

Sea Monkeys



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Team Members

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Sea.monkeys.3000.googlepages.com

Table of Content

Abstract.....	Pg3
Mission Prioritizing	Pg4
Design	Pg5
Electrical Schematics / Battery	Pg6
Troubleshooting.....	Pg7
Control System	Pg8
Challenges	Pg9
Expenditures	Pg10
Skills Gained	Pg11
Acknowledgements	Pg12
References	Pg13

Abstract

The team started with five participants and one mentor about six weeks ago. We got started because we are in a Marine Science class and we wanted to gain skills for the next level of our study. Little did we know that other people would be interested to join the team as well! This included people that had only heard of the marine classes, but were interested in what this rookie team was doing. The team tripled by the end of the second week. We put our heads together and created a presentation that we would show to people that we thought might be interested in sponsoring the team. We presented to our school principal, the dean of students and spoke to some teachers around campus. We raised more than the amount of money necessary and bought a well known R.O.V. kit, the “R.O.V.-in-a-Box.” Our team name, The Sea Monkeys, was thought of early on because we decided that it was a humorous name.

The main goal of the team was to build our ROV named George and compete in the National Underwater Robotics Challenge. Other goals included the application of the skills learned in our regular classes, such as math, physics, chemistry, and shop.

Mission Prioritizing

We quickly saw that we had the advantage of being a small ROV. We knew that with skill of the driver and a good structure we would be able to complete most if not all of the tasks. Early on we strategized and built our ROV accordingly. We followed the instructions given to us in the manual that came with the kit and once we had the basic ROV done, we continued to the modifications.

Since, as the time went on, the point possible decreased for the lights, we thought it would be wise to turn them on first. Next, we chose to go for the vials, and the palm pilot. After that, we decided to find the origin beacon, but remained undecided on whether or not to activate it. Next, we decided to go for the black box since this would prove to be one of our most difficult missions it was one of the last. We then decided to find the mark but we weren't too sure about just how to measure the depth.

