System Performance Specification

for the

KNEAD Example System

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DOCUMENT CHANGE HISTORY

The following table is a simple list of released revisions sent for review. Records of reviews and the review artifacts are saved with reviewer information in the The Balance Projectartifact repository.

Change Record

Date	Version	Author(s)	Change Reference
21 Feb 2024	P1	Lewis Collier	Preliminary DRAFT version

Each subsequent "section" outlines changes in each release.

Items in this version that are marked with change bars have been modified from the most recent previous version (e.g. P3 changes from P2) or are new as of the current revision.

Draft P1 Preliminary version of this document.

1. Change 1
2. Change 2
3. ...
4. Change N

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CHAPTER 1

Scope

ALL-1.0 :: If applicable, each section has a summary of data item description (DID) information shown in this font. These are displayed in small capital font and are not part of the formal document. Display of these DID information notes can be turned off for formal releases, but are displayed here for reference.

This document provides the System Performance Specification (**SPS**) for the Balance System. The system will be referred to as the Balance System.

1.1 Identification

ALL-1.1 :: This paragraph shall contain a full identification of the system to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

The Balance System described in this document shall be known as Balance System version 1. However, the System Performance Specification **SPS** described herein shall be applicable to pre-releases such as Beta-releases for a phased release as listed for each requirement. The major system interfaces and capabilities are fully specified in Chapter 3.

1.2 System Overview

ALL-1.2 :: This paragraph shall briefly state the purpose of the system to which this document applies. It shall describe the general nature of the system; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

The Balance System is a game that users an play a game.

Figure 1 shows the high-level architecture for the Balance System system. This diagram shows the major external interfaces that provide the capabilities of Balance System.

This system would be a game where the user would have to balance a ball on a LCD screen that is builtin on the STM32 board. The objective of the game is to balance the ball on the screen based on the way the board was tilted. Balance System would keep track of the current position of the ball and where the next updated move is. This helps keep track of the system of where the ball is until a movement has occurred. Balance System shall process at a maximum 180 Hz. This would give the user enough time to process the current angle of the ball and be able to present on the LCD-TFT screen.

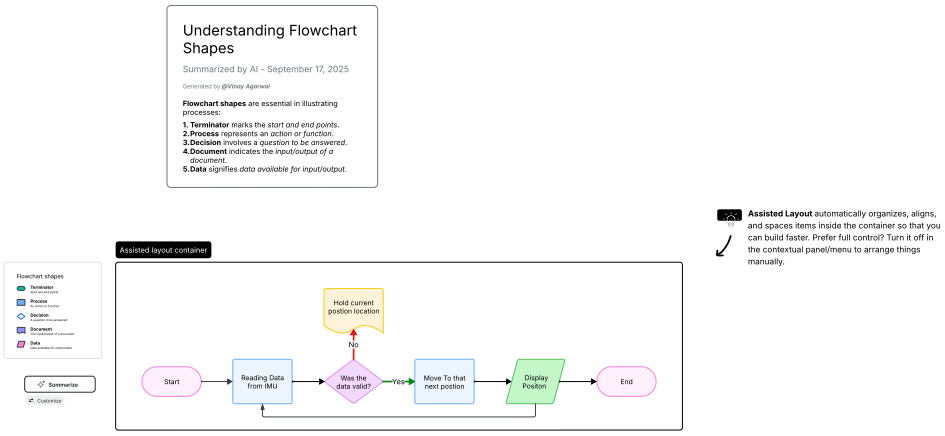

Figure 1: System Overview

1.3 Document Overview

ALL-1.3 :: This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

This section provides information about this document's security/privacy considerations, contents, structure, and version information. This section also provides information regarding how specifications are formatted in this artifact and how they can best be understood.

Because this is the overall system performance specification, this document may provide traceability to miscellaneous project documents. This allows for tracking of related doctrine, vendor, and draft specification requirements as the document is being created.

CHAPTER 2

References

This section provides a list of referenced items for this document.

2.1 Acronyms and Abbreviations

This section defines acronyms and abbreviations used in this and related documents.

Table 1: Acronym Definitions

Acronym	Definition
ABIS	Automated Biometric Identification System
SPSs	System Performance Specifications
STS	System Test Specification
End of acronym definition table	

2.2 Glossary and Definitions

This section defines glossary terms used in this and related documents.

