

# C3D

## Purpose

This tutorial shows you how to generate real time feedback from the Visual3D RealTime Tab when streaming a C3D file through Visual3D. The pictures and example in this tutorial are specific to graphing Left Ankle Angles. However, the same principles can be applied to any Link Model Based items.

## Steps

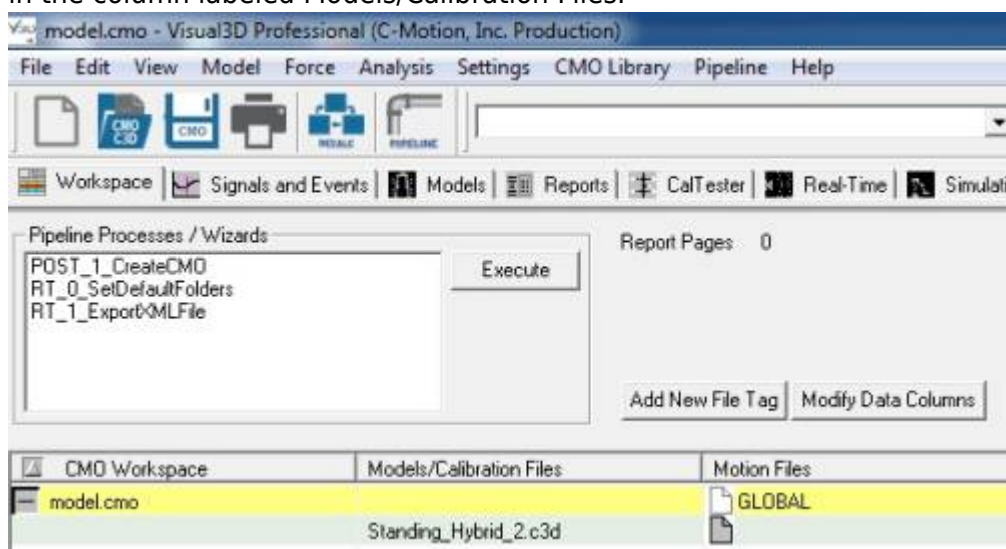
### Preparing for the Tutorial

1. Download the file [model.zip](#)
2. Save the file where you would normally save motion capture files.

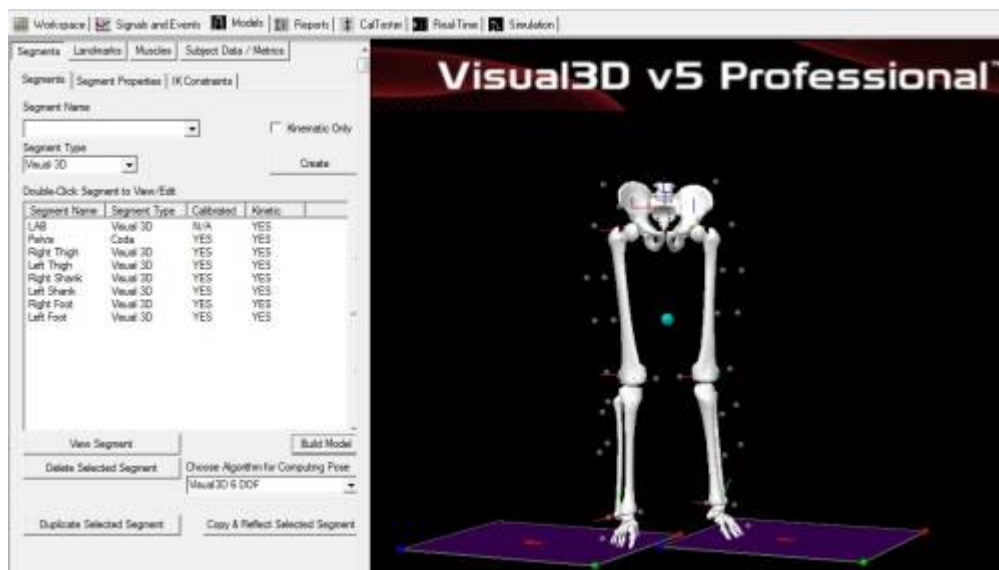
These sample Qualysis files were downloaded from [C3D.org](#)

### Step 1 - Open CMO File

1. From the File menu, select **Open/Add...**, choose *model.cmo*
2. From the workspace status screen, verify the model file named Standing\_Hybrid\_2.c3d appears in the column labeled Models/Calibration Files.

