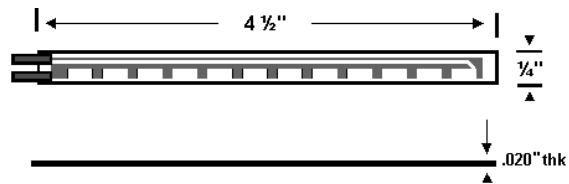


Concept to Implementation

Cases studies

Back Posture Sensing

Back Sensor -Initial Concept

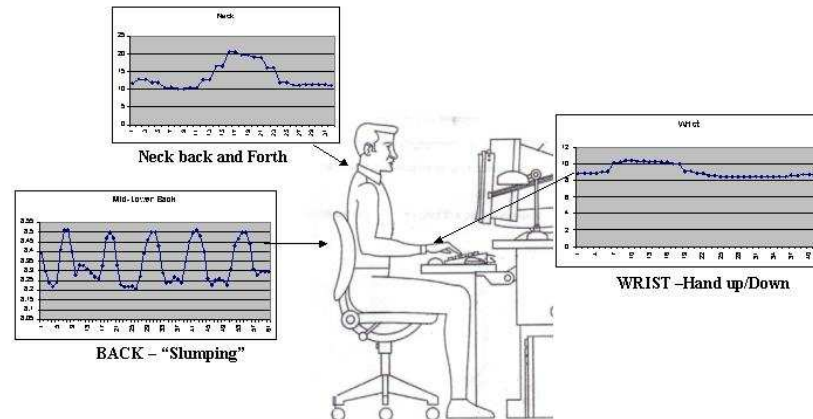
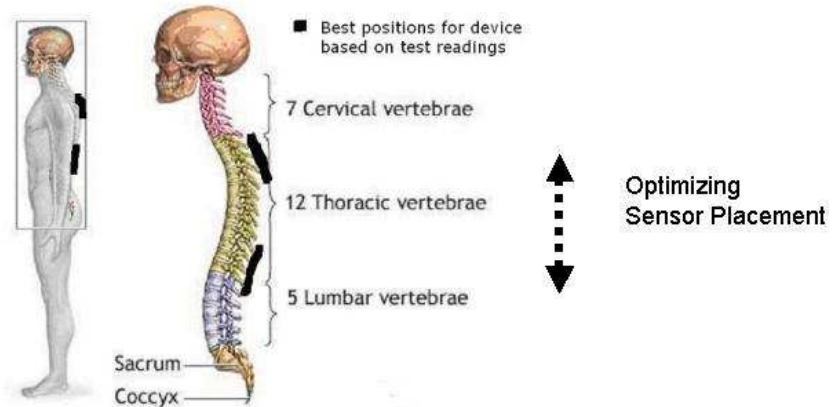


Nominal Resistance at 0 degrees 10,000 ohms

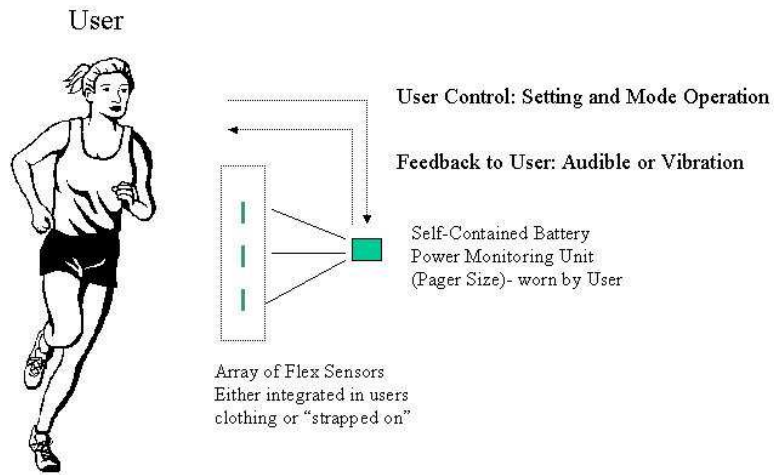
Physical Dimensions:
 Length 4.5"
 Width .25"
 Thick .020"

Approximate force
 needed to deflect end
 90 degrees:
 5 grams

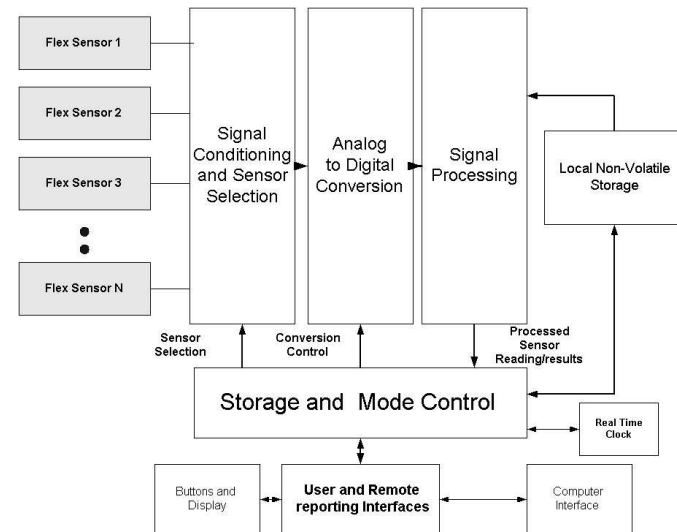
Approximate Resistance at 90 degrees 35,000 ohms



