Panoramics

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This is how I shot the panoramics in my presentation. There are many other possibilities; however, I recommend this general procedure be used for your first panoramics. Master this method before trying others.

Camera Equipment:

Digital Camera (or scan film images)

Normal wide-angle lens
- 28 mm film equivalent.
    - 17 or 18 mm for digital SLR cameras with 1.6x multiplier.
- Ultra-wide lenses will introduce unwanted distortion.

Special tripod head
- Rotates around "nodal point".
- Rotation angle markings.
- Vertical camera orientation normally used.

Why is Nodal Point Important?

Point of view changes unless camera rotates around the nodal point.
- Technical term: parallax.
- Cannot successfully stitch if point of view changes.
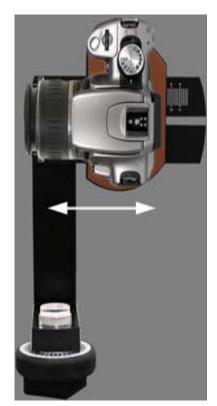- Not as important if everything in frame is near infinity.

Finding the nodal point (see pictures on next page)
- Left-right is easy: center-line of lens.
- Front-back is harder: pole test.

Pole Test

- Do this before you go out to shoot.
- Set lens to recommended setting.
    - Nodal point may change when you zoom.
- Lens should be centered over the rotation point when viewed from the front.
- Adjust front-to-back distance until middle of lens is about over the rotation point.
- Position camera with a thin vertical object ("pole") near camera (about 6-10 feet) and remainder of scene much farther away.
- Rotate camera and see if pole moves relative to background (in viewfinder).
- Adjust front-back distance until pole does not move.
- Pole should be in same relative position when the pole is at the right or left edge of the frame
- Only needs to be done once (assuming same lens and same zoom setting is always used).
    - Note or mark front-back position that gives best result.
    - Later when you shoot, adjust to match position you noted or marked previously.
    - Optional: Repeat for each zoom setting of each lens that you will use for panoramics.

Right edge of frame
when camera rotated left

Left edge of frame
when camera rotated right

Bad

Good

Panoramic Heads

- Kaidan: specializes in panoramic accessories.
- Panasaurus: budget head.
- Really Right Stuff: best if you use Arca-Swiss quick release mounts: Nodal Slide (MPR-CL II) + L-bracket, or Pano Elements + L-Bracket if you don't already have angle markings.
- Improvise: I use a Nikon PG-2 focusing rail.

Shooting Inage Sequence

Keep everything level!
- Rotation point must be level.
- Camera must be level otherwise keystone effect will make stitching more difficult.
    - I use a hot-shoe level.

Use manual exposure
- Otherwise brightness differences will make stitching difficult.
- Take average readings of several views, guess best compromise.

Do not use auto white balance or polarizing filter.
- Otherwise image color may change making stitching difficult.

Rotate in exact angle increments
- 30 percent image overlap recommended.
- Recommended lens at 30 degree increments will give about 30 degrees overlap.
    - You will have to determine best rotation increment for other lenses/zoom settings.
- Most stitching software will assume clockwise rotation (take pictures left to right).

Stitch Images Together

Software
- Canon Photostitch: bundled with Canon digital cameras.
- VrToolbox: VrWorx.
- Many others available that I have not tried.

Tips
- Follow the previous recommendations (lens, nodal point, level, etc) for best results.
- Some software will allow you to specify corresponding areas to help software stitch successfully.

Virtual Reality Panoramics

Take sequence of images similar to regular panoramic.
360 degree continuous image possible.
Stitch image similar to regular panoramic.
- Be sure to specify 360 degrees if it is.
Reduce resolution to manageable level or you will choke all but the fastest computers.
Save as Quicktime ".mov" file.
View with Quicktime (free from Apple).