CAP Mission Aircrew

Waldo System Introduction

Revision Draft June 2023

System Introduction

Whats in the Box

- WaldoAir camera system
  - Camera Pod
  - GPS antenna
  - LiPo Batteries
  - Microsoft Surface tablet with mount and charger
  - Cables for the camera (Power, GPS and Data)
  - White Gorrilla Tape
  - 12V inverter to charge the Tablet

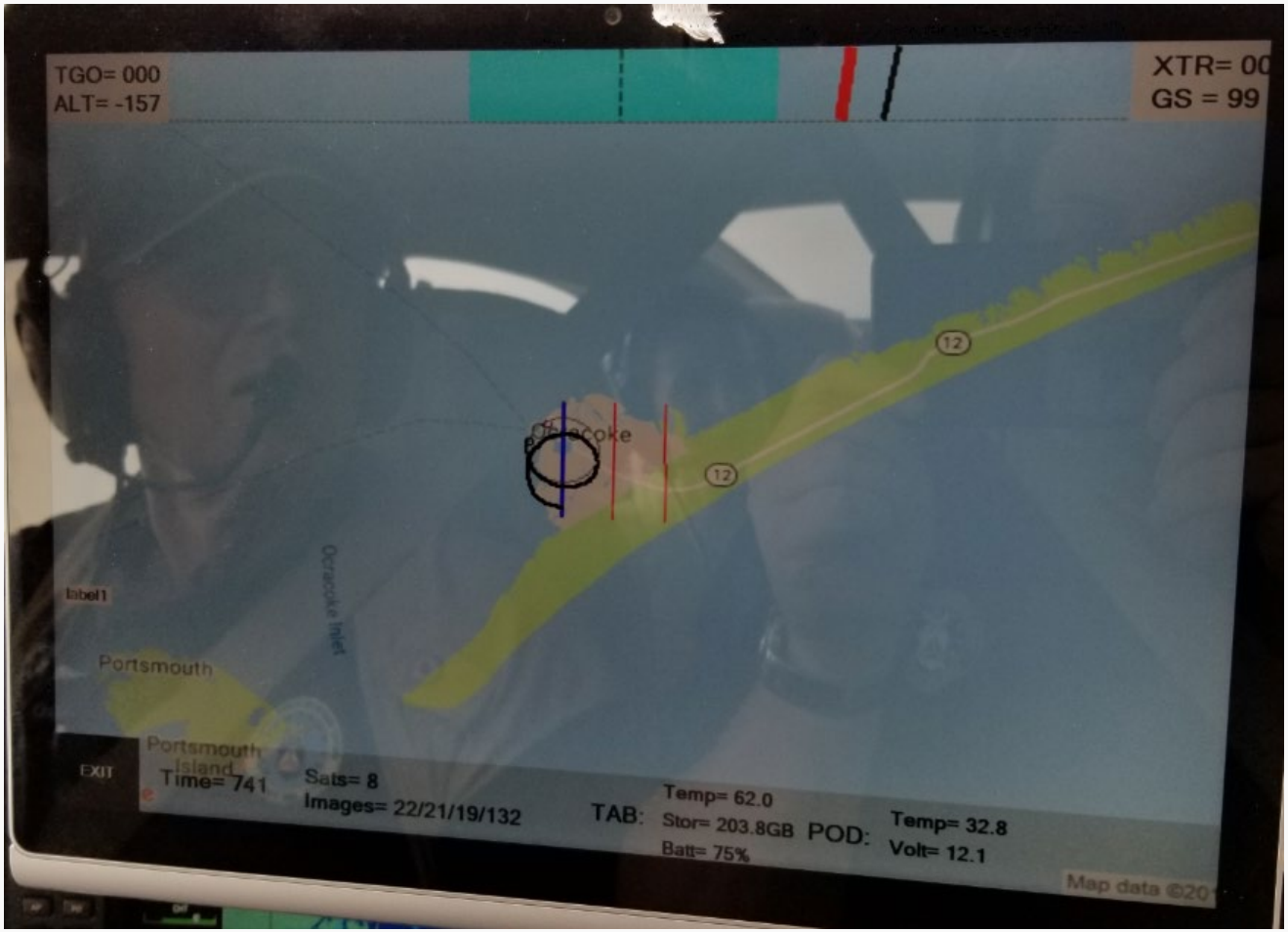
Camera Mounting

- Any CAP 172, 182, or 206 can support Waldo Operations

Flight Computer

- Microsoft Surface with Mount
- Flight plan and Steering cues
- Camera Status and control

