



Optically Based Small Arms Targeting for Air Defense Applications

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Goals of the Project

- Provide a laser-less capability for air defenders to fully participate in force-on-force training
- Link to Common Training Instrumentation Architecture (CTIA)
- Stimulate Identification of Friend or Foe
- Reinforce proper operation of the weapon
 - Proper tracking
 - Super elevation
 - Proper steps in firing procedure

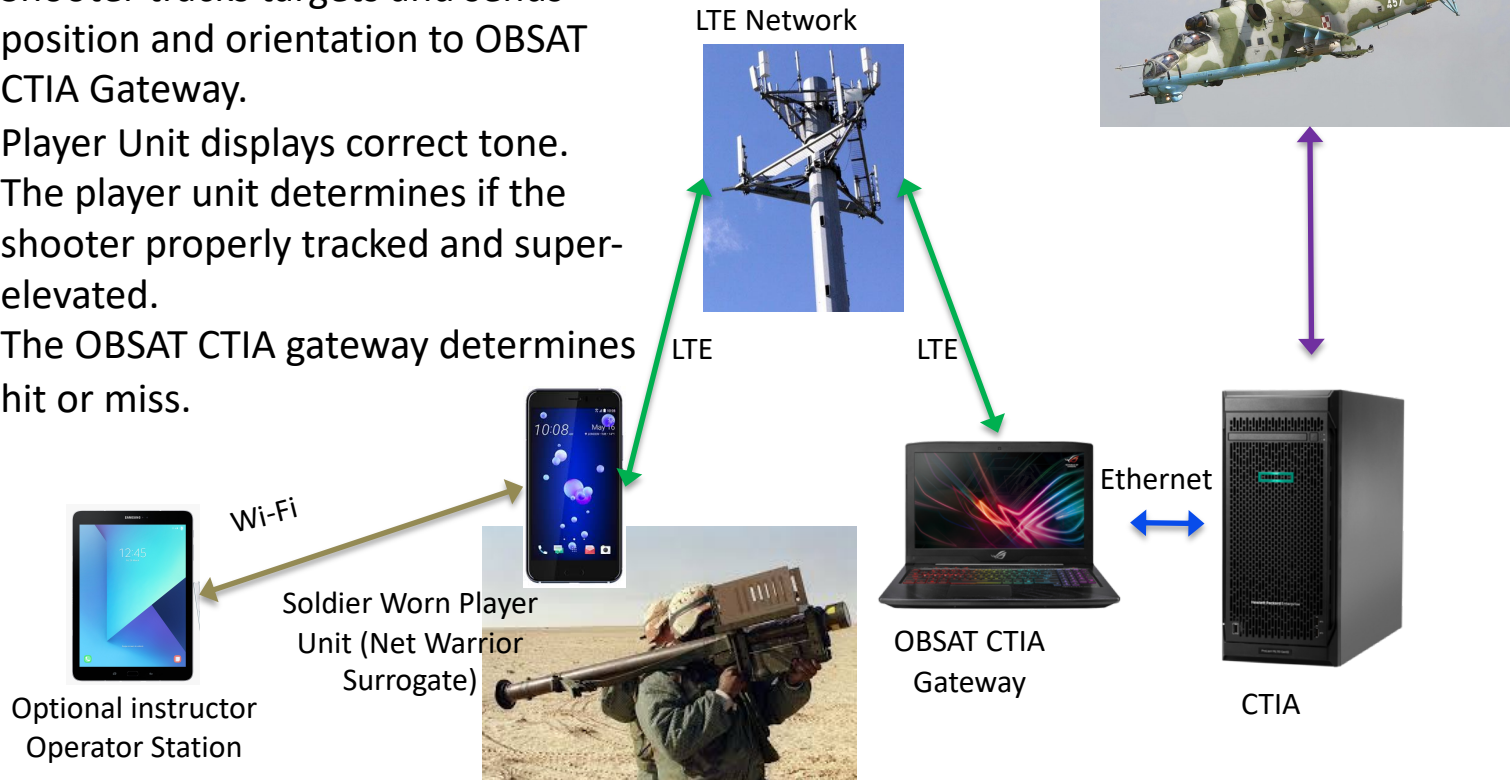
History

- Technology was originally developed to eliminate the need for laser engagement systems
 - Fire through foliage
 - Properly lead moving targets
 - Properly elevate rifle based on range to target
 - No appended equipment – use soldier, go-to-war kit
 - Engage targets at “realistic” ranges
- Successfully demonstrated target engagement out to 375 meters and beyond



System Overview

- Shooter tracks targets and sends position and orientation to OBSAT CTIA Gateway.
- Player Unit displays correct tone.
- The player unit determines if the shooter properly tracked and super-elevated.
- The OBSAT CTIA gateway determines hit or miss.



