Testing and Validation

Software/Coding Milestones

Arduino

Hopper calibration

Accelerometer conversion ratio fixed

Magnetometer usage investigated, implemented but not used by Sensor Conversion.

transmission timing optimizations

Storage

Multi-level logging for detailed metrics on user connectivity frequency

User update method strictness reduced.

Dump and reload recovery

Revised orthogonal marker/position structures

Messaging

Automatic network detection

Resilient thread spawn error handling (fork-bomb corner-case fixed)

Refactored automatic server or alternate server reconnection methods

Cross-platform threading implemented

Sensor Conversion

Fixed hopper thresholding method

Implemented orthogonal marker storage update methods

Magnetometer conversion investigated, development time outside deliverable timeline

automatic USB/COM port re-detection after accidental disconnection

xbee transmission timing fixes (series 2 discontinued/retired)

HUD

Touch screen friendly GUI update

GPS and bearing update implemented

Available user cycling

Added GPS information display

Variable relative location scale

GUI API refactor/migration

Resolution/orientation automatic resize outside deliverable timeline

Testing Milestones

Arduino

Sensors calibration

Runtime tests

Circuitry validation (debugging usb-battery weirdness)

xbee effective range testing

automatic reconnection on power restart/failure verification

final enclosure assembly

Virtual consumer latency testing

Storage

Database virtual clients stress testing

Forced Failure mode recovery testing

Input handling coverage checking

Internal Storage structure corruption handling

Messaging

Server socket contention resolution

Automatic reconnection verification

Next-server fallback testing

Invalid input handling

Timeout handling

self-testing tool suite for network messaging primitives

HUD

Server input failure mode recovery testing

GPS error handling

Position update contention testing (adding message timestamp)

screenshot acquisition method verification

Virtual users GUI stress testing

Geometry clear and re-draw testing

coordinate format conversion testing

View-only app build version

Validation Methods

Arduino

Multi-situational metric comparison (sensors verified in the field)

Outdoor usage handling (robust hopper and tank enclosure prints)

Battery runtime meter usage

Storage

Network temporal storage center

Multi-source update handling

Messaging

Real-world Automatic retry and reconnection

WiFi field/woods effective range testing

HUD

GPS plotting

Server Information plotting

compass bearing access

remote screenshot capture

User button control vs touch control

Actual Multi-user mapping