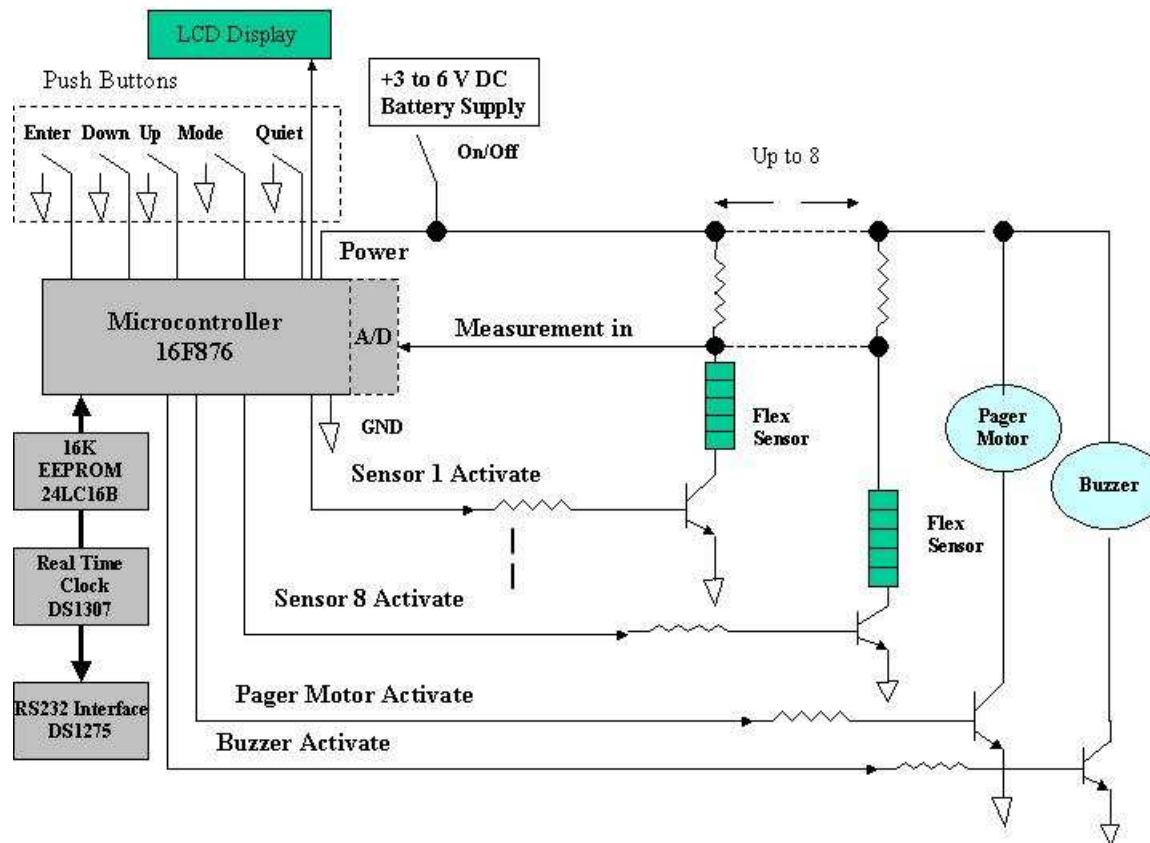
Block Diagram



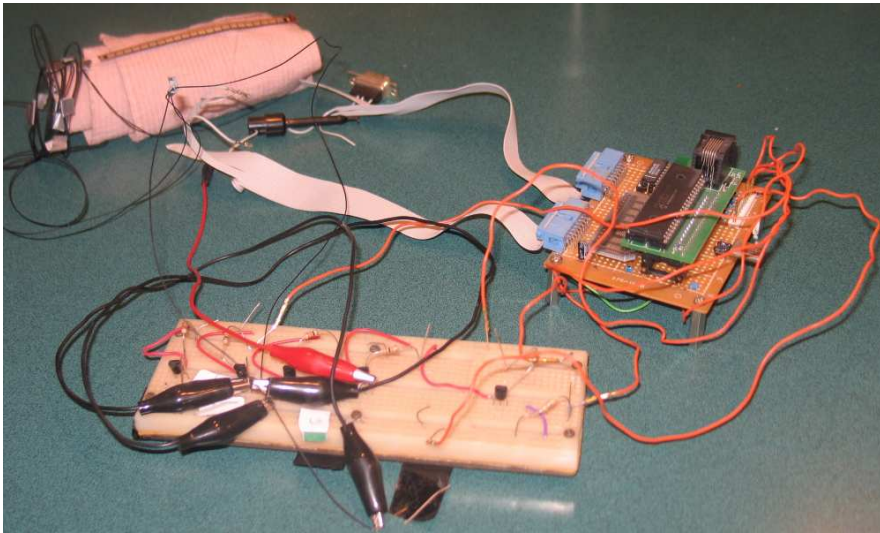
Posture Monitoring System Concept



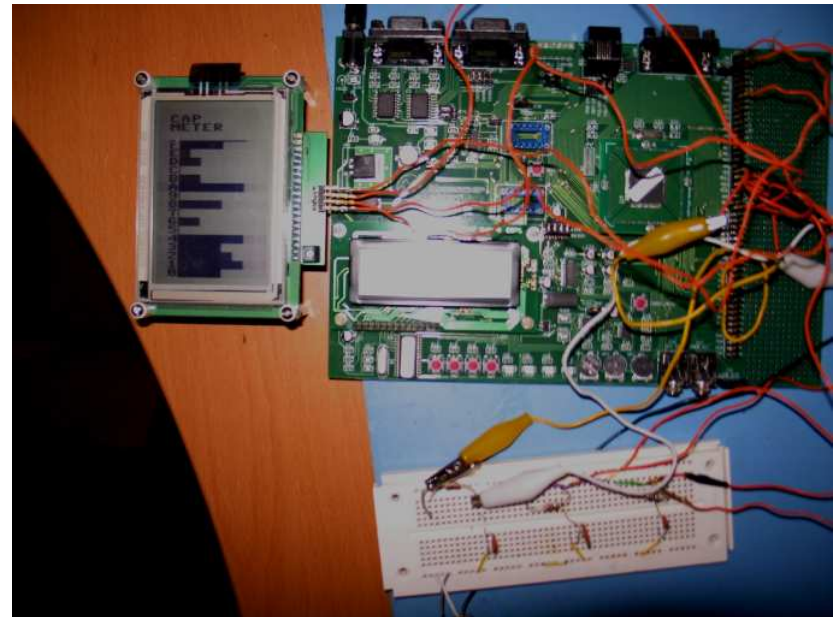
Implementation Concept



Back Sensor Sensor and Processor Enhancement



Flex Sensor Only
PIC16F877 (8 Bit)



Flex Sensor and Cap Array
DSPIC (16 bit)

