

Beneficial Design

Designing Beyond the Norm to Meet
the Needs of All People

Research
Design
Education

Stanford University

8 February 2011

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Beneficial Designs' Mission Statement

Beneficial Designs works towards universal access through research, design, and education. We believe all individuals should have access to the physical, intellectual, and spiritual aspects of life.

BD Virtual Tour

BD 2010

Beneficial Designs' Mission Statement

We seek to enhance the quality of life for people of all abilities, and work to achieve this aim by developing and marketing technology for daily living, vocational, and leisure activities.

Design of Consumer Products

Product Development

Assessment of Products

Universal Design of Products

Product Development

Mainstream Products

Opportunity for Universal Design

Adaptive Products

Personal Technologies

Activity Specific Technologies

Design of Consumer Products

BD Projects 2009

Measurement and Testing of Products

Wheelchair Testing

Seat Cushion Testing

Single Rider Golf Cars

Adaptive Sports Equipment Testing

Playground Surface Testing

Measurement and Testing of Products

Usability of Consumer Products for
Persons with Cognitive
Impairments

Development of Uniform Standards for Cognitive Technologies

Goal

**Increase Access to Technology
for People with Cognitive
Impairments**

A word cloud featuring various electronic and household items. The words are arranged in a roughly triangular shape, with the largest words at the top and smaller words at the bottom. The colors of the words range from dark green to light yellow-green. The items listed include:

- cell
- email
- ear.buds
- DVD
- phones
- smoke.alarms
- cell.phones
- screen.readers
- social.networking
- TV
- calendars
- stoves
- music.players
- headphones
- laptop
- toaster.ovens
- internet
- audio.books
- camera
- Internet
- video

Identify, measure, and report on design features for people who have difficulty

Learning

Processing

Remembering

Communicating

Making decisions.

Simple Camera Example (disposable film)

Cognitive Result: A

No excess programs

Reliable center focus

Simple one click button to take a picture

Larger button size

Easy to grasp shape

Loud “click” tones



Complex Camera (digital single lens reflex)

Cognitive Result: M

Multi-level menus

Custom menus

Heavy, large shape

Interchangeable lenses

Multiple program functions

Multiple buttons, wheels, switches

Requires more knowledge to operate

Traditional look-through viewer



Consumer Products

Such As:

Cell phones

Transportation issues

Microwaves

Fire extinguishers

Distance Between Keys

Measure and disclose the vertical
and horizontal button/knob
distance from adjacent
buttons/knobs/icons

Motor Assist, Perception, Memory

Force Required to Press Key

Determine the force (N) to operate
the keys.

Motor assist, Durability

Time required to hold button or switch to turn off

Determine the time required to hold
the button or switch to turn the
device off and on.

Timing, motor assist

Number of steps to place call to an existing number in contact list

Attention, clarity, decision making,
memory, motor assist, motivation,
organization, perception, timing

Error Recovery Design

Attention, clarity, decision making,
memory, motor assist, motivation,
organization, perception, timing

Prompting Options

Indicate if the prompting sequence
can be customized for the user.

Memory, Organization

Objectively Measureable Evaluation Criteria

Customization Opportunities

Durability

Input Mechanism

Operation/Navigation/Software Design

Outputs

Physical Characteristics

Input Mechanism

Buttons

EMG

Eye tracking

Headset jack

Joystick

Keyboard

Mouse

Pointing device

Touchscreen

Track ball

Voice control

Operation/Navigation/ Software Design

Steps to place call to saved #

Steps to place call to new #

Maximum steps to access features

On / off Activation

Supports assistive devices

Operation/Navigation/ Software Design

Pause

Peripherals Supported

Peripherals Required

Replay

Simultaneous keys required

Buttons and Switches

Feedback upon activation

Font size

Font type

Multifunction

Number of buttons

Design in the Built Environment

Access to Ski Areas

Access to Amusement Park Rides

Sidewalk Environments

Outdoor Recreation Trails

Measurement of the Built Environment

Ground and Floor Surface Testing

Universal Trail Assessment Process

High Efficiency Trail Assessment
Process

Trailware Software

Measurement of the Environment

Tools and Technology or Trails

Measurement and Testing of the Built Environment

Public Rights of Way Assessment
Process

Standards Development - RESNA

**Rehabilitation Engineering and
Assistive Technology Society of
North America**

Wheelchair and Seating Standards

Wheelchairs and Transportation

Mattress Overlays

Standards Development – RESNA

Assistive Technologies for Persons
with Cognitive Impairments
Emergency Stair Travel Devices

