Automated Beverage Station

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Team No.: 3

Course/Section: ELET 4308/12597

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Project Objective

- **To provide a solution for the food service industry's problem with liquor cost.**
- **To create a product that is portable and can be used for personal use.**

Description

The user will choose from the menu on the LCD:

1 **Tom Collins** (Vodka and Sweet and sour)
2 **Vodka and Sprite**
3 **Whiskey Sour**
4 **Bourbon and Sprite**
5 **Vodka shot**
6 **Bourbon shot**
7 **Repeat Menu**

Description (cont'd)

- **The user will enter their selection on the keypad**

Description (cont'd)

- **The microcontroller will send a signal to the correct relay**

Description (cont'd)

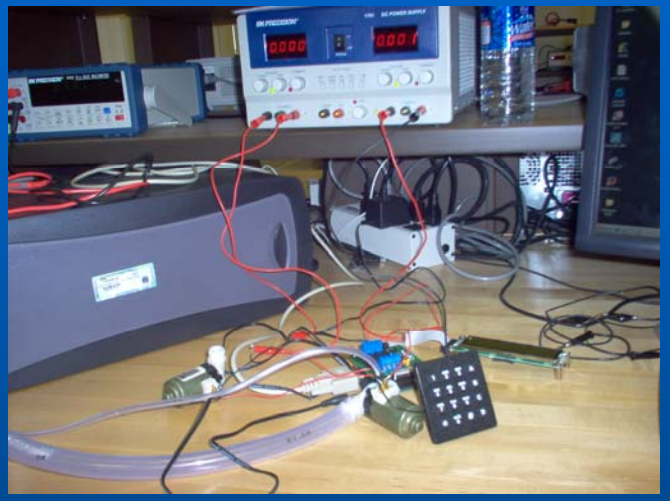
- **The relay will close, which will complete the circuit between the battery and pump.**

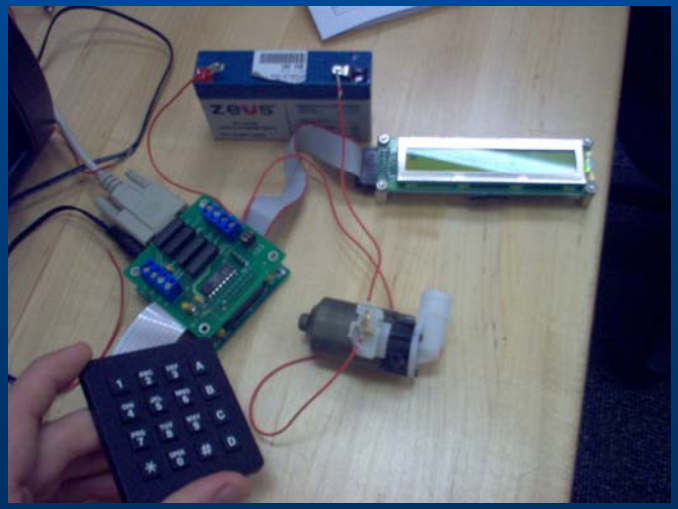
Description (cont'd)

- **The pump will draw liquid from the bottle and distribute the liquid into the user's glass**