Earthbox Watering System

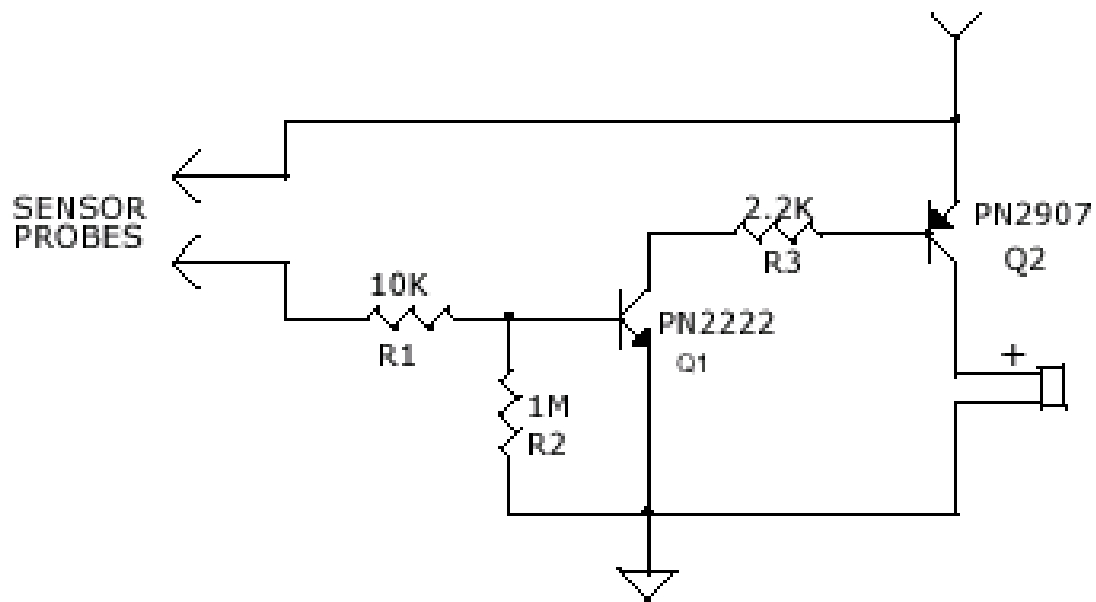
Earth Box System



Seepage Port

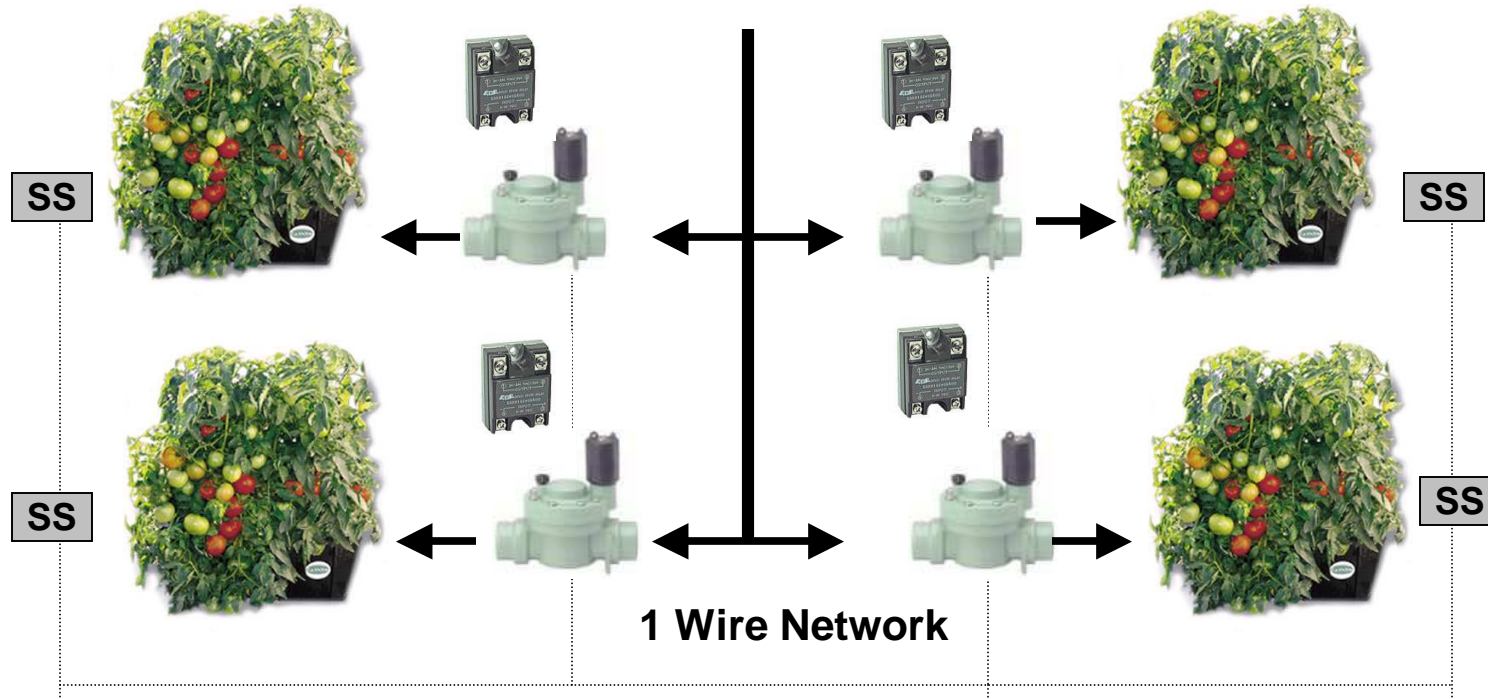
- **Patented Mulch Cover** Stops weeds and conserves water. No need for herbicides. Protects from storms and drought. *You never have to weed.*
- **Potting Mix** eliminates rocky or poor soil conditions and disease. Transfers the ideal moisture to your plants from the bottom up. *You never have to dig.*
- **Fertilizer Band.** Provides your plants exactly what they want, when they need it. Add fertilizer just one time, there's no schedules and no guessing.
- **Aeration Screen.** Provides proper oxygen to the roots. Prevents root rot and mold found in other containers.
- **Water Reservoir.** It's self watering so go away for the weekend! The EarthBox automatically waters your plants for you. It's impossible to over water.
- **UV Protection.** Resists even desert sun for years and years. Portable, reusable, recycled. Good for our environment.

Seepage Sensor



CURRENT CONDUCTION THROUGH WATER TRIGGERS ALARM BEEPER.

