



***Add 360° To Your Hack
With RICOH Cameras***



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RICOH THETA 2013



UNOFFICIAL
GUIDES

Developer Community

<http://theta360.guide>

Agenda for Today

Camera Intro

- ❑ Theta V

Cool Usage Examples

- ❑ Telepresence robot
- ❑ Live streaming to SteamVR headset

Good tools for this weekend

- ❑ 360 video (from file) in Unity
- ❑ 360 VR gallery using JavaScript A-Frame
- ❑ 360 camera control from Raspberry Pi

bit.ly/thetahack17

RICOH THETA 360 degree cameras



RICOH THETA
2013



RICOH THETA M15
2014



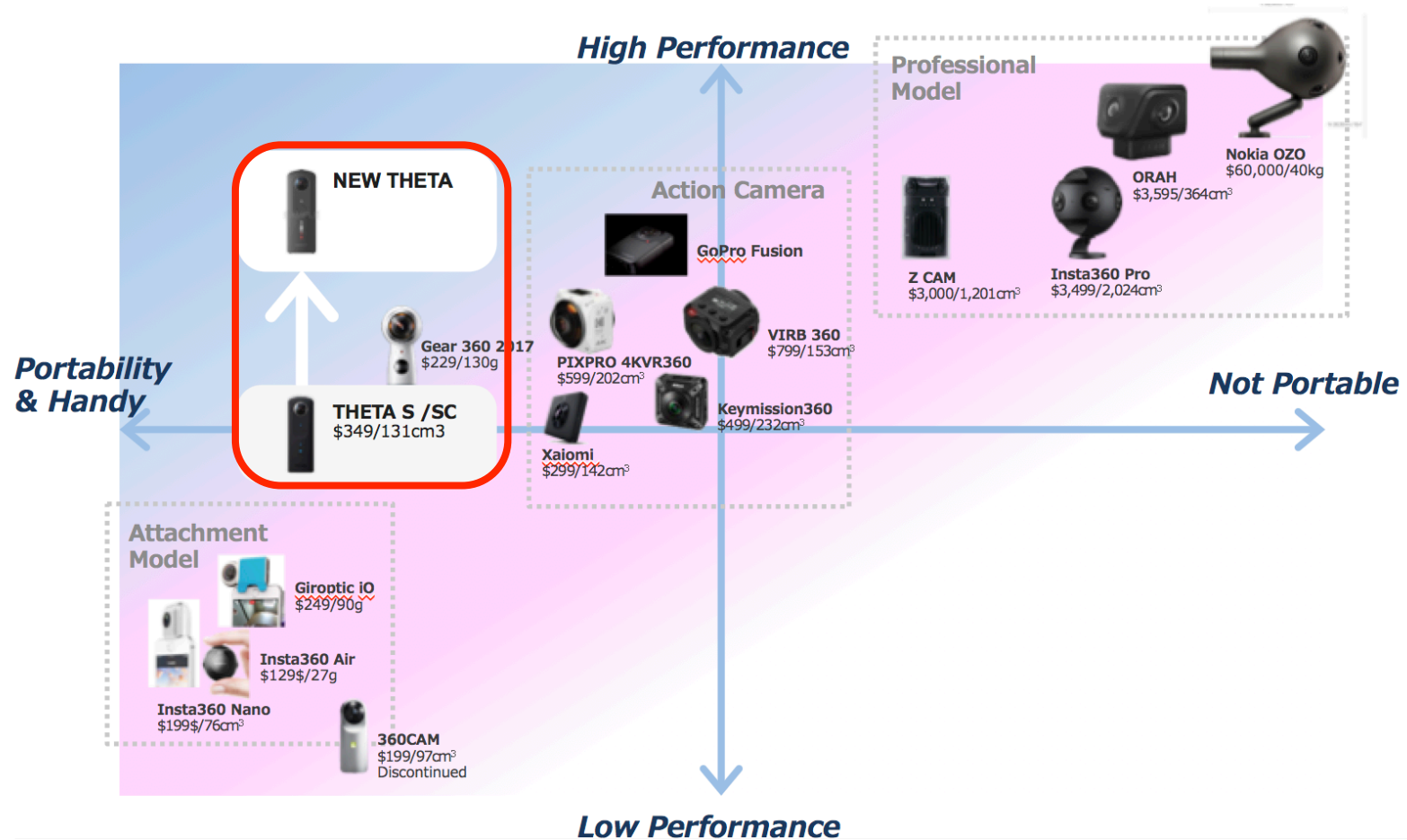
RICOH THETA S
2015



RICOH THETA SC
2016

