

Simulator Development Division  
PIN - 900453  
C/o 56 APO

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Force Commander  
Counter Terror Force  
Manesar, Gurgaon  
Haryana-122051

### **SCOPE OF WORK: AR BASED UNIFIED RECONNAISSANCE APPARATUS (AURA)**

1. Ref visit of Brig Ved Pal Yadav, SM\*, Force Cdr, HQ CTF, NSG on 07 Oct 2025.
2. The draft scope of work AR Based Unified Reconnaissance Apparatus (AURA) is att as appx. The proj is about devp of a helmet-mounted AR based Heads-up Display integrated with supporting hardware & comm sys. The aim is to provide soldiers with real-time visual data feeds (text, images, video & navigation) directly in their field of view, improving situation awareness.
3. The draft scope of work is being fwd for vetting at your end, pl.

*hm-o.*

(Hari Om Ahlawat)  
Col  
HoD  
for Offg Comdt

Encls: (As above)

**DRAFT SCOPE OF WORK**

**AUGMENTED REALITY BASED UNIFIED RECONNAISSANCE APPARATUS  
(AURA)**

**INTRODUCTION**

1. The Scope of Work is regarding the development of a unified system consisting of a helmet-mounted Augmented Reality (AR) Heads-Up Display integrated with supporting hardware and communication systems, and a small tactical reconnaissance drone subsystem. The integrated project is to be called the **Augmented Reality-based Unified Reconnaissance Apparatus (AURA)**.
2. The purpose is to provide soldiers with real-time visual data feeds (text, images, video, navigation) directly in their field of view, improving situational awareness, survivability, and effectiveness.
3. This Scope of Work (SoW) covers the AR glasses themselves, the communication backbone, supporting devices (e.g. weapon-mounted digital scopes), and integration with satellite navigation systems.

**OPERATIONAL USE CASES**

4. **Operational Use Cases.**
  - 4.1. **Silent Command Messaging.**
    - 4.1.1. Soldiers operate under radio silence.
    - 4.1.2. Requirement: Commanders must push text/graphic information (e.g. orders, building layouts) directly to AR glasses.
    - 4.1.3. Notes: Messages may be relayed via a secure smartphone or portable communication device carried by each soldier.
  - 4.2. **Drone Video Feed Integration.**
    - 4.2.1. A reconnaissance drone provides live situational awareness.
    - 4.2.2. Requirement: Real-time drone video feed displayed on soldiers' AR glasses.
  - 4.3. **Weapon Scope Integration (Corner Shot Capability).**
    - 4.3.1. Requirement: A digital riflescope mounted on the weapon should transmit its live view wirelessly to the AR glasses.

4.3.2. Outcome: Soldier can observe/engage from behind cover without direct exposure.

#### 4.4. **Navigation & Satellite Integration.**

4.4.1. Requirement: Integration with NavIC / GPS for real-time overlays of maps, waypoints, and routes onto the AR glasses.

### SYSTEM DESIGN AND ARCHITECTURE

#### 5. **Helmet-Mounted, Lightweight, and Modular Heads-Up Display Unit.**

5.1. The complete solution will be centred around helmet helmet-mounted, lightweight and modular HUD (Heads Up Display) unit.

5.2. The HUD display must integrate seamlessly with standard combat helmets using side rail or NVG mounting options, ensuring compatibility with existing gear.

5.3. Its lightweight waveguide optics and compact design must provide full-colour overlays without obstructing natural vision, enabling soldiers to maintain situational awareness even in dynamic combat environments

#### 6. **Integrated Compute and Communication Integration.** At the core of the system is a compact compute and communication module, which provides:

6.1. **Wireless connectivity** (Bluetooth, Wi-Fi) for secure, short-range data sharing.

6.2. **Wired standard interfaces** (USB-C, DP, RS-485) for easy interoperability with tactical radios, sensors, and command systems.

6.3. **Dual-band GNSS** (GPS + NavIC) support, ensuring robust navigation overlays in denied or contested environments.

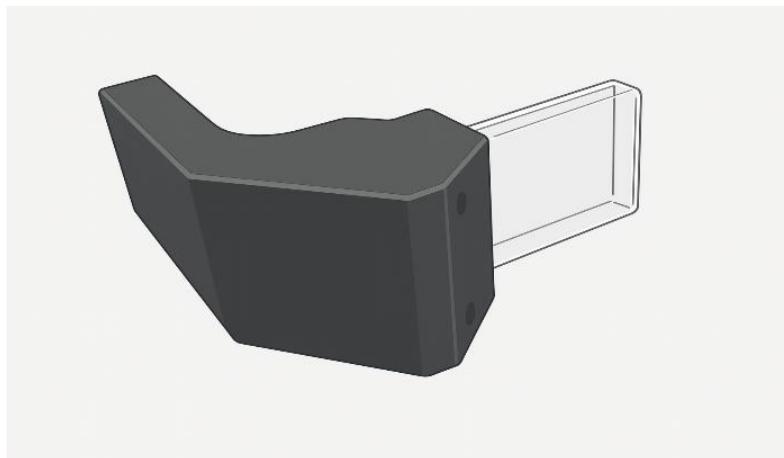
7. This architecture allows the HUD to act as a **plug-and-play node** within the broader tactical network, minimising integration complexity while enhancing interoperability with soldier systems.

