Accessible Weight Scale for Seated Users

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Overview

- Background Information
- Currently Available Products
- Accessible Weight Scale for Seated Users
  - Elevated Toilet Compartment
  - Posture Support
  - Handheld Console
  - Operation Procedure
- Budget
- Conclusion
- Q & A

Background Information

- Project is funded by RERC-AMI National Student Design Competition
- Clients have limited leg, hand and arm strength; poor eyesight and memory
- Objective
  - Design accessible weight scale that is:
    - Convenient
    - Easy-to-use
    - Easy-to-sanitize
    - Inexpensive
    - Accurate

Currently Available Products

Sitting Scale (MODEL 6461)

- Pros
  - Inexpensive ($200)
  - Portable
- Cons
  - Capacity 250 lbs
  - Accuracy 1 lb
  - Display not visible to user
  - No foot support
  - Does not store readings

Healthometer Model 595KL Digital Chair Scale

- Pros
  - Capacity 600 lbs
  - Accuracy 0.2 lbs
- Cons
  - Expensive ($1,169)
  - Bulky
  - Display not visible to user
  - Does not store readings

Detecto Model 6876 Euro Chair Scale w/ Flip-Seat

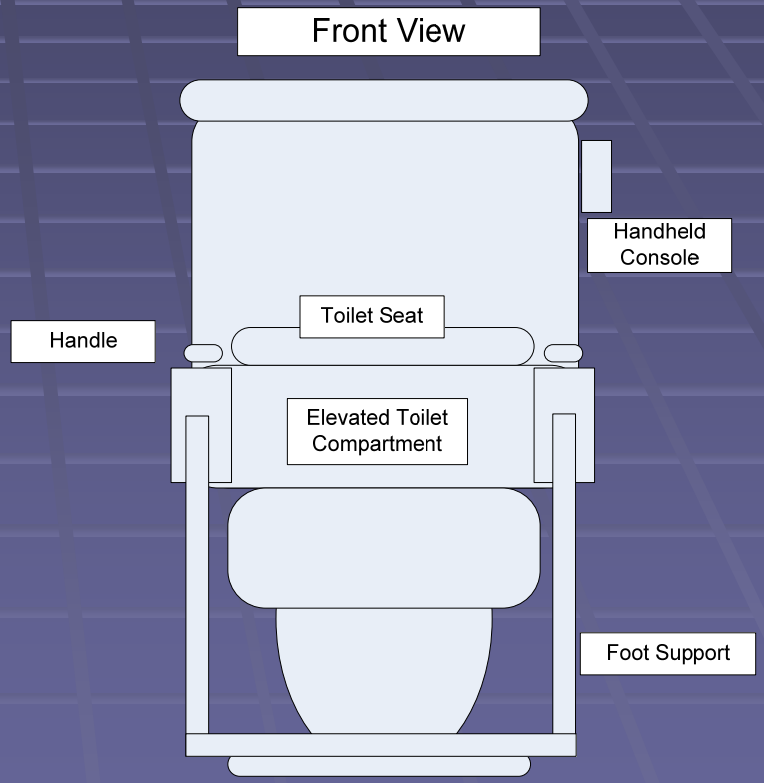
- Pros
  - Capacity 600 lbs
  - Accuracy 0.2 lbs
  - Measures BMI
- Cons
  - Expensive ($1,749)
  - Bulky
  - Display not visable to user
  - Does not store past readings

Accessible Weight Scale for Seated Users

- Integrated into an elevated toilet seat
- Store previous readings
- Take a reading in under 10 seconds
- Total capacity: 500+ pounds
- Accuracy: 1/5 pound
- Display outputs and prompts visually and audibly
- Easy-to-use

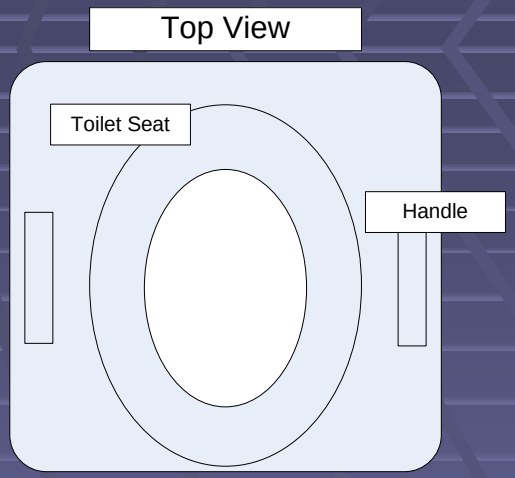
Accessible Weight Scale for Seated Users

