**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.

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| **Test** | A test image will be displayed, the image is clear and legible when viewed through the device. |
| **Results** | *To be determined* |
| **Conclusion** | *To be determined* |

1. 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:
     1. Peripheral 1 – Displays data from the first connected peripheral (e.g., voltmeter).
     2. Peripheral X – Displays data from any additional connected peripherals, up to "n" number of peripherals.
   * Document Display mode:
     1. Document 1 – Displays the first uploaded document (e.g., pinout).
     2. 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

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

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

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

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

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

1. 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 μg/m³.

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

1. 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.

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

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

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| **Test** | A pinout PDF will be uploaded on the app and it is viewable on the device HUD in document mode. A note will be created on the device and can be reviewed on the app. |
| **Results** | *To be determined* |
| **Conclusion** | *To be determined* |

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

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| **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** | *To be determined* |
| **Conclusion** | *To be determined* |

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

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

1. 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.

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