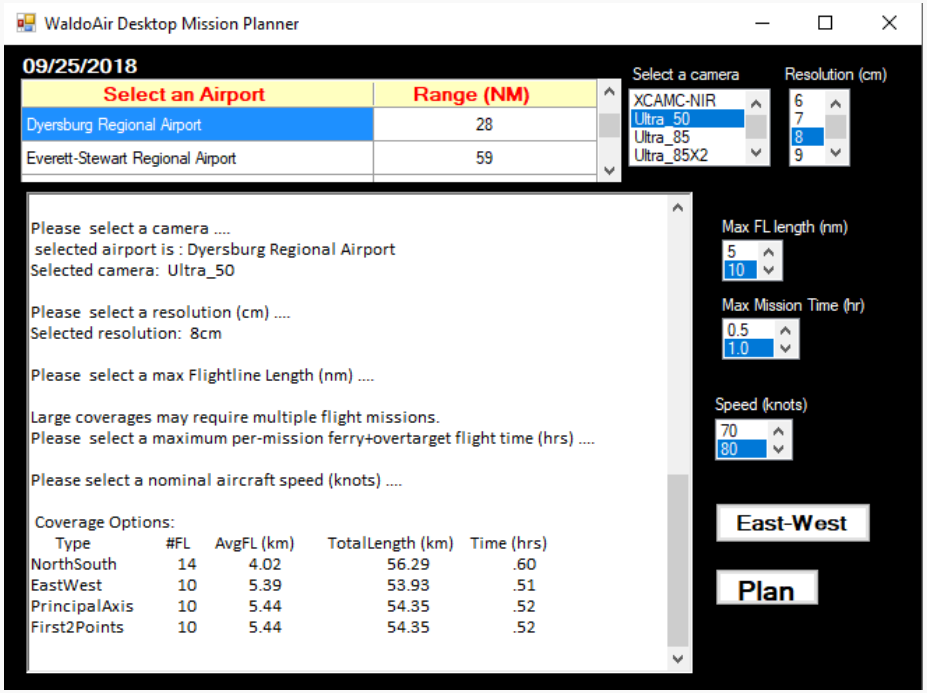
Computer Details



Delivering Images

- Waldo data requires high speed to upload
- Flights run 80+ gigabytes depending on area
- Alternative to upload is external drive

Flight Planning



Parameters

- Area 8 sq mi
- 8cm Ground Sample Distance
- .25mi Swath
- 2800 agl
- 33mi over target
- 10 Flightlines
- 394 images
- .4 hr to cover

- Area 8 sq mi
- 4cm Ground Sample Distance
- .~~13mi~~ Swath .10
- ~~1400~~ agl 4000
- 66mi over target
- 20 Flightlines
- 1552 images
- .8 hr to cover

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SQTRs for Waldo

- Waldo Mission Pilot
- Waldo Operator
- Waldo Flight Planner

Waldo Mission Pilot

- **Familiarization and Preparatory Training**
  - Safety concerns for Waldo Sorties
  - Flying Waldo Grid Pattern
  - Discuss CRM for Waldo Sorties
  - Flight limitations for Waldo Systems
- **Advanced Training**
  - Prepare for Waldo Sortie
  - Complete Waldo Grid Sortie

Waldo Operator

- **Familiarization and Preparatory Training**
  - Install System
  - Uninstall System
  - Load Flightplan on FCS
  - Monitoring System
  - Battery Safety
  - Recharging System
  - Delivering Data
  - Prepare for Flight
  - Troubleshoot and Test System
- **Advanced Training**
  - Prepare for Waldo Sortie
  - Complete a Grid Sortie

Waldo Flight Planner

- **Familiarization and Preparatory Training**
  - Google Earth Polygons
  - Export Data from Google Earth
  - Import KML to Flight Planner
  - Create Grid Flight Pattern
  - Flight Pattern Time Management
  - Export Flight Pattern
  - Deliver Flight Pattern and Briefing

- **Advanced Training**
  - Prepare for Waldo imaging Sortie as Planner
  - Complete planning for a Grid Sortie

Current System

- CAP Has
  - Xcam Ultra 50
    - 17100 x 5792 image size
    - 100MP (2 50MP cameras)

Initial Training

- Initial train the trainer often happening on actual missions
- Excellent support from WaldoAir
- Materials are being developed
- In person classes when able
- Some wings have EMA support

