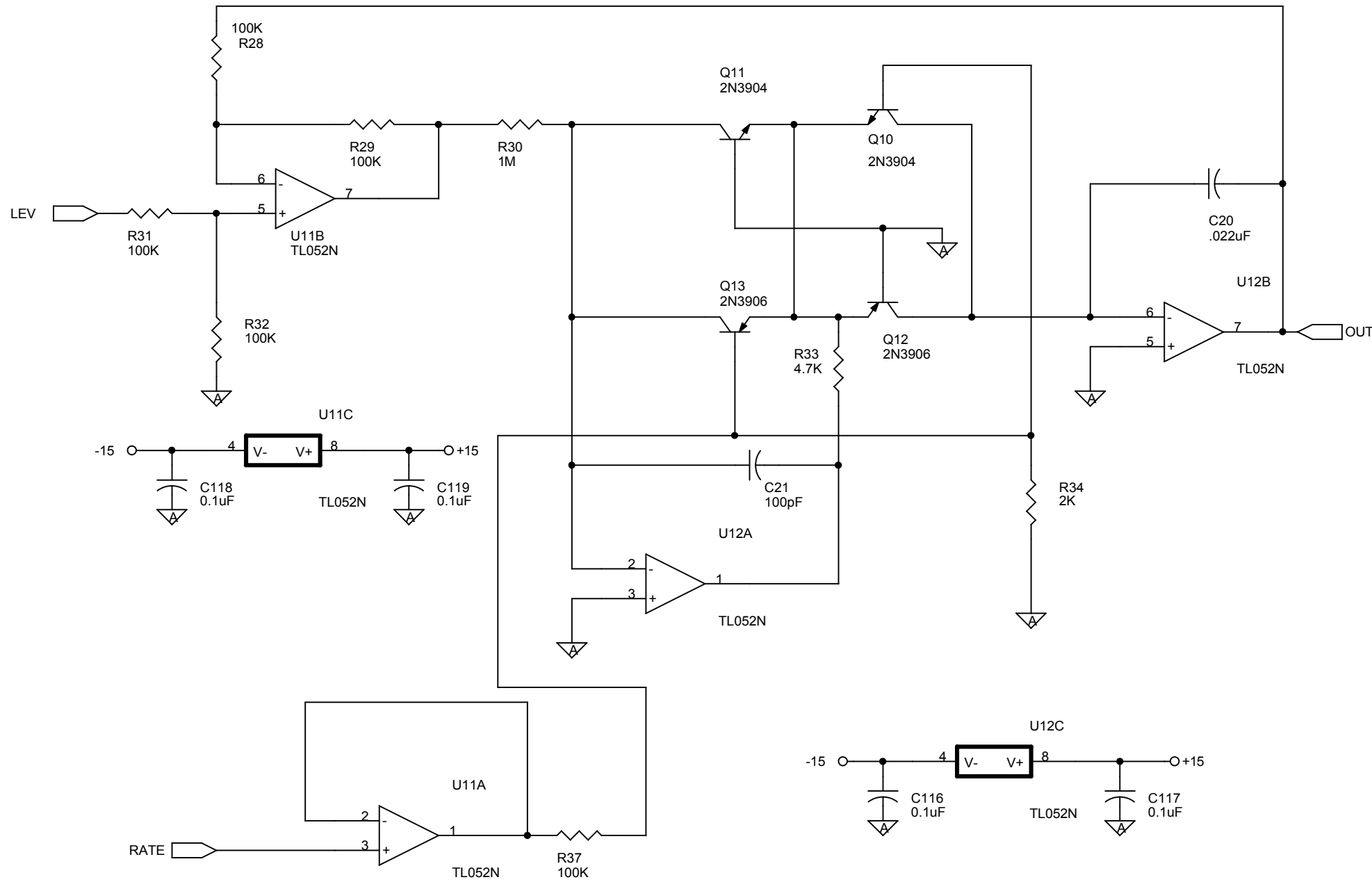
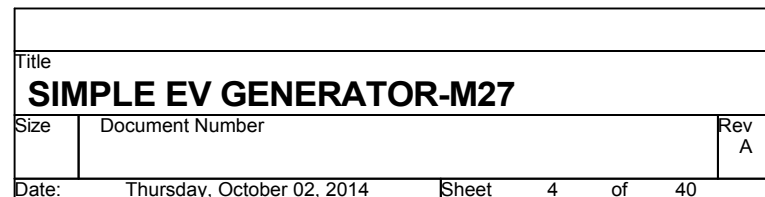


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|------------------|------------------------------|---------------|
| Title            |                              |               |
| NOOTA-MIDI TO CV |                              |               |
| Size A           | Document Number              | Rev A         |
|                  | 100-1069                     |               |
| Date:            | Saturday, September 27, 2014 | Sheet 2 of 40 |

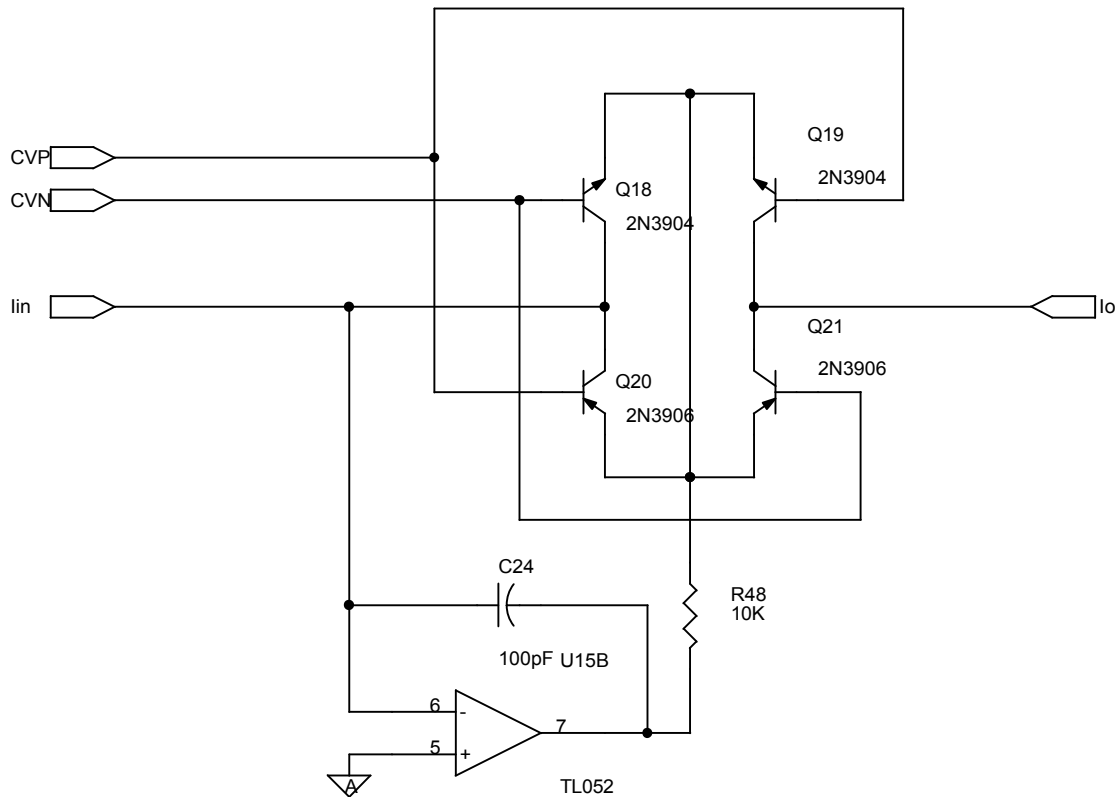


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|-------------------------|----------------------------|---------------|
| Title                   |                            |               |
| SIMPLE EV GENERATOR-M26 |                            |               |
| Size                    | Document Number            |               |
| Date:                   | Thursday, October 02, 2014 | Sheet 3 of 40 |
|                         |                            | Rev A         |

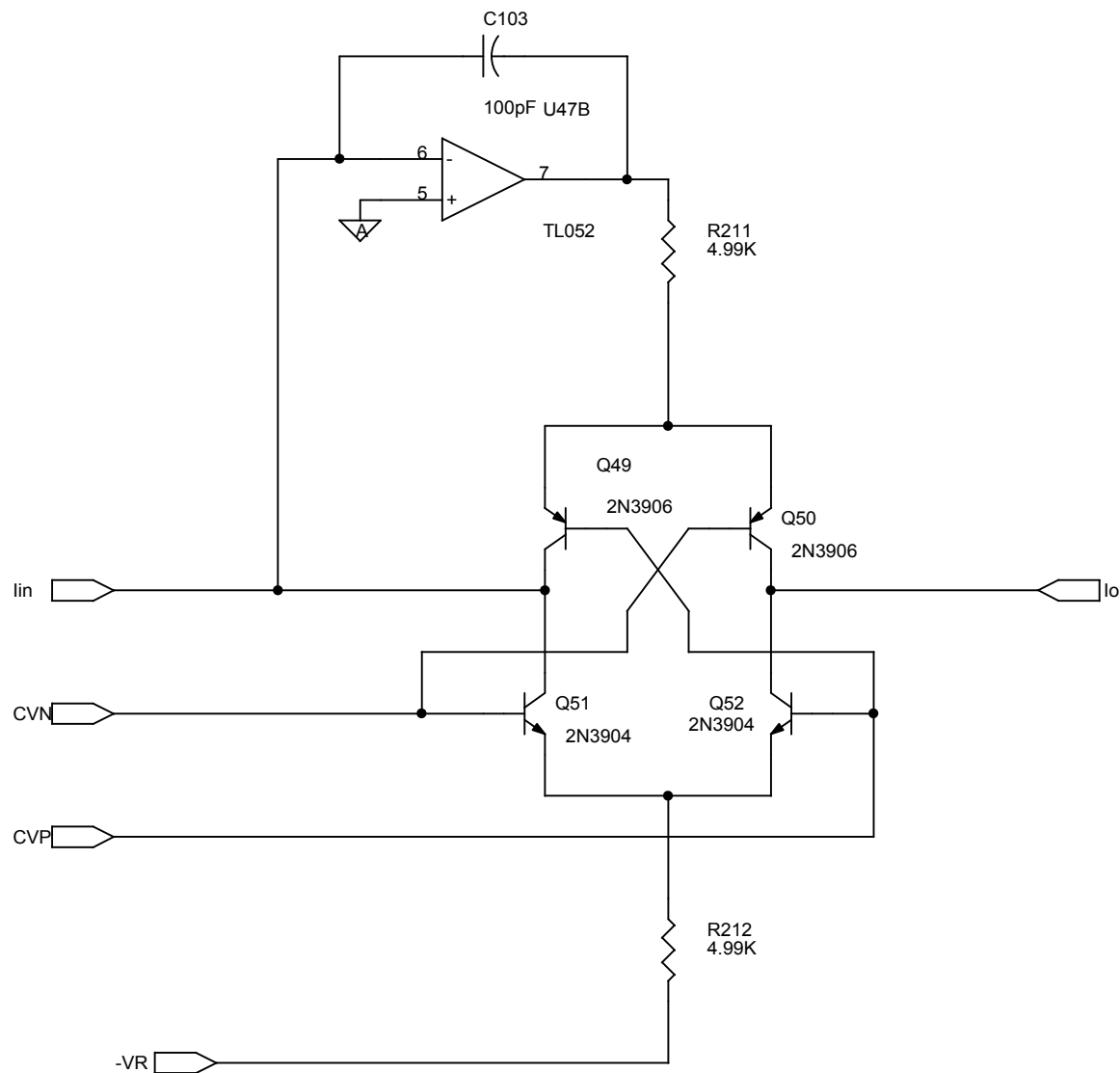


This is basically a log-antilog multiplier. It was invented by a gentleman named David Blackmer back in the 1960's. This version of the thing is a little different. The emitters of the two log-antilog pairs have been connected together. The first I saw this particular configuration used was by Jürgen Haible. It is a very clever and useful version of the Blackmer Log-Antilog Multiplier.

