

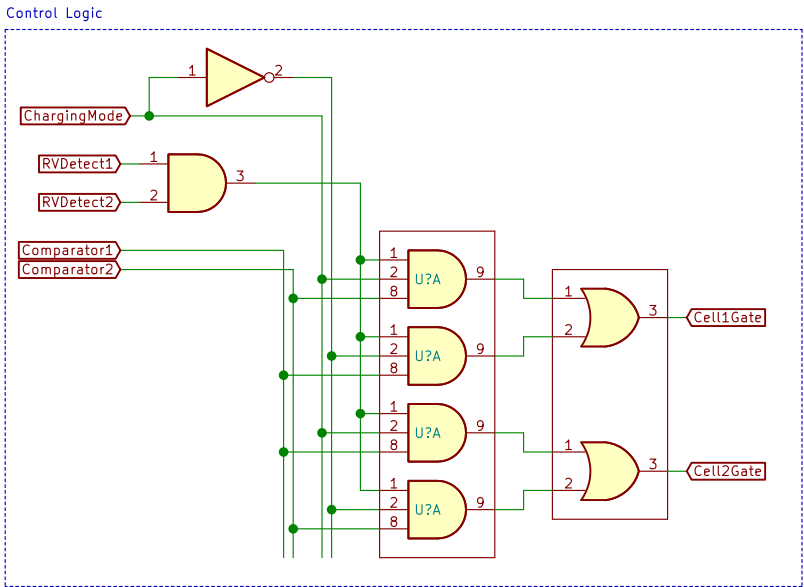
## Control Logic Truth Table

RV Detect 2	RV Detect 1	Comparator 1	Comparator 2	ChargingMode	Cell1Gate	Cell2Gate
0	0	0	0	0	0	0
0	0	0	0	1	0	0
0	0	0	1	0	0	0
0	0	0	1	1	0	0
0	0	1	0	0	0	0
0	0	1	0	1	0	0
0	0	1	1	0	0	0
0	0	1	1	1	0	0
0	1	0	0	0	0	0
0	1	0	0	1	0	0
0	1	0	1	0	0	0
0	1	0	1	1	0	0
0	1	1	0	0	0	0
0	1	1	0	1	0	0
0	1	1	1	0	0	0
0	1	1	1	1	0	0
1	0	0	0	0	0	0
1	0	0	0	1	0	0
1	0	0	1	0	0	0
1	0	0	1	1	0	0
1	0	1	0	0	0	0
1	0	1	0	1	0	0
1	0	1	1	0	0	0
1	0	1	1	1	0	0
1	1	0	0	0	0	0
1	1	0	0	1	0	0
1	1	0	1	0	0	1
1	1	0	1	1	0	1
1	1	1	0	0	1	0
1	1	1	0	1	0	1
1	1	1	1	0	1	1
1	1	1	1	1	1	1

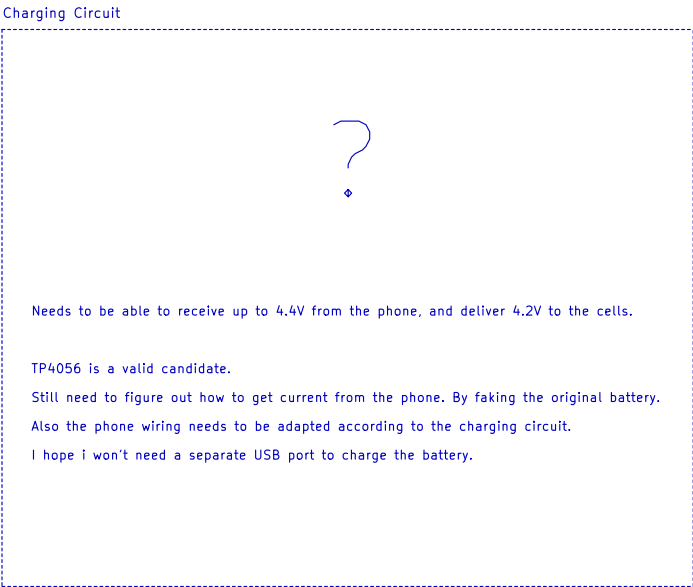
RV Detector is High if the cell is inserted correctly  
ChargingMode High if Cells are charging  
Comparator 1 (U11) High if VCell1 >= VCell2  
Comparator 2 (U12) High if VCell2 >= VCell1

Reverse Polarity, Shut down everything

Correct Polarity, unfeasible Comparator combination. Shout down everything  
Correct Polarity, unfeasible Comparator combination. Shout down everything  
Correct Polarity, Cells are unbalanced, Cell 2 is Higher, Discharging -> Close Cell2Gate  
Correct Polarity, Cells are unbalanced, Cell 2 is Higher, Charging -> Close Cell1Gate  
Correct Polarity, Cells are unbalanced, Cell 1 is Higher, Discharging -> Close Cell1Gate  
Correct Polarity, Cells are unbalanced, Cell 1 is Higher, Charging -> Close Cell2Gate  
Correct Polarity, Cells are balanced, Close both gates  
Correct Polarity, Cells are balanced, Close both gates



Cell1Gate = (ChargingMode && Comp2 && (RVD1 && RVD2)) || (! ChargingMode && Comp1 && (RVD1 && RVD2))  
Cell2Gate = (ChargingMode && Comp1 && (RVD1 && RVD2)) || (! ChargingMode && Comp2 && (RVD1 && RVD2))



Needs to be able to receive up to 4.4V from the phone, and deliver 4.2V to the cells.

TP4056 is a valid candidate.

Still need to figure out how to get current from the phone. By faking the original battery.

Also the phone wiring needs to be adapted according to the charging circuit.

I hope i won't need a separate USB port to charge the battery.