



Computer Engineering Department

Course Name: Microprocessor Lab

Number: 10636392

Lab Report Grading Sheet

Instructor: Dr. Aladdin Masri	Experiment #: 2
Academic Year: 2019/2020	Experiment: DAC0832
Semester: Summer Semester	

Students				
1- Mohammad Badawi		2- Taher Anaya		
3-		4-		
Performed on: 24 th of August		Submitted on: 3 rd of September		
Report's Outcomes				
ILO __ =() %	ILO __ =() %	ILO __ =() %	ILO __ =() %	ILO __ =() %
Evaluation Criterion			Grade	Points
Abstract answers of the questions: “What did you do? How did you do it? What did you find?”			0.5	
Introduction and Theory Sufficient, clear and complete statement of objectives. In addition to Presents sufficiently the theoretical basis.			1.5	
Apparatus/ Procedure Apparatus sufficiently described to enable another experimenter to identify the equipment needed to conduct the experiment. Procedure sufficiently described.			2	
Experimental Results and Discussion (In-Lab Worksheet) Crisp explanation of experimental results. Comparison of theoretical predictions to experimental results, including discussion of accuracy and error analysis in some cases.			4	
Conclusions and Recommendations Conclusions summarize the major findings from the experimental results with adequate specificity. Recommendations appropriate in light of conclusions. Correct grammar.			1	
Appearance Title page is complete, page numbers applied, content is well organized, correct spelling, fonts are consistent, good visual appeal.			1	
Total			10	



Abstract:

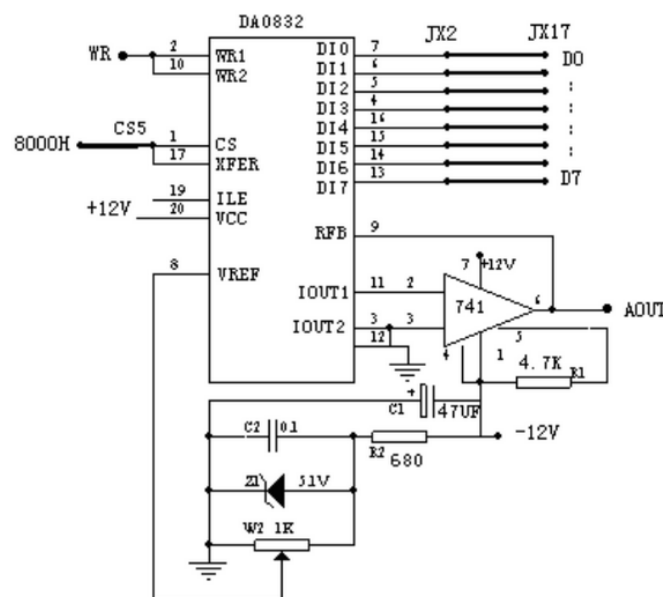
In this experiment, we will be using the DAC0832 to generate square wave and sinusoidal signals, which will be shown on the oscilloscope.

Objectives:

- To be familiar with the DAC0832 digital-to-analog convertor.
- To learn one of the infinite usages of the DAC0832.

Procedure:

The DAC0832 is a digital-to-analog convertor that converts a certain 8-bit digital value to its equivalent analog value. The values range from 0-255 for the 8-bit digital value, which will be translated to a range of 0-5V analog value.



This experiment consists of two simple parts:

- 1- Generating a square wave signal.
- 2- Generating a sinusoidal signal.

The DAC0832 is connected to port 8000H.



Procedure: (cont.)