POSITIVE VOLTAGE ON CVP INCREASES GAIN  
POSITIVE VOLTAGE ON CVN DECREASES GAIN  
GAIN

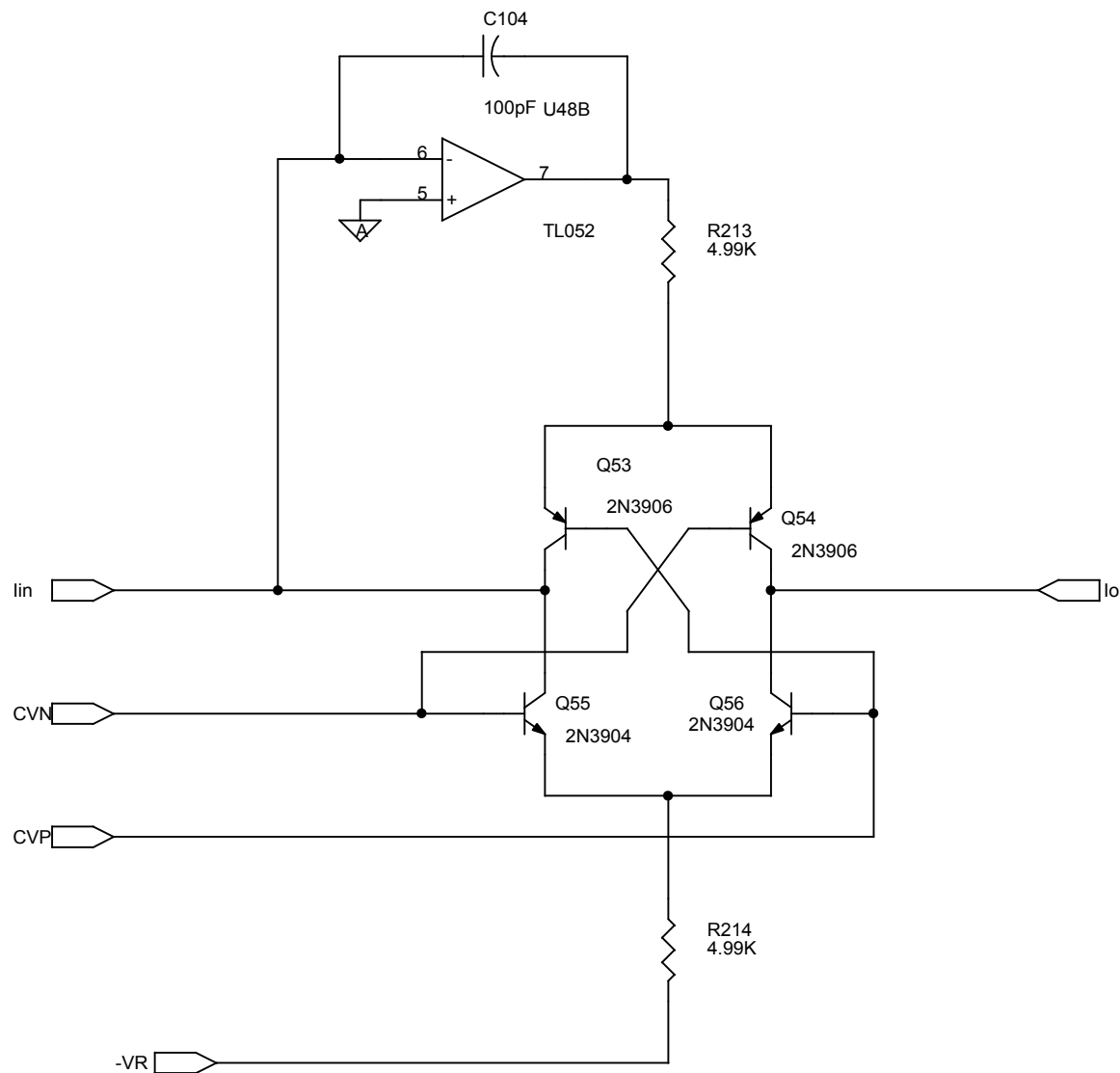


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| Title            |                            |               |
| BM ATTENUATOR-M1 |                            |               |
| Size             | Document Number            | Rev           |
|                  | 100-1069                   | A             |
| Date:            | Monday, September 29, 2014 | Sheet 5 of 40 |

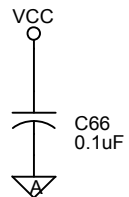
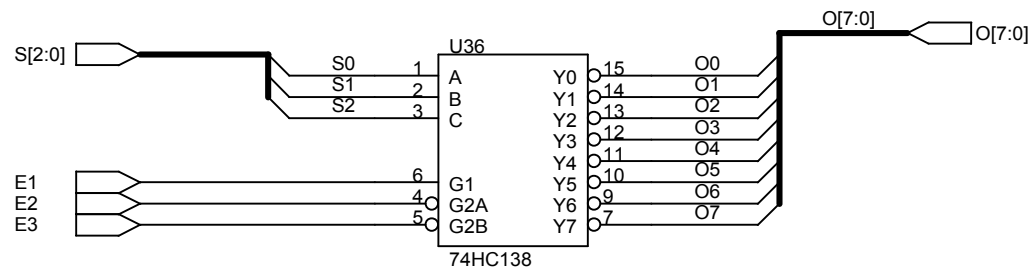


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| Title                  |                 |     |
| NOOTA-BLACKMER VCA-M16 |                 |     |
| Size                   | Document Number | Rev |
|                        | 100-1069        | A   |

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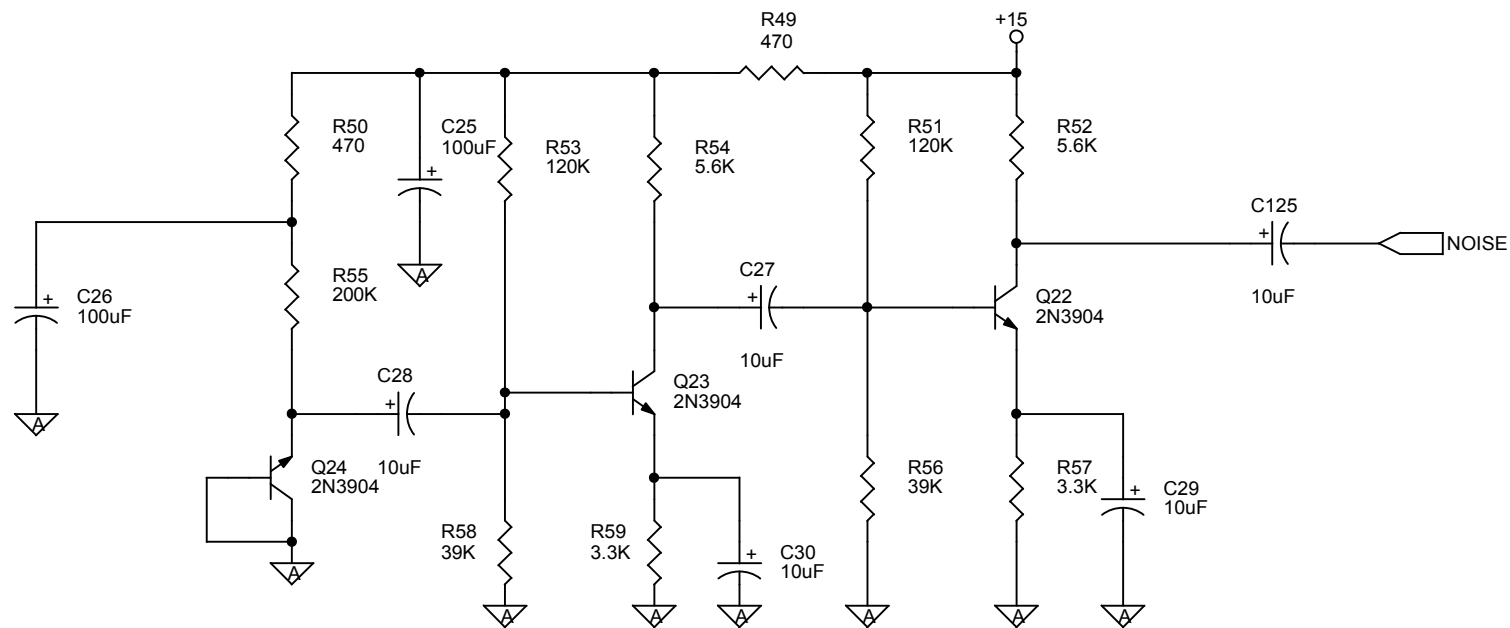
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| Title                  |                 |     |
| NOOTA-BLACKMER VCA-M17 |                 |     |
| Size                   | Document Number | Rev |
|                        | 100-1069        | A   |



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| Title         |                                    |          |
| NOOTA-DECODER |                                    |          |
| Size<br>A     | Document Number<br><b>100-1069</b> | Rev<br>A |

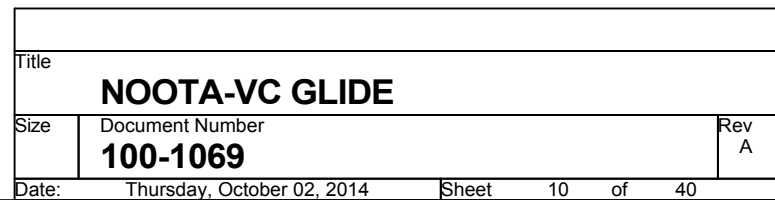
Date: Saturday, September 27, 2014 Sheet 8 of 40

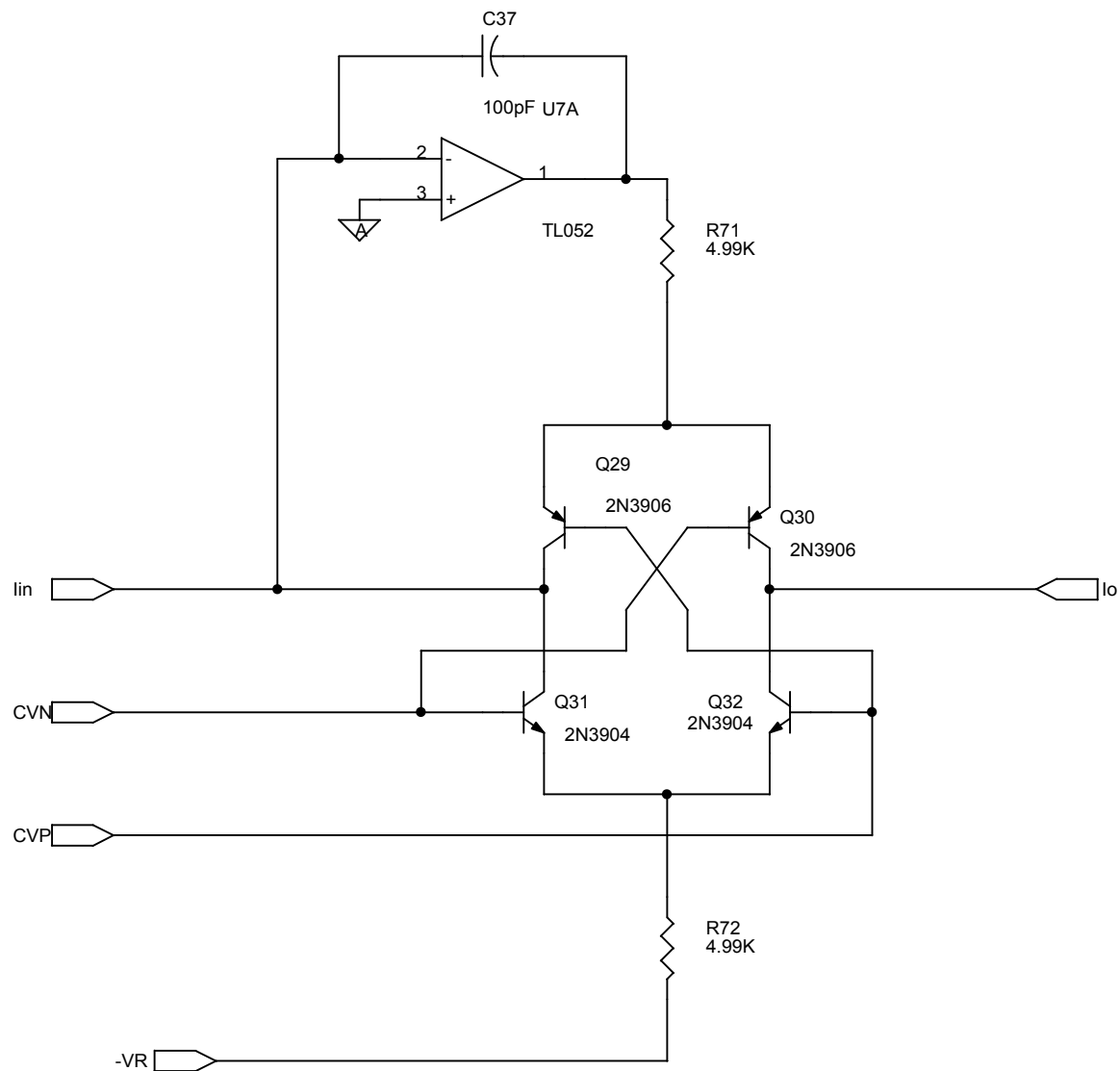




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| Title                     |                 |     |
| NOOTA - CHEEZY NOIISE GEN |                 |     |
| Size                      | Document Number | Rev |
|                           | 100-1069        | A   |

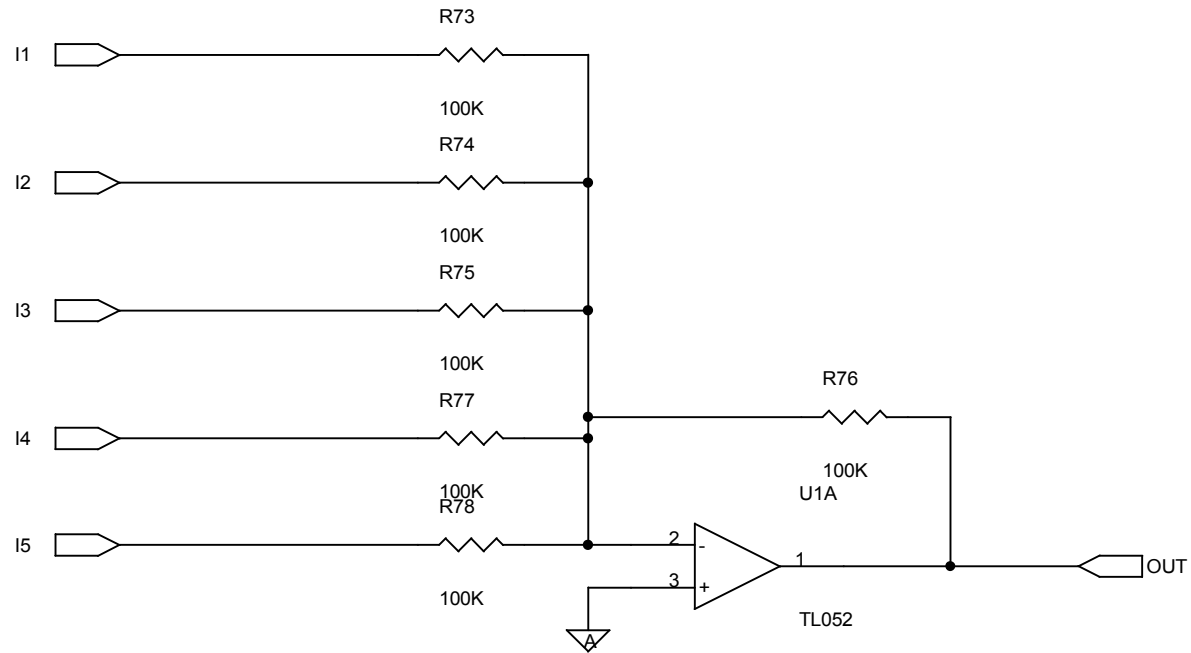
Date: Thursday, October 02, 2014 Sheet 9 of 40





