

Request #: HUTRR71
Title: Additional Usages for Spatial Controllers
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Pages Affected: Generic Device Controls 0x06
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Title: HUTRR71 Additional Usages for Spatial Controllers

Summary:

We propose additional supporting feature report usages for handheld spatial controllers that users move freely through space to provide position and orientation input to the host OS. The additional usages specifically relate to handedness and tracking offsets.

Background:

Spatial controllers come in many shapes and sizes. The feature reports proposed here allow spatial controllers and other devices to self-describe various physical properties relevant to the host OS.

Some controllers support equivalent operation in either hand, while other controllers are dedicated by their physical form to either left-hand or right-hand operation. For a dedicated left-hand or right-hand controller, the host OS will need to know the physical nature of the controller to avoid guessing at handedness with unnecessary heuristics. The Bias physical descriptor was originally meant to surface this type of fixed handedness information, but real-world HID parsers do not generally in practice support physical descriptors. These explicit usages enable controllers to self-describe handedness with feature reports, which is a more common mechanism.

Different controller models may have varying physical forms while sharing a common tracking technology. The host OS may use a common driver to track the physical position of a family of controllers that share a tracking technology, even though the relative positions of key points on the controller reported to application software may differ between controller models. Enabling a controller to self-describe the offset from its tracking origin to key parts of the controller enables a single host driver to support many related controllers.

Proposal:

New usages to be added to Section 9, Table 11: Generic Device Controls Page (0x06)

Usage ID	Usage Name	Usage Type
30	Handedness	NArY
31	Either Hand	Sel
32	Left Hand	Sel
33	Right Hand	Sel
34	Both Hands	Sel
35-3F	Reserved	
40	Grip Pose Offset	CP
41	Pointer Pose Offset	CP
43-FFFF	Reserved	

Update the Reserved section 27-FFFF to be 27-2F.

Definitions:

Tracking pose

A device's tracking pose is the oriented point within its physical body that its tracking technology will locate when determining the controller's position and orientation.

Depending on the host OS, this point may not be directly reported to application software.

Grip pose

A device's grip pose is the oriented point within its physical body where the user's palm holds the device.

The grip pose's position is a point along the ray normal to the user's palm at its centroid, centered within the controller's grip.

The grip pose's orientation has its forward axis pointed along the handle of the controller in the direction of the user's thumb.

The grip pose's orientation has its right axis pointed along the ray normal to the user's palm when opened to form a flat 5-finger pose. (forward from the left palm and backward from the right palm)

Pointer pose

A device's pointer pose is the oriented point at its tip where users would expect a pointing ray to emerge.

The pointer pose's orientation has its forward axis pointing along the device's natural pointing ray, with the up axis aligned to point straight up away from gravity when the controller is held in its neutral pointing orientation.

Descriptions:

Handedness – The hand or hands in which a device is designed to be held during typical operation.

Either Hand – Held in a single hand, either left or right.

Left Hand – Held in just the left hand.

Right Hand – Held in just the right hand.

Both Hands – Held in both hands.

Grip Pose Offset – The device's fixed transform in position and rotation of its grip pose relative to its tracking pose.

Pointer Pose Offset – The device's fixed transform in position and rotation of its pointer pose relative to its tracking pose.