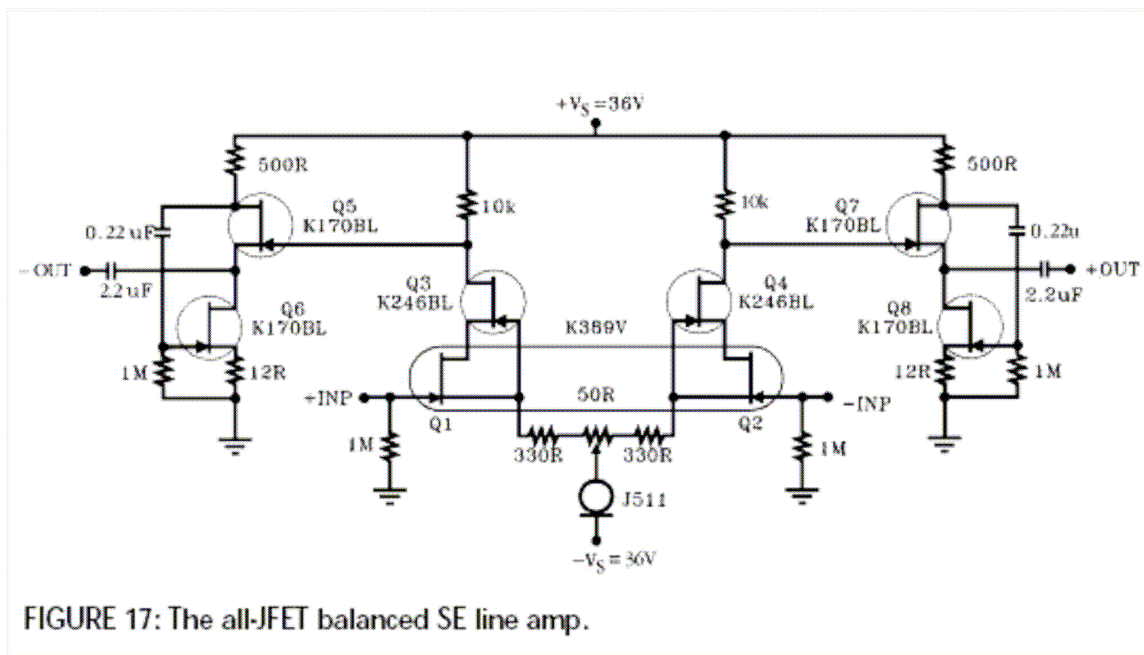


**Borbely Erno All JFET SE line amp**

Notes:

1. Use +22Vs positive supply and -20Vs negative supply to give about 8V peak to peak output voltage.
2. 10k Q3 & Q4 drain resistors changed to 6.2k.
3. J511 use one 2SK170 ( $I_{dss}$  6.2mA) and resistor 25R to adjust to about 4.2mA current.
4. Input resistor use 100k instead of 1M.
5. 12R source resistor at Q6 and Q8 use 10R.
6. Output couple capacitor use 10uF Rifa cap and put a 100k resistor to ground at +/- OUT o/p socket.
7. Q3 and Q4 use 2N5459,  $I_{ds} \sim 7$  mA matched for both channel. This is 25V part and limits supply voltage to +25V max.
8. Q5, Q6, Q7 & Q8 K170BL matched to about 7.5mA  $I_{dss}$  for both channel.
9. Q1 and Q2 K389BL matched to about 11mA  $I_{dss}$  for both channel.
10. All resistor metal film 1% 1/4W.
11. No 50R VR used.

