

ULTIMATE POSE MASTER

Use it as a synthetic and organized control interface with all the “smart features” linked to the helpers, which is the default when the you open the interface,

OR

Click on the button located at the bottom left of the interface, “Disconnect Helpers (Basic Use)” and use this script as a synthetic control interface, without the “smart features” linked to the helpers.

This button then becomes the “Reconnect Helpers (Advanced Use)” so that you can swap from one mode to another fast and easily.

Summary (click on lines to browse document)

What can you do with Ultimate Pose Master

Release Notes: Version 1.1 update (including how to solve lag issues)

Release Notes: Version 1.3 update (Compatibility with 8.1 and improvements)

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WHAT CAN YOU DO WITH ULTIMATE POSE MASTER (FOR GENESIS 8, 8.1 AND GENESIS 3)

With Pose Master you will be able to create poses or modify existing poses in a very efficient way. This is a very flexible tool which can be used in different ways.

- You can choose to use it as a synthetic interface gathering and giving control on all bones rotations (and translations for hip and figure) in an organized way (please note that pectorals, metatarsals, ears and face bones are not included). For this, you simply have to “Disconnect Helpers”, and act on the various bones dials as if you were in the Parameters Tab. In order to gain time, all helpers can be disconnected simultaneously but you can disconnect the exact ones you want too.
- Or you can choose to use Pose Master with some of, or all, its automatic control mechanisms, which will allow you to place hands (the one(s) you want) and feet (the one(s) you want) at a given location, and to adjust the other figure bones while keeping these hands and feet in place: you can decide if, and which, hand(s) and foot (feet) follow the other bones “the normal way” or try to stay where you placed them. Options are also available to know which specific arms and legs bones will be automatically adjusted or not when you work on the pose of your figure. These automatic controls can also give you the possibility to rotate the eyes so that they look in the direction of a node of your choice.
- You can define, for each hand and foot, a preferred orientation, and impose this orientation to the hand and the foot while you adjust the hand and foot location or the arm and leg rotation.
- At any time, you can display and/or update the location of the Center of Mass of the figure, and the direction the figure is looking into. You can also choose via the interface an object in the scene to be in the direction the figure is looking into.
- You can load directly via the interface a few fingers poses (fingers + carpals), so that it gives you a better overview of your final pose “without zero posed fingers”, and you can also benefit the optimized “Fingers” Tab of the interface.

Tips:

It is HIGHLY RECOMMENDED to use the texture shaded mode while you pose the figure! If you use the Nvidia Iray mode, the interface will work, but will be much less responsive, much slower, and as a consequence harder to handle. AT THE BOTTOM OF THE “GENERAL OPTIONS” TAB YOU HAVE TWO BUTTONS. One to apply “NVIDIA Iray”, and the other one to apply “Texture Shaded” preview modes.

The same way, the figure with high Mesh Resolution levels (3, 4) will be less responsive.

For large variations of hands or feet positions of bones rotations, it is better to use the handles of the dials. Once you are close to the positions and orientations you want, it is much better to use the “-“ on the left and the “+“ on the right of each dial, or to enter directly the value you want.

If you enter the values manually for the rotations of arms or legs bones, the value you entered may be recalculated – and modified - if the corresponding helpers are connected.

If, in connected mode, you have convergence issues, such as a straight leg, arm, with the hand or foot being far away from the helper, you can read this documentation, use the interface buttons displaying Solutions (General Options Tab), or look at the YouTube video to very rapidly bring the situation back to normal: <https://youtu.be/LfV-6CVpTjA>, and <https://youtu.be/835atAwU3NY>

RELEASE NOTES: VERSION 1.1 UPDATE

The update from the original 1.0 to the 1.1 version includes several new tools dedicated either to answer the features requests on the forum, or to address more specifically the few of you (two people declared this at the time of the update) who experiment lag issues when they use this in the connected-advanced mode (i.e. with the helpers being active).

Performance tools included:

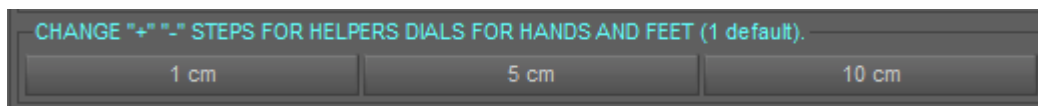
The “Arms” Tab became the “**Arms/Conv.**” Tab since it now **additionally includes convergence presets** and other tools for the eventual people who may encounter lag issues, or for anybody who may want to test other settings. They are located at the bottom of this tab. Those three convergence presets are “Default”, “Medium”, and “Fast”, and correspond to the three following buttons:



Now in the Arms/Conv Tab, you can find 3 convergence settings. They all act on BOTH feet (and legs legs) and hands (and arms) in connected (advanced) mode. The “Default” on the left is the slowest and most precise. The “Fast” on the right is the minimum convergence settings, is much faster and responsive, but less precise. This is the one you can use if you have big lag issues. The “Medium” one is a compromise for people who may want a more responsive situation, without losing too much precision. You can set up your own convergence settings at the top of the “General Options” Tab.

Even if it seems that the wide majority of users does not meet any performance issues, these convergence tools can be useful for everybody. You will also find in this 1.1 version sensitivity presets for hands and feet helpers dials (*allowing to define the “step” used when you use the “-” and “+” around the helpers dials, and as a consequence to work more efficiently with those “-” and “+” instead of the dials handles*).

The drawback of the fast and medium solution is that if you want to reach a stretched leg, you may have to decrease (near 0) the Bend Shin dial(s) (available in the interface), since the low number of iterations may not manage to un-bend the shin enough depending on your needs.



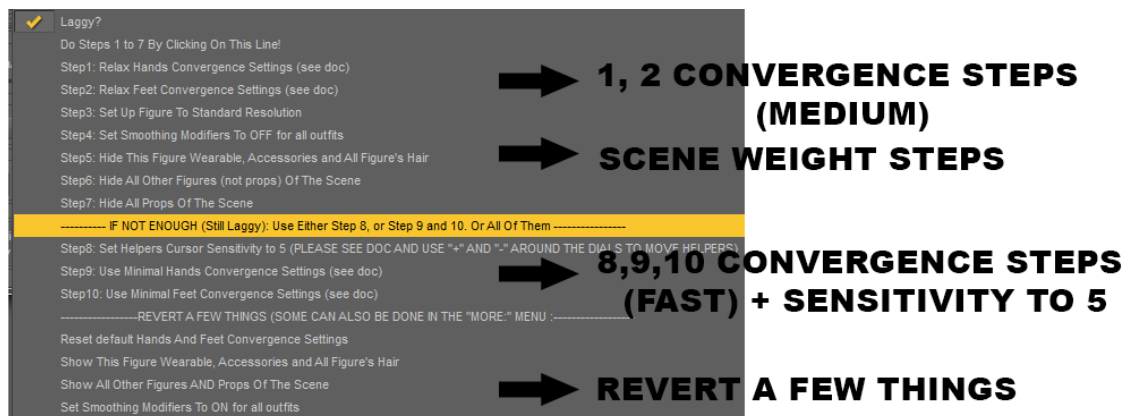
Now in the Arms/Conv Tab, you can find 3 sensitivity settings for helpers dials. They all act on BOTH feet and hands helpers dials. This allows you to use a 5 or 10 cm step, and to use the “+” and “-” around the dials driving the helpers location to solve the eventual lag or slow down issues, as explained bellow.

The issue for the few people who are experimenting lag issues comes from all the morphs included in the figure (JCMS, etc, etc) which are controlled by the pose. It is because refreshing those morphs takes a lot of time, much more time than the calculus made in the script. In order to completely solve this issue, if changing the convergence settings as mentioned above is not enough, the best way is to set up a 5 or 10 cm step (sensitivity) for the hands and feet helpers and to use only the “+” and “-” around the dials, and to avoid using the handles of the dials. It should completely solve the issue, because at each step you have only one refresh of all the controlled morphs in the figure, instead of tens if not hundreds

of those when you use the handle of the dial. IF YOU USE THOSE “+” and “-“ around the helpers dials, you can hold down the left mouse button of them to have a continuous (but step by step) variation of the hands or feet location.

Even if located in the “Arms/Conv.” tab, all these convergence/sensitivity tools act both on hands (arms) and feet (legs) dials. For now, they are located in the same Tab as the Arms, because I found it very handy, requiring less “clicks” to access it than if it was in another tab, but if it is an issue for users, it is possible to move them to a new dedicated tab.

“Laggy?” Additional Tools have been included in the bottom right of the interface, so that they are permanently available. In the “Laggy?” menu you will find many scene and convergence tools dedicated to lighten the scene and the calculations. Several steps are proposed to solve the lag issues some of you may suffer from.



In the “Laggy?” Menu, located at the bottom right of the interface, you will find, just below the “Laggy?” line, a choice to make all the modifications step 1 to step 7, then all the choices individually, allowing (1-7) to change the convergence settings of the calculus and to SIMPLIFY your scene, in term of mesh resolution of your figure and of properties and visibility of other elements which may slow down the scene. In the second part of the menu (the 3 choice bellow IF NOT ENOUGH..) you can change the sensitivity of the steps of the “+” and “-“ of the dials moving the helpers and set the lightest convergence settings possible. Finally, the four last choices allow you to revert a few of your choices.

“More:” in the more menu located at the bottom right of the interface, you will be able to:

- Store at any time a pose you like, so that you can restore it later on during the same or another script session. Only one pose can be stored, if you store the pose again, the new pose will replace the previous stored pose.
- Restore the latest stored pose (from this or any other session of the script). You have two choices: you can restore it and leave the helpers where they currently are, or you can restore it and place the helpers on the hands and the feet.
- Change cursor sensitivity to 1 and 5, which can also be done using the buttons added in the “Arms/Conv.” Tab.
- To hide some elements which may be heavy in the scene and prevent the script to be as responsive as it should be (such as figure children accessories and wearables, all wardrobe and accessories (including the ones of the other figures), all hair of the scene, all figures (except the one selected) in the scene, all non-figures in the scene).
- To show those elements.

- At the end, two choices, one to close the script keeping the helpers, or to delete the helpers and close the script.

“Convergence Max. Iter. recommended values”: The previous minimum of Max. Iterations indicated in title of the two convergence boxes of the “General Options” Tabs were lowered from 5 to 2 for the hands and from 20 to 5 for the legs. This change was made so that people with responsivity issues dare to lower strongly these values. Yet, the previous limits (5&20) remain the recommended limits if you need a very precise result.

Other tools: a 2-3, and even up to 5 seconds to load for the script is normal, because a lot of things occur in the background. Yet, some debugging tools have been included in during the launch procedure in order to see in the log file the duration of 8 initial steps. This is probably temporary and should be removed in the next update.

Features requests:

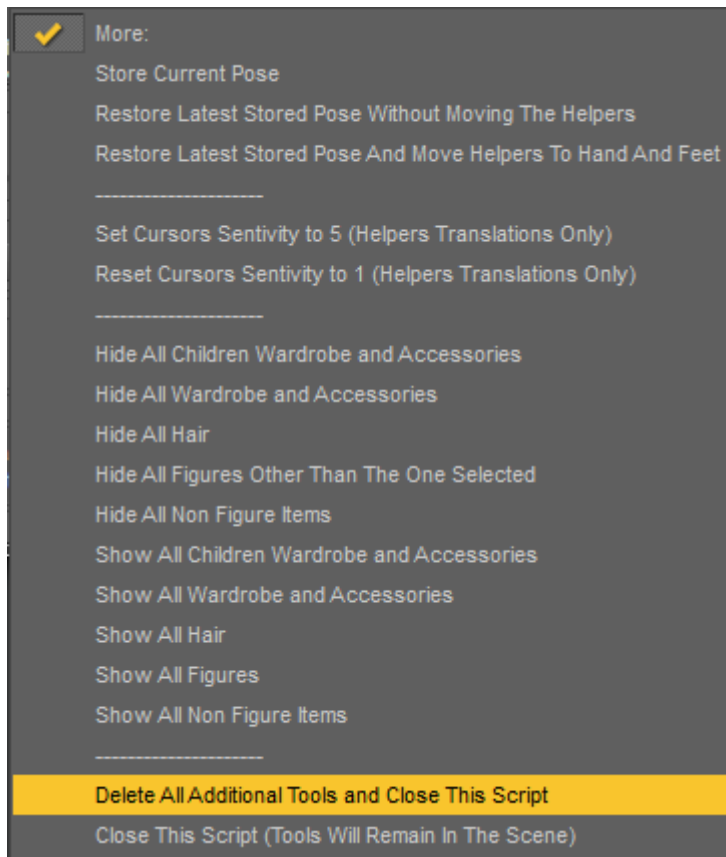
Visibility:

Additional choices in terms of visibility were included in the “Choose Action (Visibility):” menu of the General Options Tab: “Hide All Helpers In Render Modes” and “Show All Helpers In Render Modes” will allow you to hide and show helpers only when you render the scene, or when you

When any visibility choice is make for a given scene, it remains as it is for any of this scene session, and for any script session, until you change it again, or until you delete the helpers from the scene, meaning that you only have to make this choice once for a given scene.

Store a pose to restore it later on:

While you develop you pose you are now able to store it at any time, and to restore the latest stored state at any time to. If you decide to restore a pose, you have two choices for that: with or without placing the helpers on the hands and feet. All these Store/Restore tools are available as the three first choices of the More menu located at the right bottom of the interface.



In the "More:" Menu, located at the bottom right of the interface, you will find Store/Restore Tools, Scene tools (hide and show by category), and two options to keep or not helpers and other tools in the scene when before the script close it (the script will simply close, or delete all tools and close).

Pending Features requests:

Not implemented: Undo the latest action.

RELEASE NOTES: VERSION 1.3 UPDATE

The update from the original 1.1 to the 1.3 version includes or changes:

- **the compatibility with Genesis 8.1** was added, considering the resolution of Genesis 8.1 begin higher, it is a good idea to lower the figure resolution (to 1 preview – 2 render for instance), either before launching the script, or using the “Laggy?” menu, “step 3”.
- **the improvement of the launch duration of the script** was obtained by restricting to the minimum what is saved in the initial pose and reloaded after the pose tools are created
- **you keep your initial camera** view when you launch the script (previously the view was automatically switched to perspective view).
- Concerning **automatic eyes placement**, now when this is processed, (by changing the target for the eye once automatic mode is activate), the main eyes pose controls (up-down / side-side) are first zeroed before the calculations occur. This was necessary for a better control of Genesis 8.1 eyes.
- **The convergence settings are now by default set to medium** (a bit faster but a bit less precise convergence), and “medium” configuration was adjusted consequently. You can change this in one click in the first tab, where you can access 3 convergence settings buttons (precise, medium, fast). You can also set up precisely what you want in term of distance and maximum iterations in the “General Options” tab. This change is due to the fact that Genesis 8.1 figures use a higher resolution, making the calculations slower, and to the fact that most people won’t read the documentation telling them it is better to set up figures to a “normal” resolution when using the script.
- **The leg convergence process** was adjusted so that it is now faster. It still requires more iterations than the arms, but is now faster than it used to be in the previous versions.
- **The helpers are now set invisible in simulation** as soon as you launch this script. **The helpers are now automatically set invisible in render, except** if you launch the script with NVIDIA Iray as the viewport Drawstyle (but all other Drawstyles, “Cartoon”, “Texture Shaded”, etc, etc will correspond to the use of “invisible in render” helpers). You can change at any time the render visibility of the helpers in the General Options Tab.
- **The Set Smoothing Modifier ON / OFF** now acts only on elements of the type : “Follower/ Wardrobe”.

Information: due to the choice to have a faster launch speed, the eyes pose cannot be restored when you use the “Restore initial pose”. Yet, the eyes can be restored if, just after the interface is opened, you click on the dropdown menu at the bottom right of the interface named “More”, and choose the option “Store Current Pose” near the top of the list. You will then be able to restore the initial pose AND the eyes pose by using the same dropdown menu and chose one of the two “Restore Latest Stored Pose” option.

Reminder concerning the usage of body pose controls before launching the script. In general, people start from pose presets without pose controls activated (so there is no problem), but it was planned anyway in this update to adapt the limits of the helpers variations so that they take into account the eventual pose controls applied before initialization. This was not technically possible so far, even is a solution is being studied. Yet in the meantime there is an easy solution : if, because of initialization steps with these pose controls activated, the space area the helpers can browse is too small, you simply have to remove the limits of each helper using the dropdown menu in the box of the corresponding helper (bottom of each “Move X X Helper” box, “Choose Action” menu, choice “Set Helper Limits OFF”).

I. Introduction

The purpose of this product is to modify existing poses or to create new poses in an easier, more flexible, and efficient way. It can be used on Genesis 3 and Genesis 8 and 8.1 figures only.

For this, you will use the various tools and options provided by the interface obtained by double clicking on the script "Ultimate Pose Master.dse".

The first important thing you have to know is that when you launch this script, the figure you want to pose, or a bone of the figure you want to pose must be selected.

I.1. Elements added to the scene

When you launch this script, several objects will be added to the scene if they do not already exist:

- Active Elements:
 - o Left Hand and Right Hand Helpers (one for left, and one for right)
 - o Left Foot and Right Foot Helpers (one for left, and one for right)
- Passive Elements:
 - o Origins of the Helpers coordinates, parented to some key bones of figure (Right/Left Shoulder Reference Location, Right/Left Thigh Reference Location). These are Daz Studio "nulls".
 - o V3D Eyes Axis, a long blue axis (null) located in the direction the figure is looking into, located in the middle of both eyes and parented to the head, and V3D Eyes Target Point, a point initially located at 1 m from the eyes, on the V3D Eye Axis.
 - o Later on, you can ask in the interface for the green Center of Mass axis (null) to be created.

The active helpers are real props and will be rendered if you do not hide them, or remove them for final render. They can be hidden for rendering in the interface, and of course in Daz Studio Interface too. In this interface, you can also translate these Helpers individually via Sliders (Dials), and arms and/or legs bones will be calculated so that the hands bones and/or the feet bones follow these helpers (will remain on it, see details later on in the documentation). You can move them in Daz Studio before launching the script.

In brief, Left Hand Helper controls the left hand location, Right Hand Helper controls the right hand location, Left Foot Helper controls the left foot location, Right Foot Helper controls the right foot location. Helpers can be disconnected from and reconnected to the elements they control. Furthermore, they also aim at keeping hand and/or feet in place: for a given Helpers locations of helpers, the surrounding arms and legs bones can be adjusted while keeping hands and feet on these locations.

If these objects, the helpers, already exist from another script session, and if their initial distance to the elements they control is higher than a given value, you will be asked when you launch the script if you want to place on hands or feet, or if you want to leave them where they are. If you choose to leave them where they are, you can place them on hands at any time later on, individually using the dropdown menu of the interface boxes dedicated to each helper, or collectively using the corresponding dropdown menu of the "General Options" tab.

The other elements added are "invisible for the render", parented to the Chest Upper Bones for the Hands, named "Right Shoulder Reference Location" and "Left Shoulder Reference Location". They are

parented to the Pelvis for the Feet, and named “Left Thigh Reference Location” and “Left Thigh Reference Location”. These are Daz Studio “Nulls” which will be used as the reference point (0 point) for Right/Left Hand/Feet Helpers Translations (the Up-Down, Left-Right, Back-Front coordinates of the helpers are related to these Nulls Locations).

When you launch the script, all the elements present in the scene, as well as all the elements which do not already exist and are created, will be affected to (when they are created), or transferred to (if they exist) the figure which is selected when you launch the script.

I.2. Eventual Modifications To The Initial Pose

If limits of some of the bones were off, they might be restored, changing your initial pose. More precisely LIMITS WILL BE RESTORED FOR SHOULDERS, COLLARS, FOREARMS, THIGH, SHIN, AND ALL TRUNK NODES as soon as you launch the script. This was an obligation to avoid unwanted figure deformation behaviors when several properties raised above the limits simultaneously.

The eyes pose controls (side-side and up-down only) will be reset to 0 if you use any of the dials or options related to the eyes in this interface, in order to allow the script to work correctly with the automatic alignment of eyes with target. Similar side-side and up-down controls for the eyes are available via the interface.

THE LIMITS of the eyes, when both eyes are controlled simultaneously have been set so that left eye and right eye rotation remain the same. They cover a range a bit smaller than the individual range of limits. In practice the limits for the eyes do not change in your Daz Studio interface, they change only for the script.

I.3. Important Remark regarding Body Pose Controls

It is recommended not to work using Pose Controls activated on the legs and arms level (eventually, but the impact is lower, on the waist and neck levels too). Even if you use such Pose Controls, most of the script tools should work properly or almost properly but you will probably have limitations in term of reachable areas, as well as in terms of flexibility of bones adjustments for given hands/feet locations.

There is no special issue working with hands Pose Controls or Toes Pose Controls, more precisely not more issues than when working in the parameters tab with such pose controls activated. Face pose controls are not affected by the script. You can use them. Eyes Pose Controls (Side-Side, Up-Down) will be set to 0 as soon as you will dial any of the dials related to eyes in this interface.

The interface, in the “General Options” Tab, is able to open the “Bake To Transforms” script, basically included in Daz Studio. You can this way bake the various body areas. If your figure is using face expressions, avoid to “bake to transforms” them, by never selecting the “Head” in the Properties Path of the options provided by this script.

I.4. Views

When you open the script, the view is automatically set to perspective view. If you were using a camera, you can select this camera at the bottom of the interface, in the “Perspective” dropdown menu (you can choose here any camera or view). The interest of using the perspective view is that it is the only view which can rotate around the figure or a node while using this script.

II. Posing figure arms using Hands Helpers Or Not

II.1. Introduction to the helpers and the first tab of the interface

In summary, the first tab of this interface allows you to pose precisely the hands of the figures, and once they are placed, to change the orientations of the arms allowing to reach this place for the hand.

For this, you will probably use the “Helpers” provided. The Helpers are objects loaded into the scenes and appear in the scene Tab with the names “Left Hand V3DPose Helper” and “Right Hand V3DPose Helper”.

Hands and Feet Helpers are Red-Green-Blue Arrows Objects. The colors are very important because in the interface, the dials driving the slider location act on the Red, Green, then Blue direction showed by this object, corresponding to the World Space Coordinate System X, Y, Z directions. They are named respectively “Left-Right” (for Red), “Down-Up” (for Green), and “Back-Front” (for Blue). You can move these helpers in the first Tab of the interface, named “Arms”, and, for the feet, in the second Tab of the interface, named “Legs/Hip”.

THOSE HELPERS, for the hands, ARE LOCATED AT THE ORIGINS OF THE HAND NODES (BONES), not in the middle of the palm, not at the tip of it, but the origin of the hand bone, which is close to the wrist.

You simply have to know and/or anticipate that when you place the helpers before launching the script or when you move the helpers.

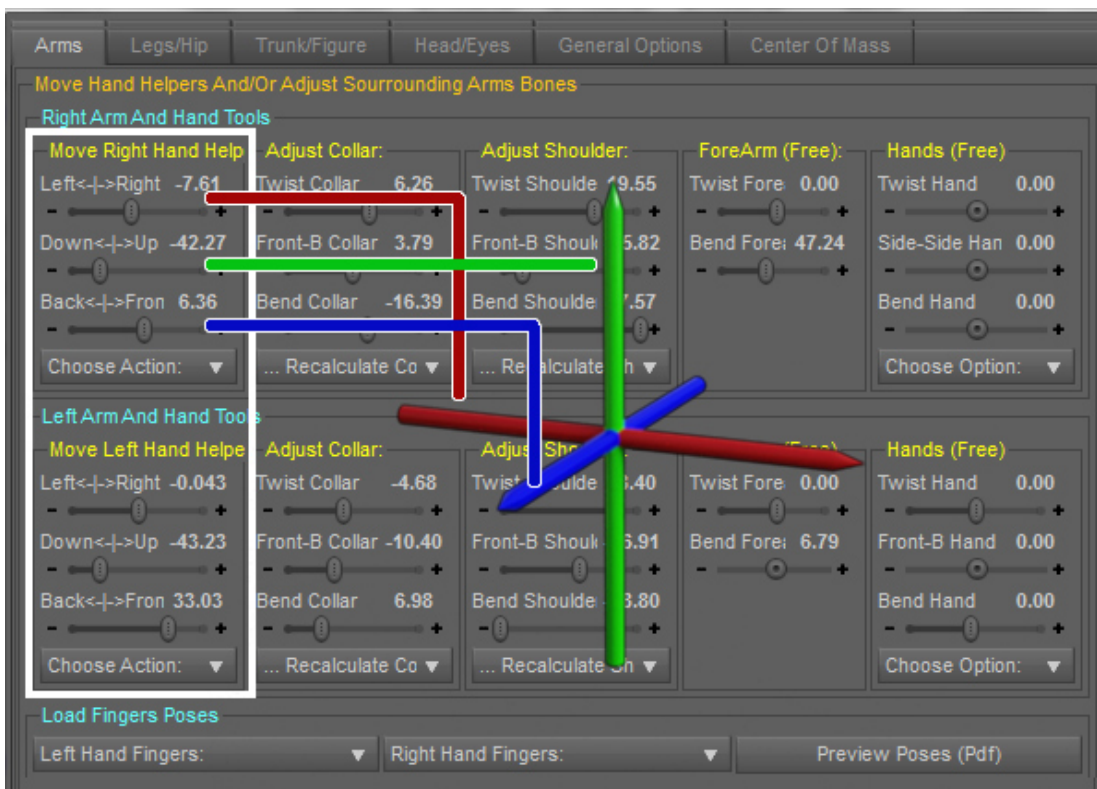


Illustration : “Arms” Tab of the interface. In the white box : dials to move hand helpers. In the middle, illustration of what a helper looks like. THE ARMS TAB BECAME THE ARMS/CONV TAB AFTER THE 1.1 UPDATE.

