UAS TigerShark
Description and Specifications

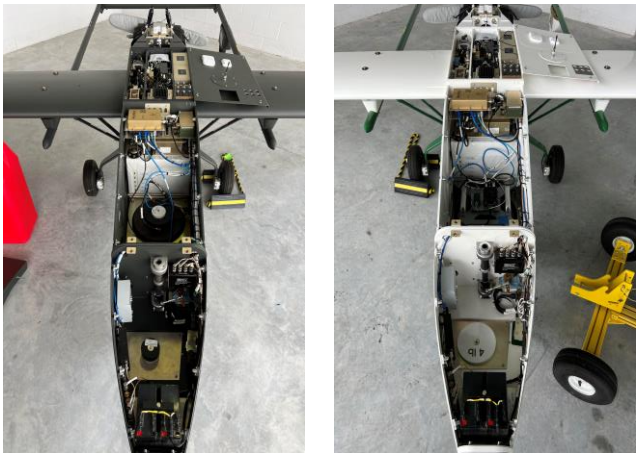
Palm Beach County Sheriff's Office

1 Unmanned Aerial System Descriptions-TigerShark UAS:

The NASC TigerShark is a Group 3 Category UAS with standard fixed wing aircraft take-off and landing capabilities (IMAGES 1A -1C). TigerShark can be operated both autonomously and manually. The autonomous navigation features the Cloud Cap Technology based autopilot system, Piccolo. The Piccolo command center allows the Pilot to set preflight/inflight flight plans, along with specialized mitigation logic for possible inflight emergencies. For Piccolo Autopilot- Autonomous Runway Takeoff & Landing, reference video- https://www.youtube.com/watch?v=xLGJZoYg9Ag .

1A: TigerShark UAS

1B: TigerShark UAS



1C: TigerShark Internal systems

TigerShark provides law enforcement with a flight time ranging between 8 to 12 hours.

Table 1 describes TigerShark general specifications.

Table 1: TIGERSHARK GENERAL SPECIFICATIONS	
Wingspan	21' 9" (6.6m)
Length	14' 3" (4.3m)
Ground to Top of Winglet	3' 9" (1.1m)
Ground to Top of Tail Boom	4' 1" (1.2m)
Ground Clearance	1' (0.3m)+
Nose to Propeller	9' 2" (2.8m)
Width of Fuselage	1' 3" (0.38m)
Tail Boom Width	4' 4" (1.3m)
Engine	Herbrandson 372cc., 32HP
Power Generation	1.5kW Alternator
Propeller	31" x 18" (787mm x 457mm)
Fuel Capacity	20 gal. (76L)
Empty Weight	315 lbs.* (143kg)*
Gross Weight	515 lbs. (234kg)
CG Range	33-37% MAC
Best CG Range	36% MAC (Zero fuel landing weight)

Source: https://www.nasc.com/pages/defense/uas/tigershark.html
NOTE: *Dependent on payload weight

2 TigerShark UAS Payload MX-10:

The TigerShark has a maximum payload weight of 95lbs and provides a maximum of 900 Watts for payload operations. The PBSO TigerShark will be equipped with WESCAM's MX-10; a small, fully digital high definition multisensory, multi-spectral imaging system payload. Features of the MX-10 include HD thermal, HD daylight and low light cameras with continuous zoom infrared (IR) and electro-optical (EO) capabilities (IMAGE 2). The MX-10 also provides high sensitivity color and low light imaging, eye-safe laser range finder. An integrated switch matrix provides HD-SDI and analogue video outputs with 1080p HD video. MX-10 is a ruggedized, 38lb four axes stabilized turret with sharp optics and stabilized performance. The MX-10 is equipped with a built-in vibration-insulation and an integrated GPS receiver. Image 2 delineates the MX-10 features.

Image 2: WESCAM MX-10

2: WesCam MX-10

3 Camera Systems:

TigerShark is equipped with three forward looking "Nose camera" systems (IMAGE 3). This includes two Day Electro-Optical (EO) camera systems, and one Night Infra-Red (IR) Camera system. The two daytime cameras display HD quality video feed with a 40-degree field of view. The Night IO camera system display's HD quality video feed with a 36-degree field of view. These cameras will not only aid with manual landing scenarios, but also with locating other aircraft in flight.

Electrical Systems: TigerShark is equipped with a Mode S transponder, ADSB In-and-Out, and VHF voice communications.

Lighting Systems: TigerShark is equipped with FAA certified strobe lights, navigation lights, and anti-collision lights.

