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Test Plan, Test Design Specifications and Test Cases
Version 1

CENG 408

Innovative System Design and Development II

AUTONOMOUS VEHICLE

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1. INTRODUCTION

1.1 Version Control

Version No	Description of Changes	Date
1.0	First Version	March 25, 2022

1.2 Overview

KAŞİF is an unmanned ground vehicle. The use case of the system had been explained in the SRS document. The system will be tested according to these features in different environments.

1.3 Scope

This document includes the test plan of the use cases, test cases according to the test plan, and test design specifications. Therefore, the following sections will explain how we will implement test cases and what will be the test criteria.

1.4 Terminology

Acronym	Definition
SRS	Software System Requirements
SDD	Software Design Document
UGV	Unmanned Ground Vehicle
GUI	Graphical User Interface
Autonomous Driving	A control mode which has no need to human interaction when driving.
Manual Driving	A control mode in which vehicle requires a controller to be able to move.
Android Application	A software which is coded by team members, and it includes different modes and features of the system.

2. FEATURES TO BE TESTED

In this section, we will explain our test plan and provide general information regarding the features to be tested. Additionally, for each feature, there will be a Test Design Specification given at the end of this document.

2.1 Detecting Objects

KAŞİF UGV has a camera which can detect objects and send the real time video to our Android application. Therefore, users are capable of observing external threats around that environment.

2.2 Autonomous Driving

KAŞİF UGV can move without any human interaction. For that purpose, the system uses the outputs that are received from its sensors. In this way, it can act as a guard instead of soldiers.

2.3 Manual Driving

KAŞİF UGV can be operated via our Android Application. For that purpose, the system has a Bluetooth module to transmit data. In this way, KAŞİF can be used for surveillance to make a reconnaissance.

2.4 Warning Users

KAŞİF UGV can detect harmful objects specifically. When it detects such an object, a warning is sent to the Android Application, and a message is displayed on the screen.

3. FEATURES NOT TO BE TESTED

In this section, we described features which we will not be tested.

3.1 Performance on different environments

Our hardware components can be used when the environmental factors are regular. Therefore, we will not test KAŞİF UGV under such circumstances.

3.2 Autonomous mode when the path is not regular

KAŞİF UGV can operate in autonomous mode when the path is separated by obstacles. Because of the sensor's performance, it cannot operate in any other road autonomously. Therefore, we will not test KAŞİF UGV when the path is not regular.

4. ITEM PASS/FAIL CRITERIA

To be able to get success on this project, our vehicle should move properly without a controller, or move according to the controller's inputs, detect objects with high accuracy, and warn the user when the detected object is classified as a threat. If any of the features are described in Section 2, we will consider the test as failed.

4.1 Exit Criteria

- 100% of the test cases are executed
- All High and Medium Priority test cases passed

5. REFERENCES

[1] CENG408_Group7_SRS, March 25, 2022. Available:
https://github.com/CankayaUniversity/ceng-407-408-2021-2022-Autonomous-Vehicle/wiki/Software-Requirement-Specification-(SRS)

[2] CENG408_Group7_SDD, March 25, 2022. Available:
https://github.com/CankayaUniversity/ceng-407-408-2021-2022-Autonomous-Vehicle/wiki/Software-Design-Description-(SDD)

6. TEST DESIGN SPECIFICATIONS

6.1 Detecting Objects (DO)

6.1.1 Subfeatures to be tested

6.1.1.1 ESP-32 Camera and Android Application Connection (DO.CAAC)

To be able to display detected objects on the screen, the ESP-32 Camera and Android Application must be connected via Wi-Fi. After the connection is handled, we receive a real time video on the screen. At this step, system is ready for detection procedure.

6.1.1.2 Clarify Object Identity (DO.COI)

Since we are detecting objects, the identity of each object is crucial because we want to know what the external objects in the environment are. Therefore, we require identity of each object with high accuracy.

6.1.1.3 Clarify Object Type (DO.COT)

Once we observe objects and detect their identity, we should know the object type as it is threat or not. For that purpose, we clarify each object's type based on their safety.

6.1.2 Test Cases

In this section, we listed related test cases for feature Detecting Objects (DO).