Automatic Watering System



Solenoid Control
Water Valve



Seepage Sensor



Solid State Relay

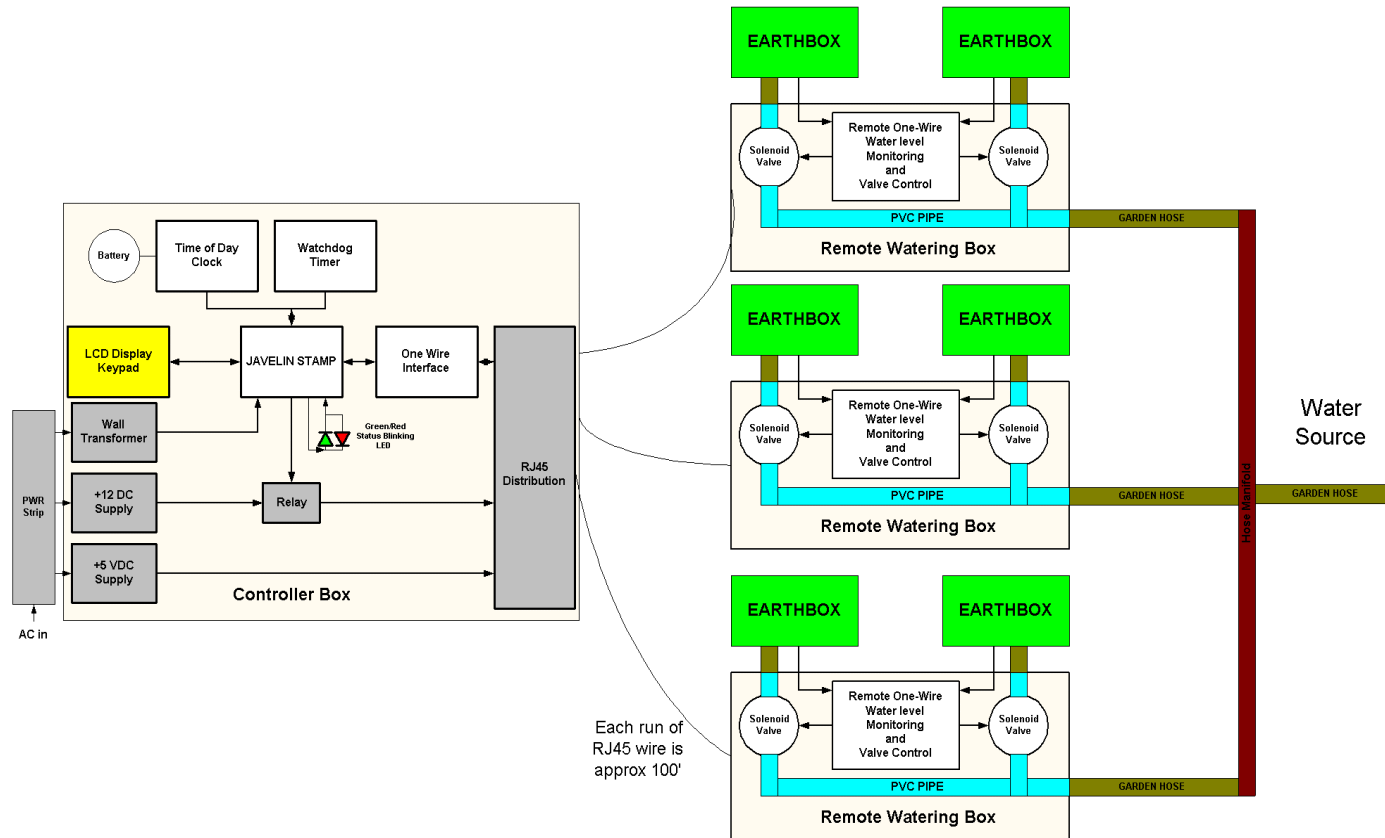


Clock



Mode/Control Settings

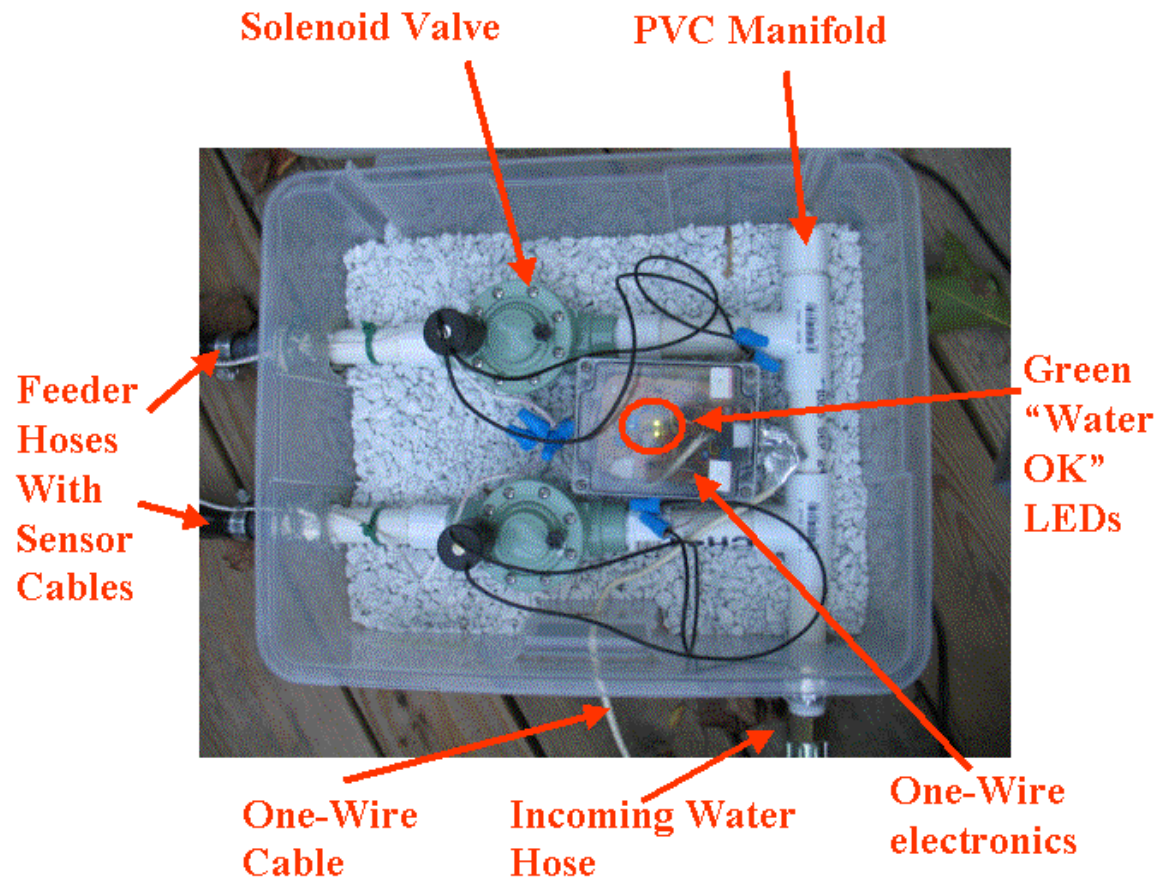
Refined Block Diagram



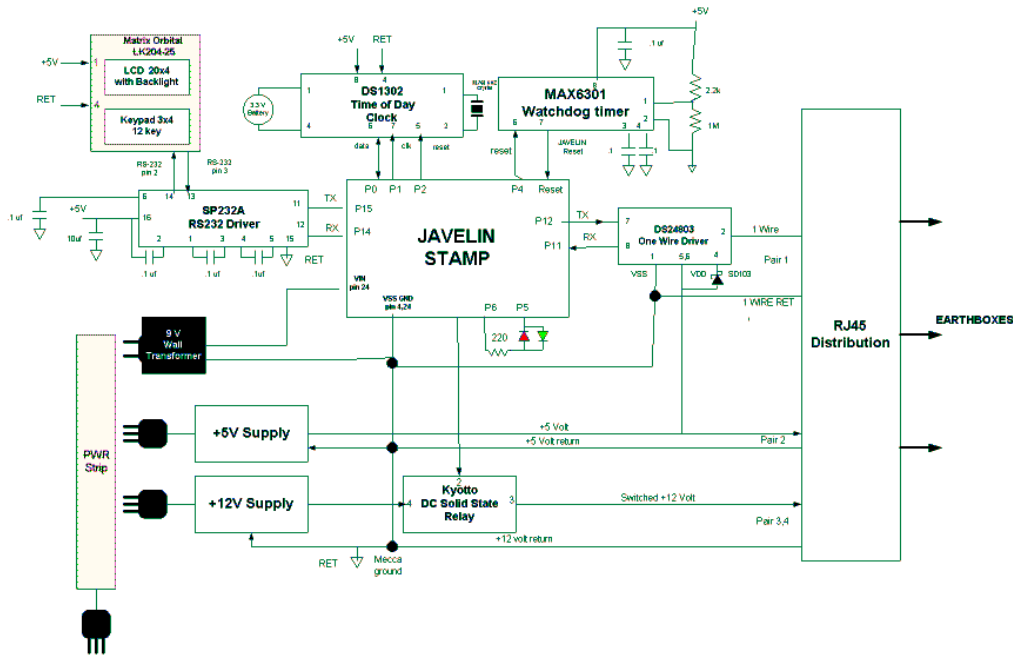
Implementation



Remote Box Implementation