Standards Development - ANSI

**American National Standards
Institute**

Single Rider Golf Cars

Aerial Tramway Standards

Standards Development - ASTM

**American Society of Testing
Materials**

Universal Design of Fitness
Equipment

Playground Surfacing

Universal Design of Fitness Equipment (UDFE) Standards

Accessible “mainstream” fitness equipment

– user friendly

Health benefits for everyone

Social benefits for everyone

Comply with the Americans with Disabilities Act (ADA)



General – Seats

Seat width minimum
380 mm (15.0 in.)

Seat depth minimum
255 mm (10.0 in.)

**Removable seat
Allows for
wheelchair
access**







General – Handles

Static handles in seating area to assist with transfers

Significant color contrast between static and dynamic handles



Treadmill – Handrails

Non-slip surface

Round/oval grippable
shape

Higher Step-up Heights- Hard



Low Step-up Height Design



General – Access and Setup

Maximum step-on height
170 mm (6.7 in)

Significant color contrast
between key components





General – Adjustment Mechanisms

Tethered to equipment

Should not require two hands, fine
finger control, excessive wrist rotation,
tight grasp, or a pinch grip

Shoulder Press, Lat Pull, Triceps Push, Bicep Curl

Min Start Weight

5 kg (11.0 lb)

Min Increment

2.5 kg (5.5 lb)

Significant color contrast between pin
and weight stack

LifeFitness

UT OR PRESS QUICK START

Calories

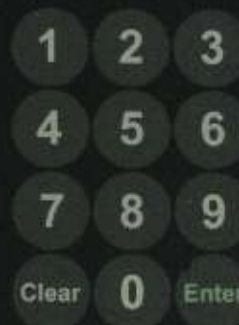
Distance

Time

Incline

Speed

Heart Rate



WARNING

Read and follow all instructions and warnings. Consult your physician prior to using this equipment. Follow all applicable safety rules and instructions. Keep children away from this equipment.

CAUTION: Contact a physician before using this equipment. Stop exercising if you feel pain, dizziness or short of breath.

CAUTION: RISK OF INJURY TO PERSONS - TO AVOID INJURY, STAND ON THE SIDECHAINS BEFORE STARTING TREADMILL. READ INSTRUCTION MANUAL BEFORE USING.

ATTENTION: Consult a physician before using this equipment. Stop exercising if you feel pain, dizziness or short of breath.

When in panic: Stop using this equipment. Do not use the treadmill if you are under the influence of alcohol, drugs or medication. Use the emergency stop button.

POLAR
HEART RATE MONITOR

Life Fitness USA 1-800-225-3367
Life Fitness UK 01753 603380/2884
Life Fitness AU 01437 576131/576133
Life Fitness Asia Pacific 1-800-225-3367
www.lifefitness.com

LifeFitness

UP OR PRESS QUICK START

Calories

Distance

Time

Incline

Speed

Heart Rate



WARNING

POLAR
www.polar.com

Life Fitness, Inc. 30225 080
Life Fitness, Inc. 02120 080
Life Fitness, Inc. 02120 080
Life Fitness, Inc. 02120 080
www.polar.com

Read and follow all warnings and cautions. Always use proper technique and correct posture. Do not use any equipment if you are injured or have any medical conditions. Do not use any equipment if you are pregnant or have any other medical conditions. Do not use any equipment if you are under the age of 18.

CAUTION: RISK OF SLURRY TO PERSONS - DO NOT
DRINK BEVERAGES OR DISPERSED BEVERAGES, INCLUDING
FRUIT JUICES, WHILE WORKING OUT. ALWAYS USE PROPER

ATTENTION: Do not use the console until you are seated. An emergency stop button is located on the console to stop the console in case of an emergency.

