

Importing a Kuper Text file into a Maya Camera

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First of all, a couple of details about the difference between the Kuper and Maya coordinate systems.

- Kuper Axes and directions, with all rotations at Zero.
 - VTrack (Z axis) – looking straight through the lens, parallel to the track
 - VEW (Y axis) – Horizontally to the camera
 - VNS (X axis) – Vertically to the camera
 - VPAN (Y Rotation)
 - VTILT (X Rotation)
 - VROLL (Z Rotation)
- Kuper Axes names are grounded in more traditional camera animation. The axes names are different than in typical 3D animation. Here is a correlation:

<u>Kuper Axis Name</u>	<u>Maya Axis Name</u>	<u>Positive Direction (at 0 Rotation)</u>
VTRACK	Z-Translation	Behind the camera
VEW	X-Translation	To the right of the camera
VNS	Y-Translation	Above the camera
VPAN	Y-Rotation	Camera rotating to the Right
VTILT	X-Rotation	Camera rotation Up
VROLL	Z-Rotation	Camera Rotating Counter Clockwise

 - PLEASE NOTE: Maya's axis rotation is according to "right hand rule of rotations". Kuper's VPAN, or Y-Rotation is opposite this. So if the Kuper operator hasn't corrected for this before exporting the text file, it will be necessary to Scale the Maya Camera's Y-Rotation by -1.
- Kuper's Origin (X=0, Y=0, Z=0) is a point in space that is dictated by the mechanical camera device Kuper is controlling, usually some kind of crane system. Kuper's math requires that the mechanical system be "Zeroed", or "Homed" in a particular way to ensure proper mathematical corrections of the actual motor positions. The Home position is with the crane arm parallel to the track, with the camera level and pointing straight down the track. This means that the VNS / Y-Translation Home position will usually be somewhat off the physical ground plane. To place the Y data's origin on the ground plane, the data must be offset. The amount of offset differs from rig to rig, depending on the particular mechanical configuration used.
- Kuper may be set up to output in any linear units the operators choose. Rotations are always in degrees. Be sure you have the linear units on Maya set to match the Kuper ASCII.

Kuper Data Files

Kuper ASCII text files are very simple. They consist of a header with columns of numbers – each column is an axis, each row is a frame. The overall format is “space delimited ASCII” or “Tab Delimited ASCII”. In fact, the overall format of the numbers is exactly the same as a Maya .MOV file (a Maya MOVE file – a text file, not to be confused with a Quicktime movie file).

The columns each correspond to an axis listed in the header, and each row is a frame. If it's necessary to edit the text file, Kuper text files may be imported into a spreadsheet, manipulated, and then exported from the spreadsheet as a Space or Tab delimited text file.

Kuper puts a header on the text file which is always in a form like this:

 Axes = Axis1, Axis2, Axis3

where the list of axes is in the same order as the columns of axis data. An actual Kuper Text file of a move built in Virtual Axes would probably have a header like this:

 Axes = VTRACK, VEW, VNS, VPAN, VTILT, VROLL

There may be more axes like focus or zoom or model movers. It's important to keep a record of this list so you know the order of the axes, because Maya requires you to specify the import order in the Import Options Dialog.

Importing to Maya

You will get a file from Kuper that is named something like KUPER.TXT, or KUPER.ASC (the operator has control of this name and extension). If you open it with a text editor, you will see the header and the columns of numbers. The first things you need to do to use it with Maya is to strip the Kuper axes header out and then rename it as a Maya move file. I usually do this by opening it in a text editor (DOS EDIT or Windows NOTEPAD work well, and deleting the first line. Then I “Save As...” the new file name – something like KUPER.MOV.

In Maya, select the camera to which you wish to import the Kuper move data. For the purposes of this explanation, I've created a camera in Maya from the CREATE menu, by clicking Create>Cameras>Camera. This resulted in a Camera named camera1 appearing on my screen.

To import the Kuper move file we've created, select the camera (in my case I clicked on the camera in the screen, and the channel list shows “camera1” and all its axes. (The order of the axes in the list is, I believe, “hard wired” into Maya, so you cannot change it. We will be loading the Kuper data into the Translate and Rotate axes. The Scale and Visibility don't matter to us for importing... at least to my knowledge.)

Open the Import Options screen by clicking on the File menu. Find the “Import...” option and click on the box at the end of its row. In the “General Options” section, select “move” as the File Type. In the “File Type Specific Options” section, select the axes listed in the box, then click “Remove Selected” (middle button at the bottom of the box) to clear the axes, or just click “Remove All”. This is done so you may “Add” the axes back in the correct order. Now look at the header of the Kuper file to determine the import order of the axis data. If the Kuper header is “Axes = VTRACK, VEW, VNS, VPAN, VTILT” then you will add Maya camera

axes to the File Type Specific Options list box in that order. You can add them one at a time, or in groups, or by adding some and deleting others, just as long as the final list is in the correct order. You do this by selecting the axes in the “camera1” channel box in the correct order then clicking the “From Channel Box” button at the bottom of the box. For the above mentioned “Axes =” list, you should end up with a list like this:

- Camera1.tz
- Camera1.tx
- Camera1.ty
- Camera1.ry
- Camera1.rx

Now click Apply at the bottom of the import Options Box. A file selection window opens, and you select the Kuper .mov file you created that has the header removed from it and click “Import”. You should then be able to run the move on camera1.

If you need to reverse the pan because it wasn’t done before import, you can do it like this (there must be other ways, but I don’t know Maya very well, so bear with me). Select the camera1. In the Channel Box, select Rotate Y. Click EDIT in the Channel Box menu bar. Click Graph Editor in the menu list. In the Graph Editor, select “camera1_rotateY” in the list at the left. Click EDIT in the Graph Editor menu. Find Scale, and click on the box to the right of the word Scale. This opens the Scale Keys Options window. I use these settings to reverse the action of the pan...

- Time Range: All (default, I think)
- Method: Scale / Pivot
- Only Scale...: Checked (I don’t know what this does. Default, I think)
- Time Scale: 1.000 1.000 (default, I think)
- Value Scale: -1.000 1.000 (this is the one that makes it happen)

Click Apply and you will see the curve flip, and when you run the move the motion will be reversed.

Anything else you want to do, like offset, camera lens stuff or fitting this camera move into your scene, you’re on your own. This exhausts my current knowledge of Maya!!!

Good luck.