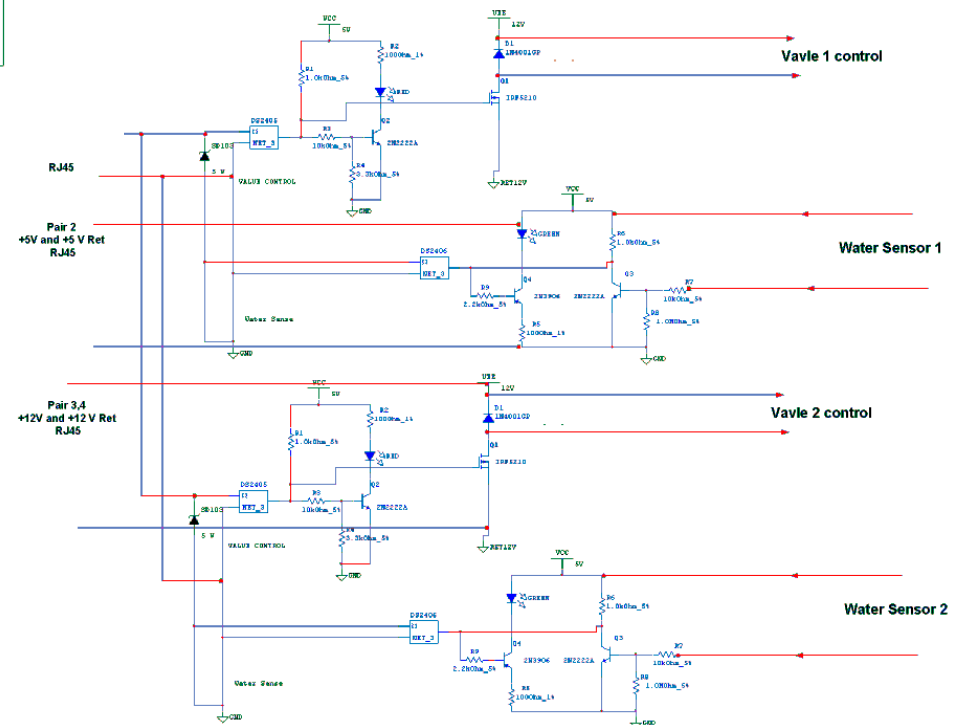


Hardware Electronics

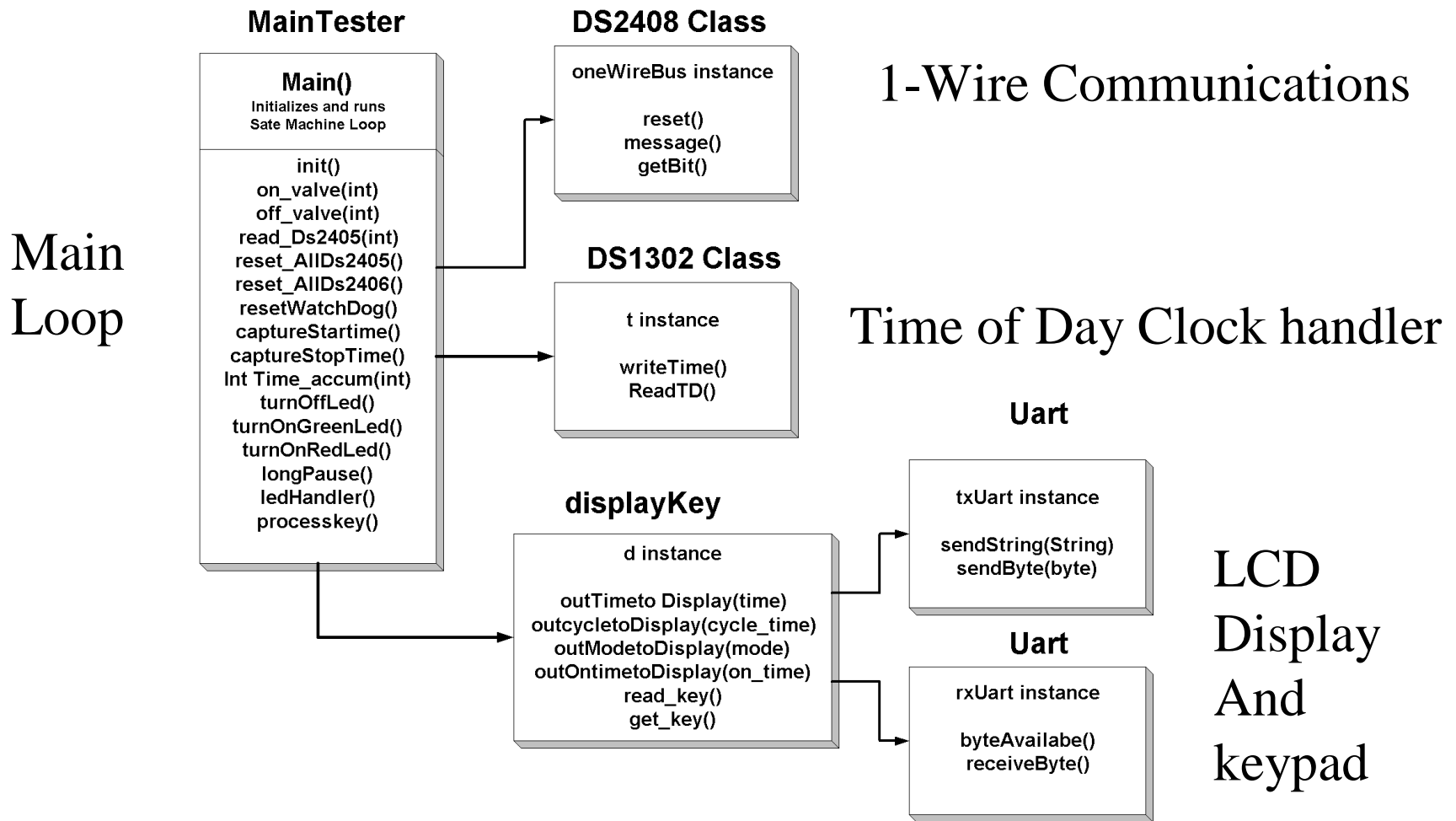


Microcontroller

1-wire sensors



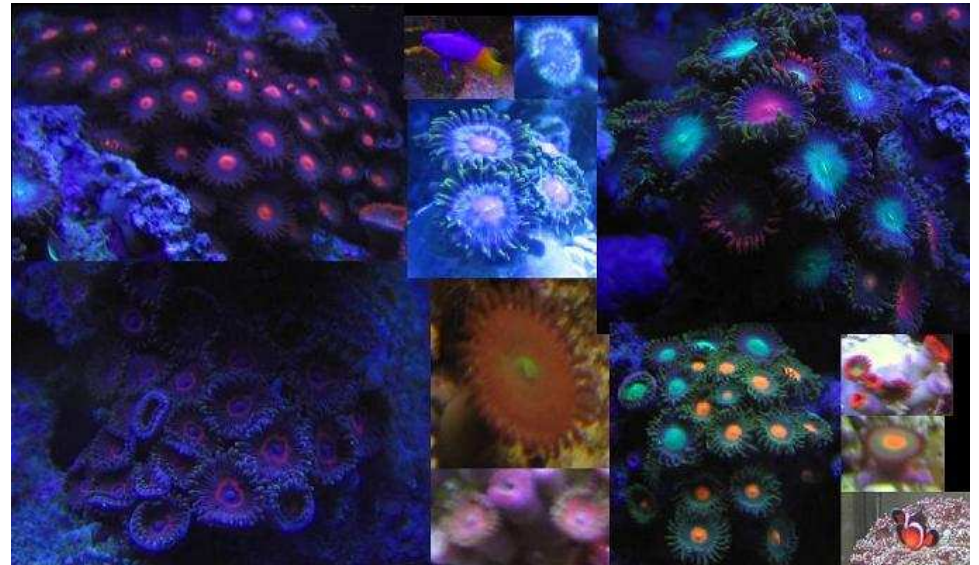
Firmware



MOON LIGHT

Aquarium Digital Lighting

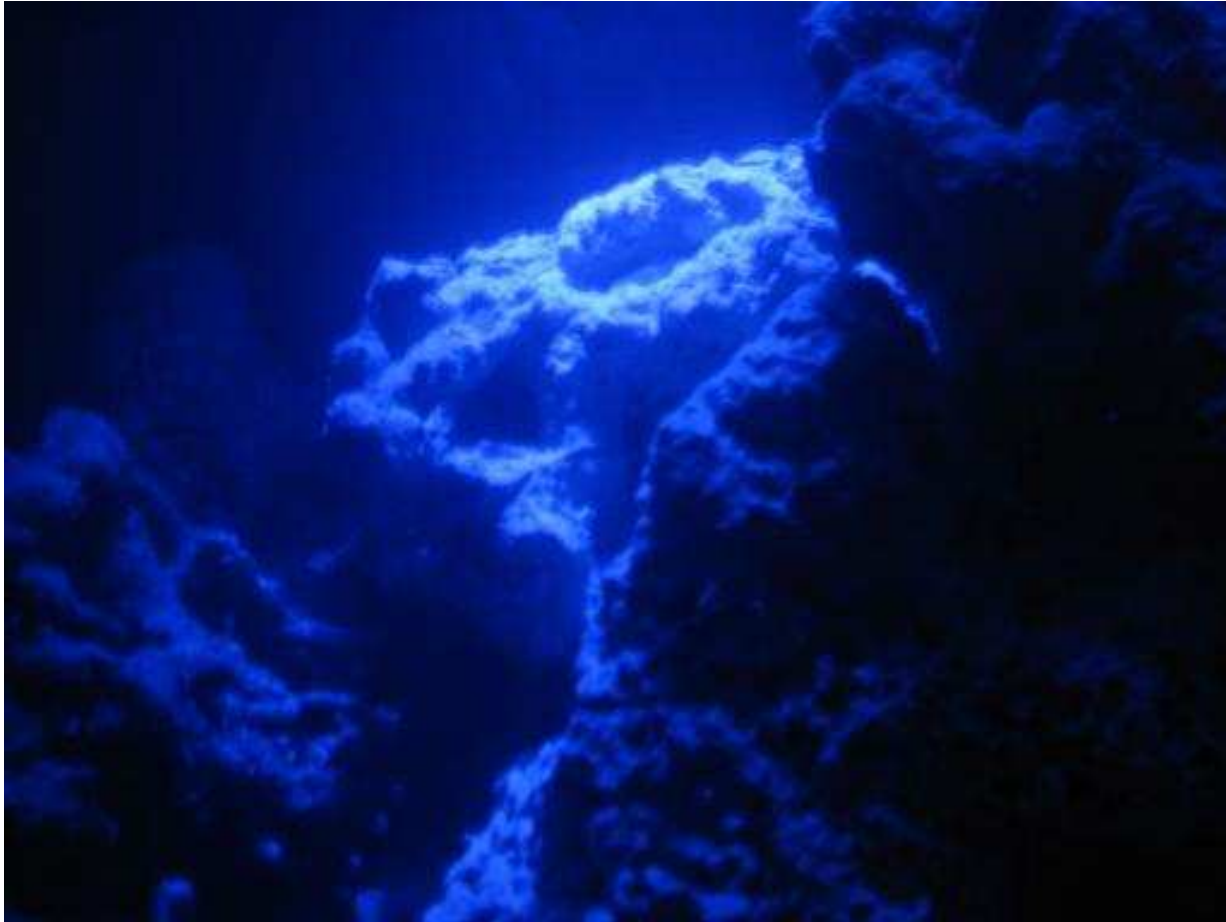
Aquarium Zoology



Normal Aquarium