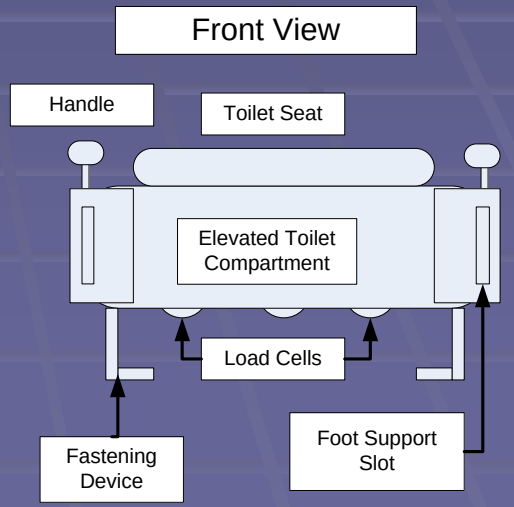
- Main components
  - Elevated toilet compartment
  - Toilet seat
  - Handles
  - Adjustable/removable foot support
  - Handheld console



Elevated Toilet Compartment

- Elevates toilet seat 5”
- Made of 2 aluminum alloy plates and solid aluminum rods
- Bemis 500PRO Round Wood Toilet Seat
- Contains slots for foot support
- Houses electrical components
- Communicates wirelessly w/Handheld console

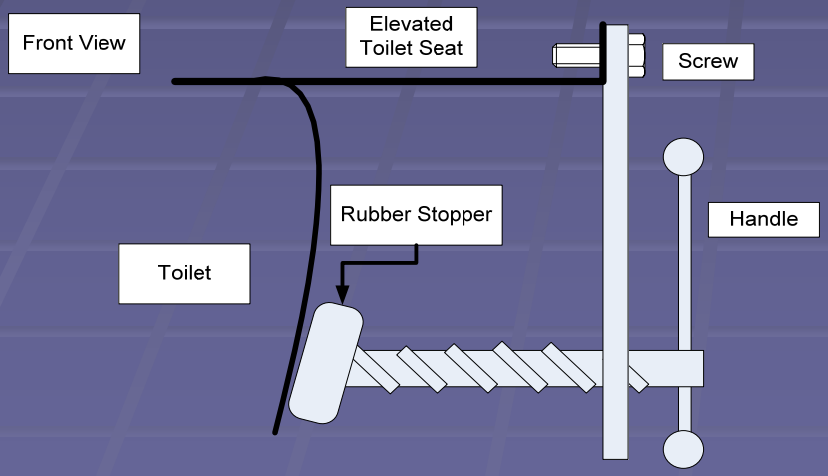


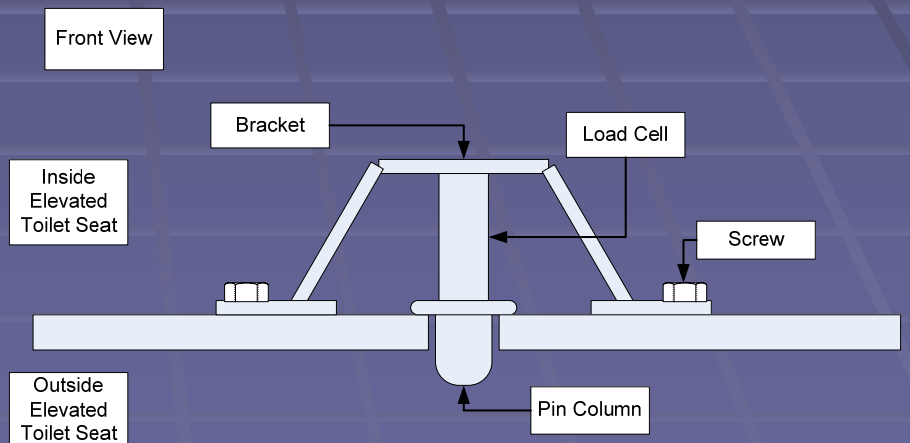


Elevated Toilet Compartment

- 4 Clamp mechanisms hold compartment on toilet
- 3 Load cells held by mounting mechanism