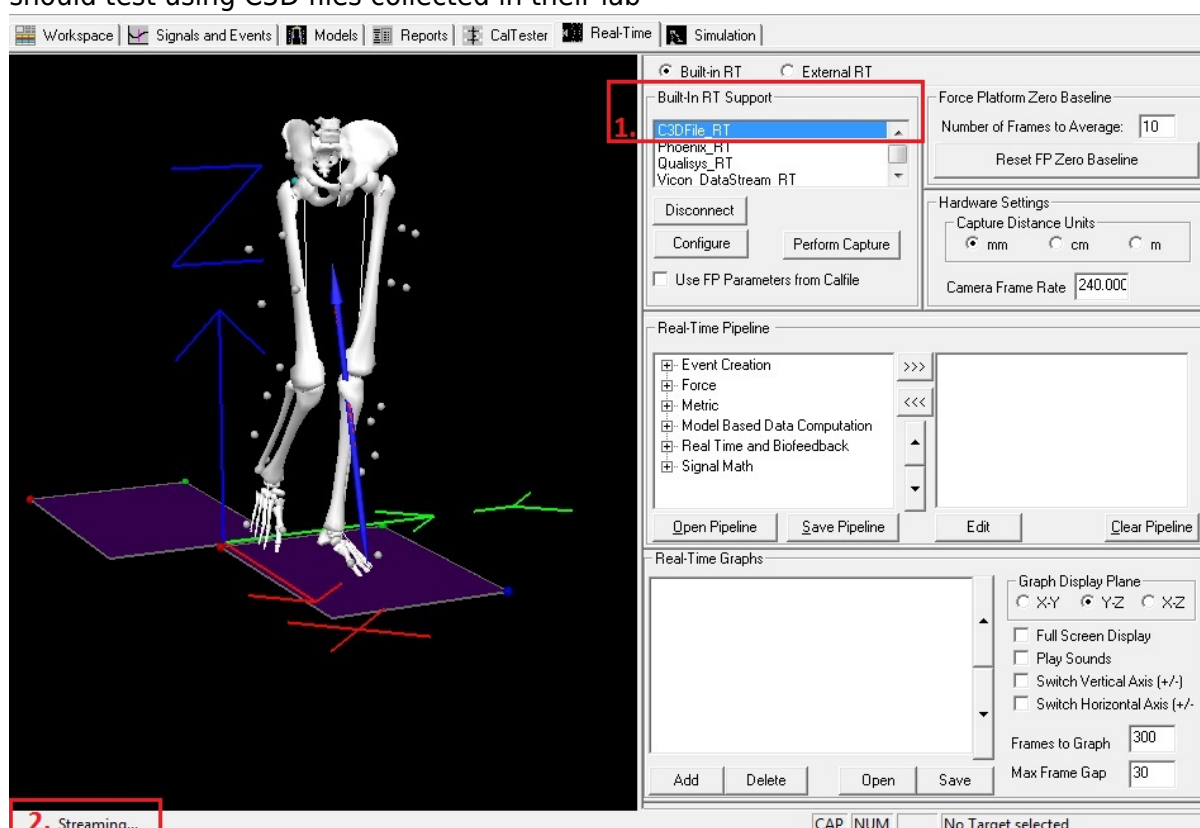


3. Switch to the **Models** tab to verify bones in picture

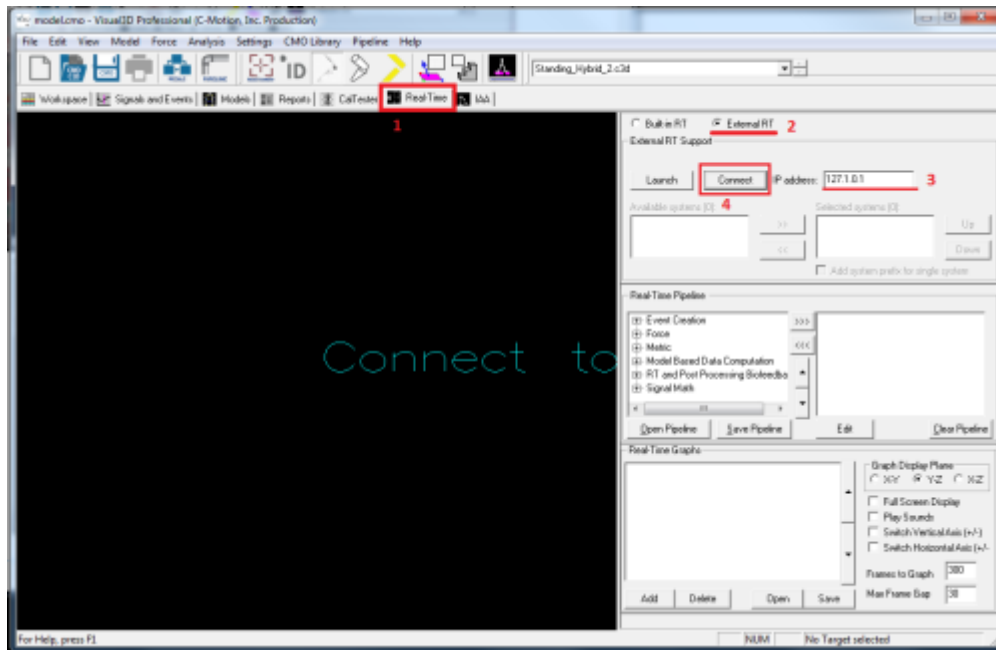


## Step 2 - Connect to RT stream/Load Emulation

1. Open the *Real-Time* tab
2. Connect to the C3D stream using either:
  1. the Built in RT plugin Click **C3DFile\_RT** (used to emulate a camera system), Browse the dynamic C3D file (Walking\_Hybrid\_2.c3d), **NOTE:** Before using the real time stream, users should test using C3D files collected in their lab



