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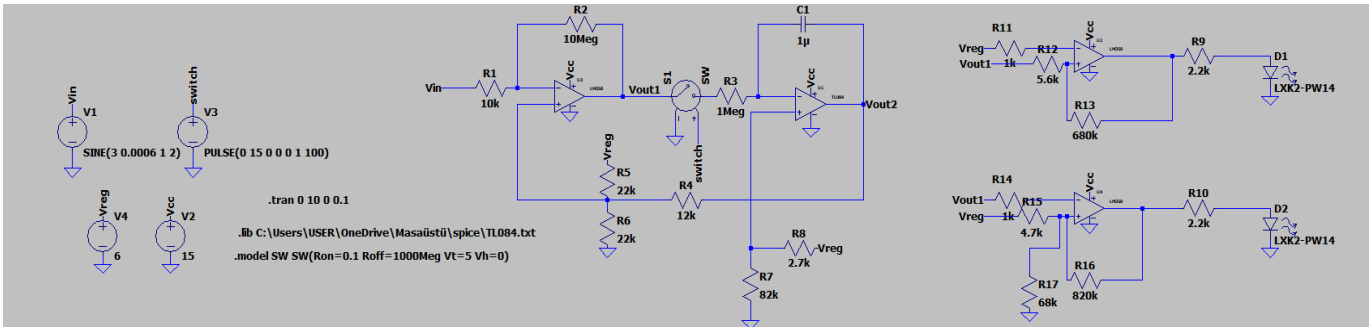
Date: 19.04.2024

EE313 PROJECT

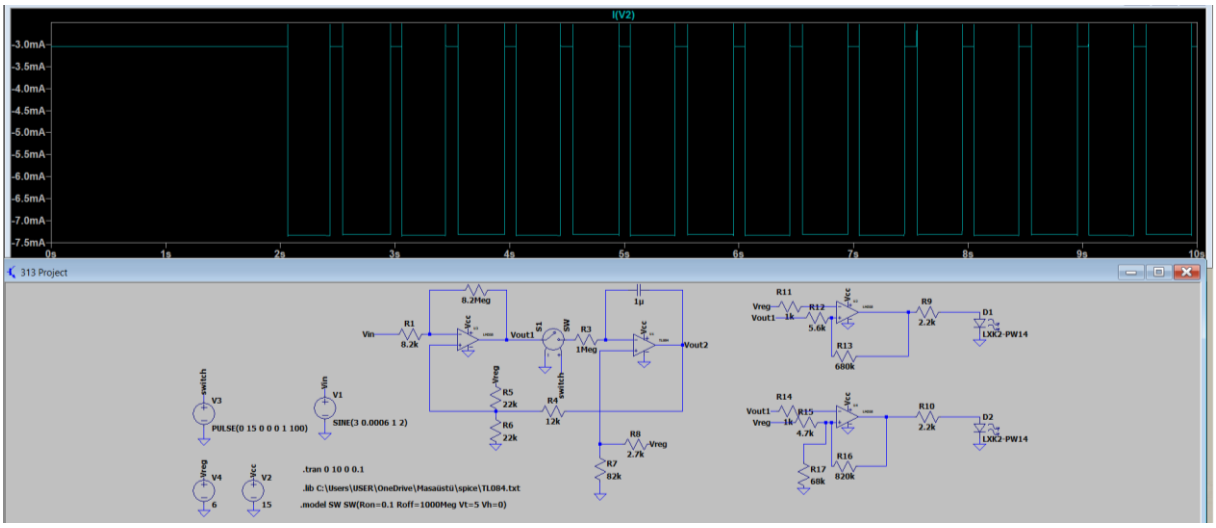
Overall Compass Circuit with LEDs



However, my spice library didn't contain the specified LED model, I used some other model.

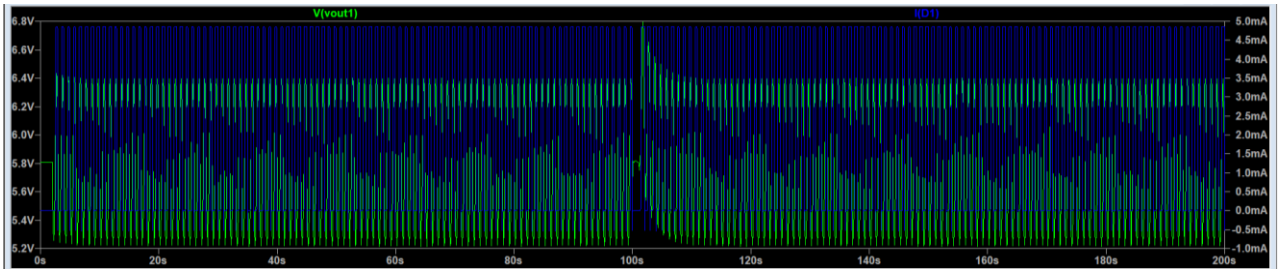
Specification 1)

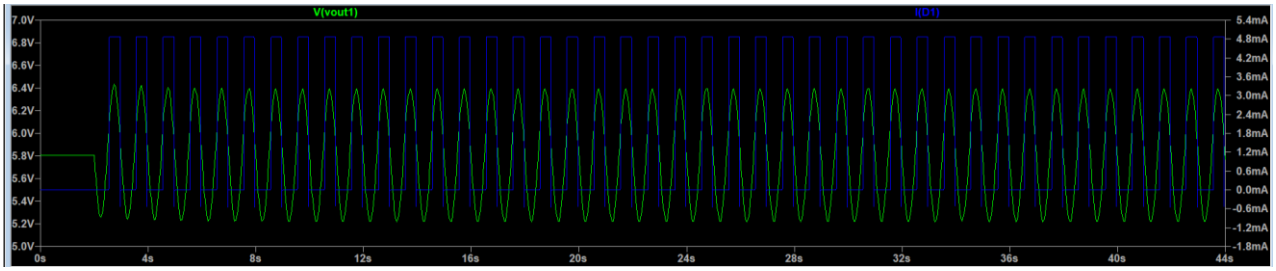
Current consumption from +15V supply < 30 mA



