> What Monitor?

Stardust XR and Building a Mobile Spatial-Desktop PC

with Oli Potter

BluedotAster
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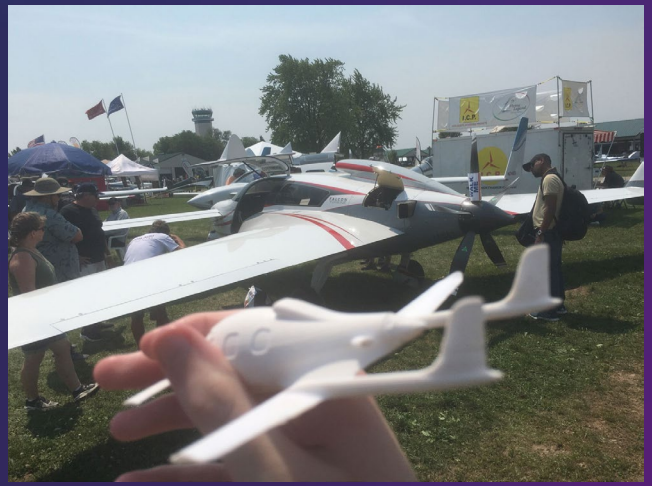
Foreword -

- **Mixed reality as a medium-**
  > Dominated by entertainment, training
  > Lends itself to broad utility use
- **The practicality of spatial desktops-**
  > Unique advantages for input, visualization; but not without challenges
  > Require deep operating system integration to work well
  > *Too darn rare*
- **Ultimate goal: Open-access, broadly compatible, unrestricted utility**

What I Do -

Oli Potter (21M), local tinkerer

- **Background-**
  > System design, various
  > Independently seeking knowledge post 2020/21
- **Interest in XR-**
  > Social VR to utility XR
  > Project inspirations: Lynx, XRDesktop
  > Got sick of waiting, so here we are!



Accidental convergent evolution
(Circa 2021)

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What This Is(n’t) -

The spatial desktop knows what it is, because it knows what it isn’t~

- **Exploration of what makes a spatial desktop-**
  - Monado runtime and family- “native” OpenXR on PC
  - Inherent features and enablement from Linux
  - Technical: The workings and challenges of “flat” app integration
  - Practical: What a spatial desktop enables
- **What I ain’t talking about-**
  - > Environment- or vendor-specific interfaces or app development
  - > Personal challenge: don’t ramble about rumored or meme headsets

System Underpinnings -

- **Intrinsic modularity of Linux-**
  - > Open source; infinite expansion
  - > Funny business (like building an XR-only OS) is easier*
  - *> This machine lacks Vision*
- **Abstract running environment for 2D and 3D apps-**
  - > Window system as an overlay
  - > Deeply and naturally OpenXR
  - > Dedicated display server/window system
- **Freedom of space-**
  - > No monitor or desk-centric input devices needed*
  - > Freely movable objects and panes

Stardust XR; Anatomy of a Display System -

- **Origins-**
  > Nova (technobaboo)
    > Overgrown personal project, *years* in the making
- **Deep-level foundations-**
    > Based in StereoKit- not your regular app engine
    > Designed for efficiency and expandability
- **Server + Module model-**
    > Separated into individual modules for expandability
    > Multiple display environments, input strategies, etc

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Journey from Window to Space -

- **Desktop apps don’t care-**
  - > Most flat apps follow orders (movement, resizing, etc. handled by OS)
  - > If it works like a window pane, and handles inputs like a window pane…
- **Considerations for Wayland display protocol-**
  - > Refined, but fresh off the press
  - > Display system of choice for XR
  - > Designed for intimate control- a little bit janky

> Problem: out-of-order popup initialization

> Problem: compatibility layer doesn’t play nice

The Mobile Dimension -

- **What a spatial desktop PC doesn’t need-**
  > Monitor or (most) creatures of the desk
  > A dedicated space, much like a laptop or tablet
- **Viable strategies-**
  > Static PC plus wireless- dirt common
  > Streamers: WiVRn (built for Monado), ALXR (ALVR fork, less well supported with Monado)
  > Wearable PC- take it for a walk!
  - Carry it where it’s comfortable
  - Battery power constraints

The Project PC -

- **Where I started-**
  - > Ryzen 9 + mobile dGPU- blatant overkill
  - > P4E (I am fueled by spite)
- **Where it’s going-**
  - > Battery power- the biggest powerbanks I can find; 2-3 of them
  - > Custom shell to fit all the bits

Evolving to a Better System -

- **Further developments for Stardust XR-**
  - > Launcher/UI for the server and supporting bits
  - > Window system refinement
  - > Fine-tuning software build generation for various distribution services
- **XR infrastructure**
  - > ETFR (in testing)
  - > Lower-factor compression for wired setups, if possible
- **OS elements and QoL**
  - > Automating the XR launch process
  - > Directly integrating headless (HMD-only) running as a natural feature
  - > Functional lock screen, virtual monitor fallback, development-on-system

What You (or I) Can Do -

- **Try this on your setup, or build your own!**
  > Should work with any hardware, within reason
  > Cook up your own flavor- customization proliferation is only natural
- **Support the development of these tools-**
  > These codebases can use some looking after; the more eyes the better
  > Contributions of any kind are most welcome;
  this area is suffering an acute labor and bread shortage at the moment

We want YOU to join the FOSS XR community!

Acknowledgements -

Nova (technobaboo)- for being such a steadfast mentor, and committed builder through these times!

The Linux VR Adventures community- this would be a whole lot harder without your guidance!

And, perhaps, you!

Thank you!