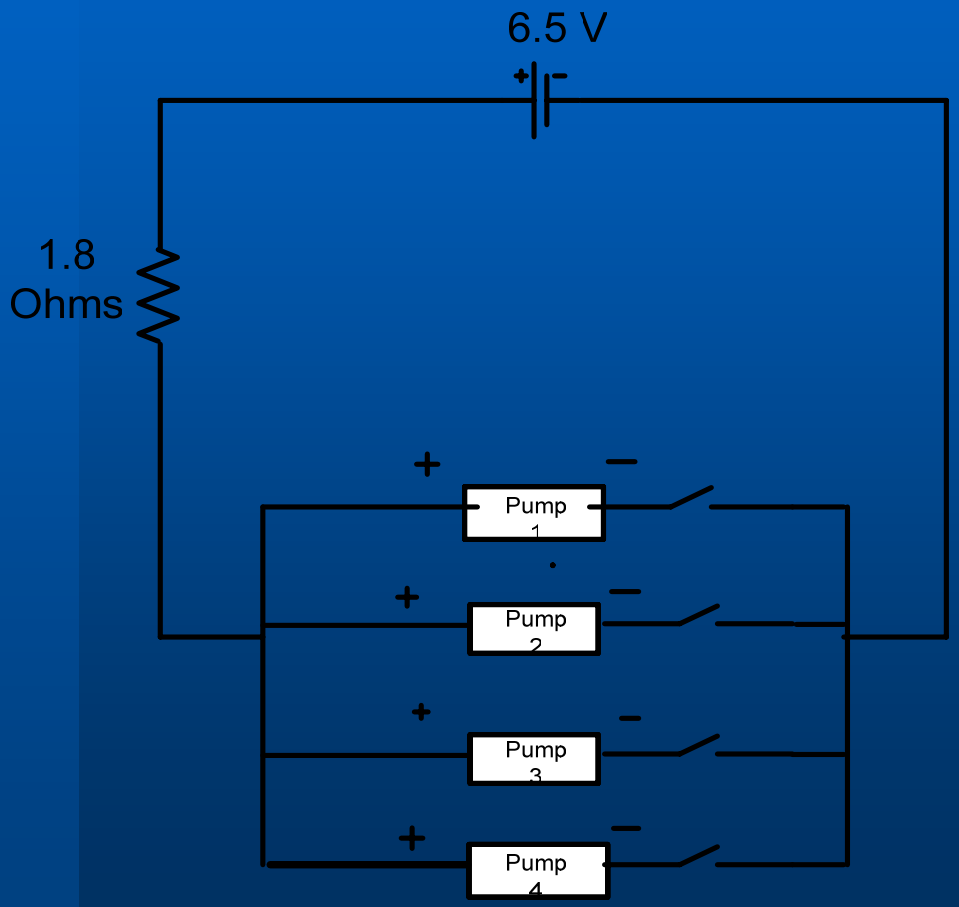
Components

- Microcontroller
- 4 reed peripheral relay board
- 4 windshield washer pumps
- LCD
- Keypad
- 6v battery