Moon Light Aquarium



Benefits:

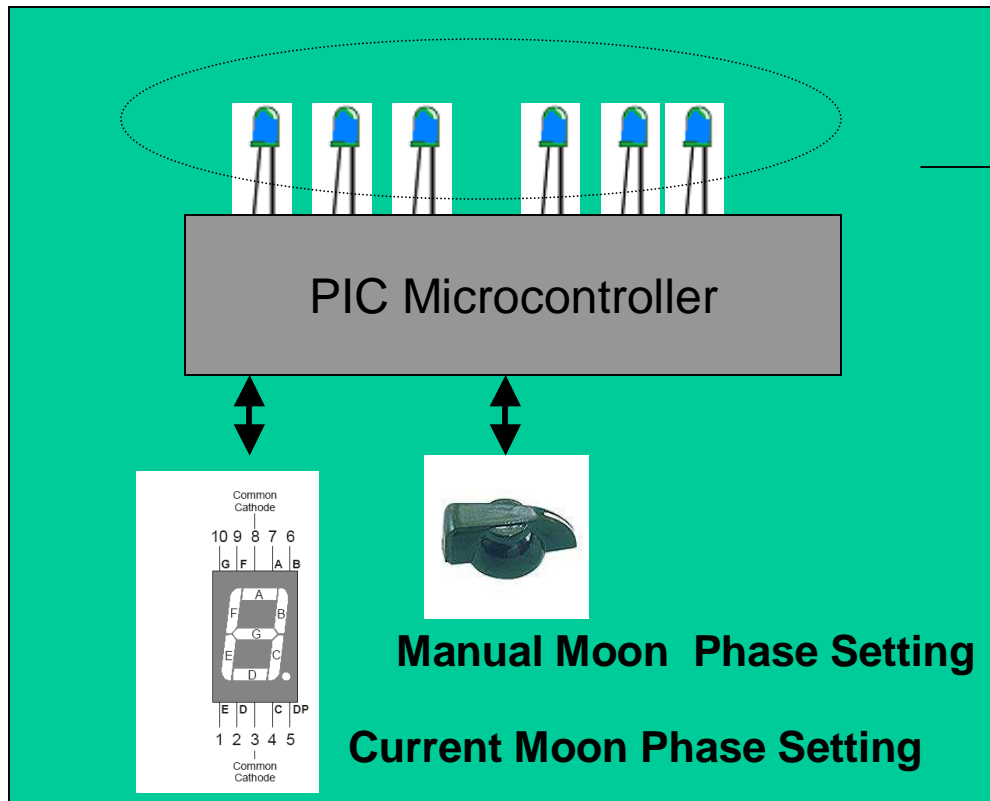
The benefits of Moonlight technology is many:

- Reduction to both fish and invertebrate stress because the user's aquarium environment approaches that of a natural reef
- Improvement of aquarium coral health. Coral are naturally stimulated by moonlights. Some species of coral actually spawn in conjunction with the Lunar Cycle
- User Enjoyable viewing of your aquarium while main lights are not on to more relaxing light environment

Moon Light Simulation for Salt Water Aquariums

MOON PHASES

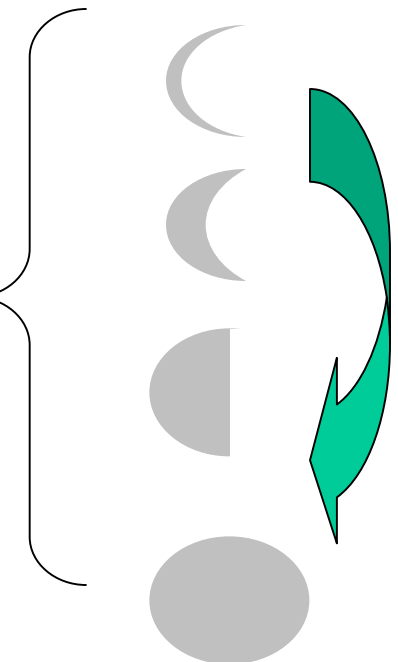
Six Blue LEDs –same Wavelength as Moonlight



