TECHNICAL & ARCHITECTURAL DRAWING & DOCUMENTATION WORKBOOK

Name:

Course Date:

Programme:

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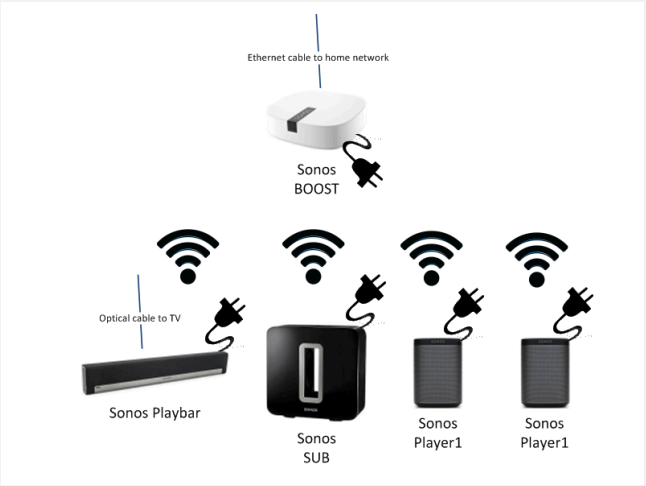
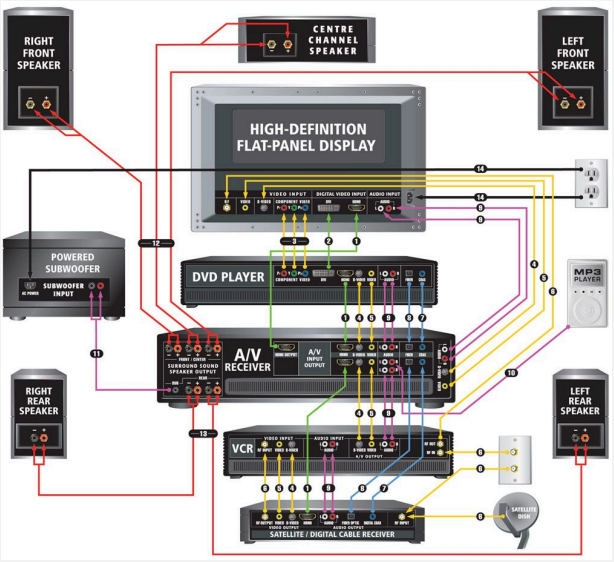
Technical Drawings

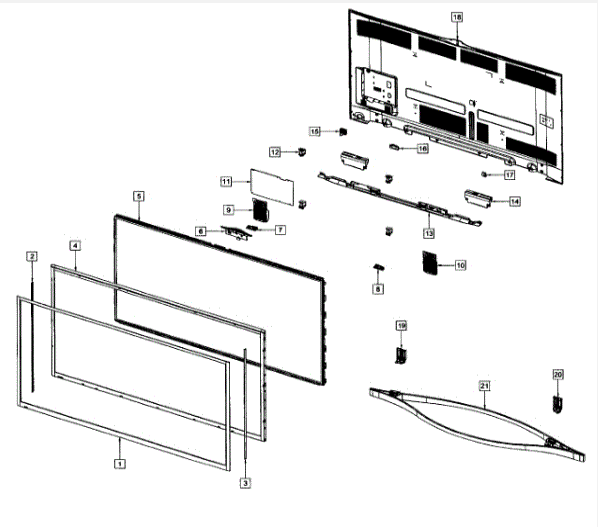
Task 1a:

Define Technical Drawings	These are detailed, precise drawings that are used in engineering and manufacturing to represent components and systems.

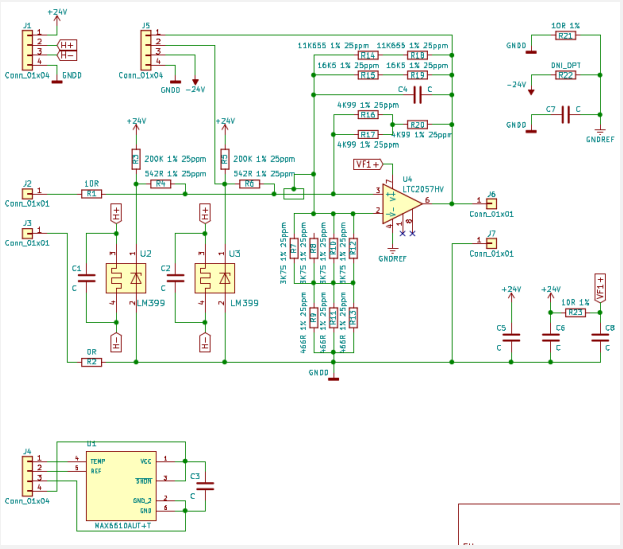
Task 1b:

Identify the type of drawings that are below, the options are:

Drawing	Drawing Type
	• Parts Drawing
	• Wiring Diagrams



- Assembly Drawing



- Schematics

Task 1c:

Based on what you have learned, provide 3 key points on why technical drawings are important:

Importance of Technical Drawings
1. Provide a standardised format detailing a project specification
2. Accuracy - It reduces the likelihood of production delays, which can be very costly.
3. Documentation: These drawings provide a record of the design process, making it easier to troubleshoot and maintain.

Architectural Drawings

Task 2a:

Define Architectural Drawings	Drawings used in architecture and construction to depict buildings and structures, including their design, layout, and functionality.

Task 2b:

Identify & state the importance of TWO characteristics of Architectural Drawings:

Characteristic	Importance
Design	Ensure accuracy, streamline communication
Layout and functionality	Facilitate smoother project execution

Task 2c:

Match the component with the functionality by using the "Insert" tab and selecting "Shapes" option to add either a plain line or double ended arrow to make a connection between the boxes:

Detail

Focuses on specific elements of a building, such as stairs, windows, joinery etc. Complex or intricate parts of the design.

