

GMAX / SiegeMax Modeling, Rigging and Animating HELP

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This is not a deep guide, more like little advice on how to make certain things work for game. Also this is not originally meant for anyone else but our game building team. Content applies to Gmax and SiegeMax(=Gmax for Dungeon Siege 1).

*** update 26.11.2008, ver 1.9. added to animation info on how to use both FK and IK

*** update 20.8.2008, ver 1.8. extended "Texturing" and added images to it.

*** update 19.8.2008, ver. 1.7. all content under an index, renaming, content updates big & small

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1. Tools, Siegemax commands and using Gmax with other 3D-software

1.1 TOOLS

If you use Gmax, you most likely want to make things for a game engine – for example Siege Engine which runs under the hood of game Dungeon Siege(1). To make 3D game assets you'll need copy of the game, your game-specific version of Gmax and the game specific-Toolset. In case of Dungeon Siege, those are SiegeMax and Siege Tools.

<http://garage.gaspowered.com/?q=downloads>

On SiegeMax

You'll need the Dungeon Siege (the game), Dungeon Siege Toolkit and Gmax downloads. You'll need a patched copy of Dungeon Siege or a copy of "Dungeon Siege Legends of Aranna" which doesn't need the patch. Here's where you can get the patch:

<http://www.gaspowered.com/ds1/content.php?loc=downloads>

GMAX USER KEY

To use Gmax you will need to create a profile at Turbosquid to get a user key. Also, if you uninstall Gmax and reinstall later, you need to go and pick up a new key.

<http://www.turbosquid.com/gmax>

1.2 HELP FILES

http://files1.turbosquid.com/Products/L567278/DX2GHGDAJB/gmax12_help.exe

http://files1.turbosquid.com/Products/L567281/YVES9KYKPA/gmax12_tutorials.exe

<http://files1.turbosquid.com/Products/L567279/XQX7B3S93K/library.exe>

GOOD HELP FOR CHARACTERS IS WATCHING SAMPLES

<http://garage.gaspowered.com/?q=downloads>

It is a good idea to download one of the characters from and study imesh and animations.

SIEGEMAX TUTORIALS

http://garage.gaspowered.com/?q=su_214 (character tutorials)

http://garage.gaspowered.com/?q=su_215 (object tutorials)

OTHER HELP

Gmax tutorials don't much tell about Gmax as 3D software. But as Gmax is essentially 3DS Max 4.0, you can use 3DS Max tutorials. There should be many available online and for free. The 3DS Max's own tutorials are good. Most basic tutorials from versions 3-6 apply to Gmax.

1.3 SIEGEMAX SPECIFIC COMMANDS/MODIFIERS

Some of these are available from Modifier-menu. Right-click-menu has them too and more.

For many of these to function, your Gmax file-name needs to be something like "m_u6p_spinningwheel" (stands for: mesh, u6p, item) AND your mesh-name in Gmax has to be the same as filename or "skinmesh".

- SKIN (to make bones you've made to move the mesh)
- SIEGE MAX ASP (to set changable body parts for character-meshes)
- SIEGE MAX SNO (to set object active boundaries, doors, walkable areas and such)
- SIEGE MAX ROOT TOOLS (to set object root – tells the game where object is in relation to ground)
- SIEGE MAX EVENT TOOLS (to set special events for frames in animation, like hit, death and so on)
- ITEM TOOLKIT (you can set handles aka grips for weapons, root for items, tracers and more)
- REF OBJ DROPPER (gives you reference objects to get your object scale right)
- NECK STITCH TOOLKIT (for setting the neck vertexes and their order for creatures with changable heads)

1.4 GMAX WITH OTHER 3D SOFTWARE

For modeling and texturing you can use pretty much anything. Just import it as outlined below. 3DS-format is the key. I have no definite info on bringing in animation, but if it ever is possible it is via 3D Studio Max.

MODELS TO GMAX

If you have 3DS MAX:

Just make your model, map it and texture in 3DS MAX and export as 3DS. Gmax reads this.

