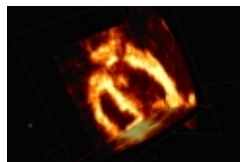


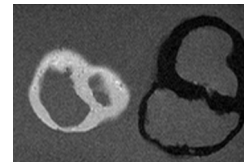
*Ideal for imaging dynamic cardiac structure, cardiac function and image guidance.*



Tri-planar rendering through one phase of a dynamic 3D CT scan of the heart phantom.



Tri-planar rendering through one phase of a dynamic 3D US scan of the heart phantom.



T1 weighted spin-echo sequence of two heart phantoms illustrating control of the MR relaxation parameters of myocardium.

## Product Description

Shelley's dynamic multi-modality anthropomorphic heart phantom is ideal for sophisticated analysis and validation of cardiac motion related to the human heart.

The dynamic human heart replica is made of a hydrogel material that realistically mimics the biomechanical properties (elasticity) of human soft tissue and incorporates anatomically correct left and right ventricle structures for imaging under ultrasound, CT, X-ray and MRI. The hydrogel is doped with contrast materials to mimic soft tissue under ultrasound, CT, x-ray and MR imaging.

User-friendly software, precise dual servomotors and an actuator are connected to the hydrogel heart phantom allowing for independent control of compression, stretching and torsion motion of tissue deformation. The flexible motion control software allows users to easily program and execute sophisticated cardiac motion events, including RR intervals and arrhythmia. ECG signals can be input to drive/synchronize the timing of the heart contraction.

## Applications

The phantom is designed for a wide range of development & validation studies in cardiac imaging, including:

- image processing: segmentation and visualization algorithms, real-time processing, morphological and anatomical characterization
- dynamic multi-modality and intra-modality image registration and fusion involving ultrasound, CT, x-ray & MR
- elastography: strain estimation, deformation tracking and tissue tagging acquisition and analysis
- dynamic, real-time, and motion-compensated data collection and reconstruction algorithms
- interventional device navigation: position & orientation
- characterization and correction of cardiac motion artifacts
- 4D optical flow-field measurement



## Features

- Left and right ventricular anatomy
- Realistic biomechanical properties
- Multi-modality imaging
- Realistic cardiac motion
- Programmable
- ECG signal input to drive the timing of the contraction
- Simulation of regular and time varying RR intervals
- Acoustic window for multi-angle ultrasound imaging
- Standardized ports for fluid flow and device access

## Benefits

- Perform multi-modality experiments / assessments.
- Makes 3D cardiac modeling and multi-modality imaging development, that require a great deal of testing and re-testing in the lab, easier by using a realistic dynamic phantom.
- Reproduce realistic cardiac motion helps to develop and test novel reconstruction and acquisition techniques and in order to get the best possible image quality.
- Allows control of cardiac rate and variability to test against sources of artifacts in a controlled manner.
- A very cost effective tool for shortening the research and development cycle when designing new methods for image based diagnostics and interventions.
- Increase the pace and productivity of your medical imaging research projects.
- Reduces reliance on animal studies and human volunteers.

## Optional Accessories

- Simplistic coronary vasculature.
- Pneumatic actuator for MRI motion
- Pneumatic respiration actuator for MRI

## Specifications / Requirements

### Motion specifications

Beats per minute: 90 (Max.)  
41 deg. Rotation  
2.8 cm (1.1") stroke

### Hydrogel heart specifications

PVA moulded construction  
Left ventricle volume, 100 ml  
Right ventricle volume, 100 ml

### Motor Controller specifications

VSA v4.0  
RAPU Manager Controller  
ASICC II Board  
Infrared remote control (for MRI Version)  
2 HITEC servos; HS 6965HB; HS 815BB  
USB connection

### Platform/Tank specifications

Tank/reservoir O.D. dimensions:  
Length 61cm (23.625") x Width 26.75cm (10.5") x  
Height 28cm(11").  
With electronics & actuator encasement the total length is  
76.25cm (30").  
Total weight: 17Kg (37 Lbs).

### Electrical specifications

110 Volt AC input  
5 volt 2.6 amp DC power supply  
5 Volt 3 amp DC power supply  
9 Volt battery (ASICC II Board)

### Computer system requirements

Windows ME/2000/XP/Vista with mouse  
(Windows 95/98 are not supported)  
USB 1.1/2.0 port  
SD/SDHC storage card



Patent Pending

S H E L L E Y M E D I C A L I M A G I N G T E C H N O L O G I E S

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