TC ID	Requirements	Priority	Scenario Description
DO.CAAC.01	3.2.2.11	High	Wi-fi connection's configuration is set to 2.4 Ghz.
DO.CAAC.02	3.2.2.11	High	ESP-32 Camera is detected by Wi-fi.
DO.CAAC.03	3.2.2.11	High	Press "STREAM" button on Android Application.
DO.CAAC.04	3.2.2.11	High	Receive real time video from camera.

TC ID	Requirements	Priority	Scenario Description
DO.COI.01	3.2.2.11	High	Press "DETECT" button on Android Application.
DO.COI.02	3.2.2.11	High	Every possible object which can be safe or dangereous is detected.

TC ID	Requirements	Priority	Scenario Description
DO.COT.01	3.2.2.11	High	Clarify object identity as it is dangereous or not.

6.2 Autonomous Driving (AD)

6.2.1 Subfeatures to be tested

6.2.1.1 Autonomous Mode Choice (AD.AMC)

User should make a choice between autonomous and manual modes. When Autonomous Mode button is pressed vehicle needs to be configured as autonomous automatically.

6.2.1.2 Checking Obstacles (AD.CO)

KAŞİF UGV has a sensor which is responsible for checking obstacles. This sensor should calculate the distance between vehicle and obstacle and return the relative data.

6.2.1.3 Vehicle Movement (AD.VM)

KAŞİF UGV should start to move according to the sensor's data. The distance should be calculated carefully to provide accidents and crashes. According to that information, vehicle should move from its current position.

6.2.2 Test Cases

In this section, we listed related test cases for feature Autonomous Driving (AD).

TC ID	Requirements	Priority	Scenario Description
AD.AMC.01	3.2.2.9	High	Connection between Android Application and HC-05 Bluetooth Module satisfied.
AD.AMC.02	3.2.2.9	High	Autonomous Mode choice must be sent to vehicle's bluetooth module.

TC ID	Requirements	Priority	Scenario Description
AD.CO.01	3.2.2.9	High	Choice data is received by HC-05. HC-SR04 sensor module is activated.
AD.CO.02	3.2.2.9	High	Path is created regularly with obstacles and other solid materials.
AD.CO.03	3.2.2.9	High	HC-SR04 calculate the distance between obstacle and itself.
AD.CO.04	3.2.2.9	High	According to calculated distance, vehicle starts to move.

TC ID	Requirements	Priority	Scenario Description
AD.VM.01	3.2.2.9	High	When vehicle escaping from one obstacle, it should not hit to another one.
AD.VM.02	3.2.2.9	High	Sensor's peformance should be observed to understand how much distance it can calculate.
AD.VM.03	3.2.2.9	High	According to calculated distance path width will be updated.

6.3 Manual Driving (MD)

6.3.1   Subfeatures to be tested

6.3.1.1.   Manual Mode Choice (MD.MMC)

User should make a choice between autonomous and manual modes. When Manual Mode button is pressed vehicle needs to be configured as manual automatically.

6.3.1.2.   Check Cables and Power (MD.CCP)

To be able to drive in manual mode, the Bluetooth sensor must be turned on and Bluetooth module should exist. This relationship should be checked before making this move.

6.3.1.3.   Bluetooth and Android Application Connection (MD.BAAC)

For the vehicle to be driven manually, the Bluetooth and Android application must be connected via Wi-Fi. After connecting, the vehicle will be able to be driven with the motion screen.

6.3.2 Test Cases

In this section, we listed related test cases for feature Manual Driving (MD).

TC ID	Requirements	Priority	Scenario Description
MD.MMC.01	3.2.2.10	High	The user has to choose between autonomous or manual driving.
MD.MMC.02	3.2.2.10	High	The driver should direct KAŞİF using the direction keys in the android application.
MD.MMC.03	3.2.2.10	High	It should check the data from sensors and camera while driving.

TC ID	Requirements	Priority	Scenario Description
MD.CCP.01	3.2.2.10	High	Check Bluetooth module and all power cables.
MD.CCP.02	3.2.2.10	High	Check if the wires are in the right place using the pin-to-pin diagram.

TC ID	Requirements	Priority	Scenario Description
MD.BAAC.01	3.2.2.10	High	Connection between Android application and HC-05 Bluetooth module satisfied.
MD.BAAC.02	3.2.2.10	High	Manual Mode choice must be sent to vehicle's Bluetooth module.

