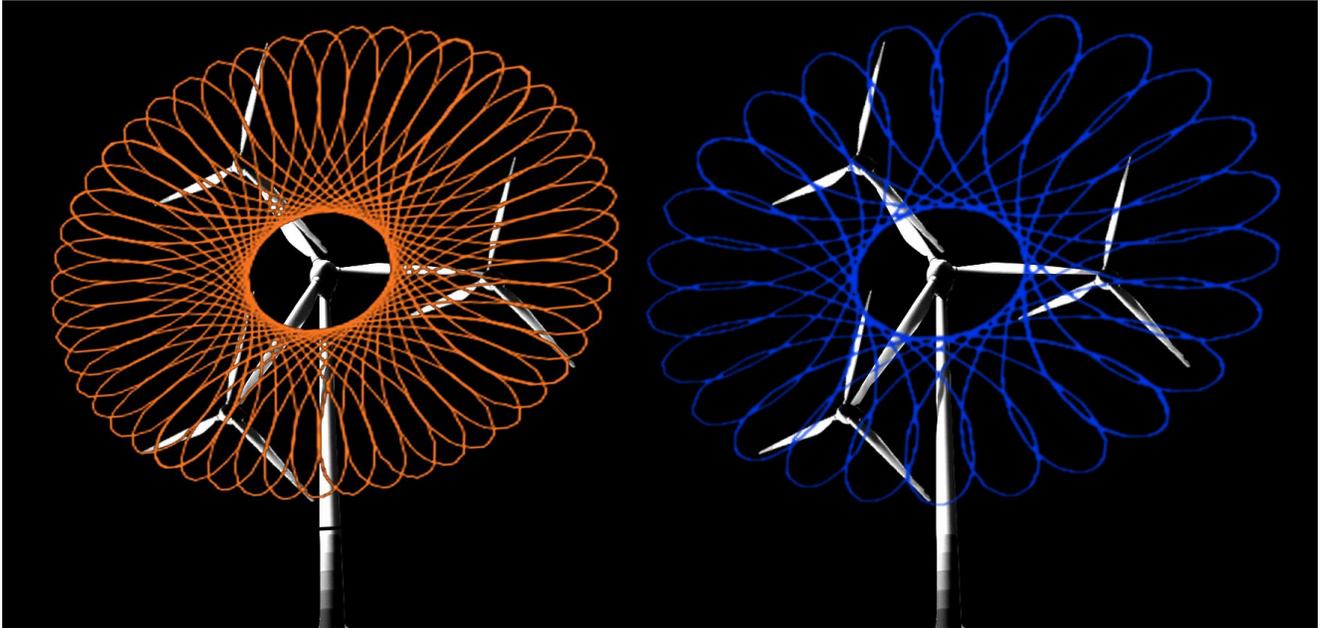


# SPIROW

Dan Anderson  
c/o 3137 W 42<sup>nd</sup> Ave  
Vancouver, BC, V6N 3H1  
604.221.1460  
[dan.j.anderson@gmail.com](mailto:dan.j.anderson@gmail.com)

# SPIROW: THE BODY



Physically, the Spirow will be something quite large – but hardly imposing, though impressive. The centre of the center prop will be 22ft in the air, its 6ft-radius props with 3ft-radius subprops will graze barely below 13ft, safely above the heads of passing cyclists, and it will cut at the sky 31ft up at its peak.

The “rowboat” at the bottom will be 6ft across, 6ft long, and approx. 2ft deep, carefully made out of scrap. The draw length for the rower(s) will be approx. 5ft, including a sliding seat for easier power generation.

Materially, the windmill portion will be made out of steel road bike frames, preferably salvaged. Three welded in a bundle will form the main pole, supported by a tripod of three other sets of bundles of three at its base. Each of the 'blades' will be bike frame, but not bundled, and sanded a textured but scintillating silver.

Each prop, large and small, will have LEDs in bundles coming out of holes at four equidistant points, with a bundle at each axle as well. These will be run by wire to electronics (detailed momentarily).

Chains will run between the rowboat and a hub at the bottom of the windmill, which will turn a chain leading to the centre prop, at which junction there will be yet another set of three gears, one leading to each of the outside props. Thus the outer triplets will be fixed gear, geared such that a given point on a blade of one will have a corresponding point on one blade of each other outer prop that traces the same path (though 120 degrees later), so that there will be three bundles of LEDs tracing the same path, so that only three rotations per second of the large wheel should inscribe a convincing spiralling path, giving a spirograph-like effect.