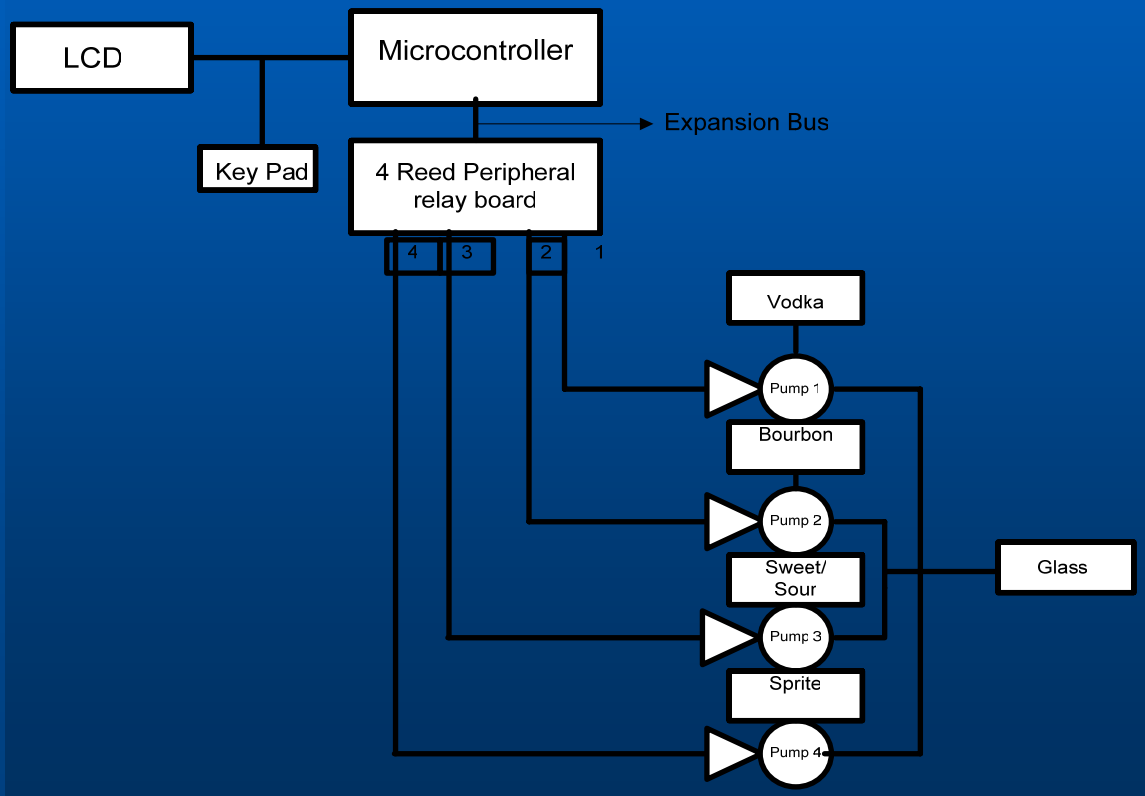




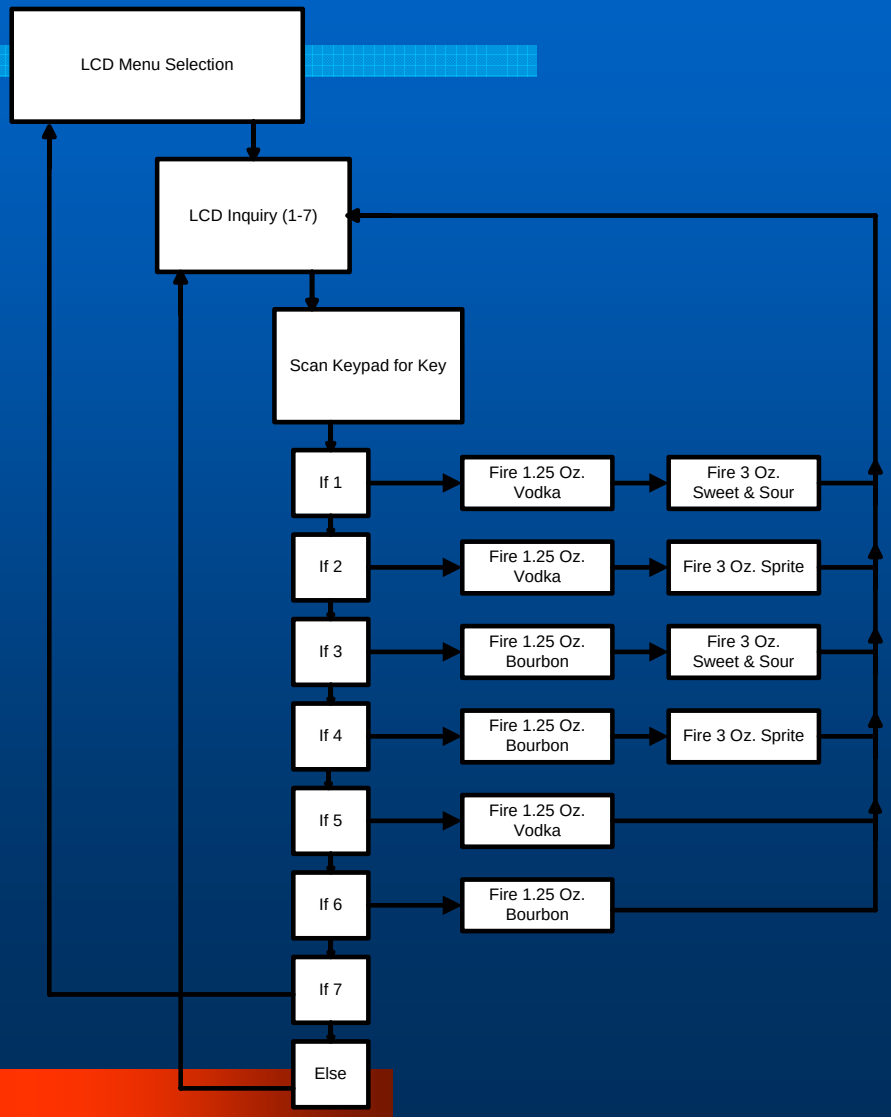
Circuit Schematic



Block Diagram



Control Program Pseudocode



Testing

- A measuring cup was used to measure the amount of liquor
- The delays in the programming were adjusted until the desired amount of liquor was achieved

Competitive Analysis - Easy Bar cocktail station

- **Expensive**
- **Designed to work in restaurants**

FOR MORE INFO...

www.easybar.com

Competitive Analysis - Robotender

- Expensive
- Needs large area to work in
- Not practical for home use
- Can be dangerous
- High Maintenance

FOR MORE INFO...