8. **Power for Continuous Operations.** The system must employ a hot-swappable smart battery pack with modular capacities (3,000–5,000 mAh). Soldiers can replace batteries in the field without interrupting operation, guaranteeing extended mission endurance (6 to 8+ hours) and eliminating downtime during critical engagements.

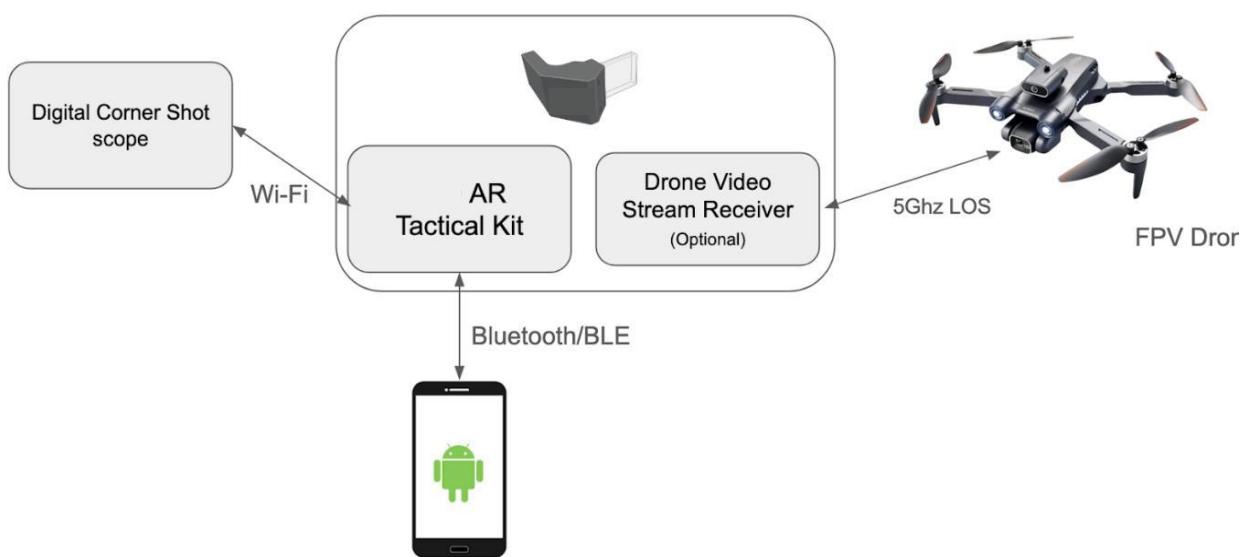
9. **Drone Receiver Module.** A compact USB-C plug-in receiver optimised for FPV Drone's line of reconnaissance drones, enabling soldiers to view live UAV video feeds directly in the display. This will support real-time reconnaissance, surveillance, and situational awareness.

10. **FPV Drone.** The FPV drone shall employ a carbon fibre composite airframe with an all-up weight not exceeding 1.25 kg and endurance up to 35 minutes. It shall support mission ranges up to 15 km, with telemetry maintained up to 3 km under visual line of sight conditions.

11. **Wi-Fi Camera Scope Integration.** Weapon-mounted digital scopes (day and thermal) can securely stream their video feed to the HUD display, enabling corner-shot capability and safer engagement from behind cover.



*Figure 1: Helmet mounted Heads-Up Display (HUD). (Image is for reference)*



*Figure 2: Solution Architecture*

## TECHNICAL SPECIFICATIONS

### 12. **Display System (HUD).**

- 12.1. Optical Waveguide Display System
- 12.2. Full Colour Display
- 12.3. Resolution: 720p 30fps
- 12.4. Field of View: 30 degrees
- 12.5. Ambient Brightness control
- 12.6 Eye Relief: At least 15mm
- 12.7 Brightness: At least 2k nits to User Eye
- 12.8 Aspect Ratio: 1:1

### 13. **Integrated Communication and Compute System.**

- 13.1. Arm Cortex -A53 or similar
- 13.2. OS: Linux / Android
- 13.3. Interfaces: USB-C DP and RS485
- 13.4. Wireless Interfaces: Wi-Fi5+ and Bluetooth 5.2
- 13.5 RAM: 8GB LPDDR5
- 13.6 Storage: 64GB UFS

### 14. **Battery Pack.**

- 14.1. Lithium Ion: up to 5k mAh to support up to 8 hours of usage
- 14.2. Supports hot-swap battery and onboard charging

15. **Total System Weight.** Approx 350 g to 500 g based on battery capacity chosen, including Drone Receiver ~ 570 g. The design must ensure that the centre of gravity remains at the centre of the head, with strategically distributed headstraps to minimise wearer fatigue. System without Battery - Approx 250gms