6.4 Warning Users (WU)

6.4.1 Subfeatures to be tested

6.4.1.1 Checking Wi-fi and Bluetooth Connection (WU.CWBC)

Detected dangerous objects must be transmitted by KAŞİF UGV. Additionally, detected objects must be able to be displayed on the warning screen. Therefore, ESP-32 Camera and Android app must be connected via Wi-Fi. The autonomous vehicle must be within Bluetooth range for transmitting the warning to the user. In this step, the system is ready for transmission and detection.

6.4.1.2 Detecting Threat (WU.DT)

The object is detected when dangerous objects or enemies move or are found in the facility. The vehicle warns the user depending on the correct identification of the detected hazardous object and its type.

6.4.1.3 **Reporting Message (WU.RM)**

KAŞİF UGV detects all objects while driving. It transmits a report to commander or controller (soldier) when hazardous materials or incidents are detected. This reporting message is displayed on the Android application screen with time and type knowledge.

6.4.2 Test Cases

In this section, we listed related test cases for feature Warning Users (WU).

TC ID	Requirements	Priority	Scenario Description
WU.CWBC.01	3.2.2.2 - 3.2.2.12	High	Wi-fi for ESP-32 Camera and HC-05 Bluetooth connections for Android app are provided.

TC ID	Requirements	Priority	Scenario Description
WU.DT.01	3.2.2.2	High	Detect threat or enemy object.
WU.DT.02	3.2.2.2	High	Inform commander for warning about dangerous objects or enemies using the Android app screen.

TC ID	Requirements	Priority	Scenario Description
WU.RM.01	3.2.2.2	High	A warning message is sent to the commander.
WU.RM.02	3.2.2.12	High	The controller or commander displays warning messages.
WU.RM.03	3.2.2.12	High	A detailed report was given for dangerous objects or enemies with the time and type information.

7. Detailed Test Cases

7.1 DO.CAAC.01

TC_ID	DO.CAAC.01
Purpose	Make ESP-32 visible by Wi-fi for connection process.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	20 seconds
Dependency	There must be Internet connection.
Setup	A computer/router and Android smartphone must be provided.
Procedure	[A01] Connect computer and smartphone to the Internet.
	[A02] Open Network & Internet settings from computer.
	[A03] Press Mobile Hotspot section.
	[A04] Select network band as 2.4Ghz.
	[V01] Observe connection is ready with 2.4Ghz band.
Cleanup	Close Wi-fi connection.

7.2 DO.CAAC.02

TC_ID	DO.CAAC.02
Purpose	Make ESP-32 Camera ready to stream.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	10 seconds
Dependency	DO.CAAC.01 needs to work correctly.
Setup	Computer must be working.
Procedure	[A01] Power up the ESP-32 Camera.
	[A02] Power on the Mobile Hotspot with configured settings.
	[A03] Open devices connected section.
	[V01] Observe ESP-32 Camera in the device list.
Cleanup	Disconnect power of ESP-32 Camera.

7.3 DO.CAAC.03

TC_ID	DO.CAAC.03
Purpose	Make Android application ready for receiving video data.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	30 seconds
Dependency	DO.CAAC.01 and DO.CAAC.02 need to work correctly.
Setup	Android smartphone must be provided.
Procedure	[A01] Connect that smartphone to internet.
	[A02] Install Android application to smartphone.
	[A03] Open Android application.
	[A04] Choose one of the modes.
	[V01] Observe STREAM button on the screen and press it.
Cleanup	Close the application.

7.4 DO.CAAC.04

TC_ID	DO.CAAC.04
Purpose	Observing real time video stream from vehicle's camera.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	10 seconds
Dependency	DO.CAAC.01, DO.CAAC.02, and DO.CAAC.03 need to work correctly.
Setup	Android smartphone must be provided.
Procedure	[A01] A connection message is observed after DO.CAAC.03 test case.
	[A02] Video is transmitted by Wi-fi.
	[V01] Observe the stream on the smartphone's screen.
Cleanup	Press STREAM button again to block display of stream.

