



COMMUNICATOR[®]

Gesture BUILDER

Version 2.0

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USER'S GUIDE

Vcommunicator Gesture Builder 2.0 User's Guide

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Introduction

Vcommunicator® technology uses Vcom3D's computer-generated three-dimensional (3D) animated characters that can communicate with lip-synched speech, gesture, facial expression, and other human behaviors. Authoring Tools included in the Vcommunicator Suite are:

1. Gesture Builder, a tool for creating gestures for animating 3D characters, and
2. Vcommunicator® Studio, a tool for adding gesture, facial expression, and gaze orientation to synthetic and/or recorded speech tracks.

Also compatible with Gesture Builder is Vcom3D's Sign Smith Studio sign language authoring tool. It operates on the same principles as Vcommunicator Studio but provides sign language access to content.

Gesture Builder will allow users of Studio to create new gestures (or signs), including gestures that can be spatially inflected at run-time. A key feature of this tool is the use of our Inverse Kinematics (IK) technology. This allows the user to focus on the hand position. Once the user selects a hand shape and positions the hand, the IK software automatically places the joints of the wrist, elbow and shoulder in the correct position. This approach is fast and easy and puts the power of creativity more fully into the hands of the Studio users.

To organize the handshapes, we have listed all applicable shapes for Vcommunicator Studio first. Following that list are the manual handshapes based on American Sign Language. These would be used in Sign Smith Studio. However, all handshapes are usable in both products thereby increasing the choices available to the user.

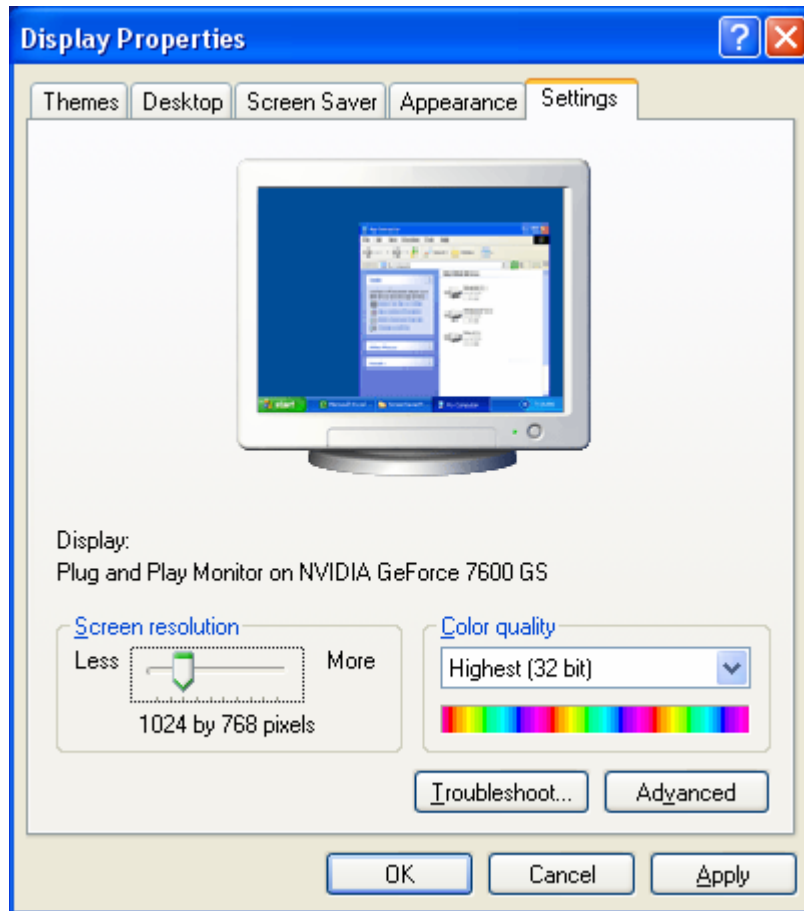
System Requirements

This version of the Gesture Builder runs on personal computers with the Windows® operating system. The recommended minimum system configuration is:

- Pentium 2.0 GHz processor
- 512 MB RAM
- 100 MB hard disk space
- CD-ROM drive
- 1024x768 resolution (or better)
- OpenGL(R) accelerated graphics card
- Windows 2000, XP, and Vista

Display Properties

Your display properties should be set for 1024 x 768 pixels or higher and 32 bit color (Highest or True Color). Display properties can be set by right clicking on the monitor background. Click Properties and then select the settings tab in the pop-up menu. Then select colors and screen area.