No 3DS MAX:

If your software has 3DS-export, use it and import to Gmax.

If there is no 3DS-export, export as OBJ and use Milkshape(or other conversion software) to convert it to 3DS. Milkshape is shareware, has a nice free demo and is not expensive to buy, either.

MILKSHAPE AND MD3

<http://chumbalum.swissquake.ch/>

GMAX > OTHER PROGRAMS > GMAX

1. Gmax: Scale object to small size, export as MD3, 1 frame only. You will need the MD3-plugins:
http://www.sleepyghost.com/u6p/gmax_ExportMD3.zip
http://www.sleepyghost.com/u6p/gmax_ImportMD3.zip
2. Milkshape: Import MD3 + export as OBJ.
3. Other 3D software you like to use. I use Modo.
Modo:
Import OBJ + work out the UVs & textures. If you have only one material and one set of UVs, export as OBJ. If you use more materials, save these meshes as separate scenes. Export each mesh as OBJ.
4. Milkshape: Import OBJ, export 3DS.
5. Gmax: Import 3DS, check and clean your model of extra vertices and faces. It is very likely you have those. Also rotate your model to stand upright, scale to proper size, maybe also move it's pivot point to a good place(often bottom center) and reset pivot.

If at any stage you don't see your texture on model, just drop it on it again. The UV's are still present.

1.5 RENDERING? (I want to show my work to others!)

This is a problem. Rendering is disabled in SiegeMax and exporting of animation is disabled also. Even exporting meshes is made difficult. There are workarounds for rendering and exporting. Some words to google for are "export gmax animation", "render gmax", "render gmax yafaray", but be warned it is not easy.

If you just want to show you've made stuff for a game, finish it, get it in game or make a test-environment with your toolset(like SiegeTools), play it and record a video screen-capture. There is free software for this. Then edit to your liking in video editing software.

2. Model for game

2.1 MESHES FOR GAME

Meshes and animation are exported as separate files. Idea is that many meshes can use one rig and can run all animations made with that rig. All meshes and animation files, when exported, refer to Naming Key. This is a file that tells exporter what goes where. Game needs a naming key to use your objects. See SiegeAcademy tutorials for more.

MESH Gmax-files should have animation length as 1 frame, speed 12f/s(custom). Characters and other animatable objects need skin-modifier. Buildings and such need SNO-modifier. Some characters need ASP-modifier on top of SKIN. Export by right-clicking your mesh, choose export mesh from pop-up menu.

2.2 OBJECT SCALE

You can test you object's game size in SiegeMax. Just right-click viewport and select "Open RefObj Dropper". Double-click on your selection, then click anywhere in the 3d view, and your reference object will appear.

2.3 LOW-POLY WORK

Usually the less polygons you use the better. Just keep things relatively blocky. Remember 6 or 8-sided barrel will look round in game because of the smoothing. End polycount is better keep under 200 for simple objects, 400-900 for characters – or less if you can wing it. And the polygons you count are triangles, not quads. See Right Click over your object >Properties.

You can use triangles to make shapes. Sounds simple but this is easy to overlook when people normally model with quads or n-gons. Use that extra edge you have in every quad.

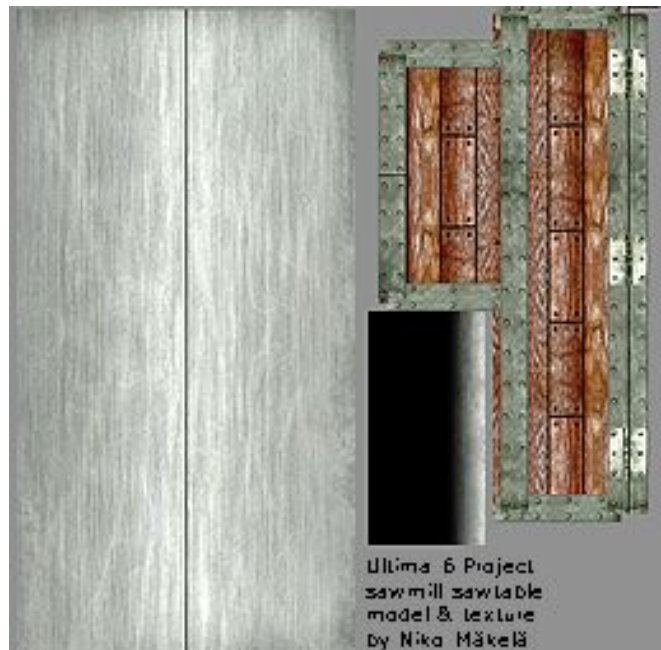
You can add false shapes by drawing some shadows&highlights into textures. But do it very sparingly. In game strong shadow on texture, but no hole/groove/whatever in geometry to account for it, looks odd.