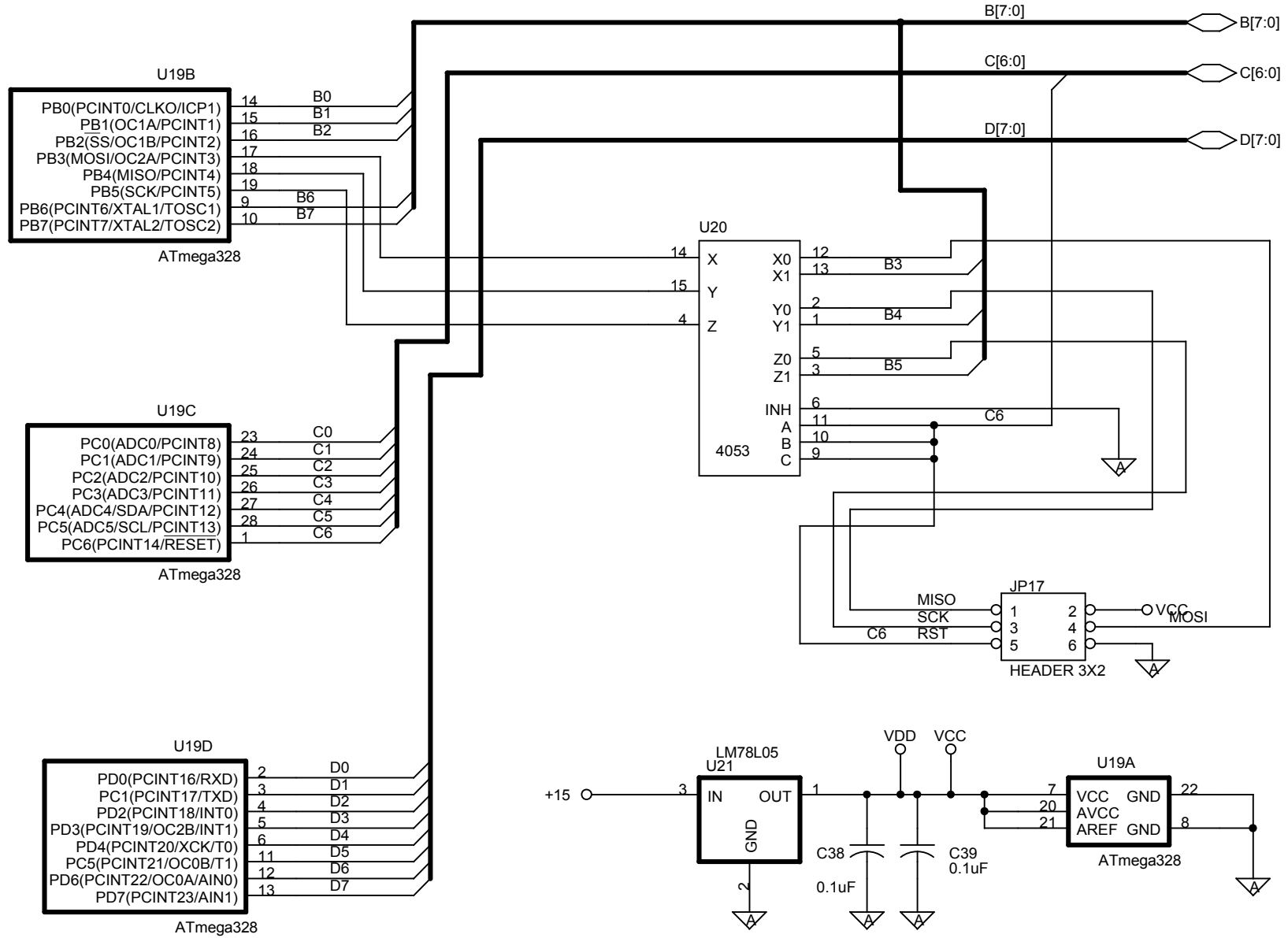
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| Title                  |                 |     |
| NOOTA-BLACKMER VCA-M15 |                 |     |
| Size                   | Document Number | Rev |
|                        | 100-1069        | A   |

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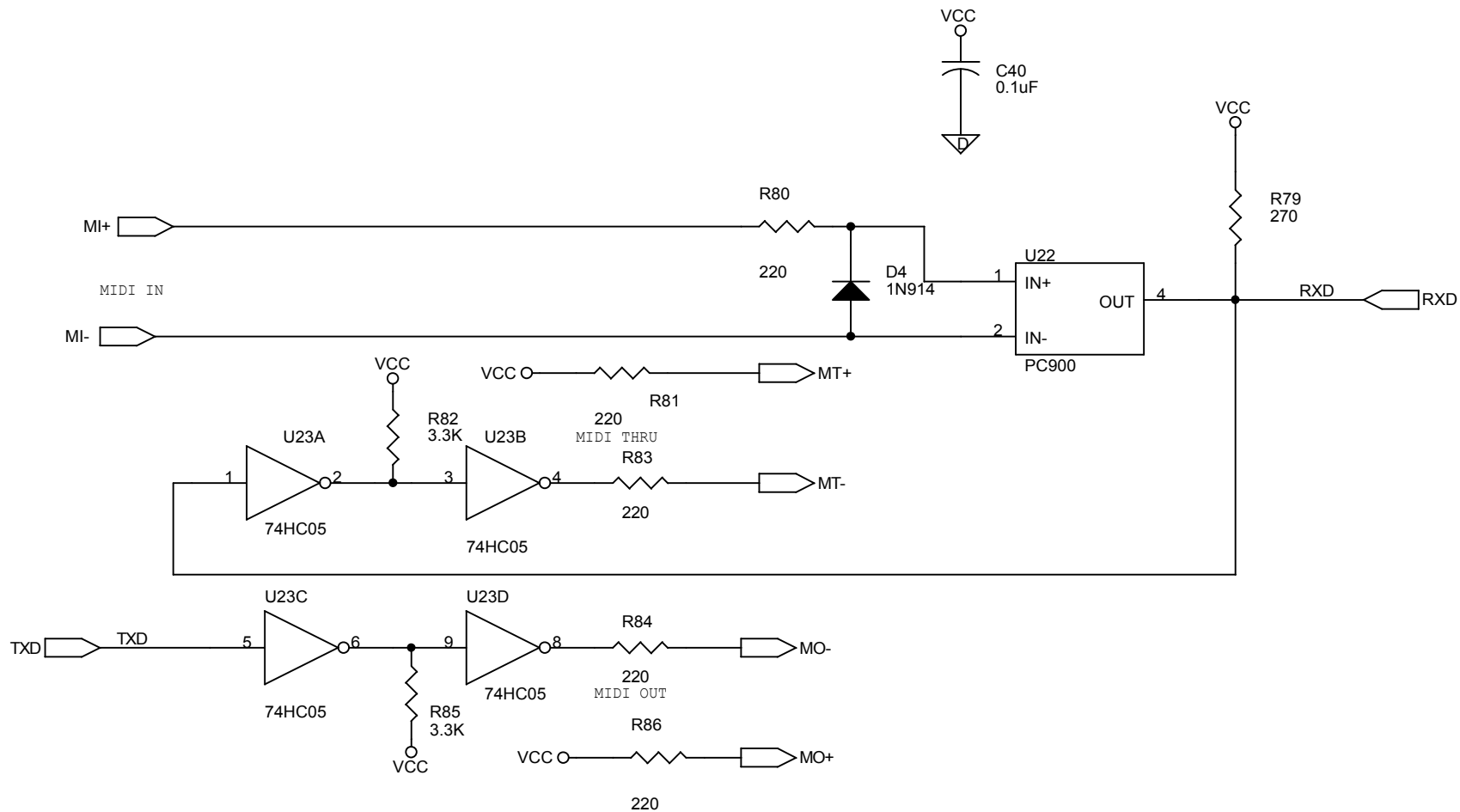


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| Title               |                             |                |
| NOOTA- CHEEZY MIXER |                             |                |
| Size                | Document Number             | Rev            |
|                     | 100-1069                    | A              |
| Date:               | Wednesday, October 01, 2014 | Sheet 12 of 40 |

REV B: ADDED 4053 AND ISP  
CONNECTOR

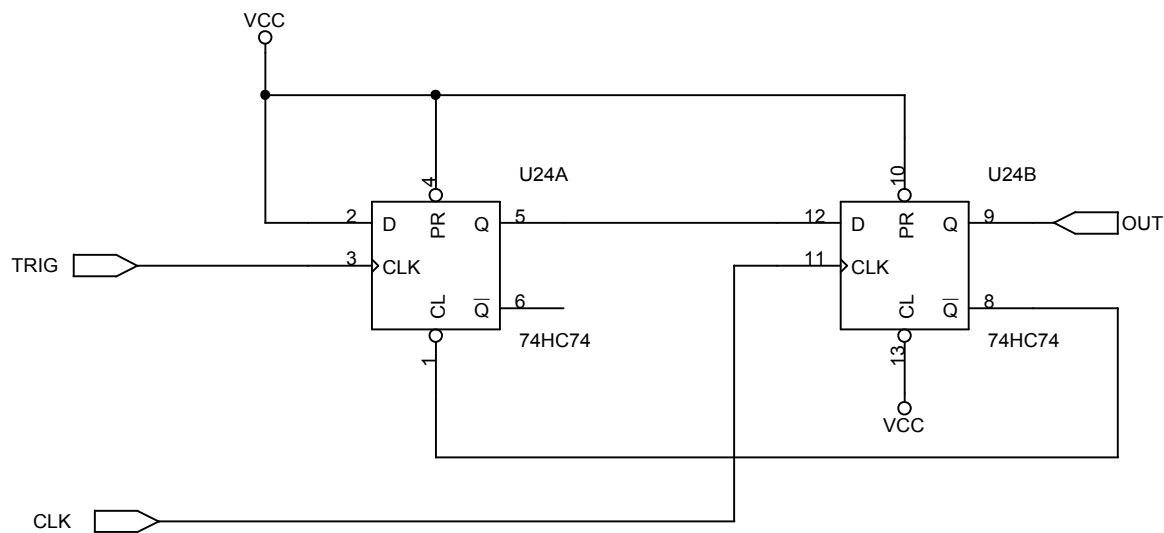


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| Title               |                              |                |
| NOOTA-ATmega328 CPU |                              |                |
| Size                | Document Number              | Rev            |
| A                   | 100-1069                     | B              |
| Date:               | Saturday, September 27, 2014 | Sheet 13 of 40 |