7.5 DO.COI.01

TC_ID	DO.COI.01
Purpose	Make Android application ready for detecting objects from video data.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	10 seconds
Dependency	DO.CAAC.03 needs to work correctly.
Setup	All the set up in DO.CAAC must be provided.
Procedure	[A01] Stream is receiving from ESP-32 camera.
	[V01] DETECT button is pressed.
Cleanup	Close the application.

7.6 DO.COI.02

TC_ID	DO.COI.02
Purpose	Detect every possible object around vehicle.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	Not estimated.
Dependency	DO.COI.01 needs to work correctly.
Setup	All the set up in DO.CAAC must be provided.
Procedure	[A01] DETECT button must be observed.
	[A02] Press DETECT button.
	[A03] Detection algorithm is run.
	[V01] Observe detected objects.
Cleanup	Press DETECT button again to display only stream.

7.7 DO.COT.01

TC_ID	DO.COT.01
Purpose	Define if object is dangereous or not.
Requirements	3.2.2.11
Priority	High.
Estimated Time Needed	30 seconds
Dependency	DO.COI test cases need to work correctly.
Setup	All the set up in DO.CAAC and DO.COT must be provided.
Procedure	[A01] Object is detected.
	[A02] Check that object is the list of dangerous materials.
	[A03] If it is, identify it as a threat, otherwise identify it as a safe one.
	[V01] Observe the identifications.
Cleanup	Press DETECT button again to display only stream or close the application.

7.8 AD.AMC.01

TC_ID	AD.AMC.01
Purpose	Handle connection between bluetooth module with Android application.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	20 seconds
Dependency	Bluetooth module should be powered up. Android application is ready to use.
Setup	HC-05 Bluetooth module is assembled, and smartphone has an internet connection.
Procedure	[A01] Open the application.
	[A02] Open device's Bluetooth via application.
	[A03] List devices and find HC-05.
	[A04] Observe HC-05's led is blinking.
	[A04] Press HC-05 on the list.
	[V01] Observe blinking is stopped and connection is satisfied.
Cleanup	Disconnect the power supply of Bluetooth module or close the application.

7.9 AD.AMC.02

TC_ID	AD.AMC.02
Purpose	Handle mode choice of user.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	10 seconds
Dependency	AD.AMC.01 needs to work correctly.
Setup	HC-05 Bluetooth module is assembled, and smartphone has an internet connection.
Procedure	[A01] After observing connection is satisfied, observe the next page.
	[A02] Observe two buttons as options manual or autonomous.
	[A03] Press on AUTONOMOUS button.
	[V01] Choice should be sent to the vehicle.
Cleanup	Disconnect the power supply of Bluetooth module or close the application.

7.10 AD.CO.01

TC_ID	AD.CO.01
Purpose	Activate HC-SR04 sensor module.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	10 Seconds
Dependency	AD.AMC test cases should work correctly.
Setup	An admin user should be created.
Procedure	[A01] Choice is received by Bluetooth module.
	[A02] According to the choice, function calls are set for autonomous.
	[V01] Observe HC-SR04 sensor module is activated.
Cleanup	Disconnect the power supply of Bluetooth module or close the application.

7.11 AD.CO.02

TC_ID	AD.CO.02
Purpose	Create a proper path or parkour for efficient movement of the KAŞİF.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	Width of the road should be configured according to HC-SR04.
Setup	Materials and components for road is provided.
Procedure	[A01] Set up a dummy parkour to understand HC-SR04 performance.
	[A02] According to [A01] test, put the obstacles for road.
	[V01] Observe that road is ready for self-movement of the vehicle.
Cleanup	Clean the road.

7.12 AD.CO.03

TC_ID	AD.CO.03
Purpose	Calculate distance between obstacles and KAŞİF UGV.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	30 Seconds
Dependency	AD.CO.01 and AD.CO.02 needs to work correctly.
Setup	Sensor, arduino must be powered up. Application must be opened.
Procedure	[A01] Vehicle comes closer to obstacle.
	[A02] Signal is sent from sensor and comes back.
	[V01] Observe distance according to time during the [A02].
Cleanup	Power off the modules and close the application.

7.13 AD.CO.04

TC_ID	AD.CO.04
Purpose	Vehicle starts to move according to sensor's data.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	20 Seconds
Dependency	AD.CO.01, AD.CO.02 and AD.CO.03 needs to work correctly.
Setup	Sensor, arduino must be powered up. Application must be opened.
Procedure	[A01] Distance data is received.
	[A02] According to data, vehicle decides on direction to move.
	[V01] Observe vehicle moves itself.
Cleanup	Power off the modules and close the application.