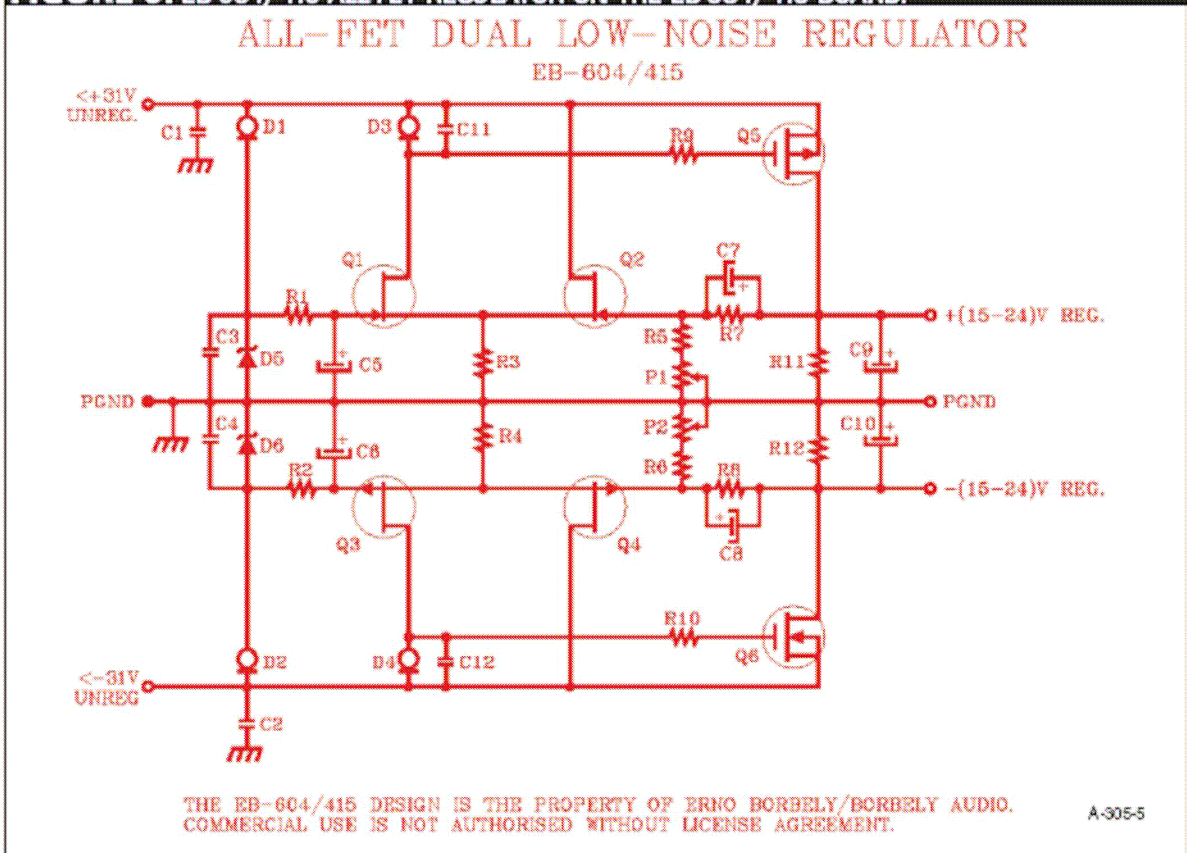


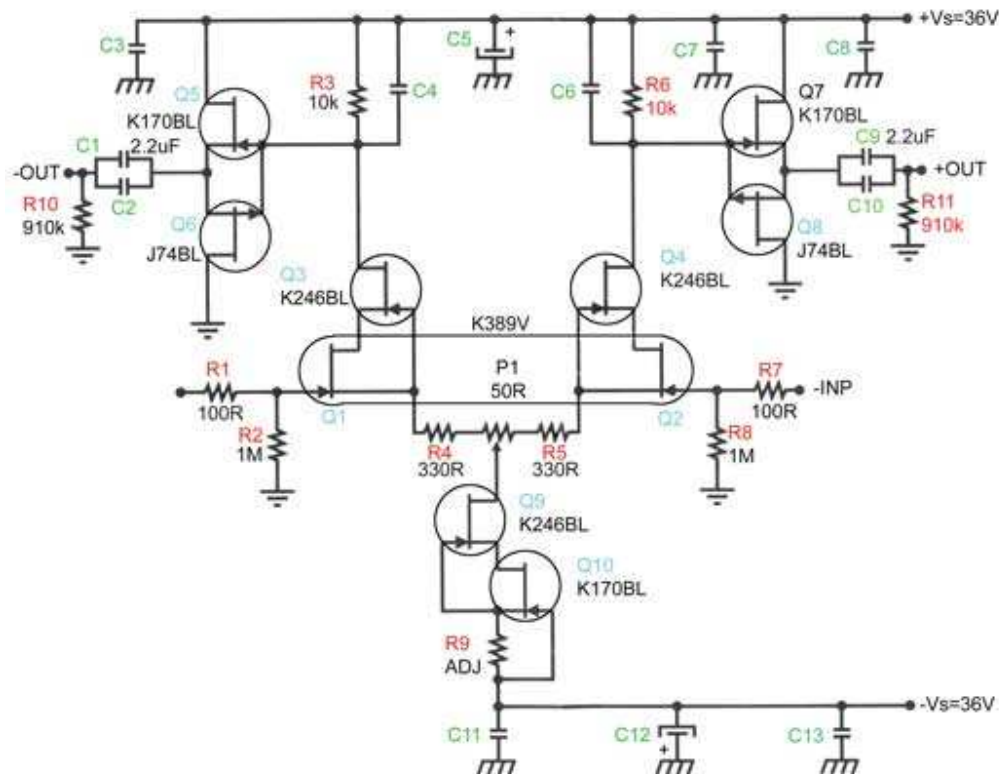
## **Borbely Erno Jfet Low Noise Regulator**

### Notes:

1. D1 and D2 use K170  $I_{dss}=6\text{mA}$  & resistor 100R to get about 2mA current.
2. D3 and D4 use K170  $I_{dss}=6\text{mA}$  and resistor 200-250R to get about 1mA current.
3. D5 use LM336-5V; D6 use TL431 two pieces in series  $V_{ref}$  to get 5V voltage ref..
4. C1 – C4 use 0.1uF 63V MKP Epcos.
5. C5 and C6 use 220uF 35V Philips 037 series.
6. C7 & C8 use 22uF 63V Philips radial capacitor. C11 & C12 not use.
7. C9 and C10 use 220uF 63V Panasonic FC, also parallel a 0.1uF MKP Epcos.
8. Q1 and Q2 use 2SK170BL,  $I_{dss} = 11\text{mA}$  matched.
9. Q3 and Q4 use 2SJ74V,  $I_{dss} = 15\text{mA}$  matched.
10. Q5 use 2SJ148 and Q6 use 2SK982 MosFET.
11. R1 & R2 use 3k; R3 and R4 use 1.8k; R5 and R6 use 2k; R7 and R8 use 10k.
12. R9 and R10 use 100R; R11 and R12 use 9.1k. All resistors metal film 1%, 1/4W.
