

THE TETRODE BOARDS

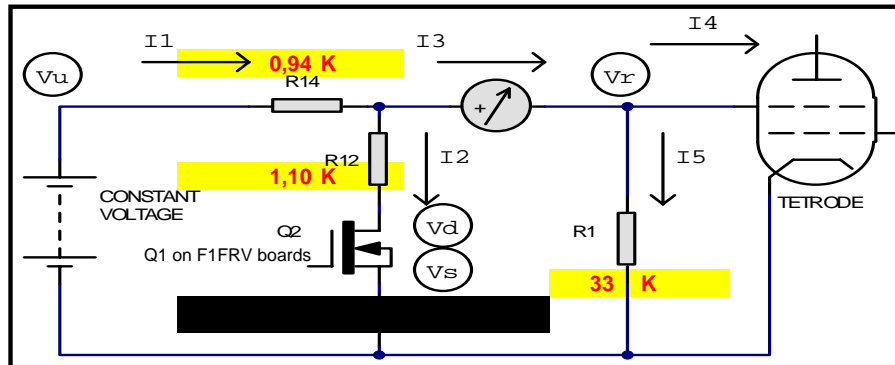
Calculation of R1, R12, R14

This spreadsheet follows the method in Application Note 3
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Modification for F1FRV board, with power MOSFET and R1 at DC ground

Rev 1b October 14, 2010

Application Note 3, Figure 2 (modified)



Input cells are **Yellow** Results are **Red**

Tube:
GU-78B

Step

1 Enter unregulated input voltage: $V_u = 500$ V at load ~ 160 mA

2 Enter regulated output voltage: $V_r = 350$ V

3 Resistor R1: Use next standard value below $35,00$ k
Enter value used for R1: $R_1 = 33$ k
Power dissipation of R1 4 W

4 Enter maximum positive screen current: $I_4 = + 100$ mA

Minimum value of I2 (keep-alive current for Q2) = 10 mA (fixed)

5 Resistor R14: Use next standard value below $1,24$ k
Enter value used for R14: $R_{14} = 0,94$ k
Power dissipation of R14 24 W

6 Enter maximum negative screen current $I_4 = - 100$ mA

7 Resistor R12: Use next standard value below $1,47$ k
Enter value used for R12: $R_{12} = 1,10$ k
Maximum power dissipation of R12 = 59 W @ $I_2 = 238,4$ mA

Values in Figure 2

$I_5 = 10,6$ mA

$I_3 \text{ Pos} = 110,6$ mA

$I_1 = 159,6$ mA

$I_3 \text{ Neg} = -89,4$ mA

$I_2 = 238,4$ mA



MAXIMUM power dissipation of Q2 = $27,8$ W

SELECT RESISTORS MAX DISSIPATION AT LEAST 2 OR 3 x USED POWER DISSIPATION SEE TEMP VS POWER CURVE,
RESISTORS CAN BE PARALLELED TO OBTAIN THE DESIRED VALUE (EG. 3 x 3,3 K 50 W IN // TO HAVE 1,1 K 150 W)
RESISTORS CAN BE SERIALISED TO OBTAIN THE DESIRED VALUE (EG. 2 x 470 50 W in SERIE TO HAVE 0,94 K 100 W)