Fake geometry. Say you need a grate with lots of holes, bars crossing over and over. Modeling them would mean lots of polygons. Why not make circular plane and texture that with a transparent texture?

2.4 TEXTURING http://www.sleepyghost.com/doc/character_mapping_gmax.pdf

Uvmap modifier in Gmax goes a long way to texture simple objects. Object below is mapped with UV-map and edited with UV-unwrap. My other guide(see above link) shows how to map more complex objects like characters.

- Forget superfine details. Objects are rarely seen close-up in game and texture-size is so limited(max. 256X256 for Dungeon Siege, see image) that everything goes blurry when viewed close.



- Make textures smaller than 256x256 unless it's for a large object (like the sawtable) or a complete character. As an example a helmet texture could be 64x64 pixels, maximum.
- Textures should be in powers of 2; for example, 128x256 is fine, and 128x128 is also fine, but 196x256 is not.
- If you want detail somewhere on your model, both UV-map and paint that specific part in texture bigger than the rest.
- UV-map with overlaps so same parts of a texture are re-used. This way your texture has less images in it, have them bigger and therefore show more detail. Nobody is bothered if your 3D-cabinet uses same texture-part in more than one place. And if you're good at re-using, nobody will notice, either.
- You can use more than one texture on an object. Use Multi Sub-object-material. This feature helps further when you need to change some but not all textures on a model like clothes on a character. And then there's the possibility of finer detail; Big & critical object in game could load two 256x256 textures.

3. ANIMATE IN GMAX

3.1 ANIMATIONS FOR GAME

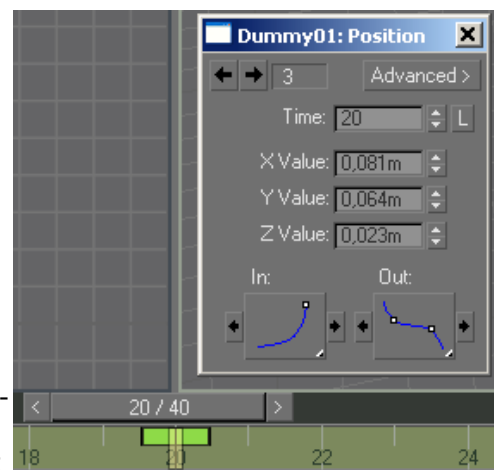
ANIMATION Gmax-files should have meshes named skinmesh inside Siegemax. Set animation speed as 12f/s(custom), length anything from 2 or so at shortest to, say, 800 frames at longest. Most animation are short in keyframes, fidgets are normally the only longer ones. Your animation Gmax-file needs to have the exact same rig (bones and control objects) as same character's MESH Gmax-file has. Export as animation from right-click-menu.

Game will interpolate your 12f/s animations to whatever frame rate the player's computer can handle. So the anims will get smooth. When animating it is best to forget tiny movements and focus on big ones, because the end result will be interpolated. In interpolation tiny details are either lost, not helping the end result, or are just never seen by the gamer.