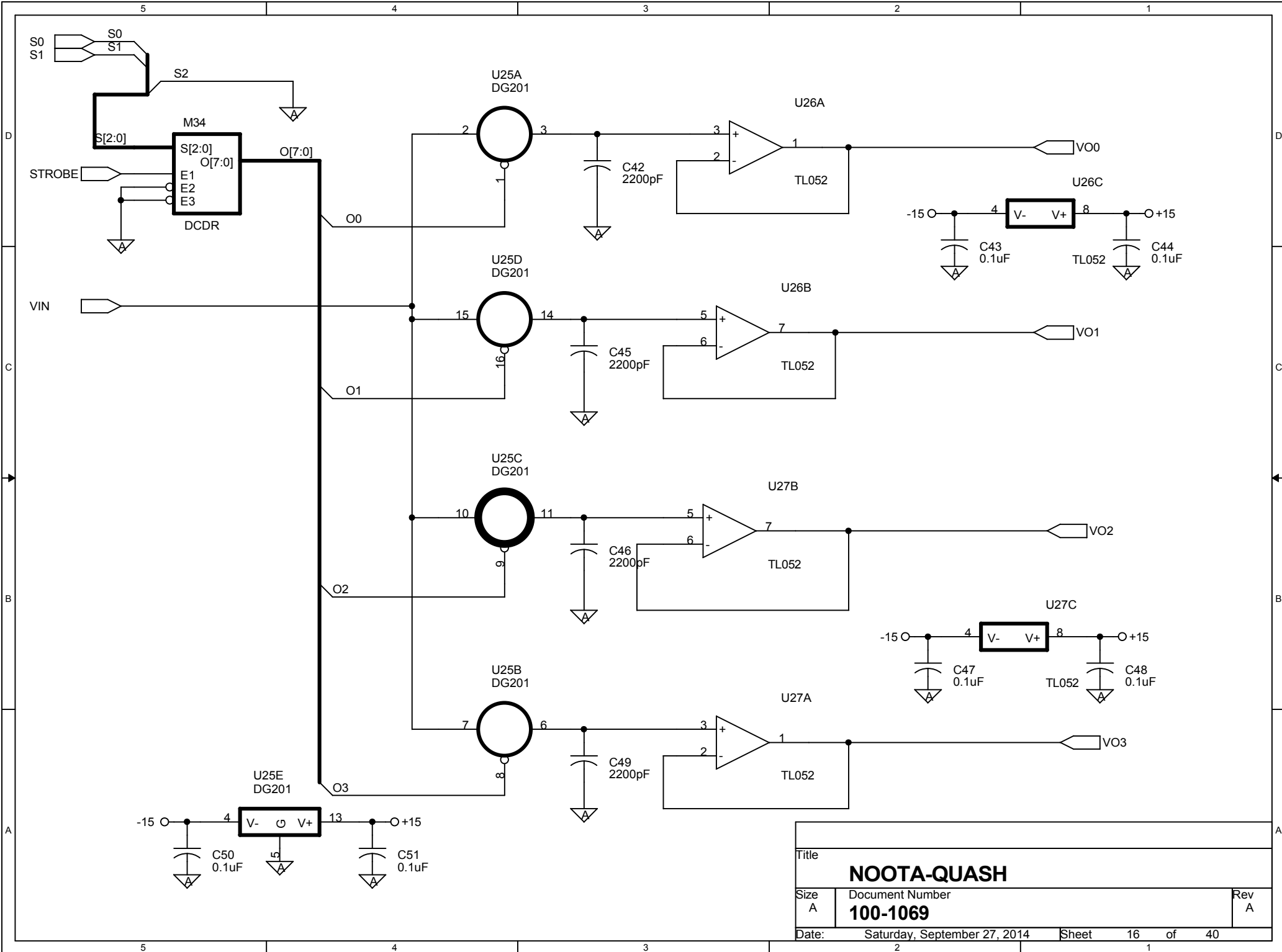


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| Title      |                 |     |
| NOOTA-MIDI |                 |     |
| Size       | Document Number | Rev |
|            | 100-1069        | A   |

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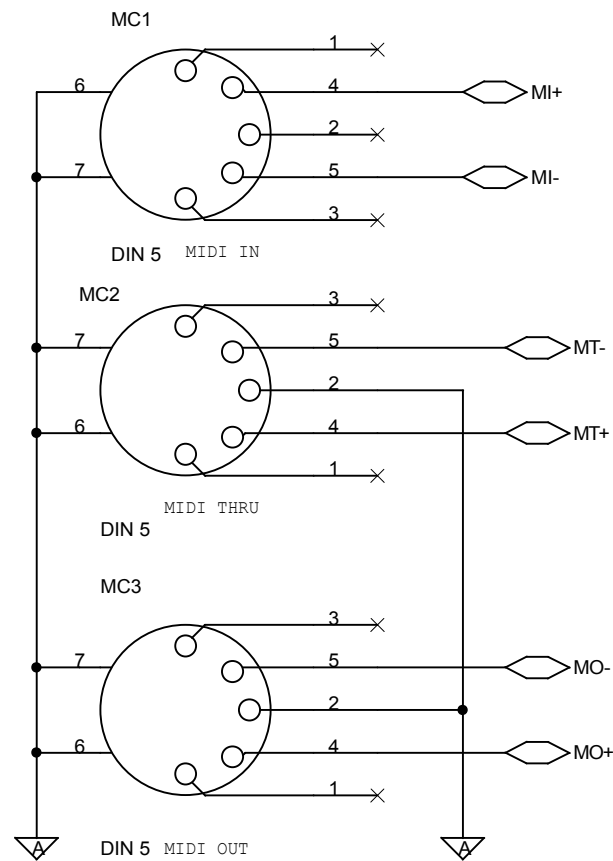


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| Title          |                                    |                  |
| NOOTA-ONE SHOT |                                    |                  |
| Size<br>A      | Document Number<br><b>100-1069</b> | Rev<br><RevCode> |
| Date:          | Thursday, October 02, 2014         | Sheet 15 of 40   |

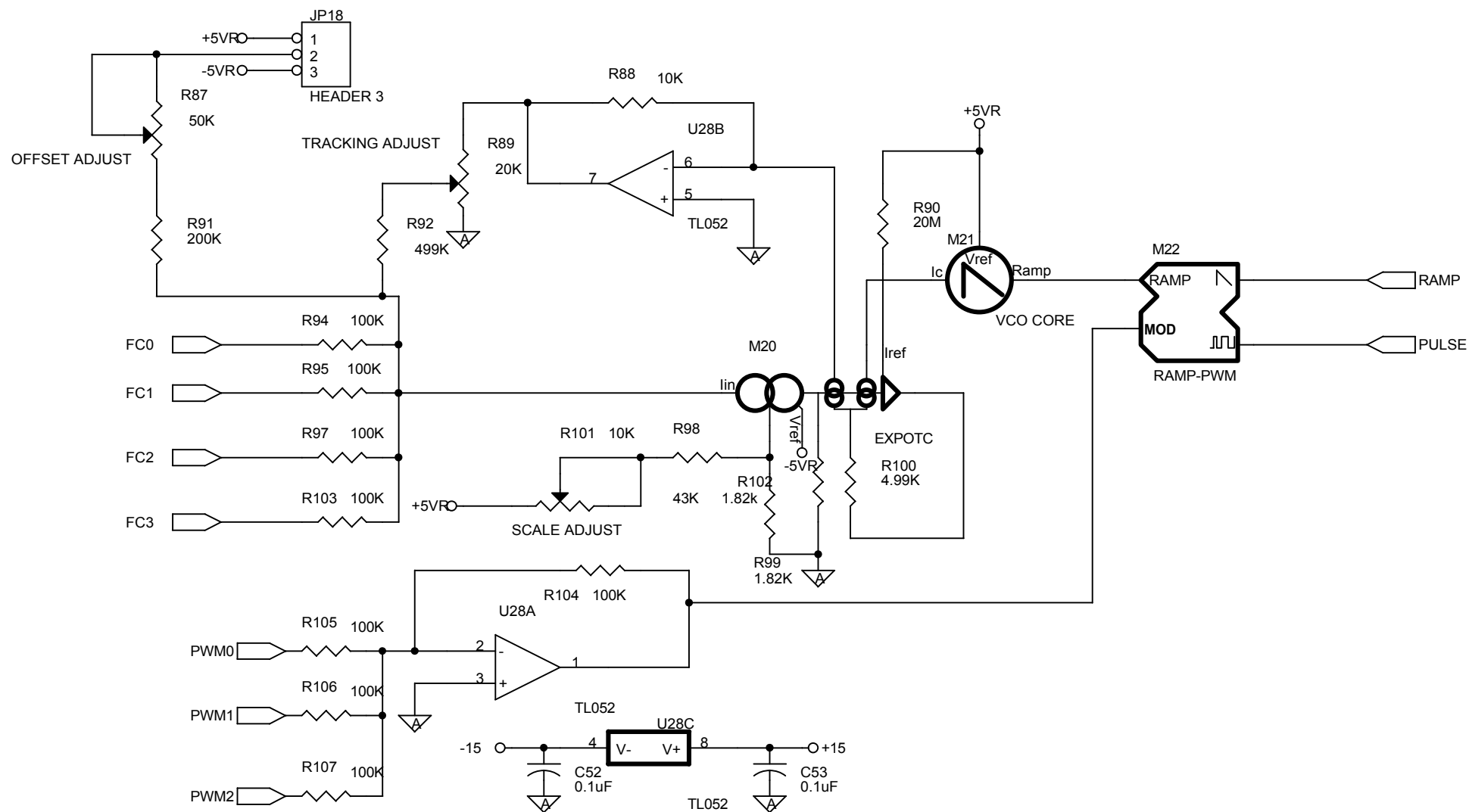


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| Title       |                              |                |
| NOOTA-QUASH |                              |                |
| Size        | Document Number              |                |
| A           | 100-1069                     |                |
| Date:       | Saturday, September 27, 2014 | Sheet 16 of 40 |
|             |                              | Rev A          |

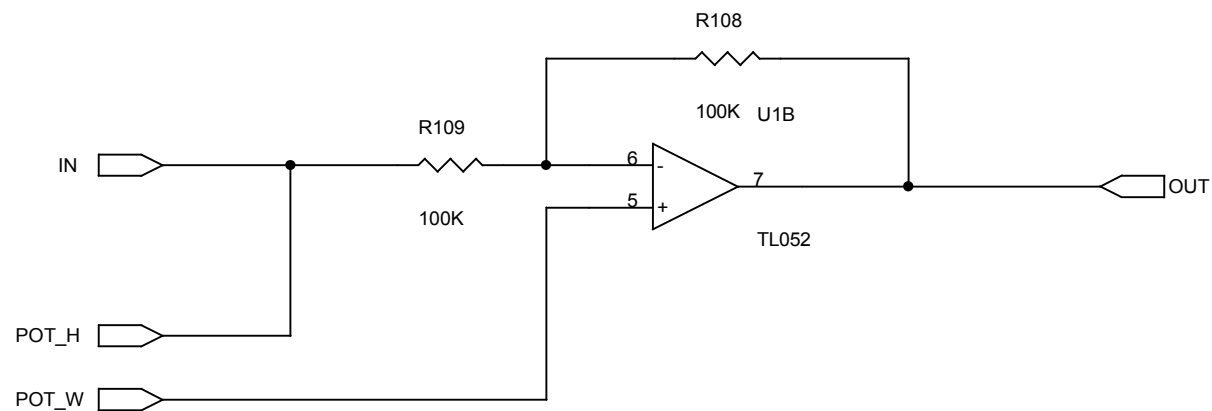




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| Title           |                              |                  |
| MIDI CONNECTORS |                              |                  |
| Size<br>A       | Document Number<br><Doc>     | Rev<br><RevCode> |
| Date:           | Saturday, September 27, 2014 | Sheet 17 of 40   |

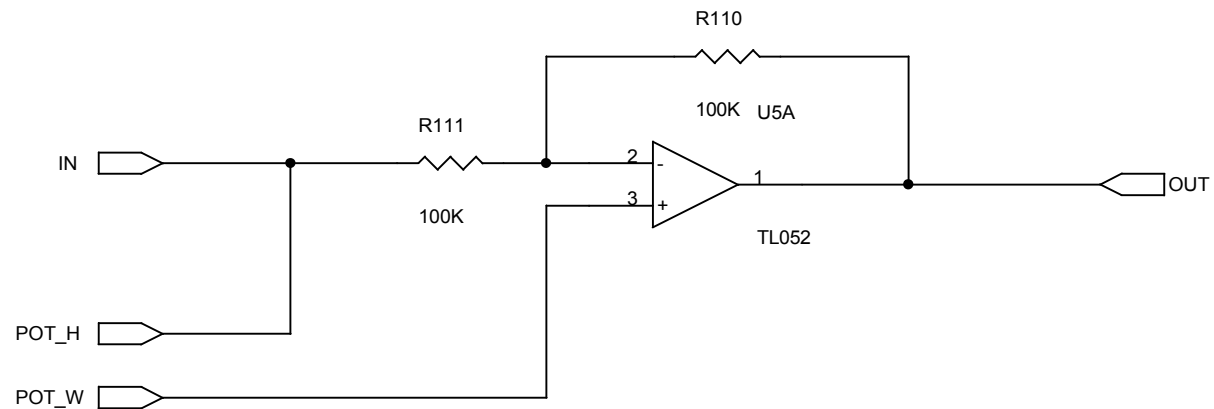


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|------------------------|----------------------------|----------------|
| Title                  |                            |                |
| NOOTA - BLACKMER VCO-1 |                            |                |
| Size A                 | Document Number            | Rev B          |
|                        | 100-1069                   |                |
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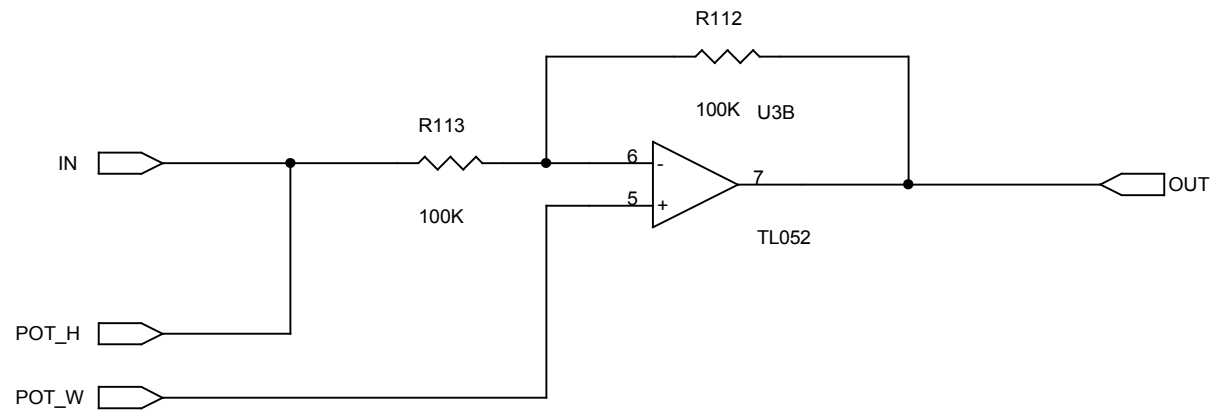