2. the External RT plugin, see the instructions on how to run biofeedback through Visual3D server: [Visual3D Server Tutorial](#)

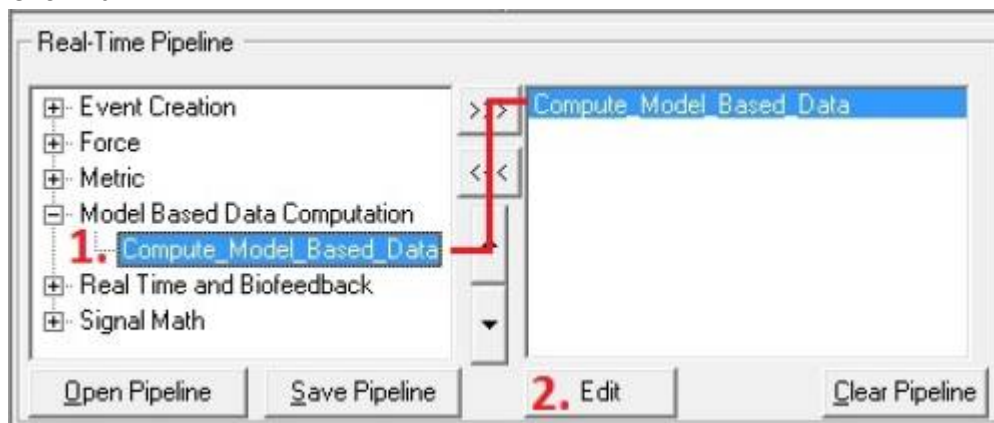


3. The data is automatically applied to the model

**NOTE:** Streaming status is in the lower left

### Step 3 - Compute model based item: RT pipeline

1. Open up *Model Based Data Computation* under the **Real-Time Pipeline**
2. Double click *Compute\_Model\_Based\_Data*
3. Click **Edit**



4. Change the corresponding:
  - Data Name:** Ankle
  - Folder:** ORIGINAL
  - Model Based Item Properties:** JOINT\_ANGLE
  - Segment:** Right Foot
  - Reference Segment:** Right Shank

**Compute Model Based Data**

Data Name: **Ankle**

Folder: **ORIGINAL**

Result Folder will always be Original

Joint Angle (degrees):

Segment and Reference Segment define the angle desired.  
Normalization is relative to standing posture.  
The Cardan Sequence defines the order of rotations.  
Warning!!! If you are using the anatomical axes (ML, AP, or AXIAL) the sign of the angle follows the Right Hand Rule about the actual corresponding segment coordinate system axes.

Model Based Item Properties

JOINT\_ANGLE

Negate

☐ X

☐ Y

☐ Z

Normalization

Normalization Off

Segment: **Right Foot**

Reference Segment: **Right Shank**

Cardan Sequence: **X-Y-Z**

Done Reset Dialog Cancel

5. Click **Done**

## Step 4 - Create Graph

1. Click **Add** in the **Real-Time Graphs** section, and enter the following:  
**Data to:** LINK\_MODEL\_BASED::ORIGINAL::Ankle

**Add/Modify Real-Time Feedback**

Graph Type: ☐ No Graph ☒ 2D Graph ☐ Bar Chart

Data to: 1.

Component:  Line Color:

☐ Graph P2D StdDev Component

Graph Position: Column:  Span:   
Row:  Span:

☒ Automatically Scale to Signal Min/Max ☐ Scale Graph to User Defined Min/Max

☐ Highlight Target Range  +/-

☐ Highlight Metric Mean ☐ Highlight Metric StdDev

Event Handling

☐ Anchor Graph Start Frame on Event ☐ Anchor Graph Stop Frame on Event

☐ Update Graph Every Nth Cycle

Number of Cycles to Display:

Select Events to Annotate:

Warning Data Color. NOTE: If 'Less Than' equals 'Greater Than' then there is no warning given.