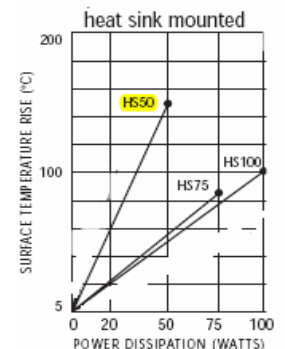
DESIGN CHECK

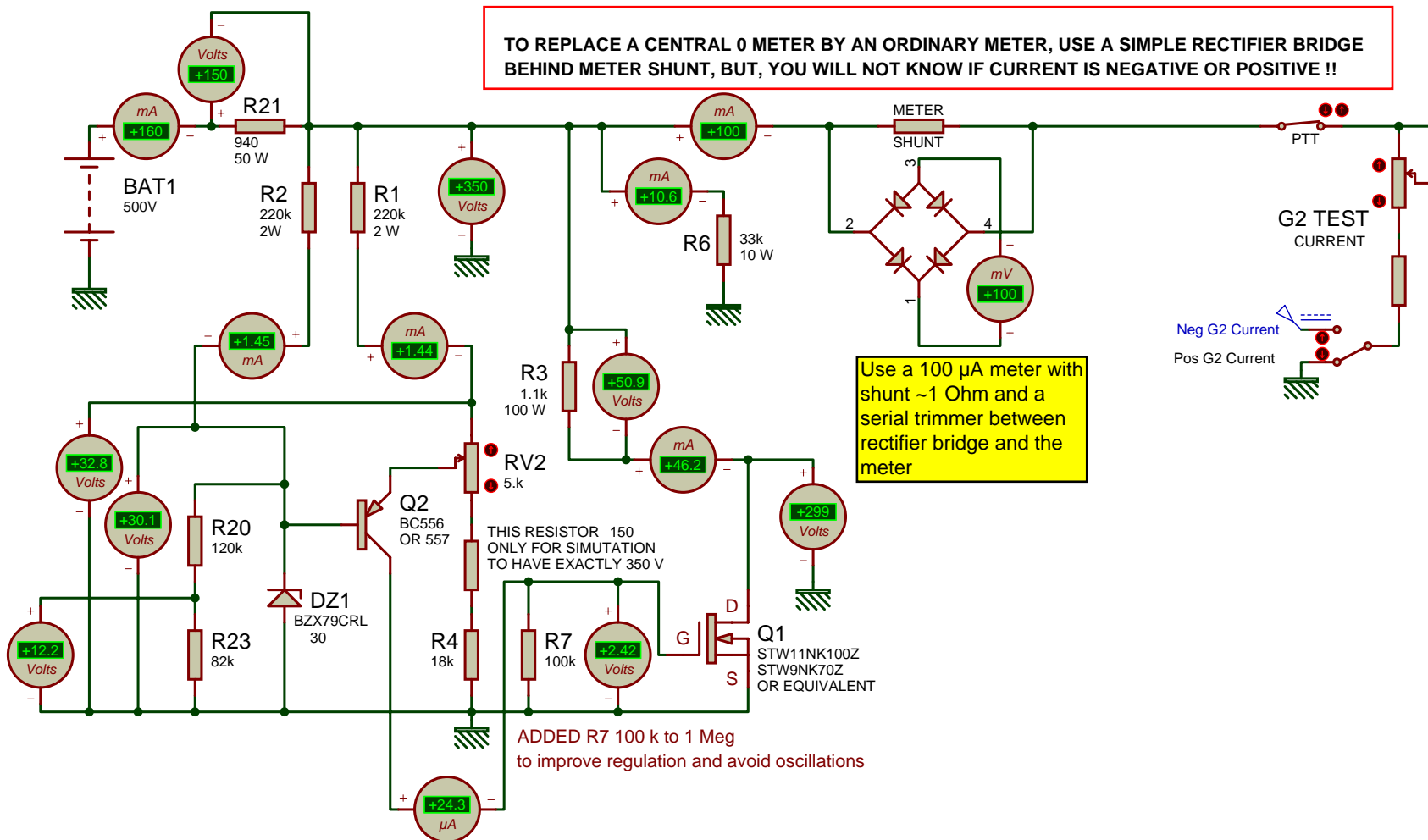
Go back to **Step 1** now, and try a **5% lower** value for V_u . In cell D25, enter 475 V

Do you see any red error messages?

If you see any red error messages, your present resistor values are marginal!

You should reduce the indicated resistor values, and/or increase the transformer voltage, until **no** error messages appear when you decrease V_u by 5% from your expected minimum value at maximum current. EXCEPT IF YOU ARE SURE OF INPUT VOLTAGE STABILITY AT I_1 CURRENT, AND NETWORK MINIMUM VOLTAGE,

