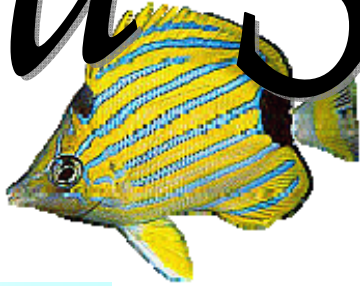


Sea Star

May



2008

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Stay Cool This Summer

By Shane Heil

As summer approaches, most of us have thoughts of yard work, baseball games and family vacations. In many cases the aquarium is put on 'auto pilot' and may be ignored for the next few months. If your dedication seems seasonal – you are not alone! With a little fore site and a small bit of preparation your aquarium will weather your attention lull just fine and you can enjoy your summer outdoors.

The most common problem aquarium owners face each summer is temperature creep. Most of us are used to water temps near 80° F and feel fairly comfortable hovering in this range. However, it doesn't take too many hundred plus days outside to bump your water to 85° F and even higher. Prepare now while we still have a few cloudy days and your fish are still on your mind.

Add a Fan: Adding air movement across the top of the aquarium or sump can have a dramatic affect on water temperature. It is not uncommon to see temperature drops of 2 to 5 degrees or more. Be prepared for additional evaporation which will require more top-off water than during the colder months.

Reduce the Light Cycle: Shaving off an hour at the beginning and end of your normal light cycle is a great way to temporarily reduce heat and your electric bill. This works exceptionally well if you are running metal halides to illuminate your tank.

Open the Canopy: If your aquarium lights are enclosed in a wood cabinet you can reduce the heat transfer to the water by dissipating the heat into the surrounding area by opening the hood and allowing the heat to escape. You can further improve this by adding a small fan to move this heated air away from the aquarium.

Buy a Chiller: Although purchasing a chiller is the most expensive option to reduce water temperature, it is also the most reliable. The price of chillers has dropped a bit in the last few years and they are becoming a reasonable safeguard against summer temperature creep. Be sure to do your homework and don't over do it. Buy the appropriate sized chiller for your tanks water volume and your specific cooling needs.

Freeze some RO: For immediate responses to temperature creep, you can easily add ice to your sump. Buy some old ice cube trays to make a reef safe, all natural heat deterrent. Keep a few bags of RO cubes on hand for those especially hot days. Although this is a short term fix, it can and will save your aquarium in a heat emergency.

Did you know ?

The average summer temperature of Salt Lake Cit is 92.2° F. While the average winter temperature for the same region is only 36.4° F.



March Meeting Recap

By Adam Blundell

Meeting Date: 30-Apr-08 Attendance: 66

Tank of the Month

Lorraine Richards (Bluespotjawfish). Lorraine's 125 gallon tank features a full line up of colorful coral and fish. This tank is loaded with beautiful LPS corals including some very large *Euphyllia* colonies.

Her tank has been set up since 1999 but crashed pretty hard and was re-established in 2006. As Lorraine's username would suggest, she loves jawfish and you can't help but love the personality of her blue spot.

In addition to her 125 gallon reef, Lorraine also maintains a 50 gallon tank dedicated to anemones as well as a leather coral dominated tank complete with a stock, freshwater light hood.

Calcium Reactor Presentation

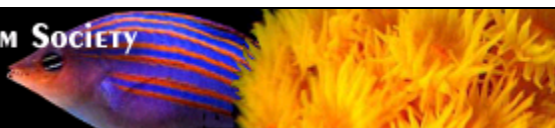
Corey Price, our resident structural engineer led the way with a discussion on the uses of calcium reactors. Corey began by discussing times when you would want to use a calcium reactor and times when you would not. Different methods of adding calcium and carbonates are available and Corey discussed the pros and cons of each method.

