

AUTHREX SYSTEMS

Simulation User Guide AUTHREX Tactical COP


3D Fratricide Prevention — 6-Asset JADC2 Swarm

FIELD	VALUE
Document	Simulation User Guide
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Dependencies	THREE.js r128 (CDN), WebCrypto API
Browser	Chrome 90+ / Edge 90+ (WebGL + WebCrypto required)
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1. PREREQUISITES

Before opening this simulation: (1) Use Chrome 90+ or Edge 90+ (recommended). Firefox and Safari may have WebGL differences. (2) Ensure internet connectivity — this simulation loads THREE.js from a CDN. Without internet, the 3D visualization will show a fallback message but the governance engine continues. (3) Open the HTML file directly in the browser (double-click the file or drag into Chrome). No web server is required. (4) Allow the page to fully load before interacting with controls.

2. QUICK START





Open in Chrome. A 3D scene shows 6 wireframe assets (1 C2 command, 2 destroyers, 3 UCAVs) connected by DDS mesh links. This simulation runs an automated 5-phase fratricide prevention scenario. Click  EXECUTE FRATRICIDE SCENARIO to start — the scenario plays out automatically with timed phases.

3. STEP-BY-STEP WALKTHROUGH




Automated 5-Phase Fratricide Prevention

This scenario runs automatically after injection. Each phase triggers on a timer.




Step 1: Click  EXECUTE FRATRICIDE SCENARIO — Phase 1: Byzantine fault detected. UCAV-01 begins hostile behavior.

-  **Observe:** UCAV-01 wireframe turns RED
-  **Observe:** DDS link to UCAV-01 changes color (degraded)
-  **Observe:** Telemetry table shows UCAV-01 status: COMPROMISED
-  **Observe:** Pipeline: SATA → ALERT




Step 2: Wait ~3 seconds — Phase 2: Target lock. UCAV-01 locks onto friendly destroyer.

-  **Observe:** Targeting reticle appears on DDG-71
-  **Observe:** HMAA governance pipeline shows FIRE state
-  **Observe:** Authority escalation begins





Step 3: Wait ~3 seconds — Phase 3: MAIVA PBFT consensus. Peers vote on Byzantine node.

-  **Observe:** 4/5 peers (>66%) vote to quarantine UCAV-01
-  **Observe:** MAIVA indicator shows QUORUM
-  **Observe:** Combat log: PBFT CONSENSUS REACHED

Step 4: Wait ~2 seconds — Phase 4: CARA interlock fires automatically.

-  **Observe:** Full-screen CARA INTERLOCK alert flashes
-  **Observe:** Missile (if launched) destroyed with falling-body animation
-  **Observe:** UCAV-01 authority = 0, status = QUARANTINED

Step 5: Wait ~2 seconds — Phase 5: Post-incident ADARA analysis.


-  **Observe:** ADARA performs EW triangulation
-  **Observe:** Deception source analysis results displayed
-  **Observe:** Pipeline: ADARA → TRIANGULATE
-  **Observe:** All nodes except UCAV-01 return to NOMINAL

4. INTERFACE REFERENCE

4.1 Dashboard Metrics

METRIC	RANGE	MEANING
Callsign	Asset ID	Node identifier (C2-CMD, DDG-71, DDG-88, UCAV-01/02/03)
Auth	0 - 3	Current authority tier. Drops to 0 on CARA interlock.
Trust	0.00 - 1.00	SATA trust score
CRI	0.00 - 1.00	Cascade Risk Index = 1 - ACI
Status	NOM/COMP/QUAR	Node governance state

4.2 Controls

BUTTON	FUNCTION
 EXECUTE FRATRICIDE SCENARIO	Start the 5-phase automated scenario.
Note: All subsequent phases are automatic — no clicks needed after INJECT.	

4.3 ERAM Pipeline Indicators

The pipeline banner at the top of the screen shows 6 BLADE governance modules. Each indicator changes color based on simulation state:

COLOR	STATE	MODULES	MEANING
Green	NOMINAL	All modules	System operating within normal bounds
Amber	WARNING	MAIVA, ADARA	Anomaly detected, monitoring escalation
Red	CRITICAL	SATA, HMAA, CARA, FLAME	Compromise detected or interlock active

4.4 Node States

STATE	COLOR	MEANING
NOMINAL	Green wireframe	Operating normally
COMPROMISED	Red wireframe	Byzantine behavior detected
QUARANTINED	Grey/dimmed	CARA interlock — authority revoked, isolated

5. WHAT SUCCESS LOOKS LIKE

A successful demonstration shows the complete automated fratricide prevention chain: detection → targeting → consensus → interlock → analysis. The key moment is the CARA INTERLOCK alert — a full-screen flash proving the governance system intervened before a fratricide event.

Key point: this is the only simulation where CARA fires automatically via PBFT consensus without operator intervention, demonstrating that the governance pipeline can prevent fratricide at machine speed.

6. TROUBLESHOOTING

PROBLEM	SOLUTION
Black screen / no 3D	Requires internet for THREE.js CDN. Use Chrome with WebGL enabled.
Buttons don't respond	Buttons enable in sequence (phase guards). Select scenario first, then EXECUTE/INJECT.
Hash shows N/A	WebCrypto requires HTTPS or localhost. Open via file:// in Chrome.
Pipeline banner missing	Scroll to top. Banner is fixed-position. Check if boot animation is still playing.
Page feels slow	Close DevTools. Reduce browser tabs. Ensure GPU acceleration is enabled in browser settings.

END OF GUIDE

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