



Deployment Testing

30 November 2019

Version 1.2



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Dayton, Ohio

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1. Introduction

A key aspect of the Nomad capability is the ability to rapid deploy and re-deploy to support tactical operations. To support this, the system was optimized for transportability and deployability by tailoring the packing and power requirements to enable operations by a small team. This included packaging the equipment (including air vehicle) in easily transportable containers and designing the containers to be able to include both battery and shore power capability.

2. Transportability

2.1. Test 15-01

Test 15-01 demonstrated Nomad's transportability. This test was executed in Dayton, Ohio, and consisted of the equipment being loaded in a standard M998 Humvee. The equipment include the air vehicle pre-configured with a day camera and full sensor payload (battery charged). Time started when the vehicle began unloading and the equipment was set up for operations. The time ended with the aircraft taking off. Operations were conducted with two operators, representing the optimal tactical team.

TEST 15-01 METADATA

| | |
|----------------------|------------------|
| DATE | 26 November 2019 |
| LOCATION | Dayton, Ohio |
| CONFIGURATION | Nomad-02-03 |
| SETUP TIME | 14 minutes |

The two operator team (controller and communicator) unpacked and deployed the system in 14 minutes. The primary controller prepared the ground station, including unpacking and configuring the laptop and controller. The communicator prepared the air vehicle, include conducting pre-flight and setting up the communication links. The setup included utilizing the antenna mast required to ensure maximum range for the communications systems.

3. Power

The OTSS-E system operations require flexibility in deployment. While the primary CONOPS is for rapid re-deployment in support of tactical operations, there are secondary CONOPS that benefit from access to a stable power source. Because of this, Nomad has been designed to operate with both battery and shore power.

3.1. Test 16-01

Test 16-01 demonstrated the use of both shore power and battery power for Nomad.

TEST 1 METADATA

| | |
|----------------------|------------------|
| DATE | 27 November 2019 |
| LOCATION | Dayton, Ohio |
| CONFIGURATION | Nomad-02-02 |

First a completely discharged battery was connected to 115 VAC 15 amp power (normal wall socket power) to charge the battery. The complete charge took 2 hours and 15 minutes. Next the system was operated using shore power for 1 hour. With a completely full battery, the system was disconnected from shore power and run until the battery was fully discharged. The air vehicle was not in flight, but the system was fully operational on the ground.

TEST 16-01-01

| | |
|---------------------|---------|
| TIME | 1200L |
| VEHICLE ONLY | 7 hours |
| FMV ONLY | 4 hours |
| MAXIMUM LOAD | 3 hours |

4. Weather Performance

The OTSS-E system CONOPS show a limited weather capability, including moderate rain. To facilitate this, the Nomad system was designed to be water resistant where possible, while still being optimized for the required performance. The XYZ team interpreted this to mean transient rain conditions.

4.1. Test 17-01

Test 17-01 demonstrated Nomad's performance in moderate rain conditions. This test was originally intended to be conducted during the final payload testing, but testing was delayed until the appropriate rainy conditions were found.

TEST 1 METADATA

| | |
|----------------------|--------------------------|
| DATE | 29 November 2019 |
| LOCATION | Dayton, Ohio |
| CONFIGURATION | Nomad-02-03 |
| PRECIPITATION | 2.5 millimeters per hour |

Rain testing showed that the basic air vehicle was extremely resilient to rain. The air vehicle performed as intended, with no flight critical failures even after 25 minutes of flight. The mission systems, including the payloads, experienced intermittent faults but returned to operation during flight. Of note, the wide area camera system failed after 10 minutes of sustained moderate rain.