7.14 AD.VM.01

TC_ID	AD.VM.01
Purpose	Handling vehicle movement without any crash or accident.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	All the AD.CO test cases should be working correctly.
Setup	Sensors and arduino board must be powered up. Path and obstacles must be ready.
Procedure	[A01] Observe an obstacle.
	[A02] Calculate the distance between obstacle and vehicle.
	[A03] According to distance, escape from obstacle.
	[V01] Observe while escaping from obstacle, vehicle do not crash.
Cleanup	Power off the modules and clean the path.

7.15   AD.VM.02

TC_ID	AD.VM.02
Purpose	Understanding sensor's performance for future paths and parkours.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	All the AD.CO test cases should be working correctly.
Setup	Sensors and arduino board must be powered up. Path and obstacles must be ready. For distance calculation, metric components must be provided.
Procedure	[A01] Put multiple obstacles to path with different features.
	[A02] Run the vehicle with autonomous-mode.
	[A03] Check distance calculation of sensor.
	[V01] Observe the performance of sensor with different circumstances.
Cleanup	Power off the sensor module and clean the path.

7.16   AD.VM.03

TC_ID	AD.VM.03
Purpose	To obtain better results, update path features according to observations.
Requirements	3.2.2.9
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	AD.VM.02 should be working correctly.
Setup	Path must be organized according to AD.VM.02 test.
Procedure	[A01] According to observations at AD.VM.02, calculate distances.
	[V01] Using new distance data, update the path.
Cleanup	Clean the path and power off the HC-SR04 sensor.

7.17   MD.CCP.01

TC_ID	MD.CCP.01
Purpose	Check the Bluetooth module and cables
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	60 seconds
Dependency	Bluetooth and Arduino datasheets
Setup	Datasheet must be provided.
Procedure	[A01] Open datasheet.
	[A02] Check cables of Bluetooth and pins.
	[A03] Check cables of Arduino.
	[A04] Select HC-05 Bluetooth module.
	[V01] Observe connection is ready with HC-05.
Cleanup	Close datasheets.

7.18 MD.CCP.02

TC_ID	MD.CCP.02
Purpose	Check wires in right place.
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	30 seconds
Dependency	Pin-to-pin diagram.
Setup	Pin-to-pin diagram must be provided.
Procedure	[A01] Open pin-to-pin diagram.
	[A02] Check wires in right place by using diagram.
	[A03] Check cables of Arduino.
	[V01] Observe action is ready.
Cleanup	Close diagram.

7.19 MD.BAAC.01

TC_ID	MD.BAAC.01
Purpose	Connect application and HC-05
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	15 seconds
Dependency	Application and Bluetooth connection
Setup	Application and Bluetooth must be provided.
Procedure	[A01] Open application and HC-05.
	[A02] Check the connection via application or module.
	[A03] Give direction via application.
	[V01] Observe movement.
Cleanup	Close connections.

7.20 MD.BAAC.02

TC_ID	MD.BAAC.02
Purpose	Check the Manual Mode
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	30 seconds
Dependency	There must be Manual mode in a KAŞİF.
Setup	Bluetooth and Manual mode must be provided.
Procedure	[A01] Select the Manual mode via Bluetooth.
	[A02] Check connections in a KAŞİF.
	[A03] Give direction via application.
	[V01] Observe moving in a manual mode.
Cleanup	Close manual mode.

7.21   MD.MMC.01

TC_ID	MD.MMC.01
Purpose	Select Mode
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	10 seconds
Dependency	There must be permission to give selection.
Setup	Select mode via Bluetooth.
Procedure	[A01] Connect Bluetooth by using phone.
	[A02] Select the manual mode via Bluetooth.
	[A03] Give direction via application.
	[V01] Observe moving in a manual mode.
Cleanup	Close Bluetooth module and application.

7.22   MD.MMC.02

TC_ID	MD.MMC.02
Purpose	Control directions
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	A minute
Dependency	There must be connection with KAŞİF and selected manual mode.
Setup	Application and connection.
Procedure	[A01] Check connection with vehicle and application.
	[A02] Decision directions.
	[A03] Give directions via application.
	[A04] Check if it's correct.
	[V01] Observe true directions in a manual mode.
Cleanup	Close manual mode and application.