3.2 GENERAL ANIMATING

Siege University has good notes on animating, see: http://garage.gaspowered.com/?q=su_214

- First check do you have more bones than you need. Check you rig if you simplify anywhere. Is there some joint that never much rotates? If there is, make no joint (just one bone instead of 2). Simplify.
- Remember to animate in 12f/s speed as shown in the tutorial.
- First make a default pose for your creature: a neutral and relaxed position. Always start from this pose and end animations to it. This is because all animations, except death, are loops. Still only running, walking, flying and such motions are given looping command in the Event Tools.
- There are two default poses, stances, one for general animations and other for combat animations. The poses can be the same, but usually "ready to fight" should be different. See the above linked tutorial for more.
- Make as few keys as possible. The animation is interpolated anyway in game, so fine details are lost.
- If a motion doesn't stop where you want, setting a lot more keys may not be the best fix. It works, yes, but gets messy. Instead try to fix the problems with in and out-curves. These are found, when key is selected, under Motion Tab OR by right-clicking the key on timeline (as in picture). Usually "flattening curves" is done in Curve Editor to stop/start motion where you want them. But gmax doesn't seem to have a curve editor where to do it.
- Try animating with round movements (as in nature). Especially with IK-libms it is easy to make too direct and mechanical movements.



3.3 Forward Kinematics (FK) and Inverse Kinematics (IK)

Without IK-setup you are working in FK. For example rotate first bone in a limb, then forward to next one and so on. You have to estimate all movements and where the final bone, a foot for example, will end. Problem is to hit your target(i.e. foot on ground) and not miss or overshoot. Something like holding a foot in place for duration of a step becomes near impossible. But good thing about FK is that you get natural, rounded motion this way.

With IK you move the end goal and the rest follows. That's it. Keep eye on mechanical unnatural motions. Those come easy with IK.

Switching between FK and IK is possible. Considering how twitchy Gmax can be, I'd not use it to switch FK to IK and back in one animation. But turning IK off for end of the animation or for all of it, is fine. Say you want to make a character do something that is difficult to do with IK like a somersault. When you begin this new animation, select bones in the limbs that have IK. Make a keyframe for all of them at frame 0. Select each IK target on at a time and under Motion Panel turn of IK(normally enabled). If you notice a twitch anywhere, undo and make sure all IK-limb bones have keys, then try it again. Now you can animate the bones however you like. If your animation is an attack or other animation that should end in the same pose it started at, copy the keys from frame 0 to end of your animation to make sure you finish where you started.

3.4 ANIMATING BODY

- MOVE your control-object(master) to move your character's hips(or other 'root').
- ROTATE the hip-bone and other body/torso-bones.

3.5 ONE 1/3 OF A STEP (in a walk-cycle)

- move the hips, maybe rotate hip-bone
- leg that stays on ground: copy previous(on ground) key for the foot target to keep foot in place, perhaps rotate the foot-bone a bit
- leg that moves: move the foot target, rotate the foot-bone
- rotate bones(spine) above the hips, neck and head included, to counterbalance hip rotation and weight shifting
- move hand targets to move arms, move elbow targets

3.6 SKINNING BASICS

- SKIN lets the bones move the mesh or parts of the mesh
- select mesh and apply skin-modifier
- Add bones inside the modifier and set how much they effect each bone. Usually select a bone in the modier, select vertexes on the screen and in the modifier type in the value of influence. Say a head bone could move head vertexes 100%. And mesh parts at simple joints could have 50% influence for one bone, 50% for the other
- When creating bones for a regular bipedal character, you better follow Siege University tutorial on the number and naming of bones, at least. http://garage.gaspowered.com/?q=su_214 (character tutorials)