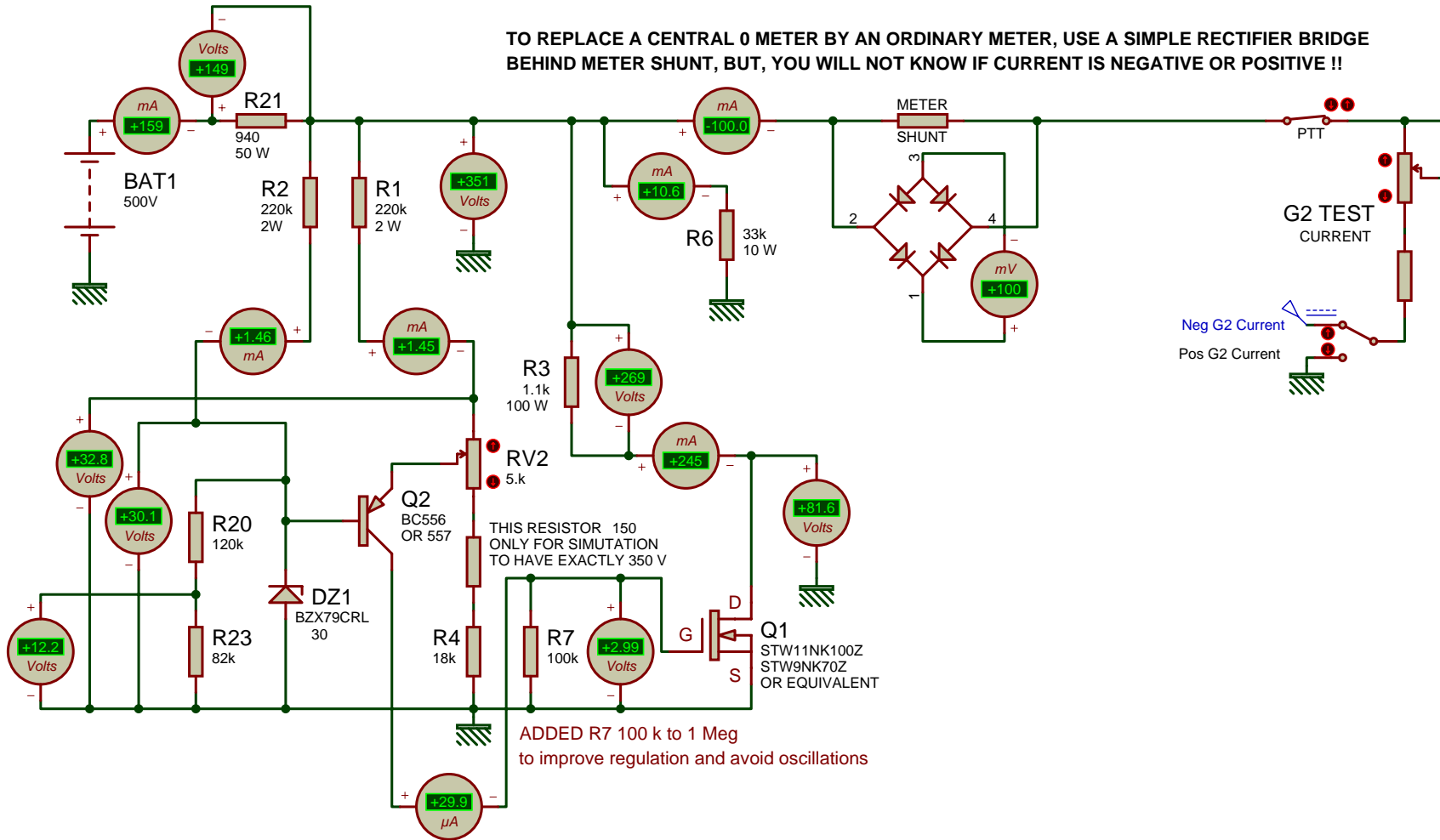




	V R3	I Shunt (mA)	Q1 V DS	P R3 (W)	P Q1 (W)
PTT OFF	160	146	190	~23.5	~27.8
G2 +100 mA	50	45	301	~2.5	~13.5
G2 -100 mA	270	246	80	~66.5	~20 W