Floor Plan

Depicts the layout of each storey of a building, showing walls, doors and windows as well as fixed installations.

Site Plan

Provides a bird's eye view of the building, it's location and surrounding area, including landscaping and pathways.

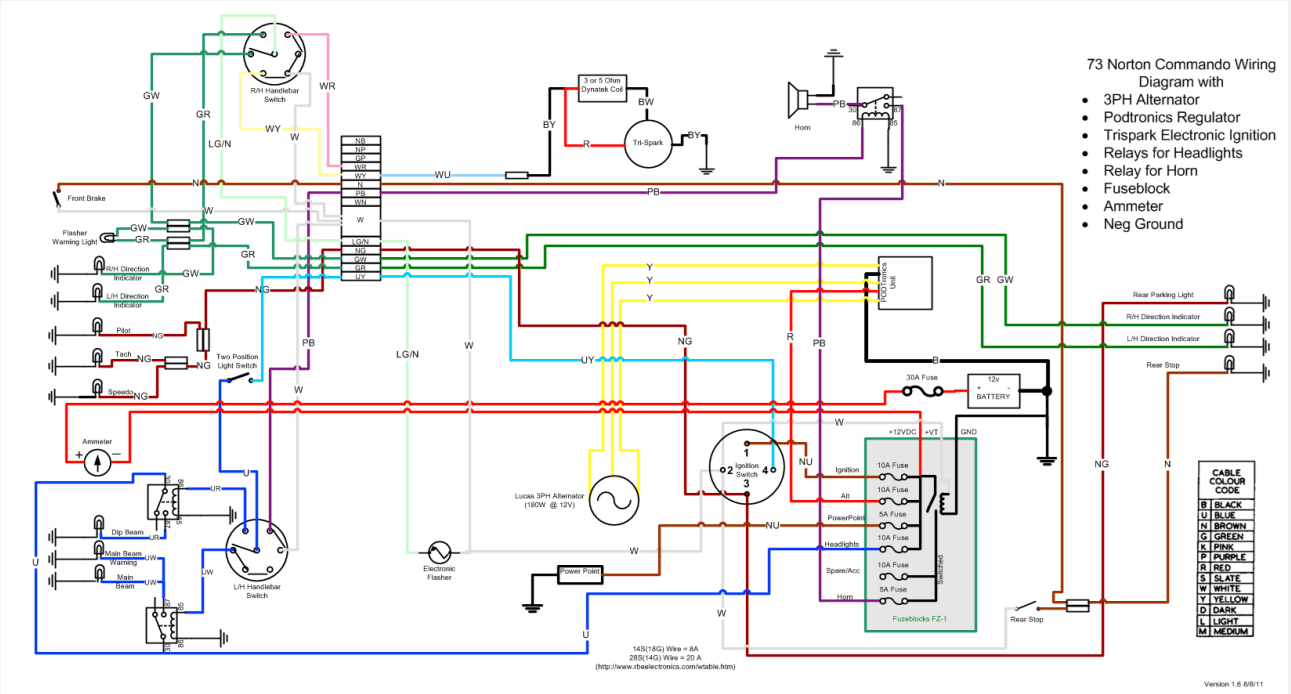
Optional Extension Task:

Choose one technical drawing and one architectural drawing and explain how it relates to smart technologies:

Technical Drawing	Drawing Type: Link to Smart Tech:
Architectural Drawing	Drawing Type: Link to Smart Tech:

Interpreting Technical Drawings

Wiring Schedules

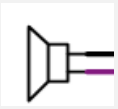


There is a PNG file named “Wiring Schedule” that has been provided to you by your tutor for a full-sized version of this diagram that you may wish to use.

Task 3a: Identifying Symbols:

Using the wiring schedule image, identify the names of the below symbols:

Symbol	Symbol Name
	**Lucas 3PH Alternator (180W @ 12V)**

	**Horn**
	**30A Fuse**

Task 3b: Identifying Codes:

Using the wiring schedule image, identify the colour of the wires from their codes:

Wire Code	Wire Colour(s)
UR	**Blue Red**
WR	**White Red**
NG	**Brown Green**

Task 3c: Tracing Connections:

Using the wiring schedule image, identify the specified connections:

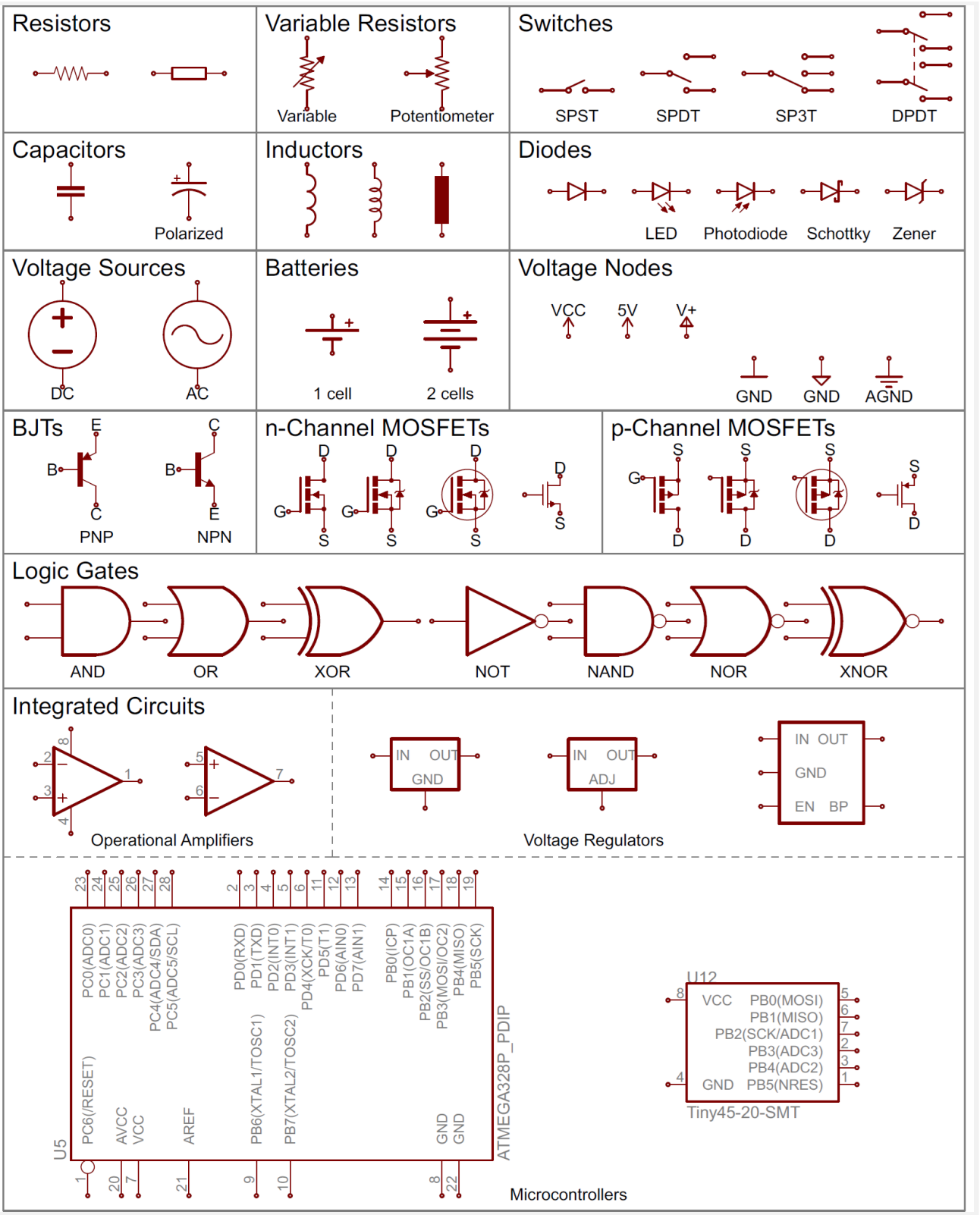
Connection Question	Connection Answer
From point 4 on the Ignition Switch, where does the connection end, and what colour is the wire?	**Connection End: Two-position light switch** **Wire Colour: Blue Yellow**
The THREE yellow wires coming from the Alternator, connect to what?	**Connection: PODTronics Unit**
What Amp is the fuse that powers the horn, and what colour is the wire for the horn?	**Fuse Amp: 5 A** **Wire colour: Purple Black**

Optional Extension Task:

Find the following on the wiring schedule, advising the wire colour and where the connection originates:

Speedo	Wire Colour: Brown Green Connection Origin: Rear Parking Light
Rear Stop	Wire Colour: White Connection Origin: Rear Stop

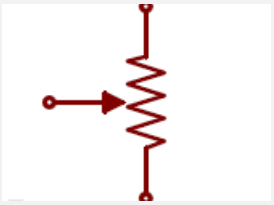
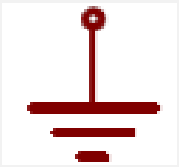
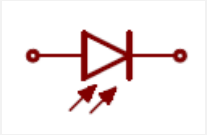
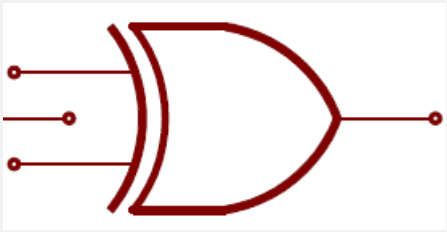
Schematic Components & Symbols



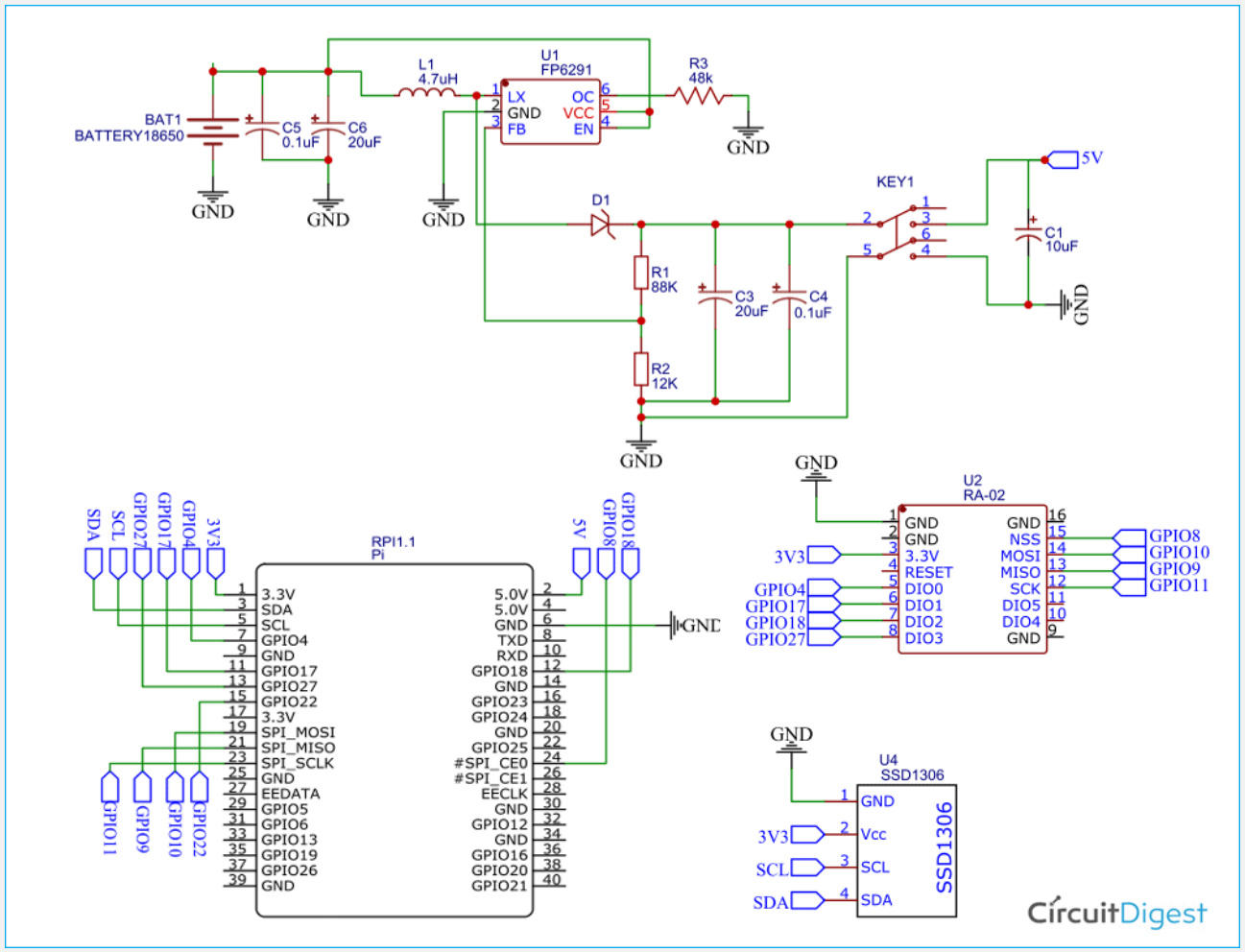
There is a PNG file named “Schematics Components and Symbols” that has been provided to you by your tutor for a full-sized version of this diagram that you may wish to use.