It is important to understand that the names of the sliders have to be seen from the “World Space”, and not the “figure” point of view. If the figure you work on is facing the camera, then the names of the dials moving the helpers are perfectly representative of the movements of the helpers in relation

to the figure and to the World Space Coordinate System. But if the figure is, for instance, facing the Left Direction (turned of 90 degrees around Y), or any other direction, then then names are only representative the movement of the helpers in the World Space Coordinate System. **AT THE BOTTOM OF THE INTERFACE, YOU HAVE A BUTTON : “Helper Dials: Colors” WHICH WILL RENAME THE DIALS “RED Axis”, “GREEN Axis” and “BLUE Axis” which is helpful for your brain if the figure is rotated for instance of at least 45 degrees (or more) in one or two directions. YOU CAN REVERSE THIS CHOICE by clicking on the same button, which was renamed “Helper Dials: Directions”. In brief, you can swap from one to another type of label for the dials.**

The colors of the arrows of the helpers are here to show you what those directions are:

On the helper, you can consider that The X controller (Left-Right) makes the helper move along its Red axis, the Y controller (Down-Up) along its Green axis, and the Z controller (Back-Front) along its Blue axis. These X,Y,Z of the helpers also correspond to the X,Y,Z directions of the World Space Coordinate System. The values indicated by these dials respectively represent the distances in centimeter of the Helpers (X,Y,Z) to a Reference Location (Right/Left Shoulder Reference Location) which is located near the collar of the figure (in zero pose) and parented to the chest.

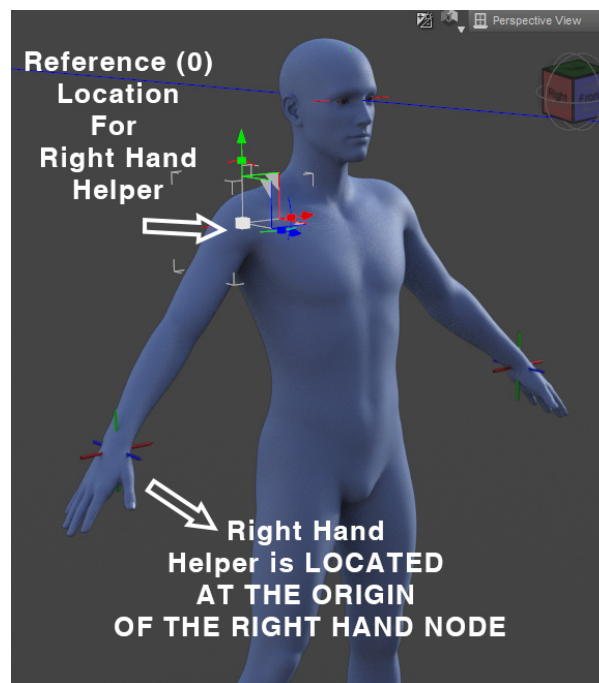


Illustration: The Helpers are located (and drive) the origin of the Hands Nodes. The dials allowing to move them are calculated regarding the location of a reference point in the body. Yet, the absolute values do not really matter since you are going to use these dials to go “more or less to the right”, or “more or less to the top” or “more or less to the back”. When you move the helper using the interface, the arms bones change, so that the origin of the hand node moves to stay on the helper, if possible.

II.2. Moving the helpers

If you already used this script in your scene and the helpers already exist in your scene, you can place them where you want (see remarks about that later on) before launching the script. Otherwise, they will be created and placed on the hands when you launch the script for the first time in a scene. If you observe “lag” issues, please read the 1.1 release notes at the beginning of this documentation.

II.2.a. Limits of the dials moving helpers

Helper dials use basically limits and are clamped. Those limits are calculated for each figure using the length of the arms with an additional margin. Even if you stay within the limits provided by the dials of the Helpers movements, there are some places that hand cannot physically reach. In this case, you will see the script trying to keep hand on helper, but the helper being finally not on the hand any longer.

If a helper was already in the scene, and that its location is such that one of the dials controlling its relative location (relative to its reference) is above the limit calculated, then the corresponding dial will automatically not use the limits. The recommended limits can be set on and off via the interface (in the “Choose Actions:” Dropdown Menu of the “Move Right Hand Helper” Box).

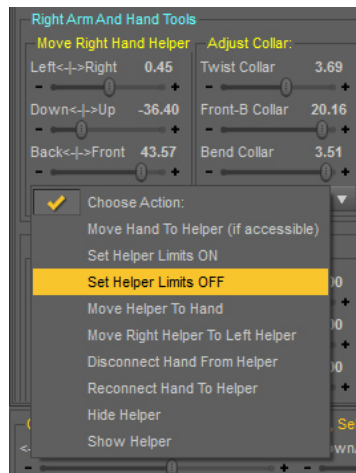


Illustration : You can set limits of Helpers On and OFF, and do much more, in the Choose Actions Menus of Move Right (or Left) Hand Helper Box.

II.2.b. Body will not move, only arms bones will

Moving the hands helpers or adjusting the collars and shoulders surrounding bones will NEVER move the body in the scene, only the arms bones will be calculated, no other bones. If a helper cannot be reached (because the arm is too short to reach it), then the script will anyway try to calculate a solution, changing a bit the arms angles towards the helper direction, but will not move anything else in the body. If the helper is too far for the hand to reach it, you can choose to move the figure closer to the helper or the helper closer to the body, using this interface, or in Daz Studio interface before launching this script.

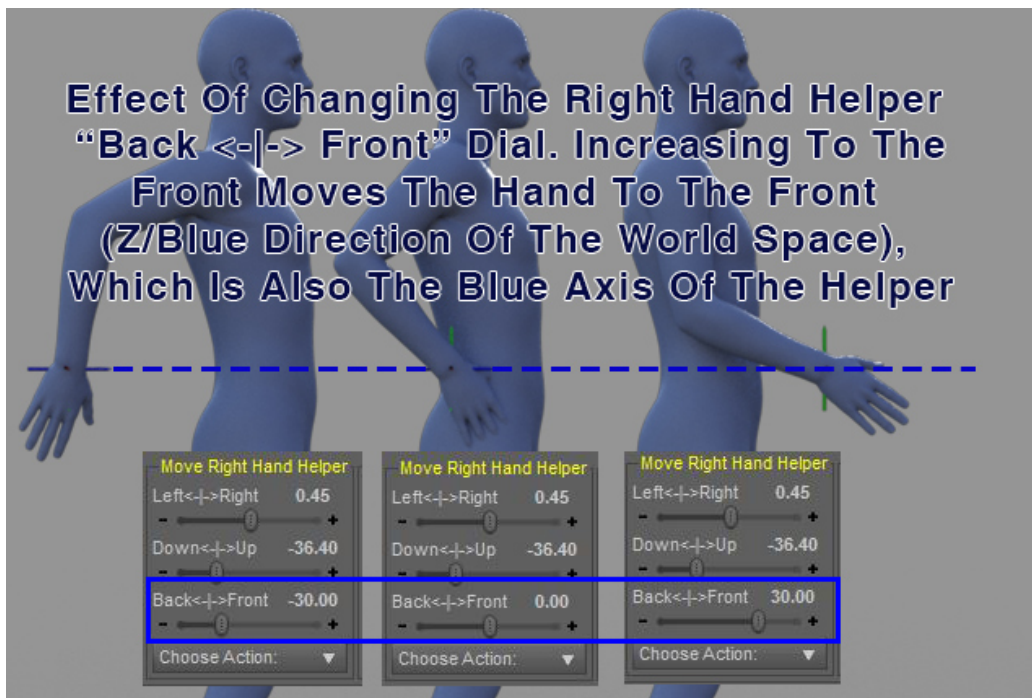
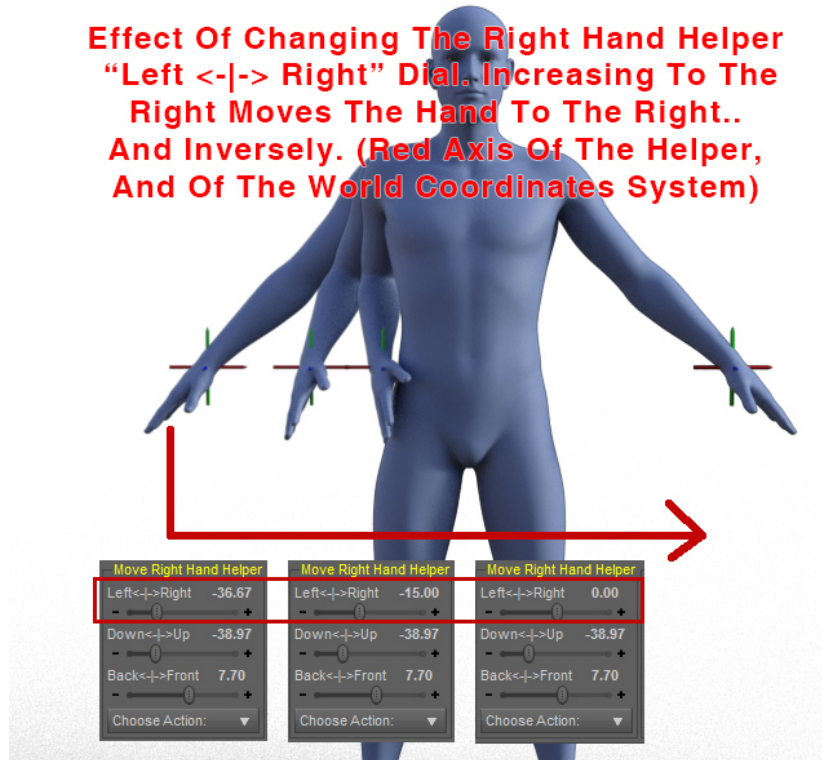
Yet, if you move the body or other body parts influencing the hands locations, you will have options in this interface to keep hands in place or not while doing so. This will be detailed later on.

II.2.c. What happens when you change a Hand Helper Dial

When you change a Hand Helper Dial, all the bones (collar, shoulder, forearm) of the corresponding arm are recalculated in order to place the hand node as close as possible to the helper.

This is why, in the interface, you will see all the dials of the arm bones rotations changing when you change the Hand Helper location. Please note that the Forearm Twist is ALWAYS FREE, meaning that since its rotation does influence the final hand location only in a very small way, I decided not to include it in the calculus when you change the helper location, which can be seen as an advantage.

**Effect Of Changing The Right Hand Helper
 “Left <-|-> Right” Dial. Increasing To The
 Right Moves The Hand To The Right..
 And Inversely. (Red Axis Of The Helper,
 And Of The World Coordinates System)**



Illustrations above: Examples of effects of moving the helper (Left/Right then Back/Front directions). Using the Down-Up Dial would act the same but along the vertical axis of the World Space Coordinate system, represented in the helper by the “Green Direction”.

The solution (the way to set up all arms bones) to do place the hand node at one location is in general not unique, meaning that there are several sets of arms bones rotations which will allow you to reach this pose. This script tries to keep the closest solution to the current solution (the current pose). But

once this is done, you can change the rotation of the arms bones using the other dials proposed in the “Arms” Tab of the interface, in the “Adjust Collar” and “Adjust Shoulder” boxes of “Right Arm And Hand Tools” (you have the same for the left arm).

II.3. How to adjust surrounding bones (collar, shoulder) dials

I.3.a. Use Of “Adjust Collar” and “Adjust Shoulder” dials

For a given hand location, you can change the properties of the collar and the shoulder allowing to reach this location, changing the arm pose while keeping hand in place.

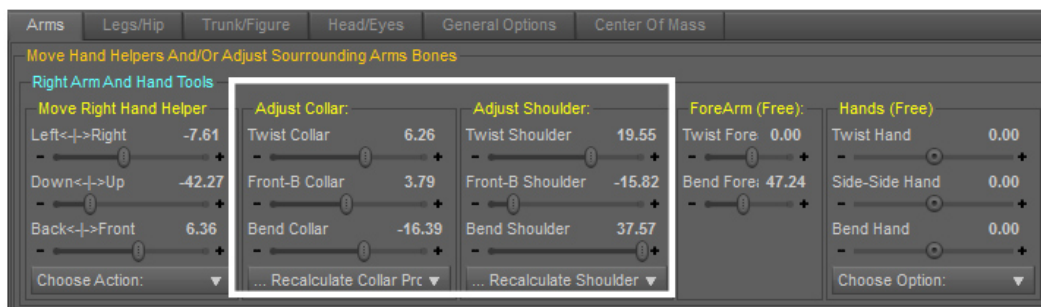


Illustration: These are the dials you can change in order to change the arms position while keeping hand in place, if possible. You find the same in the “Left Arm And Hand Tools” box.

For instance, you can decide that the collar is more twisted, in this case, you increase the “Twist Collar” dial. You can decide that the shoulder must be more “Front”, in this case you increase the Front-B Shoulder dial, etc, etc. In any cases, whatever the dial you change in “Adjust Collar” and “Adjust Shoulder” boxes, ALL the rotations of ALL the arms bones (Right Arm Only if you use the Right Arm And Hand Tools and Left Arm Only if you use the Left Arm And Hand Tools), including the one you just modified, are recalculated in order to keep hand in place. In case of lag issues, please refer to 1.1 update release notes (beginning of this document)

The following image (next page) illustrates various arms position all leading to the same hands locations.

They were obtained by posing the figure (for the left arm, initially, only the forearm bend was used), and when launching the script, the helpers were created and placed at the hand nodes origin.

In the case helpers would already have been present in the scene, the script would have asked if I wanted to place them or leave them where they are. I would have used this option, even if this can be done directly from the interface. Then I changed progressively the various Collar and Shoulder properties (Twist, Front-Back (=Front-B), Bend), so that they change the arms orientation to the orientations I wanted to obtain. In order to keep a better control, it is better to proceed with small variations of each dial rather than huge variations, because, depending on the other initial conditions (the ones of the dials you don’t move), it can go very fast (medium variations can have big effects).

Helpers moving dials being constant, you can adjust the collar and shoulder dials to change the angles with which the arms keeps the hand in place. Here hand nodes are always at the same place (on their relative helpers).

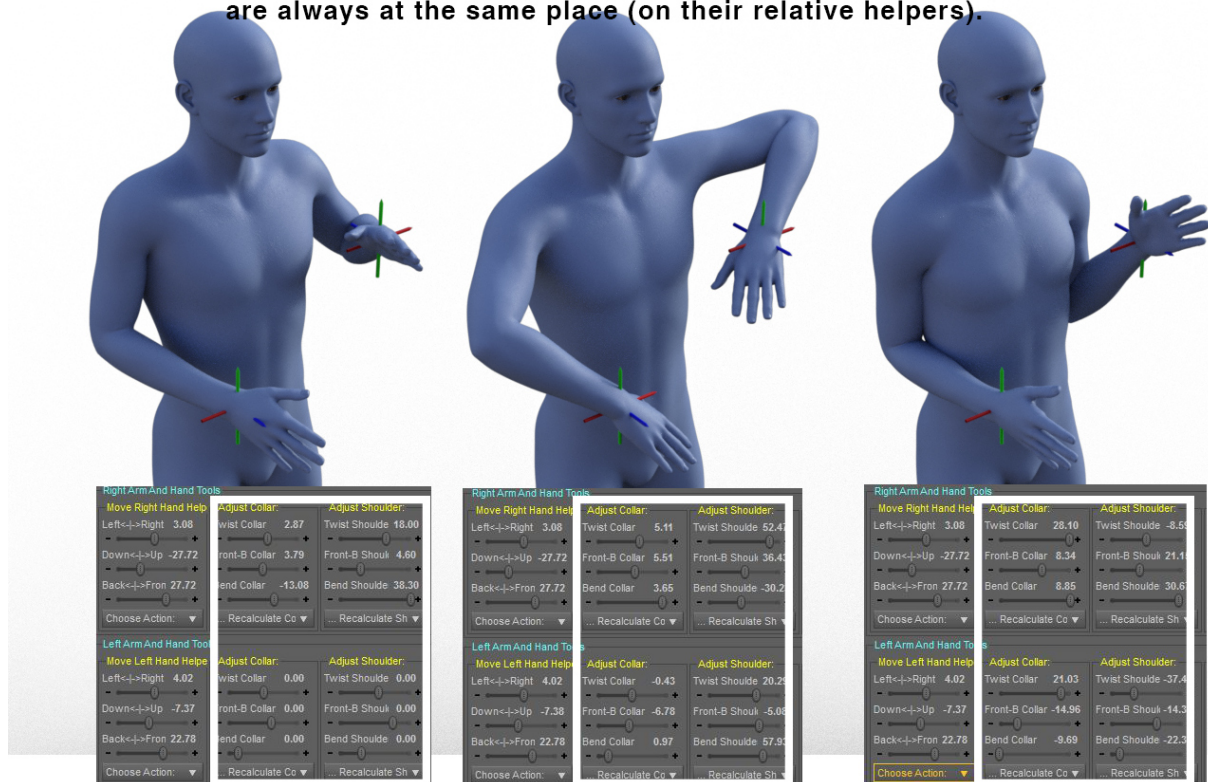


Illustration: Changing the dials of the “Adjust Collar” and “Adjust Shoulder” boxes allow to change the way arms reach a given hand location.

I remind here that when you change one of the “Adjust Collar” or “Adjust Shoulder” dial, all shoulder and collar bones (of the corresponding arm) are recalculated, as well as the Forearm Bend.

This has a first consequence, which is that if you enter “manually – via keyboard” a value for a rotation, (for instance you write “-20” as the value for “Front-B Shoulder”), this may not be the final value you obtain, this may not be the final rotation of this node. It may be close to this value. The reason why is that everything will be recalculated in order to keep hand in place, USING the “-20” for “Front-B Shoulder” as a new starting position (initial condition), and not as the final state of it.

This has a second consequence which is that sometimes you cannot “push” a dial above or below a certain value, which is yet not the limit for this dial. The reason is that this is the highest or lowest value the dial can reach “while trying to keep hand in place” for the other initial values of the other dial. The calculus which is made brings this value back to a value close to the previous value used, because a higher (if you don’t manage to increase it) or lower (if you don’t manage to decrease it) value for this property could not lead the hand to where it has to be. Very often, when this happens, some of the other values for collar and shoulder bones reached their max or min limits. **The dial can even seem to be stuck, and in this case, you have to act on other dials of “Adjust Collar” and “Adjust Shoulder” boxes first.** The less there are possibilities to reach a given location for the hand, the more the dials are – seem to be - limited in term of amplitude of variation, the less they seem responsive.

II.3.b. When the Hand does not reach/stay on the Hand Helper

It can happen that the hand does not reach, or does not stay on the Hand Helper if you adjust the various “Helper” dials or “Adjust Collar”, “Adjust Shoulder” dials of the helper location. In this case, ONCE ONLY, a message will pop up warning you that it seems that the calculus did not converge to a solution, and proposing you how to solve it. If you want to read this message again you have to use the two buttons of the “General Options” tab named “Legs Solutions”, and “Arms Solutions”. It is a summary of what is in this documentation.

PLEASE ALSO SEE THIS VIDEO, YOU SHOULD FIND YOUR SOLUTION: <https://youtu.be/LfV-6CVpTjA>

There are several reasons for convergence to fail:

-- > **First: It is impossible for the Hand to be located where you placed the helper.**

This will happen if the helper is too far from the figure location, for instance this is obvious if the distance between the helper and the “Right/Left Shoulder Reference Location” located near the collar is higher than the arm length. The arm is simply too short. Yet the calculus will be made anyway to try and minimize the distance between the Helper and the Hand.

This can also happen if the helper location lead to bones rotations above the limits. For instance, try to touch all the parts of your collar (back/front/tip) with your wrist (which is approximately the Hand Location for this script). You will see that most of the places are impossible to reach (maybe a few collars can be reached if you have a very very long forearm). For most of people this is impossible. This is not possible for Genesis 8, 8.1 or 3 figures too.

In these cases, it is normal that the hand cannot be placed on the helper.

-- > **Second: The calculus stopped before you placed the hand at the right place**

This case of figure should not happen very often, I personally never met this issue with a “classical use” of the script.

What has to be understood is that the functions which calculate the bones rotation to place the hand on the helper work are iterative. There are several steps placing the hand closer and closer to the helper. These steps are repeated either a certain number of times (until a “maximum number of iterations” is reached), or until the distance between the hand and its helper is below a certain value (minimum error). If these iterations are stopped because of the distance criterium, then the hand should be in place (the distance between the hand and the helper is lower than the minimum error). If they are stopped because the maximum number of iterations has been reached, then this distance should be higher than the minimum error.

Both the maximum number of iterations and the minimum error can be modified in the interface, in the “General Options” Tab, illustrated in the next image.

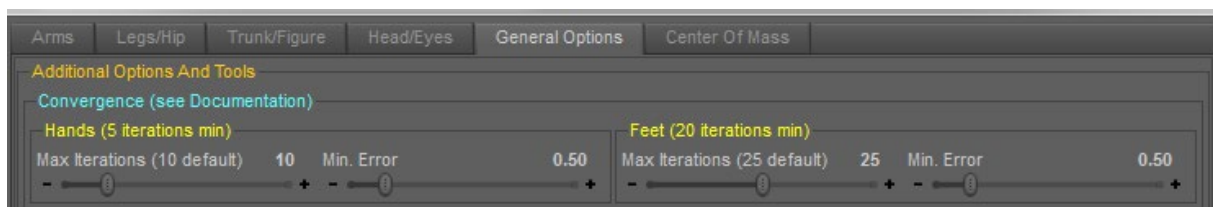


Illustration: You can change for Hands and Feet the numbers of iterations and the minimum distance (Min. Error)

They are initially set up to be very robust in most cases, with a minimum error of 5 millimeters (the distance between Hands/Feet and their helpers should be lower than 0.5 cm). You can increase or

decrease these distances. You can also increase or decrease the “Max Iterations”, i.e. the number of iterations after which the calculus will stop, whatever the distance of the Hands/Feet to their helpers.

If you set up a very small Min. Error and/or a very small number of iterations, and ESPECIALLY if the Max Iterations, the maximum number of iterations, is low, then yes, you may not be able maintain the Hands/Feet on their helpers.

The solution can be to restore the iterations criteria if you changed them, and eventually to increase the number of iterations if it is not enough (which slows down the convergence).

-- > Third: The most probable case, is a “natural non-convergence” of the calculus

Sometimes, VERY OCCASIONALLY, depending on the initial conditions in term of arm pose and helper location, the calculus does not manage to converge to the solution. Briefly speaking, the calculus starts with operations on shoulders and collar which will not allow the hand to reach the helper at the end. In those cases, whatever the maximum iterations you will set, the arm seems to be locked “in a bad position”, whereas it is obvious that the hand should be able to reach the helper. It rarely happens when you dial the “Move Right Hand Helper” dials, it can happen a bit more frequently if you change the “Adjust Collar” and “Adjust Shoulder” dials, and that you set some values for the dials which are not compatible at all with the current hand (helper) location.