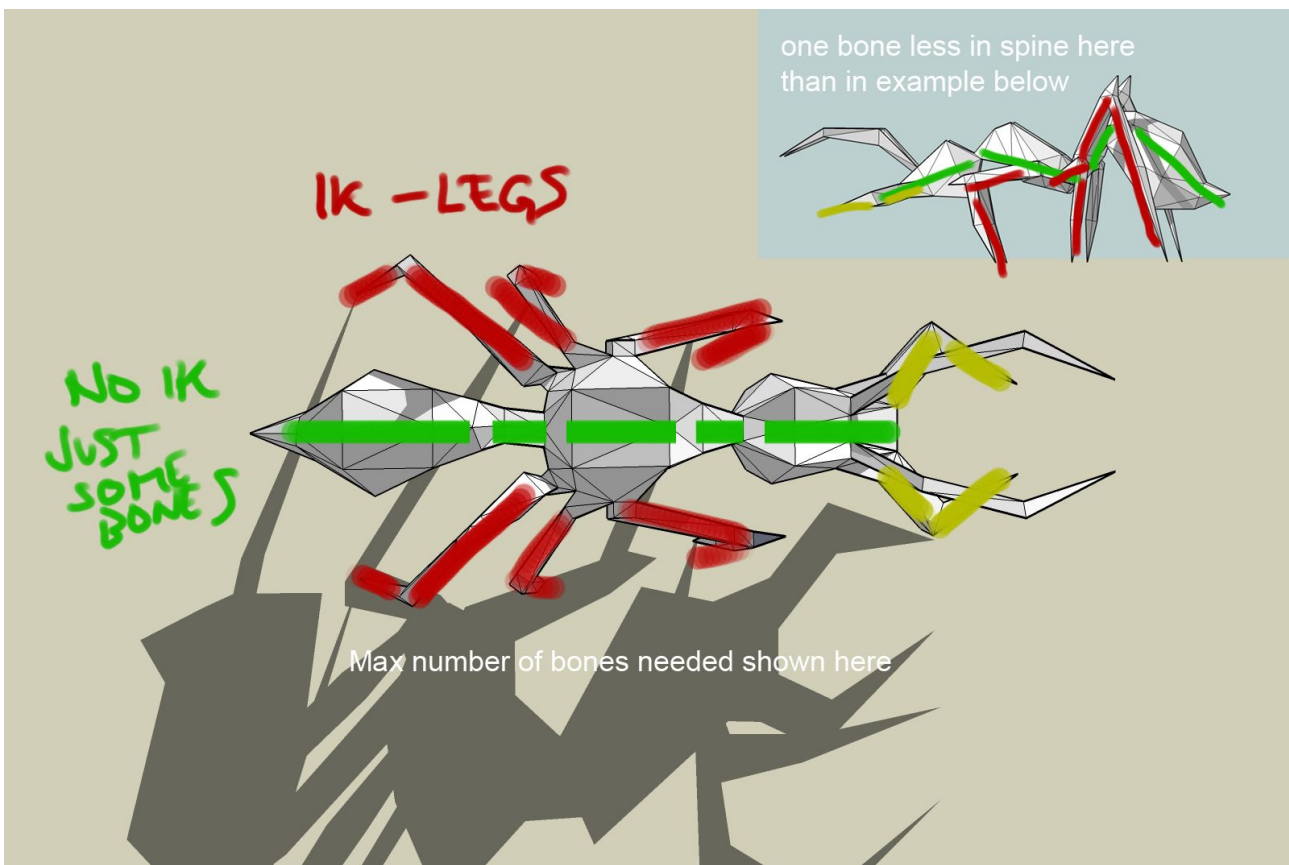
Ant-example

(original Giant Ant model design by Alex Gonzales, final Ultima 6 Project game model & anims by me)

Setting up an IK-controlled foot (x6) with a knee-control, and few bones for the spine, is pretty much it for an ant. Well, that and parenting the legs to the spine and spine-root and controllers to a main controller. If you want to control the jaws, then that is a few more bones(parented to the head, of course).

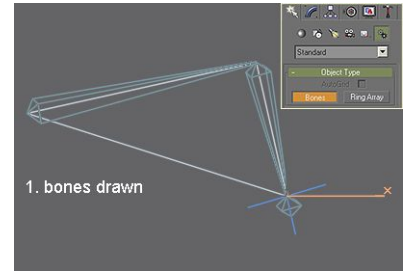
Alternative to knee-control-objects is making several IKs with one after the other. That is making IK for each bone alone – each gets its own end effector. On how to add IK, see 4.2 and 4.3.