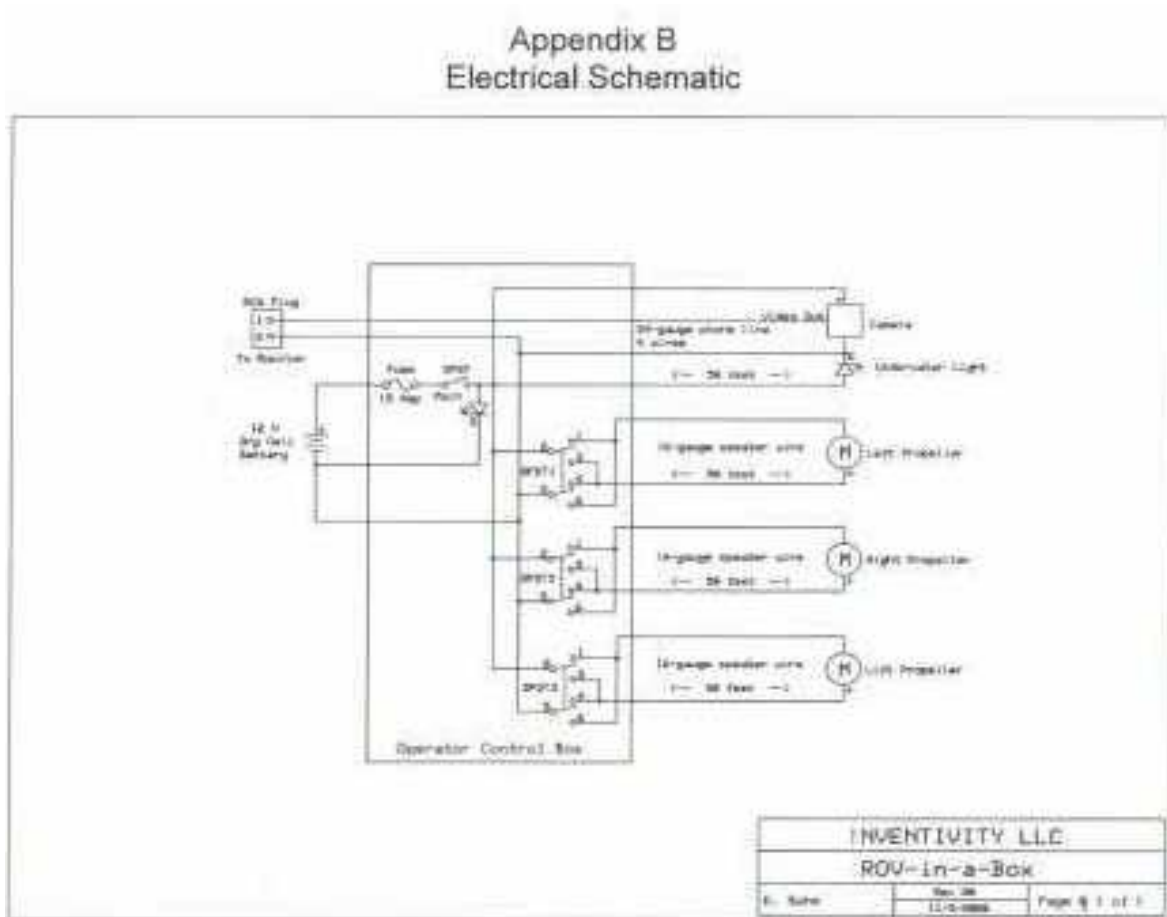
Design

To be able to complete the missions presented, we had to come up with something that was not only effective, but simple and inexpensive as well. Since we had only limited resources, we had to really think about what we could do.

We tried many ideas first, which included hooks that stuck out in the front, nets and magnets. We decided that adding “dangerously strong magnets” would really do the job of picking up the vials and the palm pilot. Next we put a hook in the center of the ROV to be able to pick up the black box but not have our weight shift to any side.

Electrical Schematics / Battery

We used a 12 volt battery to power the control system that operated our ROV.



Troubleshooting

Troubleshooting has been happening throughout the whole building process. One of the first problems we faced was mounting of the motors. While trying to mount the motors on the 1/2 P.V.C. pipes we kept noticing that they could easily slip off. We easily fixed this by adding a few zip ties to each of the P.V.C. pipes holding the motors. The next problem was wiring and soldering. While trying to solder wires together we would sometimes get our wires mixed up. One wiring problem is that one of the switches would turn on a motor but it would go in the wrong direction. Another problem was our light, when we had connected it we had noticed that 2 wires made the light dim but 3 of the wires would make it bright, we quickly fixed these problems by looking at our wiring diagrams.

The solder was a tricky one. While soldering we would sometimes add too much to a few wires and to others a little bit. So when we finished soldering we would test things out and noticed that some things wouldn't work. We checked everything we soldered and saw that on the wires we added to little solder to them they had fallen off. We quickly fixed that by adding more solder to them than before. We again checked our work and again some things didn't work. We were stumped until we thought that maybe we added too much solder, at thinking we tried to take off solder from the wires with too much solder but leaving just enough that we knew it would fall off. So once that was done we tested everything out and everything was working fine.

Two of our biggest problems were the light and the camera. So after our little light incident we didn't leave the light on, we took it off so we could test our ROV underwater. The problem with the light is that while we were in classes at school we came back later that day to try and work on our ROV but we noticed that someone had ripped a wire from our light up to where it was epoxyed. We were left with only 1 wire for the light, so we had to drill into the light's epoxy to expose the wire, once we did that we soldered another piece of wire onto the exposed wire and we quickly gooped it to prevent any more damage to the wire. Our light was fixed after all that but next one of our biggest problems came, the camera. While trying to solder the camera and light together so we could connect them to the ROV we noticed that someone had ripped our camera wire too but not to the tip, we had less than half the original wire and we had to solder a wire from the light to the small camera wire then to a wire from the phone line. We had to do it slowly so we wouldn't damage the camera's little wire.