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| Title             |                                    |          |
| NOOTA - CV ATN M1 |                                    |          |
| Size<br>A         | Document Number<br><b>100-1069</b> | Rev<br>A |

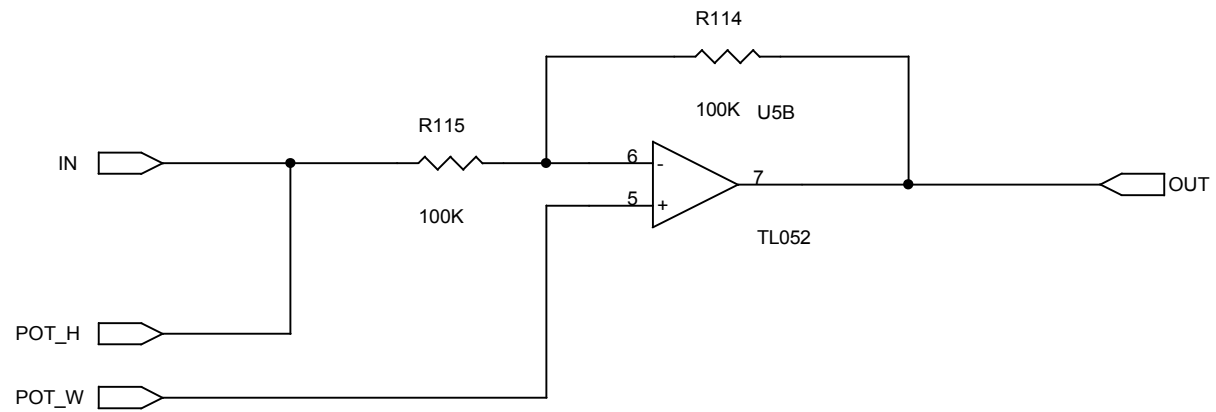
Date: Sunday, September 28, 2014 Sheet 19 of 40



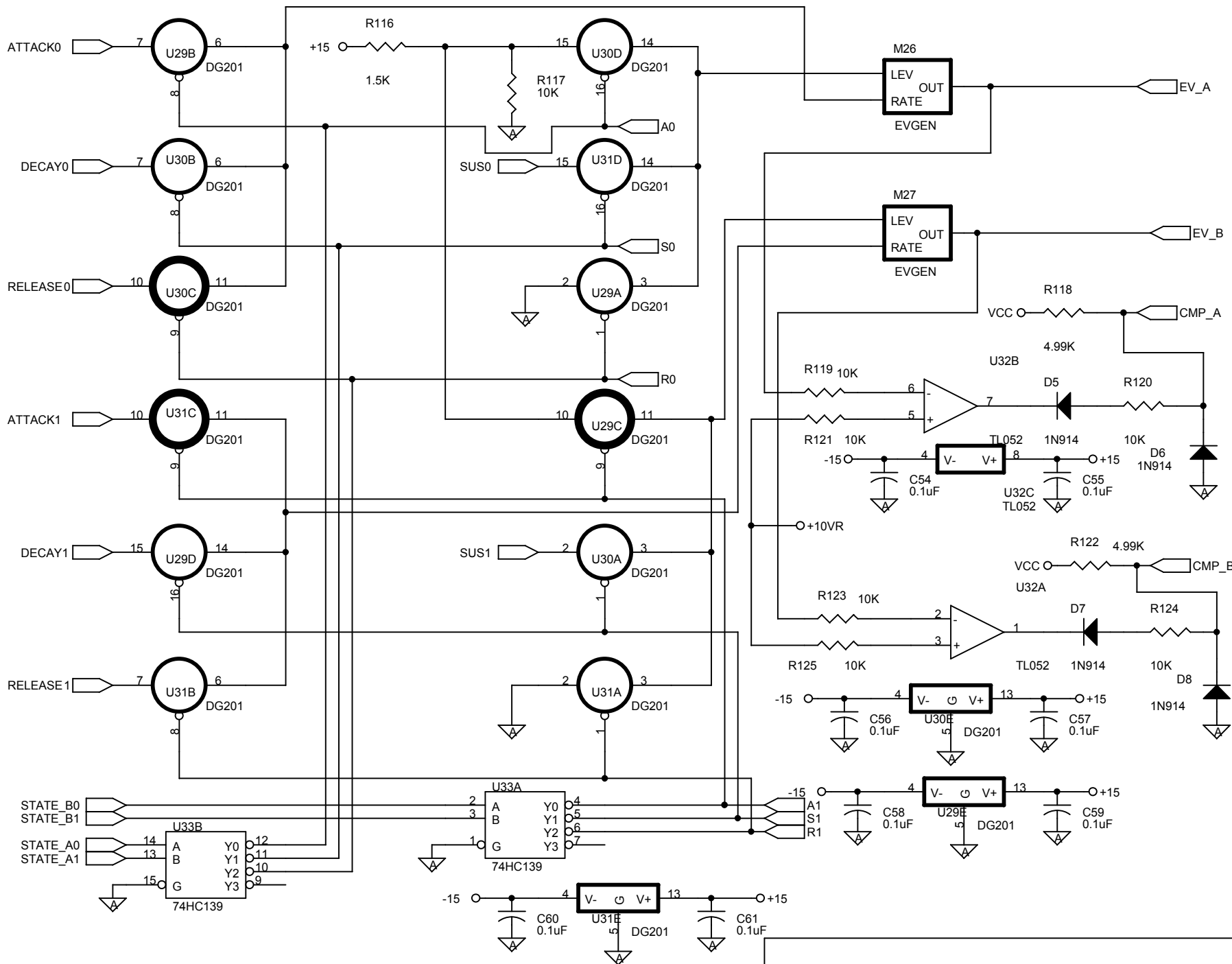
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| Title             |                             |                |
| NOOTA - CV ATN M3 |                             |                |
| Size<br>A         | Document Number<br>100-1069 | Rev<br>A       |
| Date:             | Sunday, September 28, 2014  | Sheet 20 of 40 |



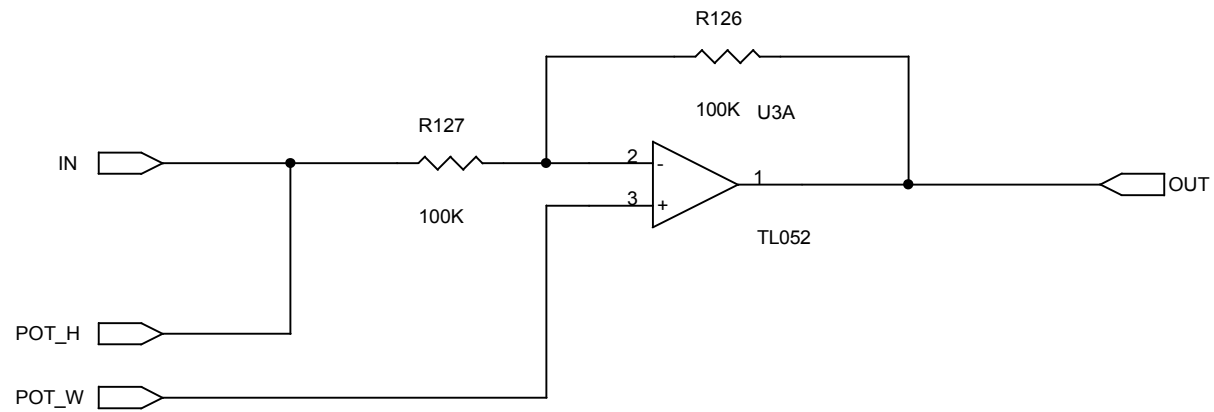
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| NOOTA - CV ATN M4 |                                    |                |
| Size<br>A         | Document Number<br><b>100-1069</b> | Rev<br>A       |
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|                          |                                    |                |
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| Title                    |                                    |                |
| <b>NOOTA - CV ATN M2</b> |                                    |                |
| Size<br>A                | Document Number<br><b>100-1069</b> | Rev<br>A       |
| Date:                    | Sunday, September 28, 2014         | Sheet 22 of 40 |

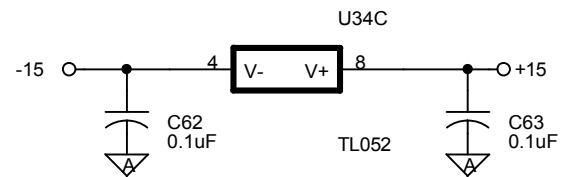
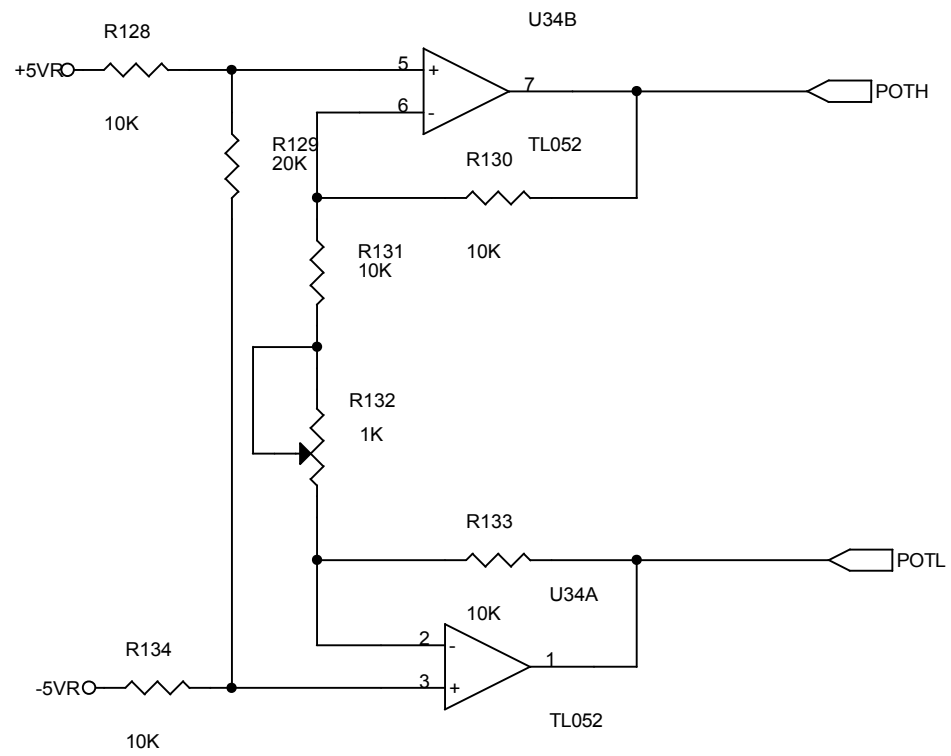


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| Title                         |                              |                |
| NOOTA-DUAL ENVELOPE GENERATOR |                              |                |
| Size                          | Document Number              | Rev            |
|                               | 100-1069                     | A              |
| Date:                         | Saturday, September 27, 2014 | Sheet 23 of 40 |

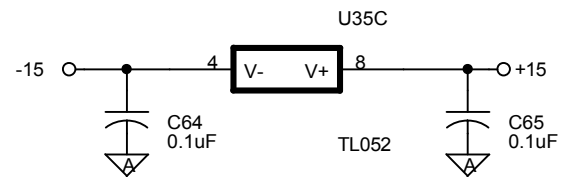
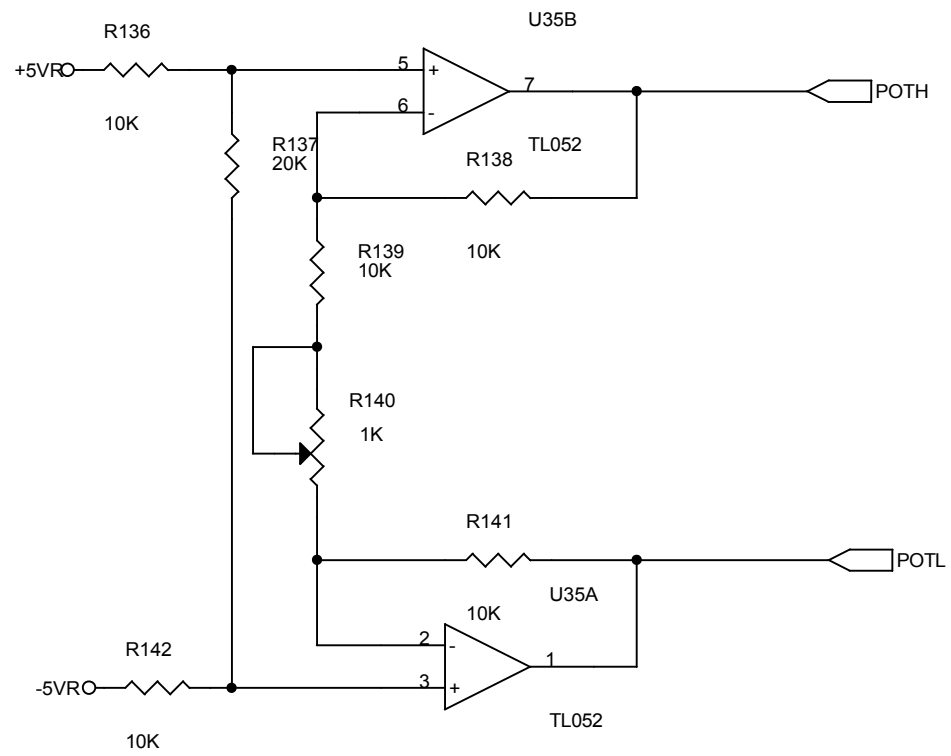