Table 2: Glossary Terms and Definitions

Glossary Term	Definition
STM32F429I	Micro-controller board has all component fit onto one board.
Customer	The professor that is view the grading all assignments.
End of glossary terms table	

2.3 Referenced Documents

This section lists the referenced documents for this document. The references are categorized into two categories:

External Documents not directly associated with this project.

Project Documents that are directly associated with this project.

2.3.1 External Documents

2.3.2 Project Specific Documents

CHAPTER 3

Requirements

3.1 States and Modes

3.1.1 States

A summary of the states is provided in Table 3. See the formal specifications, if applicable, in the following sections for formal statement of the state requirements, and accompanying notes that provide further clarification on the meanings of the states.

STATES	
State Name	**Summary**
State 1	Board bringup
State 2	Information screen
State 3	Screen update
State 4	Level complete
State 5	Tilting system

Table 3: Summary of States for Balance System

Specification 3.1.1.1 State One	
Text	Board bringup
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The State-1 state generalizes the case where the system is **...TBD...**.

Specification 3.1.1.2 State Two	
Text	Information screen
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The State-2 state generalizes the case where the system is **...TBD...**.

Specification 3.1.1.3 State Three	
Text	Screen update
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The State-3 state generalizes the case where the system is **...TBD...**.

Specification 3.1.1.3 State Three	
Text	Level complete
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The State-3 state generalizes the case where the system is **...TBD...**.

Specification 3.1.1.3 State Three	
Text	Tilting system
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The State-3 state generalizes the case where the system is **...TBD...**.

3.1.2 Sub-States

A summary of the sub-states is provided in Table 4. This table also provides a list of the states in which each sub-state is valid. See the formal specifications, if applicable, in the following sections for formal statement of the sub-state requirements, and accompanying notes that provide further clarification on the meanings of the states.

SUB-STATES		
Sub-State Name	**Summary**	**Valid States**
Sub State A	summary	State 1
Sub State B	summary	State 2
Sub State C	summary	State 3

Table 4: Summary of Sub-States for Balance System

Specification 3.1.2.1 SubState A	
Text	The system shall provide the SubState-A substate.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubState-A substate generalizes the case where the system is **...TBD...**.

Specification 3.1.2.2 SubState B	
Text	The system shall provide the SubState-B substate.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubState-B substate generalizes the case where the system is **...TBD...**.

Specification 3.1.2.3 SubState C	
Text	The system shall provide the SubState-C substate.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubState-C substate generalizes the case where the system is **...TBD...**.

3.1.3 Modes

A summary of the modes is provided in Table 5. This table also provides a list of the sub-states in which each mode is valid. See the formal specifications, if applicable, in the following sections for formal statement of the mode requirements, and accompanying notes that provide further clarification on the meanings of the states.

MODES		
Name	**Summary**	**Valid Sub-States**
Mode 1	Mode 1 summary	Sub-State A
Mode 2	Mode 2 summary	Sub-State B
Mode 3	Mode 3 summary	Sub-State C

Table 5: Summary of Modes for Balance System

Specification 3.1.3.1 Mode One	
Text	The system shall provide the Mode-1 mode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The Mode-1 mode generalizes the case where the system is ...TBD....

Specification 3.1.3.2 Mode Two	
Text	The system shall provide the Mode-2 mode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The Mode-2 mode generalizes the case where the system is ...TBD....

Specification 3.1.3.3 Mode Three	
Text	The system shall provide the Mode-3 mode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The Mode-3 mode generalizes the case where the system is ...TBD....

3.1.4 Sub-Modes

A summary of the sub-modes is provided in Table 6. This table also provides a list of the mode in which each sub-mode is valid. See the formal specifications, if applicable, in the following sections for formal statement of the sub-mode requirements, and accompanying notes that provide further clarification on the meanings of the states.

SUB-MODES		
Name	**Summary**	**Valid Sub-States**
Sub-Mode A	Sub-Mode A summary	Mode 1
Sub-Mode B	Sub-Mode B summary	Mode 2
Sub-Mode C	Sub-Mode C summary	Mode 3

Table 6: Summary of Sub-Modes for Balance System

Specification 3.1.4.1 SubMode A	
Text	The system shall provide the SubMode-A submode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubMode-A submode generalizes the case where the system is ...TBD....