13. P1 and P2 use 5k, 20T box type for fine adjustment.
14. Unregulated front end use 8x BYV27-150 diodes and 4x 1000uF, 35V Panasonic FC capacitors for filtering.
15. Transformer use 18V x 2 to supply both channel, 18V decouple with 0.1uF 160V MKP Epcos capacitor.

**FIGURE 5: EB-604/415 ALL-FET REGULATOR ON THE EB-604/410 BOARD.**



**Actual ckt used:**

Problem: Gain is too high, thus need to adjust **R4 & 5**.

1. No P1.
2. C7, C11: 0.22u 63V Epcos film cap
3. C11, C5: Pana FC, 270u 63V, I think silmic II is good here also.
4. C8, C13 not used. Use 50 to 220pf if needed
5. C1, C9: 56u 75V wet tantalum cap
6. C2, C10: 0.22u K40Y-9 Russian PIO
7. C4, C6: not used
8. **R4, R5: 330 // 681 ohm**
9. R3, R6 use  $4k7 + 4k7 = 9.4k$
10. R10, R11: 100k
11. R2, R8: 100k
12. Q3 and Q4 Idss .10mA matched
13. Q5, Q6, Q7, & Q8 Idss 6 to 8mA matched.
14. R9 about 10ohm, use 50 VR to adjust if necessary