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| Title             |                                    |       |          |
| NOOTA - CV ATN M5 |                                    |       |          |
| Size<br>A         | Document Number<br><b>100-1069</b> |       | Rev<br>A |
| Date:             | Sunday, September 28, 2014         | Sheet | 24 of 40 |

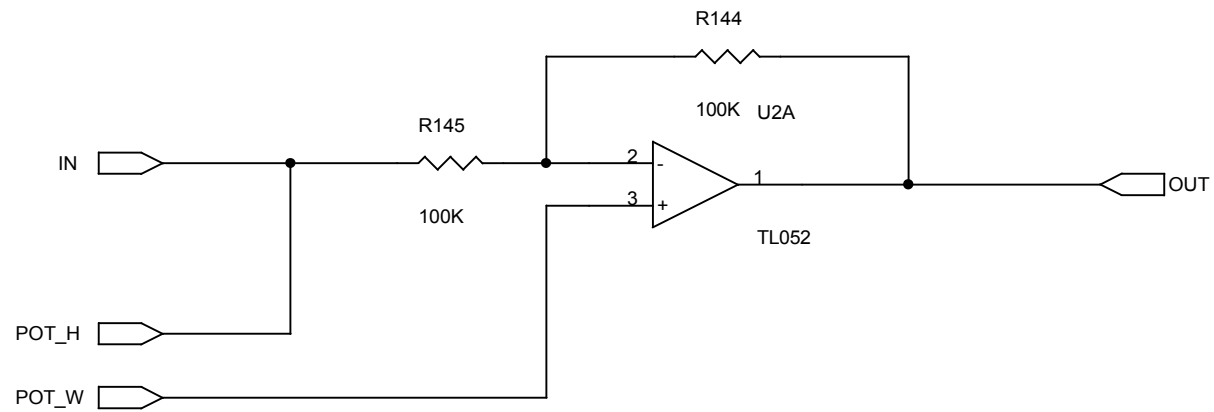




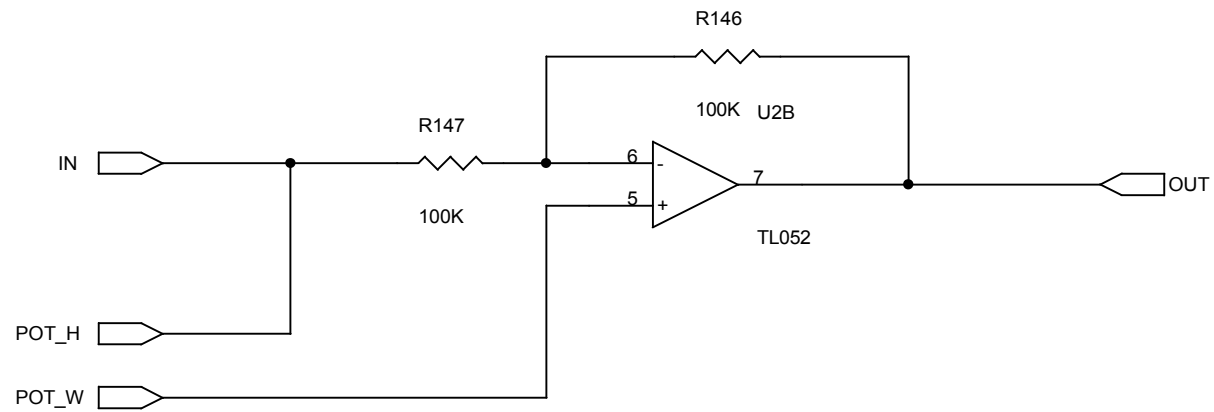
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| Title                 |                                    |                |
| NOOTA-POT SCALE VCO 1 |                                    |                |
| Size<br>A             | Document Number<br><b>100-1069</b> | Rev<br>A       |
| Date:                 | Saturday, July 26, 2014            | Sheet 25 of 40 |



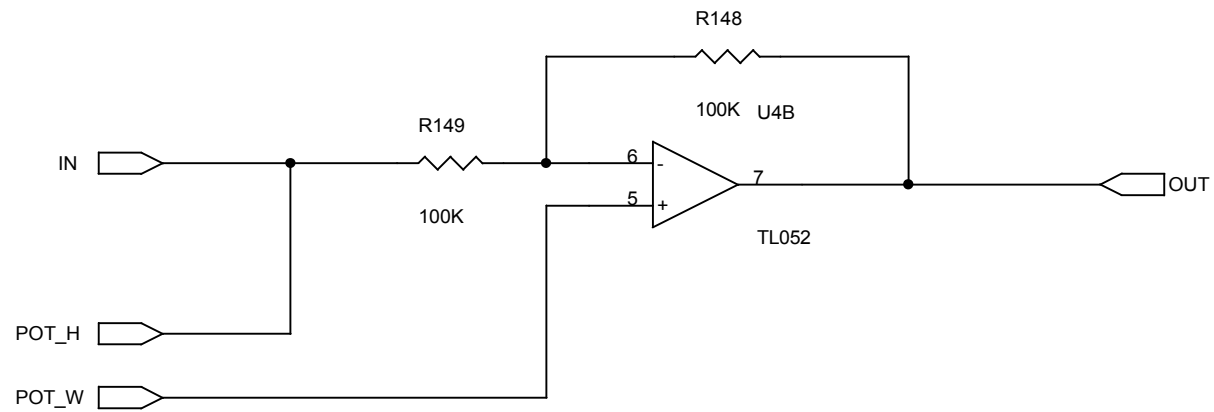
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| Title                 |                                    |                |
| NOOTA-POT SCALE VCO 2 |                                    |                |
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| Date:                 | Saturday, July 26, 2014            | Sheet 26 of 40 |



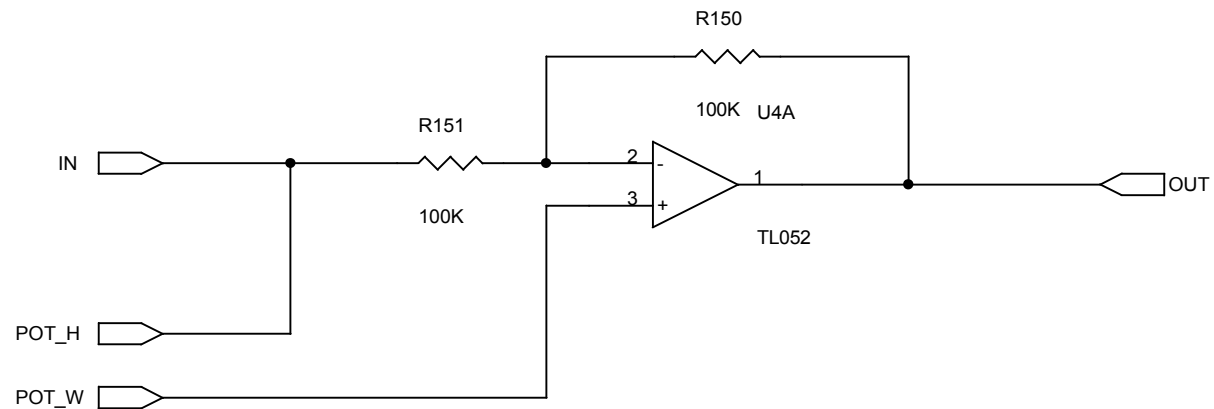
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| Title             |                             |       |          |
| NOOTA - CV ATN M9 |                             |       |          |
| Size<br>A         | Document Number<br>100-1069 |       | Rev<br>A |
| Date:             | Sunday, September 28, 2014  | Sheet | 27 of 40 |



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| Title                    |                                    |                |
| <b>NOOTA - CV ATN M8</b> |                                    |                |
| Size<br>A                | Document Number<br><b>100-1069</b> | Rev<br>A       |
| Date:                    | Sunday, September 28, 2014         | Sheet 28 of 40 |



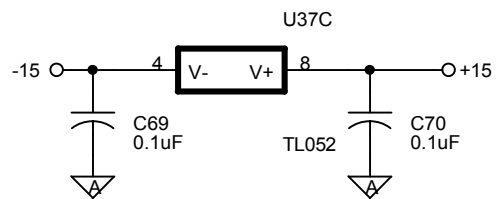
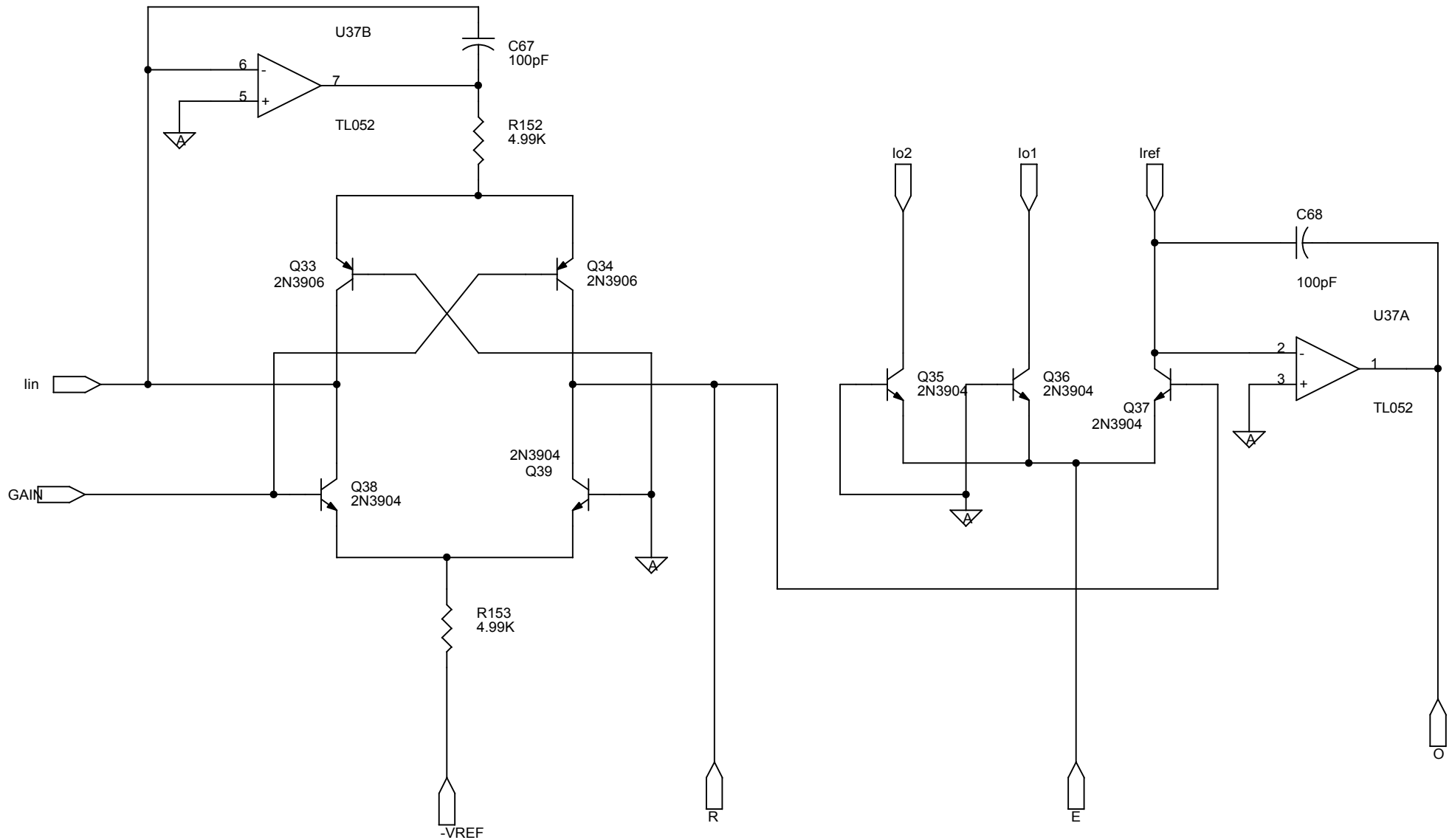
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| Title             |                                    |                |
| NOOTA - CV ATN M6 |                                    |                |
| Size<br>A         | Document Number<br><b>100-1069</b> | Rev<br>A       |
| Date:             | Sunday, September 28, 2014         | Sheet 29 of 40 |