It is obvious that the hand should be able to reach this location, and yet, when I tweaked the “Adjust Shoulder” dials, I ended up with this situation

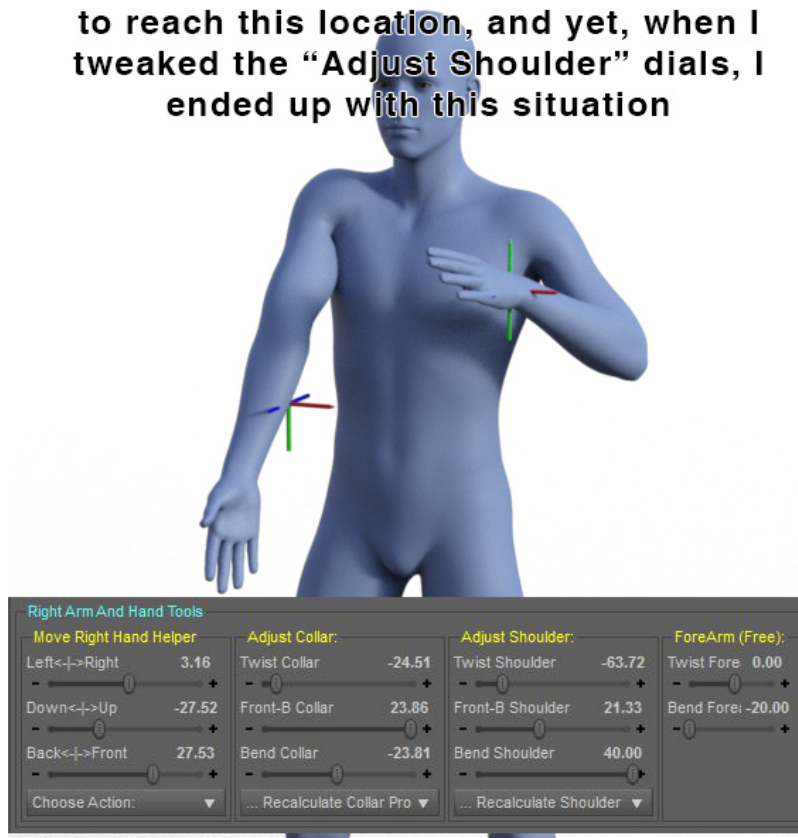


Illustration: Sometimes the Hand should be able to reach a location, and yet the calculus does not manage to solve that. There are tons of easy solutions to solve this.

This, for arms, is very easy to solve (a bit easier than for legs), and you have several ways to do so.

----- > Solution 1 for these non-convergence cases

You can try to solve this by pushing the sliders (dials) of the “Adjust Collar” and “Adjust Shoulder” from left to right and then, if no solution was found from right to left. The idea is to change the “initial state” of the figure which will allow the calculus to place the hand correctly. It can be interesting to begin with the “Adjust Shoulder” dials which contribute more to the final arm pose than the “Adjust Collar” dials (speaking about the calculus). Some dials will seem “locked” (because the current solution is trapped in a very robust local minimum), but don’t worry, you can try to “force them” and if it does not work, you can act on the other dials. **THE “TWIST” dials are often interesting to move first to find the solution.**

If you are able to identify which dial value “does not look right” (this can be intuitive if you created a lot of poses), begin by this dial. Otherwise, try them all, until you manage to find the one solving the issue. In this case (previous image) for instance, I pushed the Twist Shoulder dial 2 or 3 times to the right to increase it, and it solved the issue. I reloaded the scene (in order to have the issue back in the scene), and then I pushed the Bend Shoulder dial 2 or 3 times to the left to decrease it, and it solve the issue too. There is not only one way to solve the issue.

You have to move left to right / right to left the dials of the Adjust Collar and Adjust Shoulder Boxes. In this specific example, increasing Twist Shoulder 2 or 3 times or decreasing Bend Shoulder 2 or 3 times works as a solution.

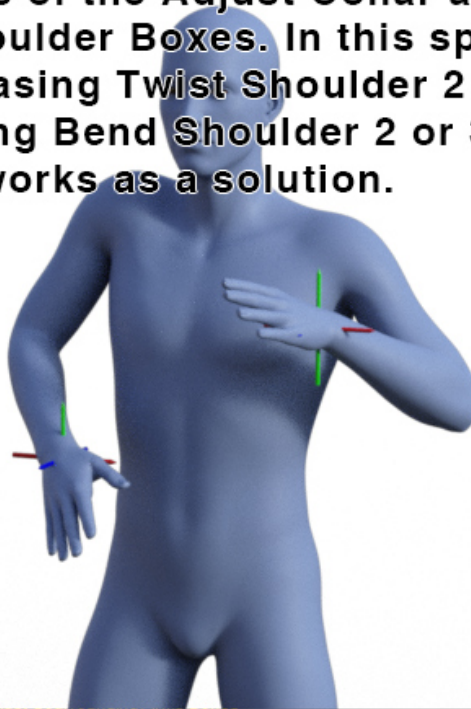


Illustration: The issue visible on the previous image was solved by changing the initial conditions of the calculus: by moving the dials of the “Adjust Shoulder” and “Adjust Collar” boxes.

----- > Solution 2 for these non-convergence cases

The second solution consists in bending the forearm (the forearm bend dial is free, it will not trigger any calculation), and then do an action which will trigger a new calculation.

For instance, in this second solution you can push the Forearm bend to 135 (its maximum value, or -135 for the left arm). Of course, the hand is still far away from the helper, because no calculation is made if when you act on the “Bend Forearm” of the “ForeArm (Free):” box. Once done, in order to move the hand back to the helper, you then have several solutions as shown in the image bellow.

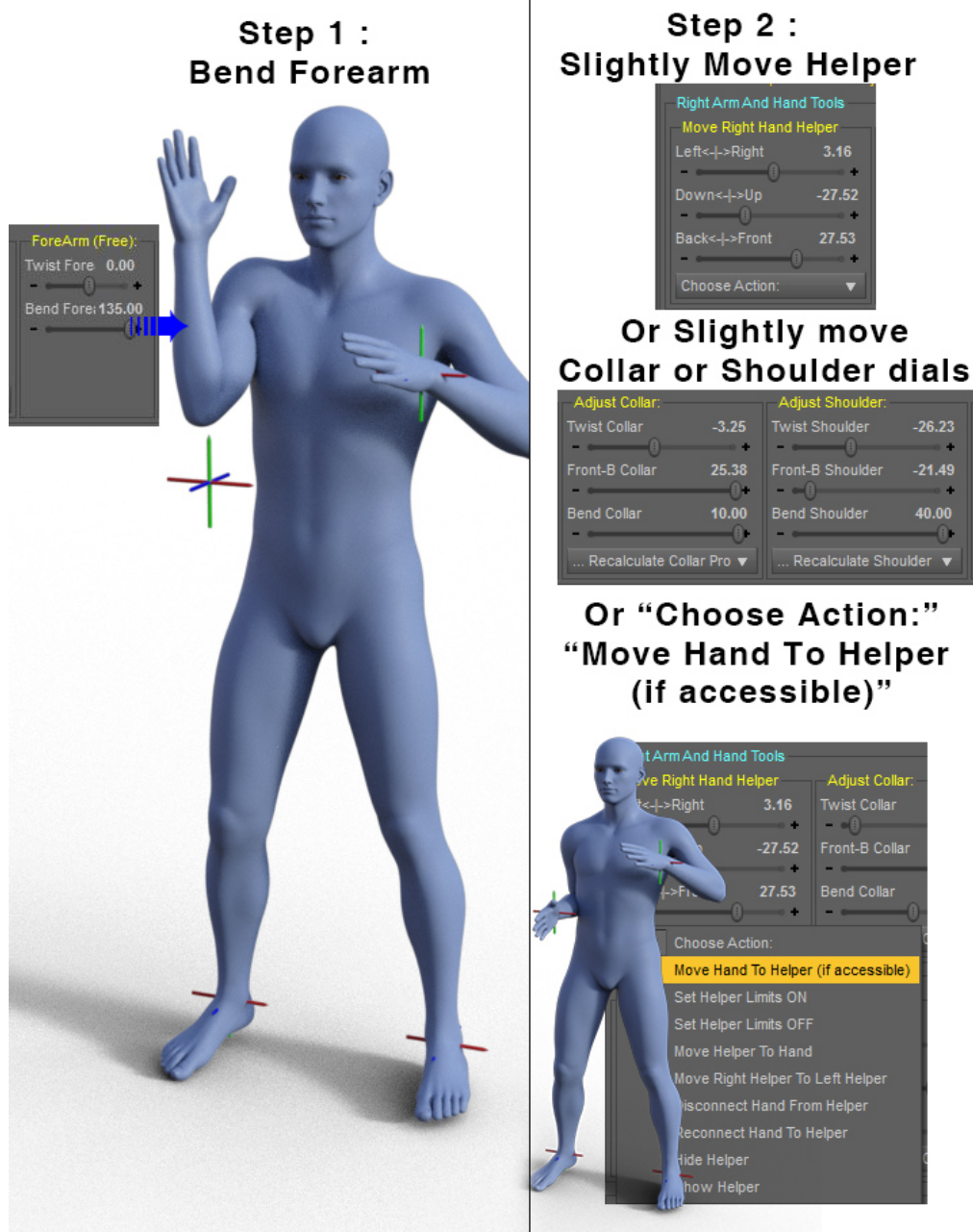


Illustration: Example of another way to solve the issue.

Details are summarized in the text below.

- You can use the “Move Hand To Helper (if accessible)” option of the dropdown menu at the bottom of the “Move Helper” box.
- You can slightly change the dials of the “Adjust Collar” and “Adjust Shoulder” boxes
- You can slightly move the Helper using the “Move Right (or Left) Hand Helper”

All these actions will trigger a new calculus, using the new forearm bend as one of the initial conditions. It is very often enough to solve the issue. This can also be done by completely resetting the arm in the “General Options” Tab, and then use the “Move Hand To Helper (if Accessible)” option of the Move Right Hand Helper Box.

----- > Solution 3 for these non-convergence cases

Another solution you can prefer to solve this is to move the hand using the dials (of the Move Right/Left Hand Helper box) :

- from left to right (up to the maximum limit of “Left-Right” dial), then dial it back in its original place,
- IF not enough, from right to left (to the minimum limit of “Left-Right” dial), then dial it back in its original place,
- IF not enough, do the same operations with the “Down-Up” dials, and IF not enough with the “Back-Front” dial.

At one moment, the arms bones should be modified enough to come back to a safe configuration. In brief, make the hand browse the maximum available space so that at one moment the bones properties are modified enough to follow the hand properly again.

All those three solutions have worked so far independently (I mean, on all situations like this one, the three solutions always worked, each single one, whatever the one which was chosen, worked). I provide them all to you in case you find a very special case of figure which has not been met so far where one of these solutions would not work. The best thing is to look at the video tutorial to see how to proceed. The latest solution you can have is to disconnect the hand, try to place it correctly, “without the helper”, and then connect it again.

II.4. Disconnections of Hands (And Feet) From Helpers, Partial or Total

II.4.a. Total Disconnection of the Helper of one hand/foot (or two hands/feet)

You can at any time totally or partially disconnect a hand from its helper (and you can reconnect it later on). The total disconnection will be the first described here since it is the easiest to understand. In order to disconnect the helper from the hand, you simply have to go in the “Choose Option:” dropdown menu of the “Move Right (or Left) Hand Helper” box, and select “Disconnect Hand From Helper”, as shown in the image next page.

Once one hand and its helper have been disconnected, whatever you do with the script the hand will NEVER follow the helper. You can move the helper, move the arm bones, move any bones in the body which can induce a change in the hand position (hip translations and rotations, any trunk bone such as abdomen and chest rotations, full figure translation and rotations), the hand will completely ignore the helper location, and the calculus to place the hand on the helper will NEVER be launched.

In this case, if one hand is disconnected from its helper, you can still use the dials controlling all the arm bones (the dials of the “Adjust Collar”, “Adjust Shoulder”, “ForeArm (Free)” boxes), the script will apply the rotations you will set up for the corresponding bones, regardless of the helper location, the

script becoming this way a synthetic control interface of the main bones of the figure (you may also want for to reach this “simple interface” behavior to disconnect feet helpers).

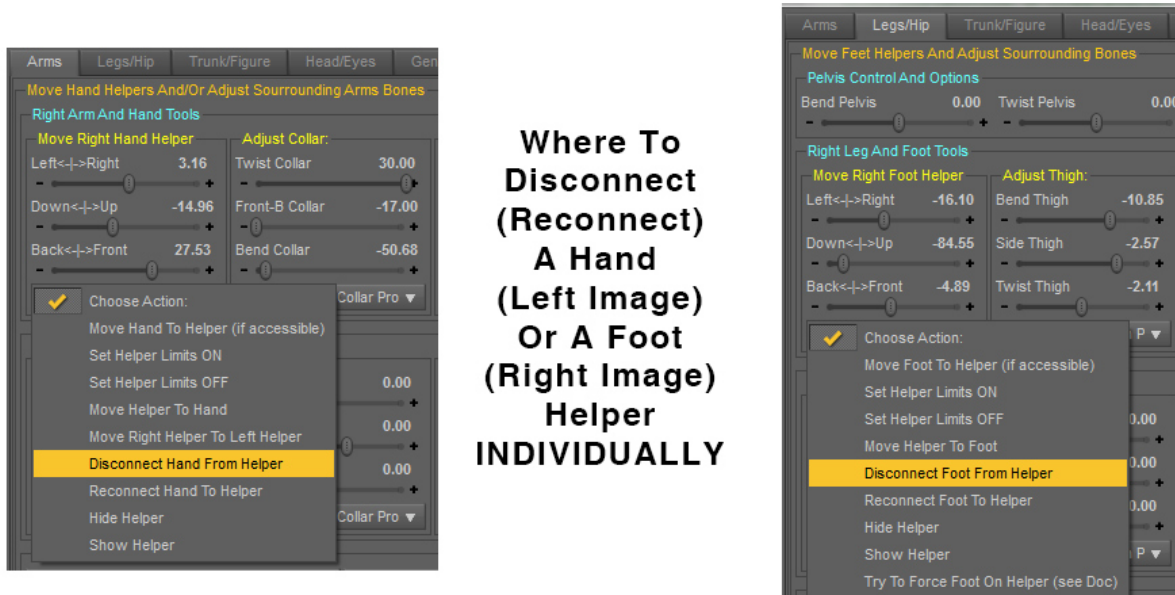


Illustration: How To Disconnect Hand From Helper from the individual “Choose Action:” of the corresponding helper box. The same is shown here for the foot. It is also in the “Choose Action:” dropdown menu of the box allowing to move this helper.

This disconnection action can be done helper by helper, in the “Choose Action:” dropdown menus of the respective Move Right (or Left) Hand (or Foot) Helper boxes. This disconnection action can also be done collectively, either for both hands, or both feet, or all helpers (hands and feet helpers). For this you will have to go to the “General Options” Tab, in the “Collective Helpers Actions” and in the “Connect/Disconnect All Helpers, Arms, Legs” boxes, as shown in the next illustration. In the “Choose Action:” dropdown menu, select “Disconnect Both Hands Helpers”. If you want the feet helpers to be disconnected too, you can immediately choose “Disconnect Hands and Feet Helpers”.

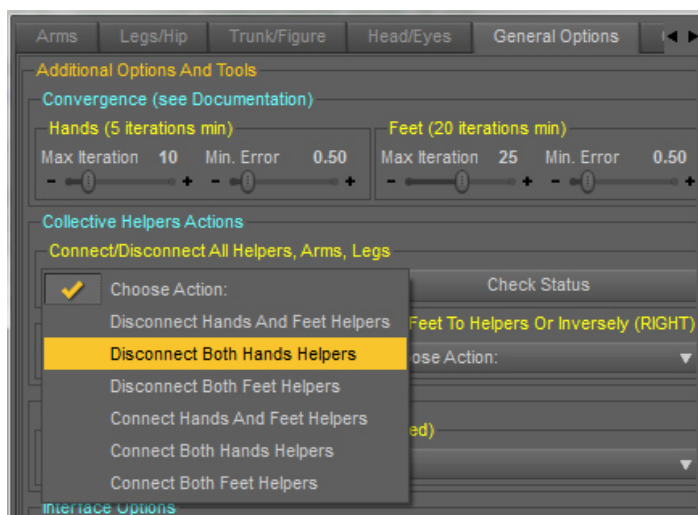


Illustration: How to “Disconnect Both Hands Helpers” from the collective “Choose Action:” box, located in “General Options” Tab. In the same menu you can re-connect them. In this same menu, you can also do the same for both feet (you can disconnect or re-connect both feet here)

Using the same menus, in the individual boxes of each helper or via the collective helpers action, you can re-connect hands and feet to their corresponding helpers.

II.4.b. IMPORTANT : Full Connection or Partial Disconnection of Hand Helpers (feet will be explained in the “feet” part of the document)

When the hands are connected to their helpers, you have several options you can activate to obtain either a full connection or a kind of “partial disconnection” when some specific body areas impacting the hand location are modified. The first ones can be found in the “Arms” Tab.

--- > Collar and Shoulder bones

For each arm, in the “Adjust Collar” box, you can find a dropdown menu with two options.

... Recalculate Collar Properties To Try To Keep Hand In Place

.. Let Collar Properties Free (Hand Will Move Away From Helper)

The first one is the default. It means that whenever arms bones need to be recalculated to keep the hand on the helper, then the collar bones are included in this calculus.

In the second one, whenever arms bones need to be recalculated to keep the hand on the helper, then the collar bones will NOT be included in the calculus, and will remain constant. You can choose this option if you want to keep the collar bones constant while you move the helper. Most of the time the calculus will find a solution to keep the hand on the helper using only shoulder and forearm bones rotations. But there are some places in the space around the figure that you will not be able to reach with the hand, because of this limitation of “keeping constant” the collar bones during the various steps. IF THE COLLAR IS “FREE”, then when you change the collar dials, no calculus will be processed, meaning the hand will go away from the helper. If you want to place the hand back with the collar rotation values you set up while the collar is free, you have to trigger a new calculus by for instance, changing slightly one of the “Adjust Shoulder” dial. This behaves the same way (with “shoulder” instead of “collar” when you set the Shoulder property free.

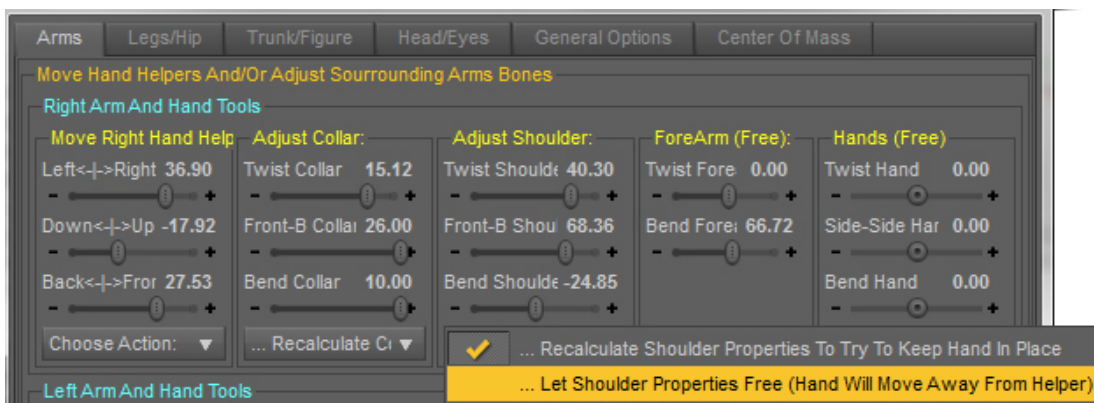


Illustration: How to “Disconnect Both Hands Helpers” from the collective “Choose Action:” box, located in “General Options” Tab. In the same menu

For each arm, in the “Adjust Shoudler” box, you can find a dropdown menu with two options.

... Recalculate Shoulder Properties To Try To Keep Hand In Place

.. Let Shoulder Properties Free (Hand Will Move Away From Helper)

The first one is the default. It means that whenever arms bones need to be recalculated to keep the hand on the helper, then the shoulder bones are included in this calculus.

In the second one, whenever arms bones need to be recalculated to keep the hand on the helper, then the shoulder bones will NOT be included in the calculus, and will remain constant. You can choose this option if you want to keep the shoulder bones constant while you move the helper. Pretty often, the calculus will find a solution to keep the hand on the helper using only collar and forearm bones rotations. But there are a lot of places in the space around the figure that you will not be able to reach with the hand, because of this limitation of “keeping constant” the shoulder bones during the various steps.

It is mentioned in the second option “Hand will move away from helper”. Actually, hand will not necessarily move away from the helper, if the other bones which are recalculated can be moved enough to compensate the bones which don’t.

Of course if you take the second choice both for Collar and Shoulders, then, since only the Forearm bend will be calculated, then the hand will move away from the helper.

--- > When you move hip

In the second Tab of the interface, “Legs/Hip” you have the possibility to translate and rotate the hip of the figure, which necessarily change the location of hands in space if nothing is done to keep them in place.



Illustration: hands disconnection is possible while moving hip. You just have to select the second or third option provided.

When you change the hip location and/or translations, you have 3 options:

- Adjust Hands to Stay On Helpers (Helpers and hands don't move)
- Adjust Helpers To Stay On Hands (Helpers move to follow hands)
- Let Hands and Helpers Free (Helpers don't move, Hands move with the body)

The first choice will recalculate the arms so that the hands stay on helpers (of course if the helpers are too far to be reached, the calculus will place the hands as close as possible). The helpers remain at the same place in the World Space Coordinate system. This is not the choice by default for arms and hand.

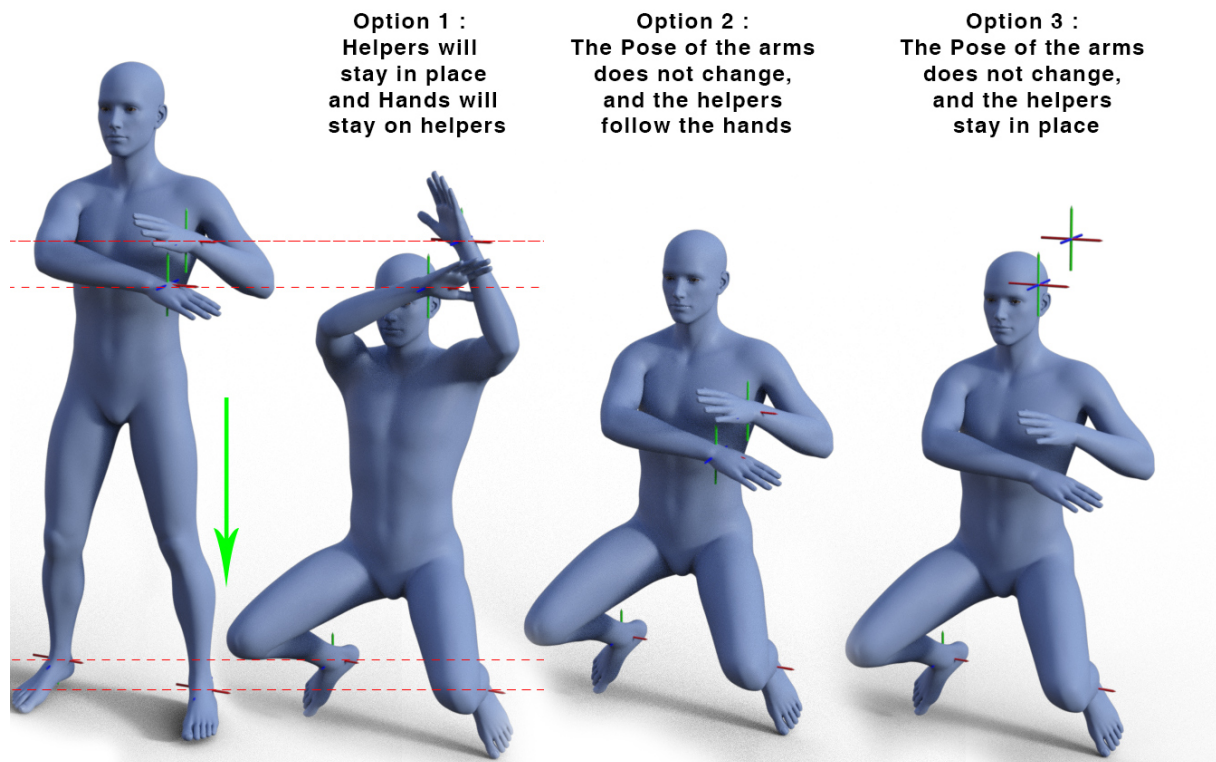


Illustration: When you move the hip, here is the effect of the options that you have for hands and helpers.