The Display Properties Dialog

Work Space

Tool Bar

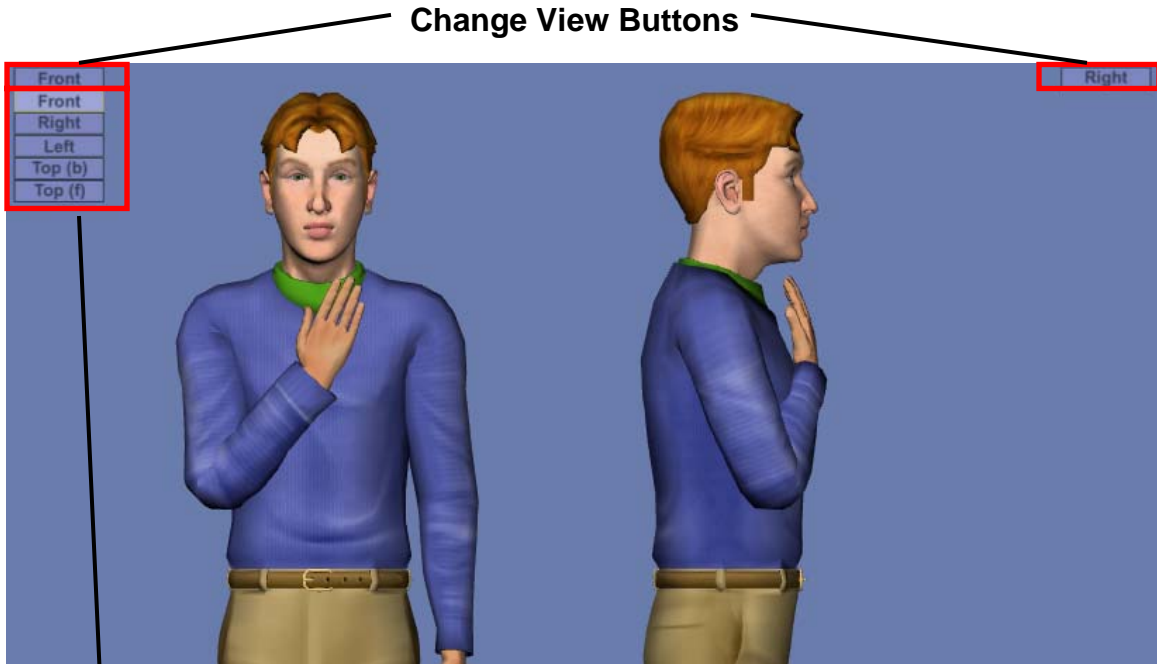


In order from Left to Right:

- **New:** Opens a new gesture with a single hold block for the right hand.
- **Open:** Opens an existing gesture (*.ges) file.
- **Save:** Saves the current gesture to the computer.
- **Hand Shape (HS):** Opens the Hand Shape view, which allows you to change the shape of the hand in the current time segment.
- **Active Articulator (AA):** Opens the Active Articulator view, which allows you to select a point on the hand that will interact with a Focal Site.
- **Focal Site (FS):** Opens the Focal Site view, which allows you to select a point on the body or opposite hand that will interact with the Action Articulator point.
- **Elbow Target:** Toggles the use of the Elbow Target sphere, which defines a location the elbow will attempt to “point” toward.
- **Recorder:** Toggles the recording feature. When this is on, all character movements are recorded. When it is turned off, those movements are placed in the timeline as Holds and Movements.
- **Preview:** Plays your gesture from beginning to end.
- **Export Action:** Exports your gesture to an Action (*.act) file.

Dual View

Shown below is the Dual View Interface of the Character Model you will use to build a gesture. Each view can be changed individually by clicking and selecting the menu at the upper left and right of each view.



The Dual View Window

Change View
Menu

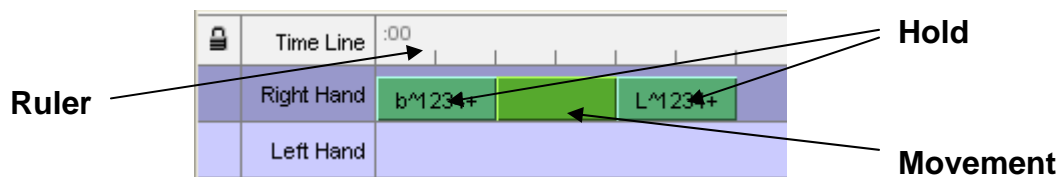
Time Line

Gestures usually have a beginning position and an end position. From one position to the next, the gesture might also change its hand shape and hand orientation. The Time Line allows you to create these changes in sequence by adding time segments for both the left and right hands. There are two basic types of time segments: Holds and Movements.