Warning: Do not use the console if you are pregnant or have any other medical conditions. Do not use the console if you are under the age of 18.

CLIMBING

Display

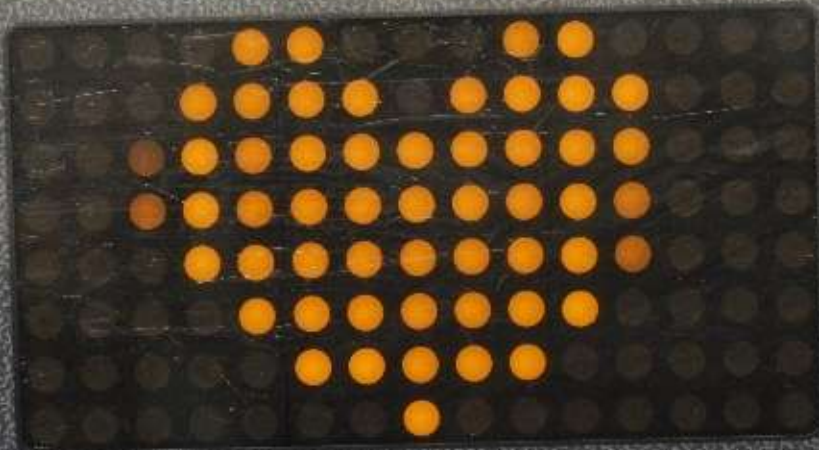
Time Remaining

Calories/Hour

Floors Climbed

Level

Climb Max



Speed

Programs

Manual



Fat Burning



Strength



Endurance



HR Control

Advanced Options



1 2 3

4 5 6

7 8 9

0 Clear

Start Enter

▲

▼

CLIMBING

Display

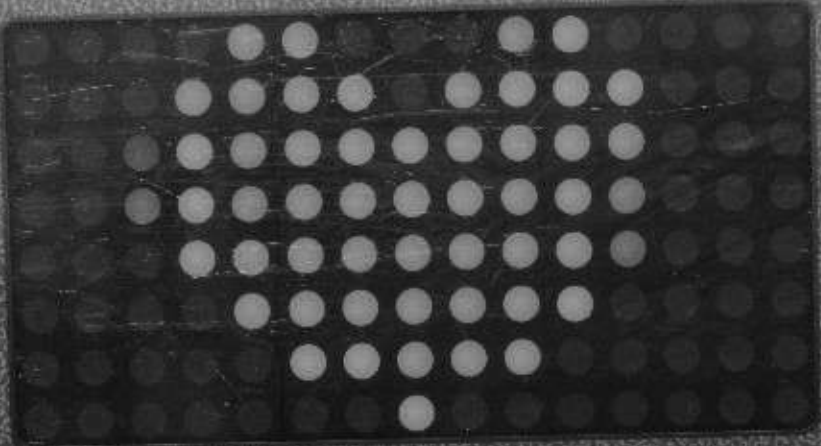
Time Remaining

Calories/Hour

Floors Climbed

Level

Climb Max



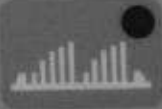
Speed

Programs

Manual



Fat Burning



Strength



Endurance



HR Control

Advanced Options



1 2 3

4 5 6

7 8 9

0 Clear

Start Enter

▲

▼

Consoles – Colors

Significant color contrast

Start controls shall have

green

Stop controls shall have

red

Department of Justice Proposed Ruling

President's announcement to amend
Title III – July 2010:

**The Americans with Disabilities
Act regulations will cover the
use of exercise equipment in
health clubs, hotel fitness
centers, public recreation
centers, and schools**

Department of Justice Proposed Ruling

Specific criteria shall be specified for each piece of fitness equipment to define what will make it more universally accessible

Minimum Scoping Recommendations for UDFE

Minimum required pieces of accessible equipment –one of each or 10% of each type

Bicycle (recumbent or upright)

