Virtual Cameras and KUPER CONTROLS

You are a cameraman standing behind the camera with your eye looking through the lens...

VTrack (+) Track BACK Away From Subject
VTrack (-) Track FORWARD Toward Subject
- Zero position is arbitrary or set to start of shot -
("VTrack" is equivalent to **Translate Z** axis, and is calibrated in **decimal inches**.)

VEW (+) Move the camera to the RIGHT
VEW (-) Move the camera to the LEFT
(Perpendicular to the track)
- Zero position is typically center of rig travel -
("VEW" is equivalent to **Translate X** axis, and is calibrated in **decimal inches**.)

VNS (+) Move the camera UP
VNS (-) Move the camera DOWN
(Perpendicular to the ground plane)
*- Zero position for **boom arm is level** at an arbitrary height*
("VNS" is equivalent to **Translate Y** axis, and is calibrated in **decimal inches**.)

NOTE: Film cameras are typically in the **rotation order:** ROLL-TILT-PAN; in MAYA use "**ZXY"**

VPan (+) Pan RIGHT horizon fixed; image moves to Left
VPan (-) Pan LEFT horizon fixed; image moves to Right
*- Zero position is camera **facing forward**.on the Z axis -*
("VPan" is equivalent to **Rotate Y** axis, and is calibrated in **decimal degrees**.
Here KUPER departs from MAYA; pan values are opposite sign
Axis is always perpendicular to ground plane on every system)

VTilt (+) Tilt UP horizon moves Down
VTilt (-) Tilt DOWN; horizon moves Up
*- Zero position is camera at **dead level** -*
("VTilt" is equivalent to **Rotate X** axis, and is calibrated in **decimal degrees**.)

VRoll (+) Roll COUNTERCLOCKWISE horizon twists to Right
VRoll (-) Roll CLOCKWISE horizon twists to Left
*- Zero position is with the **horizon level** -*
("VRoll" is equivalent to **Rotate Z** axis, and is calibrated in **decimal degrees**.)

The export order from a World Centered and Baked out MAYA camera is therefore:
TZ, TX, TY, RY*-1, RX, RZ with the origin at a known position within the set

*Typical **KUPER ASCII** file in column and rows with one line header:*

```
Axes = VTrack, VEW, VNS, Vpan, Vtilt, VRoll
47.1054     176.92     24.939     -23.5196    36.0916     35.512
47.1055     176.919    24.9386    -23.4909    36.0864     35.497
```

etc.