

RESEARCH

1) Diving Coaster: Vanish

Basic Stats:

Park it's located in: Yokohama Cosmoworld

Year Opened: Operating since 3/1999

Type: Steel - Sit Down

Manufacturer: Senyo Kogyo Co., Ltd

Height: 115 ft

Length: 2,441.5 ft

Inversions: 0

Duration: 1:58

Number of trains: 2 trains

Cars per train: 6 cards per train

Riders per car: Riders are arranged 2 across in 2 rows for a total of 24 riders per train.

Major elements of the ride or overall design: Underwater Tunnel

The track itself goes in an underwater tunnel which allows riders to essentially seem like they 'vanish'. In, addition, the restraint system used is a basic shoulder restraint system.

Good & Bad aspects of ride's design:

The good aspects for this ride is that it is incredibly unique in the fact that riders seems to 'vanish' and that adds an element of surprise. In addition, it is a one of a kind roller coaster which in itself also enhances the rider experience. The bad aspects of this ride design are that it is relatively simple and has no inversions. In addition, according to riders who have been on the ride before, riders are unable to choose their seat. In fact, it is assigned. However, no matter where you sit you get a similar experience with the back end of the coaster surprisingly having the more intense experience.

Aspects of ride I intend to use:

I intend to use the 'vanishing' concept so that guests on the roller coaster will be able to go into an underwater tunnel as well. This would help increase the guest satisfaction with the ride! In addition - it would be fun and incredibly unique. It's unique-ness would parallel the unique-ness of Carnegie Mellon and it's students.

2) Rock 'n' Roller Coaster

Basic Stats:

Amusement Park: Walt Disney World - Disney's Hollywood Studios (Lake Buena Vista, Florida, USA)

Classification: Roller Coaster

Type: Steel - Sit Down

Year Opened: 7/29/1999

Manufacturer: Vekoma

Lift/Launch System: LSM

Capacity: 1,800 riders per hour

Length: 3,403 ft

Height: 80 ft

Inversions: 3

Duration: 1:22

G-Force: 5

Max Acceleration: 0-57mph in 2.8 seconds

Elements: Roll Over & Corkscrew

Cars per train: 6 cars per train

Riders per car: Riders are arranged 2 across in 2 rows for a total of 24 riders per train.

Major elements of the ride or overall design:

Five separate audio scores synchronized to the ride and played through a 32,000 watt audio system with over 900 speakers.

Good & Bad aspects of ride's design:

The best aspect of this ride is that the music and the movements of the roller coaster synchronize together. This takes the whole roller coaster ride to a whole other level. The fact that the music's tempo mirrors the ups and downs and inversions in the roller coaster make the experience amazing! In addition, this roller coaster has a 90 degree lift system which is both good and bad. Some people enjoy the sensation which for others this is uncomfortable.

Aspects of ride I intend to use:

At some point in my ride I would like to utilize the 90 degree lift system as well as the integration of sound into the ride.

3) Dauling Dragon

Basic Stats:

Amusement Park: Happy Valley (Hongshan, Wuhan, Hubei, China)

Classification: Roller Coaster

Type: Wood - Sit Down

Year Opened: 4/29/2012

Builder: Martin & Vleminckx

Designer: The Gravity Group, LLC

Built By: Philadelphia Toboggan Coasters, Inc.

Length: 3,914.1 ft

Height: 105 ft

Inversions: 0

Cars per train: 4 trains with 6 cars per train.

Riders per car: Riders are arranged 2 across in 2 rows for a total of 24 riders per train.

Major elements of the ride or overall design:

It's an inverted dueling roller coaster! This massive dueling racing coaster at Happy Valley in Wuhan, China features the one and only high-five element where both trains bank at 90 degrees toward each other creating a pseudo-hand slapping opportunity.

Good & Bad aspects of ride's design:

The fact that riders can interact with another roller coaster is a really cool part of the ride and is known as the 'ride the high five'! The bad aspect of this design is that it can be clunky at times and riders have experienced some headaches. However, the overall experience of racing against another dragon and fighting with them throughout the ride adds a unique twist to the roller coaster!

