Visual Observers

Chase Aircraft

The pilots are responsible for piloting their own aircraft and observation of the UAS; ATC will provide radar information to the AVO and chase aircraft. ATC will utilize the pilots to confirm radar information if necessary.

Observers are trained pilots. Crewmembers are thoroughly familiar with pertinent parts of 14 CFR 91 (111, 113). All personnel involved with the operation of the UAS are members of the Pennsylvania Army National Guard.

The chase aircraft will be responsible for observing airborne traffic and will have direct radio communication with ATC for receipt of observed radar targets.

The Chase aircraft will not pilot the UAS and will not be treated as a formation flight with the UAS. Chase Aircraft will be responsible for monitoring only 1 aircraft.

Ground Observers

Ground observers are trained members of the UAS crew and members of the Pennsylvania Army National Guard. UAS crew members have sufficient expertise interacting with ATC. Ground observers are trained in airspace awareness and the requirement to keep the UAS deconflicted from all other airborne operations. All UAS Operators receive FAA Ground School training.

The ground observers will visually assess other airborne operations and notify the UAS operator in the event of a potential conflict. In addition to observers, the UAS will be provided flight-following services from ATC. The operator will take appropriate action to avoid other airborne traffic as instructed by ATC or notification by an observer. Should another aircraft's flight path appear to take it into the flight path of the UAS, the UAS will alter its flight path away from the other aircraft.

Ground observers are limited to 3000 feet vertically and 1 nautical mile laterally**.** Ground observers are only at the launch and recovery site, all other observations will be by the airborne chase aircraft**.**

Ground observers that are members of the UAS team will be on headset communications and/or hand-held radios communicating with the UA operator in the ground control station.

Observers will only monitor one (1) UAS and will not operate the UAS while tasked as an observer.

Forward or side-looking cameras

Camera

The Plug in Optronic Payload Model 200 (POP 200). The POP 200 primary use is to provide either IR or Television (TV) real time imagery downlinked from the AV to GCS MPO.

Characteristics

The Shadow 200 utilizes a POP 200 with two EO/IR sensors.
Pop 200 camera has focus and zoom capability comparable to the human visual capabilities from the cockpit perspective (on the UA).

Sensor #1 – Electrical Optical:
Type: InSb, 320 x 240 IR Charge-Coupled Device (CCD) array
Resolution: 470 TV lines
Fields of View: 3 Steps
Wide 22 degrees Horizontal x 16.5 degrees Vertical
Medium 6.9 degrees Horizontal x 5.2 degrees Vertical
Narrow 1.72 degrees Horizontal x 1.29 degrees Vertical
Super Narrow 0.85 degrees Horizontal x 0.65 degrees Vertical

Sensor #2 - Infrared:
Camera Type: InSb, 320 x 240 IR Charge-Coupled Device (CCD) array
Resolution: 470 TV lines
Fields of View: 3 Steps
Wide 22 degrees Horizontal x 16.5 degrees Vertical
Medium 6.9 degrees Horizontal x 5.2 degrees Vertical
Narrow 1.72 degrees Horizontal x 1.29 degrees Vertical
Super Narrow 0.85 degrees Horizontal x 0.65 degrees Vertical