System Overview

(Player Unit and Stinger Surrogate)

14-16 May 2019
Stockholmsmässan, Sweden



Instructor
Operator
Station
(IOS)
(Optional)



Stinger
Surrogate

Wi-Fi



Thermal Scope

Wi-Fi

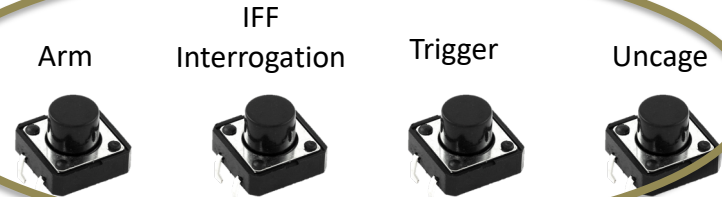


Player Unit

Wi-Fi



Raspberry Pi
Zero



Arm

IFF
Interrogation

Trigger

Uncage



Inertial Labs OS3D
Orientation Sensor

Air Defense System Instructor Station

losObsatAda.UWP

User information **Stinger Preparation** Stinger Engagement Stinger Images

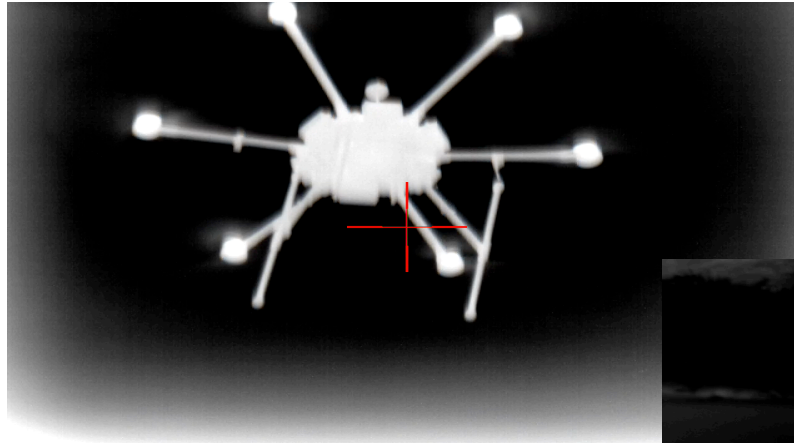
Attached IFF interrogator to belt and clamped IFF connector cable to flak jacket:	<input type="checkbox"/>	No Go
Placed weapon on right shoulder:	<input type="checkbox"/>	No Go
Touched BCU to make sure it is inserted:	<input type="checkbox"/>	No Go
Unfolded IFF antenna with left hand:	<input type="checkbox"/>	No Go
Removed front cover with left hand:	<input type="checkbox"/>	No Go
Raised sight assembly into the lock position with left hand:	<input type="checkbox"/>	No Go
Removed IFF connector cable from flak jacket:	<input type="checkbox"/>	No Go
Removed IFF protective cover on the gripstock:	<input type="checkbox"/>	No Go
Connected IFF connector cable to gripstock:	<input type="checkbox"/>	No Go
Moved the left hand forward and grasp the uncaging switch (do not press the switch):	<input type="checkbox"/>	No Go
Pointed weapon at target and centered target in range ring of front sight range ring	<input type="checkbox"/>	No Go

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User information Stinger Preparation **Stinger Engagement** Stinger Images

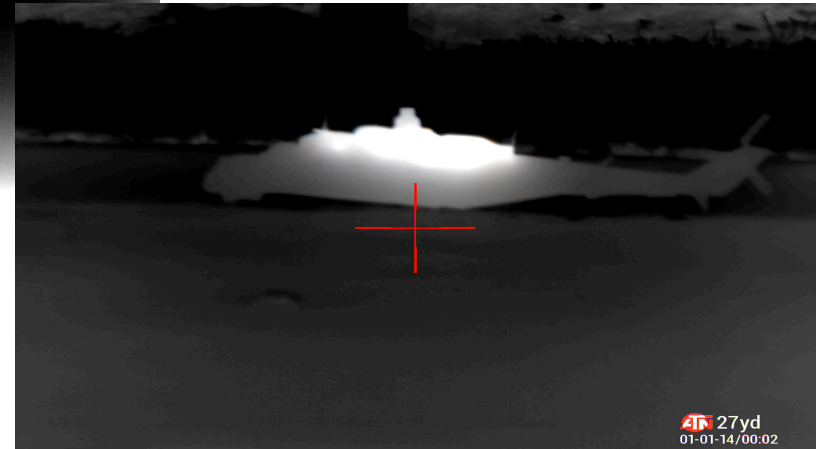
Point the weapon at the detected aerial target and center it in the range ring:	<input type="checkbox"/>	No Go
Interrogate aircraft and listen for the response:	<input type="checkbox"/>	No Go
Track and range the target, with your left foot pointed toward the target:	<input type="checkbox"/>	No Go
Activate the weapon and obtain an acquisition tone:	<input type="checkbox"/>	No Go
Listen for the acquisition tone:	<input type="checkbox"/>	No Go
Press and hold the uncaging switch:	<input type="checkbox"/>	No Go
Insert the correct superelevation and lead:	<input type="checkbox"/>	No Go
Hold in the uncaging switch, squeeze and hold the firing trigger in, and keep tracking the target for 3 to 5 seconds:	<input type="checkbox"/>	No Go
Remove BCU within 3 minutes:	<input type="checkbox"/>	No Go

Air Defense System Instructor Station



Hexacopter drone
through thermal
seeker

Metal target through
thermal seeker





Summary

This technology enables Stinger gunners to participate in live, force-on-force training for the first time.

The use of COTS orientation and position sensors provide enough accuracy.

The system ensures the gunner:

- Properly tracks and lead the target
- Confirms identification of friend or foe, and
- Properly super-elevates the Stinger before firing.