If a Calcium Reactor is right for you, then we've got a way to save some money. Corey put together a parts list of what you need to make a reactor for under \$100. The most difficult part about this is getting two flanges to perfectly align. *Have no fear - the club has laser cut flanges available for purchase!*

Corey hooked up the reactor in about 20 mins (including the time needed to glue!) and we were able to award one to JP Sheperd (sumostorm) as a raffle prize.

Next Month

Join us for an in-depth look at coral propagation. We will examine methods of fragging several different coral varieties and demonstrate common and not so common techniques to successfully cut and attach coral fragments. The procedures will be projected overhead, so there won't be a bad seat in the house! Feel free to ask questions and share your experiences as we strive to improve the success of local coral propagation.



Spring Training and The Florida Aquarium

By Andrew Fresh

My son and I recently returned from a father and son trip to Florida. While in the sunshine and warm weather we had the opportunity to go to Major League Baseball spring training. OK, so that was the main reason for the trip. We both love baseball, and we went for the atmosphere, the autographs and to get away from our crummy Utah weather (if only for a few days).

First, I'd like to say that if you get the opportunity to go to spring training either in Florida or Arizona, go! The atmosphere was awesome! Everyone is friendly, and it will provide memories for years to come. My son and I managed to go to four games in four days. We saw six different major league teams, and one college team. The University of South Florida played the Yankees in one game.

The stadiums were similar to going to see the Salt Lake Bees, only with big league names. You could get right up to the dugout, or the wall to get autographs and greet players. Most of the players were willing to sign, but those seeking a profit on autographs are quickly ruining this in my opinion. I won't go on that rant right now. As a fan, the opportunity to see a college pitcher bean Derek Jeter, and the New York Yankee fans get upset was great for a Yankee hater like me. Autograph opportunities abounded and my son came home with 30 or so autographs from players and managers. We had the opportunity to meet the Head Coach's wife for the University of South Florida, the extra insight into the college players really added to the game. I can't say enough about the experience.



Besides baseball I thought we'd have a great opportunity to take a break and go to the Florida Aquarium located in Tampa, Florida. Tickets for the aquarium were not too outrageous; my adult ticket was \$17.95 and the children's ticket was \$12.95. Upon entering the aquarium you are presented with a petting pool that has bat rays, sting rays, and some small sharks. We had the opportunity to pet the bat rays but the sting ray stayed just out of hand's reach and the sharks preferred a spot in the back of the pool.

To get to the main exhibits you actually go up a flight of stairs. Once at the top of the stairs, you can, of course go any direction you want. But the main opening at the top of the stairs seemed to draw people towards the Freshwater / Swamp area. I found this area interesting, mostly because I could see how big mangroves grow, and the gators were

Did you know ?

The Global Coral Reef Institute (GCRI) was established at The Florida Aquarium to develop and focus programs in conservation, preservation and restoration of coral reefs around the world. Their "coral farm" exhibit is used show visitor how coral colonies can be generated in completely artificial conditions.



here. The gators were fairly small guys; they ranged in size from 2 to 4 feet. They were pretty sedentary when we got to the aquarium; they were just floating along like logs. The freshwater area also contained a River Otter pool. These guys were great fun to watch, they performed back flips underwater, and actually followed us the length of the pool like we were going to feed them.

In this freshwater area was "Aquariumania", billed as a great area to view for "Aquariumaniacs". Perhaps this set expectations too high for me, because I was truly disappointed in the exhibit. As someone who has never had a freshwater aquarium, unless you count a gold fish in a jar that lived for a few months, I didn't find the exhibit all that interesting. The aquariums themselves showed different types of aquariums, from the basic freshwater setup to a setup that was actually pretty cool. This "cool setup" actually was setup to be almost completely clear. The aquarium was created with glassfish, clear glass beads, and clear acrylic cylinders.

One area that I did find interesting was the history that was in a couple displays. These displays had items such as old tanks, air pumps, fish traps, and an old metal shipping container used to ship fish in years past. The only display of saltwater was a couple of bow front tanks with some clownfish, and dotty backs. The tanks were using fake rock, plastic anemones and gravel. Again, I wasn't too impressed.

