Comprehensive 360° Situational Awareness for the Crew Served Weapons Leader

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**Situation**

- **Threat:** Multitude of asymmetric threats across full spectrum of operations, to include Military Operations in Urban Terrain.
  - **Soldier’s Tasks:**
    - Conduct kinetic and non-kinetic engagements with enemy combatants.
    - Protect the local populace.
    - Minimize collateral damage on the battlefield.
    - Maintain non threatening posture towards local nationals.

- **Blue Force Gap:** Narrow Field of View/RWS observation systems do not provide adequate situational awareness to Soldiers.
  - **Mission Accomplishment risk and complexity increases:**
    - Soldiers remain exposed.
    - Existing EO/IR systems lack a 360 degree EO/IR capability. *(Lack glass cockpit).*
    - Multitude of sensor/data inputs creates “information overload”.
    - Adverse impact on mission accomplishment. *(Limited “See first - Hit first” capability).*

- **Solution:** Close the identified gap and speed the Soldier’s decision cycle.
  - Provide a 360° imaging system that increases the operational effectiveness of the Platform:
    - Present the Soldier with actionable information at the Squad Level.
    - Enable the Soldier to see while operating under armor *(Create glass cockpit).*
    - Provide Slew-to-Cue and other system integration *(Intelligent system integration).*
    - Result in Squad Leader regaining the tactical advantage *(Provides Overmatch).*
Current CONOPS

- **Being Inside an Armored Vehicle Blocks Soldier's Natural Sensors (Eyes, Ears, Nose)**
- **Manning a Weapon mounted on a Turret Exposes Soldier to Hostile Fire**
- **GPS and Remote Data Feeds Added to Armored Vehicles**
- **Gunshot Detection Added to Armored Vehicles**
- **More Displays & Sensors to Attend Too**
- **RWS: Stabilized Multi-spectral Electro-Optical Sensors and Weapons Added to Armored Vehicles**
- **Soldier Can Observe and Engage with RWS**
Future CONOPS with 360° SA System

- Improved Ability to Observe and Act
- Improved Ability to Orient and Decide
- Interpreting Sensor Data Requires Less Operator Attention

- Single Display to Attend for All Sensors & Weapons
  - Data From Other Sensors Displayed In 360º Panorama
  - Images Fused Into Low Latency 360º Panorama
  - Staring 360º Array of Multispectral Camera
  - RWS: Stabilized Multispectral Electro-Optical Sensors and Weapons Added to Armored Vehicles
  - Improved Ability to Observe and Act
  - Improved Ability to Orient and Decide

- Soldier Can Observe and Engage with RWS

Single Display
(Interface all sensors/ weapons/FBCB2 feed)
OODA- Observe, Orient, Decide, Act

- **OODA Loop**:  
  - Accepts the uncertain, continually changing environment and thrives upon the chaos of the battlefield  
  - Enables Soldiers to be comfortable in an ambiguous/chaotic environment and control the situation

- **Key to Winning = Exploit the OODA Loop**:  
  - Soldier can navigate through the OODA cycle faster and reach a decision before the enemy can react.  
  - Soldier can cut through the “fog of war” and gain better tactical awareness of his surroundings.

- **Materiel solution required**:  
  - Provide the Squad Leader with a highly integrated and easy to use Situational Awareness system  
  - Provide actionable information at the Squad Level  
  - Avoid sensor and cognitive overload
360° EO/IR Situational Awareness System
Speeds Blue Force OODA Loop

Vehicle Platform

Current Fight (SA Systems)

Future Fight (SA Systems)

O·N·E 360
Panoramic Camera

Single Display

4 separate and independent displays to monitor as a Squad Leader/Crew Served Weapons Leader

Single display to monitor as a Squad Leader/Crew Served Weapons Leader

Panoramic Video

Zoom Window

CROWS/Map data/AUX Video Feed

Status and Control

L-3 KEO Company Proprietary
Addition of 360° SA System Increases Tactical Advantage of Blue Force

COL Boyd’s Study of the F-86 Versus the MiG:

- F-86 aircraft had a glass canopy giving the pilots a 360° field of vision.
- F-86 Pilot had a much easier time observing his enemy then the enemy had of him.
- Exploitation of the OODA Loop must be conducted to win in “4th Generation of Warfare” posed by terrorist and non-conventional forces.

Key Advantages of a 360° SA System:

- 360° imaging increases the operational effectiveness of the Platform
- Soldier’s see the entire battlefield instantaneously and continuously while under armor (Creates glass cockpit
- Slew-to-Cue and other system integration (i.e., Hostile Fire Detection, SIGINT, VICTORY) complement the Platform
- Gives a tactical advantage to the Platform and Squad (Provides Overmatch)
Close the Operational Gap on CROWS with 360° Capability
- Allows the Soldier to see the entire battlefield instantaneously and continuously while under armor (Create glass cockpit)

Provides Comprehensive 360° Situational Awareness for the Crew Served Weapons Leader
- Provides actionable information at the Squad Level
- Avoid sensor/s and cognitive overload on the Squad Leader (Intelligent System Integration)

The Squad Leader needs a highly integrated and easy to use Situational Awareness system
- Use the OODA Loop to our advantage- Save Soldier’s Lives
- Increase the operational capability of the Squad Leader and Crew Served Weapons Leader- Regain the advantage over the enemy combatant
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