Task 4a: Identifying Symbols & Components

Using the schematics image, from the symbol identify the component and component type:

Symbol	Symbol Name
	**Component: Potentiometer** **Component Type: Variable Resistors**
	**Component: AGND - Analog Ground** **Component Type: Voltage nodes**
	**Component: 2 cells** **Component Type: Batteries**
	**Component: Photodiode** **Component Type: Diodes**
	**Component: XOR (Exclusive OR)** **Component Type: Logic Gates**

Schematic



There is a PNG file named “Schematic” that has been provided to you by your tutor for a full-sized version of this diagram that you may wish to use.

Task 4b: Tracing Connections:

Using the schematic image, identify the specified connections:

Connection Question	Connection Answer
From the controller connection “LX” identify the following: • **Endpoint** • **Components it passes through** • **How many junctions it passes through**	**Endpoint: Battery** **Components: Inductor** **Number of Junctions: 3**
From the controller connection “FB” the connection passes through a junction and splits both left and right, reaching	**Resistor reference 1: R1 88K**

resistors, what are the resistors FULL references?	**Resistor reference 2: R2 12K**
There is ONE Zener Diode in the schematic, where does the connection that passes through it start?	**Connection Origin: LX**

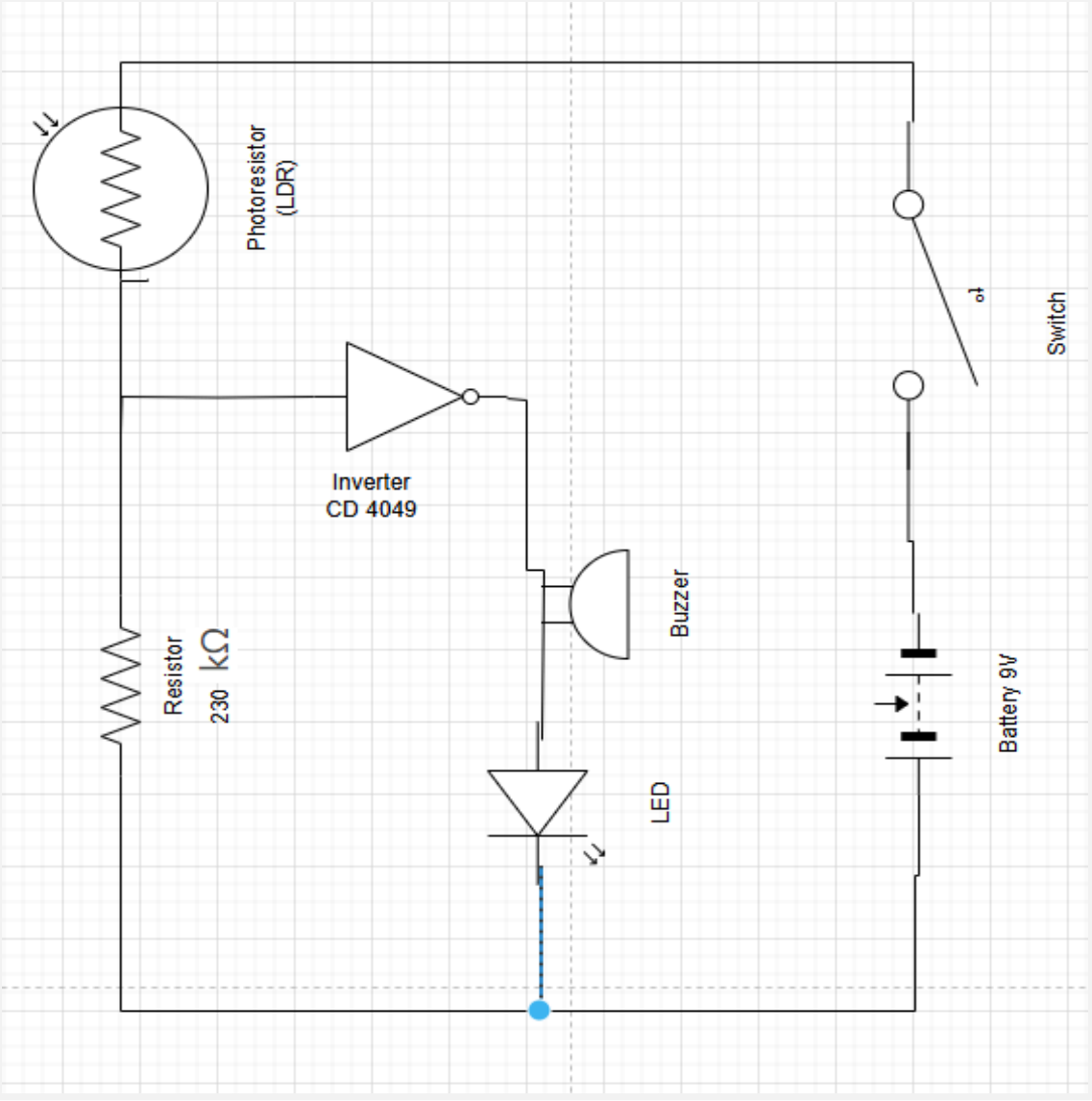
Creating Technical Drawings

Task 5a:

Create your own basic electrical schematic:

Your Schematic

Screenshot of your schematic: Electronic Eye



Written explanation of what it contains and shows:
This is an Electronic Eye Circuit, often used for security or automatic lighting applications. To detect light changes using an LDR (Light Dependent Resistor) and activate an alert system (LED + buzzer) when light is interrupted or significantly changed (such as a person passing in front of it).

- Photoresistor (LDR): Senses light level
- 230kΩ Resistor: Sets threshold with LDR
- CD4049 Inverter: Processes light signal
- Transistor: Switches the alert components