When you do the 3 legs on one side you should be able to mirror those over. And if you have made IK for the legs already and still want to mirror them over, see 4.4.



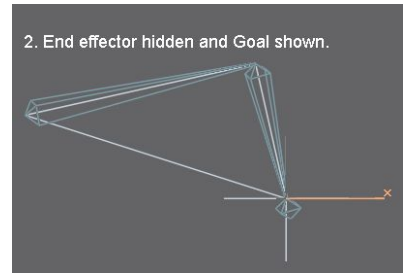
4.2 RIGGING AN IK-LIMB

4.2.1 Draw two bones for the limb and end the 3rd bone with right-click. When you draw the bones, have the IK-solver enabled (assign to children, assign to root). Have a slight angle in your limb. This tells the IK-solver which way the bone shall rotate (in the example this angle is overdone).



You can setup IK after building your bones, and not while building them, if you like. See step 6.

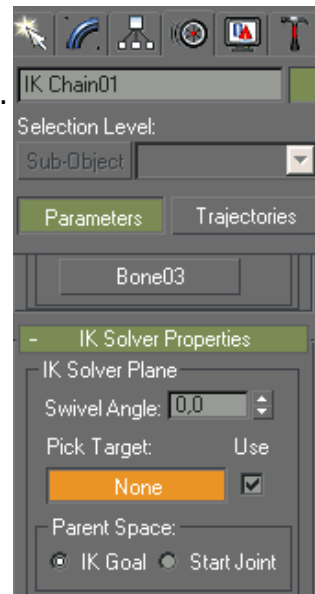
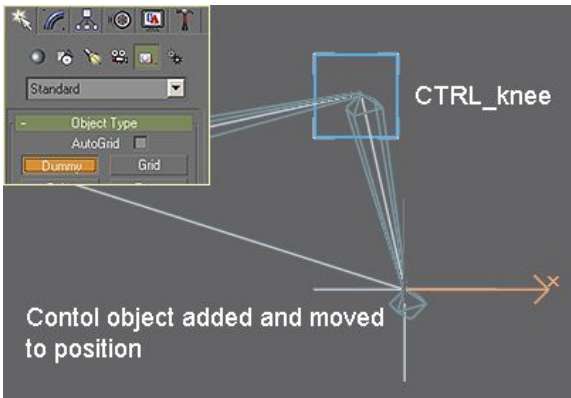
4.2.2 Hide the End effector in the options and set Goal visible instead. Goal is easier to select than the effector. Set the Goal to a size that's nice and easy to pick(=large).



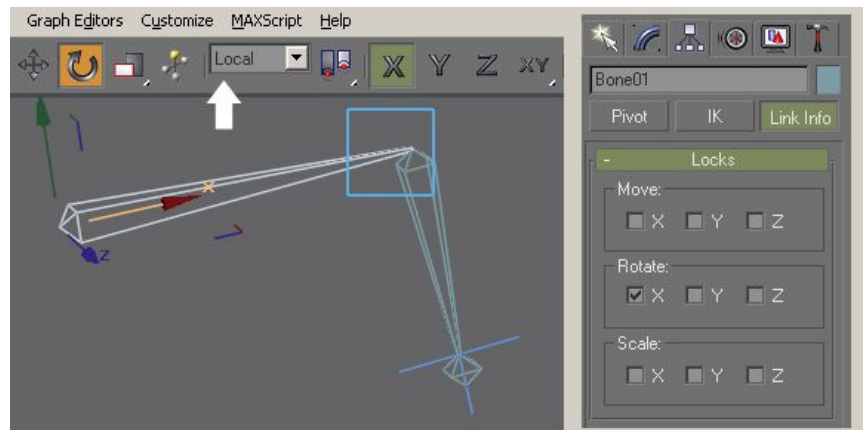
4.2.3 Place bones how you like them in your mesh, often needs scaling up/down. If a bone is too long or short, scale it. You don't have to draw them all over again. Often it is best start scaling from root-bone forwards as scaling one scales all under it. Or you can set the child bones not inherit parent properties (see step 5.).

