

Dev Log 8: Camera Summon, Outlines, and Backpack Polish

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Overview

This development log continues the refinement of the Metro-inspired backpack workflow in *Birdwatching VR*. The main goal of this session was to make the player's core tools easier to access during actual gameplay, especially the camera, while also improving visual feedback for grabbable objects and reducing the number of awkward interaction failures caused by physics, transform offsets, and inconsistent grab poses.

Shoulder-Based Tool Retrieval

The earlier backpack summon system was still too unreliable when used directly in VR, so the interaction design was split into two clearer shoulder actions. This was intended to support a more readable dominant-hand workflow.

- The left shoulder zone remained responsible for summoning the backpack.
- The right shoulder zone was repurposed to summon the camera directly whenever the right hand was empty.
- This supports a more natural loop where the player can keep the feeding stick or bingo book in the left hand while using the camera in the right.
- Extra haptic feedback remained important so the player can feel when a hand has entered the correct summon zone.

Backpack Storage and Placement Fixes

A large amount of time in this session was spent stabilizing how stored items snap to the backpack. The key issue was that tools appeared visually close to the bag in the editor but still stored at incorrect offsets or rotations once the game was running. This exposed problems in both the transform math and the assumptions about where each item should attach.

- Each tool now uses a dedicated `BackpackStowAnchor` to define the actual contact point that should align with a slot.
- Storage alignment was simplified toward world-space snapping so the anchor-to-slot relationship is more predictable.
- The feeding stick scale issue was corrected by preventing spawn anchors from inheriting incorrect scale values.
- Stored items were also re-snapped during update so they follow the backpack more reliably while the bag is moving.

Camera Handling Improvements

The camera remained the most difficult tool in the entire system. Unlike the book or feeding stick, the camera has a more complex internal hierarchy and a much stricter requirement for comfortable in-hand use because the player depends on its live preview screen. As a result, the session focused heavily on camera-specific pose tuning.

- A runtime camera hold attach point was introduced so the camera can be gripped from a more consistent location.
- The summon and pickup logic was repeatedly tuned to reduce situations where the camera appears far away from the hand or twisted at an unusable angle.
- Additional smoothing was added for the camera preview so the small screen is easier to read while taking photos.
- A subtle stored-camera sway was explored to help the camera feel like a hanging object when attached to the backpack.

Outline Feedback for Grabbable Objects

To improve object readability, a new outline solution was added to the project. The aim was to make it easier for the player to understand which objects are currently interactive without relying only on physical placement and hand proximity. This was especially useful as the backpack system became more complex.

- The **Linework Lite / Free Outline** package was imported and added to the project's asset credits.
- The active URP renderer presets were prepared for the outline renderer feature.
- A reusable runtime highlighter was added so the backpack, camera, bingo book, and feeding stick can respond more clearly to hover or selection.
- The outline colour choice leaned toward a warmer yellow highlight so it feels readable without overpowering the stylized art direction.

Problems Encountered

Even though several systems improved, this phase still revealed how fragile the interaction stack becomes once inventory, runtime parenting, grab poses, and rigidbody behaviour all overlap. Many of the issues were not simple one-step bugs, but chains of smaller transform and collider problems that only became visible during full VR testing.

- The backpack still occasionally interfered with the rig in ways that felt physically wrong, including pushing or launching the player.
- The camera shoulder summon was brought much closer to correct, but its rotation was still inconsistent enough to feel unfinished.
- The feeding stick became the most stable stored item, while the camera and book exposed more complicated alignment failures.
- Several fixes improved one interaction while temporarily making another interaction worse, which slowed the iteration process.

Current status: the feeding stick is now the strongest example of the backpack inventory working as intended, the bingo book is in a better state than before, and the camera is significantly improved but still needs final pose tuning before it feels reliable enough for polished gameplay.

Reflection

This was another debugging-heavy session, but it pushed the backpack system closer to something that could work as a legitimate part of the final demo rather than just a prototype gimmick. The main lesson from this phase is that VR comfort depends just as much on predictable grab poses and clear feedback as it does on visual fidelity. The outline system and the shoulder-zone split both helped make the intended interaction model clearer, even though the camera still requires more careful refinement.

Next Steps

- Finalize the camera's in-hand rotation so it feels natural every time, whether picked up from the table or summoned from the right shoulder.
- Confirm that the outline highlights are rendering cleanly on all intended grabbable objects in actual play mode.
- Eliminate any remaining backpack collision behaviour that can interfere with locomotion or player comfort.
- Continue polishing the relationship between stored item slots and their stow anchors so all tools feel visually grounded on the bag.