The Hydraulophone: World’s First Musical Instrument Making Sound Out of Water

Hydraulophone & Violin Performance
Ryan Janzen, Hydraulophone; Colin Maier, Violin
The Hydraulophone: 
A musical and scientific breakthrough

The hydraulophone is an incredibly fun and musically expressive instrument for both experienced musicians and those with no musical training.

The notes are laid out like a piano. When the holes are pressed, the water flowing out is redirected into a sounding mechanism. The result is a huge innovation in music making.
Business Overview: Large, Untapped Market with 18-year Exclusive Monopoly Rights

- World’s largest waterpark designer & manufacturer waiting to buy
- Proven success in waterparks, splash pads, beach areas, civic centres, museums, and attractions internationally
- Numerous Hydraulophone art installations around the globe
- Strong patent portfolio already successful in defending against infringers
- Countless applications in rehabilitation, spa facilities, cancer treatment, and in retirement homes

World’s largest Hydraulophone as the main centrepiece outside the Ontario Science Centre
**Proven Traction:** Numerous installations around the world prove a substantial market for this product

Steve Mann and his student, Chris Aimone have built a number of hydraulophones (including several “Nessies”) by hand. The success of these sales have spawned an entire backlog of orders from around the world!

(Top – left to right:) Legoland California; Canadian National Institute for the Blind. (Bottom – left to right:) African Lion Safari; Experimentarium in Copenhagen. (Not shown:) Chicago Children’s Museum.
WhiteWater West Industries, Ltd., the world's largest designer and manufacturer of waterpark attractions has purchased several hydraulophone “innards” for their AquaTune™ product.

The company wants to install them in most of the waterparks, splash pads, and aquatic areas around the world. We have been unable to meet their demand.

- Founded: 1980
- Annual Revenue: over USD $100 million
- Revenue per sale of innards: $10,000
- 4000+ projects worldwide
- 450+ employees globally
- 19/20 of the world’s top waterparks

“A park might spend **$500,000 to $1 million** on a typical attraction, and needs up to 20 of them, curated so that there’s something for everyone in the family.”

- Rick Briggs, Design Director, Whitewater West
**Market Profile: Waterparks as a low-risk, high-reward point of entry**

There are an estimated **over 1,338 waterparks in the world**, with the vast majority in US.

### Countries with Most Waterparks (2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>858</td>
</tr>
<tr>
<td>Canada</td>
<td>68</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>26</td>
</tr>
<tr>
<td>Australia</td>
<td>24</td>
</tr>
<tr>
<td>Mexico</td>
<td>21</td>
</tr>
<tr>
<td>India</td>
<td>18</td>
</tr>
<tr>
<td>Spain</td>
<td>17</td>
</tr>
</tbody>
</table>

**Source (Int'l):** [World Waterpark Association (WWA)](https://www.worldwaterparkassociation.org)

**Source (US Waterparks):** [2015 Waterpark Industry Update, Hotel & Leisure Advisors](https://www.hotelandleisure.com/articles/2015-waterpark-industry-update)

“As the amount of indoor waterpark square footage and number of outdoor waterparks increase in 2014 and 2015, many new parks are looking to the latest trend in recreational water entertainment to set them apart.”

- 2015 Waterpark Industry Update, Hotel & Leisure Advisors
Market Profile: Waterparks as a low-risk, high-reward point of entry

At the current confirmed price point of $10,000 per sale, the total market opportunity is **at least $13.4 million** on only the first flagship innards product in the waterpark market alone.

This estimate does not take into account multiple/repeat sales, manufacturing and selling the entire hydraulophone, other musical products/services, and other target markets.

Total Revenue – Waterparks Only ($ millions)

<table>
<thead>
<tr>
<th>Total Market Penetration</th>
<th>Average Revenue per Waterpark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$10,000</td>
</tr>
<tr>
<td>10%</td>
<td>1.3</td>
</tr>
<tr>
<td>20%</td>
<td>2.7</td>
</tr>
<tr>
<td>30%</td>
<td>4.0</td>
</tr>
<tr>
<td>40%</td>
<td>5.4</td>
</tr>
<tr>
<td>50%</td>
<td>6.7</td>
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<tr>
<td>60%</td>
<td>8.0</td>
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<tr>
<td>70%</td>
<td>9.4</td>
</tr>
<tr>
<td>80%</td>
<td>10.7</td>
</tr>
<tr>
<td>90%</td>
<td>12.0</td>
</tr>
<tr>
<td>100%</td>
<td>13.4</td>
</tr>
</tbody>
</table>
Selected Patents from Steve Mann’s IP Portfolio

A strong intellectual property arsenal allows us to corner the market, enjoy pricing power, and build a foundational business to develop and commercialize a wide array of innovative musical and Phenomenal Augmented Reality products.