4.2.4 Make an IK Solver Target for the knee/elbow.

First make a dummy-object and place it where the joint is. Then select your IK and, under animate-tab, set the dummy as IK Solver Target. Name it.

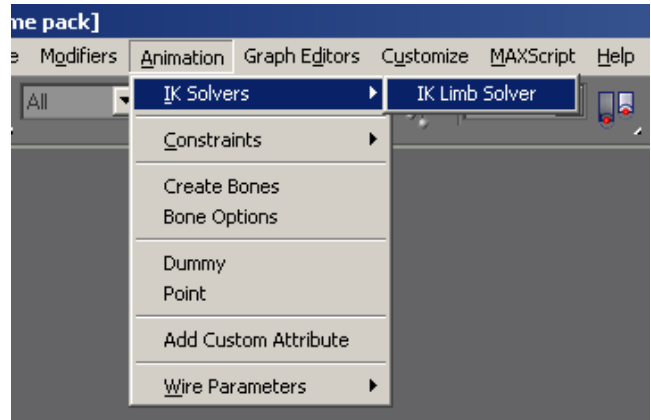
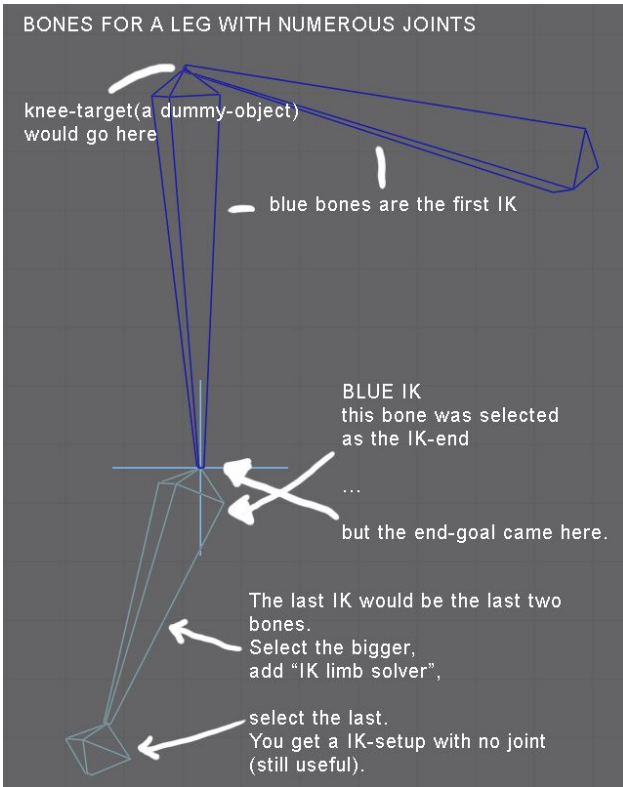


4.2.5 Optionally you can set many limits on how much the bones can turn or if they can turn in the different axis at all. Maybe you should make a bone not rotate in some axis? You can do this in Hierarchy-tab and under Link Info. Select a bone, choose rotate, view local axis for the bone and then check the boxes for the axis you want to lock.



