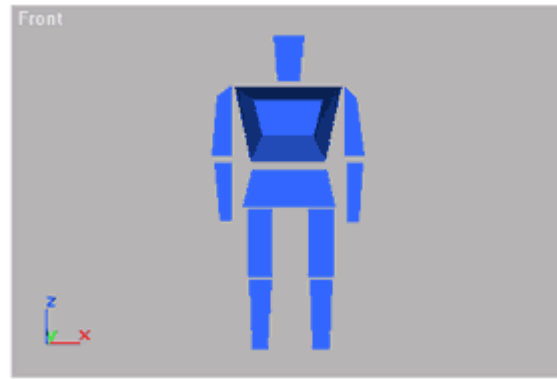


Animating a Walk Cycle

Create your Character:

Create your figure in the front Viewport using boxes. Refine the boxes if desired.



Name all your objects accordingly.

Link it together using the Select and Link Tool.

The Pelvis needs to be the Root Object.

Move all of the Pivot points into their relevant positions. You need to make sure the pivots for the arms and legs are mirrored exactly on both sides of the body. (I used the transform type in to make sure of this). After you have re-positioned each Pivot Point, you need to click the “Reset: Transform” button at the bottom of the rollout.

You need to set the Inheritance settings as follows: (Always use the Local Coordinate System).

The lower portion of the leg should not inherit rotation in the X axis. This is to make sure that when you lift the characters thigh, the shin just hangs below it).

The Thigh should not inherit rotation in the Y axis. This is to make sure that when you raise the characters hips from side to side, the legs hang vertically below them.

Animating:

Turn on the Angle Snap option. 

By default this is set to 5 Degrees. Leave it as this.

Change your animation length to 24 frames and make sure it is set to PAL.

Because there is a frame 0 in Max, we are actually working with 25 frames.

So, a walk cycle consists of 2 steps: Right foot forward, left foot forward.

So, the first step takes us from frame 0 to frame 12, and the second step takes us from frame 12 to frame 24.

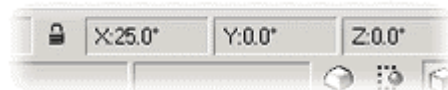
Frames 6 and 18 are also important frames as they are the point at which the legs are both more or less in line.

Setting the Initial Position:

So, at frame 0 we need to set the starting position of the legs. When you are creating walk cycles, you need to write down all the angles you use, as these are very important. Make sure you are always using the Local Co-ordinate system.

All leg rotations are in X

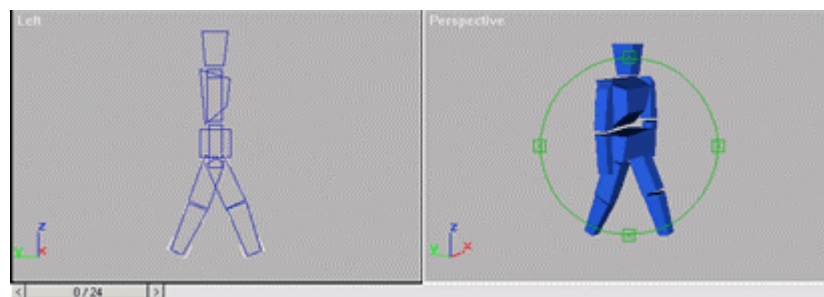
Use the Select and rotate Tool, and watch the angle amount at the bottom of the screen:



?? Rotate the Left Thigh: -25
 ?? Rotate the left Shin: -20

?? Now, the secret to the legs is to swap these amounts for the other leg. So:

?? Rotate the Right Thigh: 20
 ?? Rotate the Right Shin: 25



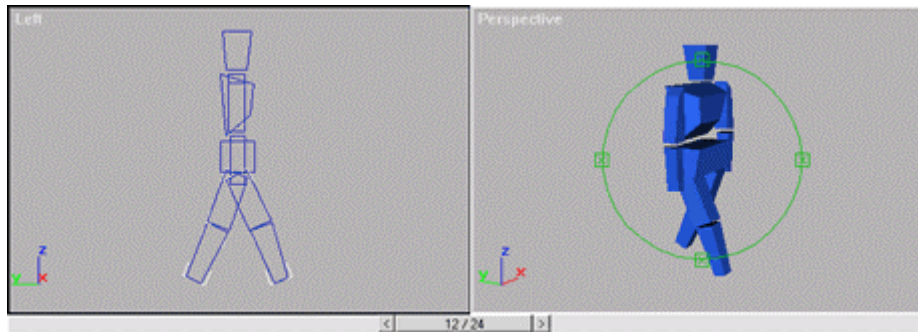
Reverse Position:

Now at frame 12 we want the position of the legs to be reversed, so turn on the Animate Button and move to frame 12.

The difference in angle between the Left Thigh and Right Thigh is 45, so rotate both 45 in opposite directions.

The same applies to the Shins.