7.23   MD.MMC.03

TC_ID	MD.MMC.03
Purpose	Control data comes from sensors and camera.
Requirements	3.2.2.10.
Priority	High.
Estimated Time Needed	3 minutes
Dependency	There must be connection with sensors and camera.
Setup	Ready KAŞİF for everything
Procedure	[A01] Check connections sensors and camera.
	[A02] Check Wi-Fi connection with ESP-32.
	[A03] Check images comes from camera.
	[A04] Check data comes from sensors.
	[V01] Observe true and real data.
Cleanup	Close the power.

7.24   WU.CWBC.01

TC_ID	WU.CWBC.01
Purpose	Handle Wi-fi and HC-05 Bluetooth connections with Android app and computer.
Requirements	3.2.2.2 – 3.2.2.12
Priority	High.
Estimated Time Needed	2 Minutes
Dependency	All the DO.CAAC and AD.AMC.01 test cases should be working correctly.
Setup	A computer/router, Bluetooth module connection, and Android smartphone must be provided.
Procedure	[A01] Check all connections are done, using DO.CAAC procedures.
	[A02] Check KAŞİF UGV is within Bluetooth range.
	[V01] Observe the ESP-32 Camera and HC-05 Bluetooth connections.
Cleanup	Close Wi-fi connection and disconnect power of ESP-32 Camera and Bluetooth.

7.25   WU.DT.01

TC_ID	WU.DT.01
Purpose	Warn the user if the object is dangerous.
Requirements	3.2.2.2
Priority	High.
Estimated Time Needed	10 seconds
Dependency	All the DO.COT test cases should be working correctly.
Setup	All the set up in DO.CAAC and DO.COT must be provided.
Procedure	[A01] Check all connections are done, using DO.COT.01 procedures.
	[A02] According to observations at DO.COT.01, list information.
	[V01] Observe type and identification knowledge in the list.
Cleanup	Press DETECT button again to display only stream or close the app.

7.26   WU.DT.02

TC_ID	WU.DT.02
Purpose	Give information to the commander regarding hazardous objects or enemies.
Requirements	3.2.2.2
Priority	High.
Estimated Time Needed	10 seconds
Dependency	WU.DT.01 should be working correctly.
Setup	The path must be organized according to WU.DT.01 test.
Procedure	[A01] According to observations at WU.DT.01, collect information.
	[V01] Using listed information, give knowledge to the commander.
Cleanup	Clean the path or close the application.

7.27   WU.RM.01

TC_ID	WU.RM.01
Purpose	Give a report message to the commander for detecting objects or enemies.
Requirements	3.2.2.2
Priority	High.
Estimated Time Needed	2 Minutes
Dependency	WU.DT.02 should be working correctly.
Setup	Path must be organized according to WU.DT.02 test.
Procedure	[A01] According to observations at WU.DT.02, notify information.
	[V01] Using reporting message, display object type, and time knowledge on the Android app screen.
Cleanup	Clean the path and close the application.

7.28   WU.RM.02

TC_ID	WU.RM.02
Purpose	Display and observe warning messages by the commander or controller.
Requirements	3.2.2.12
Priority	High.
Estimated Time Needed	Not estimated.
Dependency	WU.RM.01 should be working correctly.
Setup	Path must be organized according to WU.RM.01 test.
Procedure	[A01] According to observations at WU.RM.01, examine information.
	[V01] Using reporting message, display knowledge on the Android app screen by the commander or controller.
Cleanup	Clean the path and close the application.

7.29   WU.RM.03

TC_ID	WU.RM.03
Purpose	Observe a detailed report message by the commander or controller for hazardous objects or enemies' time and type information.
Requirements	3.2.2.12
Priority	High.
Estimated Time Needed	Not estimated.
Dependency	WU.RM.02 should be working correctly.
Setup	Path must be organized according to WU.RM.02 test.
Procedure	[A01] According to observations at WU.RM.02, examine information.
	[V01] Using reporting message, display type, and time knowledge on the Android app screen by the commander or controller.
Cleanup	Clean the path and close the application.

8. Test Results

Test implementations are not yet complete.