Specification 3.1.4.2 SubMode B	
Text	The system shall provide the SubMode-B submode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubMode-B submode generalizes the case where the system is ...TBD....

Specification 3.1.4.3 SubMode C	
Text	The system shall provide the SubMode-C submode.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The SubMode-C submode generalizes the case where the system is ...TBD....

3.2 External Interfaces

SPS/SSS-3.2.0 :: This section lists the external interfaces to the system. This section can be organized simply as inputs and outputs or in another logical grouping. The goal is to introduce ALL of the external interfaces so that their data can be defined before the data is used in the processing section. This section is divided as needed to specify the requirements, if any, for the system's external interfaces. This section may reference one or more Interface Requirements Specification (IRS) or other documents containing these requirements.

The external interfaces for this system are shown in Figure 2. The requirements for these interfaces are described in more detail in the following sections.

User The operator(s) that control the Balance System, § 3.2.1

Network The network(s) that connect to the Balance System, § 3.2.2

Power The network(s) that connect to the Balance System, § 3.2.2

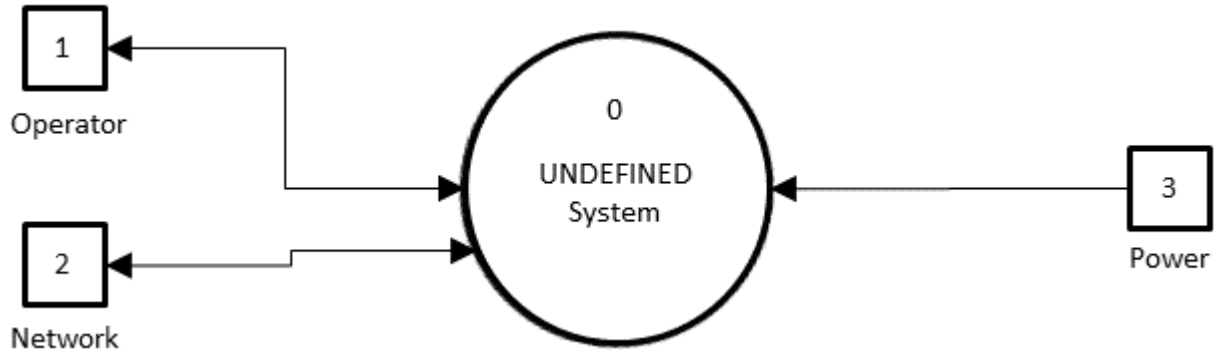

Figure 2: System Context Diagram (DFD-C)

3.2.1 Operator Interfaces

Specification 3.2.1.1 Operator	
(KPP) Text	All Balance System variants shall be capable of connecting to an Operator.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. N/A

3.2.2 Network Interfaces

Specification 3.2.2.1 Approved Network	
(KPP) Text	All Balance System variants shall be capable of connecting to an approved network.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. N/A

3.2.3 Power Interfaces

Specification 3.2.3.1 Power	
(KPP) Text	All Balance System variants shall be capable of connecting to **...TBD...** Power.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. N/A

3.3 Capabilities

SPS/SSS-3.3.0 :: This section shall be divided into subsections to document and describe the requirements of each capability of the system. A "capability" is defined as a group of related requirements. The word "capability" may be replaced with "function", "subject", "object", or other term useful for presenting the requirements.

This section defines the capability areas for the Balance System. The segment design is structured to meet the requirements as specified in the **...TBD...** artifacts. Each area provides a subset of the overall capabilities for the Balance System segments. These segments are shown in Figure 3, are summarized below, and are more fully specified in the following subsections.

The capability requirements for these segments are described in more detail in the following sections:

Operator Processing handles the **HMI** interface to the operator and provides overall control and configuration to the Balance System, § 3.3.1.