Our president Mary was the one to solder the three wires together. She managed to get the wires from the light and the phone line soldered next was the little wire from the camera. Mary while doing it slowly somehow managed to burn off the wire from the camera so we were left without that wire. We again tried to expose the wire but while doing so we did not find the wire at all; our only option was to buy a new camera. When our camera finally arrived we had gooped it to make it waterproof. We tried to use the lens from the old camera but it was too damaged and blurry. Once finishing the camera we soldered the wires that needed to be soldered and then mounted the light and camera onto the ROV. Once we finished that we didn't have no more troubleshooting and everything else we did was a success the first time.

Control System

The Sea Monkeys Control Box is created to be easy to use and understand. Composed of a hollow container, our control box controls three fuses that are left, right, and lift. It turns on our light and camera automatically; the power flows through each and one of the areas allowing us to be in control of what we want it to do. Our ROV is not programmed it is preset to the way we want.

Challenges

As a rookie team, we faced many challenges. We had the ambition and the desire to compete, but soon after signing up for the competition we faced a challenge of not having an ROV or the money to build one. We created a presentation and asked the staff members around campus to sponsor us. Many of them thought that we were directly associated with the main team, Falcon robotics, so they denied us, thinking we did have the available finances. Finally, after having struggled a little, we were able to buy the ROV-in-a-Box kit. We went over a hill only to stand before a mountain. None of us had any experience with any sort of building and wiring and handling of tools. We took it one step at a time, following the instructions given to us in the manual that came with the kit and adding steps as we went along. Throughout the course of the six weeks, we didn't just have that problem. Our Styrofoam was broken in half, and people didn't know how to keep their hands off of our stuff. Our light was broken and so was our camera. We were fortunately able to fix the light but had to buy another camera. This new camera didn't come assembled like the one in the kit, so we had to do so. After having passed that, we still had to find a driver, this we solved easily. Who ever wanted to do it, could try out. The team decided who had the most skill and they got the honorable position. These were our challenges but our perseverance helped us overcome them.

Expenditures

Expenditures

Funding:

Sponsor	Donated	
Beth Ellickson	\$20, time and Space	
Fredi Lajvardi	Time, tools and knowledge	
Karen Suhm		
Steohen Ybarra		\$100
Mr. Kemp	\$6 and contacts	
Ramon Martinez		\$42
Mr. Harris		\$10
Diamond on the Road		\$25
Kemp Motor Cross		\$25
Yesenia Robles		
Yesenia Quintana		

Expenses

Date	Business	Ite4-m	Cost
4/24/08	Nventiviry	ROV -n-a-Box	\$250 + tax
4/26/08	Home Depot	PVC Cement	\$4.97 + tax
5/12/08	Radio Shack	15W GRD Soldering Iron	9.75 + tax
5/14/08	Super Circuits	B/W Micro Lens Camera	\$17.99 + shipping
5/14/08	Michaels	White Styrofoam Block	\$3.23 + tax
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Skills Gained

Having no experience means that we gained a lot of skills. First of all, we had to learn the name of the tools we were working with, which sounds simple enough, but really isn't for some people. After learning the names, we had to actually learn how to work with them. We had some trouble in the beginning, but we learned. Working under time constraints was also something that we had to get used to, and fast! We only had six weeks to build it so we had to overcome anything fast. We really counted on the team actually being there, because we took anything anyone had to offer. We learned a lot from our mentors and all the people around us.

Acknowledgments

Beth Ellickson

Fredi Lajvari

Team 842 Falcon Robotics Team

Karen Suhm

Stephen Ybarra

Mr. Kemp

Ramon Martinez

Mr Harrison

Yesenia Robles

Yessenia Quintana

Kemp Motor Cross

Diamond on the Road

References

www.h2orobots.org

Instruction manual

Fredi Lajvardi

Team 842

Karen Suhm