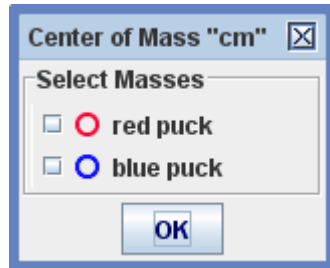


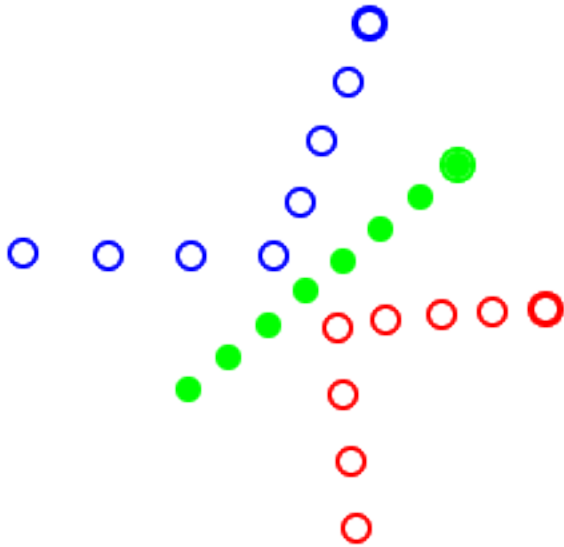


# Multiple and extended objects

## *Center of mass*



- *Multiple pointmass tracks*
- *Steps are determined by positions and masses of pointmass tracks*
- *Solid footprint*



**Useful resources:**  
[Tracker Help: center of mass](#)  
[Elastic collision TRZ](#)



# Multiple and extended objects

## *Two-body system models*

**Model Builder**

Model:  $\blacklozenge$  system (model A + model B)

**Parameters**

Name	Expression
m	3.0
m1	1.0
m2	2.0
k	2

**Initial Values**

Name	Expression
t	0.0
r_relative	150.0
$\theta_{\text{relative}}$	0.0
vr_relative	0.0
$\omega_{\text{relative}}$	1.0

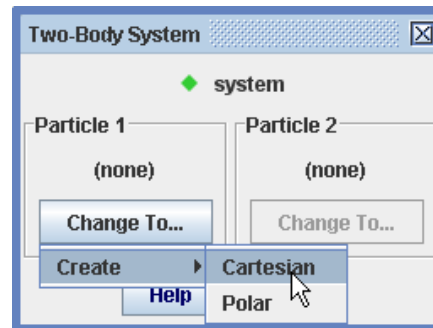
**Force Functions**

Name	Expression
fr_internal	$-k\hat{r}$
f $\theta$ _internal	0

Variables (click to paste): r, vr,  $\theta$ ,  $\omega$ , t, m, m1, m2, k

Buttons: Help, Undo, Redo, Font Size, Close

- Join two dynamic particle models
- Define internal forces
- Initial state = relative  $r$ ,  $v_r$ ,  $\theta$ ,  $\omega$
- System position = cm

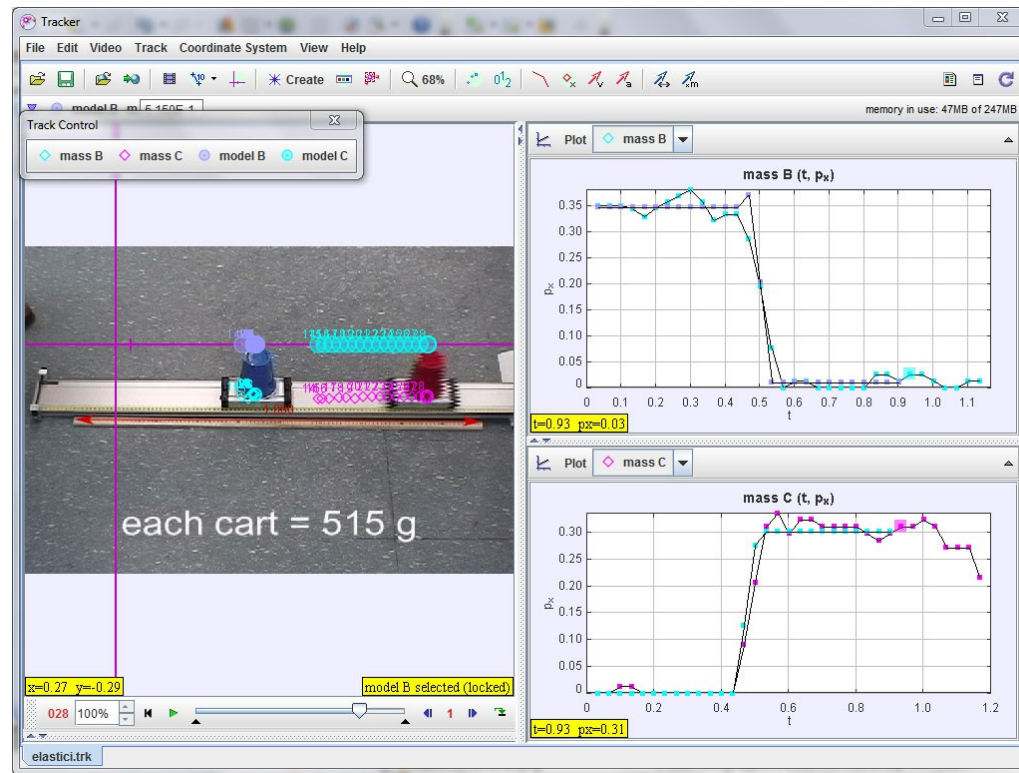


Useful resources:  
[Tracker Help: particle models](#)