After the freshwater stuff, I was hoping for some good saltwater to make me more excited about the aquarium. We finally headed into what I guess comes to mind when I hear about an aquarium. The next area focused on the bays and beaches and all of the life found in this area can be found in and around Tampa. I thought these displays were interesting, the highlight of this area was definitely the goliath grouper, he was about 4 feet long, and according to the information, the grouper weighed 200 pounds.

Just outside this area was a touch area, the aquarium had inverts that could be touched, sea urchins, and starfish abounded in this very cold water. When I stuck my hand in I was expecting water the temperature of my tank at home. That was not the case. These inverts are all from the Pacific Northwest and the water was downright frigid.

Finally we came to a reef tank. A tank near the invert "touch" display was my favorite. It was a smallish tank, when you consider that the largest tank at the aquarium is a 500,000 gallon display. The tank was probably around 100 gal



and looked very much like something that we would see in our hobby. It had a collection of softies, and some LPS. There was a wrasse - or at least I think that's what it was. There was also a small clown fish hosting in an anemone. The tank looked very healthy except for some algae on the sand, which it seems a few hermits and some snails could have taken care of.

We proceeded to the next area of the aquarium. This area included the 500,000 gallon "Coral Reef", and the shark tank. Both of these huge displays had shows with a diver that included a question and answer session. The "Coral Reef" had lots of fake coral, and over 2000 fish. With the exception of 2 or 3 varieties all of the fish are native to the waters of Florida. There were only 3-4 tanks with actual corals in them, not concrete and plastic. The tanks that did have corals in them, were very healthy looking, with a large variety of SPS, LPS and softies, I recognized some frog-

spawn, many mushrooms, zoos, and SPS like a sea fan, and others. We especially liked these also, lingering to find those items that we had seen before in someone's tank on the reef tour.

The area that I found most interesting was probably the smallest area. Now I know I may get ridiculed for liking "Sea Horses", but the Sea Dragon exhibit was awesome, these creatures were just not something you see everyday. They are from Australia, and as my son put it, they looked like piles of dirty leaves.

The "Sea Hunt" area was also down this path. I found this area visually appealing, the area had round viewing displays, or tubular tanks which gave a good view of the fish. The tank with the "medusoids" jellyfish was especially neat. The green and blue light that flitted through the jellyfish made them look spectacular. The whole exhibit used interesting names for the animals, rather than calling them nautilus, it called them nautiloids. They sure look weird.

The final two areas of the aquarium I'll review in short order. There is a kids' play area that was really a bit lacking, my son is only 8 and he wasn't interested in anything in the play areas. The area was definitely designed for small children, and perhaps those kids really are not interested in sea life.

Ray's Café was reasonably priced, and for a few bucks you could feed a family if you were at the aquarium.

Overall I was pleased with The Florida Aquarium. The cost was about what I would expect for a day of fun. Besides the couple of diver interactions, there are a few feedings available and if you are more adventurous and have a larger budget you can actually swim with the fish in the "Coral Reef" or Dive with the Sharks. If I went back to Tampa with the rest of our family, I would go back and see the exhibits again. This was definitely not a wasted day.

The whole trip was completely worth it. Now for one shameless plug: if you have children and have to fly, go JetBlue. Their flights all have DirecTV satellite connections in the seat back, that can make a flight go by in no time, especially for an antsy 8 year old.



WMAS Word Jumble

How quickly can you unscramble the following fish words?

racceo - _____

crraoaop - _____

anluairis - _____

xloonzaaahte - _____

cieetslrs - _____

ocareilnl - _____

miauaqru - _____

ixnae - _____

eskmrim - _____

iaoratnopp - _____



Avoiding a Tanktastrophe

By Phillip Douglas

Ever walk into a store and get that feeling of excitement when you look at something? I have on multiple occasions - although I must confess it is usually gas. It reminds you of being a kid again. Except now instead of mommy please? It is how I explain this one to 'em. If that is the case you are perhaps fortunate as the bachelors/bachelorates have no one to seek forgiveness from. As such it gets purchased and brought home with no colorful dispute in which you know the other person is right and are simply stubborn to admit it. So you fester and force out an apology the following day having learned a lesson.

