



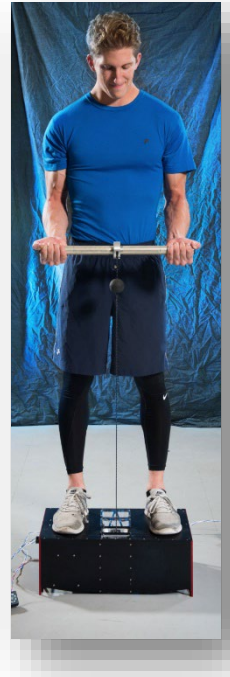
# ROCKY Exercise Device

## Resistive Overload Combined with Kinetic Yoyo

Developed by NASA Glenn Research Center and ZIN Technologies

### Overview

- Single output exercise device capable of accurately simulating the load profile of a mass in a 1-g environment (free weights) for strength training and the load profile of a rowing machine for aerobic training
- Ultra-compact volume and weight
  - 21.5" x 13.5" x 7.5" platform
  - ~25 lbs. of mass
- Power connection: 120 VDC via external power supply
- Controlled by either a custom software interface or a handheld controller for quick setup if laptop is unavailable
- Device can be switched on and is ready for use within seconds



### Exercise Capabilities

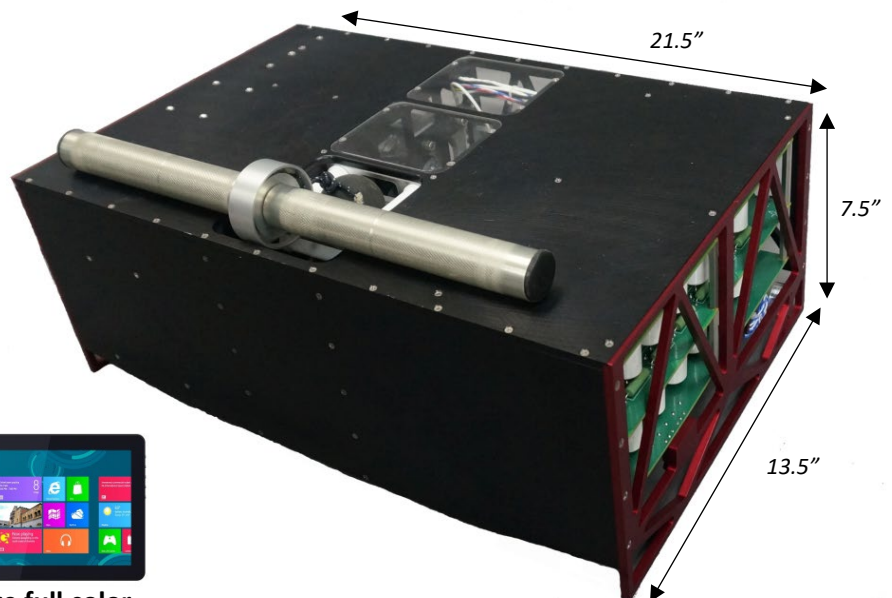
- Resistive loads between 10 and 400 lbs. of resistance at velocities up to 2 m/s
- Rowing mode up to 220 lbs. of force at 2 m/s
- Maximum displacement of over 12 ft.
- Eccentric overloading: capable of providing different loads for concentric and eccentric phases of movement

### Safety

- Software has been developed as "safety critical" which will safe the system if any critical element goes outside of tolerance
- Virtual racking: software control feature applies the working load only when user is within their calibrated range of motion. Allows for safe single user operation.
- Emergency stop cuts power to motor should operator need to immediately stop exercise session



Breadboard ROCKY being used in resistive mode as a rowing machine (slide not necessary in 0-g)



Handheld device controller



Future full color touchscreen control