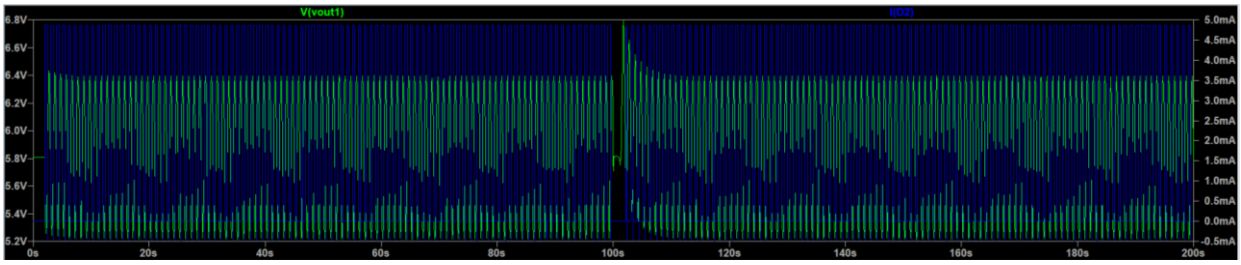
Specification 2)

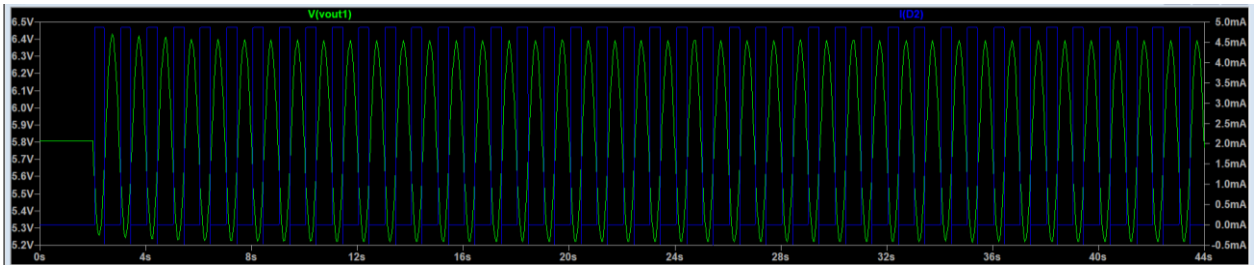
In the South, compass works properly more than 3 minutes after auto-zero.





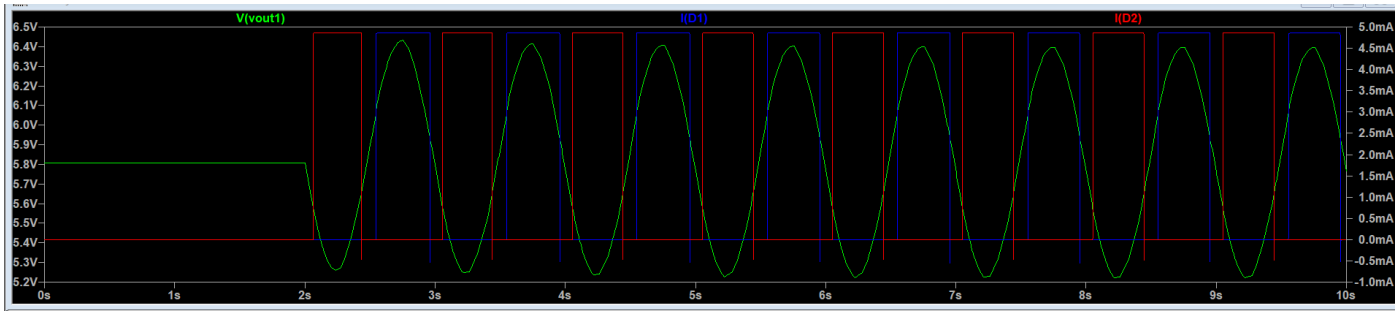
In the North, compass works properly more than 3 minutes after auto-zero.





Specification 3)

By checking the duty cycles of the LEDs we can guarantee, Leds turned on within ± 45° of North or South. ID2 is the RED LED showing the North. ID1 is the GREEN LED showing the South.



Specification 4)

Also, from the above graph by aranging the opamp resistances, LED doesn't flicker while turning on and off. When Vout in its positive peak ID1 is in its peak, green led will turn on showing the South, when Vin is very above 5.8V. When Vout in its negative peak ID2 is in its peak, led led will turn on showing the North, when Vin is very below 5.8V.

Diptrace Schematic of My Circuit

#	RefDes	Value	Name	Pattern
1	C1, C3, C4	1u, 330n, 100n	Capacitor, Ceramic	CAP200
2	D1, D2		LED-3mm Round Red	LED-3mm
3	Q1	UGN3503U	UGN3503U	UGN3503
4	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17	1k, 5.6k, 1k, 47k, 680k, 2.2k, 2.2k, 6.8k, 10meg, 1meg, 12k, 22k, 22k, 82k, 2.7k, 820k, 68k	Resistor320	RS320
5	S1		DTS-6, Pushbutton Sw	DTS-6
6	U1, U2	LM358	LM358	DIP8
7	U3	TL064	TL084	DIP14
8	U4	7806	7806	TO250