Now let us say you splurged on impulse for your aquarium and you just started a war or even worse caused a holocaust - much like all my attempts to use a computer. Well, fear not I have a guaranteed way to avoid this: just send the money you would have spent, directly to me, and you will never have to worry about these tanktastrophes! I mean think about the benefits... (Please do not send any money to me I am joking. And yes I know tanktastrophe is not really a word but it sounds cool right?) I digress.

It is really simple/responsible just to force yourself to ask the clerk to hold it. In doing so, you accomplish quite a bit. You look responsible to you local fish store. You have time to explain it to your wife/husband. You have time to make certain you will not be sending such a creature to an untimely demise by doing research and making sure you have a place you could place said creature. You also have a chance to sleep on it and know whether or not you screwed up (most important to those of us who are single). And the topper ... your critter has now been screened for diseases and you will know for certain what and if it eats.

Now I will gladly acknowledge that the longer you can wait the better for this last portion. But I would imagine it is not gas exciting you, but anticipation - so you really want it (if it is gas just let it go and shuffle to the other side of the store quietly and hope they think it was someone else. I bet that would work out well - never tried it). If you simply ask them to hold it and wait a day you are buying yourself precious time to make sure you want it, can care for it and won't get divorced or bankrupt over it. Plus you come out looking like a saint. Now I know you may feel like an idiot should you have to cancel, however wouldn't it be better to swallow your pride than commit involuntary homicide or give grounds for divorce? In the end you feel better about yourself because, present company aside, no one likes being an idiot - I simply do it for entertainments sake!

Tube Anemones

By Connie Perkins



It all started when I moved to Salt Lake City, Utah from Portland, Oregon. I was missing Oregon and needed something to remind me of home. Cody, one of my neighbors back home had given me a 30 gallon tank along with its only inhabitant, a snowflake eel named Jackson. Over time, I bought several more fish, a cheap filter, and changed the water every 5 or 6 months. I must say it did rather well, no thanks to my fish keeping abilities, there is no doubt it was pure luck. I always loved that fish tank and thought maybe having another might lift my spirits.

I was off to Petco, where I found a 45 gallon corner tank and stand. This time however, I decided to have a reef tank, not just a fish tank. Coral and fish come from the same ocean, how hard can it be? Throw in some water and salt and there you have it, my own little slice of the ocean and a great reminder of Oregon. Yep, this is going to be a breeze, I will feel better in no time!

The first thing I did was to call the only store in the valley that actually answered their phone, The Aquarium. The voice on the

other end of the line said without hesitation, the temperature of a salt water reef tank is 78 degrees. Yep this is going to be a snap. He knew that question right off the top of his head, how hard can this be?

I decided to pay this store a visit and found a salesman named Matt, He asked all kinds of questions; "How long has your tank been running?" Three days I said. "Did you use live water?" My reply: what? "How much live rock do you have?" None. "What are your water parameters?" Again, what? Who tests their water and for what? Although I found our chat to be most informative, Matt flat out refused to sell me anything. He said I was not ready. It became apparent that I needed to do more reading up on this hobby. Maybe there was a little more to it than I had expected. Matt let me borrow two books and gave me the web address of the local reef community, Wasatch Marine something or other. He strongly suggested I learn a bit more about reef keeping before buying any fish or animals.