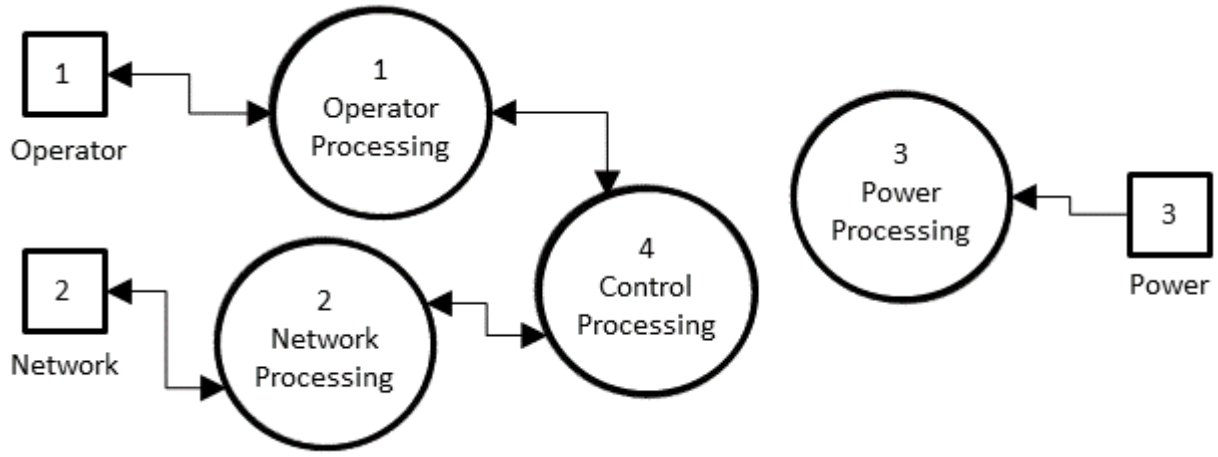

Figure 3: System Top-Level Diagram (DFD-0)

Network Processing handles the network interface, § 3.3.2.

Power Processing handles the power input and conversions as necessary, § 3.3.3.

Control Processing handles all major capability control, § 3.3.4.

3.3.1 Operator Processing

The operator requirements for Balance System are listed below.

Specification 3.3.1.1 Power	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** operator inputs.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files, e.g., OperatorInputs.tex and OperatorOutputs.tex, as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

Specification 3.3.1.2 Power	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** operator outputs.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files, e.g., OperatorInputs.tex and OperatorOutputs.tex, as needed. Just use the RequirementNumberAM command to keep numbers correct if subsubsections are added.

3.3.2 Network Processing

The network requirements for Balance System are listed below.

Specification 3.3.2.1 Network Types	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** network types.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders, e.g., NetworkTypes.tex, NetworkInputs.tex, and NetworkOutputs.tex, etc. as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

Specification 3.3.2.2 Network Inputs	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** network inputs.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders, e.g., NetworkTypes.tex, NetworkInputs.tex, and NetworkOutputs.tex, etc. as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

Specification 3.3.2.3 Network Outputs	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** network outputs.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders, e.g., NetworkTypes.tex, NetworkInputs.tex, and NetworkOutputs.tex, etc. as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

3.3.3 Power Processing

The power requirements for Balance System are listed below.

Specification 3.3.3.1 Power Voltage	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** power voltage(s).
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

Specification 3.3.3.2 Power Current	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** power current.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders as needed. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

3.3.4 Control Processing

The control requirements for Balance System are listed below.

Specification 3.3.4.1 Control One	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** control one.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders as needed for areas of control capabilities. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

Specification 3.3.4.2 Control Two	
(KPP) Text	All Balance System variants shall be capable of **...TBD...** control two.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Add as many of these as necessary. Split into files/folders as needed for areas of control capabilities. Just use the RequirementNumberAM and RqtNumberBase commands to keep numbers correct if subsubsections are added.

3.4 Internal Interface Requirements

SPS/SSS-3.4.0 :: This section shall specify the requirements, if any, imposed on interfaces internal to the system. If all internal interfaces are left to the design or to requirement specifications for system components, this fact shall be so stated.

This section provides the internal interface requirements. These requirements for these interfaces are described in more detail in the following sections:

Internal Interface Requirement One stuff

Internal Interface Requirement One more stuff

3.5 Internal Data Requirements

SPS/SSS-3.5.0 :: This section shall specify the requirements, if any, imposed on data internal to the system. Included shall be requirements, if any, on

databases and data files to be included in the system. If all decisions about internal data are left to the design or to requirements specifications for system components, this fact shall be so stated.

This section provides the internal data requirements. The Balance System capability is segmented into the following specification groups:

Data Storage provides the data storage requirements, § 3.5.1.

Report Logs provides the report log requirement, § 3.5.2.

