

Verification Test Procedures

Project: Geek Goggles

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1. The device will reflect a rendered display on a micro-display through a collimating lens and prism onto an optical mounted on safety glasses so the user can see an image overlayed a comfortable distance in front of them.

Test	A test image will be displayed, the image is clear and legible when viewed through the device.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

2. The device will display various view modes that can be cycled through on the glasses using a simple button UI:
 - Default mode - only displays time for minimal visual invasion
 - Peripheral Display mode:
 - i. Peripheral 1 – Displays data from the first connected peripheral (e.g., voltmeter).
 - ii. Peripheral X – Displays data from any additional connected peripherals, up to "n" number of peripherals.
 - Document Display mode:
 - i. Document 1 – Displays the first uploaded document (e.g., pinout).
 - ii. Document X – Displays any additional uploaded documents (e.g., schematics, datasheets), up to "n" number of documents.
 - Camera mode - display view from camera so user can take picture
 - Sensor mode - display basic sensor info, temp, noise, air quality

Test	The device will cycle through each display mode on button click, each mode is clearly displayed. The device is able to cycle back to the original mode
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

3. The user will be able to photographically document their project with a camera on the device.

Test	The user can view the camera in the camera display mode then take a picture by clicking a button on the device, the picture then successfully uploads to the web app allowing the user to view it.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

4. The user will be able to document their project by taking voice notes.

Test	The user then selects to record a voice note via button click in basic mode, the note records and uploaded to the web app allowing the user to review the note.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

5. The Geek Goggles will allow the user to receive alerts on the HUD. A safety alert will set off when the noise quality exceeds 90dBA, or when the air quality exceeds a general ppm of 35 $\mu\text{g}/\text{m}^3$.

Test	Using a speaker and a phone based decibel meter we will create a sound above 90dBA. The device displays a safety alert in the HUD telling the user the environment has a potentially dangerous noise level and to use hearing protection. Then we will create some air contamination from solder smoke and place the device directly above. The device displays a safety alert in the HUD telling the user the environment has potentially dangerous air quality and to move to better ventilation.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

6. The device will allow each user to connect the device to a phone or peripheral, with a transfer delay of at most 100ms between the device and the peripheral.

Test	Create a packet of test data from the peripheral with a time-stamp, once the data is received on the device, create another time-stamp and compare the difference between the times
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

7. A user interface on a phone in the form of a web application where the user can upload documents, set timers and view notes.

Test	A pinout PDF will be uploaded on the app and it is viewable on the device HUD in document mode. A 30 second timer will be set in the app and after 30 seconds an alert will be displayed on the device HUD stating the timer is over. A note will be created on the device and can be reviewed on the app.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

8. The glasses will be attached comfortably to the user to support the weight of the device.

Test	The device will be attached to a willing test subject who will lean over a table simulating a working environment and the device will not fall off the user. The user can hold that position comfortable for 30 seconds. The position held by the user will be a position that they could normally hold for 30 seconds with no issues.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

9. Optionally, depending on available time and project resources we would like to allow the user to use voice commands to change display modes.

Test	While wearing the devices the user will say a set of commands and the device will change to the next display mode.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>

10. Optionally, an Augmented reality overlay will be implemented so the user can see details such as voltage while looking at a specific peripheral or schematic based info when looking at a part of the circuit.

Test	The user will directly view a running peripheral and see in the HUD that peripherals data appear.
Results	<i>To be determined</i>
Conclusion	<i>To be determined</i>