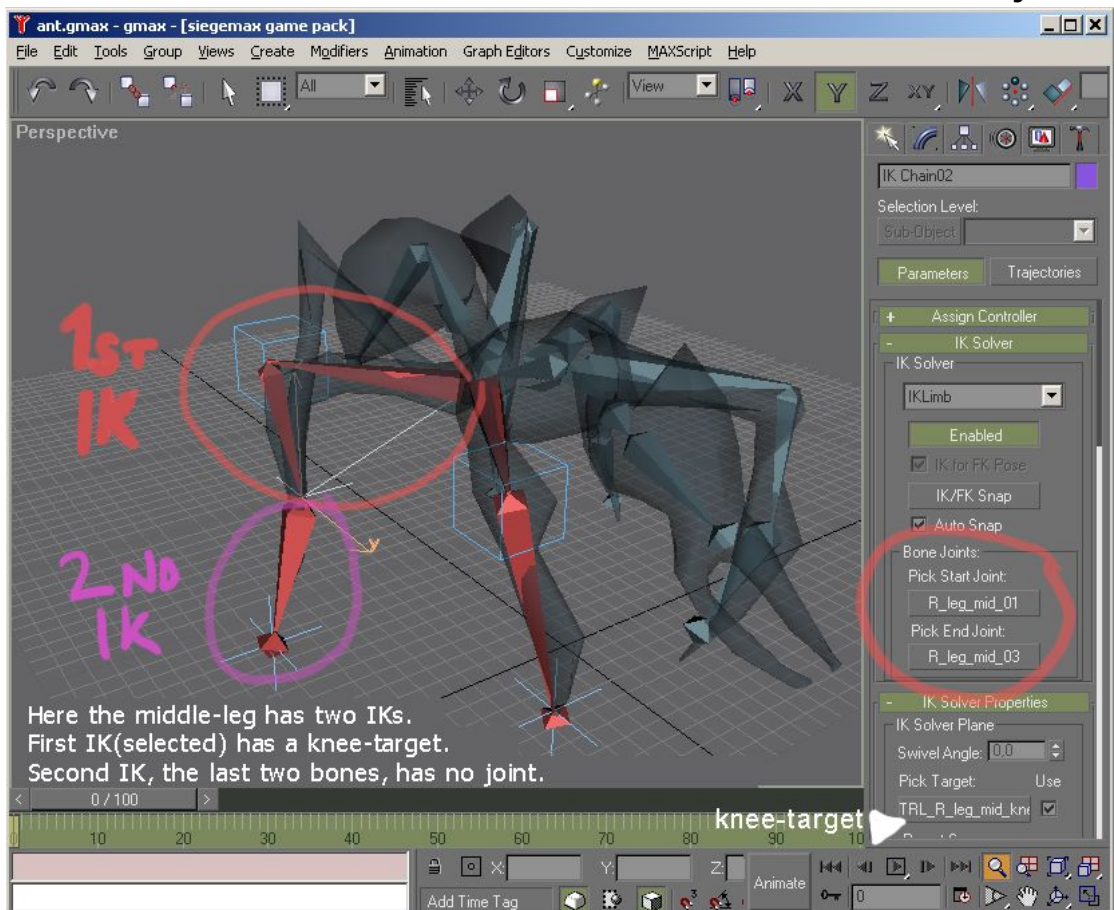
4.3 Leg with many joints / adding IK after bones.

You can have a leg with many joints and may then need several IK's. Drawing these at once can be problematic. Luckily you can setup IK's after building the bones.



Adding IK after the bones..

- Draw your bones without IK enabled in bone creation
- Select the beginning bone for the IK, then in the under Animation-menu select IK Limb Solver. Then select the end bone for the IK.
- If you select the second bone down in the limb, you get a one bone IK (no joint).
- If you select two bones down, you get an IK-limb with a joint in between (knee or elbow).
***** Select 2 bones for IK = no joint**
***** Select 3 bones for IK = with joint**



4.4 MIRRORING IK-LIMBS

While rigging it is often convenient to copy things rather than make all from scratch. As most creatures are symmetrical, copying helps. IK can bring some issues to it, though.

To avoid issues when mirroring IK-limbs over (i.e. From left to right), do the following.

1. Select the goal/end effector in each of your IK-limbs (right-hand side in under Motion-rollout. There turn the IK solver off.
2. Then set Parent Space as Start Joint (just in case).
3. Select all the limbs you want to mirror and and their IK-targets (=goals= the cross at the end).
4. Set the editing space as Transform Coordinate Center. Now next thing you do happens in relation to the Coordinate Center(0,0,0), which should be in the absolute middle of your character. So mirrored hands appear at the right location.
5. Mirror the limbs. In the popup-window select Mirror IK-limits and Mirror Bones.
6. In the mirrored limbs IK turn Parent Space back to Goal and enable the IK.
7. Give good names for the new bones and IK-goals. You can give them new colour also to differentiate right from left.

