16 KB Page Size Requirement – Fix Report

1. Background

Google Play has introduced a mandatory **16 KB memory page size requirement** for Android App Bundles (AAB). This requirement affects how native libraries are aligned in memory at runtime and is enforced **during Play Store validation**, not during local APK installation.

Since:

- Google Play accepts **only AABs** for production uploads
- APKs are no longer allowed for publishing

any app whose AAB does not comply with this requirement will fail Play Store submission, regardless of whether the app works correctly when installed locally.

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2. Origin of the Issue

The project was originally built using **Unity 2021 LTS**.

While:

- APK builds from Unity 2021 worked correctly
- Gameplay, controls, and performance were stable

the issue arose because:

- Unity 2021 uses an older Android toolchain
- That toolchain does **not fully support the 16 KB page size requirement**
- As a result, **AABs generated from Unity 2021 fail Play Store validation**

This is a known limitation when targeting newer Play Store requirements using older Unity versions.

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3. Why a Fix Was Required

This issue could not be ignored because:

- Play Store submission is blocked if AAB validation fails
- APKs cannot be used as a workaround
- The app cannot be published or updated unless the AAB complies

Therefore, a toolchain-level fix was required rather than gameplay or code-level changes.

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4. Solution Approach

After evaluating possible approaches, the most stable and recommended solution was selected:

Upgrade the project to Unity 2022 LTS

Reasons:

- Unity 2022 includes updated Android Gradle and NDK support
- Native libraries generated in Unity 2022 comply with the 16 KB page size rule
- This follows Unity's and Google's official recommendations
- Avoids unsafe post-build hacks or manual binary modifications

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5. Implementation Details

The following steps were taken:

1. **Project upgraded from Unity 2021 LTS to Unity 2022 LTS**
2. Build artifacts refreshed to ensure a clean Android build environment
3. **AABs regenerated using Unity 2022**
4. Minor Unity 2022–specific adjustments were made to:
    - Align rotation updates with the physics update cycle
    - Prevent subtle visual drift introduced by Unity 2022 timing changes
    - Preserve original gameplay behavior without changing logic

No gameplay systems or control logic were redesigned.

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6. Impact on Existing Builds

APK Builds

- APKs are not affected by the 16 KB page size requirement
- Previously approved APKs remain valid
- APKs were re-exported and tested again for verification
- No issues were found

Source Code

- Core gameplay logic remains unchanged
- Inputs, controls, and camera behavior preserved
- Only compatibility-related adjustments were made

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7. Testing Performed

Testing was conducted after the Unity 2022 upgrade on:

- Touch input
- Controller input

Verified areas:

- Player movement and turning
- Camera behavior
- Gameplay flow and responsiveness

No functional regressions were observed.

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8. Git and Build Status

- Updated Unity 2022–compatible source code pushed to Git
- AABs now fully comply with Play Store requirements
- APKs verified and stable

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9. Final Status

- 16 KB page size requirement resolved
- AABs successfully generated using Unity 2022
- Source code synchronized
- Ready for Play Store upload

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10. Conclusion

The 16 KB page size issue was caused by limitations in older Android build toolchains and required an editor upgrade to resolve. Migrating the project to Unity 2022 LTS ensured compliance with current Play Store requirements without introducing instability or gameplay changes.

No further updates are required at this stage.