# Multiple and extended objects

## *Collisions*

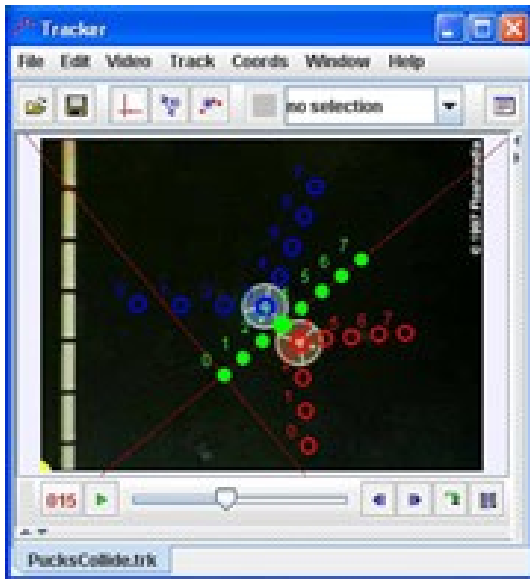


Useful resources:  
[Collision force model TRZ](#)



# Coordinate systems

*Reference frames, world views*



**Useful resources:**

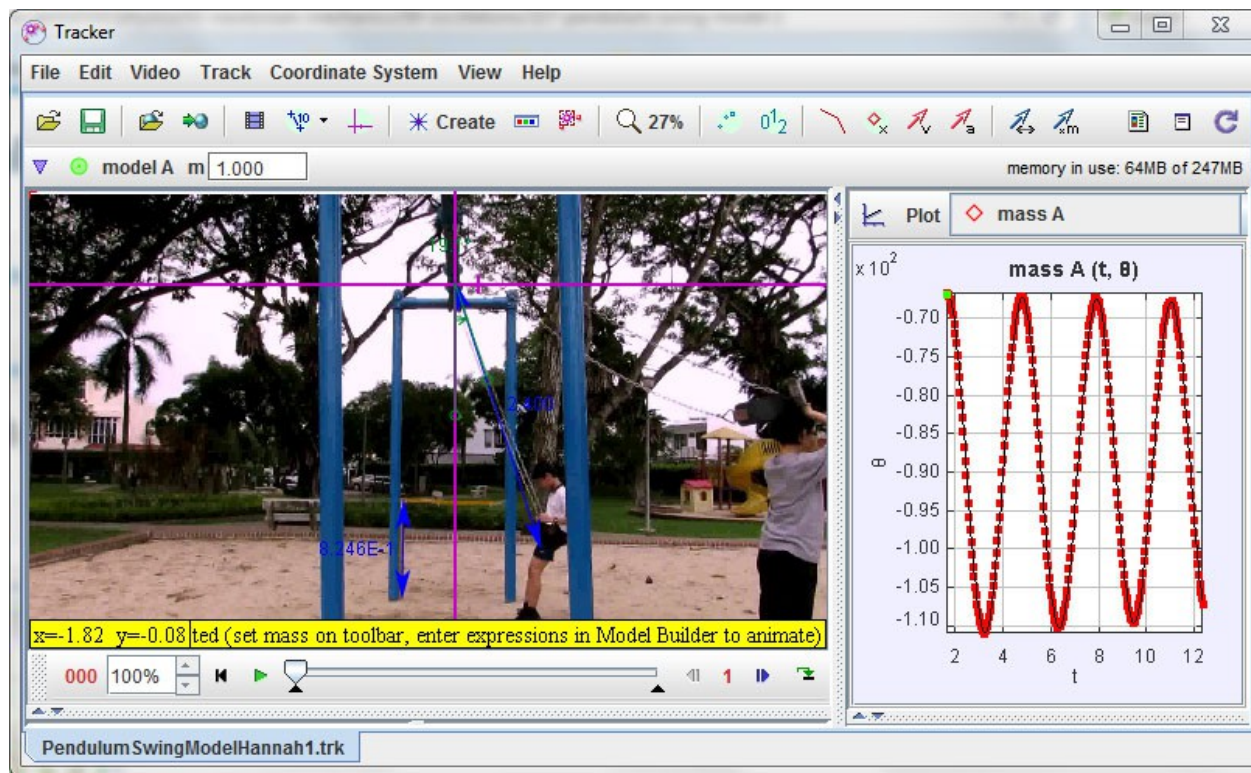
[Tracker Help: coordinate system](#)

DL browser: [PucksCollide.zip](#)



# Coordinate systems

## *Polar coordinates*



Useful resources:

[Pendulum swing model TRZ](#)