- Buzzer + LED: Alerts user visually and audibly
- 9V Battery + Switch: Powers the circuit

Schematic of Your Circuit

Screenshot of your Circuit:

Screenshot of your schematic from your circuit:

Written explanation of what it contains and shows:

Technical Documentation

Task 6a:

From the descriptions listed below, cut and paste them into the table below to match the purposes of technical documentation:

Purpose	Description
Communication	• Facilitates clear and precise messaging between developers, users, and stakeholders.
Instruction	• Provides step-by-step guidance on how to use, maintain, and troubleshoot systems or products.
Compliance	• Ensures adherence to industry standards and regulatory requirements.
Maintenance & Support	• Assists in ongoing care, making it easier to update and fix issues.
Knowledge Transfer	• Ensures that know-how is preserved and can be shared between team members or to new employees.

Task 6b:

From the statements below fill in the missing word:

Accuracy	Reduces the risk of **errors** by providing detailed instructions.
Efficiency	Speeds up the learning curve for **new** users or team members.
Consistency	Ensures that processes and products are handled **uniformly** across different users and scenarios.
Accountability	Provides a written record of **procedures** and standards that can be referenced if issues arise.

Task 7a:

From the features listed in the boxes below identify the type of technical documentation that it describes:

Features	Document Type
• Version information • New features • Improvements • Bug fixes • Known issues • Upgrade instructions	Release notes

Features	Document Type
• Workflow diagrams • Steb-by-step procedures • Roles & responsibilities • Best practices • KPIs & metrics	Process documentation

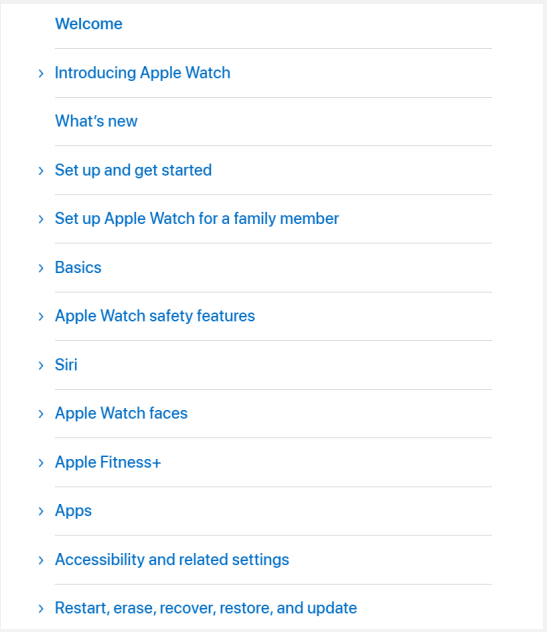
Features	Document Type
• Prerequisites • Installation steps • Configuration	Installation guide

- Verification
- Troubleshooting

Task 7b:

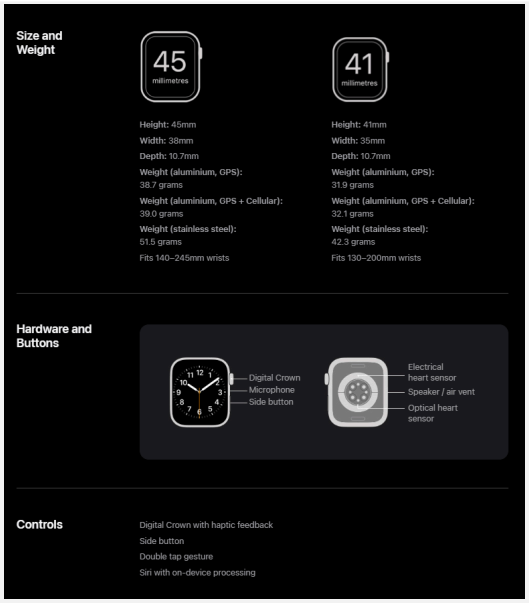
From the screenshots below, identify the types of documents the excerpts show:

Technical Document 1



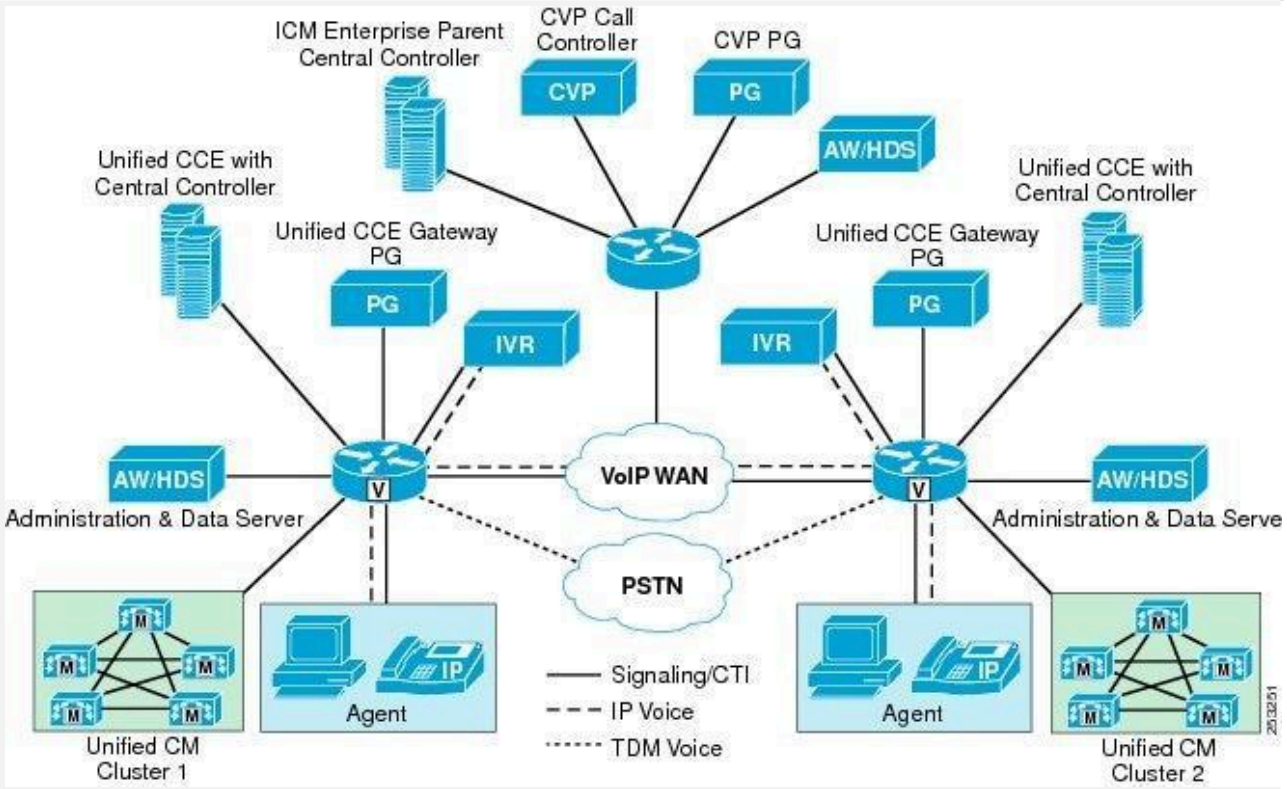
Document type: User Manual

Technical Document 2



Document type: Technical Specification

Technical Document 3



Document type: System Architecture document

Optional Extension Task:

Choose one of the documents from task 7b and identify at least TWO features that are present: **System Architecture document**

Technical Document:	Feature 1: Architecture diagrams Feature 2: Data flow diagrams

Using Technical Documentation

Task 8a:

Considering the **SIX** key uses of technical documentation as well as what was learned during tasks 6 & 7, examine the excerpts from documentation below and identify the key uses of each one. The key uses covered are:

- **Navigating Documents:** Understanding the structure and sections of technical documents to quickly find relevant information.
- **Interpreting Technical Language:** Familiarity with technical terminology and symbols used in documentation.
- **Following Instructions:** Step-by-step adherence to procedures outlined in documentation to ensure accuracy and consistency.
- **Referencing Specifications:** Using technical specifications to verify requirements and constraints during development and troubleshooting.
- **Troubleshooting:** Utilising troubleshooting guides to diagnose and resolve issues efficiently.
- **Compliance and Standards:** Ensuring all activities adhere to documented standards and regulatory requirements.

Excerpt of Release Notes

Hue Bridge

Discover the latest improvements and updates to the Hue Bridge. With each update, we publish release notes so that you can stay up to date on the improvements we make.

Want to make sure you get the updates immediately? Enable automatic updates for your Philips Hue system in the Hue app (**Settings > Software update > Automatic update**).

Bridge V2 is the square-shaped Hue Bridge.

All release notes as of April 30, 2020, refer to the Hue Bridge V2.

June 20, 2024
Software version: 1965053020

- Improved performance and reliability of the system.

June 10, 2024
Software version: 1965017030

- Added support for device groups.
- Resolved an issue where, if the Bridge couldn't retrieve the time, it would send multiple DNS requests.
- Improved performance and reliability of the system.

May 23, 2024
Software version: 1964117020

- Improved performance and reliability of the system.

April 25, 2024
Software version: 1964061010

- Resolved an issue where, in rare cases, specific non-Hue lights would fail to connect to the Bridge

Key use(s):Compliance and Standards: Ensuring all activities adhere to documented standards and regulatory requirements.

- **Navigating Documents:** Understanding the structure and sections of technical documents to quickly find relevant information.

Excerpt of Technical Specification

Connectivity	
Audio output	- Optical x 1 - Co-axial x 1 - 3.5 mm jack x 1
Connections	- HDMI 2.0a x 3 - USB 2.0 x 2
WiFi	Yes
Ethernet	Yes
DLNA certified	Yes
Screen	
Screen technology	LED directlit
Resolution	4K Ultra HD 3840 x 2160p
Screen size	43"
HDR	- HDR10+ - HDR10 - Hybrid Log Gamma (HLG)
Picture enhancement	4K upscaling
Noise reduction	Yes
Processing rate	60 Hz

Key use(s):Interpreting Technical Language: Familiarity with technical terminology and symbols used in documentation.