Aspects of ride I intend to use:

I intend to use the dueling roller coaster idea. In addition, I hope to mimic many of the basic up and down movements that make the roller coaster interesting and fun.

4) Phantom's Revenge

Basic Stats:

Amusement Park: Kennywood (West Mifflin, Pennsylvania, USA)

Classification: Roller Coaster

Type: Steel - Sit Down

Year Opened: 5/19/2001

Manufacturer: Arrow Dyanmics

Type: Hyper Coaster

Builder: Morgan

Track Layout: Terrain

Length: 3,200 ft

Height: 160 ft

Drop: 228 ft

Inversions: 0

Duration: 1:57

Speed: 85 mph

Cars per train: 6 cars per train

Riders per car: Riders are arranged 2 across in 2 rows for a total of 24 riders per train.

Major elements of the ride or overall design:

Although the first hill is only 160 feet high, the second hill drops riders 228 feet into a ravine and through the support structure for Thunderbolt. This strategic use of the park's hilly terrain is one of the coaster's distinguishing features.

Good & Bad aspects of ride's design:

Phantom's Revenge has a huge drop which is an insane amount of fun. In addition, I like how the ride uses Pittsburgh's terrain effectively to help assist with the drops. The worst aspect of the design is the fact that the lift hill is so large, however this is a necessary requirement!

Aspects of ride I intend to use:

I intend to have a massive drop like that in phantom's revenge. In addition, the way the roller coaster utilizes the steel track (in terms of hills and banking) is something I intend to use as well.

5) *Incredible Hulk*

Basic Stats:

Amusement Park: Universal Studios Islands of Adventure (Orlando, FL, USA)

Classification: Roller Coaster

Type: Steel - Sit Down

Year Opened: 5/28/1999

Manufacturer: B&M

Lift/Launch System: Tire Propelled Launch

Capacity: 1,920 riders per hour

Length: 3,700 ft

Height: 110 ft

Drop: 105 ft

Inversions: 7

Duration: 2:15

G-Force: 4

Max Acceleration: 0-40mph in 2seconds

Elements: 150 ft long Tunnel, Zero-G Roll, Cobra Roll, Loop, Corkscrew, Loop, Corkscrew

Cars per train: 8 cars per train

Riders per car: Riders are arranged 4 across in a single row for a total of 32 riders per train.

Major elements of the ride or overall design:

The train accelerates to 40 mph (64 km/h) in a short time (approximately two seconds) before speeding through several inversions. When the Incredible Hulk opened, it featured the world's tallest cobra roll (110 feet (34 m)).