<https://theta360.com/en/about/theta/>

THETA's Position at 360° Market



New THETA V released in September 2017



World's best selling 360° camera

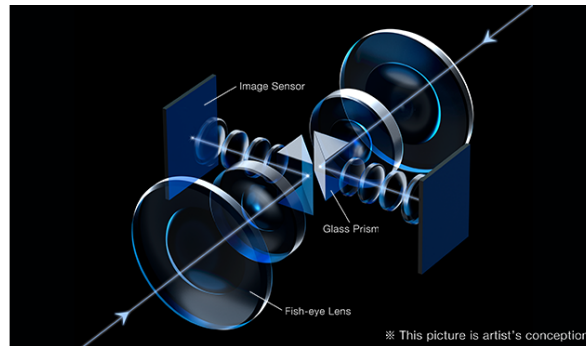
Outstanding Features

- ☐ 4K Video recording
- ☐ Spatial Audio
- ☐ 4K live streaming
- ☐ Remote Playback
- ☐ Interface

<https://theta360.com/en/about/theta/v.html>

4K/30fps video recording capability

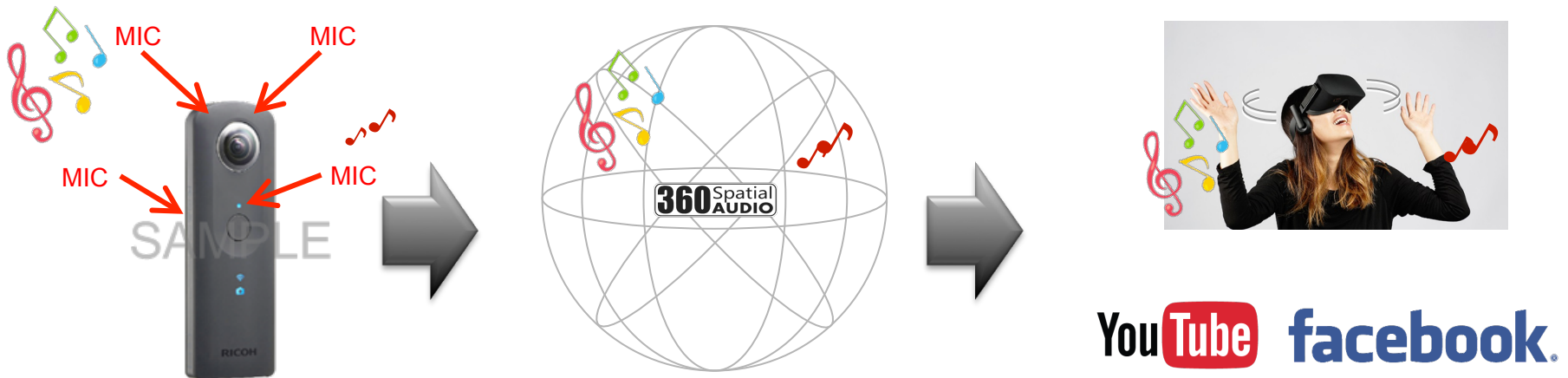
- ❑ 4K(3840x1920 : max 56Mbps) 30fps H.264/265
- ❑ Two new image sensors (1/2.3 inches)
- ❑ Video stitching process inside camera.
- ❑ Snapdragon of Qualcomm as for the main processor
- ❑ Equirectangular.MP4