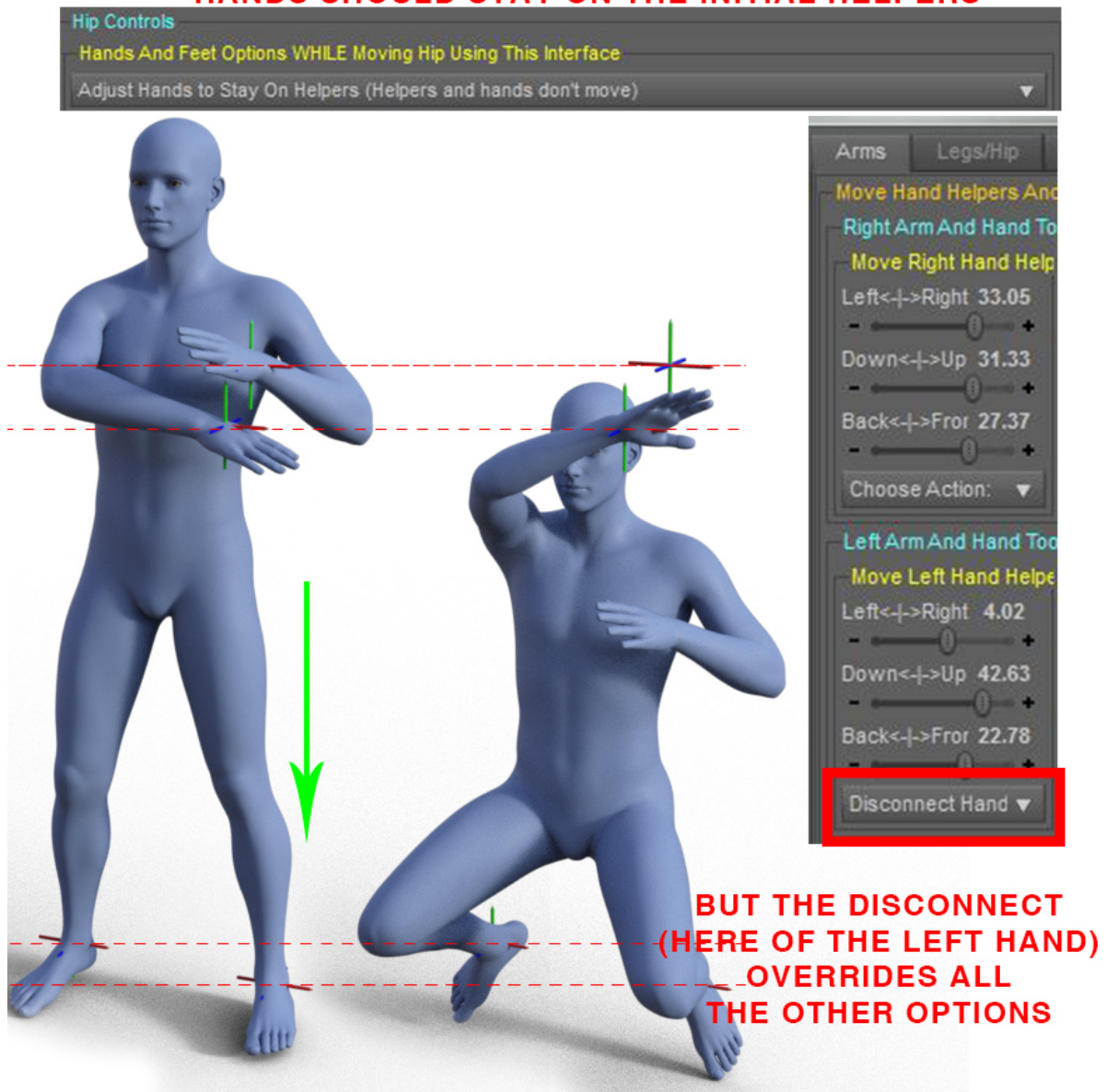
The second choice is the choice by default for arms. This time, if you move the hip, the arms will naturally follow the body, meaning that their pose, that all the rotations of all the bones of the arms will not change. Furthermore, the helpers will automatically remain on the hands.

The third choice is similar to the second one, except that this time, the helpers will not move at all. They will stay where they were when you began to move the hip.

IMPORTANT TIP: If you want one, and only one hand to stay on the helper, and the other arm to stay with its current pose (following the body movements without changing the arm pose to maintain hand on the helper), you have to use the first option (so that both hands stay on their helpers, helpers which will not move in space), AND you have to disconnect (see previous part) the hand which must not stay on the helper.

DISCONNECTING ONE HAND OR ONE FOOT OVERRIDES ALL OTHER OPTIONS FOR THIS HAND OR THIS FOOT.

HANDS SHOULD STAY ON THE INITIAL HELPERS



*Illustration: Disconnection actions override all other choices. This is a way to handle separately left hand from right hand or left foot from right foot if you need this. **WHEN YOU SEE "Disconnect..." In the choice box instead of "Choose Option:", it means that the helper is disconnected. WHEN YOU SEE "Choose Option:" it means that the helper is connected to the hand.***

--- > When you move the full figure

In comparison with the hip, the exact same options, with the exact same behavior in term of impact of hand location and helpers location, exist when you translate or rotate the full figure, in the "Trunk/Figure" Tab.

The same remark applies concerning the partial disconnection of one hand, meaning that you can have one hand connected and the other one disconnected when you move the full figure, using both the option of the “Trunk/Figure” Tab and the disconnection option of each helper box.

THE SAME OPTIONS CAN BE FOUND IN “TRUNK / FIGURE”, AT THE FIGURE LEVEL

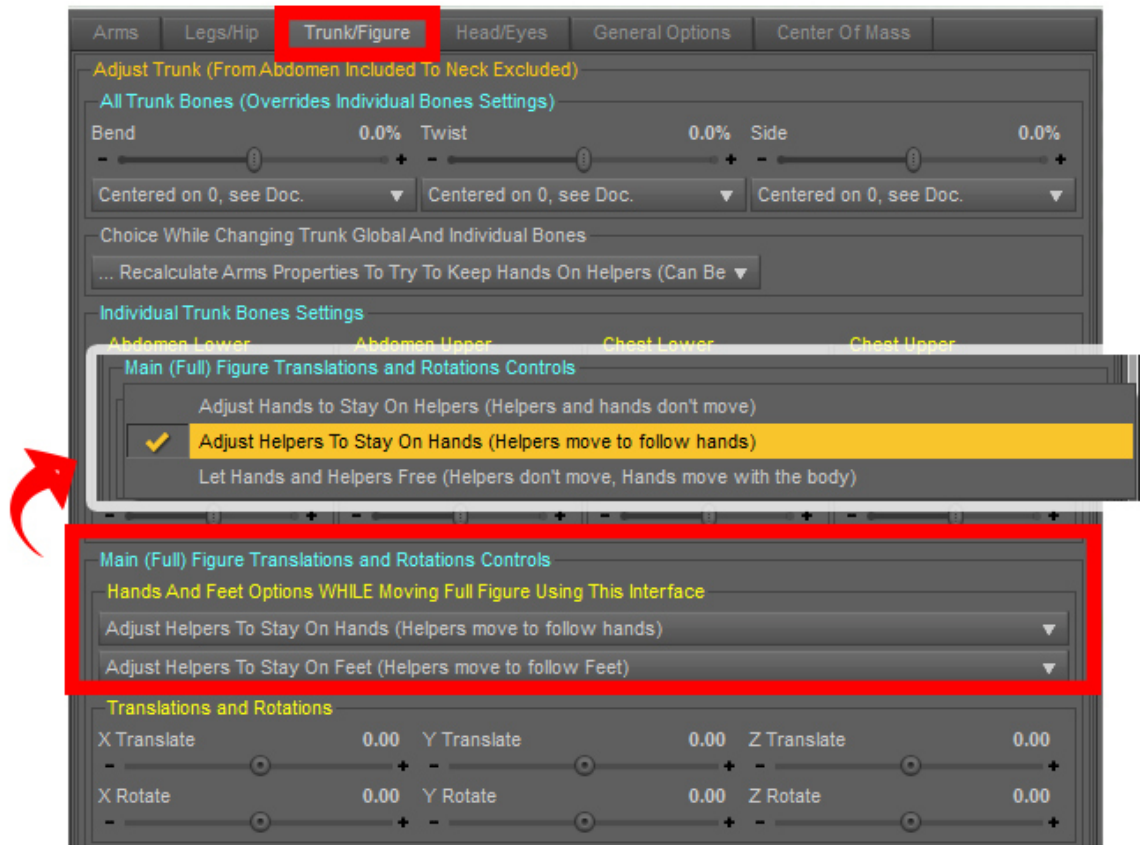


Illustration: The same way you can define how hands and feet will react when you translate or rotate the hip of a figure, you can define this reaction when you translate or rotate the full figure.

--- > When you move the trunk bones (abdomen upper/lower, chest upper/lower)

The last elements of this interface which can have an impact on hands location is the control of the trunk bones. By “Trunk” I mean abdomen lower and upper and chest lower and upper. Indeed, if you bend the trunk for instance, the location of the hands in the World space will change. This is why you also have options to define how hands will react when you change any rotation of any of the trunk bones.

You have the same way three options, which act the same as the options we saw previously for hip and figure movements, but which are presented (named) a bit differently. These options can be found in the box titled “Choice While Changing Trunk Global And Individual Bones” of the “Trunk/Figure” Tab.

These options are:

- ... Recalculate Arms Properties To Try To Keep Hands On Helpers (Can Be Overridden By Disconnection Actions - See Doc)
- ... Let Arms Properties Free (Hands Will Move Away From Helpers - Helpers don't move)
- ... Let Arms Properties Free (Hands and Helpers will move together)

THE SAME OPTIONS CAN BE FOUND IN “TRUNK / FIGURE”, AT THE TRUNK LEVEL

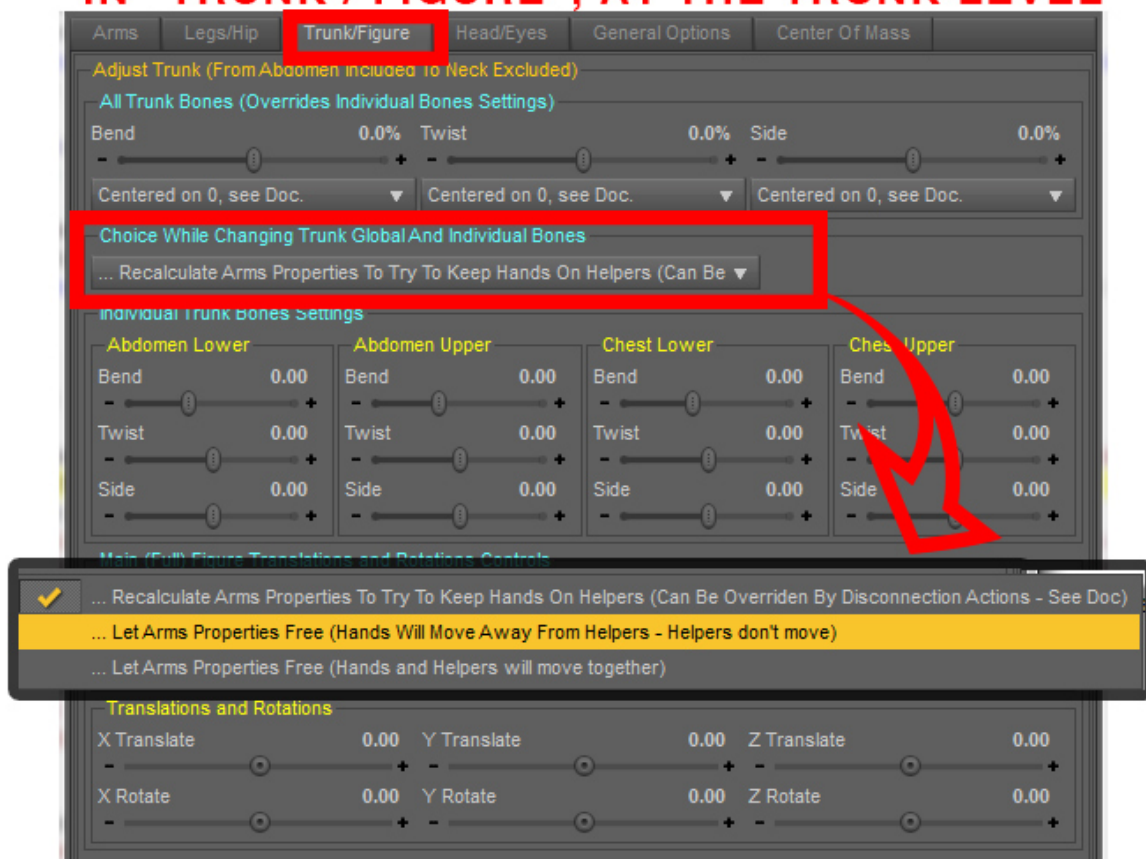


Illustration: When you Bend/Twist/Side the trunk bones individually or collectively, the behavior of the hands and the helpers while doing this is defined by three options.

If you want the helpers to stay at their current world space location (helpers don't move), and the hand to stay on the helpers, use the first choice (recalculate, the arms bones will adjust so that hand remain as close as possible to their helpers).

If you want the helpers to stay at their current world space location (helpers don't move), and the hand to move with the rest of the trunk “as they would normally do” out of the context of this script (hand and arms will follow “normally” the new trunk orientation, nothing will be recalculated), use the second choice.

If you want the hands and arms to follow “normally” the new trunk orientation (without calculations to keep hands on helpers), but you want “on the contrary” the helpers to follow the hands (so that they remain on the hands), then choose the third option.

As mentioned previously for the figure and the hip, you can decide that ONLY one hand stays on the helper. You have for this to use the first option, and disconnect the other hand using the option included in dropdown menu “Choose Action” of the “Move Right Hand Helper” (or “Left” for left hand).

II.5. The “Choose Action:” Dropdown Menu of Hands Helpers

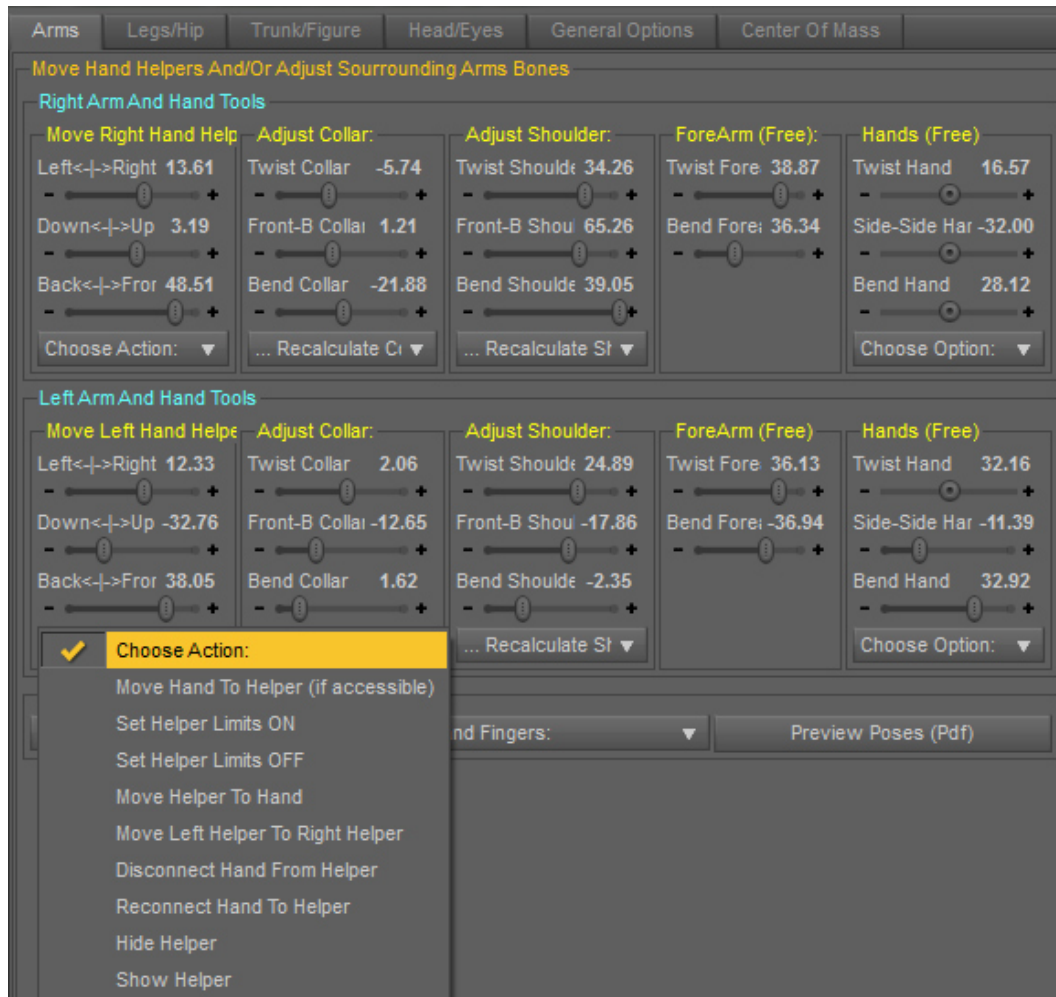


Illustration: “Choose Action:” dropdown menu

At the bottom of “Move Right Hand Helper” and “Move Left Hand Helper” boxes, you can find the “Choose Action:” dropdown menus related to each helper, from which you can Move Hand To Helper, Move Helper To Hand, Set Helper Limits (of the dials) to ON or OFF, Hide or Show Helper, disconnect hand from helper or reconnect hand to helper.

WHAT IS IMPORTANT TO NOTE is that if you see “Disconnect Hand From Helper:” as being activated (this is the text you see), then the helper is seen as disconnected by the script. If the helper is totally connected, or partially connected depending on your other choices of the other dropdown menus of trunk, collar, shoulder, hip, figure, etc, etc, then you will see “Choose Action”. Another way to know the status of the helper can be found in the “General Option” tab (see corresponding part in this document)

III. Hands And ForeArm Operations

In order to finish with the “Arms” tab and everything related to hands and arms, this document will now focus on the “ForeArm (Free):” and “Hands (Free):” boxes of the “Arms” Tab.

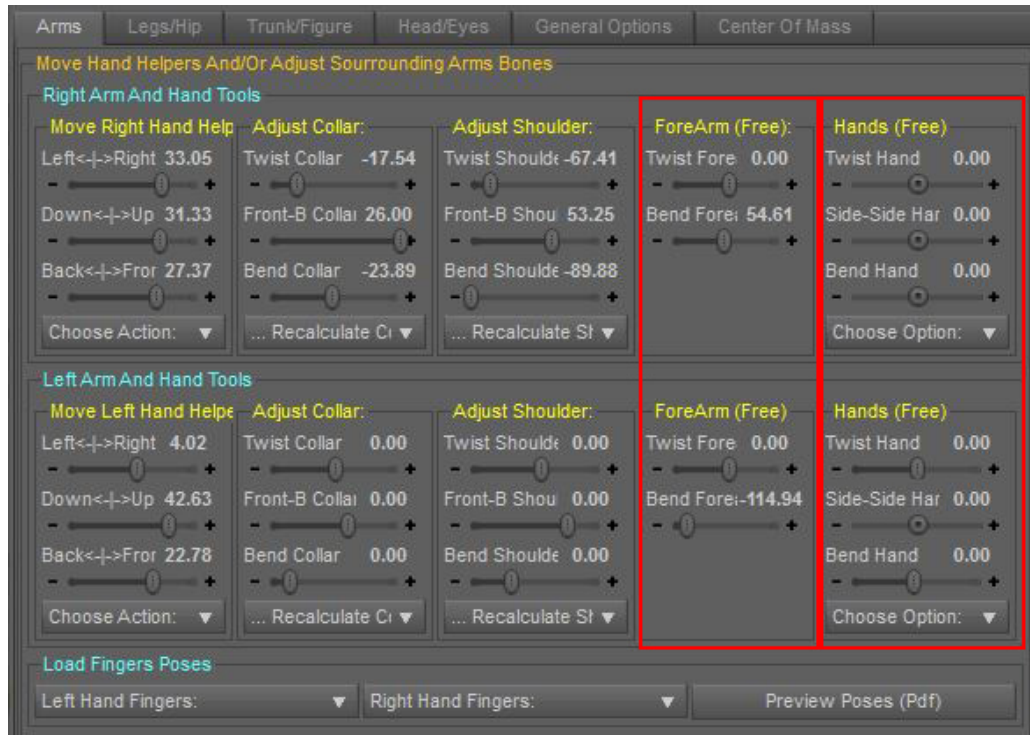


Illustration: “ForeArm (Free):” and “Hands (Free) Boxes

III.1. The “ForeArm (Free):” box

This box gives you the control on the Twist and the Bend of the Forearm. These dials are not linked to any calculation (this is why there is “Free” in the name). It means that if you change the twist or the bend of the forearm, as you would do in the “parameters” tab of Daz Studio, the hands will not be placed on the helper any more. This was a technical choice.

At any time, after you changed one or several of these Forearm settings, you can place the helper on the hand, or the hand on the helper. If you place the hand on the helper, the Forearm Bend (and all the other required arms bones rotations) will be re-calculated, but the Twist will not change.

In order to place the hand back on the helper, you can either use the “Choose Action:” dropdown menu of the “Move Right (or Left) Hand Helper” box, and select “Move Hand To Helper (If accessible)”, or you can do any of the action in this interface which will trigger a new “arm calculation”, such as changing any of the “Move Right (or Left) Hand Helper”, “Adjust Collar”, or “Adjust Shoulder” dial, or even “Trunk” dials (provided you did not disconnect the helper, or did not changed the options of Collar, Shoulder and Trunk from “....Recalculate” to “.... Let Free”).

In order to place the helper on the hand, you can use the “Choose Action:” dropdown menu of the “Move Right (or Left) Hand Helper” box, and select “Move Helper To Hand”.

III.2. The “Hands (Free):” box

You can rotate each hand around its Twist, Side-Side, and Bend Axis as you would do it in the “Parameters” Tab of Daz Studio. The choice you make will basically not trigger any additional calculus. Yet, in the “Hands (Free):” box, you have a “Choose Option:” dropdown menu, allowing you to do a few more interesting things.

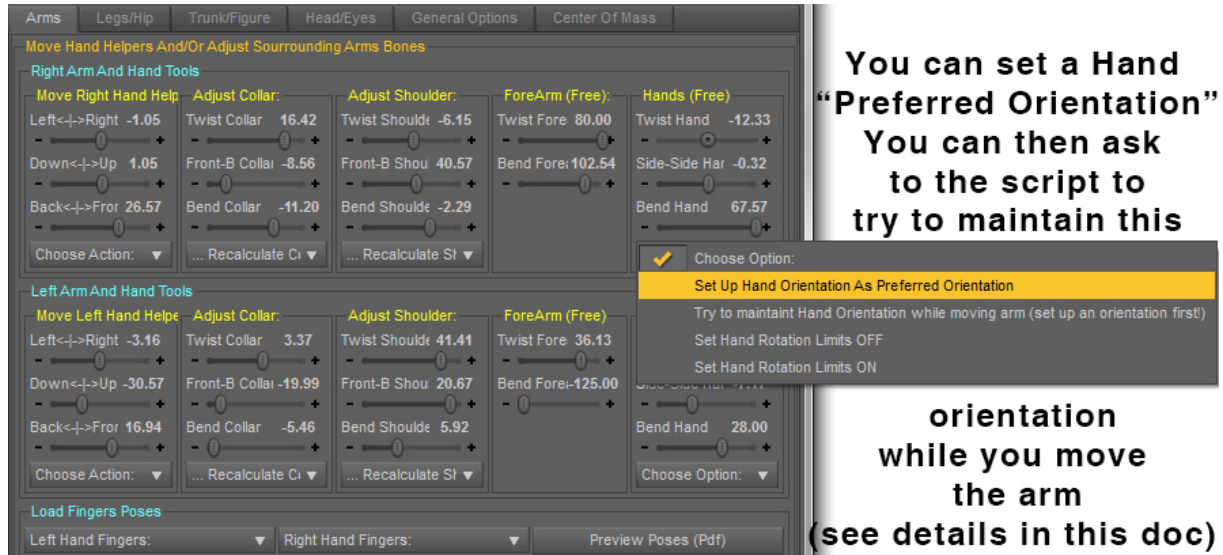


Illustration: How to set up a preferred orientation

The preferred hand orientation you can set up in the “Choose Option” dropdown menu, using “Set Up Hand Orientation as Preferred Orientation” will be remembered during all the script session, or until you define another orientation as the preferred orientation during this script session. It will be used ONLY when the option to maintain hand orientation is activated.