Electronically, an electric bicycle motor, driven in reverse to output electrical power, will be attached to a rowing machine's pull cable. The rowing machine will have seating for two, so that one person can row moderately to vigorously to give roughly 125 watts, or two people can row quite easily to give the same power. This power will be partly used by the LEDs: fifteen bundles

can be lit for 60W with *each* bundle lit as brightly as 24 lightbulbs (or 240, if ultrabright LEDs are used!) for a total of 360 lightbulbs' worth of brightness, though a battery will constantly be being charged and siphoned off to account for rowing fluctuations. The remaining power will, of course, drive the wild spinning of the Spirow itself.

In line will be a small controller panel, accessible only to those in the rowboat. Pressing buttons will alternate between patterns of LED bundles, giving different shapes and colours to the glowing pinwheel. The controller will have minimal electronics so as to be, well, cheap. Since very short range, very low power radio transmitters (like those used by remote control toys) are quite cheap, one of these at the centre axle will transmit to receivers in each outer prop, where the signal will be decoded and converted using a brushed power connection to the appropriate lit LEDs – far cheaper than having one brushed 'channel' per bundle. All wiring will run through the inside of the frame tubing whenever possible.

Easy as it would seem to be to blow over, rebar will secure it solidly (and of course these earth-art junctures will be well marked to avoid sullyng the playa with red liquid).

If preliminary tests show that there is ample power, a small sound system (translation: a beat-up boombox) may also be powered for melodies for the masses and a rhythm for the rowers.

A simple, elegant design, no?

# SPIROW: THE MIND

Humanity is travelling a frightful path. We reap more than we sow, we burn more than we craft, we open packages more than we gather in community. Still, we are not forced into this. We can strive to live sustainably, peacefully with each other, and this need not be a hardship. In fact, we *must* find joy and beauty in living without destroying (environmentally or no) or all hope is lost.

Spirow is the physical embodiment of this very need.

Environmentally, it is kind; trash bike frames saved from rusting into oily junkyard earth, energy-efficient and long-lived LEDs, and powered by that most accessible of machines, a human body, it is as kind to the environment as the rower has chosen by their diet.

Aesthetically, it will have a simple beauty; at night it will light gorgeous glowing arcs inscribed in elegant patterns, changing sporadically as the rowers see fit. Spirographs are a household name because of the intriguing depth and character that result from some of the simplest geometric interplay. George Hart (<http://www.georgehart.com/sculpture/sculpture.html>) would be no small influence.

It will build community, though briefly, by forcing an artist/viewer dichotomy upon passersby, if they find it interesting enough to warrant their time and perhaps their energy. Rowers will not be able to see the results of their mad mid-stroke buttonmashing, as they will be beneath it; they will need to gauge the reactions of those watching it, and thus they will be creators of art that the artists can only see reflected in faces. A lively audience will presumably encourage rowers: it will create a positive feedback loop of creation of beauty and of providing entertainment fed by reactions and praise or encouragement or hounding, in turn feeding back again to the rowers, at each step gaining more even more momentum from the innate desire of most people to make those around them happy, especially if those same people are doing the same in return. In physics, a system with ever-increasing energy becomes, as time increases, infinitely hot. In human relationships, it can at least sometimes lead to warm friendships.

Ok, so that last metaphor was a stretch.

In short, the Spirow is the embodiment of how humankind must learn to act: with respect for nature, with encouragement and respect for other humans, and with some degree of childlike hope, vigour and strain for change, and joy.

# SPIROW: THE BACK POCKET

Sadly, some supplies won't be salvageable.

Part	Cost (USD)
Bike frames	Salvaged
Gears, chains, and hubs	Mostly salvaged, but \$40 for a box of used chain and one or two bought-used gears
Rowboat bits and pieces	Salvaged
Sliding rails (for seats)	\$20
LEDs	40 bundles, 15 LEDs in each = 600 @ \$0.50 per
Copper wire	\$20
Brushed power connectors	Four @ \$20 per
Electronics (from PICs to the actual flicked switches to very short range radio transmitters and receivers)	A few salvaged (esp. switches), plus \$150 of parts.
Bike motor engine	\$175
Welding equipment	Borrowed
Transportation to Burning Man	Improvised (strapped to the back of a circus?)