<table>
<thead>
<tr>
<th>Country</th>
<th>Title</th>
<th>Pub. No.</th>
<th>Filing Date</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>Wet user interface or liquid user interface with one or more spray jets or bodies of water</td>
<td>CA 2499784 C</td>
<td>12/30/2004</td>
<td>12/30/2024</td>
</tr>
<tr>
<td>CA</td>
<td>Acoustic, hyperacoustic, and electrically amplified hydraulophones and multimedia interfaces</td>
<td>CA 2633679 A1</td>
<td>6/6/2008</td>
<td>6/6/2028</td>
</tr>
<tr>
<td>CA</td>
<td>Musical instrument based on water-hammer, hydraulophonic, or hydraulidiophonic percussion</td>
<td>CA 2722916 A1</td>
<td>11/26/2010</td>
<td>11/26/2030</td>
</tr>
<tr>
<td>CA</td>
<td>Fluid user interface such as immersive multimediator input/output device with one or more spray jets</td>
<td>CA 2517501 A1</td>
<td>9/9/2005</td>
<td>9/9/2025</td>
</tr>
<tr>
<td>US</td>
<td>Fluid user interface such as immersive multimediator or input/output device with one or more spray jets</td>
<td>US 7551161 B2</td>
<td>12/14/2005</td>
<td>12/14/2025</td>
</tr>
<tr>
<td>US</td>
<td>Fluid user interface such as immersive multimediator or input/output device with one or more spray jets</td>
<td>US 8294019 B2</td>
<td>5/20/2009</td>
<td>5/20/2029</td>
</tr>
<tr>
<td>US</td>
<td>Musical water instrument or water filled instrument having rigid pipes connected to elastic or rigid media</td>
<td>US 20140174277 A1</td>
<td>1/20/2012</td>
<td>1/20/2032</td>
</tr>
</tbody>
</table>
In 2011, Steve Mann successfully and quickly defended his monopoly rights against Waterplay Solutions Corp. (based in British Columbia) and Lincoln Equipment, Inc. (based in California) after discovering that they had developed and sold infringing products of an inferior quality. The defendants complied with a court order to cease the sale of said infringing products before the matter went to trial.

Stephen Mann v. Waterplay Solutions Corp et al (2011), filed in Western District of Texas

We will expect numerous competitors to rush the market upon patent expiry. That gives us approximately 20 years of monopoly power to saturate the various markets. High replacement costs for the customer for 2nd-tier copycat products will allow us to stay entrenched in the market. We will only lose a sale if we did not reach the client first.
Production Strategy: Low-cost mass production business unit will complement custom job-shop unit

FUNco

Mass Manufacture

- Commercial Waterparks
- Water & Music Therapy
- Consumer Retail & Music Education

Custom Job Shop

- Art Installations
- Music Organizations
- Custom Commercial Installations
- Custom Design Contracts

Municipal Parks & Recreation
Corporate Mission: Pioneer and Innovator in Musical Instruments, Phenomenal Augmented Reality, and Music Education

With proven success, the Hydraulophone is an ideal entry point into music and phenomenal Augmented Reality products. Steve Mann and his students have invented a host of instruments to revolutionize music performance, education, and our interaction with sound in the world around us.

(Top left to bottom) Xyolin – A single wooden plank turned into an elegant performance instrument.

Andantephone – A highly expressive musical instrument you play by simply walking on it.

Musicmaking on skates – Use your skates like a violin bow to make music, controlling your pitch with a hand-held keyer. [More Info]
Corporate Mission: Pioneer and Innovator in Musical Instruments, Phenomenal Augmented Reality, and Music Education

Steve Mann has invented a host of new musical instruments with various combinations of interface and sound-producing medium.

The hydraulophone is an example where the interface is the same as the sound-producing medium. The musician feels an intimacy with the instrument, much like a guitar or harp player does.

The Hot Tub Hydraulophone is one of many types of hydraulophones made to date.
The States of H₂Orchestra is an ensemble that has toured the world performing on instruments that exist in all four “Elements” of H₂O

Idratmosphone (Callioflute)
Gas H₂O

Pagophone
Solid H₂O

Plasmaphone
Plasma H₂O

Hydraulophone
Liquid H₂O

More Info on H2Orchestra:
http://wearcam.org/H2Orchestra.pdf
http://wearcam.org/h2orchestra.htm
Who We Are

Steve Mann
The Father of Wearable Computing

Inventor, HDR, Eyetap Digital Eye Glass, and the Smartwatch

Founder, MIT Media Lab Wearable Computing Group

Chief Scientist, Creative Destruction Lab

Chief Scientist, Meta

Inventor, InteraXon

stevemann.org
Ryan Janzen
Modern day Leonardo Da Vinci.

Prolific inventor, composer, hydraulist. Inventor of HDR audio, extramissive optics, and aircraft PLC.

ryanjanzenc.ca
Chris Aimone  Alpha polymath
CTO, InteraXon
Ken Yang
Business Spearhead
JD/MBA, Top Bay St. corporate law firm
Creative Destruction Lab Alumnus
Concert Pianist
More Resources on The Hydraulophone

Links
More Info on Hydraulophones [PDF]
States of H2Orchestra [PDF]
WhiteWater West Aquatune [Link]

Selected Articles


Steve Mann, Ryan Janzen and Mark Post. "Hydraulophone design considerations: Absement, displacement, and velocity-sensitive music keyboard in which each key is a water jet", Proceedings of the 2006 ACM International Conference on Multimedia (ACM MM), October 23-27, Santa Barbara, USA. [PDF]
