SIS990)
 fSW = 60KHz
 ILBS_TRAN = 220uA (DRV8300)
 Qtot = Qg + ILBS_TRAN/fSW = 8nC + 3.7nC = 11.7nC
 Cbst_min = Qtot / DV_BSTX = 1.76nF



Id: 2/10



FDAI needles: 180 or 260 ohms. The full-deflection drive signal is roughly +/- 3V, but they are all slightly different. So 15 mA should be enough. 6 needles total.

Sheet: /NeedleDriver1/
File: NeedleDriver.kicad_sch

Title:

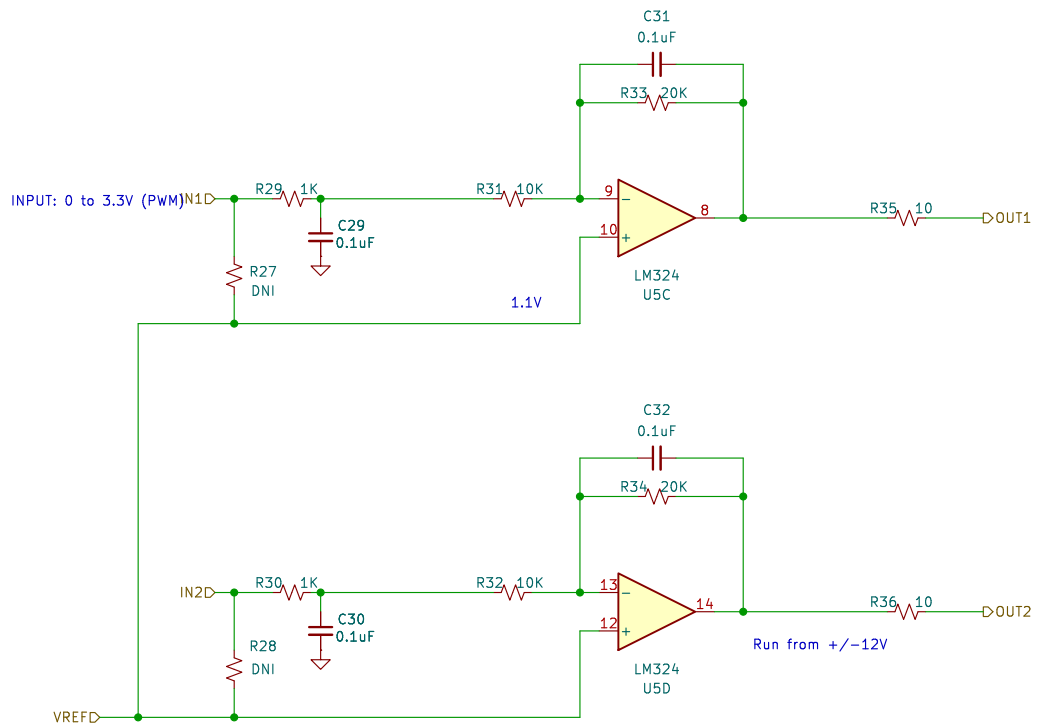
Size: A4

Date:

KiCad E.D.A. 9.0.1

Rev:

Id: 3/10



Sheet: /NeedleDriver2/
File: NeedleDriver.kicad_sch

Title:

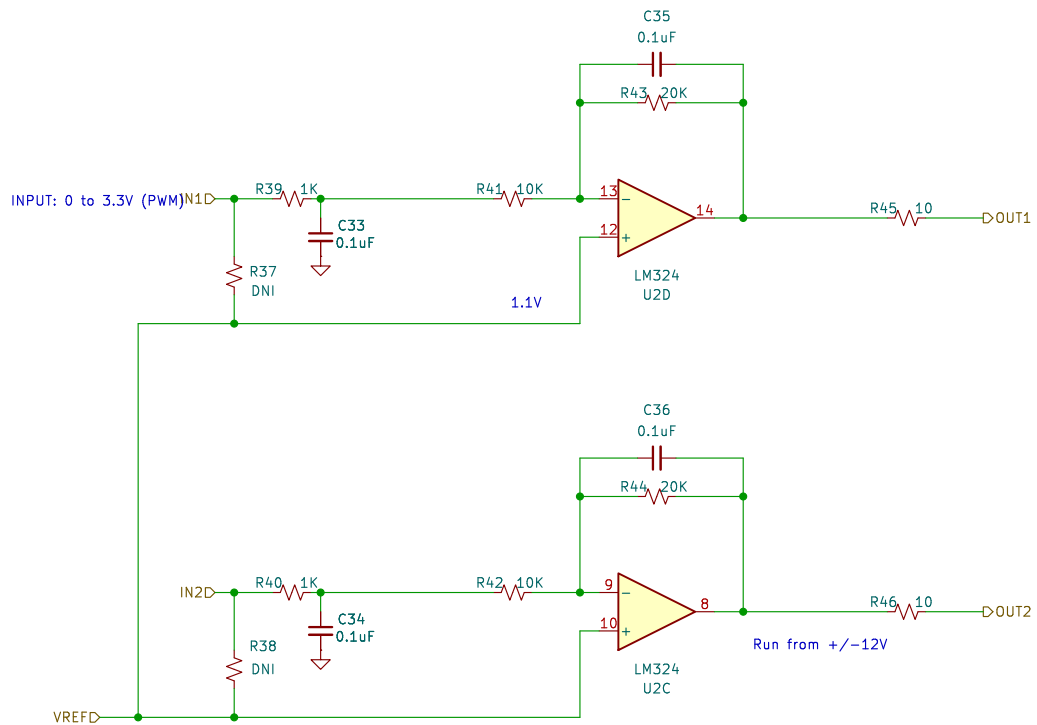
Size: A4

Date:

KiCad E.D.A. 9.0.1

Rev:

Id: 4/10



FDAI needles: 180 or 260 ohms. The full-deflection drive signal is roughly +/- 3V, but they are all slightly different. So 15 mA should be enough. 6 needles total.

Sheet: /NeedleDriver3/
File: NeedleDriver.kicad_sch

Title:

Size: A4

Date:

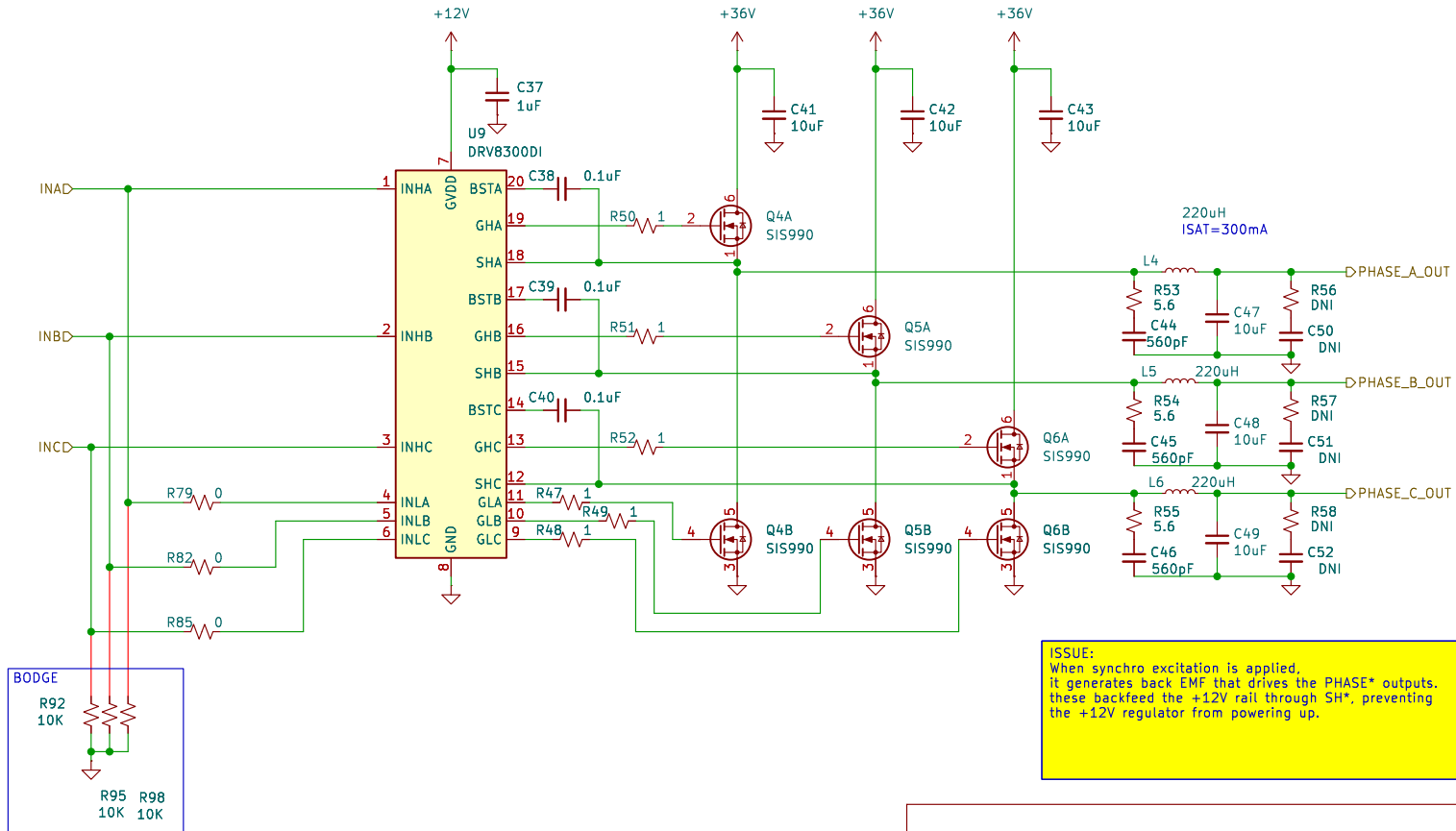
KiCad E.D.A. 9.0.1

Rev:

Id: 5/10

VREF is 2.6 VAC.
 FDAI CT winding: 11.8VAC, is 152 mH and 62 ohms. Current is up to 28 mA, depending on the shaft position.
 If you want to drive a synchro directly, I measure about 25 mA if the shaft is spinning freely. If you hold the synchro shaft so it's generating maximum torque, the current goes up to 600 mA.

$DV_BSTX = VGDD - VBOOTD - VBSTUV$
 $VGDD = 12V$
 $VBOOTD = 0.85V$ (DRV8300)
 $VBSTUV = 4.5V$ (DRV8300)
 $DV_BSTX = 6.65V$
 $Qg = 8nC$ (SIS990)
 $f_{SW} = 60KHz$
 $ILBS_TRAN = 220uA$ (DRV8300)
 $Q_{tot} = Qg + ILBS_TRAN / f_{SW} = 8nC + 3.7nC = 11.7nC$
 $C_{bst_min} = Q_{tot} / DV_BSTX = 1.76nF$



Sheet: /SingleSynchroDriver2/
 File: SingleSynchroDriver.kicad_sch

Title:

Size: A4

Date:

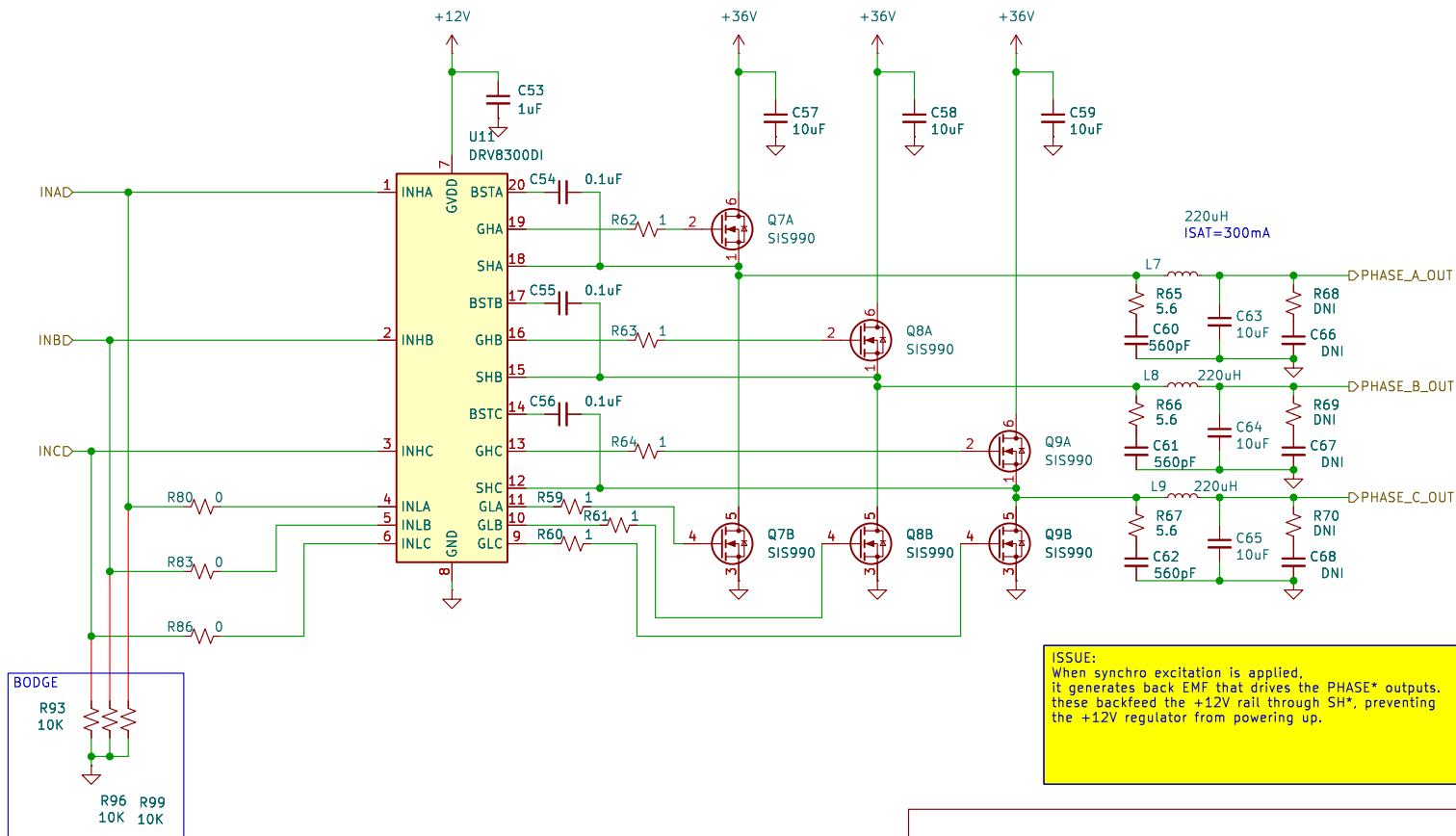
KiCad E.D.A. 9.0.1

Rev:

Id: 6/10

VREF is 2.6 VAC.
FD41 CT winding: 11.8VAC, is 152 mH and 62 ohms. Current is up to 28 mA, depending on the shaft position.
If you want to drive a synchro directly, I measure about 25 mA if the shaft is spinning freely. If you hold the synchro shaft so it's generating maximum torque, the current goes up to 600 mA.

DV_BSTX = VGDD - VBOOTD - VBSTUV
 VGDD = 12V
 VBOOTD = 0.85V (DRV8300)
 VBSTUV = 4.5V (DRV8300)
 DV_BSTX = 6.65V
 Qg=8nC (SIS990)
 fSW = 60KHz
 ILBS_TRAN = 220uA (DRV8300)
 Qtot = Qg + ILBS_TRAN/fSW = 8nC + 3.7nC = 11.7nC
 Cbst_min = Qtot / DV_BSTX = 1.76nF



ISSUE:
When synchro excitation is applied, it generates back EMF that drives the PHASE* outputs. these backfeed the +12V rail through SH*, preventing the +12V regulator from powering up.