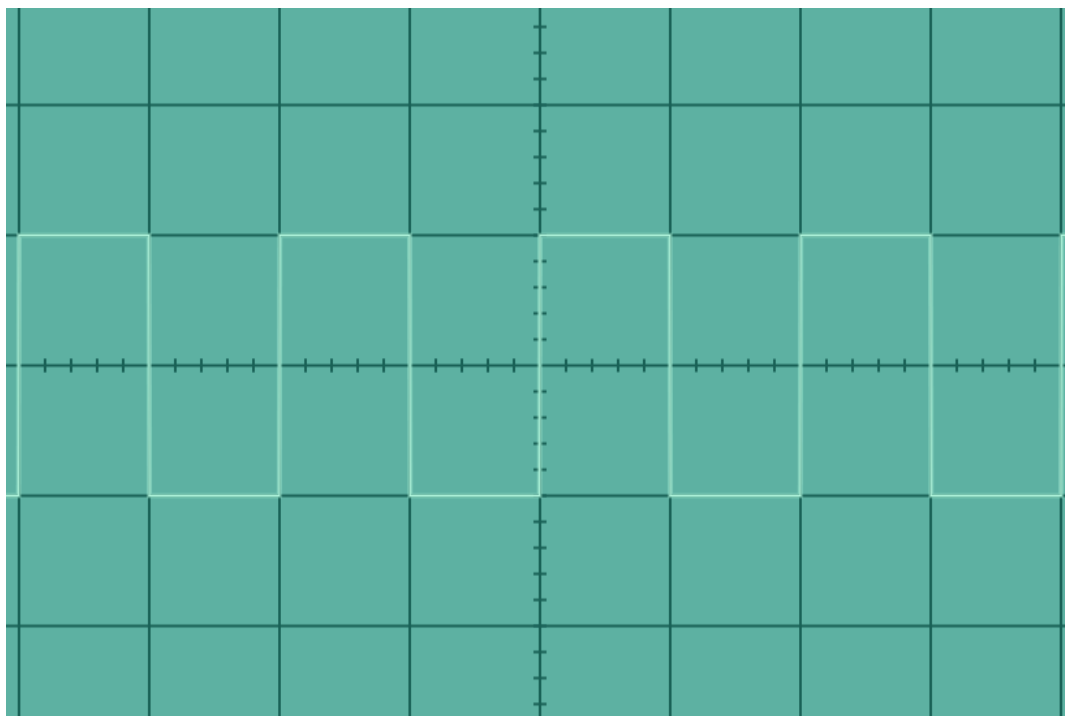
Part 1:

For the first part, we will simply output two values, 0FFH for 5V, and 00H for 0V, and there will be a time delay between both values.

Note that we cannot generate negative voltages using the microprocessor, so we will perform position shifting on the oscilloscope.

```
7  MOV DX, 8000H
8
9  L1:
10 MOV AL, 0
11 OUT DX, AL
12
13 CALL DELAY
14
15 MOV AL, 0FFH
16 OUT DX, AL
17
18 CALL DELAY
19
20 JMP L1
```

On the oscilloscope:





Procedure: (cont.)

Part 2:

This part is a little bit different, because we cannot simply make any sinusoidal operation inside the assembly language. To do that so, we will calculate the sinusoidal values for each step, and store them in the memory.

We wrote a simple C++ function that generated 100 values for our sinusoidal signal, and we stored the values inside an array:

```
19 ARR DB 07FH, 087H, 08FH, 096H, 09EH, 0A6H, 0AEH, 0B5H, 0BCH, 0C3H,  
20 0CAH, 0D0H, 0D6H, 0DCH, 0E1H, 0E6H, 0EBH, 0EFH, 0F2H, 0F6H, 0F8H,  
21 0FAH, 0FCH, 0FDH, 0FEH, 0FFH, 0FEH, 0FDH, 0FCH, 0FAH, 0F8H, 0F6H,  
22 0F2H, 0EFH, 0EBH, 0E6H, 0E1H, 0DCH, 0D6H, 0D0H, 0CAH, 0C3H, 0BCH,  
23 0B5H, 0AEH, 0A6H, 09EH, 096H, 08FH, 087H, 07FH, 076H, 06EH, 067H,  
24 05FH, 057H, 04FH, 048H, 041H, 03AH, 033H, 02DH, 027H, 021H, 01CH,  
25 017H, 012H, 00EH, 00BH, 007H, 005H, 003H, 001H, 000H, 000H, 000H,  
26 000H, 000H, 001H, 003H, 005H, 007H, 00BH, 00EH, 012H, 017H, 01CH,  
27 021H, 027H, 02DH, 033H, 03AH, 041H, 048H, 04FH, 057H, 05FH, 067H,  
28 06EH, 076H
```