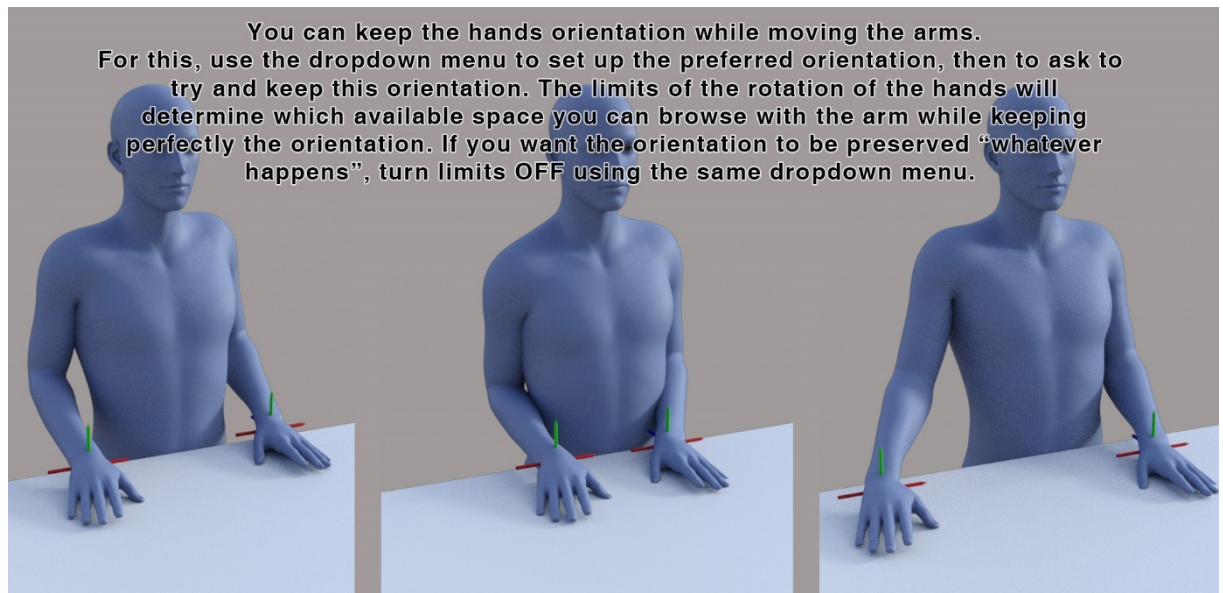


Illustration: Example of Hand Moving on a table while trying to maintain hand orientation.

Then, IF YOU WANT HAND TO KEEP, IF POSSIBLE, A CONSTANT ORIENTATION IN THE WORLD SPACE WHEN YOU MOVE THE ARM, THEN YOU HAVE TO CHOOSE THE OPTION : “Try to maintain Hand Orientation while moving arm (set up an orientation first)”.

How can you know if the option is active or not? This is very easy. If the option is active, it is the line which will show up in the menu (if it is inactive, you will see “Choose Option:”). Furthermore, if the title of the box is “Hands (Constrained)” instead of “Hands (Free):”, then you know that the option is active too.

The limitations of this orientation preservation are due to the limits of the rotations (bend, twist, side-side) hands, which will prevent the hand from reaching the desired orientation in space. With the limits activated, when you move the arms or the hand helpers, the script will try to rotate the hands correctly, but will stop at the limits of each dial. What you can do if you want to get rid of this issue, is to set the limits of the hands rotations to OFF, using the same dropdown menu as the one you use to set up the preferred orientation and to try to maintain Hand Orientation (**Set Hand Rotation Limits OFF**). Don't forget, after turning limits OFF, to restore your choice “Try to maintain Hand Orientation while moving arm (set up an orientation first)”, because the script will not remember that it was the previous option used. You can of course restore the limits to ON using the same dropdown menu.

When this option to “maintain hand orientation” is active, the hand orientation will be automatically adjusted if you change any of the dial of the boxes “Move Right (or Left) Hand Helper”, “Adjust Collar” (for each hand), “Adjust Shoulder” (for each hand), and “ForeArm (Free)”, but it also be changed if for instance you translate or rotate the figure or the hip, or if you change the trunk bones rotations with the options to keep hands on helpers being activated while you do so.

III.3. The “Load Fingers Poses” box

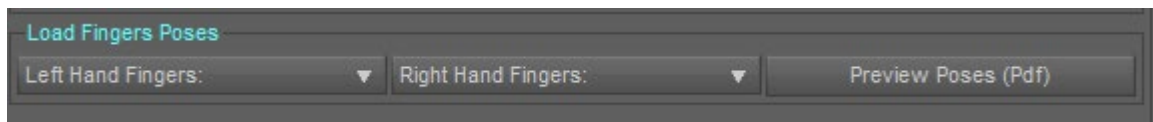


Illustration: Load Fingers Poses Box

You can finally load a few poses for the fingers in order to “not to keep zero posed” fingers, and have a better idea of what the final pose could look like with hands (fingers) posed. These fingers poses can be preview using “Preview Poses” button which opens a pdf file displaying the fingers poses. (A pdf viewer is necessary). Those poses concern only the finger, and ignore totally the pose controls, meaning that if your hand already uses pose controls, they will not be set to 0 when you apply a pose for the fingers (they will “cumulate”).

When you loaded one of the poses, the dropdown menu will display the number of the latest finger pose used;

IV. The Legs/Hip Tab (Also Includes Pelvis)

The second tab (focused on the feet and the legs) of the interface works in a very similar way to the first tab (focused on the hands and the arms). This tab is divided in 4 main parts:

The first one, at the top, dedicated to Pelvis rotations, with an option to determine whether feet should stay on helpers or not while changing Pelvis rotations.

The second one is dedicated to Right Leg/Foot and Left Leg/Foot Management using helper (if connected), or a synthetic control interface (if you disconnect the helper).

The third one allows to bend and twist the toes. AND TO SET THE FOOT AS THE ORBIT NODE FOR THE PERSPECTIVE VIEW TOOL OF THIS INTERFACE (Set Orbit)

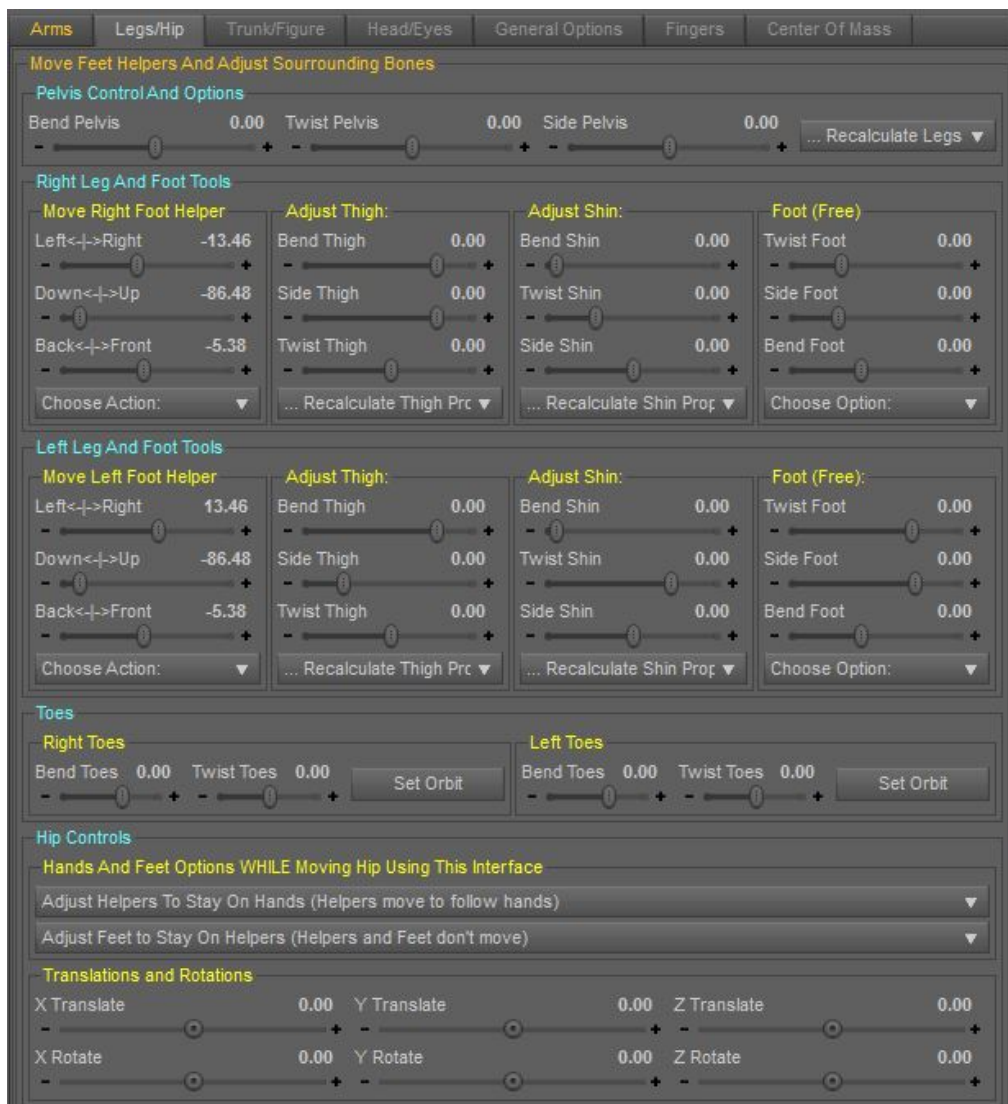


Illustration: Legs/Hip Tab

The last one, the bottom one, dedicated to hip management (translations and rotations), with options to determine whether feet or hands should stay on helpers or not while changing hip rotations and translations. The choice to place the hip with the leg was made because most of the time, when you adjust feet locations and pelvis rotations, you will need to change a bit the hip rotation and translation to keep the figure on floor with a nice global balance.

IN THIS INTERFACE, SOME OF THE "SIDE-SIDE" DIAL NAMES WERE REPLACED BY "SIDE" DIAL NAMES FOR A MATTER OF COMPACTY.

IV.1. Posing the Pelvis

In the "Pelvis Control And Options" box, you can pose the pelvis using its Bend, Twist, and Side dial "as you would do in Daz Studio Parameters Tab".

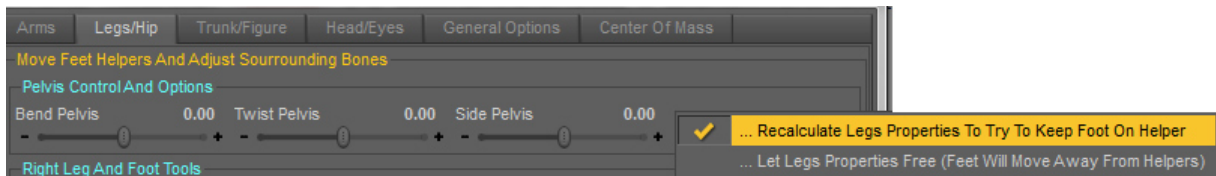


Illustration: Pelvis Box. You can choose to re-calculate all the legs bones while posing pelvis (in order to keep the feet at a given location in space) or not.

If you choose "Recalculate Legs Properties To Try To Keep Foot On Helper" in the dropdown menu at the right of this box, then, each time you change the Bend (Bend Pelvis dial), the Twist (Twist Pelvis dial) or the Side (Side Pelvis dial) properties of the Pelvis Bone, then all the Leg bones will be recalculated to try to keep the foot on (or as close as possible from) the helper to which it is associated.

As it is the case for the arms, **this option can be overridden by the disconnection actions**. Indeed, if you use the option "Recalculate Legs Properties To Try To Keep Foot On Helper", but in the same time you have the right foot helper disconnected (see later how to disconnect feet), then only the left legs bones rotations will be calculated to maintain left foot in place on its helper. And inversely. And if both feet are disconnected, everything will happen as if you used the option "Let Legs Properties Free (Feet Will Move Away From Helpers)".

Please note: Even if the helpers don't move, you may see the coordinates of the helpers (Left/Right, Down/Up, Back/Front) changing in the interface (in the Move Right/Left Foot Helpers Boxes). It does not mean that the helpers move in space. They remain at the same place and are actually re-calculated to take into account the fact that the point they use as their "0" moves in space because they moved with the pelvis.

If you use "Let Legs Properties Free", nothing will be calculated for the legs, meaning that they move with the pelvis exactly as if you change Bend, Twist, and Side-Side for the Pelvis in the classical interface of Daz Studio. In this case, the helpers stay where they are, and the legs and feet simply follow "normally" the movement of the pelvis, and you end up with having the feet away from their helpers. (Don't worry, you have options to place helpers or feet or feet on helpers).

IV.2. Posing the Legs

IV.2.a. Where are the feet helpers located

Everything mentioned here for Right Leg will of course be the same for the Left Leg, and inversely. The control of the legs is obtained using helpers placed on feet. The "Right Foot V3DPose Helper" drives the position of the right foot in space, more precisely the ORIGIN OF THE RIGHT FOOT NODE, located around the ankle. You simply have to take this fact into account when you pose the feet, but in practice,

since you drive the foot “more to the bottom”, or “more to the top”, or “more to the left”, etc, etc, it does not really matter. IF THE CONTROL IS LAGGY, PLEASE READ UPDATE 1.1 RELEASE NOTES.

IV.2.b. Presentation of the interface dedicated to feet control / Effect of Moving Helpers

Move helpers Along the X, Y, Z World Space Coordinate System “Arrows Of Helpers” represent this system

Left-Right (X) = Red Arrow
Down-Up (Y) = Green Arrow
Back-Front (Z) = Blue Arrow

Twist, Side-Side and Bend Foot Controls Dropdown Menus Option Allow To Try To Maintain Foot Orientation

Adjust Thigh and Shin Bones While Keeping Foot In Place On the Helper, (Default Option, But Can Be Disabled)

Illustration: Controls for legs and feet

In the Right Leg And Foot Tools box, you will find all the tools acting only on the right leg. In the Left Leg And Foot Tools box, you will find all the tools acting only on the left leg.

LEFT/RIGHT MOVES THE HELPER ALONG ITS RED ARROW

DOWN/UP MOVES THE HELPER ALONG ITS GREEN ARROW

BACK/FRONT MOVES THE HELPER ALONG ITS BLUE ARROW

THESE ARE RELATED TO THE WORLD SPACE X, Y, Z TRANSLATIONS

Illustrations above: interface “Legs/Hip” tab, and directions associated to the dials of “Move Right (Left) foot helper.

For the Feet Helpers (Move Right Foot Helper or Move Left Foot Helper boxes), the coordinates displayed for the dials (Left \leftarrow | \rightarrow Right, Down \leftarrow | \rightarrow Up, Back \leftarrow | \rightarrow Front) are related to Right Thigh Reference Location and Left Thigh Reference Location, which are two nulls parented to the pelvis of the figure and located (when the figure is zero posed) at the origin of each thigh bones.

When you change those coordinates, it moves the helper along the X, Y, Z axis of the World Space Coordinate System (meaning the X, Y, Z axis of a figure which has not rotated in the scene). To make things easier, if the figure is rotated in the scene, the helper has a geometry with colors allowing you to see in which direction it is going to move : along the red axis for Left \leftarrow | \rightarrow Right translations, along the green axis of the helper for the Down \leftarrow | \rightarrow Up translations, and along the blue axis for the Back \leftarrow | \rightarrow Front translations. **REMEMBER, THE BUTTON AT THE BOTTOM OF THE INTERFACE ALLOW YOU TO RENAME THE DIALS “RED Axis”, “GREEN Axis” and “BLUE Axis”, IT CAN MAKE THINGS EASIER DEPENDING ON THE FIGURE ROTATION.**

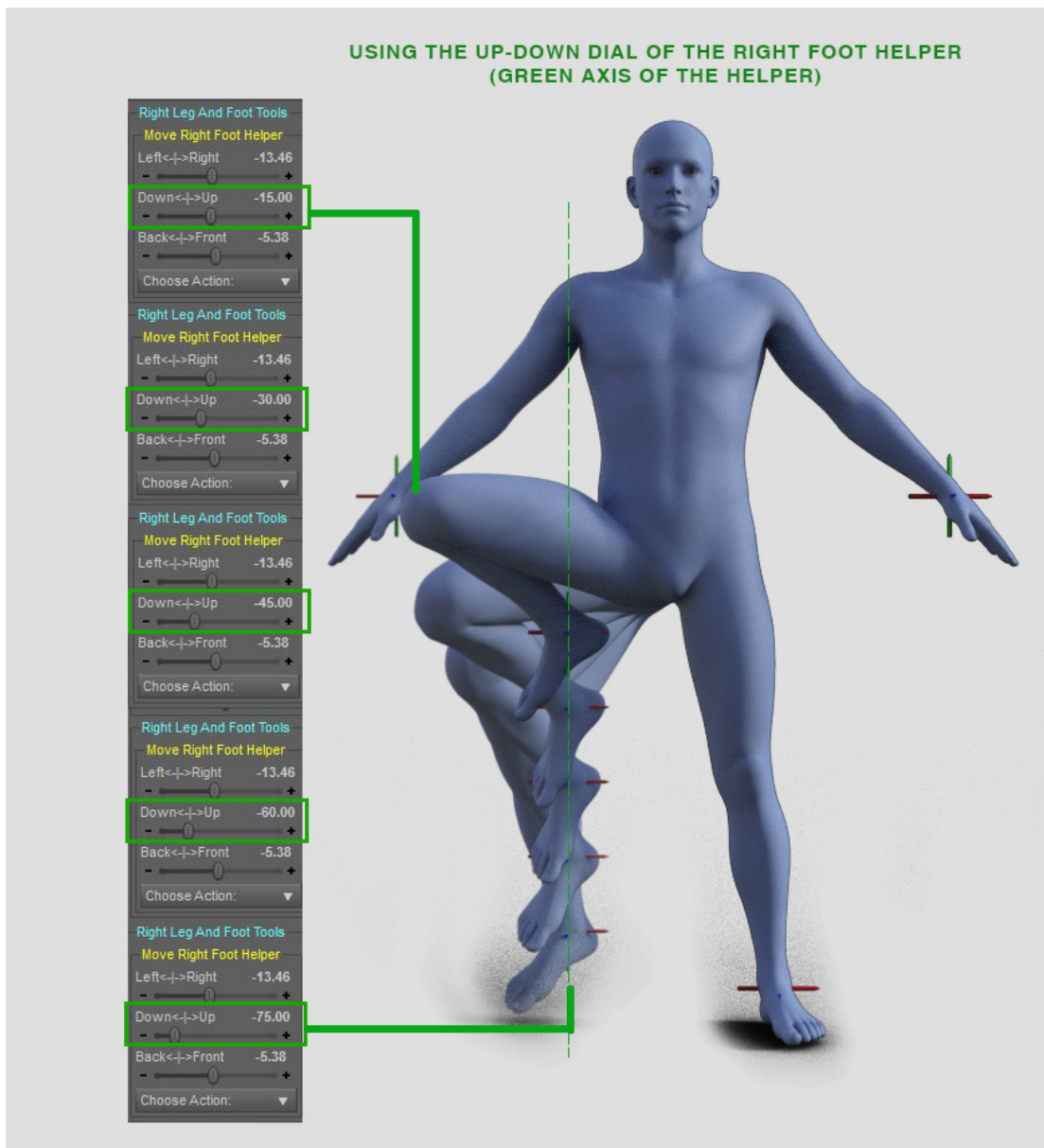


Illustration: Moving Foot Helper Up Down (ALONG ITS GREEN AXIS)

It is important to understand that the names of the sliders have to be seen from the “World Space”, and not the “figure” point of view. If the figure you work on is facing the camera, then the names of

the dials moving the helpers are perfectly representative of the movements of the helpers in relation to the figure and to the World Space Coordinate System. But if the figure is, for instance, facing the Left Direction (turned of 90 degrees around Y), or any other direction, then then names are only representative the movement of the helpers in the World Space Coordinate System. The colors of the arrows of the helpers are here to show you what those directions are:

IN SUMMARY: For the helper, you can consider that The X controller (Left-Right) makes the helper move along its Red axis (arrow), the Y controller (Down-Up) along its Green axis (arrow), and the Z controller (Back-Front) along its Blue axis (arrow). These X,Y,Z of the helpers also correspond to the X, Y, Z directions of the World Space Coordinate System, and the X, Y, Z directions of the figure if it is not rotated in the space (in the scene).

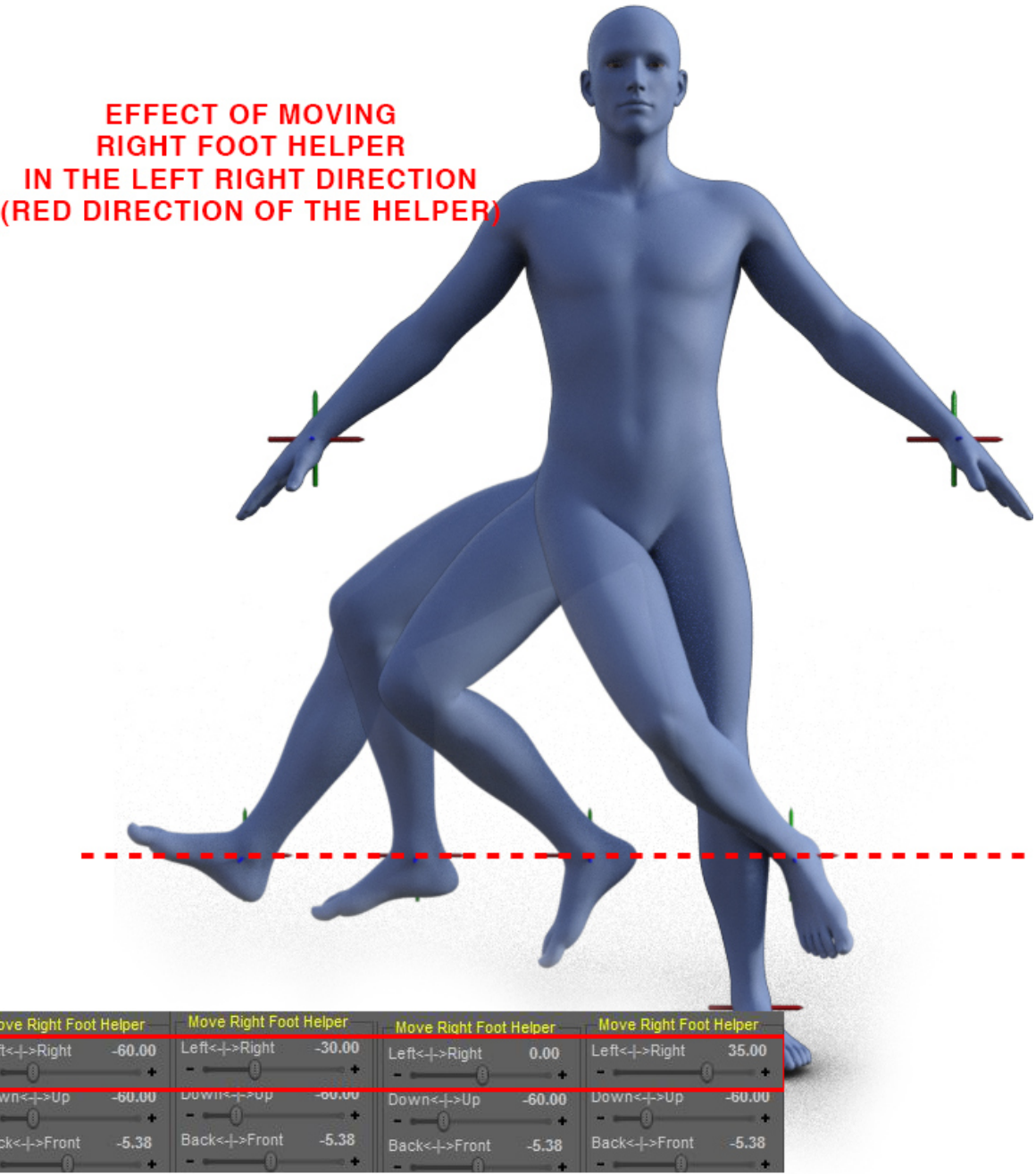


Illustration: Moving Foot Helper Left-Right (ALONG ITS RED AXIS)



Illustration: Moving the foot helper Front-Back (ALONG THE BLUE AXIS OF THE HELPER)

IN CASE OF LAG ISSUES, TRY THE SOLUTIONS PROPOSED IN RELEASE 1.1 UPDATE NOTES

IV.2.c. Move Helpers, Adjust Surrounding Bones, CONVERGENCE Remarks

As shown in the previous illustrations, moving feet helpers using the dials of “Move Right (or Left) Foot Helper” are similar to moving hand helpers.

Yet, moving the hand using a helper process reaches the result in a faster and better way than moving the feet using a helper. This is mainly because we have access for the hands to three collar rotations + three shoulder rotations + forearm bend, whereas foot control is limited to three thigh rotations + three shin rotations (but two of them on the shin with only a minor contribution to the foot location!). The more variables you have the easiest it is to reach a minimum – a solution - for the convergence method I used, this is why foot may require more iterations to reach the same precision as the hand. The second reason is that in order to make it possible for the feet to browse a maximum of space (and to make calculations more stable), some of the convergence processes to place the foot automatically begin with a strong thigh bend rotation, which can initially move the feet very far away from the helper.

The way to proceed to place a foot is very simple:

You can move the foot with the foot helper to where you want it to go, then, once done you can adjust the way the leg will reach this position using the “Adjust Thigh” and “Adjust Shin” dials. You will never

be able to make big adjustments for the “Bend Shin”, because it is very constrained by all the other settings. Depending on the feet location, you will be able to make huge adjustments IF THERE ARE A LOT OF DIFFERENT WAYS TO PLACE THE FOOT WHERE IT IS, or only minor adjustments IF THERE ARE VERY LIMITED WAYS TO PLACE THE FOOT WHERE IT IS.