Ok, so I will start the cycle by buying live rock. What the Are these people crazy? Have you seen the price of this stuff? Its rock people! After buying live rock for what I thought and still do think was absolutely nothing shy of robbery. I put it in and let the tank cycle. A month later, I went back to visit Matt and saw the coolest thing ever. After reading the books I still had no idea what it was. It had long sweeping neon orange tentacles with shorter neon yellow tentacles in the middle. Matt said it was a tube anemone. He said they can be aggressive but all in all hardy and pretty easy to keep. Well after having sticker shock on the rock, What does this little beauty cost a mere \$100.00 to \$200.00? When I heard this magnificent animal was only \$30.00, my exact words were: "Bag it up!"



When Matt touched it to place it in the bag, it disappeared into this big round hole that looked a lot like skin. When it was pulled from the sand bed I was disgusted and ready to change my mind. Where was my beautiful creature? This thing he was pulling out was a brown, slimy, mummy like shell that must have been a good 6 to 8 inches long. It had sheets of flesh that looked like torn fabric.

My first anemone, I was so excited! I got very clear instructions from Matt and did exactly as I was told. I placed it in the sand bed front and center in medium to high flow and almost cried when I didn't see it again for three days. When it finally did come out, yet again I was mesmerized by the beauty. The tentacles were orange but had neon streaks running through them. It swayed so gently in the current - you could sit and watch it for

hours. I placed a very small piece of a silver side next to it's tentacles and instantly it took it. It went straight to the mouth and was gone within seconds. What an amazing animal!

Over time I did get metal halides, better pumps, and of course lots and lots of live stock, but the tube anemone was by far my favorite. When I decided to buy a blue spotted jaw fish, I needed to close off the top of my tank. I had a friend who owns a glass shop so he set me up with a piece of Lexan. He said it would be strong enough to withstand the heat from the halides. I put the plastic on the top and that was that, my tank crashed. The heat from the halides had caused the plastic to release toxins. Within a half an hour my tank was cloudy, all fish and corals were dead.

I immediately ran to the bathroom and threw up. Then I did what we all do when a tank crashes - I cried. I did a water change and then another and another. I literally lost everything except my tube anemone. He was the only thing left in the tank alive. I eventually upgraded to a 120 and then a few years later a 210. My anemone took each move in stride.

The hobby started to get to me, or it might have been the acrylic tank. Either way, I decided it was time to take a break and sell my 210 and everything in it, including my prize tube anemone. I didn't leave the hobby behind completely, I had met a friend on the board, Tresa, and we kept in touch. One day while visiting her, she told me about a 72 gallon bow front and talked me into jumping back in with both feet, much to my husband's dismay. Here I go again!

Did you know ?

Tube anemones (Cerantharia sp.) aren't anemones at all. They are more closely related to the black corals (of jewelry fame). Although they superficially resemble anemones, the internal differences are so great that they are placed in a different subclass from true anemones.



After the tank cycled, I went on a mission to get my tube anemone back. I sent out a post to see who had purchased my anemone and what it would take to get him back. Yet again, luck was on my side. I was thrilled that the new owner had taken such good care of him. However, he was in no hurry to get rid of this wonderful creature. He liked the tube and was not sure he wanted to sell it back to me. We talked about cash but he really didn't want to sell. I had nothing to trade since I just started back up. Then it hit me, I have an R/O unit! Lucky for me I had something the new owner did not and my baby was coming back home.

I was like a kid at Christmas getting my first anemone back. I still find myself watching him for hours and yes he is still my favorite. How many people can say they have the very first anemone and that they have had it for 8 years?

If you have never owned one, I would strongly recommend it. Mine has never killed a coral, fish, or even a snail. Give them room and they mind their manners. Unlike bubble anemones that wander around, tubes stay where you place them. They are a beautiful addition to any reef tank.



Red Bug Eradication

By Dustin Ponds

I think that this bug is a little more common than most hobbyists would like to think. They are so tiny that it makes it hard to see them. I am going to start out with symptoms of these nasty little critters.

There are a few key signs that one might look for when trying to figure out what is going on with their acros. First what I noticed in mine is they didn't look as colorful. They looked browned out and they really didn't have a reason to be. The polyps weren't extended day or night. To me this was obvious that I had something going on. One last thing is you can see them crawling on your acros. They are tough to see but you can see them. In severe cases you can even lose your acros.