3.5.1 Data Storage

Specification 3.5.1.1 Data Storage	
(KSA) Text	All Balance System variants shall store digital files received for transmission using 2 TB of internal storage.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

Specification 3.5.1.2 Information Transport	
(KSA) Text	All Balance System variants shall be able to manually upload and download digital files using external SD card, CD, and DVD formats.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.5.2 Report Logs

Specification 3.5.2.1 Report Logs	
(KSA) Text	The system shall locally store reports for up to 12 months and be capable of exporting in .txt, .csv, and .xml formats.
Status	**Phase 1** T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. Where does this information come from? **...TBD...**.

3.6 Adaptation Requirements

SPS/SSS-3.6.0 :: This section shall specify the requirements, if any, concerning installation-dependent data that the system is required to provide (such as site dependent latitude and longitude or site-dependent state tax codes) and operational parameters that the system is required to use that may vary according to operational needs (such as parameters indicating operation-dependent targeting constants or data recording).

This section is provided for future expansion.

3.7 Safety Requirements

SPS/SSS-3.7.0 :: This section shall specify the system requirements, if any, concerned with preventing or minimizing unintended hazards to personnel, property, and the physical environment. Examples include restricting the use of dangerous materials; classifying explosives for purposes of shipping, handling, and storing; abort/escape provisions from enclosures; gas detection and warning devices; grounding of electrical systems; decontamination; and explosion proofing. This paragraph shall include the system requirements, if any, for nuclear components, including, as applicable, requirements for component design, prevention of inadvertent detonation, and compliance with nuclear safety rules.

This section lists the safety requirements for the system. The Balance System capability is segmented into the following specification groups:

Electromagnetic Radiation describes the safety requirements pertaining to the presence of EMR, § 3.7.1.

3.7.1 Electromagnetic Radiation

Specification 3.7.1.1 EMR Hazards	
Text	Hazards of Electromagnetic Radiation to Ordnance (**HERO**) and Hazards of Electromagnetic Radiation to Fuel (**HERF**) are not applicable to Balance System. There is no Hazard of Electromagnetic Radiation to Personnel (**HERP**) when Balance System is properly installed and operated.
Status	T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

Specification 3.7.1.2 EMR Safety	
Text	We shall identify, evaluate, assess, and mitigate any safety, health, or ergonomic hazards associated with the use, transport, maintenance, storage, and handling of Balance System.
Status	T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.8 Security and Privacy Requirements

SPS/SSS-3.8.0 :: This section shall specify the system requirements, if any, concerned with maintaining security and privacy. The requirements shall include, as applicable, the security/privacy environment in which the system must operate, the type and degree of security or privacy to be provided, the security/privacy risks the system must withstand, required safeguards to reduce those risks, the security/privacy policy that must be met, the security/privacy accountability the system must provide, and the criteria that must be met for security/privacy certification/accreditation.

This section provides the security and privacy requirements for Balance System. The Balance System capability is segmented into the following specification groups:

Security Requirements provides the physical and cyber security requirements of the system, § 3.8.1.

Privacy Requirements provides the privacy requirements of the system, § 3.8.2.

3.8.1 Security Requirements

3.8.1.1 Physical Security

Specification 3.8.1.1.1 Anti-Tamper	
Text	The Balance System shall deter all unauthorized alterations, countermeasure development, and system exploitation.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.8.1.2 Cyber Security

This section is provided for future expansion.

3.8.2 Privacy Requirements

This section is provided for future expansion.

Specification 3.8.1 Privacy	
Text	The system shall **...TBD...**.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. **...TBD...**.

3.9 Environmental Requirements

SPS/SSS-3.9.0 :: This section shall specify the requirements, if any, regarding the environment in which the system must operate. Examples for a software system are the computer hardware and operating system on which the software must run. (Additional requirements concerning computer resources are given in the next paragraph). Examples for a hardware-software system include the environmental conditions that the system must withstand during transportation, storage, and operation, such as conditions in the natural environment (wind, rain, temperature, geographic location), the induced environment (motion, shock, noise, electromagnetic radiation), and environments due to enemy action (explosions, radiation).

This section defines the environmental requirements for Balance System.

3.10 Technology Resource Requirements

SPS/SSS-3.10.0 :: This section shall be divided into the following subsections. Depending upon the nature of the system, the computer resources covered in these subsections may constitute the environment of the system (as for a software system) or components of the system (as for a hardware-software system).