USE THESE DIALS TO CHANGE FEET LOCATION

Don't Forget To Also Have a look at all the options available in the dropdown menus at the bottom of each box!

USE THESE DIALS TO CHANGE THE WAY THIGH REACHES FEET LOCATION

USE THESE DIALS TO CHANGE THE WAY SHIN REACHES FEET LOCATION

USE THESE DIALS AND OPTIONS TO CHANGE OR AUTOMATE THE FOOT ORIENTATION

Illustrations (above and below) : how to move the foot and adjust the leg

FEET ARE ALWAYS AT THE SAME PLACE. ONLY “ADJUST THIGH” DIALS WHERE USED, AND MAINLY “TWIST THIGH” AND “SIDE THIGH”



USING THESE DIALS CHANGE THE WAY THE LEGS PLACE THE FEET ON THE HELPERS. “ADJUST SHIN” DIALS HAVE A MUCH LOWER EFFECT.

When you adjust the dials of “Adjust Thigh” or “Adjust Shin” ALL THE BONES ROTATION FOR THE LEG will be calculated so that the foot does not move (stays on the helper). Adjust Shin may be very limited in term of possible variations, especially the Bend control which can remain “almost locked”.

If, when doing so, you are under the impression that you cannot push a dial further (lower than or higher than) a certain value, which is yet not the limit of the dial (the limit of the bone rotation), don't worry, this is normal. This is because, with all the other settings you are using for thigh and shin, and for the current helper (foot) location, no solution can be found with an higher (if you can push the dial higher) or lower (if you can't push the dial lower) value than the value you have the impression to “be blocked”.

Sometimes when you move the helper or when you change the “Adjust Thigh” or “Adjust Shin” dials (actually at any time when the calculus to place the foot on the helper is triggered), the calculus may not reach the right result.

There are two types of such issues. First, the helper is really close to the feet, but there is at least 5 or 6 cm of distance between them. Then, you may see that the leg is “straight” instead of being bent, and the helper is this time far from the foot, and on or almost on the leg. These are two convergence issues and the next parts show you how to solve them.

IV.2.d. Easily solve convergence issues

PLEASE SEE THIS VIDEO TO SOLVE YOUR ISSUE: <https://youtu.be/835atAwU3NY>

“Convergence issues” means that the script was not able to place the foot close enough to the helper. The first reason the foot may not be on the helper is that the helper cannot be reached.

--- > **If the helper is too high to be reached**, you can meet two situations (mainly depending on the current state of thigh bones), a straight leg or a bent leg. Most of the time, you can go from one to another state by playing with “Side Thigh” and “Twist Thigh” dials. In general, the Bend Thigh will be at its minimum (-115) value (if the helper is in front of the figure).

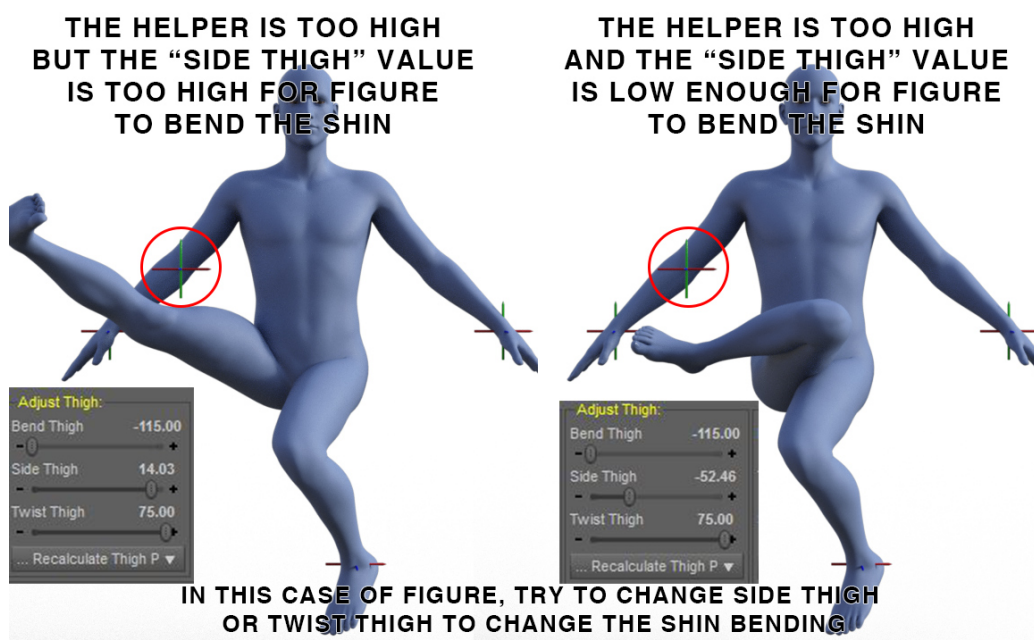


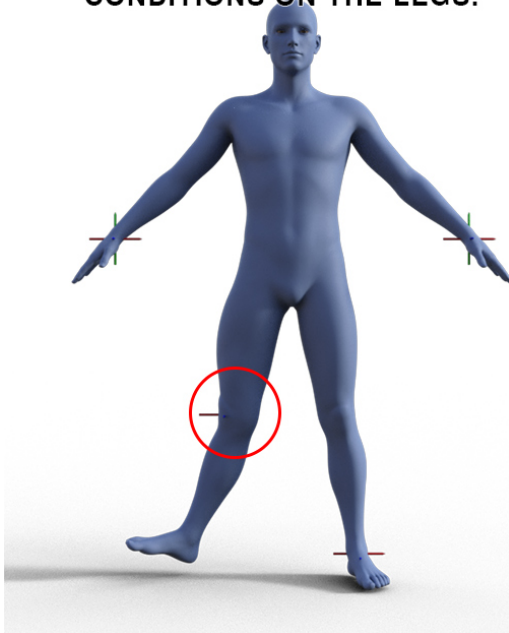
Illustration : cases you can meet when the helper is too high to be reached

--- > If the helper is too low to be reached, or too front, or too back, the script will try to place the leg in the axis of the helper. This will also limit the amount of correction you can have using the “Adjust Thigh” and “Adjust Shin” dials. For instance, if the helper is too low (below a standing figure) to be reached, then you will be able to Twist Thigh on a wide variation range, but the accessible variation range of Bend Thigh and Side Thigh will be extremely small.

--- > If the helper can “in theory” be reached, but the leg suddenly becomes “straight”

This is a convergence issue due to the fact that, with the initial conditions provided for all the bones, suddenly the script suddenly “turns some bones the wrong way”. In general, you will find the helper almost on the leg, or on the leg, as shown in the following example. There are several easy ways to solve this.

THE HELPER CAN BE REACHED BUT THE SCRIPT FAILS WITH THE INITIAL CONDITIONS ON THE LEGS.



IN THIS CASE, THE INITIAL CONDITIONS MUST BE MODIFIED SO THAT THE FOOT CAN FINALLY REACH THE HELPER:

- by moving rapidly the “Adjust Thigh” dials from right to left and left to right until the foot “jumps back to” the helper.
- by moving the helper very high (in the torso --> head direction of the figure), then moving it slowly down back to its initial location
- by using the “Try To Force Helper On Foot” option included in the dropdown menu “Choose Action:” of the corresponding “Move Right (or Left) Foot Helper” box

Illustration : cases where you moved the helper, or changed “Adjust Thigh” dials or “Adjust Shin” dials, (or whatever could trigger a leg position calculus) and suddenly the “helper lost the foot”.

Amongst the solutions you have to solve this, you can:

- First: move the “Adjust Thigh” dials of the leg presenting an issue (here in our example the right leg) from left to right and right to left. In general, this issue appears because either the “Twist Thigh” property or “Side Thigh” property prevents the script to find a solution.



Illustration : How to solve “foot away from helper” issue, solution 1

You will force them (or one of them if it is enough), to start the calculation of the foot location with other properties, which will allow the script to find a solution to place the foot on the helper. In my experience, it solved 95%, if not more, of such issues.

- Then, if not enough: you are going to move the helper to another location where the foot goes back to the helper, then move it slowly back to its initial location. Sometimes only a minor variation will place the foot back to the helper, sometimes you will have to go further, there is no rule. For this of course you have to remember the “Move Right (or Left) Foot Helper” dial(s) you are going to change if you want to place the helper and the foot exactly at the same location. It is an additional way of solving this issue if you don’t manage to do it with the “Twist Thigh” or “Side Thigh” dials.



Illustration : How to solve “foot away from helper” issue, solution 2, simply by moving the helpers and bring them back to where they initially were

- Third, still if not enough, you are going to use an utility especially made for this. It will automatically put the “Down<->Up” dial to its max and slowly bring it back to its initial value. It never failed during the test stages. The only condition in which it does not work is if the figure is too much upside down (meaning that the legs are above the head). In this case no need to use it, it would probably fail doing what’s it’s supposed to do. You find this utility “Try To Force Foot On Helper”, in the “Choose Action:” dropdown menu of the “Move Right (or Left) Foot Helper (see Doc)”. This will also reset the “clamped” option of the helper. This function must not be used if the helper is TOO FAR to be reached, only if it can be reached.

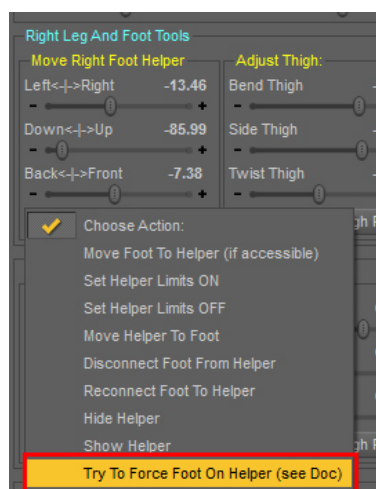


Illustration: Where to find “Try To Force Foot On Helper (see Doc)”

- Finally, if everything failed (it never happened so far), you can still “Disconnect the helper”, which allows you to use all the dials “as if there was no helper”. Then you can use the dials to place the foot near the helper (your choices in term of “Twist Thigh” and “Side Thigh”), “Reconnect the helper”, and slightly move for instance the “Side Shin” dial of the “Adjust Shin” box in order to trigger a new calculation.

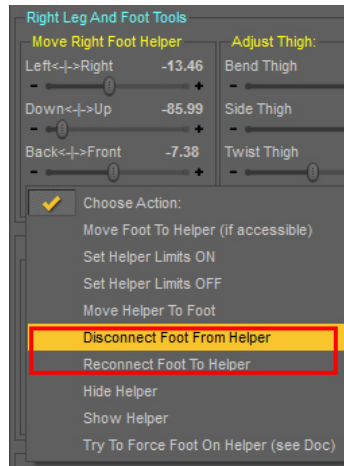


Illustration: Where to disconnect the foot (the interface then behaves as a synthetical overview and control of all the bones, without any additional calculation), and to reconnect it (it activates the calculations with the options you set up in the different boxes).

IV.2.e. Number of Iterations and Minimum Distance (to helper) for Feet

As mentioned in the part concerning the arms, for the leg, an iterative calculus is made to place the foot on the helper. This calculus stops either when the distance between the foot and the helper is below a certain value (this is the “Min. Error” value), or when a given number of iterations has been reached (this is the “Max. Iterations” value). **THESE VALUES FOR THE CALCULUS CAN BE MODIFIED AT THE TOP OF THE “GENERAL OPTIONS” TAB.**

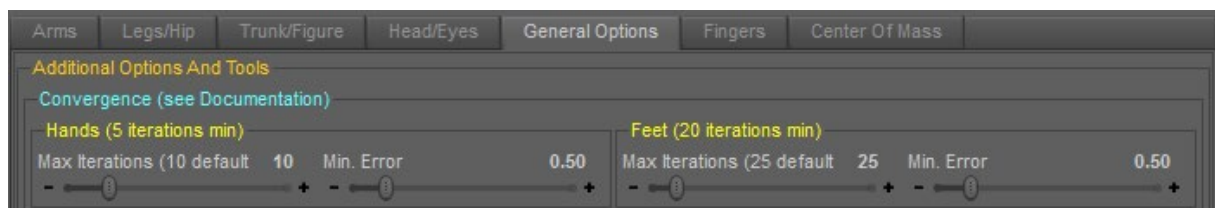


Illustration: How to set up the max Iterations and the min error, for the hands (in the left box) and the feet (in the right box)

For the legs, the number of iterations so that the distance between the helper and the foot is below “Min. Error” depends on the feet location in relationship with the body. If the foot tends to be low, to be far from the pelvis, and the leg tends to be straight, or if the thigh is not bent forward, it will take a bit more iterations it takes to get the result. In practice, with the 25 default iterations used by this program, and the 0.5 Min. Error, the final distance in such cases (pretty “straight” “vertical” leg) between the helper and the foot should vary from 0 to 1.5 cm, except if you push the number of iterations to above 40, and in this case you will be able to be permanently below the default 0.5 cm,

and often a bit below. The more precision you want, the lower you have to set the Min. Error. The lower the Min. Error is, the higher the number of iterations must be. Of course, the higher the number of iterations is, the slower everything goes. In practice, the choices I made for the default are really a good compromise between comfort of use and speed.

If you want a small distance such as 1 mm (for this you can set 0.1 the “Min. Error” for the foot), then the minimum number of iterations should be at least 50 (it can be less of course if the leg is bent).

You can anyway check AT ANY TIME THE DISTANCE between the helper and the foot, in the General Options Tab, by clicking on the button “Check Status”, which will tell you which helper is connected and what is the current distance to its related hand or foot. If the distance is higher than what you expect (for instance 5 millimeters (0.5 cm) instead of 1 millimeter (0.1 cm), you can increase the Max. Iterations in the General Options Tab, and then do a small change to one of the “Adjust Shin” or “Adjust Thigh” dial to trigger a new calculus. If the number of iterations is high, then you will be able to see the busy cursor while everything is processed.

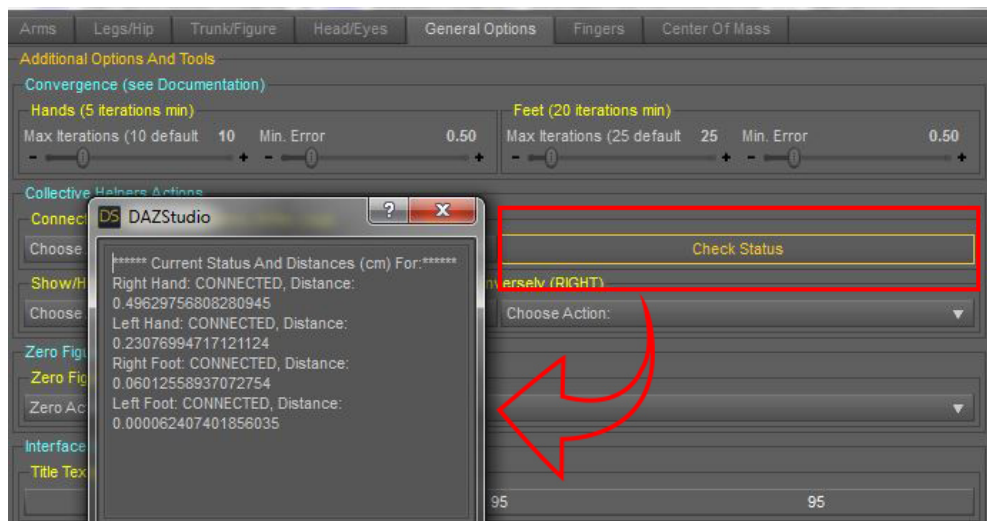


Illustration: How to check the distance between the helpers and their associated feet (or hands), as well as if the helper is seen by the script as connected or not

IV.2.f. Total or Partial Disconnection of feet (or one foot)

Each foot, as it was the case for the hand, can have 2 states:

- Connected
- Disconnected

When a foot is DISCONNECT, WHATEVER YOU DO, translate or rotate the hip, the figure, adjust thigh or shin dials, move helper, etc, etc, whatever you do, AND WHATEVER THE OPTIONS DISPLAYED FOR THE OTHER TOOLS, it will not follow the helper, NO CALCULUS WILL BE TRIGGER FOR THIS LEG. I remind here that in order to disconnect a foot from its helper, you can use the “Move Right (or Left) Foot Helper Box”, in the “Choose Action” dropdown menu, and selected “Disconnect Foot From Helper”. It is shown in the illustration top of previous page.

If you want to disconnect both feet, you can do this both in “Move Right Foot Helper” and “Move Left Foot Helper” boxes, or you can do it in the General Options Tab, “Collective Helpers Actions” box,

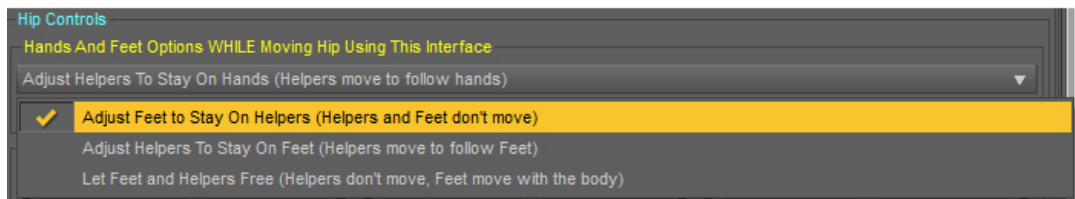
“Connect/Disconnect All Helpers (...)” sub-box, in the menu of the left, as shown in the second illustration of **II.4.a.** part, and select “Disconnect Both Feet Helpers”.

When a helper is connected then:

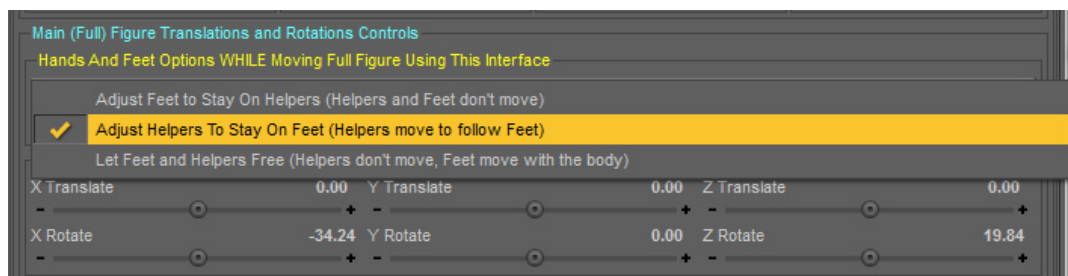
- Whatever happens the calculus to place on the foot on the helper will be triggered if you move the helper.
- **Depending upon your choices**, which are available in dropdown menus related to pelvis, hip and figure:
 - o Depending on **the choice of the Dropdown option menu associated to the hip**, a connected foot will or won't stay or try to stay on the helper if you rotate or translate the **hip** of the figure using this interface

**IN THE HIP CONTROLS BOX,
A DROPDOWN MENU ALLOWS YOU TO CHOOSE
IF, WHEN YOU CHANGE THE HIP ROTATIONS AND TRANSLATIONS:**

- **The feet stays on the helpers, which don't move**
- **The helpers stay on the feet, and the feet move “normally”, following the hip as they would do in Daz Studio**
- **The helpers don't move, and feet go away from helpers since they “normally follow the hip” as they would do in Daz Studio**



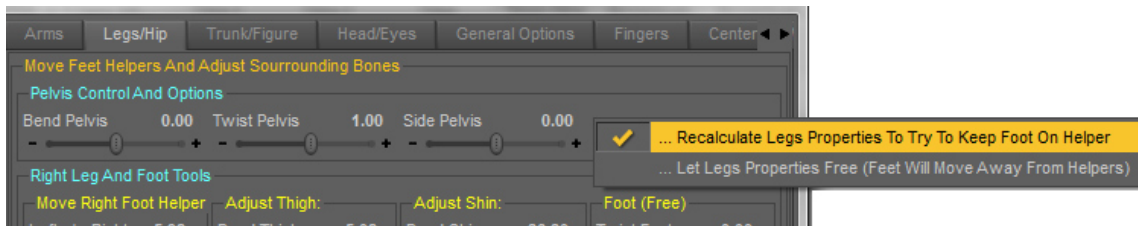
- o The same way, depending on **the choice of the Dropdown option menu associated to the figure**, with the same options available at the “Figure” controls level, a connected Foot will or won't also stay or try to stay on the helper if you rotate or translate the **figure** using this interface



If you want, for instance, a single foot to be kept in place on a helper when you move the figure, you can disconnect the helper from the foot which will be allowed to move “normally”, and then keep the option “Adjust Helpers To Stay On Feet”, which will be applied ONLY to the connected foot (and not the one disconnected). This is always the same principle.

- o The same way, depending on **the choice of the Dropdown option menu associated to the pelvis**, you can also choose that the two legs are recalculated when you modify the pelvis dials (the pelvis rotations), or that they are both ignored

But, if you choose that they are recalculated, but that you only want this to occur for one leg, then you only have to disconnect the other one which will then “behave normally” as if there was no helper. The option for the Pelvis are located at the Top of the “Legs/Hip” Tab of the interface.



IV.2.f. Posing the Hip

In the bottom tab of this interface, you can translate and rotate the hip bone of the figure. Before doing so, and if you work with connected hands and/or feet, you have to make sure that the options defining how the hands and feet and their helpers will behave when you will change hip rotations or translations are what you want.

--- > By default, the option concerning the hands will allow hands to move “freely” (as if they were disconnected, as if you worked in Daz Studio without helpers), and the helpers will remain on the hands (temporarily, the hands control the helpers).

--- > By default, the option concerning the feet will allow feet to move “freely” (as if they were disconnected, as if you worked in Daz Studio without helpers), and the helpers will remain on the feet (temporarily, the feet control the helpers).

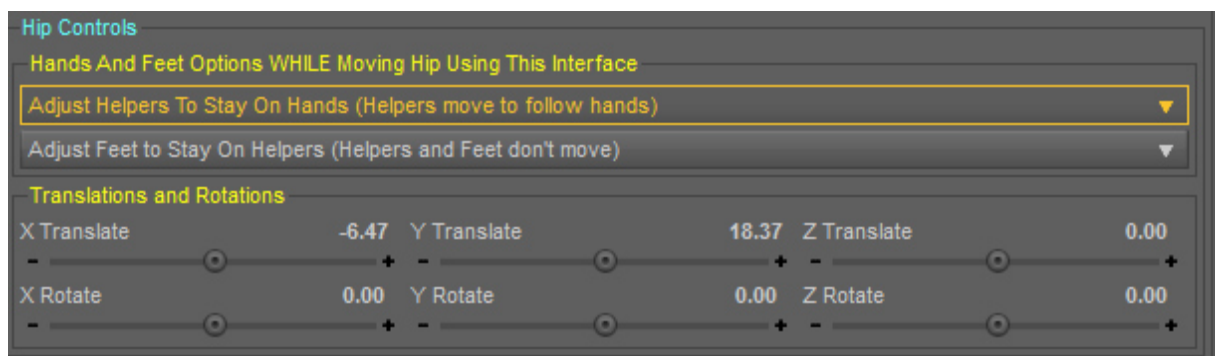


Illustration: Hip Controls box of the “Legs/Hip” Tab. Don’t forget to check that the options in the two dropdown menus above are the right one for you.

V. The Trunk/Figure Tab

For a matter of compacity, Trunk controls and figure controls have been gathered in the same Tab, named “Trunk/Figure”.

