MRTECH
Ready For Tomorrow

✈ Use Case: MRTech 5G AR Glasses with Hybrid RFID/BLE/UWB Asset Tracking for Airline MRO Operations

1. Overview

Airline Maintenance, Repair, and Overhaul (MRO) operations manage thousands of critical tools, parts, and ground support assets dispersed across wide and complex environments — from hangars and workshops to outdoor tarmac zones.

Any delay in locating or verifying these assets can cause costly **aircraft-on-ground (AOG)** situations.

The **MRTech 5G AR Glasses** integrated with a **hybrid RFID/BLE/UWB asset tracking platform** brings real-time visibility, hands-free guidance, and tool accountability into one connected ecosystem — optimizing efficiency, safety, and compliance across all maintenance stages.

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2. Challenges

Misplaced or untracked tools create downtime and safety risks.

Manual check-in/out and inspection logs are error-prone.

Fragmented data between indoor and outdoor work zones.

Regulatory audits require complete traceability of every calibrated tool used on an aircraft.

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3. Integrated Solution

The combined **MRTech + IoT RTLS** (Real-Time Location System) solution merges **RFID, BLE, UWB**, and **5G AR visualization** to deliver end-to-end visibility and control.

Technology	Environment	Function
UHF RFID	Tool cabinets, calibration rooms	Rapid identification & automated issue/return logging
BLE Beacons + Gateways	Workshops, hangars	Continuous tracking (3–10m accuracy) for mobile tools & components
UWB Anchors	Critical maintenance zones	Precision tracking (<30 cm) for high-value or safety-critical assets
5G AR Glasses (MRTech)	Technician frontline	Hands-free visualization of asset location, maintenance instructions, and tool status in real time
GPS + BLE Handover	Apron or ramp areas	Seamless outdoor tracking for vehicles and large equipment

All data is synchronized through MRTech's **5G Edge Computing Platform**, enabling instant updates between IoT tags, AR headsets, and backend MRO systems.

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4. Key Capabilities

AR-Assisted Tool Control: Technicians wearing MRTech AR glasses can view live overlays showing nearby tools or parts tagged with RFID/BLE. Missing tools trigger real-time alerts.

Hands-Free Asset Location: Visual AR/Navigation guide technicians directly to the item's location within the hangar or tarmac.

Digital Maintenance Workflow: The headset displays step-by-step repair instructions, with automatic logging of which tools were used and when.

Zone Alerts & Compliance: If a critical tool leaves a secure maintenance zone, the system sends instant AR and dashboard notifications.

Indoor–Outdoor Continuity: From hangar to ramp, assets remain visible through hybrid BLE/UWB + GPS tracking, visualized directly in the technician's field of view.

Edge-AI Insight: Real-time analytics detect patterns (e.g., tools idle too long, abnormal usage frequency) to optimize inventory and workforce deployment.

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5. Benefits

Up to 90% reduction in asset search time

✈ **Faster turnaround (TAT)** for A-checks and C-checks

Full tool accountability before aircraft release

Improved knowledge transfer via AR-guided procedures

Reduced AOG costs through proactive tracking and alerts

Optimized asset utilization and lower tool loss rates

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6. Example Scenario

During a C-check, a technician equipped with **MRTech 5G AR Glasses** begins a hydraulic system inspection.

As they open the AR dashboard, the headset overlays the required tools on the hangar map.

The system highlights that a torque wrench (RFID-tagged) is still in calibration storage — with an AR arrow guiding the user to its exact rack.

Once the tool is picked up, the BLE beacon confirms its movement, automatically logging it under the aircraft's work order.

During reassembly, the glasses display 3D/2D AR step-by-step instructions, ensuring proper torque and sequence.

Before sign-off, the system verifies that all tools have been returned to their designated cabinets — preventing FOD risk and satisfying audit requirements.

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7. Integration Options

MRO Software: AMOS, TRAX, Ramco Aviation, SAP EAM

IoT Platforms: AWS IoT Core, Azure IoT Hub, Siemens MindSphere

AR & Analytics: MRTech 5G Edge Platform (real-time synchronization with asset database)

Interfaces: REST API, MQTT, OPC-UA, WebSocket

8. Conclusion

By combining **MRTech's 5G AR Glasses** with a **multi-technology asset tracking network (RFID, BLE, UWB, GPS)**, airlines gain a unified digital twin of all maintenance activities — connecting **people, tools, and parts** in real time.

This synergy drives faster maintenance cycles, zero tool loss, and full regulatory traceability — ensuring **every flight departs safely and on schedule**.

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The global leading digital transformation
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+1 612 605 7775
www.mrtechnology.biz
sales@mrtechnology.biz
7362 University Ave Ne, Ste 310-5, Fridley MN, USA 55432