Holds are segments where the gesture is stationary. The width of these segments determines how long the character will maintain the same pose. If you make the width of a hold segment small enough, it will turn yellow, indicating that it is a momentary hold. To the viewer, this momentary hold is so short that it appears that the character never stopped moving.

Movements represent the transition period between two holds. The width of these segments determine how long it takes to transition to the next hold.

When you open Gesture Builder, the first time segment (Hold) is placed on the Time Line.



Building a One-Handed Simple Gesture

Choosing the Hand Shape

With this first exercise, you will learn how to change hand shapes, set the Active Articulator and Focal Site, set the Elbow Target, add timing segments, and change the location of the gesture. To give you a basic introduction to Gesture Builder features, this tutorial will walk you through the creation of a simple “scratch temple” gesture.

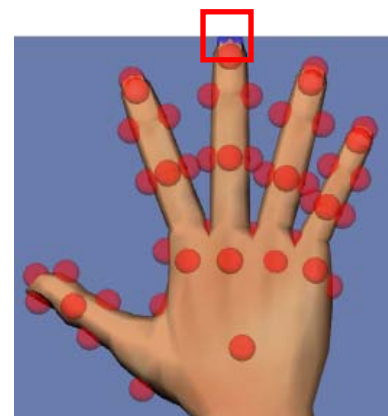
1. Create a new gesture by clicking the “new” icon in the toolbar, or by going to File->New.
2. Click the 🖐️ icon on the toolbar. The Hand Shape view appears.
3. Choose the first handshape in the 5th row from the bottom of the “5 Finger (Open)” category.



Using Active Articulator and Focal Site

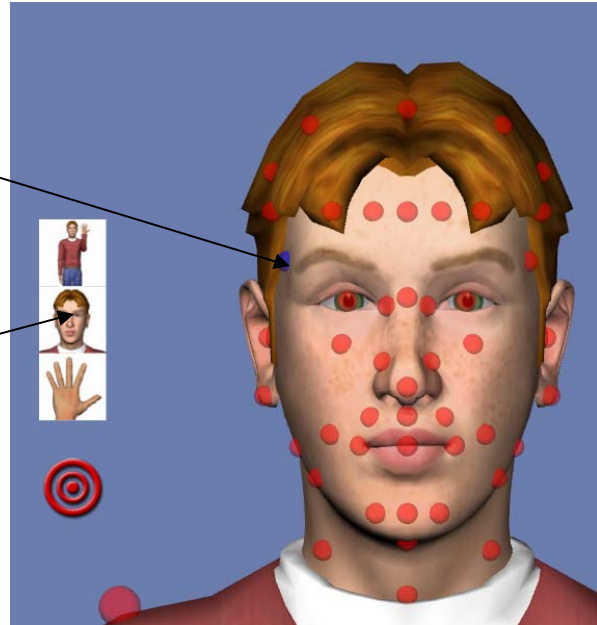
Now that you have selected the first hand shape, you need to select which part of the hand you want to contact the body. This is called the Active Articulator (AA).

1. Select 🖐️ from the tool bar.
2. Select the AA site (the tip of the middle finger).
3. Next you will need to select the part of the body that the AA site will be touching. This is called the Focal Site (FS).
4. Select 🖐️ from the tool bar.
5. Select the Head View.
6. Click on the right temple to select the FS site.
7. Deselect the FS button from the toolbar. You will now see both sides of the Dual View area.




Select This Focal Site

Head View Button



Focal Site Head View

Adjusting Orientation of the Hand and using Elbow Target

You'll notice that the right hand is in an awkward position, but the tip of the middle finger is in the right place. To adjust the orientation, use the "dials" that float near the hand. Experiment until you achieve a similar result to the picture on the right. If the elbow doesn't look like it's in the right place, try clicking on the  icon in the toolbar. A red sphere will be placed at the elbow. If you click and drag that sphere, the elbow will try to "point" at it. This is also useful when you want to make sure the elbow stays in the same place across multiple time segments.



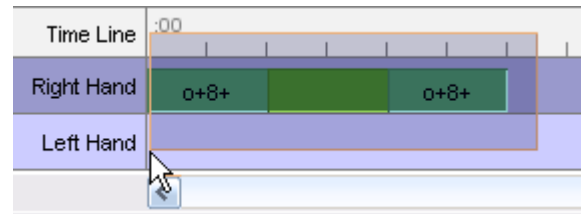
Adding More Segments

You are now ready to add more time segments to the gesture.

