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Module 914: Digital-to-Analog Converter (DAC)

Procedure

Build the following circuit. Use the rechargeable NiMH battery to power the LM358 Op Amp. There are portions of relevant datasheets on the back side of this paper.

Turn on the oscilloscope and press the Default Setup button. Use ***only*** the horizontal and vertical scale adjustments and the trigger and meas menus to complete today's task to improve your skill set.

Use the oscilloscope to view voltages V_1, V_2, and V_3. Press the buttons (four combinations, each button pressed or not pressed) and observe how the buttons affect V_3 at the output.

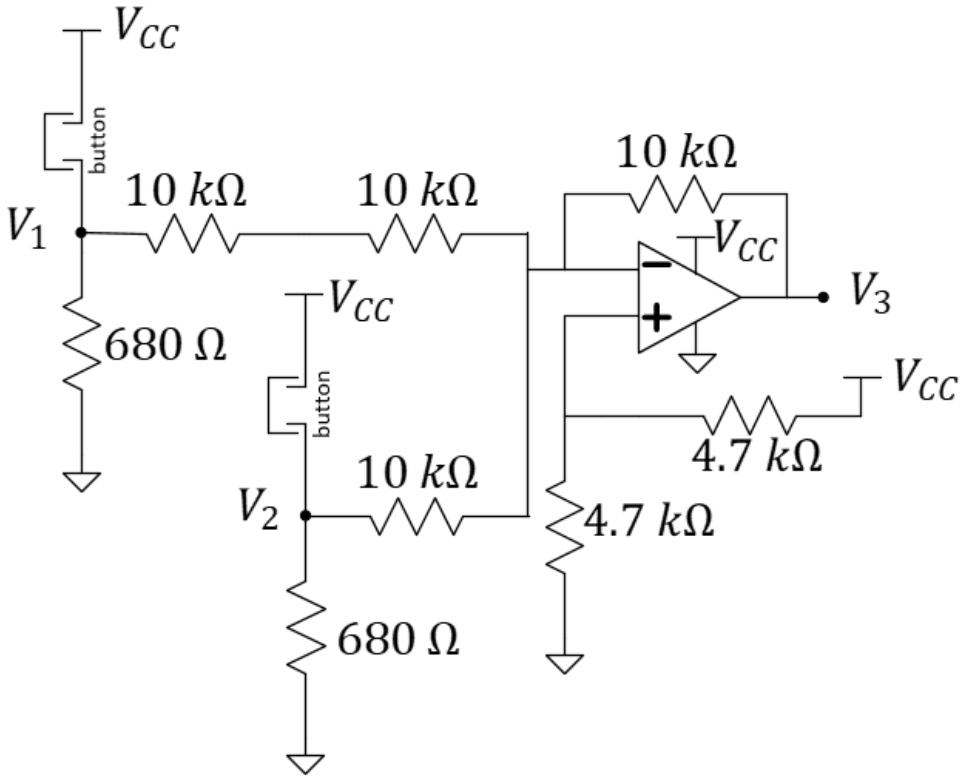


Figure 1: *An Analog-to-Digital Converter circuit.*

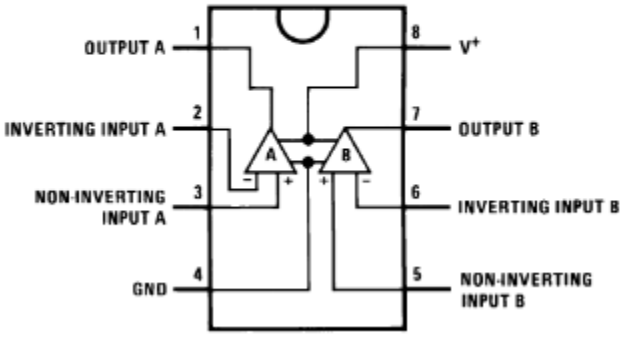
Record the four different voltages that appear at the output in a table that includes the four combinations of input voltages for V_1 and V_2. Use the oscilloscope to measure and record the four DC voltages of of V_3. Let your TA know you are ready for evaluation to receive your module grade.

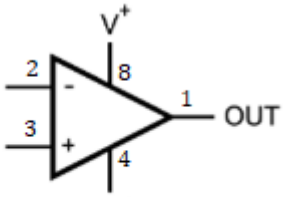
Evaluation

- Ability to map a circuit design onto the breadboard in a functional and clean manner.
- Ability to use the oscilloscope.
- Ability to troubleshoot problems that occur during a build.

LMx58-N Low-Power, Dual-Operational Amplifiers

D, P, and NAB Package
8-Pin SOIC, PDIP, and CDIP
Top View





(Left Amplifier)

6.1 Absolute Maximum Ratings

See (1)(2)(3).

			LM158, LM258, LM358, LM158A, LM258A, LM358A		LM2904		UNIT
			MIN	MAX	MIN	MAX	
Supply Voltage, V^+				32		26	V
Differential Input Voltage				32		26	V
Input Voltage			−0.3	32	−0.3	26	V
Power Dissipation(4)	PDIP (P)			830		830	mW
	TO-99 (LMC)			550			mW
	SOIC (D)			530		530	mW
	DSBGA (YPB)			435			mW
Output Short-Circuit to GND (One Amplifier)(5)	$V^+ \le 15$ V and $T_A = 25°C$			Continuous		Continuous	
Input Current ($V_{IN} < -0.3V$)(6)				50		50	mA
Temperature			−55	125			°C
	PDIP Package (P): Soldering (10 seconds)			260		260	°C
	SOIC Package (D)	Vapor Phase (60 seconds)		215		215	°C
		Infrared (15 seconds)		220		220	°C
Lead Temperature	PDIP (P): (Soldering, 10 seconds)			260		260	°C
	TO-99 (LMC): (Soldering, 10 seconds)			300		300	°C
Storage temperature, T_{stg}			−65	150	−65	150	°C

Button: The “flat” wires reach across the button. Both wires are connected when the button is pressed.