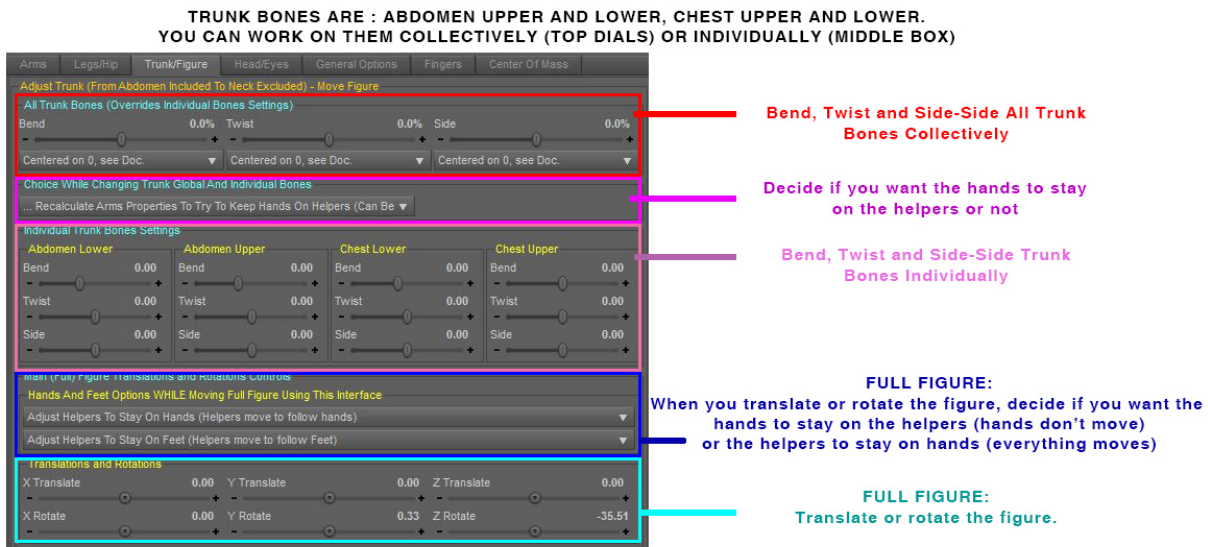


Illustration: Trunk/Figure Tab of the interface

There are two main parts in this tab of the interface. The first one is dedicated to the rotations of the trunk bones, the second one to the translations and rotations of the figure.

V.1. Trunk Controls

V.1.a Collective Trunk Controls and Options

You can Bend, Twist and Side-Side Trunk bones individually or collectively. Here again for a matter of compacity of the interface, the “Side-Side” labels were renamed “Side”. The top box “All Trunk Bones (Overrides Individual Bones Settings)”, allows you to Bend, Twist, and Side-Side (Side) all the trunk bones together. For each dial (Bend, Twist, Side) you have two options below the dial in a dropdown menu: “Centered on 0, see Doc.” Or “Linear Min-Max, see Doc.”. These two options differ on the way the bones rotations will vary with the helper. Initially, if all the values on the trunk bones are not null for a given rotation, the corresponding collective rotation will display a “?” as the current value.

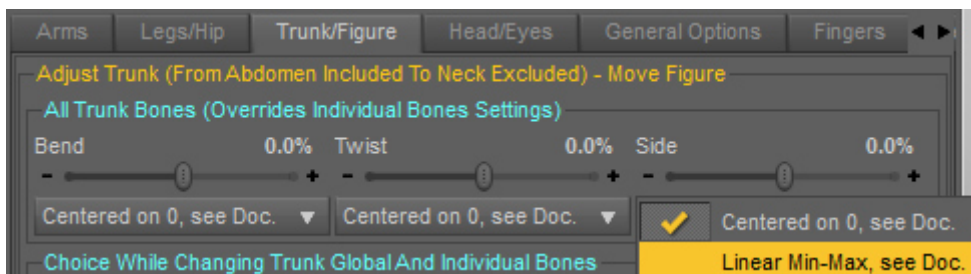


Illustration: Options associated to collective trunk control

In the “Centered on 0” case of figure, if a “Bend” or “Twist” or “Side” collective control dial is set 0, then all the individual corresponding dials of the trunk bones will be set at 0 too. Then when, for instance, you move the collective “Bend” dial from 0 to its minimum value, all the individual “Bend”

dials and rotations of the trunk bones will also be linearly driven from 0 to their minimum values. This works the same with “maximum value” if you increase the “Bend” dial to its 0 to its maximum value.

In the “Linear Min-Max” case of figure, all the individual dials will linearly vary from their minimum value to their maximum value as the corresponding (Bend/Twist/Side) collective dial vary from its minimum (-100%) to its maximum (100%). The consequence of this is that, if the minimum of a dial is different from the maximum of the dial, then when the collective dial value is 0, the individual dial values will can or will differ from 0. The two options don’t differ a lot, but it can be important for a few people to have both options.

For the dial which have their minimum limit being the negative value of their maximum limit, this choice does not matter. The choice has been kept for such dials (Twist/Side) in case you decide before you launch the script to modify some of those trunk bones limits in a “non-symmetrical” way.

V.1.b Choices you have to make for hands and helpers

Before you change the trunk rotations, collectively or individually, you have to decide what you want to do with the hands and the helpers. For this, you will use the dropdown menu of the “Choice While Changing Trunk Global And Individual Bones” box.

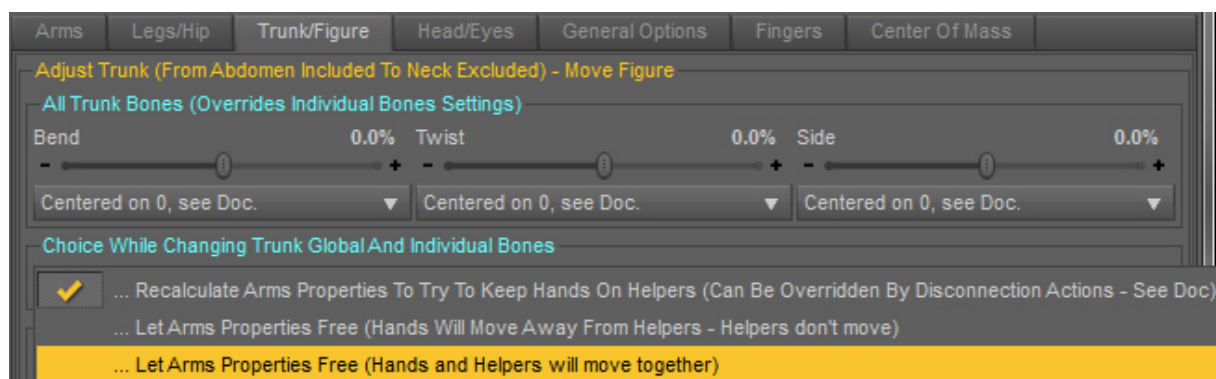


Illustration: Trunk Choice Box

If you choose:

- → ... Recalculate Arms Properties To Try To Keep Hands On Helpers (Can Be Overridden By Disconnection Actions - See Doc), then the hands which are connected will try to stay on their helpers, and the helpers will not move in the scene. I write “try to stay” because sometimes the arms are too short to make it possible. If the arms are too short, the arms will anyway straighten into the direction of the helper. The calculus of the arms are made with the Options provided in the “Adjust Collar” and “Adjust Shoulder” boxes of each arm (which can induce a partial connection only). Any “disconnected” hand from its helper will simply follow the trunk rotations “as if there was no helper”.
- → ... Let Arms Properties Free (Hands Will Move Away From Helpers - Helpers don't move), then the hands will simply follow the trunk rotations “as if there were no helpers”. The helpers will stay where they are in the scene. This way, you can choose afterwards what you do with the hands and the helpers, using the “Move Right Hand Helper” and “Move Left Hand Helper” dropdown menus “Choose Action:” either move hand to helper, either move helper to hand. Take care that if a hand is away from its helper but not “Officially disconnected” from the script, any action which will trigger a new arm calculus will try to place the hand back to its helper.

- → ... Let Arms Properties Free (Hands and Helpers will move together), then the hands will simply follow the trunk rotations “as if there were no helpers”. The helpers will stay on the hands all along the operation.

V.1.c Individual trunk controls

You can control individually the rotations (Bend, Twist, Side-Side) of all the bones of the trunk in the “Individual Trunk Bones Settings” box.

When you do so, for instance if you change the “Bend” of abdomen lower, then the “Bend” of the collective actions (the top box) will not become a “?” as it should (because it does not correspond the current individual dials any more). This choice was made so that you can remember easily your latest choice of “Collective Bend” for instance. Of course, you can still modify the “Bend” of the collective actions, and it will apply to all the “Bend” values of all the bones of the trunk. But if you do so you may observe a kind of “fast change” in the figure trunk angle, because what the collective dial showed did not correspond to the reality after you changed the individual dials. The same remark applies for the individual and collective “Twist” and “Side”.



Illustration: Individual Trunk Bones Settings Box

V.2. Body Controls

Before changing the body location (translation) and rotations, you have to make sure that the option you want for the hands, the feet and their helpers are the right ones. This is possible in the “Hands And Feet Options WHILE Moving Full Figure Using This Interface” box.

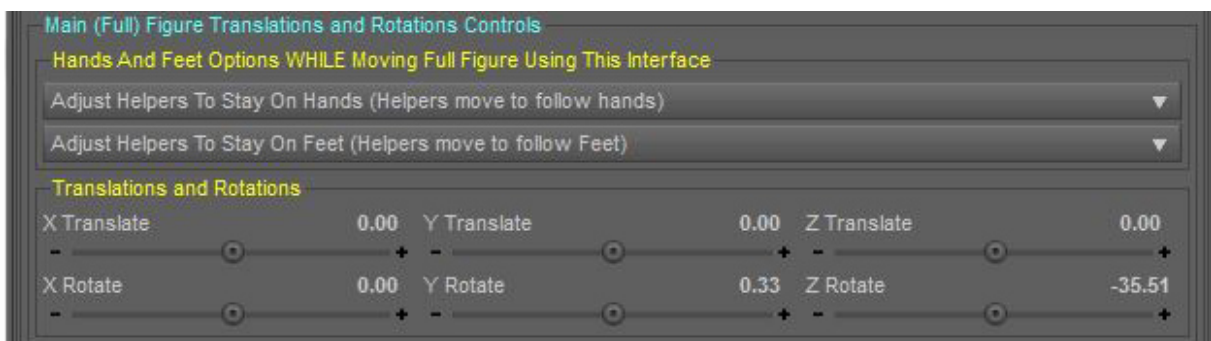


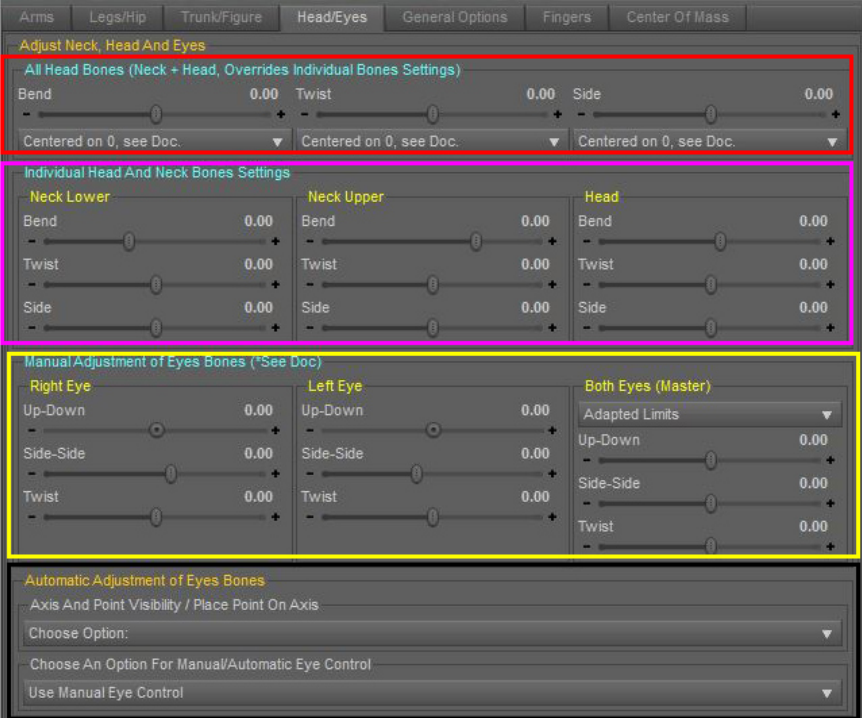
Illustration: Full Figure box and sub-boxes

THE OPTIONS AND THE OPTIONS DESCRIPTION (Adjust Helpers To Stay On Hands, Adjust Hands To Stay On Helpers, ...) are exactly the same as the ones in the previous part **V.1.b**. the only difference it that this time you have to make once choice for the feet, and once choice for the hands.

The default configuration is the one which will probably be used the more often, meaning that the hands and the feet follow the figure “as they would do it if there were no helpers”, and the helpers remain on (follow) their respective feet and hands.

VI. The Head/Eyes Tab (Head Also Includes Neck)

This Tab includes two main areas. The top boxes are dedicated to head and neck (lower and upper neck) rotations. The bottom boxes are dedicated to eyes rotations. The face bones, influencing expressions, are not included in this program.



The screenshot shows the 'Head/Eyes' tab in a software interface. It is divided into several sections:

- Adjust Neck, Head And Eyes:** A top section with three sliders for 'Bend', 'Twist', and 'Side', each set to 0.00. Below each slider is a dropdown menu with the text 'Centered on 0, see Doc.'.
- Individual Head And Neck Bones Settings:** A middle section divided into three columns: 'Neck Lower', 'Neck Upper', and 'Head'. Each column has sliders for 'Bend', 'Twist', and 'Side', all set to 0.00.
- Manual Adjustment of Eyes Bones (*See Doc):** A bottom section divided into three columns: 'Right Eye', 'Left Eye', and 'Both Eyes (Master)'. Each column has sliders for 'Up-Down', 'Side-Side', and 'Twist', all set to 0.00.
- Automatic Adjustment of Eyes Bones:** A bottom-most section with a dropdown menu 'Choose Option:' and a text field 'Choose An Option For Manual/Automatic Eye Control' with a dropdown menu 'Use Manual Eye Control'.

Annotations on the right side of the image:

- Bend, Twist Or Side-Side Head and Neck Bones COLLECTIVELY** (Red text, pointing to the top section)
- Bend, Twist Or Side-Side Head and Neck Bones INDIVIDUALLY** (Purple text, pointing to the middle section)
- Change Eyes Rotation Individually or Collectively** (Yellow text, pointing to the bottom section)
- ADDITIONAL EYES OPTIONS (including Manual/Automatic Eye Control)** (Black text, pointing to the bottom-most section)

Illustration: Head/Eyes Tab

VI.1. Head And Neck Controls

VI.1.a Collective Head And Neck Controls and Options (Top Box)

You can Bend, Twist and Side-Side Trunk bones individually or collectively. Here again for a matter of compacity of the interface, the "Side-Side" labels were renamed "Side". The top box "All Head Bones (Neck + Head, Overrides Individual Bones Settings)", allows you to Bend, Twist, and Side-Side (Side) all the Neck and Head bones together. For each dial (Bend, Twist, Side) you have two options below the dial in a dropdown menu: "Centered on 0, see Doc." Or "Linear Min-Max, see Doc.". These two options differ on the way the bones rotations will vary with the helper. Initially, if all the values on the Head and Neck bones are not null for a given rotation, the corresponding collective rotation will display a "?" as the current value.

In the "Centered on 0" case of figure, if a "Bend" or "Twist" or "Side" collective control dial is set 0, then all the individual corresponding dials of the Head and Neck bones will be set at 0 too. Then when, for instance, you move the collective "Bend" dial from 0 to its minimum value, all the individual "Bend" dials and rotations of the Head and Neck bones will also be linearly driven from 0 to their minimum

values. This works the same with “maximum value” if you increase the “Bend” dial to its 0 to its maximum value.

In the “Linear Min-Max” case of figure, all the individual dials will linearly vary from their minimum value to their maximum value as the corresponding (Bend/Twist/Side) collective dial vary from its minimum (-100%) to its maximum (100%). The consequence of this is that, if the minimum of a dial is different from the maximum of the dial, then when the collective dial value is 0, the individual dial values will (can) differ from 0. The two options don’t differ a lot, but it can be important for a few people to have both options.

For the dial which have their minimum limit being the negative value of their maximum limit, this choice does not matter. The choice has been kept for such dials (Twist/Side) in case you decide before you launch the script to modify some of those trunk bones limits in a “non-symmetrical” way.

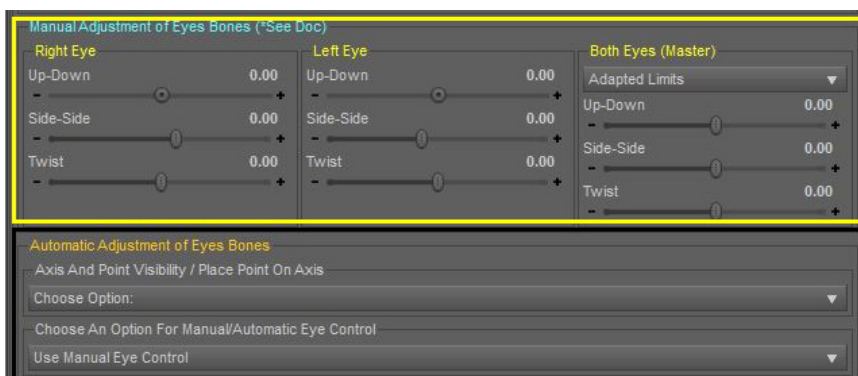
VI.1.b. Individual Head And Neck Controls and Options (Second Box)

You can control individually the rotations (Bend, Twist, Side-Side) of all the bones of the Head And Neck in the “Individual Head And Neck Bones Settings” box.

When you do so, for instance if you change the “Bend” of neck lower, then the “Bend” of the collective actions (the top box) will not become a “?” as it should (because it does not correspond the current individual dials any more). This choice was made so that you can remember easily your latest choice of “Collective Bend dial” for instance. Of course, you can still modify the “Bend” of the collective actions, and it will apply to all the “Bend” values of all the bones of the Head and Neck. But if you do so you may observe a kind of “fast change” in the figure Head and Neck angle, because what the collective dial showed did not correspond any more to the reality after you changed the individual dials. The same remark applies for the individual and collective “Twist” and “Side”.

VI.2. Eyes Controls

VI.2.a. Manual Eyes Control



Change Eyes Rotation Individually or Collectively

ADDITIONAL EYES OPTIONS (including Manual/ Automatic Eye Control)

You can rotate the eyes bones (Right and Left Eye) individually or simultaneously using the dials in the “Manual Adjustments of Eyes Bones (See Doc.)” box, meaning that you rotate the eyes yourself in the direction that you want.

If you change the dial values for the Up-Down, Side-Side or Twist rotations in the “Right Eye” or “Left Eye” box, then the modifications will be immediately visible in the scene and will be limited to the current limits you had on the figure when you launched the script (not clamped if you set some of the limits to off). Please note : in general, twist is not used to pose the eyes.

When you use dials (Up-Down, Side-Side, Twist) of the “Both Eyes (Master)” box, both eyes will move simultaneously, with some limits that will be explained a little bit later on.

Here is an important information: EACH time you use at least one of those helpers, the eventual pose controls (eyes side-side and eyes up-down of the pose controls parameters) are disabled (reset to 0). This is made in order to allow the rest of the eyes controls to work correctly in this interface.

I mentioned before, when you use the “Both Eyes” dials, there is an option box allowing you to change how it is going to be applied to the eyes, as shown in the following illustration:



Illustration: Options for “Both Eyes” controls

In the “Centered on 0” case of figure, if a “Up-Down” or “Side-Side” or “Twist” both eyes control dial is set 0, then all the individual corresponding dials of the trunk bones will be set at 0 too. Then when, for instance, you move the collective “Side-Side” dial from 0 to its minimum value, all the individual “Side-Side” dials and rotations of the trunk bones will also be linearly driven from 0 to their minimum values. This works the same with “maximum value” if you increase the “Side-Side” (or any other) dial to its 0 to its maximum value. This is not the recommended choice, since it can make the figure squint when using Side-Side (be cross-eyed), and this is due to the original limits of eyes Side-Side which are not “symmetrical”.

In the “Linear Min-Max” case of figure, all the individual dials will linearly vary from their minimum value to their maximum value as the corresponding (Up-Down/Twist/Side-Side) “Both Eyes dial” vary from its minimum (-100%) to its maximum (100%). The consequence of this is that, if the minimum of a dial is different from the maximum of the dial, then when the collective dial value is 0, the individual dial values will can or will differ from 0. The two options don’t differ a lot, but it can be important for a few people to have both options. This is NOT the recommended option, because here again “Side-Side” will end up with a cross-eyed figure.

In the “Adapted Limits” case of figure, which is the recommended option, everything will act as the “Centered On 0” case, but the difference, in order to allow the figure to keep the same eyes direction, is that the limits for the “Side-Side” of the eyes are set to (-30, 30) instead of (-40,30) and (-30,40), as it is the case by default.

VI.2.a. Automatic Eyes Control choices

In the lower Box, named “Automatic Adjustments Of Eyes Bones”, you will find two dropdown menus.

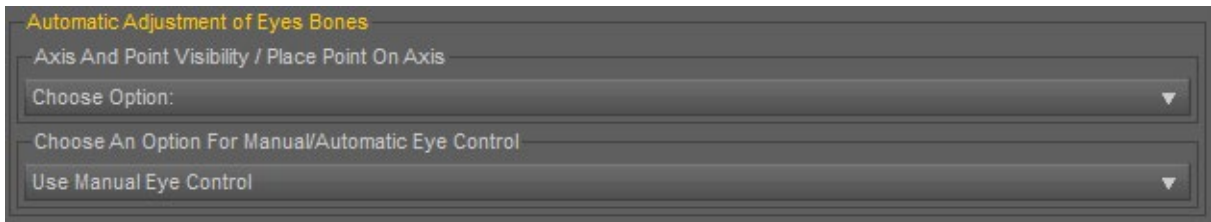


Illustration: Automatic Adjustment Of Eyes Bones box

The first one is related to the elements which will help you to control automatically the direction of the eyes, which are the “V3D Eyes Target Point” and the “V3D Eyes Axis”.

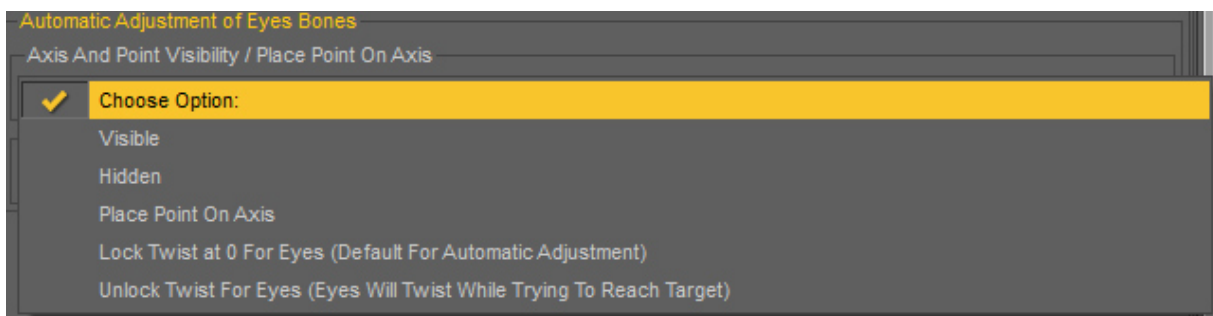
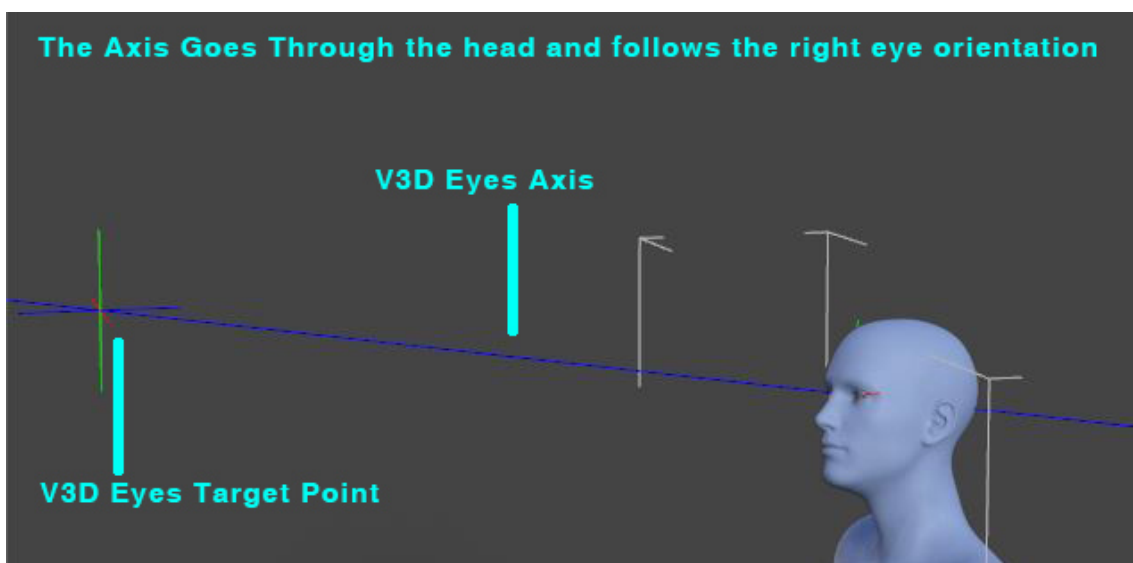


Illustration: First dropdown menu of this box

You can use this box to hide and show the “V3D Eyes Target Point” and the “V3D Eyes Axis”, using the Visible and Hidden option. It is interesting to hide them as long as you work on the other parts of the body.