1. Right-click the area next to the time segment on the Right Hand Time Line.
2. On the small menu select MH for adding one Movement and one Hold segment. (Note: There is also an option for adding an MX. The only difference between the two is that the MX Hold segment is 0/15 of a second long by default, whereas the MH Hold segment takes its length from the previous hold segment in the timeline)
3. Select the last segment (Hold) by clicking on it. This allows you to change the last part of the gesture.
4. Now click and hold on the hand in the dual view area while dragging your mouse. This will move the hand. Drag the hand down slightly.

Copying Segments

Now, we want this gesture to repeat one more time, so we need to copy the whole animation and paste it at the end. To do this, follow these steps:



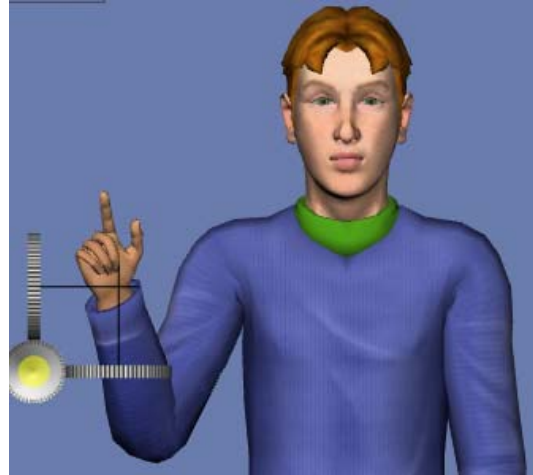
1. Click and hold in the Ruler portion of the Time Line.
2. Drag your mouse to form a selection box that includes the whole animation. Let go of the mouse button.
3. Right-click on one of the selected segments, and click Copy from the menu.
4. Now, Right-click on the empty part of the timeline to the right of your last segment, and click Paste from the menu.
5. Click the Preview button to review your gesture.
6. Congratulations! You've made a gesture!
7. If you would like to save your gesture, click the Disk icon in the toolbar, or go to File>Save.




Building a Two-Handed Gesture

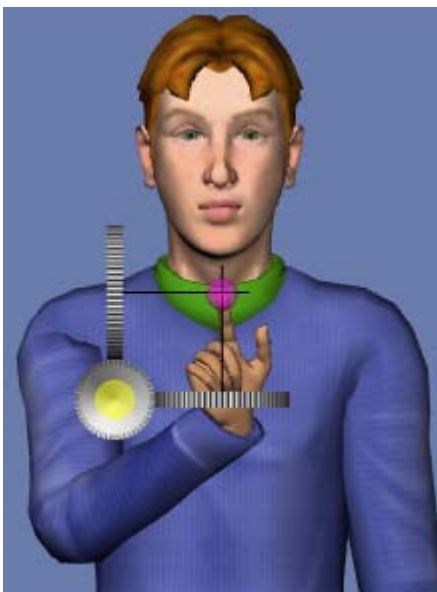
To add gestures to the left hand, follow the same procedure as for the right hand, but use the Left Hand track instead.

Building a Gesture That Points at a Target

Up until now, you have probably been making gestures that look the same in most contexts. There are other gesture types that change direction or point at a different target depending on the context. Let's create a simple pointing gesture.



1. Open a new gesture file.
2. Use what you have learned from the previous tutorial to replicate the gesture in the picture to the right.
3. Click the  icon to open the Active Articulator (AA) view.
4. Select the tip of the index finger.
5. Click the  icon to open the Focal Site (FS) view.
6. Click on the "Target" icon on the left of the FS view.
7. Click the  icon to close the Focal Site (FS) view.
8. A purple Focal Site has appeared in-front of the character's neck. Move the hand so that the tip of the index finger is at the center of that Focal Site.
9. Now, click and drag the Focal Site to return the hand to the desired location.

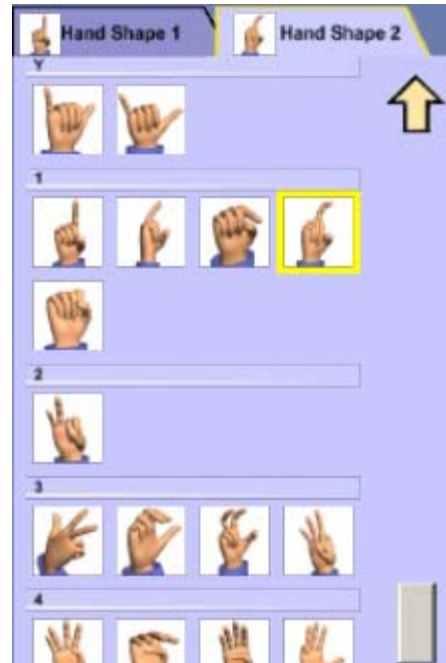


We have just defined the default position of the Focal Site for this gesture. Whenever this gesture is used in Vcommunicator or Sign Smith Studio, the user will have the option of selecting a new location for this Focal Site. The tip of the index finger will always try to place itself in the same location relative to the Focal Site. This allows you to create pointing gestures that can be told where to point, instead of making many variations of the same pointing gesture.

