

IVAS vs Biometric COP enabled Smartwatch

Situational awareness is crucial for the success and safety of military missions. To meet this need, advanced systems like the Integrated Visual Augmentation System (IVAS) have been developed to provide soldiers/Marines with Common Operational Picture (COP). The IVAS is intended to replace the helmet Enhanced Night Vision Google-Binocular, and to provide the user with a COP, and enable them to Fight, Rehearse, and Train. However, it is still undergoing development.

This article discusses a possible alternative to IVAS - a Biometric COP enabled Smartwatch (BCS) which, when employed with the Enhanced Night Vision Binocular, has more capabilities than IVAS in some areas and less in others.

IVAS Features

1. Augmented Reality Heads-Up Display (HUD): Provides real time information overlay.
2. High-Resolution Simulations: Enhances situational awareness.
3. All-Weather Goggles: Operates effectively in various environmental conditions.
4. Mixed Reality Capabilities: Integrates digital and physical environments.
5. Improved Mobility and Lethality: Aids soldiers in navigation and combat.
6. Body-Worn Computer ("Puck"): Central processing unit for the system.
7. Networked Data Radio: Facilitates communication and data sharing.
8. Conformal Batteries: Power supply for extended use.

WEIGHT: 2.9 pounds, including batteries **COST: \$42,000 each**



Biometric COP-enabled Smartwatch (BCS) Features

1. Integrated Biometric Health Monitoring
2. Receive Worldwide Alert Notifications
3. Receive Chat Messages
4. Friendly and Hostile Ground, Aircraft, or Ship locations
5. Push-to-Talk with others on the Network
6. Declare an Emergency and see other users' Emergency locations
7. Map of area Adjusts as wearer moves, with Integrated Bezel Compass
8. Receive 'Must Respond To' commands

WEIGHT: 46.5 grams, including battery **COST: \$500 each**



For some applications, IVAS systems are costly, heavy, and add significant weight to an already overburdened soldier/Marine which may decrease his/her operational effectiveness. This is true for infantry operations where personnel already are overloaded. For operations that are behind enemy lines for a significant time, this is especially true.

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An Alternative Approach

BCS does not provide all the attributes envisioned for the IVAS. However, BCS offers several operational capabilities that are not available, not even with the latest version of IVAS.

How is this done?

BCS receives data from a combination of AGIS' Data Fabric and Server. The AGIS' Data Fabric receives data from Link-16, JVMF, OTH Gold, CoT and NATO ADEM, NVG and NFFI data links, from a USAF feed of Satellite locations, along with data from one or more of the various 25 types of sensors that can be sent to the Server (i.e. magnetic detection of vehicles). The AGIS Data Fabric converts this data link information, voice, and commands into a superset data link called Multi Domain Data Link (MDDL), that is sent to the AGIS Server for transmission to the BCS devices thus providing them the ability to display the Air, Ground, Sea, Space COP on a map, and most importantly the locations of friendly and hostile units near them. MDDL also enables the BCS to communicate with others by sending the data to the AGIS Server which relays the data to other Laptop PCs, Androids, iPhones and BCSs that are on the same network.



The BCS is an integrated computer, GPS, Color display, and watch. The MDDL data link provides the information to the BCS computer to provide the COP display. Additionally, it supports Voice PTT, Chat and Emergency declarations with others on network and transmits the wearers' biometric data which alerts others if the wearer is injured.

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The BCS software selectively displays an integrated compass that is visible around the watch's bezel, and that is superimposed on a georeferenced map. While it is envisioned that the BCS wearers will principally be interested in their own map location and status of fellow Squad members, BCS can be zoomed out to give an expanded look at large areas and can display up to 4,000 MIL STD 2525 symbols.

The BCS transmits its biometric data to the AGIS Server, which forwards the data to AGIS Smartphones, PCs and BCSs. This includes:

- Blood Pressure Data: Systolic and Diastolic
- Heart Rate: Continuous heart rate, incl. resting heart rate and heart rate variability.
- Body (Wrist) Temperature.
- Electrocardiogram (ECG): Helps detect irregular heart rhythms.
- Pulse Oximetry: Measurement of blood oxygen saturation levels.
- Respiration Rate: Tracking of breathing rate throughout the day and night.
- Hydration Tracking: Monitoring of your daily water intake.

BCS data can be sent to ATAK using CoT and, because it uses a Samsung Smartwatch, the government customer will have a common supplier interface as the USMC and Army ATAK operates on Samsung Smartphones and Tablets.

Personnel Training

IVAS and the BCS have taken very different approaches to training

IVAS enables tactical planning, networked information sharing, and an augmented reality Synthetic Training Environment (STE) that enables Warfighters to fight "bloodless battles" before engaging the enemy.

BCS, on the other hand, enables collection of vital health statics during military exercises. When soldiers/Marines, who are wearing BCD devices are in their military training exercises, their body activities/ movement and vital health statics are collected and transmitted to the BCS Laptop/ Server using the BCS' integrated cellular communications. The Server stores the identity, location, time, and the biometric data in real time for those wearing a BCS, thus permitting the observation of the training exercise on a COP and the vital health data of those involved. Since the server records the data, it can be summated and used as one of the criteria for the readiness of the unit being trained to perform their mission.

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