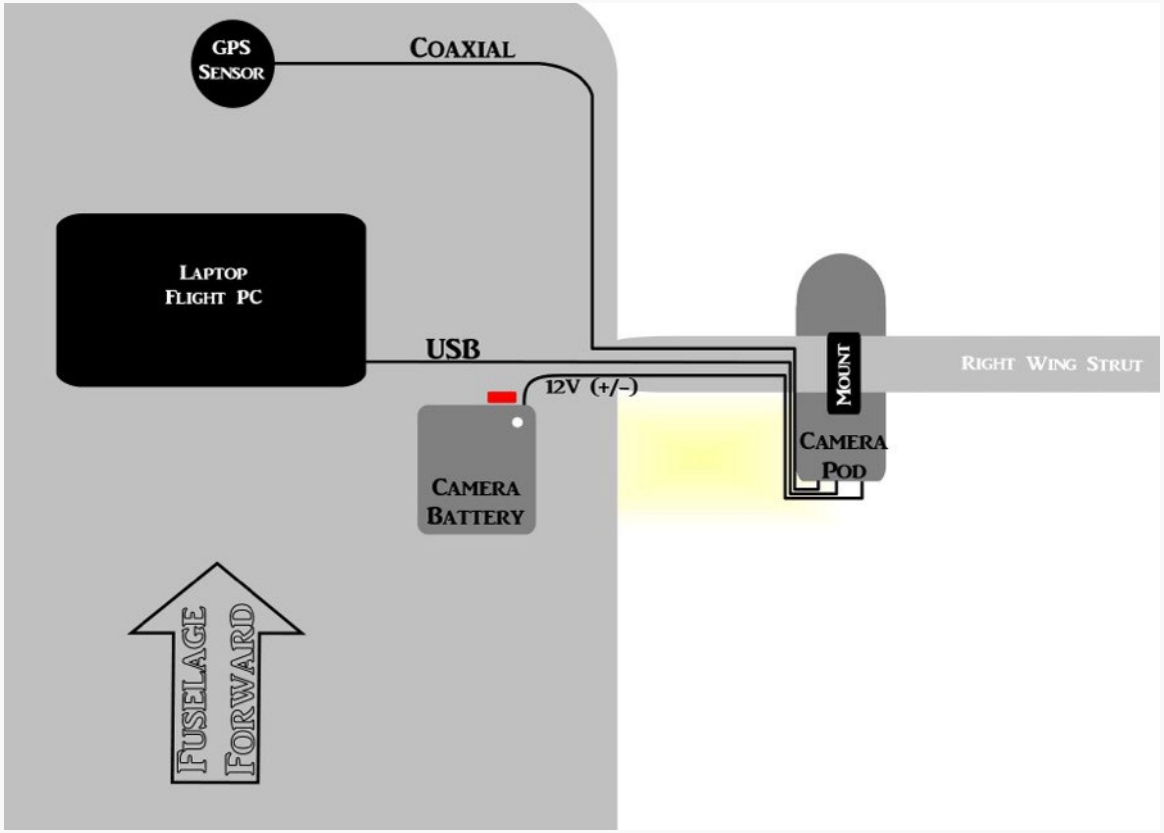
WaldoAir XCAM Ultra

- Captures Vertical and oblique images
- Processed images produce:
  - 2D+ Ortho Rectified Photo-Mosaics
  - 3D Scalable Models
- Self Contained (Not aircraft Powered)
- Images stored on Flight PC
- Images used for:
  - Pre and post damage assment
  - Infrastructure Inspection

WaldoAir XCAM Ultra
Specifications

- Dual Canon SLR Cameras (50MP each) offset 45 Degrees
- 50mm and 85mm fixed focal length
- Contains IMU & GPS
- Water Resistant

System Layout



Questions?

Capabilities and Usage

WaldoAir Usage

- With an MOU with FEMA, the CAP NOC can launch immediately after an event without waiting for a new FEMA request to be processed.
  - The morning after mission.

WaldoAir Capabilities

- **Grid** mapping is the most cost effective, quick response following an event.
- When combined with pre-mapping, it provides details on the damage with a 24 hour after event report.
- Can also be used to validate the rebuilt area matches the original.

WaldoAir Capabilities

- Circle mapping provides less immediate effectiveness but can provide detailed data in a 3D format.
- Ideal for landslides, erosions, or other events where land has moved or been removed.
- Can be used to calculate volume (cubic yards).
  - Dirt
  - Garbage
- Think of a Slinky stretched over an area, that's a Circle mapping pattern.

Questions?