Elliptical

Treadmill

Upper body ergometer

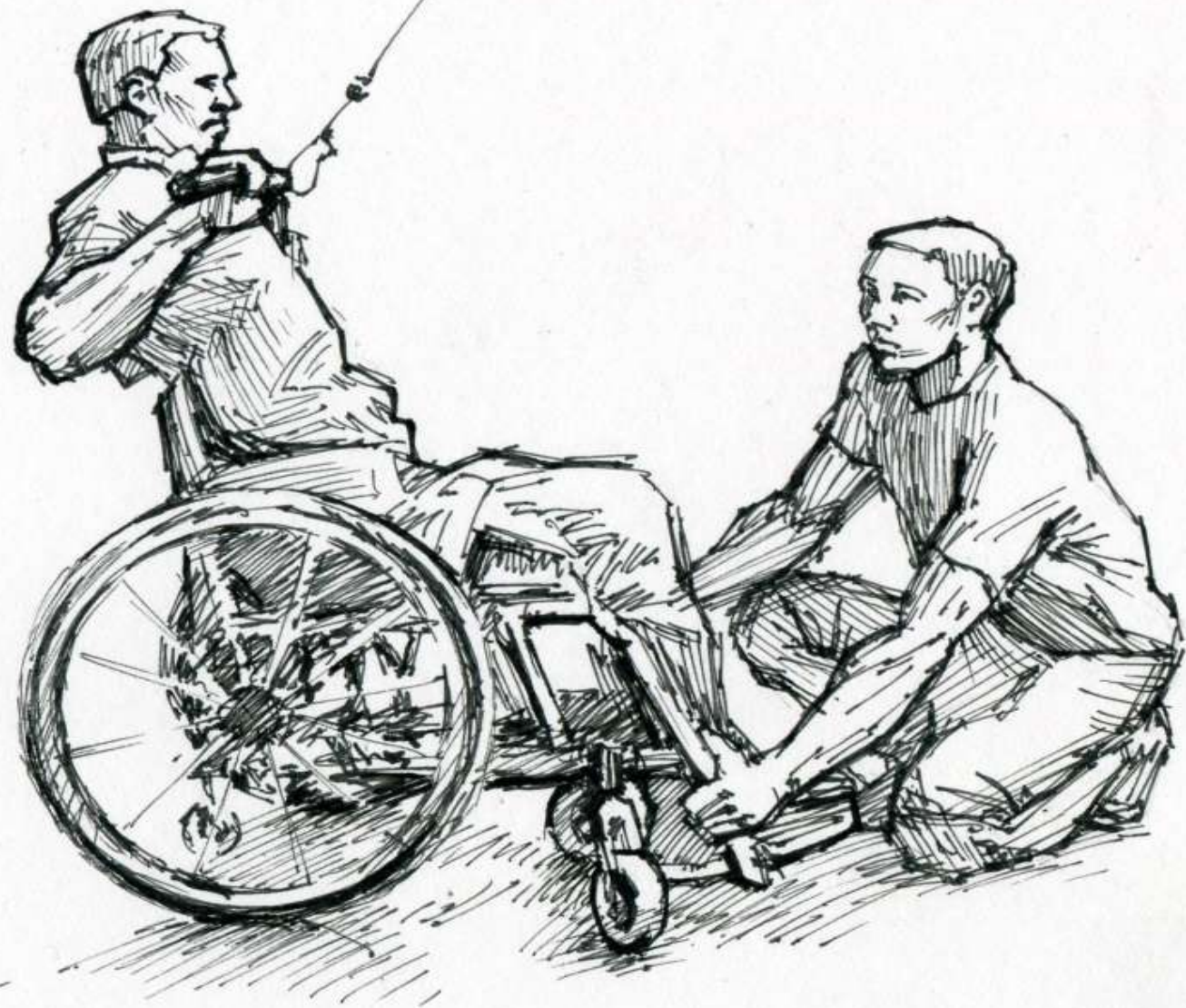
Minimum Scoping Recommendations for UDFE

Minimum required pieces of accessible equipment –one of each or 10% of each type

Upper and lower body strength equipment

Torso strength equipment





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*Working toward universal access
through research, design & education*