Aquarium of Scott Sweet

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Quiet
It needed to be as quiet as possible. The house is on a raised foundation and I learned from the first tank that the floor (and crawl space) acted like a speaker. Sound resonates and is amplified tremendously. I had to mount my sump on top of foam to isolate the base of the stand from the pumps.

Beautiful Exterior
It needed to be beautiful on the exterior, not a huge mess of wires, pumps and skimmers. This is my living room and everything had to be finished beautifully. I love woodworking, so I planned to create a wall unit facade to cover the entire tank.

Big I wanted it to be big. I decided to shoot for a 500 gallon tank. For me, my current 100 gallon was the same as the 5 gallon I had when I was a kid. Eight feet long seemed right. Deciding on the height and width was more complicated. I had read and heard that wider tanks give a greater sense of depth. I had seen one that was 30 inches wide and 24 inches high, and I really liked that depth. Wider tanks allow for much more creativity in rockscaping while leaving plenty of room in the front. Finally, I could have plenty of sand based corals that I really missed in my 100 gallon.

The height was even trickier. First, I had to get this beast into the house! My front door is about 32 inches wide. Also, I wanted to be able to reach the bottom of the tank without going scuba diving! I wanted to be sure to have enough light to reach the bottom for the bottom-dwelling corals. I had seen tanks as tall as 4 feet and knew most corals wouldn't do well with only 400 watt fixtures. I was planning on having at least 6 inches of sand on the bottom as well. Cost of materials was a big concern too. It turns out that 8 feet long tanks in glass are difficult to manufacture over 24 inches high and the maximum recommended height was 30-inches. So, I decided on a height of 30 inches.

Crystal Clear
I had many acrylic tanks over the years, but was concerned because I knew from experience that acrylic scratches easily. I decided that I wanted glass and really wanted the Starfire (iron free) glass. I had seen many of these tanks and they are really nice and clear with no green tinge. However, due to the size and difficulty of moving a heavy glass tank into position, along with problems with glass tank manufacturers, I ultimately decided on an acrylic tank.

Minimum Maintenance
I am lazy like most people, especially when it comes to doing things like water changes. I wanted to make it as maintenance free as I could. I designed the plumbing to facilitate water changing and top-off water. Also, I like to use hi-tech equipment like controllers, dosing pumps and calcium reactors.

Species Variety
I am not a purist when it comes to matching species found in the same ocean regions. I like many different types of reef animals and wanted to have a large "community" type reef. My goal was to create a natural looking habitat with the live rock, not just a rock wall. The sheer size of the tank would allow for spacing things out so that corals wouldn't compete with and damage one another.

Maximum Health
I had read a lot about refugiums, which are becoming more and more popular. I decided I wanted to have one that was a gravity flow type to minimize the small critters mortality. I also wanted to have an isolation tank that was plumbed into the overall system. With that in mind I could turn off some valves, quarantine the animal until I knew everything was ok and then reconnect the isolation tank back into the overall system when desired. I wanted this tank to be totally self-sustaining when separate, while also allowing me to empty it (partially or totally) for water changes.

The Tank
Ultimately, I settled on a acrylic tank that was 8 feet long, 2½ feet high and 3 feet front to back.

Plumbing
The plumbing had to meet my essential goals of easy servicing, high water flow and a low operating sound level.

Inside Sump
The design of the inside sump came from a person I ran into on the net. I just used an old 100 gallon fish-only tank I held onto for over 10 years! (Save them...you never know.) There are three baffles. The basic flow of the water enters from the top, over the first baffle, under the second and over the third. The 2 inch unions attach to the overflow boxes on the back of the tank. I decided to have the overflow boxes on the outside of the tank to maximize the tank size and minimize the flow obstructions associated with the boxes installed inside of the tank. I also put adjustable dams on the overflow boxes so I that the tank level can be controlled from inside the tank.

Refugium & Quarantine Tanks
The refugium and quarantine tanks are plumbed into the main system and can be isolated at any time. I made my own overflow by cutting a quarter of a 1 inch pipe away. The ends have "L" fittings going to the bulkheads.

Outside Sumps and Pumps
To keep the living room quiet, I decided to install all pumps outside in an adjacent room. The skimmer and its pump are also outside. The inside sump is connected to the outside sump with two 2 inch lines. I had to use this size because I need to support a flow of about 6000 gallons per hour through the sumps. There are three 45 gallon Rubbermaid tubs: one for the sump, one for fresh water, one for saltwater mixing and water changes. There are five pumps: two RK2 1/8 hp for recirculation, two Iwaki 70 for closed system recirculation, and one Iwaki 70 for the skimmer.

All pumps have true unions before and after the pump. That way a pump can easily be replaced without causing a flood. To facilitate plumbing to and from these pumps I used flexible PVC. Using flexible PVC eliminates the need for many elbows.

The freshwater tub is plumbed into the input (suction side) of one pump. By simply turning a couple of valves, I can empty the freshwater tub (or saltwater) into the tank in no time. There is a tub above the pumps that is plumbed into the freshwater tub as well. This way I have access to about 80 gallons of water with a flip of a couple of valves. I have the dosing pump plumbed into the freshwater line for replenishing the evaporated water. My RO/DI unit is plumbed into both of the tubs. It will automatically keep either one or both of the tubs full.

Lighting
Lighting was a project within itself. Because I wanted all sorts of livestock, I decided on both metal halides and VHOs. I like to use the VHOs in the morning and evening, as it reduces the shock to the animals of the lights turning on and off. My goal was to make it easy to clean and replace lamps, reduce corrosion due to salt, protect against UV penetration into the water column and protect the acrylic aquarium from excessive heat. Furthermore, I needed the ability to easily lower and raise the individual fixtures for cleaning, acclimation of new corals and for working inside of the tank. Finally, I wanted to have remote ballasts where heat would not be transferred into the tank.

I decided to use four 400 watt metal halides. The fixtures are manufactured by Hydrofarm (www.hydrofarm.com) and are common fixtures used for hydroponics applications. They are very high quality, with an optimal parabolic mirror-like reflector. As it turns out, Dana Riddle had done lighting tests on many fixtures, which helped me choose these. In terms of lighting intensity, I followed the golden rule of 400 watts per 2 square feet of water, so four fixtures were perfect. I measured dimensions of the fixtures and worked out a layout — equal distance from each other side to side, but offset slightly front to back because of the width of the tank (36 inches). I also centered them from bulb to bulb and made space between them so I could install the VHO fixtures.

Pulley System
I used a pulley system originally designed to raise and lower bicycles. This pulley system made it easy for me to raise and lower the lighting fixtures whenever necessary. These pulleys have a very important feature: they automatically lock in position at whatever point they are pulled to. In other words, they have a self-locking catch.

Currently, I am experimenting with the color temperature of the metal halide bulbs. The two center fixtures have Iwasaki 6.5 K bulbs, while the outside fixtures have 12 K bulbs. My goal is to get as much PAR (photosynthetic active radiation) as possible, but to also to eliminate the yellow tint caused by the Iwasaki bulbs.

Electrical
I decided to continue to use the AquaController from Neptune Systems. It is a X-10 based system that is generally quite reliable. However, I didn't want to take any chances for certain aspects of the system (pumps, heater, chiller) as I have

had problems with the X-10 signals in my house. Neptune Systems has a special product called the DCM8. It can be connected to the AquaController and controls up to eight standard electrical relays. The only catch is you have to do your own electrical work to make it work. It was just another fun aspect of this project.

Because the DCM8 is directly wired to the AquaController, I decided that the main circulation pumps (two), motorized ball valve, heater and the chiller were the most important units to control. This mi