

Testing System for Pressure Sensitive Cardiovascular Catheter

Client: Nancy Sweitzer, M.D., Ph.D.
Colette Wagner

Team Members: Marty Grasse, Co-Team Leader
Anthony Wampole, Co-Team Leader
Erik Yusko, BWIG
Danielle Ebben, BSAC
Anita Zarebi, Communications

Date: *Friday, April 27th, to Thursday, May 3rd*

Problem Statement:

In order to accurately measure internal blood pressures, a properly calibrated pressure sensitive cardiovascular catheter may be used. The current techniques for calibrating the catheter are unreliable, which causes concern about the validity of the test results. The goal of the project is to devise a testing system which more reliably calibrates and verifies the accuracy of the catheter in both atmospheric tests and tests which simulate internal bodily conditions.

Last Week's Team Goals:

- COMPLETELY FINISH PROTOTYPE!!!
 - Assemble circuit and solder together
 - Finish coding a working prototype
 - Find/Fix small leak in box
- Test the prototype with all aspects of the design
- Complete poster and deliver final poster presentation
- Begin final report
- Submit patent disclosure to WARF

Summary of Accomplishments:

- Assembled all circuitry and enclosed in steel box for isolation
- Finished code and tested inputs and outputs
- Determined leak in pressure chamber is insignificant
- Completed poster for presentation on Friday
- Began work on final paper
- Completed (mostly) patent disclosure for WARF (see attached)
- Basic testing of heater and air pump (on/off control)

Activities for Past Week:

Team: Friday Class Meeting, Several work meetings 35 hours each

Team Member of the Week:

The Team

This Week's Goals:

- Win the Biomedical Engineering Tong Prototype Award!
- Poster Presentation on Friday, May 4, 2007 from 12 to 2 in the ECB lobby
- Develop relationship between pressure and voltage and temperature and voltage
- Test heater and air pump thoroughly
 - Heat up time
 - Time to attain pressure
 - Pressure retention at different pressure levels
- Modify code for improved user interface
- Submit patent disclosure to WARF
- Complete final paper
- Deliver prototype to client

Project Difficulties: We encountered no major difficulties this week.

Project Timeline:

<i>Week starting:</i>	<i>Accomplishment/Goal</i>	<i>Completed</i>
Jan. 26, 2007	Assemble team, establish roles	✓
	Familiarize Marty with project	✓
	Brainstorm ideas to solve previous design problems	✓
Feb. 2, 2007	Finalize solution for leakage and structural integrity	✓
	Brainstorm ideas for computer control and saline heating	✓
Feb. 9, 2007	Machine box to smaller dimensions	✓
	Update PDS	✓
	Test pressure transducer with measuring equipment	✓
Feb. 16, 2007	Purchased parts	✓
	Begin work on proof of concept	✓
Feb. 23, 2007	Machine catheter fittings	✓
	Begin programming for pressure/temperature control	✓
	Continue work on proof of concept	✓
March 2, 2007	Work on prototype	✓
March 9, 2007	Midsemester Presentation/ Outreach to LaFollette High School	✓
March 16, 2007	Work on prototype	✓
March 23, 2007	Work on prototype	✓
March 30, 2007	Work on prototype	✓
April 6, 2007	Spring Break	✓
April 13, 2007	Work on prototype	✓
April 20, 2007	Work on prototype	✓
April 27, 2007	Work on prototype	✓
May 4, 2007	Final Poster Presentation	tomorrow
May 9, 2007	Final Report Due	

Expenses:

Part	Manufacturer	Part number	Distributor	price	Quantity
<i>Plastic Sheet</i>	<i>McMaster</i>	<i>8560K603</i>	<i>McMaster-Carr</i>	<i>\$33.60</i>	<i>1</i>
<i>Latches</i>	<i>McMaster</i>	<i>6082A12</i>	<i>McMaster-Carr</i>	<i>\$4.00</i>	<i>6</i>
<i>Plastic tube</i>	<i>McMaster</i>	<i>8532K12</i>	<i>McMaster-Carr</i>	<i>\$3.75</i>	<i>1</i>
SwageLok	SwageLok		Badger Fluid Systems	\$8.24	1
RTV Silicone Caulk	McMaster	76435T8	McMaster-Carr	\$3.34	1
Vacuum Tubing	McMaster	5173K48	McMaster-Carr	\$0.10/ft	2 Feet
Screws			Hardware store	\$3.47	18
Air Pump	Sensodyne		Sensodyne	\$59.00	1
Pipe fitting plug			ACE Hardware	\$1.40	1
Rubber Washer			ACE Hardware	\$1.30	1
O-Ring			ACE Hardware	\$0.59	5
Aluminum	McMaster	89845K131	McMaster-Carr	\$7.95	1
Epoxy	J-B Weld	7605A11	McMaster-Carr	\$5.53	1
Heater power supply		102-1333-ND	DigiKey	\$23.56	1
Logic FETs	International Rectifier	IRF3708-ND	DigiKey	\$2.71	3
Air pump power supply		70235K69	McMaster-Carr	\$14.22	1
Heating pad	Minco	HR5183R15.6L12BU	Minco	\$57.75	1

Total: \$317.38

Note: Last semester's purchases are in italics.