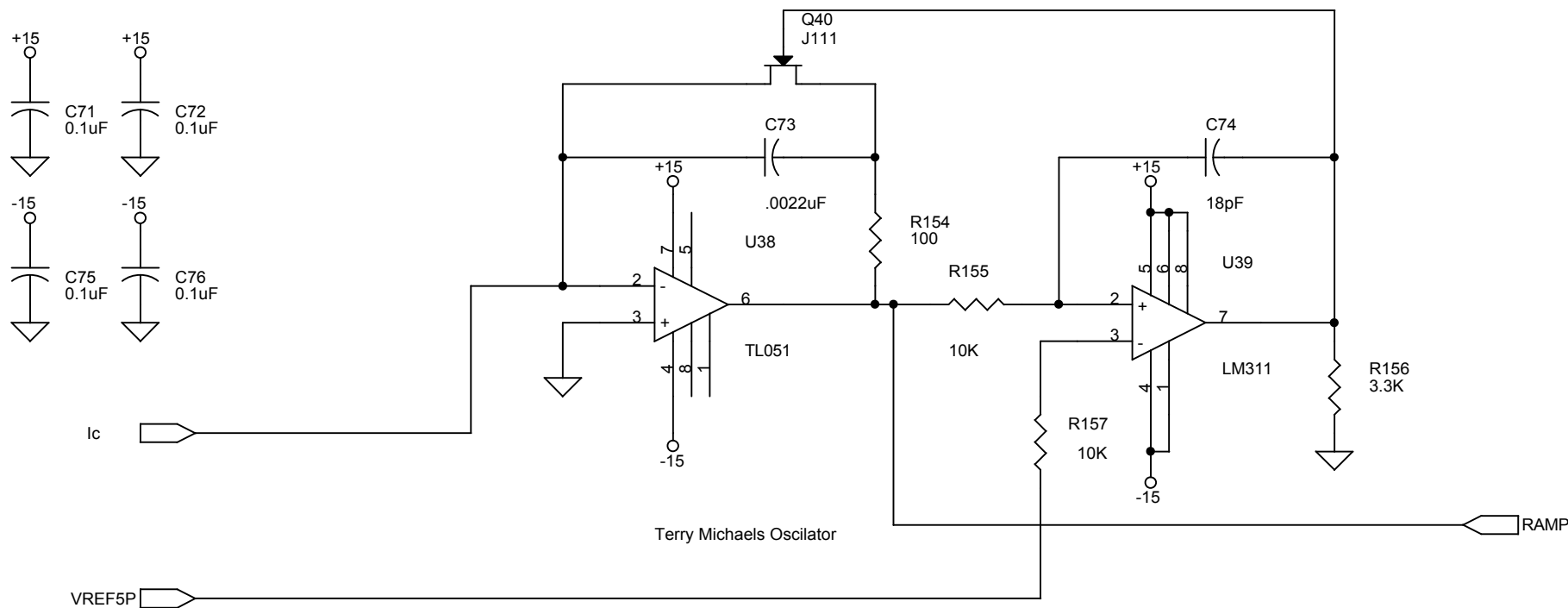


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| Title             |                             |          |
| NOOTA - CV ATN M7 |                             |          |
| Size<br>A         | Document Number<br>100-1069 | Rev<br>A |

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|   |                                    |       |          |
|---|------------------------------------|-------|----------|
| Title                                     |                                    |       |          |
| <b>NOOTA-BM COMPENSATED EXPO CONV-M20</b> |                                    |       |          |
| Size<br>A                                 | Document Number<br><b>100-1069</b> |       | Rev<br>A |
| Date:                                     | Thursday, October 02, 2014         | Sheet | 31 of 40 |



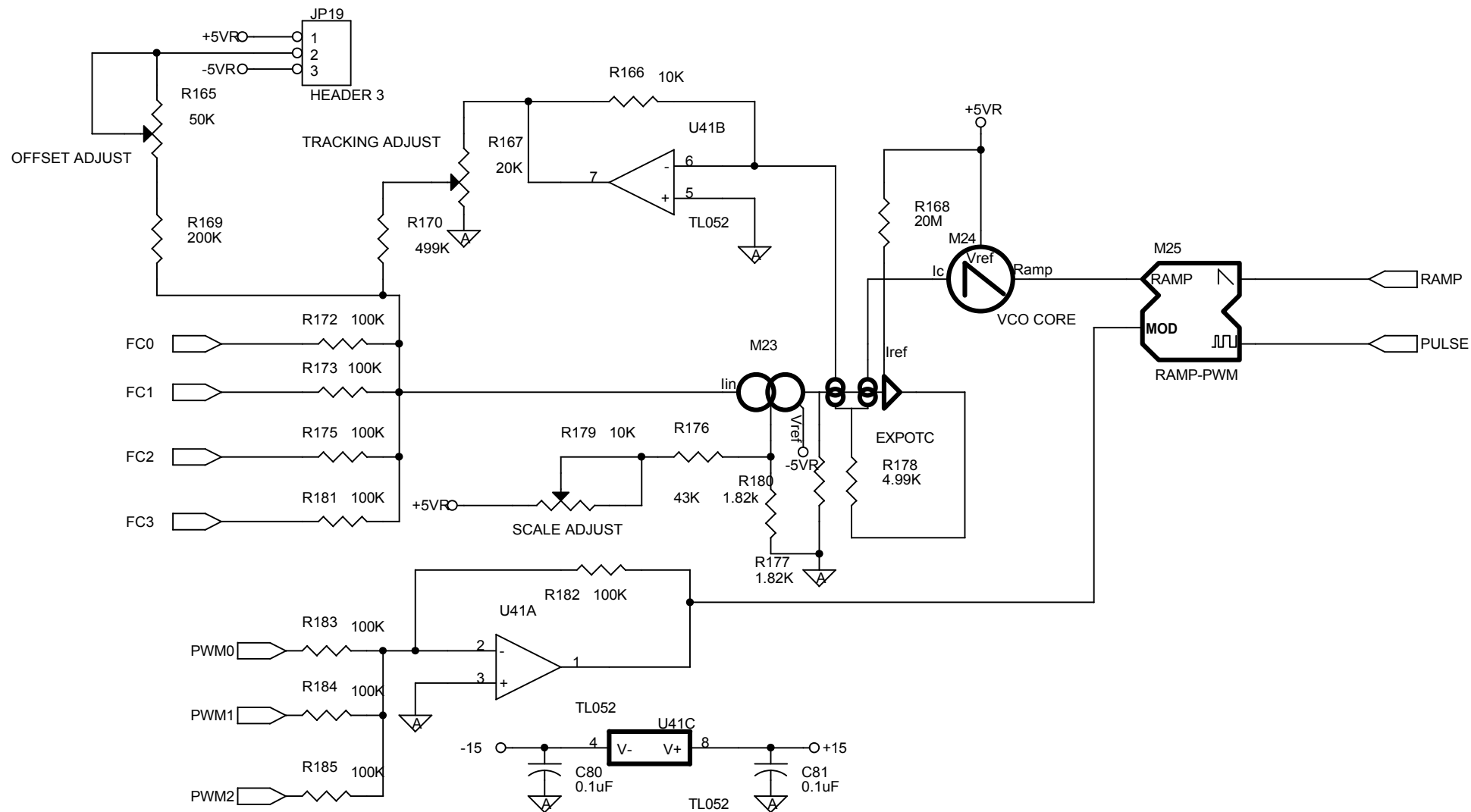


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| Title                             |                 |     |
| NOOTA-TERRY MICHAELS VCO CORE-M21 |                 |     |
| Size                              | Document Number | Rev |
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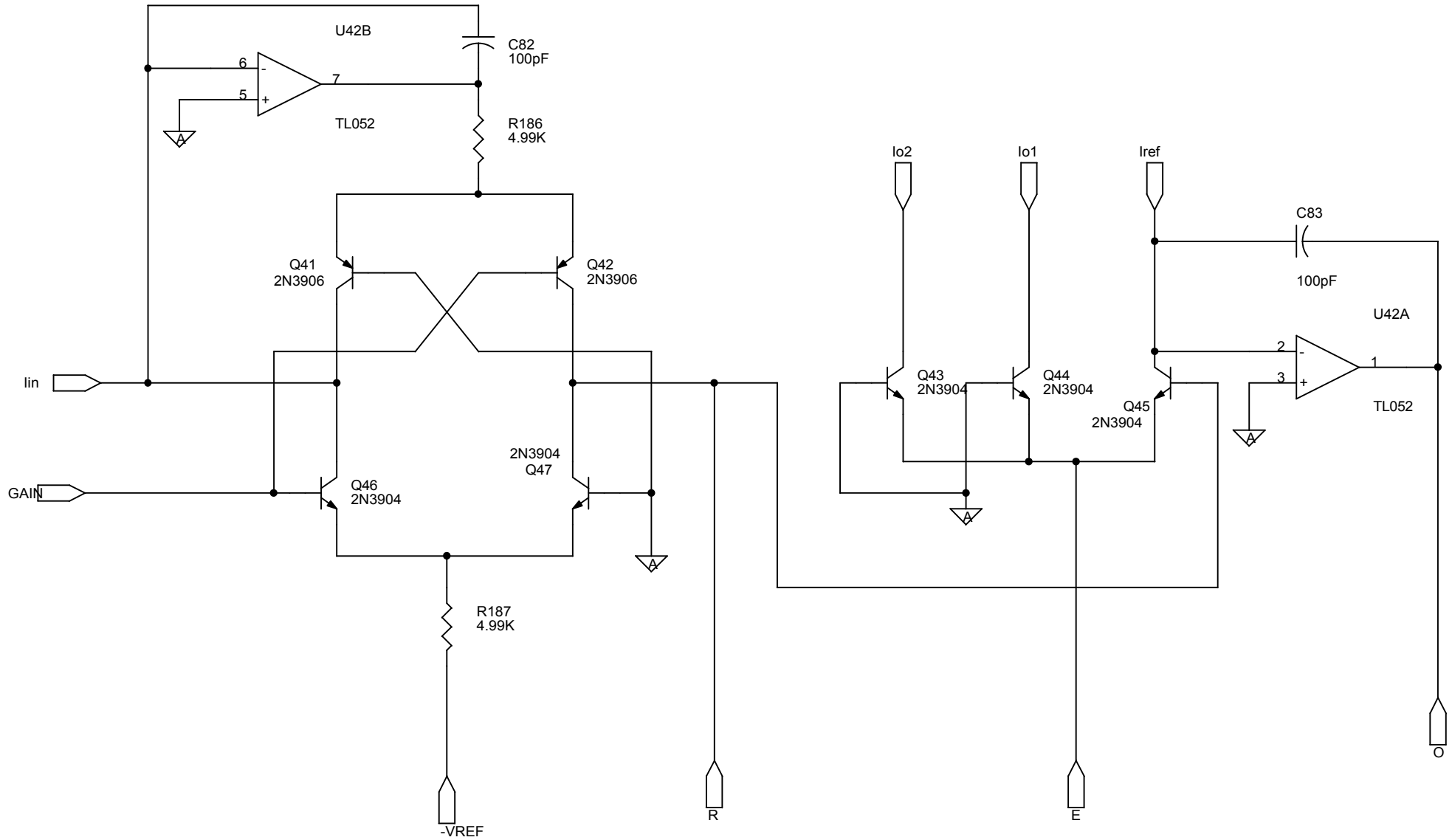