- **Navigating Documents:** Understanding the structure and sections of technical documents to quickly find relevant information.

Excerpt of User Manual

22. Troubleshooting

22.1. Tips

If you can't find a solution for your TV problem in **Troubleshooting**, you can use — **Keywords** in **Help** > **User manual** to find the information you are looking for. Select a keyword to go the most relevant page in the User manual.

If the User manual doesn't answer your question, you can go to the support website of Philips.

To solve any Philips TV related problem, you can consult our online support. You can select your language and enter your product model number.

Go to www.philips.com/TVsupport.

On the support site you can find your country's telephone number to contact us as well as answers to frequently asked questions (FAQs). In some countries, you can chat with one of our collaborators and ask your question directly or send a question by email.
You can download new TV software or the manual to read on your computer.

TV Help on your tablet, smartphone or computer

To carry out extended sequences of instructions more easily, you can download the TV Help in PDF format to read on your smartphone, tablet or computer. Alternatively, you can print the relevant Help page from your computer.
To download the Help (user manual) go to www.philips.com/TVsupport

22.2. Switch On

The TV does not switch on
- Disconnect the power cable from the power outlet. Wait for one minute then reconnect it. Make sure that the power cable is securely connected. Try switching on again.
- Connect the TV to another wall mains socket and try switching on.
- Disconnect all connected devices from the TV and try switching on.
- If the standby light on TV is on, the TV might not respond to the remote control.

Creaking sound at startup or switch off

When you are turning the TV on or standby, you hear a creaking sound from the TV chassis. The creaking sound is due to the normal expansion and contraction of the TV as it cools and warms up. This does not affect performance.

The TV goes back to standby after showing the Philips startup screen

When the TV is in standby, a Philips startup screen is displayed, then the TV returns to standby mode. This is normal behaviour. When the TV is disconnected and reconnected to the power supply, the startup screen is displayed at the next startup. To switch on the TV from standby, press ⏻ (Standby / On) the remote control or the TV.

The standby light keeps on blinking

Disconnect the power cable from the power outlet. Wait 5 minutes before you reconnect the power cable. If the blinking reoccurs, contact Philips TV Consumer Care.
In **Help** > **User manual**, press the colour key — **Keywords** and look up **Contact Info**.

TV switches off by itself

If the TV switches off suddenly, the setting **Switch off timer** might be switched on. With **Switch off timer** the TV switches off after 4 hours if no remote control signals were received. To avoid this automatic switch off, you can deactivate this switch off. In **Help** > **User manual**, press the colour key — **Keywords** and look up **Switch Off Timer**.
Also, if the TV does not receive a TV signal nor a remote control command for 10 minutes, the TV switches off automatically.

22.3. Remote Control

TV does not respond to the remote control
- The TV requires some time to start up. During this time, the TV does not respond to the remote control or TV controls. This is normal behaviour.
- The batteries of the remote control might be empty. Replace the batteries with new ones.

22.4. Channels

No digital channels found during the installation
- Check if the TV was connected with an antenna or is using a provider signal. Check the cable connections.
- Check if the country where you install the TV, has digital channels available.
- Check if you selected the correct DVB (Digital Video Broadcast) system. Select DVB-T (terrestrial) when you

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Key use(s):

- **Troubleshooting:** Utilising troubleshooting guides to diagnose and resolve issues efficiently.

Referencing Specifications: Using technical specifications to verify requirements and constraints during development and troubleshooting.

Task 8b:

From the document provided by your trainer, identify the following information:

Philips Hue Bridge Release Notes	***September 14th 2023 release*** Software Version: 1960062030 Update 1: The Philips Hue Bridge has been updated to support Matter, meaning that your Philips Hue lights and devices automatically support Matter, too. Update 2: Improved performance and reliability of the system
	April 25th 2024 release Software Version: 1964061010 Update 1: Resolved an issue where, in rare cases, specific non-Hue lights would fail to connect to the Bridge. Update 2: Updated time zones and Daylight Saving Time settings Update 3: Improved performance and reliability of the system
	Describe how you would enable automatic updates: In the Hue app Settings > Software update > Automatic update

Philips 8079 Series Smart TV User Manual	***Automatic Software Update:*** Page: 53 Section number: 19.3 How to enable: Home > Settings > Update software > Automatic Software Update
	Troubleshooting: Section number: 22 How many sub-sections: 11

	Wi-Fi & Internet sub-section number: 22.10
	Copyrights: 25 Number of copyrights: 6 Named Copyright that has a dedicated link for further information: DTS:X Name sub-section 25.6: Other Trademarks

Optional Extension Task:

For each of the elements you identified in task 8b, state the main purpose from the list of purposes you covered in Task 6a, the purposes being:

- Communication
- Maintenance & Support
- Compliance
- Instruction
- Knowledge Transfer

Task 8b Element	Purpose
Software release updates	• Maintenance & Support
Enabling automatic updates on Hue Bridge	• Instruction
Enabling automatic updates on Smart TV	• Instruction
Troubleshooting Wi-Fi & Internet connectivity	• Maintenance & Support
Copyright information	• Compliance

Creating Technical Documentation

Task 9:

Create a technical specification document for a smart device of your choice, as described by your trainer, remember to include at least FOUR of the SIX key features of a technical specification document:

- System requirements
- Functional specification
- Performance requirements

- Interface specifications
- Security requirements
- Compliance

Technical Specification

Smart Sleep Halo - AI - Sleep Optimization Headband

1. System requirements

Power Source:

- Rechargeable lithium-ion battery (lasts 5 nights per charge)
- Wireless charging dock (USB- C)

Device Compatibility:

- iOS 14.0 or higher
- Android 10 or higher
- Windows/macOS via Bluetooth desktop interface

Wireless Connectivity:

- Bluetooth 5.3
- Wif-Fi 6 for cloud sync and updates

Cloud Sync:

- Requires SmartSleep Cloud account
- 200 MB of free cloud storage included for sleep data backups

2. Functional Specification

Sleep Monitoring:

- Tracks EEG brainwave activity, heart rate, body temperature, and motion
- AI - generated sleep stage breakdown (light, deep, REM)
- Adaptive sleep coaching based on user trends

Sleep Enhancement Features:

- Delivers low-frequency auditory pulses to encourage deep sleep
- Real-time noise cancellation during REM phase
- Smart wake function based on sleep stage and schedule

Customisable Settings via App:

- Sleep goals, preferred wake-up range, ambient sound selection
- Manual override of wake times and vibration intensity

3. Performance Requirements

Latency:

- EEG signal processing delay < 100 ms

Battery Life:

- Minimum 40 hours of continuous use

Data Accuracy:

- > 92% accuracy for sleep stage classification

Durability:

- Washable outer band (removable sensors)
- Operational temperature: 0°C to 45°C

4. Interface Specifications

Device display:

- Minimal LED indicators (Battery status, Sleep mode, Sync status)

Mobile App Interface:

- Interactive sleep dashboard
- Weekly trend analysis and coaching reports
- Integration with Apple Health and Google Fit

Voice Assistant Integration:

- “Sleep Status” and “Start Sleep” voice commands with Alexa and Google Assistant

5. Security Requirements

Data Protection:

- All personal data is encrypted using AES-256 encryption
- Biometric app access (Face ID/Fingerprint)

Connectivity Security:

- TLS 1.3 encryption for cloud communication
- Enforced 2-factor authentication for SmartSleep account access

Local Storage:

- Sleep data is stored locally on the device for 7 days before automatic sync

Task 10:

Create a user manual based on your technical specification, remember to include FOUR of the FIVE key features of a user manual:

- Introduction
- Setup instructions
- Usage instructions
- Troubleshooting
- Safety Information

Technical Specification

1. Introduction

Congratulations on your purchase of the **SmartSleep Halo** – the next-generation wearable designed to enhance your sleep quality using advanced AI and neuroscience.

The SmartSleep Halo monitors brainwave activity, adjusts sleep environments in real-time, and uses gentle audio pulses to deepen and regulate your sleep cycles. Whether you're battling insomnia or simply seeking better rest, Halo is designed to guide you into smarter, more restorative sleep.

2. Setup Instructions

What's in the Box:

- 1 × SmartSleep Halo Headband
- 1 × Wireless Charging Base
- 1 × USB-C Cable
- 1 × Quick Start Guide
- 1 × Carry Pouch

Step-by-Step Setup:

1. **Charge the Device**

- Place the Halo on the wireless charging base.

- Ensure the LED turns green once fully charged (approx. 2 hours).

2. **Download the App**

- Search **"SmartSleep Halo"** in the App Store (iOS) or Google Play (Android).

- Install and launch the app.

3. **Create or Log In to Your Account**

- Sign in or create a free SmartSleep Cloud account.

4. **Pair the Device**

- Enable Bluetooth and Wi-Fi on your phone.

- Follow the on-screen instructions to pair your Halo.

5. **Fit the Headband**

- Adjust for a snug but comfortable fit around your forehead.

- Ensure sensors align above your eyebrows.

3. Usage Instructions

Using SmartSleep Halo Nightly:

1. **Put on the headband** before bed. The sensors will automatically begin monitoring when you lie down.

2. **Open the app** and start your sleep session manually, or set it to auto-start at a specific time.

3. **Enable optional features:**

- **Sound Therapy:** Choose calming sounds or brainwave-synced pulses.

- **Smart Wake:** Set a wake window; the Halo will gently wake you during light sleep.

Viewing Your Sleep Report:

After waking, open the app to view:

- Total sleep time
- Time in each sleep stage
- Sleep efficiency score
- Personalised suggestions

4. Troubleshooting

Issue	Possible Cause	Solution
Headband not charging	Improper alignment on charger	Reposition the band; ensure LED indicator lights up
App not pairing	Bluetooh off or device too far	Enable Bluetooth, move closer to your phone
No sleep data recorded	Headband not worn properly	Check strap and sensor placement
Smart Wake didn’t activate	Not in light sleep during window	Expand wake window range in app settings
No sound playing	Volume off or Bluetooth conflict	Adjust app volume, check sound settings, disconnect other devices

5. Safety Information

Please read these safety guidelines carefully before use:

Medical Disclaimer:

This product is not intended to diagnose, treat, cure, or prevent any disease. Consult your physician before use if you have any neurological or sleep-related conditions.

Battery Safety:

Do not expose the device to extreme heat or open flames. Only use the included charger.

Keep out of reach of children.

Usage Limits:

Do not use the device continuously for more than 12 hours.

Remove the headband if discomfort, irritation, or headaches occur.

Water Resistance:

The device is not waterproof. Do not submerge. Clean with a dry or lightly damp cloth.

Disposal:

Dispose of the SmartSleep Halo and its battery in accordance with local electronic waste regulations.

Course Notes:

It is recommended to take notes from the course, use the space below to do so:

I forgot to mention that I had repaired my son's Xbox console by replacing the hard drive using YouTube tutorials and a technical document. Anyway, I've fixed many other things around the house.

My late father's motto was: 'Every problem has a solution. You just have to experiment enough to find it.'

Additional Information

We have included a range of additional links to further resources and information that you may find useful.

Session Name

- Link
- Link

END OF WORKBOOK

Please check through your work thoroughly before submitting and update the table of contents.