If you want to place the “V3D Eyes Target Point” on the “V3D Eyes Axis”, you must use “Place Point On Axis” choice.

The “V3D Eyes Axis” is a long blue axis visible in preview mode (not in render mode) and ALWAYS POINTING INTO THE DIRECTION THE RIGHT EYE IS LOOKING INTO. The “V3D Eyes Target Point” is also a null, so it is also visible in preview modes. It is located either on the “V3D Eyes Axis” (when you launch the script) or in the latest target of the eye if you changed it during the script session.



You can Lock the Twist at 0 for the eyes bones in case of automatic adjustment. You can unlock it, in which case the eyes will twist too when they will try too look in a given direction.

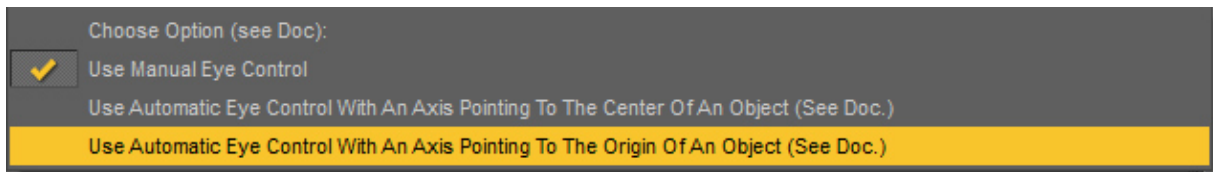


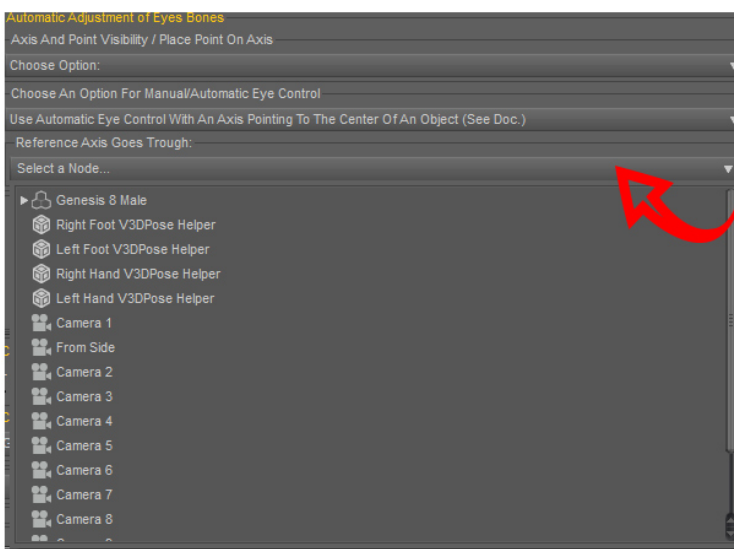
Illustration: Choice for Manual or automatic Eye Control

IN THE SECOND BOX, YOU CAN SWAP FROM "Use Manual Eye Control" to either :

"Use Automatic Eye Control With An Axis Pointing To The Center Of An Object (See Doc.)", which will be the center of the bounding box of the node you will select, or

"Use Automatic Eye Control With An Axis Pointing To The Origin Of An Object (See Doc.)", which will be the origin of the node you will select,

If you swap for any of the two last option, the interface will change to propose you a new selection box, allowing you to pick up in a the Scene list the node which will be the target for the eyes.



CHOOSE AUTOMATIC EYE CONTROL
AND THIS SELECTION BOX WILL APPEAR,
ALLOWING YOU TO SELECT
THE TARGET NODE FOR
THE EYES

Illustration: Where you can select a target node for the eyes

As soon as a target node is selected, the "V3D Eyes Target Point" is placed on the current target (center of its bounding box or origin of the node depending upon your choice), and the eye bones of the right eye will be rotated so that the right eye looks in the direction of this "V3D Eyes Target Point".

BY "IN THE DIRECTION", I MEAN THAT THE EYES BEHAVE AS IF THEY WERE LOOKING TO AN OBJECT LOCATED AT AN "INFINITE" DISTANCE, AND THE OBJECT YOU SELECTED IS IN THAT DIRECTION. It is similar to what happens in real life.

The rotations applied to the right eyes are then applied to the left eye to make sure that the figure is not "crossed eyes", and the "V3D Eyes Axis", representing the final direction the figure is looking into, is updated in order to take into account the new eyes direction.

Then you have two cases of figure.

- ➔ The first one, the node you selected in the Selection Box was in the range of sight of the figure with its current pose, in which case the eyes will REALLY be able to look in that direction, and this is confirmed by the fact that the “V3D Eyes Target Point” is ON the “V3D Eyes Axis”.
- ➔ The second one, the node was not in the range of sight of the figure with its current pose. In this case, the some of the dials of the eyes will reach their limits (-30, 30), and the “V3D Eyes Target Point” will NOT be on the “V3D Eyes Axis”. In this last case, it is up to you to rotate the head in a direction compatible with the node you want to look at (the Eyes Axis will move, but the Eyes Target Point will remain in place, until you define another node in the box).

The update of the eyes rotations IS NEVER AUTOMATIC, meaning that if you rotate the head or the body, the eyes will not automatically rotate to keep their current target. You have to update the automatic eyes rotation by clicking on the Selection Box “Select a Node”, so that the script identifies this action as a target change (even if you don’t change it), and launches the function to rotate the eyes in the right direction.

If you want the figure to look at a camera, it is better to choose the option where the axis pointing to the ORIGIN of the object.

When you choose the automatic mode, the limits for the up-down and side-side rotations are automatically set to (-30, 30).

When the eyes are automatically rotated, since it is made so that left and right eyes rotations are the same, then the “Both Eyes” dials are updated in order to correspond to the current direction of the eyes.

IF YOU CHANGE THE AUTOMATIC MODE, from “Center Of An Object” to “Origin Of An Object, don’t forget to UPDATE the target by clicking on the selection box allowing to change the target (no need to re-select the target, simply click on the selection area).

VII. The Fingers Tab

You will find in this tab all the dials of the finger bones, including the carpals, and organized to be as efficient as possible to pose the fingers.

First organized by hand. Then organized by rotations. A lot of tests have been made to configure the order of the dials, and this one is really efficient. Carpals are included and their name are “Carp.”

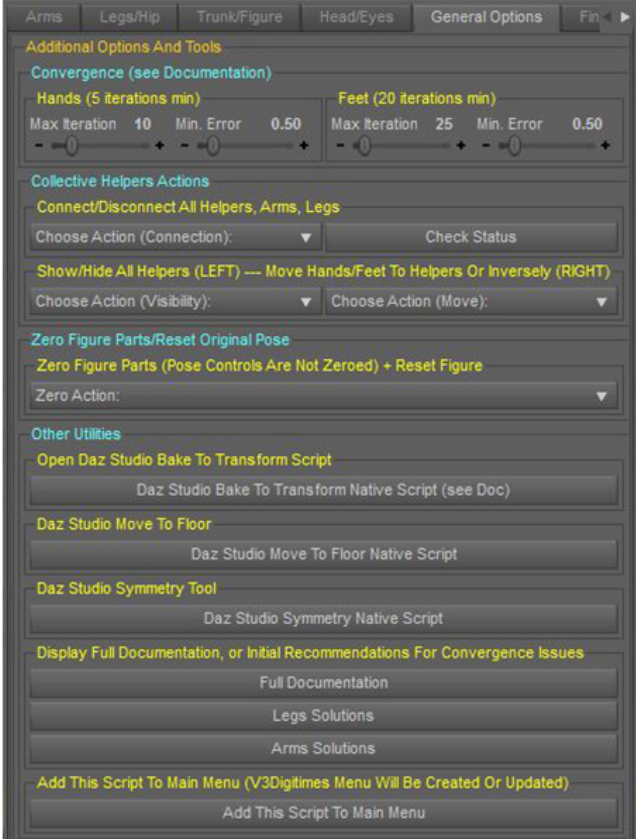
One interesting feature is that you can use the right hand or the left hand as orbit nodes for the perspective view using the “Set Orbit” button located at the bottom of the “Thumb” column.

Then you just have to use the bottom of the interface allowing you to rotate the camera left/right, up/down and to zoom on the hand, to see the hand with various angles while you pose the fingers.

	THUMB	INDEX	MID	RING	PINKY	
Fingers						
Right Hand Carpals And Fingers (Gathered By Rotation Type)						
	Thumb (Th.)	Carp. 1/Index	Carp. 2/Mid	Carp. 3/Ring	Carp. 4/Pinky	
RIGHT HAND FINGERS	Bend Th. 1 0.00	Bend Carp. 1 0.00	Bend Carp. 2 0.00	Bend Carp. 3 0.00	Bend Carp. 4 0.00	BEND
	Bend Th. 2 0.00	Bend Index 1 0.00	Bend Mid 1 0.00	Bend Ring 1 0.00	Bend Pinky 1 0.00	
	Bend Th. 3 0.00	Bend Index 2 0.00	Bend Mid 2 0.00	Bend Ring 2 0.00	Bend Pinky 2 0.00	
	Twist Th. 1 0.00	Bend Index 3 0.00	Bend Mid 3 0.00	Bend Ring 3 0.00	Bend Pinky 3 0.00	
SET HAND AS ORBIT NODE FOR PERSPECTIVE VIEW	Up-Down Th. 1 0.00	Side Carp. 1 0.00	Side Carp. 2 0.00	Side Carp. 3 0.00	Side Carp. 4 0.00	SIDE
	Set Orbit	Side Index 1 0.00	Side Mid 1 0.00	Side Ring 1 0.00	Side Pinky 1 0.00	
		Twist Index 1 0.00	Twist Mid 1 0.00	Twist Ring 1 0.00	Twist Pinky 1 0.00	
Left Hand Carpals And Fingers (Gathered By Rotation Type)						
	Thumb (Th.)	Carp. 1/Index	Carp. 2/Mid	Carp. 3/Ring	Carp. 4/Pinky	
LEFT HAND FINGERS	Th. 1 Bend 0.00	Bend Carp. 1 0.00	Bend Carp. 2 0.00	Bend Carp. 3 0.00	Bend Carp. 4 0.00	
	Th. 2 Bend 0.00	Bend Index 1 0.00	Bend Mid 1 0.00	Bend Ring 1 0.00	Bend Pinky 1 0.00	
	Th. 3 Bend 0.00	Bend Index 2 0.00	Bend Mid 2 0.00	Bend Ring 2 0.00	Bend Pinky 2 0.00	
	Th. 1 Twist 0.00	Bend Index 3 0.00	Bend Mid 3 0.00	Bend Ring 3 0.00	Bend Pinky 3 0.00	
	Th. 1 Up-Down 0.00	Side Carp. 1 0.00	Side Carp. 2 0.00	Side Carp. 3 0.00	Side Carp. 4 0.00	
	Set Orbit	Side Index 1 0.00	Side Mid 1 0.00	Side Ring 1 0.00	Side Pinky 1 0.00	
		Twist Index 1 0.00	Twist Mid 1 0.00	Twist Ring 1 0.00	Twist Pinky 1 0.00	

Illustration: The Fingers Tab

VIII. The General Options Tab



The screenshot shows the 'General Options' tab in Daz Studio. It is divided into several sections: 'Additional Options And Tools' with convergence settings for Hands (5 iterations min) and Feet (20 iterations min), both with Max Iteration and Min. Error sliders; 'Collective Helpers Actions' with buttons for 'Connect/Disconnect All Helpers, Arms, Legs', 'Show/Hide All Helpers', and 'Move Hands/Feet To Helpers Or Inversely'; 'Zero Figure Parts/Reset Original Pose' with a dropdown for 'Zero Action'; and 'Other Utilities' with buttons for 'Open Daz Studio Bake To Transform Script', 'Daz Studio Move To Floor', 'Daz Studio Symmetry Tool', 'Display Full Documentation, or Initial Recommendations For Convergence Issues', and 'Add This Script To Main Menu'.

Convergence settings

Connect/Disconnect Helpers And Check Status (+distance)

Hide, Show and move options

Zero: All, Partial. Reset: All.

Opens «Bake To Transforms»

Move To Floor

Opens «Symmetry Tool»

Opens pdf Documentation

Display solutions for Legs and Arms in case of an issue

Add This Script To Main Menu

Illustration: The General Options

In the General Options Tab, you will be able to:

- **Configure the convergence criteria** of the calculus placing hands and feet on helpers
- **Check the status of the Helpers** (connected or disconnected, as well as their distances to their respective hand or foot).
- **Process various actions on both “hands helpers” simultaneously, or both “feet helpers” simultaneously or on ALL helpers (feet and hands).** These actions are:
 - o Disconnect or Reconnect helpers
 - o Show or Hide Helpers
 - o Move Hands and/or Feet to Helpers
 - o Move Helpers to Feet and/or Hands
- **“Zero” various body areas (pose controls are not zeroed**, meaning that the final bone rotation may not be null if pose controls are initially used). These areas are:
 - o All
 - o Upper Body (all bones above the hip and pelvis, except face bones)
 - o Lower Body (Hip, Pelvis and all bones bellow)
 - o Right Leg, Foot, Toes (all together)
 - o Left Leg, Foot, Toes (all together)
 - o Right Arm, Hand, Fingers (all together)
 - o Left Arm, Hand, Fingers (all together)

- **Reset The Original Pose** (the one used when you launched the script)
- If the current Style of your interface is “Highway” or “Main Street” (but not “Darkside” or a customized style), you can change the background color of the interface.
- Use Daz Studio Script “Move Figure To Floor”
- Use Daz Studio Script “Symmetry”, which allows for instance to swap left right, or to copy right to left, etc, etc.
- Open this documentation. For this you must have a pdf viewer.
- Add this script to the top Menu of Daz Studio, under a “V3Digitimes” menu.

TAKE CARE! After using symmetry tool or “Move Figure To Floor” tools THE HELPERS ARE NOT LONGER IN PLACE ON THE HAND. YOU HAVE TO USE “Move helpers to hands and feet” in the “Choose Action (Move)” dropdown Menu.

Not represented in the image above, two buttons were added in order to swap rapidly between NVIDIA Iray preview mode, and Texture shaded mode, both at the bottom of this tab.

IX. The Center Of Mass Tab

The center of mass represents the weighted center of the figure. The weights provided are only an average for a “normal” human being. You can change this weight balance if you want.

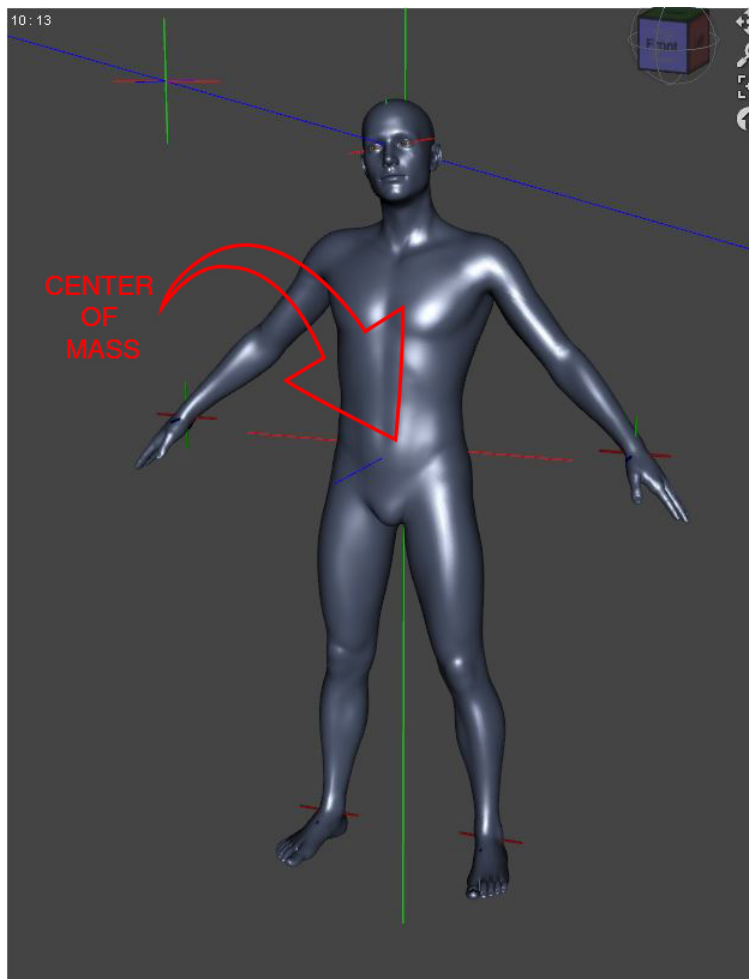


Illustration: The Center Of Mass (Huge Green axis, Red, Blue axis in the middle of the body)

The center of mass is not created by default. If you want to create it, you have to use the dropdown menu “Choose Your Action:” at the top of the tab, and choose “Create or Update Center of Mass”. It will be represented by a very long green axis, and pretty long red/blue axes (so that you can see the

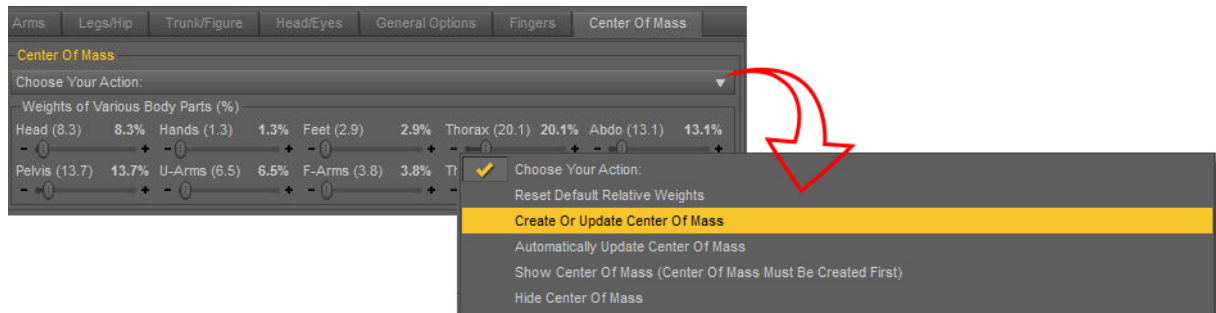


Illustration: Create the Center Of Mass or update its location

center location in the body). The green axis is long because for a static equilibrium, the green axis must be at the vertical of the support polygon of a figure (represented by the elements of the body in contact if the floor or a support object, such as a chair for instance). In movement, the rule differs of course, but the distance of the center of mass to this support polygon can also be interesting to know.

Once it is created, you have, in this same menu, options to hide and show this center of mass, to update it after you modify a pose or after you modify the repartition of the weights of the various body parts, to reset this repartition of mass.

The “Automatically Update Center Of Mass” option IS NOT RECOMMENDED, since it can drastically slow down all the other actions. The best is to modify a few elements of the pose, and then click on “Create Or Update Center Of Mass”

X. Change Perspective view and other view tools

Whatever the Tab you work in, you permanently have, in the bottom of the interface, tools allowing you to orbit the perspective view around the node of your choice. When you launch the script, this node is the latest Genesis 8, 8.1 or Genesis 3 bone (or full figure) which was selected in the scene.

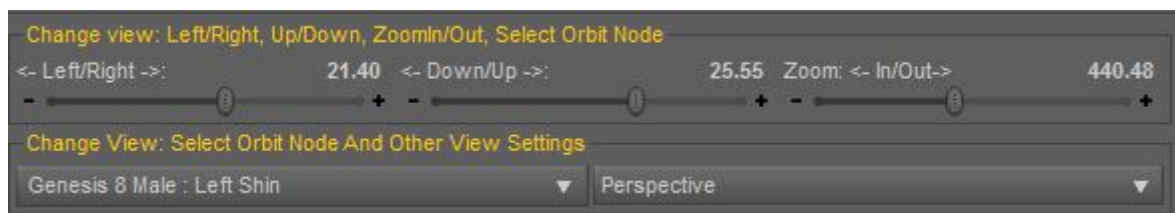


Illustration: At the bottom of the interface, you will always be able to change the view

The top dials allow you to orbit the perspective view Left to Right and Down to Up using the two first dials. You can Zoom in and out with the last dial.

In the box bellow, you will find a selection menu which will allow you to pick up the node you want to rotate around. As soon as this node is chosen, the perspective view will “jump” on this node. A little

tip here, if you want to select a node far in the arm or leg hierarchy, it may be easier for you to select the “hand” or the “feet” as the orbit node first, using the buttons in the boxes allowing you to pose fingers and toes. This way the area you are interested in will already be “expanded”.

You will also find the possibility to change the view from “Perspective”, to the classical “Top, Bottom, Right, Left, Front and Back” view, as well as any camera which would exist in the scene, as shown in the next image. Bellow these views, you have the “Safe Perspective” option which will set the perspective view to a position and with angles which are in general good to frame Genesis 8 or 3 figures.

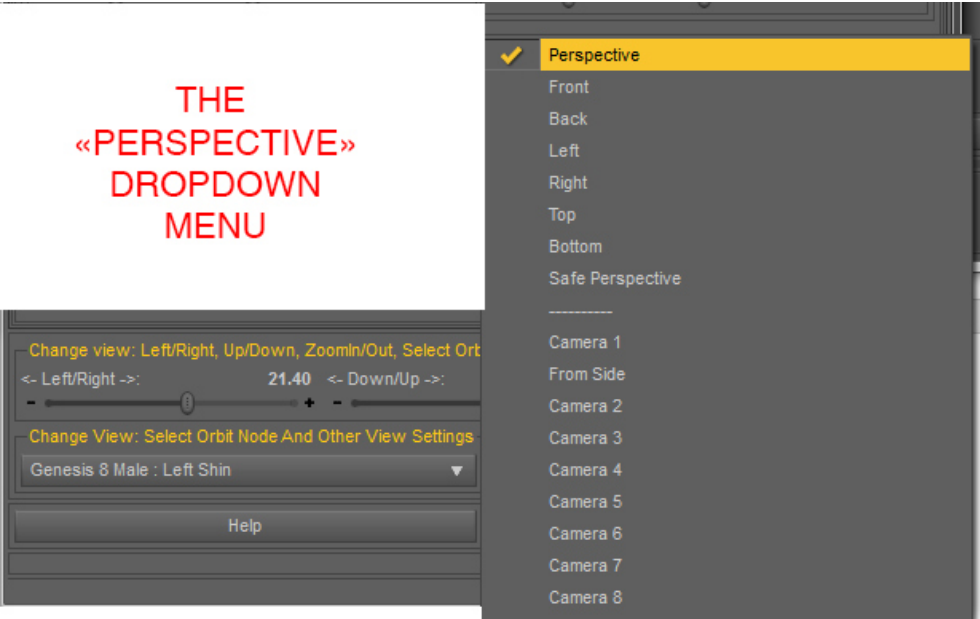


Illustration: The “Perspective” Dropdown Menu

IF YOU CHANGE for Front, Back, Left, Right, Top or Bottom views, you will lose (as long as you are on them) the possibility to change the angle of view or to zoom with the dials provided. Yet, you have in this case the option to frame either the node currently selected in the Selection Box, or the full figure you are working on.

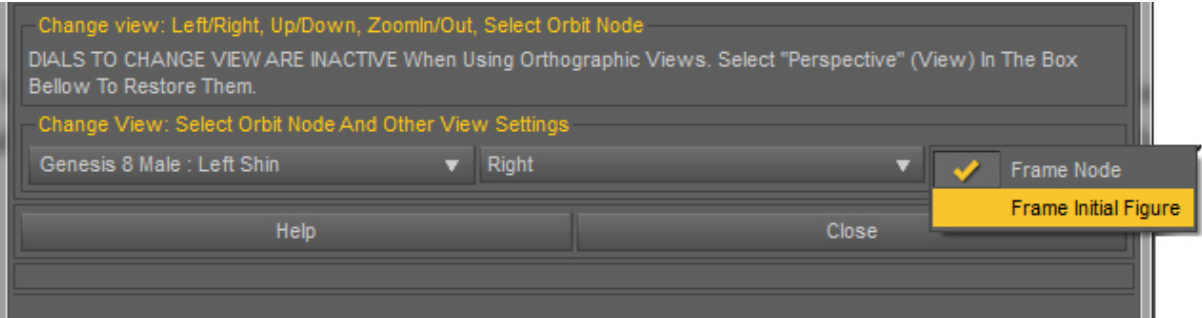


Illustration: The “Frame Node” / “Frame Initial Figure” option

IF, WHILE YOU ARE ON A SCENE CAMERA (Front/Back/etc, etc) , which is not the perspective view or a custom camera, you dial one of the orbit dials above, then you will automatically swap from the current camera to the perspective view. The same thing happens if you change the orbit node while you use a custom camera.