What do red bugs do?

What red bugs do plain and simple is: eat the flesh and the polyps of your acros. This is the reason for the loss of color and polyp extension.

How long do red bugs live?

The research that I did indicates that the red bugs' life span, from what we know, is between 5-7 days. They are prolific breeders and can multiply fast. As was stated before their only diet is acro flesh and polyps. With out acros in the tank they should die within this amount of days.

After it has been confirmed that the tank has red bugs there are a few steps that you are going to want to do before you treat the tank. First step should be to start catching all your crustaceans (shrimp, crabs, hermit crabs.) Not snails - they will not be affected. The medication that you are going to be using has a high death toll on crustaceans. The medication will likely wipe out your pods as well. So after the treatments you are going to want to find someone that has some chaetomorpha or something that has a ton of pods in to re-seed the tank.

The next thing you want to do is take the activated carbon out of the system as well as anything else that is used as a filter. You don't want the carbon absorbing the medication. Take the collection cup off of you skimmer and keep your skimmer running with out the cup. After you have done these things you are ready to treat you tank.





A typical red bug infestation on an Acropora. In the top-right corner is a close up of the red bugs with their distinctive red pigmentation. Photographed by JSteljes in June 2006 and released to the public domain.

the water change. Some of them are in the process of coloring up still, but everything has great polyp extension and improved growth and color since I did the treatment. After you have treated your system be careful what you add to your tank. If you get any across it would be wise to dip them in a solution of Interceptor. It would be tragic to have to do the whole process again - not to mention passing it around.

If you would like to do more research on this subject I pulled most of the info from these websites. I would like to thank everyone that helped me out with this task. Also a huge thanks goes out to the people that wrote the articles below.

<http://www.thereeftank.com/forums/showthread.php?t=95869>

<http://www.reefs.org/phpBB2/viewtopic.php?t=45859>

Treatment is very simple. Kind of scary, but if you ask any one that has done it they will tell you not to worry too much about it. The medication that you need to locate is called Interceptor. You are going to have to go to a veterinarian because it is a prescription drug used with dogs. I would recommend going to the vet in person with documents showing them what you need the medication for. You will need the tablets that are for large dogs 51-100 lbs. Tablets are 1 gram and they will treat roughly 380 gallons of water per pill. The treatment ratio is 0.025 grams per 10 gallons. In researching I found that some people go really heavy on treating their tanks with the medication with no ill results. I stuck to the .025 grams as close as I could guess. I used around ¼ pill to treat my 75 gallon display with the 30 gallon sump under it.

Tips:

I found it easier to crush the pill and mix in luke warm RO/DI water. After you have figured out how much you are going to need for your system you are ready to dose. Your tank should stay clear and there shouldn't be much more then a few corals sliming. I noticed that some slimed more than others.

Leave the medication in the system for around 6 hours and then do a 25% water change right after and replace the carbon and put the collection cup back on the skimmer.

You are going to want to repeat this treatment at least two more times. The bugs should be dead but there isn't a lot of info available on red bugs and just to be safe it needs to be treated a minimum of 3 times with 7 days in between each treatment.

After the first treatment I noticed that the corals extended their polyps right after I did

IMAS 6th Annual Reef Tour – What'd I Miss?

By Scott Morrell

This is one of my favorite times of the year. Spring is on the way and my mind starts to turn to the IMAS Reef Tour and kayaking. Since the majority of you could probably care less about kayaking, I would like to spend a few minutes telling you about this year's reef tour. The reef tour is always one of my favorite days of the year so March 29th was a special day! This year IMAS had a total of 19 aquariums in 14 different locations. The tanks ranged in size from a small 12 gallon nano-tank to a massive 400 gallon SPS tank.