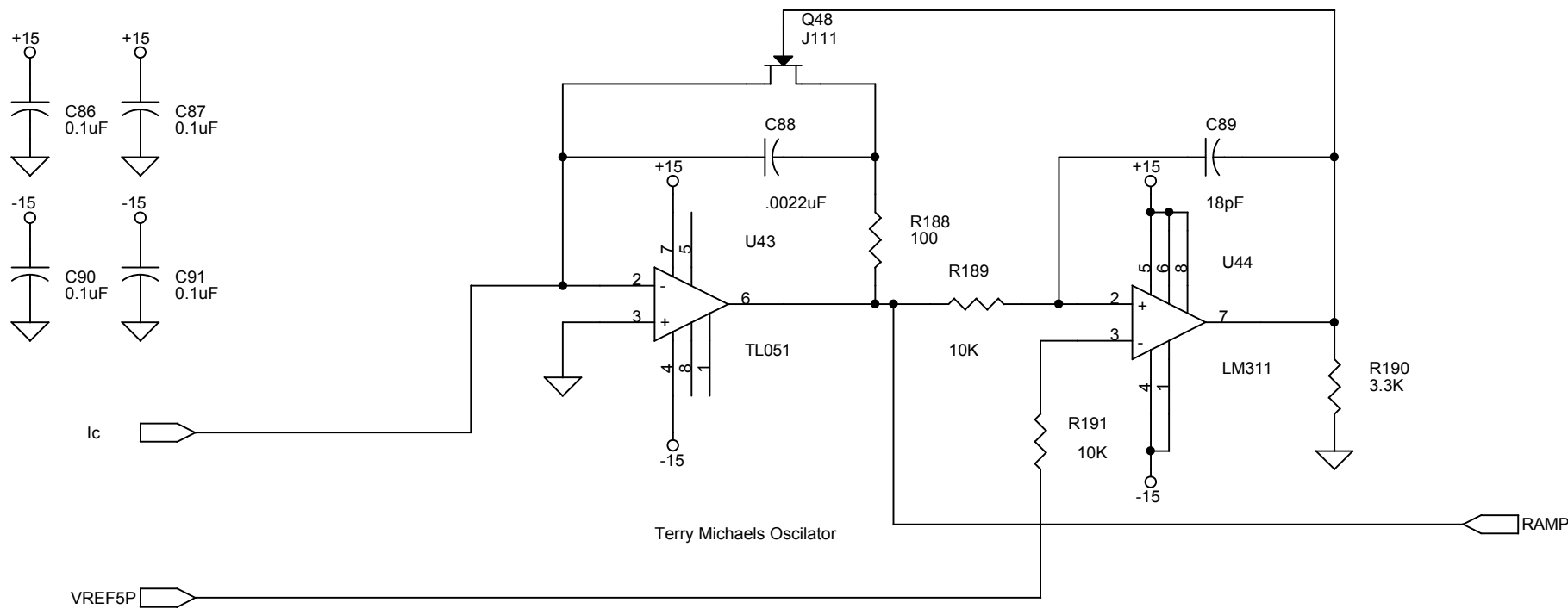
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| Title                  |                 |       |
| NOOTA - BLACKMER VCO-2 |                 |       |
| Size A                 | Document Number | Rev B |
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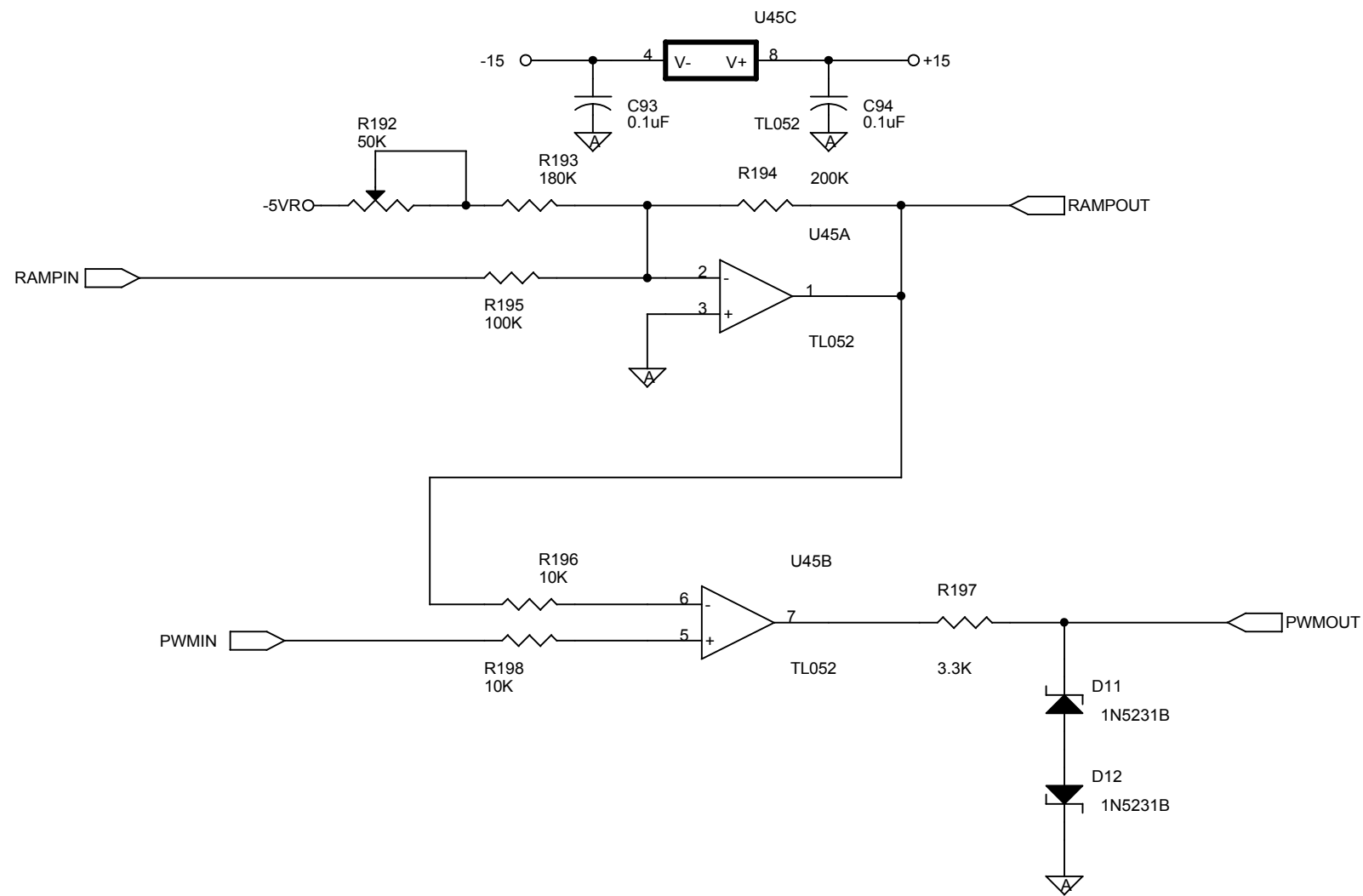
NOTE: ALL TRANSISTORS ARE THERMALLY CONNECTED.



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| Title                              |                             |          |
| NOOTA-BM COMPENSATED EXPO CONV-M23 |                             |          |
| Size<br>A                          | Document Number<br>100-1069 | Rev<br>A |
| Date: Thursday, October 02, 2014   |                             |          |
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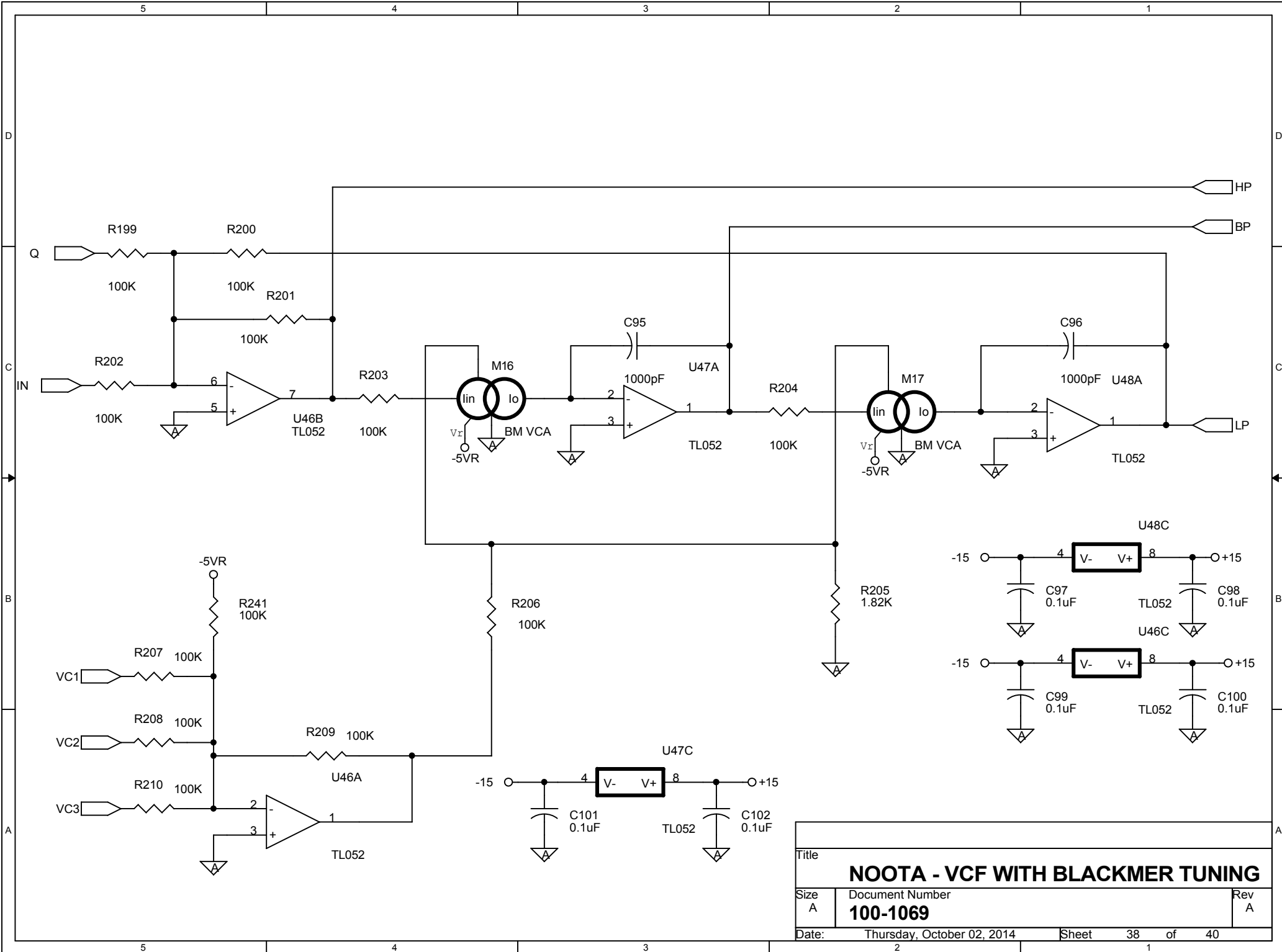


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| Title                             |                            |                |
| NOOTA-TERRY MICHAELS VCO CORE-M24 |                            |                |
| Size                              | Document Number            | Rev            |
|                                   | 100-1069                   | A              |
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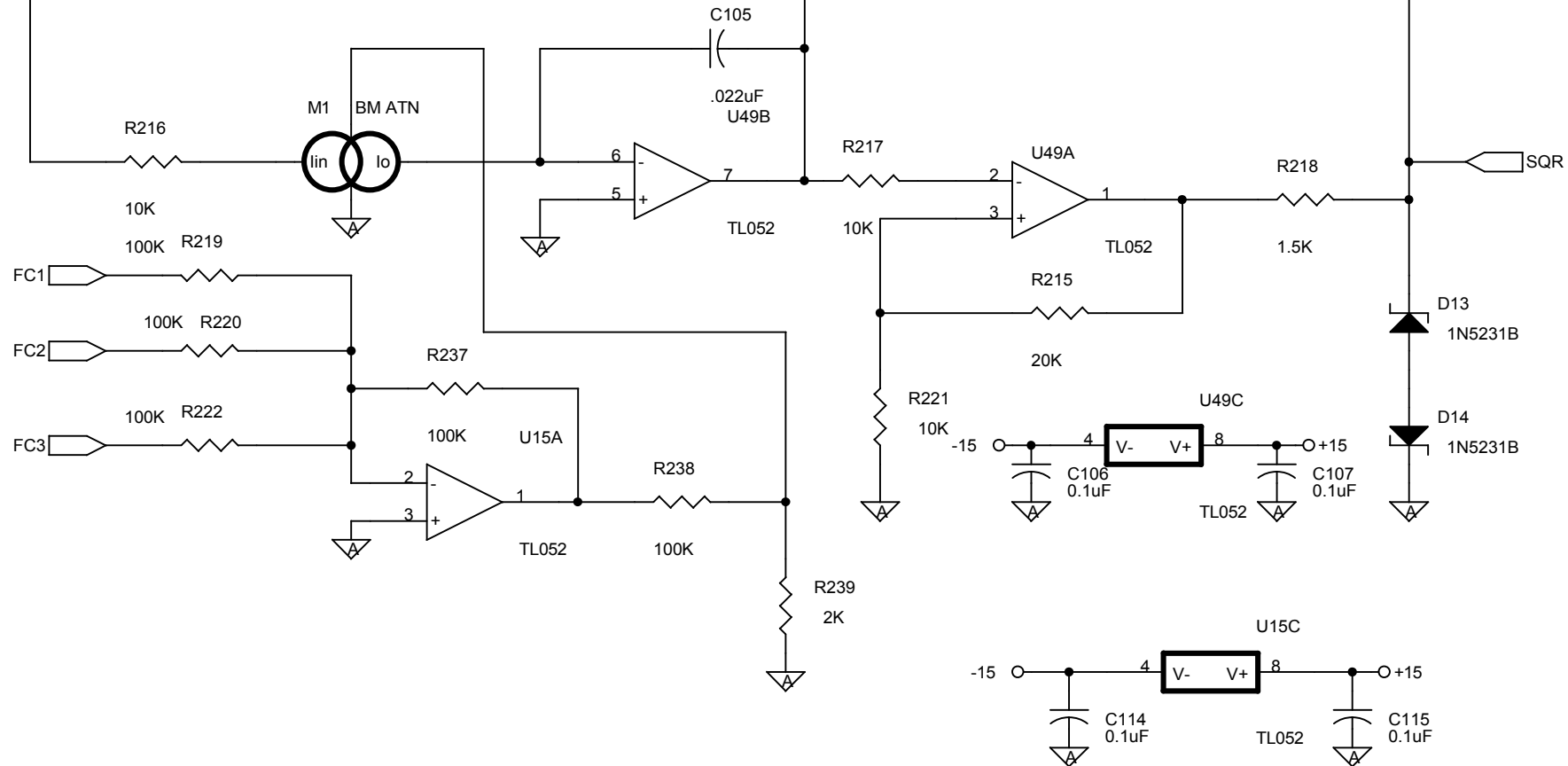
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| Title                 |                                    |          |
| NOOTA-WAVE SHAPER-M25 |                                    |          |
| Size<br>A             | Document Number<br><b>100-1069</b> | Rev<br>A |

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|   |                            |                |
|---|----------------------------|----------------|
| Title                                   |                            |                |
| <b>NOOTA - VCF WITH BLACKMER TUNING</b> |                            |                |
| Size                                    | Document Number            |                |
| A                                       | <b>100-1069</b>            |                |
| Date:                                   | Thursday, October 02, 2014 | Sheet 38 of 40 |
|   |                            | Rev A          |

REV B: COMPARATOR  
POLARITY CHANGED  
FROM NON  
INVERTING TO  
INVERTING. 7-31-2014



|                                  |                 |     |
|----------------------------------|-----------------|-----|
| Title                            |                 |     |
| NOOTA-LFO                        |                 |     |
| Size                             | Document Number | Rev |
|                                  | 100-1069        | B   |
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