



Completed Work Summary

Black Widow · BW-C45 · Physical Validation Platform

PROGRAM STATUS

Mission OS	Tests	Scenarios	Parts	Mfg
TRL 4	235+	220	71	Active

COMPLETED WORK

- Mission OS · Digital Twin — complete
- Simulations: 235+ tests, 220 scenarios
- 71 components manufactured
- Prototype assembly in progress

TECHNOLOGY AREAS

01 · Sub-drone deployment
Carrier deployment, distributed missions
[Simulation](#)

03 · GNSS-degraded
Mission planning, risk assessment
[Model-based](#)

05 · Autonomous ops
Multi-agent coordination
[Research](#)

MATURITY

Mission OS	Sub-drones	EPM
TRL 4	Simulation	Architecture
GNSS	Autonomy	Prototype
Simulation	Research	71 · assembly

CURRENT FOCUS

BW-C45 manufacturing · integration · ground tests

02 · EPM interface
Magnetic payload attachment
[Architecture](#)

04 · Mission OS
Digital Twin, GO/REVIEW/NO-GO
[TRL 4](#)

PUBLIC BENEFIT & RESEARCH GAP

Black Widow addresses a research gap in mission validation: expensive field tests are often run before operational risks are understood. Mission OS provides simulation-first GO/REVIEW/NO-GO analysis; BW-C45 extends validated models into a physical platform for integration and ground testing. Civil R&D applications include infrastructure inspection and search-and-rescue support concepts — assessed in simulation, not deployed operationally. Prototype components manufactured via in-house 3D printing (Creality K1 Max) for engineering evaluation — not production tooling. Technologies researched or simulated within Black Widow. Unless stated — not flight tested.