This section provides the overall technology resource requirements for the system. These capabilities are divided into the following sections:

Hardware details about the hardware to be used.

Software details about the software to be used.

Communications details about the communications to be used.

Other details about other technology resource requirements not covered above.

Utilization details about the resource utilization.

3.11 System Quality Requirements

SPS/SSS-3.11.0 :: This section shall specify the requirements, if any, pertaining to system quality factors. Examples include quantitative requirements concerning system functionality (the ability to perform all required functions), reliability (the ability to perform with correct, consistent results – such as mean time between failure for equipment), maintainability (the ability to be easily serviced, repaired, or corrected), availability (the ability to be accessed and operated when needed), flexibility (the ability to be easily adapted to changing requirements), portability of software (the ability to be easily modified for a new environment), reusability (the ability to be used in multiple applications), testability (the ability to be easily and thoroughly tested), usability (the ability to be easily learned and used), and other attributes.

This section specifies the Balance System quality requirements.

3.11.1 Quality Systems

Specification 3.11.1.1 Development Quality	
Text	The system design and development shall follow the implementers' certified processes.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.

3.11.2 Operational Quality

This Section is **...TBD...**.

3.11.3 Quantitative Metrics

This section provides the metrics that can be defined with quantitative measures.

3.11.3.1 Object Detection Metrics

3.11.3.2 Object Identification Metrics

3.11.4 Qualitative Metrics

This section provides the metrics that are defined with qualitative measures.

3.11.4.1 Media Selection Metrics

This Section is **...TBD...**.

3.12 Design and Construction Requirements

SPS/SSS-3.12.0 :: This section shall specify the requirements, if any, that constrain the design and construction of the system. For hardware-software systems, this paragraph shall include the physical requirements imposed on the system. These requirements may be specified by reference to appropriate commercial or military standards and specifications.

This section provides the Balance System design and construction requirements.

3.12.1 Regulatory Restrictions

This section is included for future expansion.

Specification 3.12.1.2 Proprietary Components	
Text	All Balance System variants shall include only software components that are open source or to which the developer has unlimited rights.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The inspection is of the software design documents and build scripts to ensure that all code meets this requirement.

3.12.2 Design Defences

This section provides the construction constraints.

This section is provided for future expansion.

3.12.3 Construction Constraints

This section provides the construction constraints.

This section is provided for future expansion.

3.13 Personnel Requirements

SPS/SSS-3.13.0 :: This section shall specify the system requirements, if any, included to accommodate the number, skill levels, duty cycles, training needs, or other information about the personnel who will use or support the system. Examples include requirements for the number of work stations to be provided and for built-in help and training features. Also included shall be the human factors engineering requirements, if any, imposed on the system. These requirements shall include, as applicable, considerations for the capabilities and limitations of humans, foreseeable human errors under both normal and extreme conditions, and specific areas where the effects of human error would be particularly serious. Examples include requirements for adjustable-height work stations, color and duration of error messages, physical placement of critical indicators or buttons, and use of auditory signals.

This section is provided for future expansion.

3.14 Training Requirements

SPS/SSS-3.14.0 :: This section shall specify the system requirements, if any, pertaining to training. Examples include training devices and training materials to be included in the system.

3.14.1 Manuals

Specification 3.14.1.1 Operator's Guide	
Text	The Balance System training shall provide an operator's manual.
Status	**Phase 1** T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.14.2 Materials

Specification 3.14.2.1 Training Materials	
Text	The Balance System training shall provide all training course materials.
Status	**Phase 1** T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This is a base requriement.
Notes	1. N/A

3.14.3 Courses

Specification 3.14.3.1 Training Courses	
Text	The vendor will provide specific training and course materials and programs of instruction.
Status	**Phase 1** T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.15 Logistics Requirements

SPS/SSS-3.15.0 :: This section shall specify the system requirements, if any, concerned with logistics considerations. These considerations may include: system maintenance, software support, system transportation modes, supply-system requirements, impact on existing facilities, and impact on existing equipment.

3.15.1 Support Constraints

Specification 3.15.1.1 Lithium Battery Shipping Constraints	
Text	The system contains batteries based on Lithium technologies so all shipping shall be done in accordance with regulations related to the shipment of Lithium-chemistry batteries.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**...TBD...** 4.1.2
Notes	1. This specification was added in version Av5 of this document to capture the need to plan for shipping of Lithium-chemistry batteries. 2. Lar's group has shipped these batteries before so their experience should be called upon to minimize risks, such as shipment delays.