www.honeybeerobotics.com

Cost

Table 1

Part	Quantity	Cost/unit	Estimated Cost	Actual Cost*
windsheild wiper pump	4	$ 5.95	$ 23.80	$ 20.23
peripheral relay board	1	$ 29.95	$ 29.95	$ 25.46
liquor bottles*	4	$ 22.00	$ 88.00	$ -
small tubing (8 ft.)	1	$ 1.99	$ 1.99	$ 1.99
medium tubing 1/4" (10 ft.)	1	$ 2.50	$ 2.50	$ 1.82
large tubing 5/8" (3ft.)	1	$ 2.97	$ 2.97	$ 2.97
6v, 1.2 AH battery	1	$ 9.95	$ 9.95	$ 8.46
6v battery charger	1	$ 16.00	$ 16.00	$ 13.60
speed pours	1	$ 10.13	$ 10.13	$ 10.13
adapters for tubing	4	$ 4.00	$ 16.00	$ 14.52
wood for beverage station*	1	$ 21.00	$ 21.00	$ -
Total			**$ 222.29**	**$ 99.18**
***Differences in estimated and actual cost may vary due to 15% discount received from parts purchased from EPO				
*Liquor bottles were donated by team members and do not have an actual cost				
*All wood was donated by Amanda Hardy of Hitachi Power Tools				

Cost (cont'd)

Table 2

Part	Quantity	Cost/unit	Estimated Cost	Actual Cost
4x1 Keypad	1	$ 19.95	$ 19.95	$ 19.95
resistors (1.8 Oh	2	$ 0.10	$ 0.20	$ 0.20
8051mini-max51	1	$ 69.95	$ 69.95	$ 69.95
24 x 2 LCD	1	$ 7.95	$ 7.95	$ 7.95
bread board	1	$ 10.00	$ 10.00	$ 10.00
Total			**$ 108.05**	**$ 108.05**

Actual cost of Automated Beverage Station: $ 207.23

Estimated cost when mass produced: $ 165.78

Schedule - Microsoft Project

ID	Task Name	Duration	Start	Finish	Resource Names
1	**Project Proposal**	**23 days**	**Tue 1/18/05**	**Thu 2/17/05**	**Team 3**
2	Project research/written report	22 days	Tue 1/18/05	Wed 2/16/05	Team 3
3	Presentation	1 day	Thu 2/17/05	Thu 2/17/05	Team 3
4	**Ordering parts**	**10 days**	**Thu 2/24/05**	**Tue 3/8/05**	**Carrie**
5	Fill out parts request for lab	1 day	Thu 2/24/05	Thu 2/24/05	Carrie
6	Purchase pumps	1 day	Sun 2/27/05	Sun 2/27/05	Carrie and Leah
7	Purchase battery, charger	1 day	Mon 2/28/05	Mon 2/28/05	Carrie and Leah
8	purchase tubing for pumps	1 day	Tue 3/1/05	Tue 3/1/05	Carrie and Leah
9	Purchase peripheral board	1 day	Thu 3/3/05	Thu 3/3/05	Carrie and Leah
10	Purchasing speed pours	1 day	Tue 3/8/05	Tue 3/8/05	Carrie and Leah
11	**Begin wiring circuit**	**17 days**	**Mon 3/14/05**	**Tue 4/5/05**	
12	Connect pump to peripheral board	4 days	Mon 3/14/05	Thu 3/17/05	Carrie and Leah
13	Wire battery to system	3 days	Fri 3/18/05	Tue 3/22/05	Carrie and Leah
14	wire remaining pumps	10 days	Wed 3/23/05	Tue 4/5/05	Carrie and Leah
15	**Programming the microcontroller**	**31 days**	**Tue 3/8/05**	**Mon 4/18/05**	**Justin Miller**
16	program keypad/LCD	6 days	Tue 3/8/05	Tue 3/15/05	Justin
17	program interface to one pump	9 days	Wed 3/16/05	Mon 3/28/05	Justin
18	add programming for remaining pumps	6 days	Thu 3/31/05	Thu 4/7/05	Justin
19	final programming and debugging	5 days	Tue 4/12/05	Mon 4/18/05	Justin
20	**Construct the station**	**16 days**	**Wed 4/6/05**	**Tue 4/26/05**	
21	build the frame	7 days	Wed 4/6/05	Wed 4/13/05	Carrie
22	build bottle holders	5 days	Thu 4/14/05	Wed 4/20/05	Carrie
23	add components	4 days	Thu 4/21/05	Tue 4/26/05	Carrie
24	**Testing**	**9 days**	**Tue 4/5/05**	**Thu 4/14/05**	
25	test mini-max and pumps	3 days	Tue 4/5/05	Thu 4/7/05	Team 3
26	test unit for correct pour	3 days	Tue 4/12/05	Thu 4/14/05	Team 3
27	**Final Report**	**17 days**	**Thu 4/7/05**	**Thu 4/28/05**	**Team 3**
28	Written Report	14 days	Thu 4/7/05	Mon 4/25/05	Team 3
29	Final Project Presentation	1 day	Thu 4/28/05	Thu 4/28/05	Team 3

The End

Any Questions?