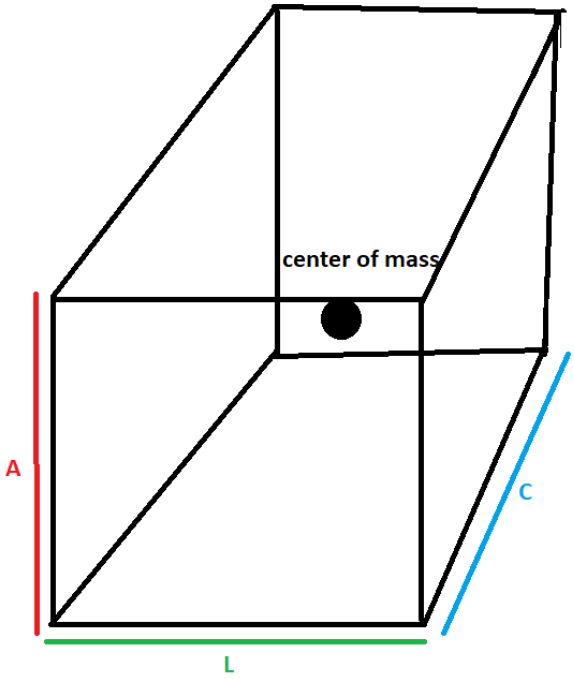
US419 – Center of Mass of Containers

Containers can have 2 sizes, that are the default ones used, a container can either be 1 TEU or 2 TEU, that corresponds to 20 inches and 40 inches respectively. Below, are the calculations made for each one. Because a container is completely symmetric, the center of mass of it, will be exactly on the same place as its geometric center.



Container (20') = 1 TEU
C = 5,900m
L = 2,350m
A = 2,393m

Center of mass (20'):
x = 2,95m
y = 1,175m
z = 1,1965m

Area (20') = 2(5,900 x 2,350) + 2(2,350 x 2,393) + 2(5,900 x 2,393) = 67, 214 m^2

Volume(20') = 5,900 x 2,350 x 2,393 = 33,179 m^3

Container(40') = 2 TEU
C = 12,036m
L = 2,350m
A = 2,392m

Center of mass (40'):
x = 6,018m
y = 1,175m
z = 1,196m

Area (40') = 2(12,036 x 2,350) + 2(2,350 x 2,392) + 2(12,036 x 2,392) = 125,392 m^2

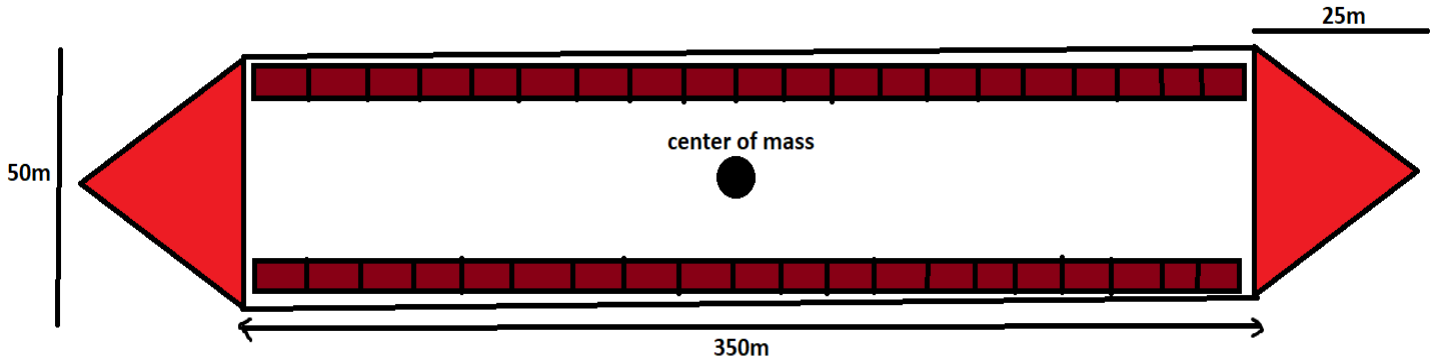
Volume (40') = 12,036 x 2,350 x 2,392 = 67,657m^3

Suppose we want to load 40 containers into the ship and maintain the center of mass of it. To maintain the ship's center of mass we need to distribute the containers in the ship equally and the containers total weight in each side should be almost the same or even the same. Knowing this, distributing the containers inside the ship would be like in the picture below. We can see each side of the ship has 20 containers of the same size, and the sum of the weight of each side, should be the same or the closest it can be.

Container (20'):
fit 59 containers in length
fit 21 containers in width

Container (40'):
fit 29 containers in length
fit 21 containers in width

both can be stacked up, only to 8 containers maximum



- Container