Electronics Workshop – April 28, 2016

Time & Location:

7:00 PM
Fire District 6 Training Room, 2123 Jackson Highway, Chehalis, WA

Topics:

1. Analog panel meters – determining full scale current
2. Twin-T filter
3. Let's design a front-end for a sound card oscilloscope

Bring:

DC Power Supply (could be a battery with connector or wall powered)
7805 or similar voltage regulator
some resistors, potentiometers, capacitors, breadboard

Notes:

Reference:
http://www.allaboutcircuits.com/textbook/

Analog Panel Meters:
http://groupdiy.com/index.php?topic=1996.0
http://groupdiy.com/index.php?topic=375
http://shaddack.twibright.com/projects/method_VUmeterReuse/

7805 Current Regulator:
https://in.answers.yahoo.com/question/index?qid=20071104060754AAxtysV

Twin-T Filter:
http://sim.okawa-denshi.jp/en/TwinTCRkeisan.htm
http://www.analog.com/media/en/training-seminars/tutorials/MT-225.pdf

Sound Card Oscilloscope:
http://makezine.com/projects/sound-card-oscilloscope/
https://www.google.com/search?q=oscilloscope+sound+card&ie=utf-8&oe=utf-8
http://www.analog.com/library/analogdialogue/archives/45-11/soundcard.html
https://www.zeitnitz.eu/scope_en

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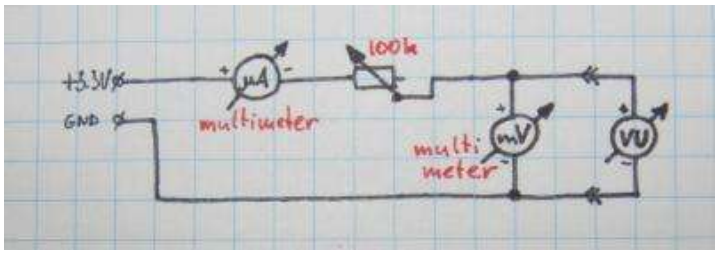

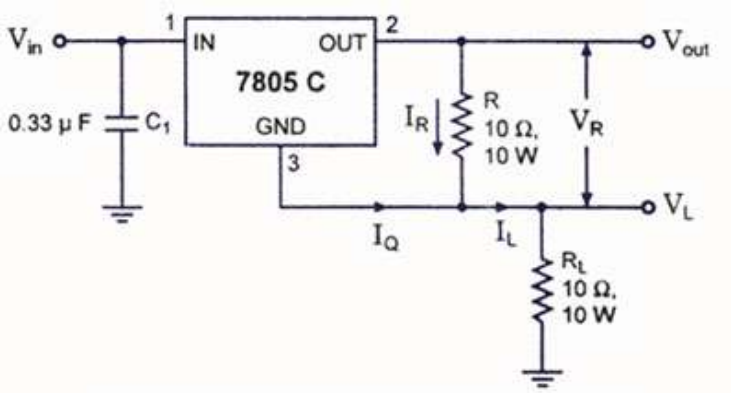

The 7805 as a 0.5 A Current Source

The 7800 regulators can also be employed as current sources. A typical connection diagram of 7805 IC as a 0.5 A current source is depicted above right. The current supplied to the load (R_L)is given as

$I_L = V_R / R + I_Q$

where Iq is quiescent current in amperes (4.3 m A typically for the 7805 IC). In figure,

$V_R = V_{23} = 5$ V; R = 10 ohms; $I_L = 5/10 = 0.5$A

The output voltage with respect to ground is

$V_{out} = V_R + V_L$

The load resistance, R_L = 10 Ohms, therefore V_L = 5 V

Thus $V_{out} = V_R + V_L = 5 + 5 = 10$ V Minimum input voltage required,

$V_{in} = V_{out}$ + dropout voltage = 10 + 2=12V