Lab8 – Black Box 3 Design

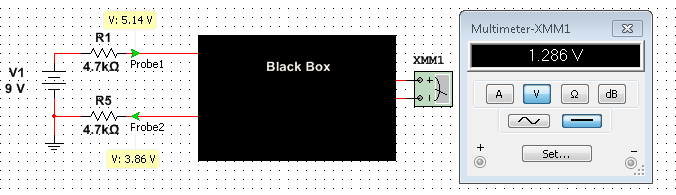
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The purpose of this lab is to:

Learn about building a circuit that produces exactly 1.3V

Using at least 3 equal value resistors (in the Black Box) design a circuit that produces an output voltage of 1.3V. Then adjust R1 so that the output voltage is exactly 1.3V.



Equipment needed:

1 – Digital Multimeter

1 – Elvis II

5 – Standard Resistors

1 – 5 Kohm pot

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measured | Calculated | Simulated |
| V1 = | 9.190V | 9V | 9V |
| VA = | 5.258V | 5.15V | 5.15V |
| VB = | 3.9389V | 3.85V | 3.85V |
| VA - VB = | 1.3206V | 1.3V | 1.3V |
| (VA - VB) adj = | 1.3003V | 1.3V | 1.3V |

|  |  |  |
| --- | --- | --- |
|  | Design | Measured |
| R1 = | 4.7kΩ | 4.592kΩ |
| R2 = | 4.7kΩ | 4.60kΩ |
| R3 = | 4.7kΩ | 4.584kΩ |
| R4 = | 4.7kΩ | 4.600kΩ |
| R5 = | 4.7kΩ | 4.706kΩ |
| R(Black Box) = | 1.567kΩ | 1.5429kΩ |
| R1adj = | 1.587kΩ | 4.761kΩ |

Observations: Decreasing the value of R1 leaves more voltage to drop over the other resistors, resulting in an increase in the voltage across R234.