LED Lamp Assembly



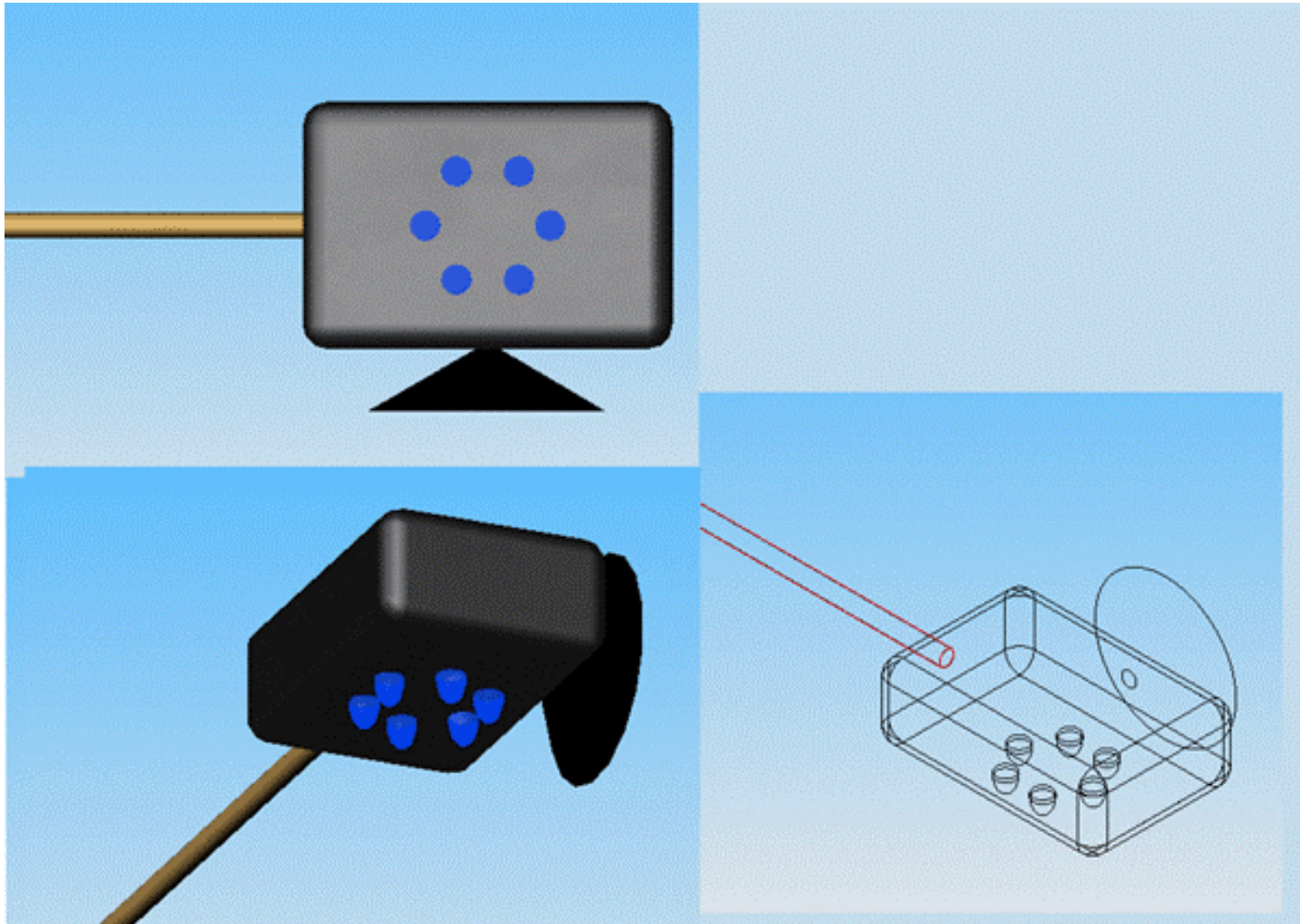
Wall Transformer



Product Concept

1. Moonlight incorporates an advanced electronic design that offers the user power efficiency, accurate moon light spectral wavelength control and calibrated illumination to fully realize a simulated Lunar Cycle solution
2. Intensity control knob allows users to manually set the proper Moon Cycle phase luminosity as needed
3. Moonlight provides continual feedback to user on the current Moon Cycle phase
4. The low power system consists of a main controller unit and attached pod. The pod houses six 470nm Blue Light LEDs (approx wavelength of Moonlight). LEDs by design should provide tens of thousands of hours of usage.
5. Pod is Velcro or suction cup attachable to allow the user placement of light source to suit individual lighting ascetics over a wide variety of aquarium sizes without need for special attachment or custom drilling.
6. All pods use Silicone sealant to protect electronic from salt environment. The main controller uses a UL certified detachable power supply to meet UL appliance safety precautions.
7. Materials under \$40
8. Moon Light can be continuously operations and work in conjunction with normal lights at all times

Moon Light Fixture



Moon Phases

Phase	Description
New Moon	The Moon's un-illuminated side is facing earth. The moon is not visible
Waxing Crescent	The Moon appears to be partly but less than one-half illuminated by direct sunlight.
First Quarter	One-half of the moon appears to be illuminated
Waxing Gibbous	illuminated more than one half
Full Moon	The moons appears to be illuminated completely
Waning Gibbous	more than one-half illuminated
Last Quarter	One half of the moon appears to be illuminated
Waning Crescent	Less than one half appears to be illuminated

Moon Simulation Scheme

Display	Phase	Percent Light –# of 6 LEDs on
0	New Moon	0% none (0/6)
1	Waxing Crescent	40% (2/6)
2	First Quarter	50% (3/6)
3	Waxing Gibbous	60% (4/6)
4	Full Moon	100% (6/6)
5	Waning Gibbous	60%(4/6)
6	Last Quarter	50%(3/6)
7	Waning Crescent	40%(2/6)

29.5 day cycle
8 phases to cycle
Assume
3.625 days/phase

Moon Light Controller