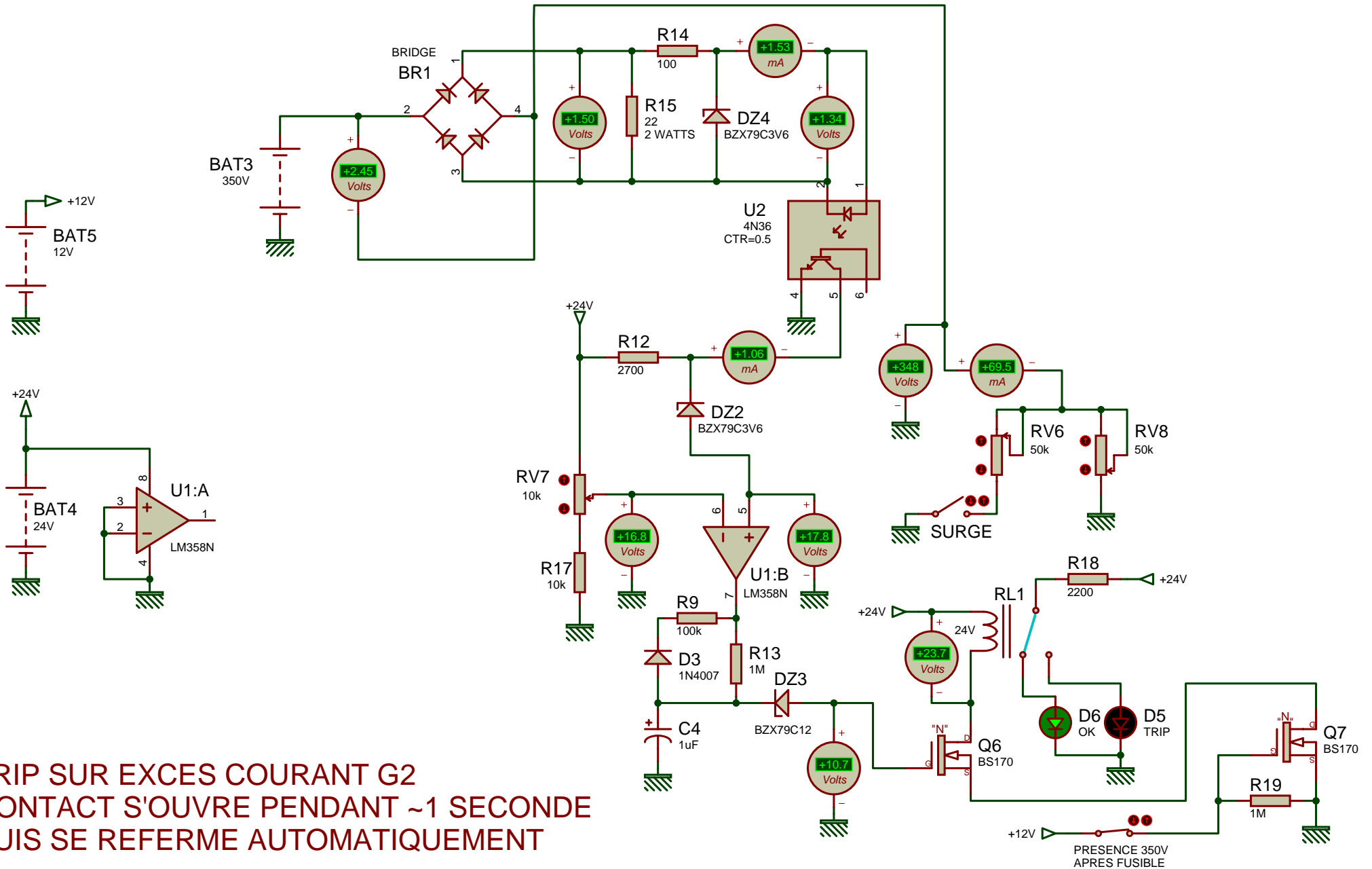
TETRODE LINEAR AMPLIFIER G2 SHUNT SUPPLY WITH MOSFET

TO REPLACE A CENTRAL 0 METER BY AN ORDINARY METER, USE A SIMPLE RECTIFIER BRIDGE BEHIND METER SHUNT, BUT, YOU WILL NOT KNOW IF CURRENT IS NEGATIVE OR POSITIVE !!