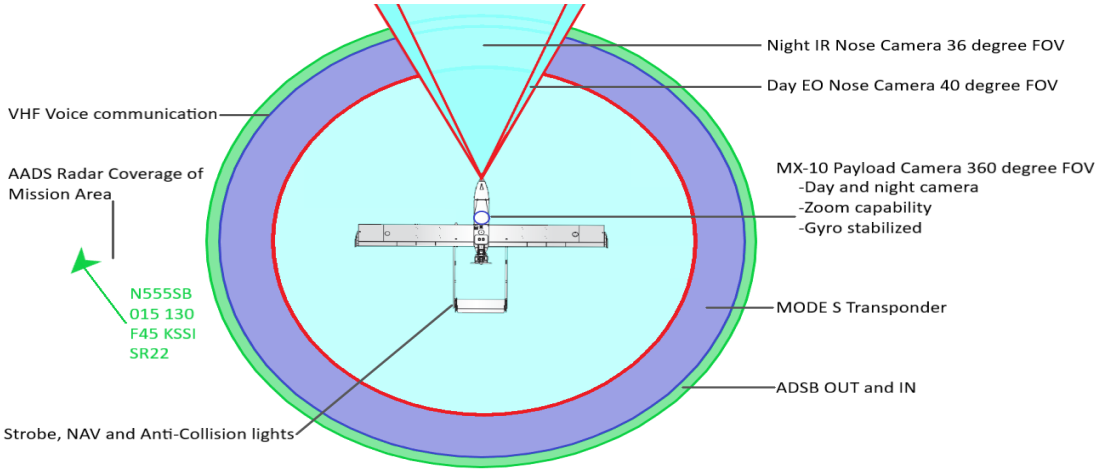


IMAGE 3: See and Avoid

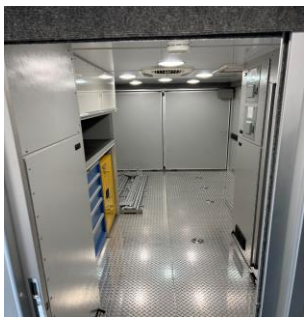
4 Ground Control Station (GCS): The GCS is a 35'2" in length 2017 Ford F750 box truck (IMAGEA through 4H).

4A: Ground Control Station (GCS)

4B: Ground Control Station w/UAS

The GCS (Rear Box) is 25’5” and is divided into two compartments; maintenance and flight operation areas (Image 3A) . The 17’6” maintenance area is equipped with a work bench, large tool box, a storage compartment, roof access, ventilation system, fire safety box, and rear door access. The Ford F750 is equipped with a 300-amp generator. In addition, the GCS is equipped with the following: a Cummins 10,000-Watt generator with a Magnum MS Series Inverter and a tracking antennae mast extending 31’10” and VHF access.

4C: Maintenance Entrance



4D: Maintenance Bay

4E: Maintenance Workstation

The exterior of the GCS houses three security cameras which provides security for the access points for flight operation areas. The 7’9” flight operation area is equipped with seven 24” screen monitors and a single 10” screen which displays exterior security camera feeds. The other monitors are designated for the following areas:

a. Pilot Station: Two monitors are designated for the Pilot Station and are not connected to the internet to avoid external malware issues.

b. Payload Operator Station: Three monitors are dedicated to the Payload Operator Station. One monitor provides command-and-control to the MX-10 payload system while displaying video images from the aircraft’s payload. The other two monitors display linkage data from each pre-positioned radio (UAS, GCS and the tracking antennas) to track the necessary bandwidth strength.

c. Radar Operator Station: There are two monitors designated for the Radar Operating Station and one is a reserved monitor.

4F: Flight Operation Entrance

4G: Flight Operation Area

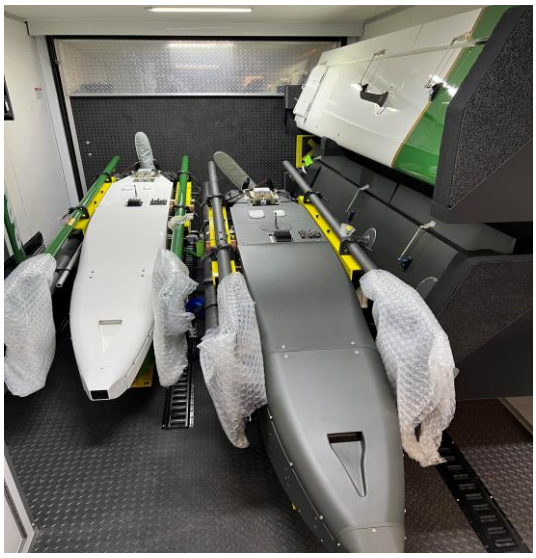
4H: Radar Operator Systems

The GCS specifications are outlined in Table 2

Table 2: Ground Control Station Specifications	
Make/Model	2017 Ford
Engine	F750, Diesel
Power Source	300amp generator
Weight	25,999 lbs
Max Height	12'1"
Crew Cab Capacity	Three
Total Box Length	25'5"
Total Box Length w/Cab	35'2"
Leveling System	Quadra BigFoot System
Security	3 External Surveillance Cameras
Access	Side and Rear

5. Care and Storage of Aircraft

The Tigershark aircrafts are housed in a secured aircraft hangar, fully assembled. When disassembled, the UAS is housed in a custom-designed, enclosed trailer (Images 5)



5: Dissembled UAVs in Workstation