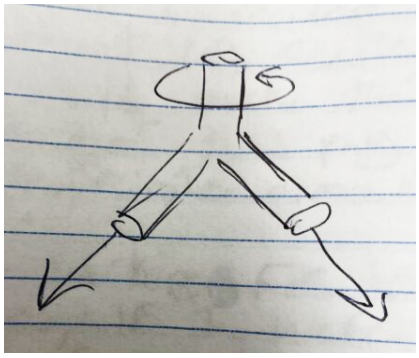
2025 Stage Machine Design Contest Proposal
Rue Zadik, Samuel Lee, Rhys Mix

The Goal:
The effect the machine aims to achieve is a soft, gentle petal drop lasting 30 seconds that falls onto a 3’ diameter circular area center stage. It will use 1.5” silk flower petals, but the machine should also be usable for other drop effects, including for large objects like ping pong balls or small particulates like confetti or fake snow. The machine must be mechanical and silent. It is to be operated from 25 feet off stage, and the bottom of the machine must be 15 feet above deck height. The machine will be hung from a schedule 40 batten, and must have a footprint of 20” by 20” or smaller. The device needs to be reloadable from the ground without lowering the batten or using ladders or lifts. It needs to be able to be reloaded in under 10 minutes.

Our Machine:
Our Machine will accomplish this by funneling the flower petals into a Y-shaped piece of pipe, which will spin to create a conical volume of petals. This leaves several challenges: the mechanism to make the pip spin, the connection point between the spinning pipe and stationary cone, the mechanism controlling the petal flow, the construction and suspension of the cone, and material choice for all pieces.



Pipe Spin Mechanism:
Since the pipe must be controlled mechanically, we decided the most efficient method of making the pipe spin is a system of pulleys that rotate a loop of string around the pipe. When constructing the device, we might incorporate gears in order to adjust the speed the pipe spins.

Cone-Pipe Connection Point:
Our first idea for the connection point between the cone and pipe was a large ball bearing. This was intuitive because of their circular shape. However, after further research we determined it would be better to use a lazy suzan. This is because it has less exposed pieces in the center, so it is less likely to catch on petals, and because it comes with screw holes which can be used to attach it to the pipe and cone.

Petal Flow:
In order to control the petal flow, we decided to design a mechanism that closes off the end of the funnel, unless a deck crew member is actively pulling on a string. We initially considered a small rectangular slot with a panel that would slide out of the way, but decided that that would create too much of a bottleneck in the flow of petals. Our next idea was to create a 3d printed iris mechanism, but decided that that has many moving pieces and is likely to get jammed or broken. We decided that it would be best to use a circular plate that slides into a groove in the cone, so it can open fully and avoids creating a bottleneck. In order to cause the plate to slide back into place when the string is not being pulled, our initial idea was to use springs. However, we were concerned about the consistency and reliability of a spring mechanism, and concerned

that petals may get tangled in the mechanism. We have decided that using magnets would work best.

Cone Construction:
Initially, we planned to buy a cone that was already constructed. However, when we realized how much modification we would need to do to the cone, and how specific its dimensions need to be, we determined it would be best to create our own cone. With our budget, we decided it would be optimal to create a wooden frame for structure, lined with a cardboard cone. We are considering adding a layer of aluminium foil in order to decrease friction and static electricity. We plan to hang our mechanism by the base of the wooden frame, using airliner cable connected to batten clamps.