Total: **894.90 USD** (\$785 USD before taxes)

# **SPIROW: THE BODY BUILDERS**

Crewmembers are going to be contingents of people from all over. Specific crew:

Dan Anderson – Project lead, modeller (via OpenGL simulation), provider of the majority of the grunt work, materials scrounging, finger-crosser. Skills: model construction and software simulation, ability to find otherwise-junk bikes, welding, miscellaneous power tool conquering, leadership and organizational skills of some degree or other (hopefully). (2<sup>nd</sup> year burner, Mondocrew)

Charlie Brinson – Sparker of ideas. Skills: sparking. (4<sup>th</sup> year burner, Mondocrew, mad plotter)

Leon Cox – Hired (for beer) hand. Skills: everything construction related, and hopefully some confirmation and feedback into designs. (Virgin burner)

To be filled – More hired hands, as many hands make light of adages.

To be filled – Electrician extraordinaire, confirmer of circuit plans most fearsome.

To be filled – Onsite setup and takedown crew (hopefully Mondocrew, burners most lively).

## SPIROW: RAGING FLURRY

Milestone	Date
Design fleshed out	February 10, 2007
Proposal submitted	February 15, 2007
Software model completed, designs evaluated	February 30, 2007
Toy model completed	March 15, 2007
Full-scale construction begins	March 16, 2007
Unattached centre prop built, mounted on an axle, drilled, tested with battery-powered LEDs	April 8, 2007
Electronics construction begins (purchase of most electronics must happen now to get bulk rates, and the hub motor will be needed for testing)	April 10, 2007
Single outer prop built, mounted on an axle, tested using battery-powered LEDs	April 17, 2007
Electronics for centre prop completed, tested	April 30, 2007
First outer prop attached to centre prop, first electronics tests begin	May 6, 2007
All outer props built, attached. Gears, chains mostly connected.	May 25, 2007
Electronics and wiring testing and debugging finished.	June 25, 2007
Main post built, connected to main axle.	July 5, 2007
Rowboat constructed, power system and protected chain drives connected and built	July 14, 2007
System tests begin	July 15, 2007
Dan cries and gets back to welding	July 15, 2007
Bugs gone; it spins, it's beautiful. Then it's disassembled so it can be moved. Aww.	July 27, 2007
Get to the playa	August 27, 2007 (eeeeeeaaarly morning)
Spirow erected onsite, tested	August 27, 2007 (sundown)
Breath caught after all of that	August 27, 2007 (just after sundown, passed out in our tents)
Dismantling!	September 3

# **SPIROW: LEAVE ONLY TRACERS**

Spirow will leave only memories, photographs, and tracers. Rebar will be excruciatingly carefully removed. No on-site construction will occur, so there will be no shavings. Spirow will be packed up and taken away, and neither scorch marks nor debris will be left behind. A ground sweep will be conducted to ensure that the incredibly unlikely occurrence of an LED blowing off hasn't chanced, and that no-one has broken rowboat parts off and left them on the playa.

# SPIROW: THIS TITLING SCHEME IS GETTING OLD

If you, gentle reader, happen to be a funding evaluator, and you'd like to see a simulation before allocating precious art funding to Spirow, well, that just plain makes sense. Just ask – Dan won't be reachable between the 17<sup>th</sup> and the 24<sup>th</sup> of February, but building the simulation to try a few patterns out is a very high priority when he returns, and a working simulation will shortly thereafter be in a forwardable state.

## Resources used:

<http://www.mondospider.com/>

The amazing Mondo Crew

<http://www.allelectronics.com/cgi-bin/category/340500/Ultrabright.html>

LED cost reference

<http://www.kpsec.freeuk.com/components/led.htm>

LED power ranges (under "Reading a table of technical data for LEDs")

<http://www.calorie-count.com/calories/activities/2.html>

Rowing power output estimates

<http://www.ebikes.ca/store/>

Hub motor cost and usage reference

[http://content.answers.com/main/content/wp/en/thumb/a/a4/250px-Various\\_Spirograph\\_Designs.jpg](http://content.answers.com/main/content/wp/en/thumb/a/a4/250px-Various_Spirograph_Designs.jpg) and  
[http://www.eddaardvark.co.uk/python\\_patterns/images/spirograph00009.gif](http://www.eddaardvark.co.uk/python_patterns/images/spirograph00009.gif)

Spirographs!