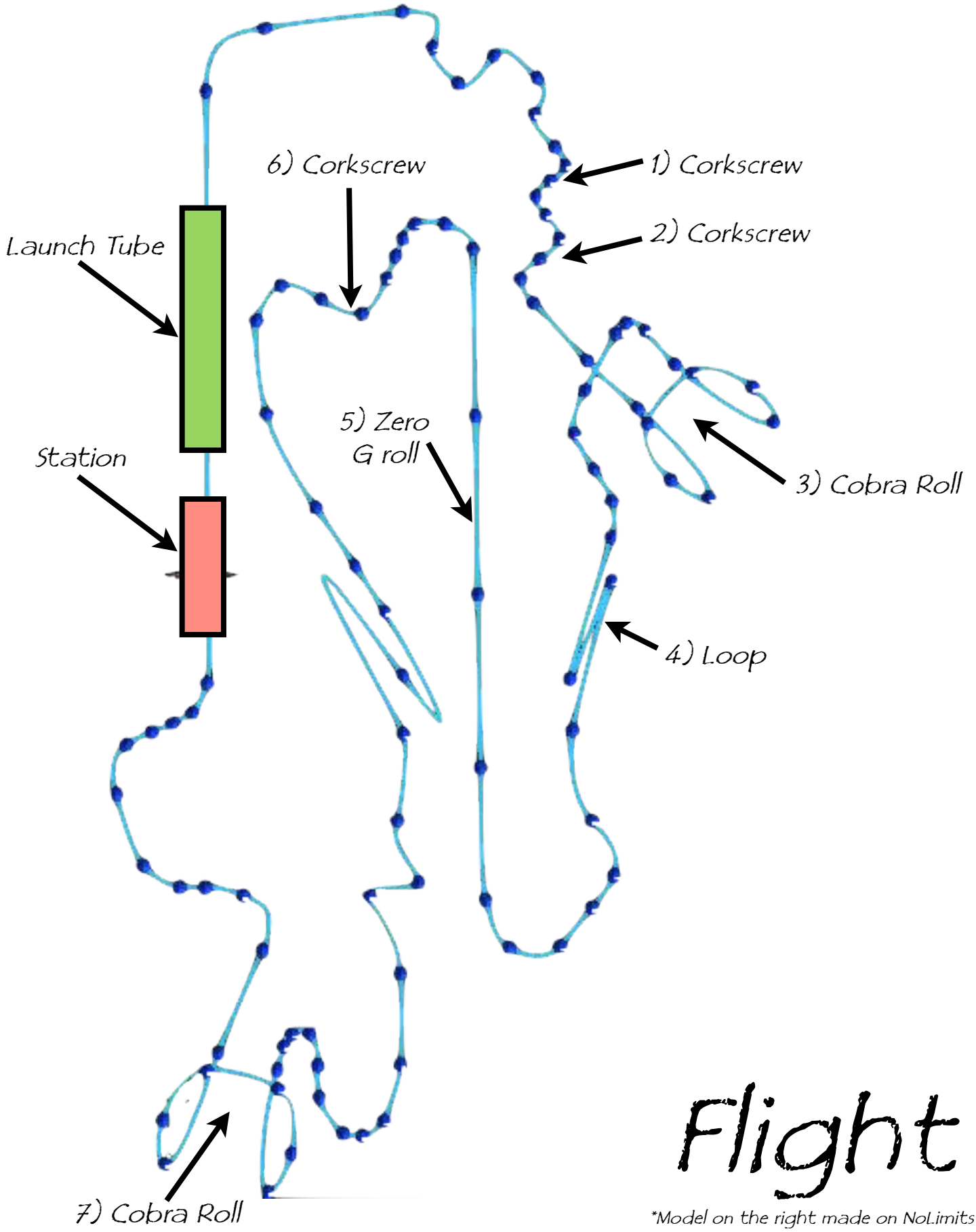
Good & Bad aspects of ride's design:

The good aspect of this ride is that there are an extreme number of elements and inversions in this ride! In addition it uses a launch lift hill as opposed to conventional chain lifts.

Aspects of ride I intend to use:

I hope to utilize the number of inversions (I hope to exceed 5) and also have a launch lift hill to speed up the coaster at first as this roller coaster did!

VISUAL REPRESENTATION



Flight

*Model on the right made on NoLimits

IAAPA

Roller Coasters & IAAPA:

At IAAPA, not only did we get to talk to many people in the industry, we got to visit numerous roller coaster companies as well! Each one definitely had their own persona, but each were also very optimistic and excited about the future. Below is a summary of some of the cool things certain manufacturers were able to tell us:

Maurer Sohne:

The biggest thing they were talking about was the Maurer Skyloop. The skyloop boasted that it had the world's highest inversions, spectacular design, very compact layout, 52m in overall height and an extendable track length of more than 1000m! The skyloop is an attraction that required little investment and space. The X-Car in it could come as standard or a double 6-seater mini-train. This innovation was definitely the talk at their booth.

Dynamic Attractions:

Dynamic Attractions is making some cool new roller coasters. They were talking to us mainly about how their new innovations power some of the most well known rides. The best example of this was Disney's Soarin', In addition, they mentioned their core product line consisted of the: Dynamic Flying Theatre, Family Coaster, LSM Launch Coaster, Tilt & Drop, Robotic Arm Dark Ride, Motion Base Tram Ride and the AGV Dark Ride.

PTC- Philadelphia Toboggan Coasters INC:

PTC is a full service company where their products, parts and services completely cover all the needs of roller coaster owners and operators world wide. PTC had a large booth and actually displayed some of their coaster parts as well for everyone to see.