Now all we need to do is to iterate over the array:

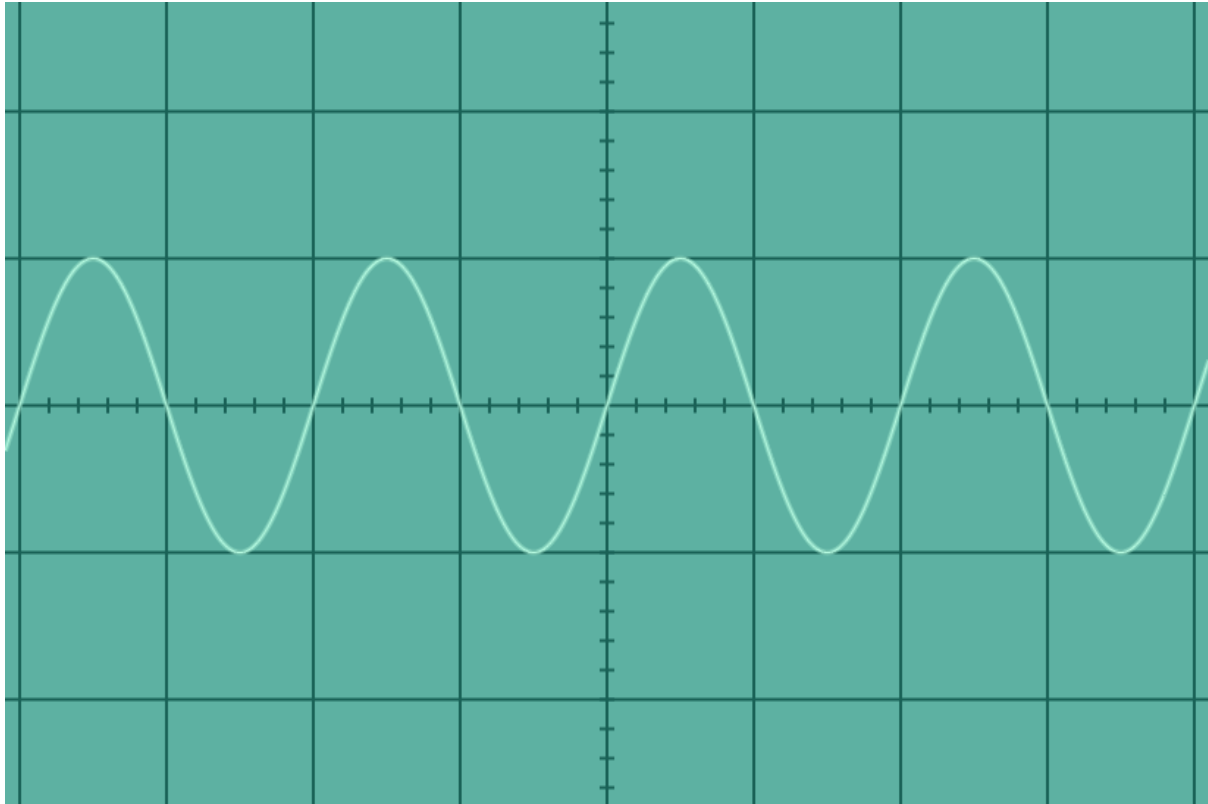
```
7 MOV DX, 8000H  
8 LEA SI, ARR  
9 MOV BX, 0  
10  
11 L1:  
12 MOV AL, [SI + BX]  
13 OUT DX, AL  
14 INC BX  
15 CMP BX, 99  
16 JNE L1  
17  
18 JMP START
```



Procedure: (cont.)

Part 2: (cont.)

On the oscilloscope:



Conclusion:

In the end, we learned how to use the DAC0832 to convert digital values to analog signals. Additionally, we learned on of the infinite usages of the DAC0832.