Sheet: /SingleSynchroDriver3/
File: SingleSynchroDriver.kicad_sch

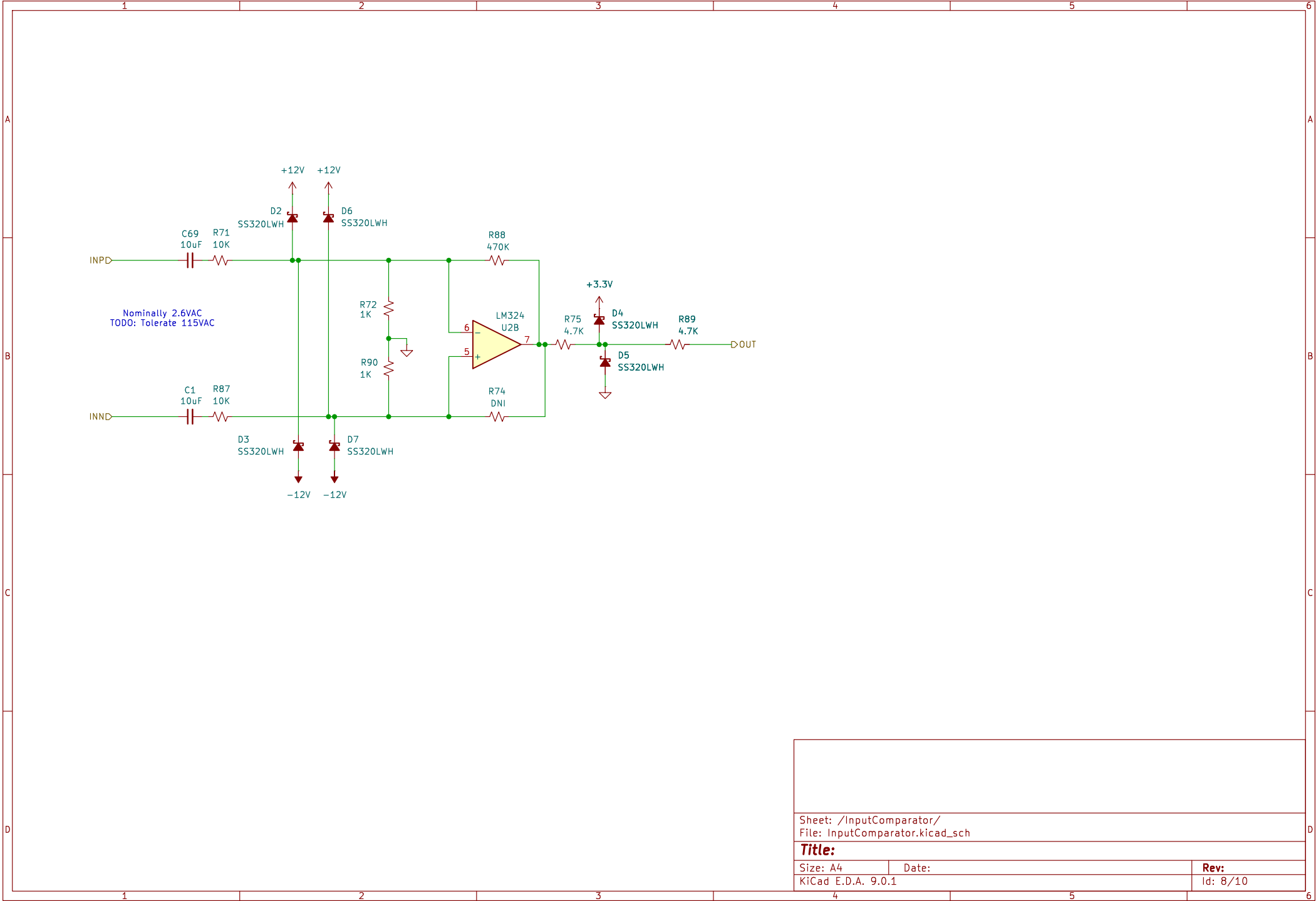
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Size: A4	Date:
KiCad E.D.A. 9.0.1	

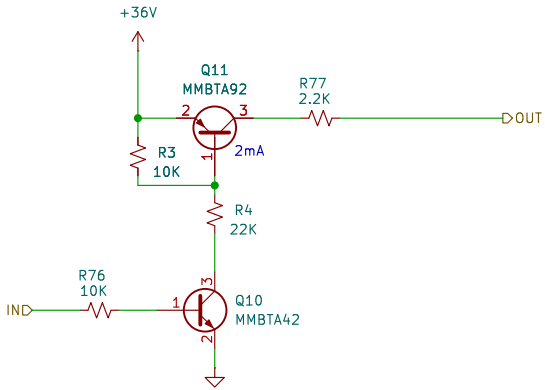
Date:

Rev:

Id: 7/10



Flag solenoid
3.55k ohm
Voltage range approx 16 to 28V
4.5ma at 16v
6.75ma at 24V
7.89ma at 28V



Sheet: /FlagDriver/
File: FlagDriver.kicad_sch

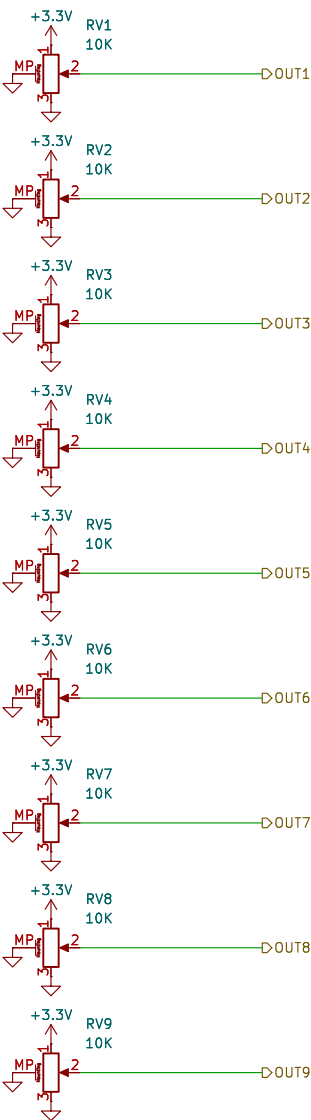
Title:

Size: A4 Date:

KiCad E.D.A. 9.0.1

Rev:

Id: 9/10



Sheet: /Pots/
File: Pots.kicad_sch

Title:

Size: A4
KiCad E.D.A. 9.0.1

Date:

Rev:
Id: 10/10