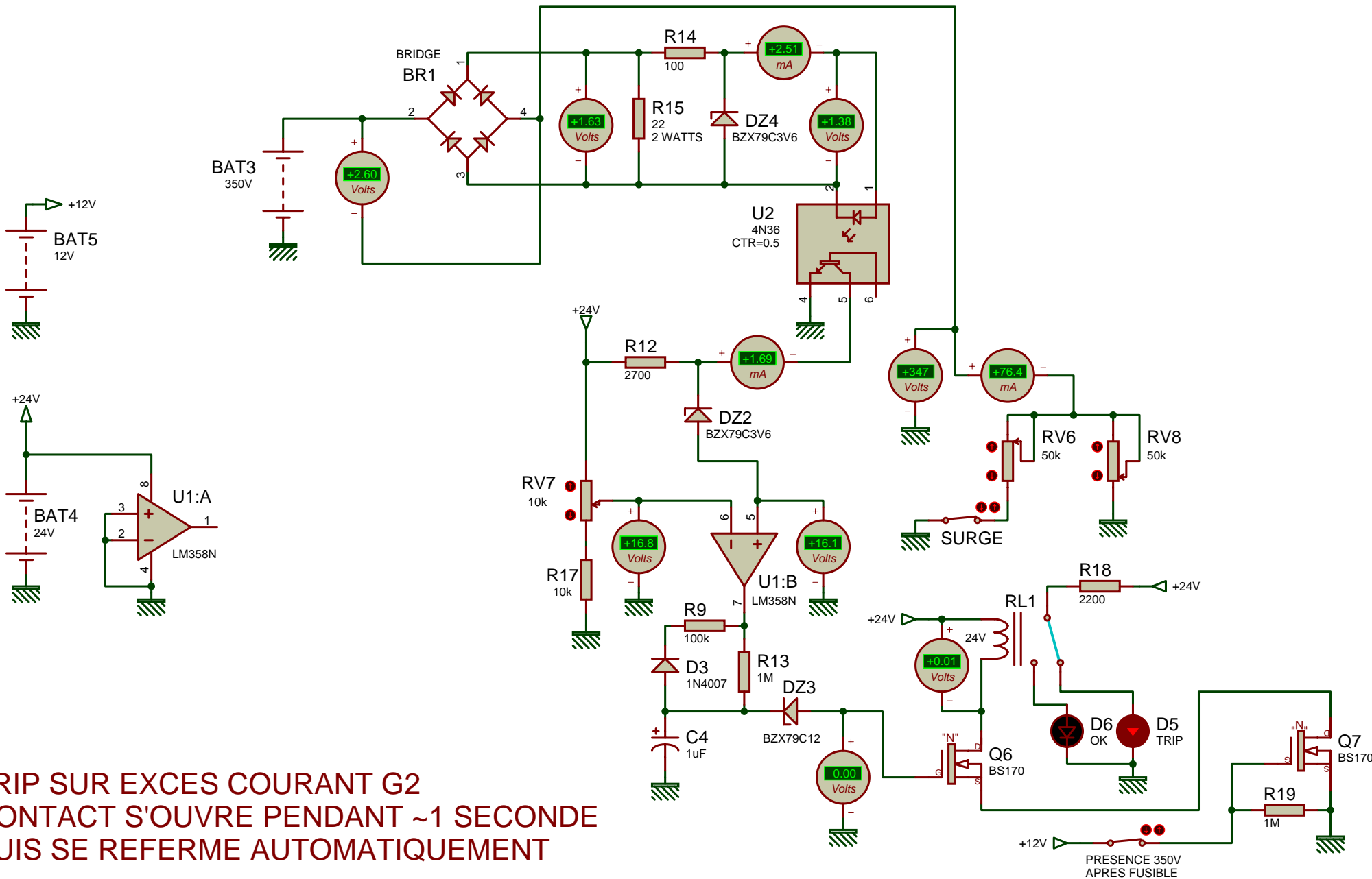
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TETRODE LINEAR AMPLIFIER G2 SHUNT SUPPLY WITH MOSFET



TRIP SUR EXCES COURANT G2
 CONTACT S'OUVRE PENDANT ~1 SECONDE
 PUIS SE REFERME AUTOMATIQUEMENT

<p>TRIP G2 G2 SHUNT SUPPLY WITH MOSFET</p>	<p>DOC N°: Amateur Radio BY: f1frv@sfr.fr DATE: 22/08/14 REV: 5 PAGE: 2/2</p>
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