To create a security case for ACAS Xu based on the security case pattern provided and using the domain-specific information, we start by replacing placeholders in the goals, strategies, and context with ACAS Xu-specific details. The hierarchical tree structure of the assurance case is then constructed.

\*\*Hierarchical Tree Structure of the Security Case for ACAS Xu:\*\*

- \*\*Goal (G0, "ACAS Xu satisfies security requirements")\*\*

- \*\*Context (C0, "ACAS Xu is designed to prevent collisions between drones or between a drone and other objects.")\*\*

- \*\*Context (C1, "Security requirements are about protecting ACAS Xu from malicious entities.")\*\*

- \*\*Assumption (A0, "ACAS Xu's system security requirements are complete, adequate, and consistent.")\*\*

- \*\*Justification (J0, "The argumentation is based on satisfaction of identified security requirements.")\*\*

- \*\*SupportedBy\*\*

- \*\*Strategy (S0, "Argue through asset protection and secure development requirements")\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G1, "ACAS Xu satisfies the asset protection requirements")\*\*

- \*\*Assumption (A1, "Asset inventory of ACAS Xu is established.")\*\*

- \*\*SupportedBy\*\*

- \*\*Strategy (S1, "Argue through the different stages of the system development life cycle")\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G3, "Asset protection requirements are met during the architecture design phase")\*\*

- \*\*Context (C2, "ACAS Xu utilizes sensors, processors, and actuators to compute and execute collision avoidance strategies.")\*\*

- \*\*SupportedBy\*\*

- \*\*Strategy (S2, "Argue through deriving security threats from security requirements")\*\*

- \*\*Justification (J1, "Detection and mitigation of threats fulfill the security requirements.")\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G5, "ACAS Xu architecture is protected against identified security threats (STs)")\*\*

- \*\*Assumption (A2, "All relevant threats have been identified for ACAS Xu.")\*\*

- \*\*SupportedBy\*\*

- \*\*Strategy (S3, "Argue over each security threat")\*\*

- \*\*SupportedBy (Dynamic: Based on identified STs)\*\*

- \*\*Goal (G0.1, "ACAS Xu architecture is protected against ST1: Tampering")\*\*

- \*\*Goal (G0.2, "ACAS Xu architecture is protected against ST2: Spoofing")\*\*

- \*\*Goal (G0.3, "ACAS Xu architecture is protected against ST3: Elevation of privileges")\*\*

- \*\*Undeveloped (G4, "Asset protection requirements are met during other phases")\*\*

- \*\*UndevelopStantiated (G2, "ACAS Xu satisfies secure development requirements")\*\*

- \*\*UndevelopStantiated (G6, "ACAS Xu architecture is validated")\*\*

In this hierarchical structure, the goals, strategies, and necessary supporting elements such as contexts, justifications, and assumptions are organized to reflect their relationships and dependencies, providing a clear and structured argumentation for the security of ACAS Xu. Elements like `Undeveloped` and `UndevelopStantiated` indicate areas that would require further development or specific instantiation details, especially in applying the pattern to the ACAS Xu system.