<https://theta360.com/en/about/theta/technology.html>

360° Spatial Audio

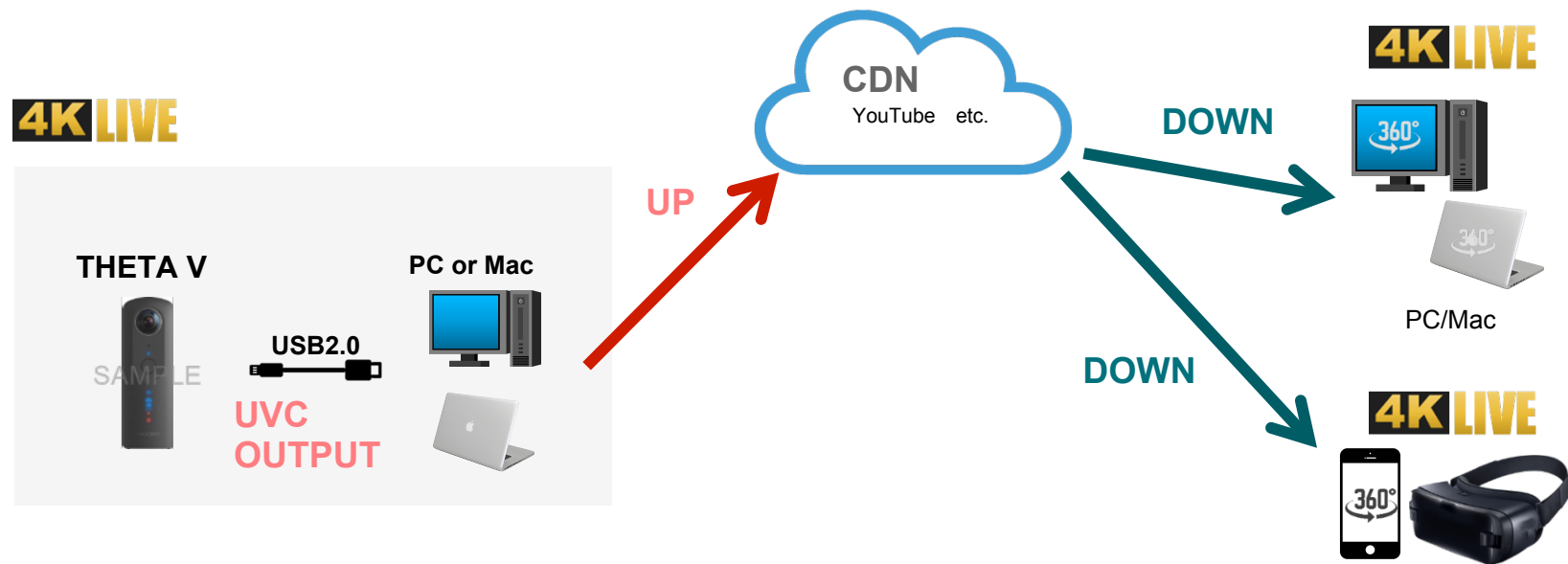
- ❑ 4 - microphones implemented
- ❑ 4 channels L-PCM can be layback on Ricoh companion PC/Smart phone app
- ❑ can uploaded and playback on YouTube/Facebook



<http://lists.theta360.guide/t/youtube-spatial-audio-support-now-available/1675>

360° 4K Live Streaming

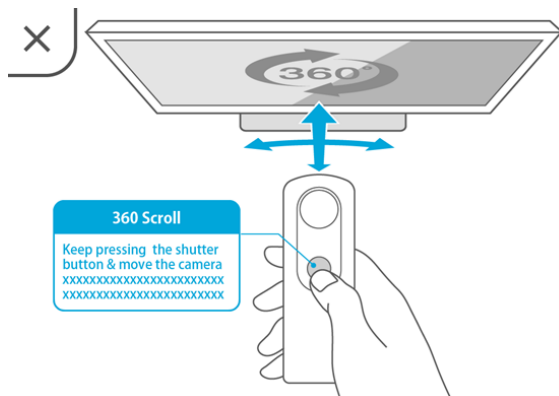
- ❑ High quality UVC output via USB is possible
- ❑ 4K (3840x1920, 30fps) H.264 live streaming



<http://lists.theta360.guide/t/howto-ricoh-theta-v-4k-live-streaming-with-uvc-4k-driver-for-windows-10/1647>

Remote Play Back

- ❑ THETA V can playback video and still image in-body. By using Miracast, spherical images can be shared with TV, projector etc.
- ❑ Use THETA V like a joystick



<http://lists.theta360.guide/t/howto-theta-v-easy-remote-playback-technique-without-miracast-display-adapter/1653>

Interface of THETA V



- Wifi : Open Spherical Camera-API
4K/30fps video and 14.5M Pixels photo
- USB : Picture Transfer Protocol
4K/30fps video and 14.5M Pixels photo
- USB : UVC1.5
4K/30fps Live streaming
- BLE : trigger photo and video

<https://theta360.com/en/about/theta/v.html>

Interface of RICOH R



Live Full HD 30fps for 24H

HDMI : 2K/30fps Live
(1920x960 59.94i)

USB : 2K/30fps Live UVC 1.5
(H.264 1920x960 29.97fps)

<http://ricohr.ricoh/en/>