

**Title: CODE TRANSLATORS****Materials:**

- [1] 7404
- [1] 74147 decimal-to-BCD encoder
- [1] 7447 BCD-to-seven-segment decoder
- [1] 7-segment led display

**Procedure:**

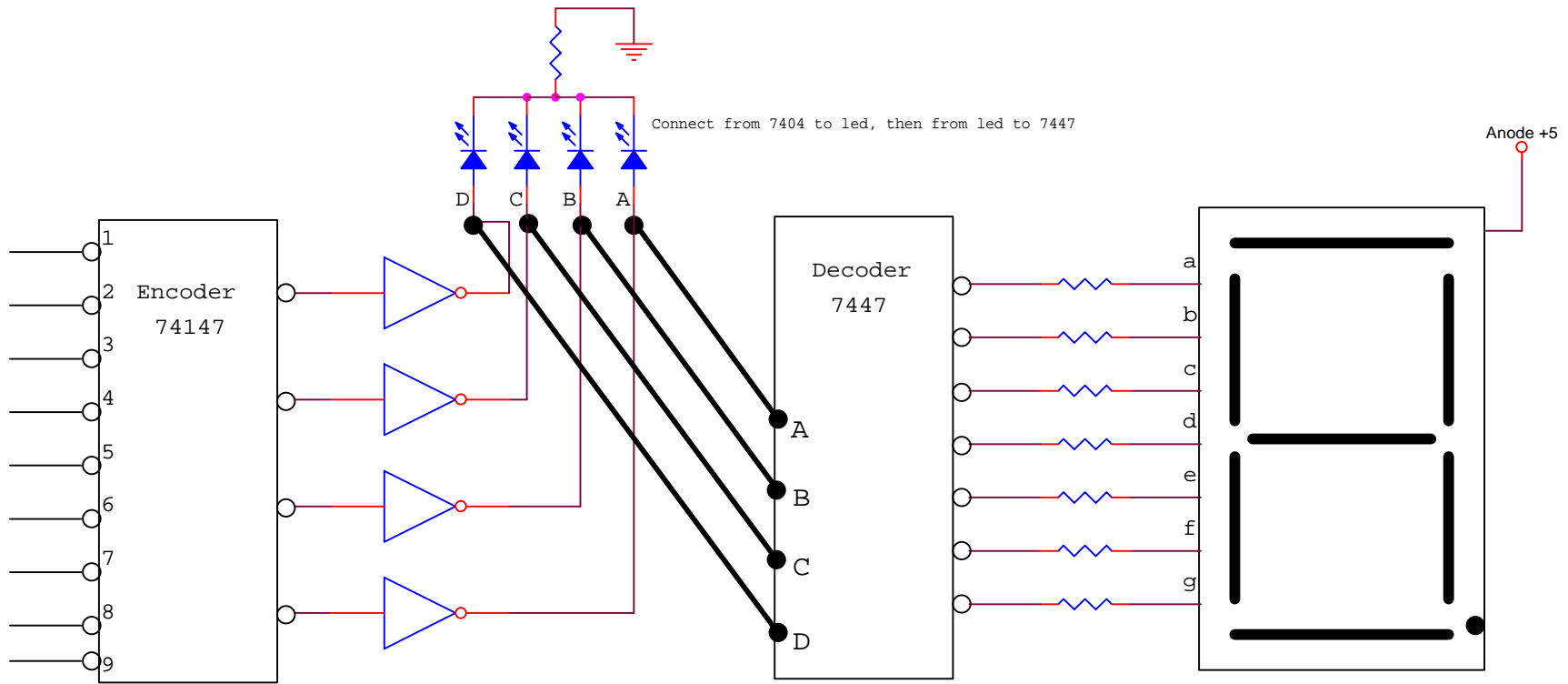
1. Insert all chips into breadboard. You should follow your instructors suggestions as to how to lay out your chips to best do this lab. If you don't, you'll end up with a mess that won't be able to be used for future labs – and you'll end up rewiring.
2. **NOTE:** As discussed in class, if you'd like to bring up your lab after the first half of the lab is done, the instructor will make sure all wiring is going well and help you – this saves all of us much time overall for this lab. If you do not come up at the half-way point to have it signed, then you will receive **NO HELP** if things go wrong (i.e., if you come with all wires and chips in board and you didn't get the half-way signature, I hope the whole things works perfectly!!). Please don't learn the hard way about wiring an entire system without checking everything at each step!
3. Wire the circuit according to the diagram.
4. Fill out truth table 5-2. **Get Instructor's Signature.**

**NOTE:** The 4 LED's, the wires from them to the 7447, the 7447, the resistors going to the 7-segment display, and the 7-segment display itself **SHOULD NOT BE TAKEN OUT OF THE BOARD! THIS PART WILL BE REUSED FOR SEVERAL OTHER LABS COMING NEXT.**

**Questions:**

1. The 74147 encoder translates from decimal numbers to what code?
2. The 7447 decoder translates from the \_\_\_\_\_ to the \_\_\_\_\_ code at the output.
3. Referring to the schematic on the back, when a 3 is being entered on the far left, what is the output at (answer all 3):
  - I. the led's D, C, B, and A?
  - II. the 7-segment code (give 0 & 1 bits)?
  - III. the digital display readout?
4. An input of the 74147 encoder is activated by a logical \_\_\_\_\_ (0, 1)?
5. A segment of the 7-segment LED display is lit when a logical \_\_\_\_\_ (0, 1) appears at the output of the 7447 decoder.
6. What is the purpose of the resistors between the 7-segment LED display and the 7447 decoder?
7. Why do we place a logical 0 in the Table in the 7-segment code section when an LED segment is lit?

Hook these 9 pins to 9 consecutive available rows in the breadboard  
(this aides in testing)



# input	BCD code				7-segment code							Digital Display
	D	C	B	A	a	b	c	d	e	f	g	
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
	<b>not lit = 0, lit = 1</b>				<b>segment lit = 0, segment not lit = 1</b>							

Optional (but highly suggested)  
"half-way" signature:

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## Various 7-segment LED Displays

(find the one you were given)