Your legs positions should now be reversed.



Move the frame 24 and reverse the legs back to their original position.

Play your animation.

The legs just drag back and forth.

Lifting the Thighs:

We need the thighs to rotate further than their final position, leaving the shins slightly behind, and then snap back.

Make sure the animate button is on.

Go to frame 9. (3 quarters of the way through the first step).

Rotate the Right Thigh: -20

Go to frame 21. (3 quarters of the way through the second step).

Rotate the Left Thigh: -20

Play your animation.

It looks better already doesn't it? But it's still dragging its feet.

Lifting the Shins:

When we move our leg forward, we usually lift our feet to avoid them dragging on the floor. Our lower leg is also whipped into the air by the sudden motion of the thigh. So:

?? Make sure the animate button is on. (That's the last time I'll tell you!)

?? Go to frame 3 (a quarter of the way through the first step).

?? Rotate the Right Shin: 20

?? Go to frame 15 (a quarter of the way through the second step).

?? Rotate the Left Shin: 20

?? Play your animation.

Right, that's the legs done. Now consider the hips.

Shake that Booty:

As you lift each leg to take a step, your hips lift to accommodate the movement.

At frame 0 the hips will be level, as the legs are both outstretched. The same applies to frames 12 and 24.

?? Go to frame 6. The right leg is in the middle of lifting.

?? Rotate the Pelvis in Z: -10

?? Go to frame 12.

?? Counter the rotation you just made (Rotate 10 in Z)

?? Go to frame 18. The left leg is in the middle of lifting.

?? Rotate the Pelvis in Z: 10

?? Go to frame 24.

?? Counter the rotation you just made (Rotate -10 in Z)

?? Play your animation.

Stand up Straight!

The Pelvis now moves correctly, but the whole upper body swings from side to side. We need to counter the rotation of the Pelvis by rotating the Chest in the opposite direction at each of the Key Frames we have generated.

?? Go to frame 6.

?? Straighten the Chest.

?? Do the same at frames 12, 18 and 24.

?? Play your animation.

Your upper body should now remain vertical. It may move from side to side, but this is OK.

Forward Momentum:

When we walk, as we shift our weight from one foot to the other, we move our chest forward. This gives us momentum to move forward.

?? At Frame 0, rotate the Chest forward 10 in X.

?? Do the same at frames 12 and 24.

Head up!

The head should remain vertical through the whole cycle.

?? Go to Frame 0

?? Straighten the Head. (Rotate in X to counter the rotation of the Chest).

?? Do the same at frames 6,12,18 and 24.

?? Play your animation.

Swinging the Arms:

Get up and walk around. Whats the first thing you notice about the movement of your arms in relation to your legs?

They move in opposite directions!

They also bend in the opposite way to the legs.

?? Go to Frame 0.

?? Rotate the Right Bicep in X: -35

?? Rotate the Right Wrist in X: -25

?? Rotate the Left Bicep in X: 30

?? Rotate the Left Wrist in X: -30

- ?? Now we need to reverse this position at frame 12.
- ?? The difference between the two Biceps is 65.
- ?? The difference between the two wrists is 5.
- ?? Rotate them accordingly so that their positions are reversed.
- ?? Do the same at frame 24.
- ?? Play your animation.

Adding Some Drag:

Your arms are swinging now, but we need to add some drag, or they look to mechanical.

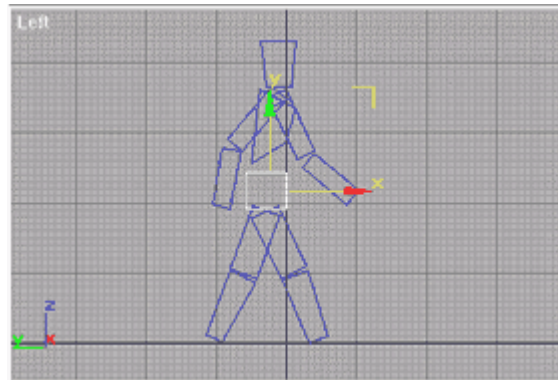
- ?? Go to frame 6.
- ?? Rotate the Right Wrist in X: -20
- ?? Go to frame 18
- ?? Rotate the Left Wrist in X: -20
- ?? This means the wrists will swing back slightly later, giving the impression of drag.
- ?? Play your animation.

There's just one thing left to do.

Keeping Your Feet on the Ground:

Watch someone walking. You will notice that they bob up and down as they walk.

- ?? Go to Frame 0.
- ?? Turn off the Animate Button.
- ?? Select the Pelvis.
- ?? Move your Character up (Y) in the Left Viewport until its feet are resting on the Origin (the thick black line):



?? We are going to use this to represent the ground.

?? Turn on the Animate Button.

?? Move to Frame 6.

?? Move your Character in Y so that it is touching the ground.

?? Do the same at frames 12,18 and 24.

?? Play your animation.

It's Finished!!!!!!