Bolliger & Mabillard:

Innovative, attractive, reliable and competitive. These were the words B&M chose to describe themselves. They had a large array of product lines out to display including: Inverted Coasters, Sitting Coasters, Hyper Coasters, Floorless Coasters, Standup-Coasters, Flying Coasters & Wing Coasters.

Silver Dollar City - Outlaw Run:

At IAAPA, I got the change to see the unveiling of Outlaw Run at Silver Dollar City. It is supposed to open in Spring 2013. They dubbed this coaster ' the World's most daring

wood coaster'. It will supposedly be the second fastest wooden coaster and have the steepest drop at 81 degrees. In addition, it will take rider upside down over 3 times!

Coollest Moments at IAAPA:

My favorite moment at IAAPA was when I got to meet Marty Sklar face to face. While our conversation only lasted 10 minutes, it was incredible that I got the opportunity to meet the man who envisioned Epcot along with Walt Disney. Along with him, I also got to meet the other four Imagineers who were critical in engineering and building Epcot itself. The advice they gave me along with their encouraging words definitely were amazing to hear. Finally, I enjoyed meeting Palace Entertainment CEO (they own Kennywood) and talking to him not only about the roller coasters at his park, but about how we enjoyed the park as well. As he said, "our job is to make life a little more fun." Finally, I enjoyed meeting so many people at IAAPA. From head Imagineers, to Universal Creative Executives, to Palace Entertainment Executives, to people from companies I want to one day work for (Disney, Universal, BDR Design Group, Thinkwell, Goddard Entertainment, RGH Entertainment etc etc), I met people who have inspired me more than any school class will probably ever be able to do. Most of all, they all made my dream to one day tell a story through themed entertainment much more attainable.

STATISTICS & CALCULATIONS

Statistics, Calculations & Estimations:

Statistics:

Launch Speed: LSM Coaster (using propulsion via electromagnets), 0 - 65 in 2.5 seconds

Maximum G-Forces: 4

Number of Trains and Size of Trains: 8 cars per trains. 4 people per car.

Calculations:

Height of the first hill of the ride based on fixed speed:

$$65\text{mph} = 29.0576 \text{ m/s}$$

$$mgh = (1/2)mv^2$$

$$g \cdot h = (1/2) \cdot (29.0576)^2$$

Thus,

$$h = 422.172 \text{ m}$$

Radius of the bottom of one of the hills:

$$4g = g + (mv^2)/r$$

$$3g = (mv^2)/r$$

$$r = (mv^2)/3g$$

$$r = 200.82 \text{ m}$$

Estimations:

Capacity: 1900 riders per hour (based off of Incredible Hulk Capacity)

Cost: 25 million

Length of the Ride: 880 ft.

WRITE - UP

Write Up:

This roller coaster is called Flight. There are two big reasons for this name. The first reason is that throughout this roller coaster I am trying to simulate the feeling of flying. Through the multiple inversions and many inversions in a row, the guest will feel like they are soaring many times (by feeling weightless).

In addition, this roller coaster is called flight because the inspiration behind the ride is from the Disney Animated Short entitled Paperman. In this short, a young man, George, tries to track down Meg, a stunning woman he notices one morning at the train station. Paperman is entirely black and white - something that I hope to mimic in the train & track design. This short is beautifully animated and it's score by Christopher Beck was the inspiration behind many of the sharp turns & drops. As I said earlier, this ride will also have speakers in the back and will be playing a shortened version of the score. The tempo of the score as well it's melody will match the movements of the roller coaster - taking this experience to the next level for the guest.

This roller coaster will span all across of CMU's campus. It will start and end at the railroad tracks in between the CIC and Craig Street. It will continue to go Morewood Avenue. The reason for this is that the roller coaster will not be in the way of any significant foot traffic at CMU. However, it will still be able to be seen anywhere on the CMU campus.

The roller coaster will be unique because using both the music, and physical movements of the ride, the guest will experience an entire story. The main animator of Paperman said, "We're really hoping that audiences watch this and say, 'Wow - something really interesting is happening over there.'" That is exactly what I hope guests will say after riding this roller coaster.