## **16. Secure Android App**

- 16.1. Installed on the Communication unit - such as Sambhav Phone
- 16.2. Manages HUD System's modes and settings
- 16.3. Receives, Interfaces, and relays commands and data to HUD
- 16.4. Allows display positioning and size configuration
- 16.5. Manages Accessory connections - such as Drone receiver and Wireless corner shot scope
- 16.6. Initiates Secure sessions for connections and data exchange

## **17. Corner Shot Wireless digital scope camera**

- 17.1. Resolution - 1080p 30fps
- 17.2. Rifle Scope compatibility - 32mm – 48mm with additional sleeves
- 17.3. Integrated 500mAh battery - upto 1hr continuous use
- 17.4. Interface: Wifi - Connects to the HUD Display system
- 17.5. Configuration and Setup supported by HUD Kit Secure Android App
- 17.6. USB-C Interface for charging and Data interface
- 17.7. Weight ~ 150gms
- 17.8 End-to-End Latency: ≤ 150 ms
- 17.9 Jitter: < 30 ms (post initial buffer)
- 17.10 Packet Loss: < 1–2% average over short intervals

## **18. Drone Receiver.**

- 18.1. Wireless Drone video receiver for ZT FPV drone
- 18.2. 5Ghz Receiver with integrated 2dBi antenna
- 18.3. Supports 2-way telemetry and RC control via the HUD Android app
- 18.4. Uses the HUD Display Kit's battery
- 18.5. Modular interface for integration with HUD Compute pack
- 18.6. Weight~ 70 gms
- 18.7 End-to-End Latency: ≤ 120 ms

18.8 Acceptable Jitter: < 30 ms.

18.9 Packet Loss: < 1% average over short intervals

**19. FPV Drone.**

19.1 All up Weight - Up to 1.25Kg

19.2 Flight Time - Up to 35 mins

19.3 Flight Distance - Up to 15 km

19.4 Telemetry - Up to 3kms VLOS

19.5 Material - Carbon Fibre composite body

**20. Security.**

20.1. End-to-end encryption.

20.2. Resistance to jamming and interception.

**21. Indigenous Design and Content.**

**21.1. Heads-Up Display System (HUD).**

21.1.1. Waveguide must be “**Made in India**”. HUD Design must be Indigenous.

21.1.2. HUD Drive Electronics must be “Made in India”, and the complete system must be assembled in India

**21.2. FPV Drone.**

21.2.1. Drone must be assembled in India

21.2.2. Drone Flight controller must be of Indigenous Design and Made in India.

21.3. **Drone Receiver.** Drone Receiver must be assembled in India.

21.4. **Corner Shot Wireless Digital Scope Camera.** The system must be assembled in India

## DELIVERABLES

22. The vendor shall deliver the following, grouped as Hardware and Software, along with documentation and training.

23. **Hardware.**

- 23.1. Monocular AR HUD unit with helmet mounts and required cabling, quantity as per supply order. Includes an Optical See Through Monocular Display and an Integrated communication and the compute system.
- 23.2. Hot-swappable smart battery packs with charger; minimum two batteries per HUD.
- 23.3. Drone video receiver module with mounting and interconnects, one per HUD compute pack.
- 23.4. Corner-shot wireless digital scope camera kit with sleeves, charging cable and mounting accessories.
- 23.5. Drone Receiver.
- 23.6. FPV Drone.

24. **Software.**

- 24.1. Secure Android application for AURA device management, display calibration and session control. (It should be security compatible for Army Secure Mobile)
- 24.2. Firmware for HUD, compute pack, drone receiver and corner-shot camera, with update utility.
- 24.3. SDK or API documentation for video ingest, telemetry, overlays and message formats, including example payloads.
- 24.4. Configuration profiles for encryption, pairing and role-based access.
- 24.5. Test utilities for latency, throughput and link quality measurement.
- 24.6. User documentation, administrator guide, maintenance manual and illustrated spares list.
- 24.7. Training material: quick start cards, classroom slides, SOPs for deployment and battery management.

25. **Warranty and Support.** Two-year warranty. AMC support option post warranty for five years.

## DEVELOPMENT MILESTONES

26. **Development Timeline:** 8 months

27. **Number of Milestones:** 3 (Three)

Milestone	Deliverable Details	Remarks
<b>Milestone 1 Week 8</b>	<p><b>Monocular AR headset</b> with full-colour sunlight-readable display</p> <p><b>Android App</b> for the Sambhav phone to receive and relay command and control information</p> <p><b>Mounting System</b> for tactical Helmet - Scheme options to be provided and finalised thereafter, post trials</p>	Acceptance: Diffused sunlight-readable display System Weight – as per specs
<b>Milestone 2 Week 16</b>	<p>ZT Drone receiver integration with drone video feed in FOV</p> <p>Android App integration for drone feed management</p>	Acceptance: LOS 5km+ live transmission with ZT FPV drone
<b>Milestone 3 Week 32</b>	<p>Corner Shot Digital scope integration</p> <p>Android App integration for digital scope management</p> <p>Final system handover and User trials</p> <p>Provided units will be <b>TRL-9</b> grade</p>	Acceptance: LOS 2m Live transmission of Weapon sight Complete System User trials Battery Live with Hot swap packs - 8hrs