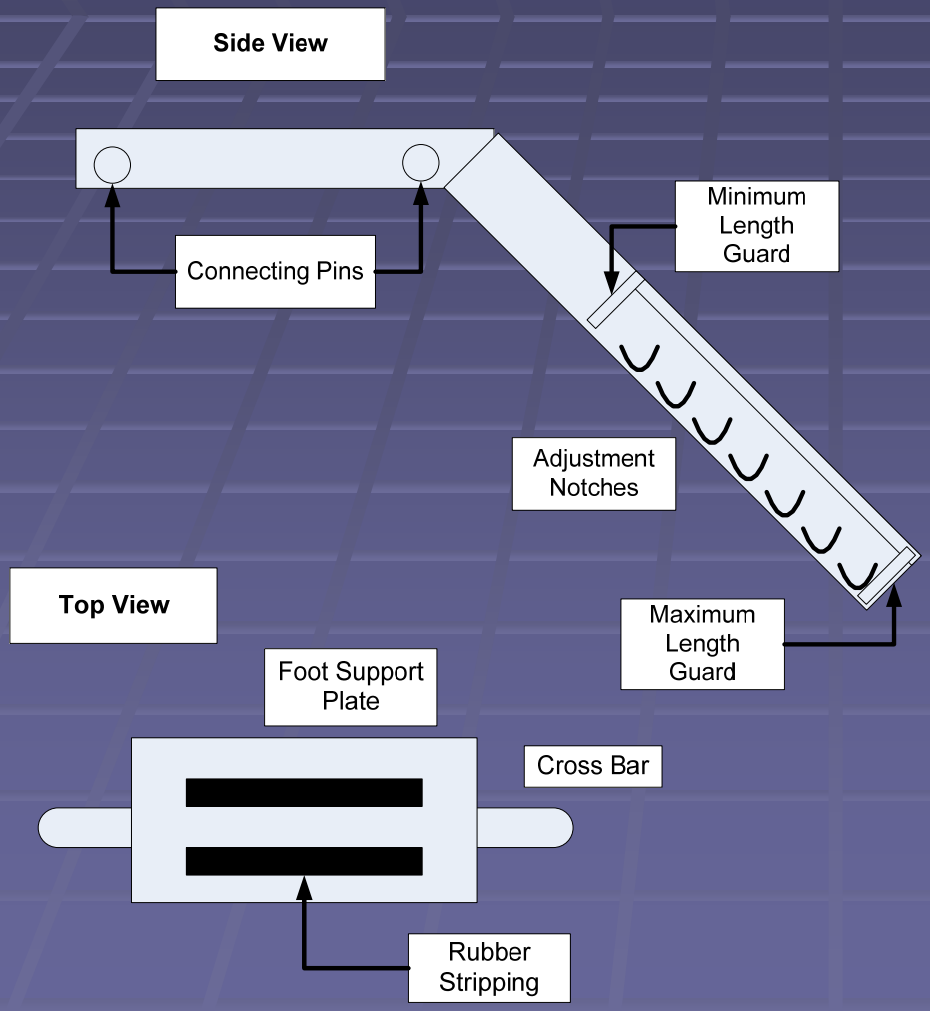
S290 Platform Load Cell





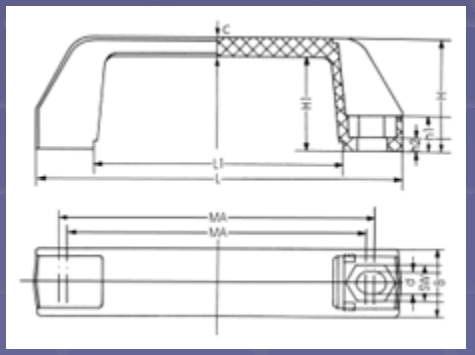
Load Cell mounting mechanism

Posture Support



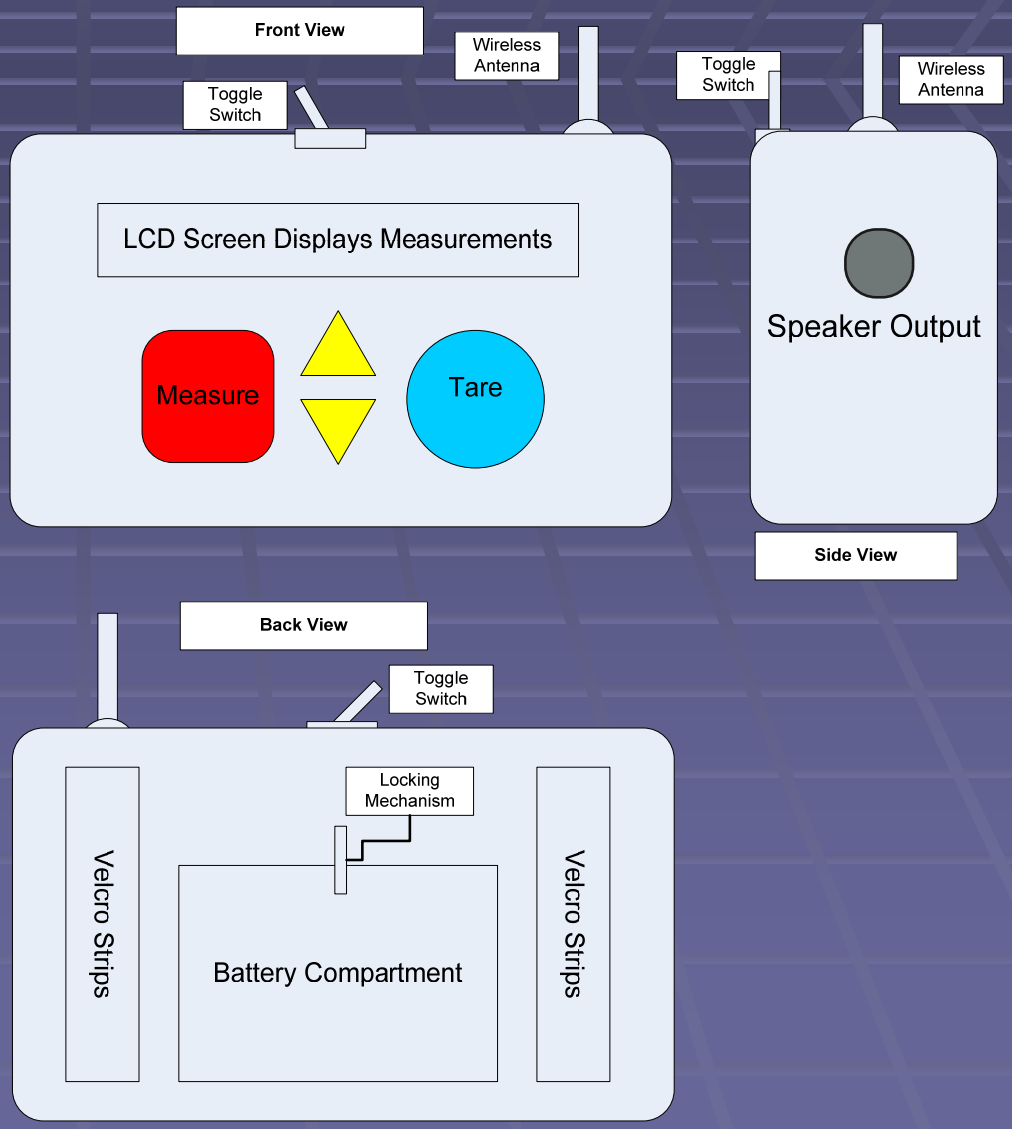
Monroe: Pull Handles

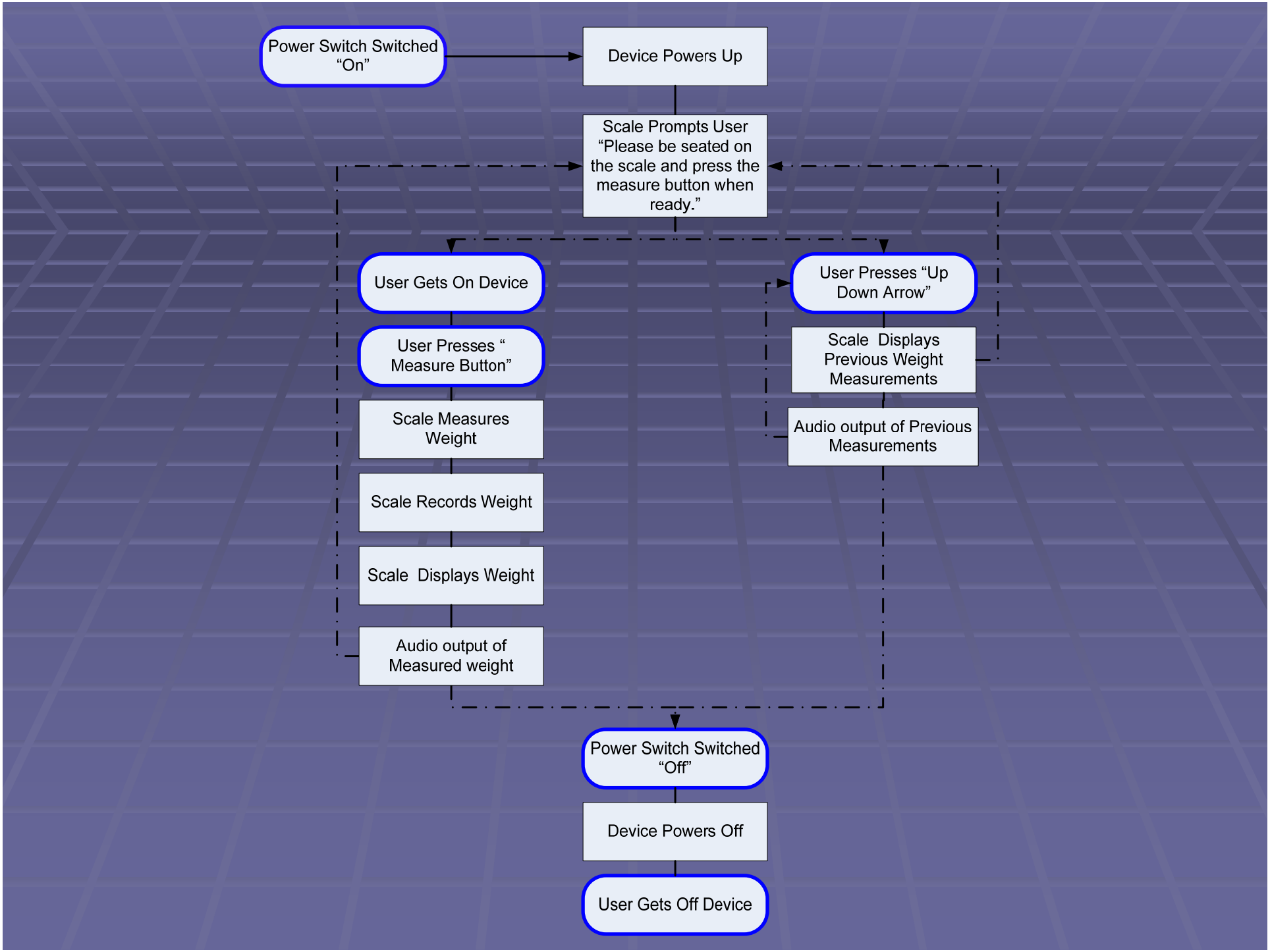
Material-Fiberglass Reinforced Technopolymer



Handheld Console

- Acts as user interface
- All buttons labeled in English and Braille
- All outputs and prompts given by LCD and Speaker
- Two Velcro strips for easy mounting
- Accessible battery compartment




Power Switch Switched "On"
Device Powers Up
Scale Prompts User "Please be seated on the scale and press the measure button when ready."
User Gets On Device
User Presses " Measure Button"
Scale Measures Weight
Scale Records Weight
Scale Displays Weight
Audio output of Measured weight