Oscillating Hand Shapes

Some gestures have a rapid change back and forth between two hand shapes throughout the gesture. These hand shapes are called oscillating hand shapes. The hand shape picker allows you to select the two hand shapes that you want to oscillate.

1. Select the 🖐️ button on the tool bar.
2. Pick the first hand shape in the Hand Shape 1 tab.
3. Next, click on the Hand Shape 2 tab. By default the “X” (no hand shape) is selected.
4. Select the second hand shape from this menu.
5. Click the 🖐️ button again to close the Hand Shape view.
6. Press the preview button to view your oscillating hand shape.





More about Segments

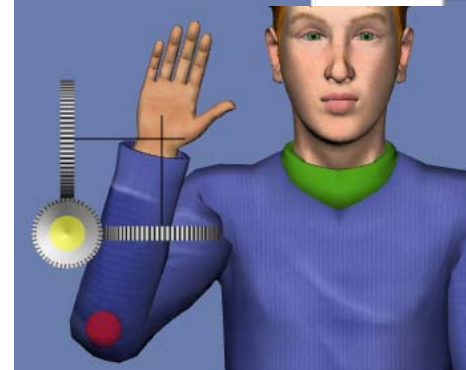
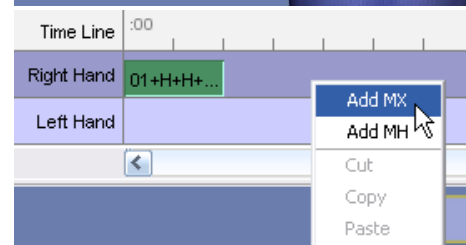
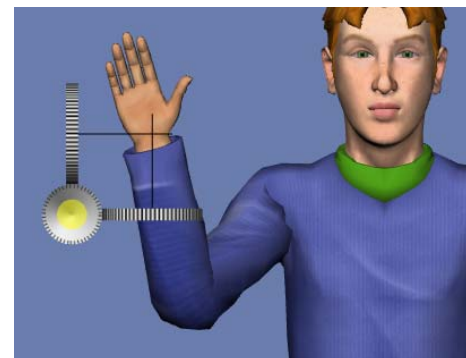
Deleting Segments

You can delete a segment by right-clicking on the segment, and selecting Delete from the drop-down menu.

Complex Movements

When building or inflecting gestures that have sweeping or circular path movements, it will be necessary for you to use several MX segments in combination. The example below will illustrate this technique by showing how to create a “wave” gesture.

1. Open Gesture Builder or click the New button if Gesture Builder is already open.
2. Click the  button to open the handshape selection window.
3. Select the handshape in the second row of the first column of the “5 Fingers (Open)” category.
4. Move and rotate the hand until it is in the position shown in the image to the right.
5. Click the  button to enable the Elbow Target. This will keep the elbow in place while we animate the movement of the hand.
6. Right-click on the timeline to the right of the Hold you are currently working on.
7. Select “Add MX” from the menu.
8. This will add a new hold segment to your animation. It is yellow to signify that it is 0/15 of a second long. We are using this so that the wave will not appear jerky.
9. Click on the new Hold segment.
10. Move and rotate the hand until it is in the position shown in the image to the right.
11. Use the mouse to make the Movement segment about 3/15 of a second long. This will provide a realistic amount of transition time between parts of our “wave”.

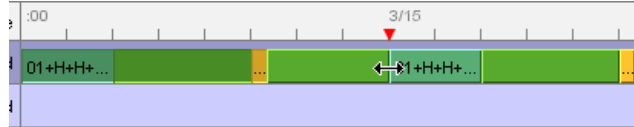


12. Using what you have learned in earlier examples, select everything in the Right Hand timeline and copy it.

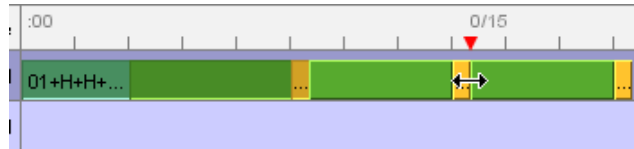


13. Paste the copied segments to the right of the current segments.

14. Resize the transition between the second and third hold segments to be 3/15 of a second.



15. Resize the third hold to be 0/15 of a second long. It will turn yellow when you do this.



16. Preview your new “wave” gesture. Notice how the hand does not appear to stop at either end of the arc.