|                   | Less Than                      | Greater Than                   | Also Change Background Color to      |
|-------------------|--------------------------------|--------------------------------|--------------------------------------|
| Warn Yellow When: | <input type="text" value="0"/> | <input type="text" value="0"/> | <input type="text" value="Default"/> |
| Warn Red When:    | <input type="text" value="0"/> | <input type="text" value="0"/> | <input type="text" value="Default"/> |
| Warn Sound When:  | <input type="text" value="0"/> | <input type="text" value="0"/> | <input type="text" value="Default"/> |

☐ Only Graph ☐ Graph Border

Sound File (Less than):

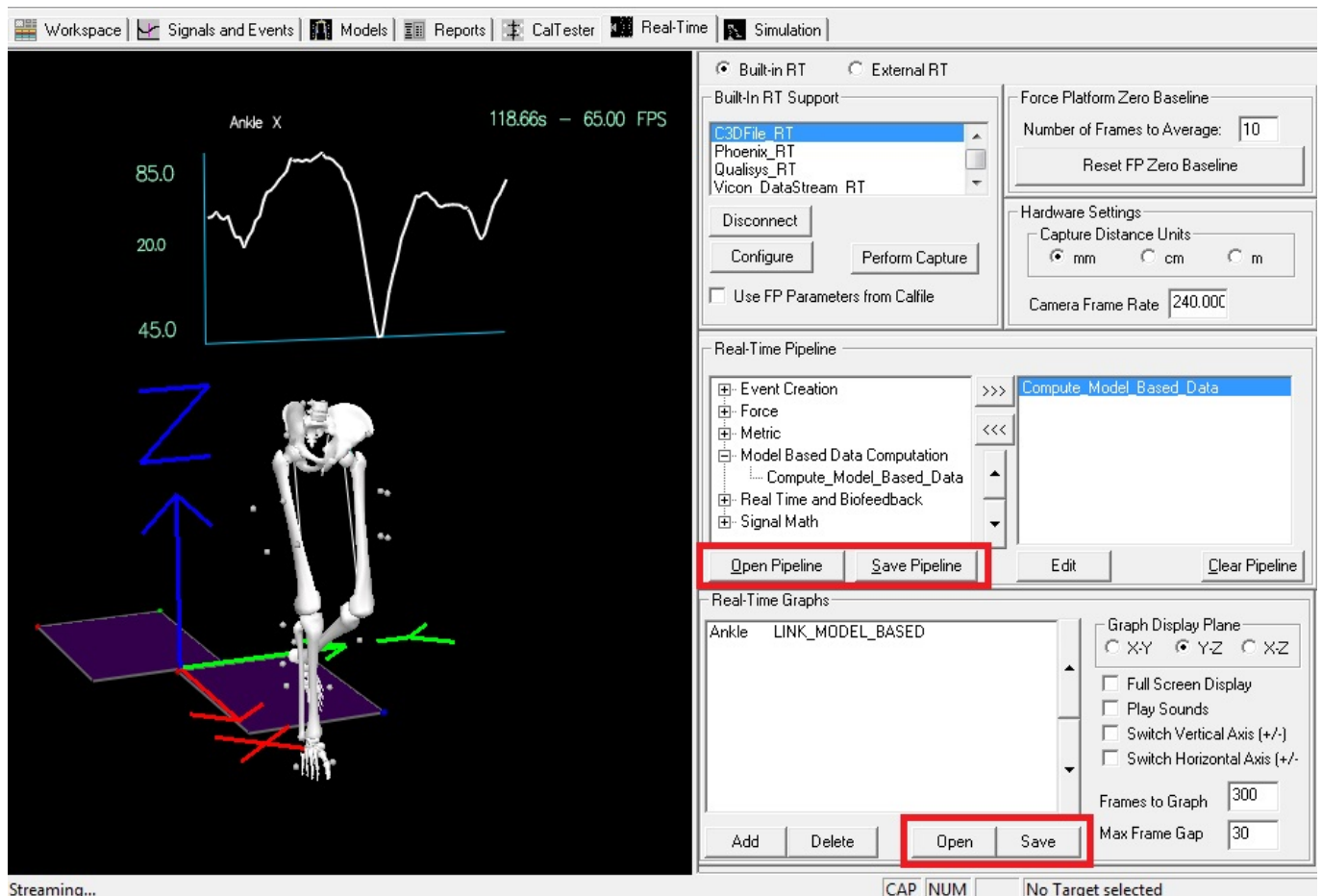
Sound File (Greater Than):

2.

2. Click **OK**

## Complete

Your result should show a Real-Time stream that looks like the picture below:



Remember to save the Graph and RT Pipeline

From:  
<https://has-motion.com/wiki/> - Wiki Documentation Site

Permanent link:  
[https://has-motion.com/wiki/doku.php?id=visual3d:tutorials:real\\_time:biofeedback:c3d&rev=1755184868](https://has-motion.com/wiki/doku.php?id=visual3d:tutorials:real_time:biofeedback:c3d&rev=1755184868)

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