User Presses "Up Down Arrow"
Scale Displays Previous Weight Measurements
Audio output of Previous Measurements
Power Switch Switched "Off"
Device Powers Off
User Gets Off Device

Part	Vendor	# of Units	Total Price
S290 Load Cells	Strain Measurement Devices	3	$190 X 3 = $570
OKW Enclosure Casing	Allied Electronics	1	$11.74
ICC/Intervox Speaker	Allied Electronics	1	$2.61
Lumex LCD	Allied Electronics	1	$20.52
IDEC Pushbutton (red, square)	Allied Electronics	1	$15.47
IDEC Pushbutton (round, green)	Allied Electronics	1	$13.25
Starpoint Triangular Up/Down Pushbuttons	Advanced Electronic Systems, Inc.	2	$20.00 X 2 = $40.00*
PIC18F6722	Allied Electronics	1	$8.93
RC8650F1C Chipset	RC Systems	1	$40.00
Linx Tech. LR 418Mhz Transmitter	Digi-Key	1	$7.46
Linx Tech. LR 418Mhz Receiver	Digi-Key	1	$13.56
Linx Tech. CW 418Mhz Antenna	Digi-Key	1	$7.88
ON Semiconductor LM317LZG	Allied Electronics	2	$0.38 X 2 = $0.76
Aluminum Alloy Plates	Yarde Metals	1	$245.10
Bemis 500PRO Round Wood Toilet Seat	Paul Supply	1	$11.24
Total Cost			**$1008.52**

Conclusion

- Many people in need of accessible weight scale
  - Obesity and old age lead to increased number of wheelchair bound
  - Diabetes leading cause of amputation
- Current products inconvenient
  - Bulky
  - Expensive
  - Additional assistance required
- Our device allows for more independence
  - Easy to use
  - Stores previous readings

Acknowledgements

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  - Dave Price, Advisor
  - Dave Kaputa
  - Rich and Serge

Sources

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Questions and Answers