Ryan Bariso, at 7years old, was the youngest hobbyist displaying his 90 gallon reef. This reef has been setup for a little over a year old. Ryan and his parents have worked hard on this DIY reef. They made the gorgeous Travertine accented stand and canopy, the auto top off with anti-TDS device for makeup water, a dual stage calcium reactor and lime water reactor to maintain calcium and alkalinity, The Bariso's have also collected south pacific "dry rock" and seeded it with 20 pounds of wild live rock and sand. The livestock includes: A Blue Tang, 2 Ocellaris Clowns, Six Line Wrasse, Hawaiian Yellow Tang, Pajama Cardinals, Strawberry Scooter Blenny, Green Chromis, Peppermint Shrimp, Crocea Clams, Conch snails, and a couple of small acropora coral.

The oldest tank, owned by Joe Daglen, is a 70 gallon plenum filtered system that has run continuously since 1991 (17 years). It has metal halide and fluorescent lighting with a protein skimmer and a phosphate reactor. The tank holds both soft and hard corals. I like to use this tank as proof the there is long term success with plenum systems.

Dave Jones had one of the most colorful tanks on the tour. This 56 gallon bow front SPS dominated tank is loaded with over 40 different varieties of vividly colored SPS. I have never seen a tank with more polyp extension on SPS corals. I spent a few minutes with Dave talking about his setup. The tank uses dual 250 watt Meta-Halide using Radium 20,000K lamps which are supplemented with 190 watts of VHO actinics. Dave attributes some of the success with alternating between using RO and tap water for makeup and water changes. Dave also adds a pinch of sugar to the tanks food. This helps boost the bacteria growth which in turn helps reduce the levels of nitrates and phosphates.

Sitting to the right of his display is Dave's grow out tank. This tank is usually full of SPS frags that are being grown out to sell and trade. Dave collects coral from all over the United States.

Zech Wendt's 270 gallon reef was one of the largest and most complicated reefs on the tour. The tank dimensions are 72" x 36" x 24". The cabinetry is solid oak and it covers from floor to ceiling and to the wall behind the tank. The outside of the cabinetry has been sealed with zero VOC stain and finish. The inside was sealed with a potable epoxy.

The two feet of space behind the tank is the home to the most complicated closed loop system I have ever seen. There are 5 Hayward valves controlling the flow from a Sequence Manta Ray



Ryan Bariso's 90 gallon reef



Dave Jones' reef



Zech Wendt's tank

What attracts your attention, is that it pulses 100% of the time. Soon after the system was set up Monica found some volunteer macro algae which came in on some of the live rock. She allows the algae to grow similar to what one sees with a refugium. If you look on the glass behind the algae you will see hundreds of baby turbo snails. She feeds this tank fairly heavily to just to provide food the baby snails.

If you ever get a chance to be on or go on a reef tour, please don't hesitate. It is a very rewarding experience

pressure rated pump. Eventually when the construction is done, the output of the closed loops will be penductors which will increase the flow even more.

When complete, the total current tank volume turnover will be more than 100%. With all the hardware and the cabinetry this system has, keeping the system's temperature down is quite a problem. Zech has a ½ horse power chiller installed in the attic. There is a cooling loop that pumps water from the tank to the attic where it is chilled before running back to the tank. This allows him to maintain the temperature he likes without overheating his house.

In my opinion, the simplest tank on the tour belongs to my lovely and gracious wife Monica. This tank has a 2" shallow sand bed, live rock, a hang on tank protein skimmer and a single power head. This tank is loaded with soft and large polyp stony corals. The most prominent coral are the pulsing pink xenia. This xenia is unlike any other I have ever seen. It grows in small heads that never get larger than my thumb. It spreads very quickly and is easy to remove and propagate. The part that



Zech Wendt's closed loop

Word Jumble Answers:

crocea	acropora
sinularia	zooxanthalae
sclerites	coralline
aquarium	xenia
skimmer	propagation



Monica Morell's pulsing xenia