3.15.2 Transportability

Specification 3.15.2.1 Transportability	
(KSA) Text	All Balance System variants shall be transportable by air, ground, and maritime resources.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.16 Packaging Requirements

SPS/SSS-3.16.0 :: This section shall specify the requirements, if any, for packaging, labeling, and handling the system and its components for delivery. Applicable military specifications and standards may be referenced if appropriate.

3.16.1 Shipping Constraints

This section is provided for future expansion.

3.17 Other Requirements

SPS/SSS-3.17.0 :: This paragraph shall specify additional system requirements, if any, not covered in the previous paragraphs. Examples include requirements for system documentation, such as specifications, drawings, technical manuals, test plans and procedures, and installation instruction data, if not covered in other contractual documents.

3.17.1 Broadcast Playlist Manager

Specification 3.17.1.1 Playlist Manager	
(KSA) Text	All Balance System variants shall interface with an approved external broadcast playlist manager that will provide the operator the ability to manage programming in real-time.
Status	**Phase 1** T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.17.2 Information Exchange

Specification 3.17.2.1 IP Data	
(KPP) Text	All Balance System variants shall be capable of disseminating data on an approved network with a reasonable response time of less than four (4) hours.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	**N/A** This is a base requirement.
Notes	1. N/A

3.18 Precedence of Requirements

SPS/SSS-3.18.0 :: This section shall specify, if applicable, the order of precedence, criticality, or assigned weights indicating the relative importance of the requirements in this specification. Examples include identifying those requirements deemed critical to safety, to security, or to privacy for purposes of singling them out for special treatment. If all requirements have equal weight, this paragraph shall so state.

3.18.1 Safety

Specification 3.18.1.1 Safety Requirements Precedence	
Text	All Balance System variants shall meet safety requirements listed in Section 3.7 before all other requirements.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Obviously safety is of utmost importance. 2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

3.18.2 Security and Privacy

Specification 3.18.2.1 Security Requirements Precedence	
Text	All Balance System variants shall meet security requirements listed in Section 3.8.1 before all other requirements with the exception of safety.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Security trumps privacy since good security should help ensure privacy. 2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

Specification 3.18.2.2 Privacy Requirements Precedence	
Text	All Balance System variants shall meet privacy requirements listed in Section 3.8.2 before all other requirements with the exception of safety and security.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. Privacy is trumped by security since good security should help ensure privacy. 2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

3.18.3 Other

Specification 3.18.3.1 Other Requirements Precedence	
Text	All Balance System variants shall meet with equal precedence all other requirements not pertaining to safety, security, and privacy.
Status	**Phase 1** Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	**N/A** This requirement is a base requirement.
Notes	1. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

CHAPTER 4

Qualification Provisions

The qualification provisions are listed in the acceptance row of the specifications in Section 3.

CHAPTER 5

Traceability

This section provides a list of the sources, if applicable, for each requirement. This traceability connects the specifications in this document to those presented in higher level sources such as a Joint Urgent Operational Need (**JUON**) document, Joint Emergent Operational Need (**JEON**), or a STATEMENT OF WORK (**SOW**)

The traceability of all specifications from each requirement to its source, if applicable, is listed in the specifications presented in section 3. Traceability from each document to requirements is provided below.

Table 7: Source to Requirement Traceability.

Source Requirement	**Traced Requirement**
N/A :: This requirement is a base requirement.	3.11.1.1
N/A :: This requirement is a base requirement.	3.12.1.2
N/A :: This requirement is a base requirement.	3.18.1.1
N/A :: This requirement is a base requirement.	3.18.2.1
N/A :: This requirement is a base requirement.	3.18.2.2
N/A :: This requirement is a base requirement.	3.18.3.1

APPENDIX A

Notes

This section provides notes, as necessary, to document the system segmentation specification.

APPENDIX B

Key Performance Parameters and System Attributes

This Appendix provides the key performance parameters and key system attributes, summarized in a short list for easy review.

B.1 Key Performance Parameters

Table B.1: Key Performance Parameter Specifications

Specification	Key Performance Parameter
REF_UNDEFINED	The system shall provide the TBD Mode in the states and substates as shown in Table 5.
REF_UNDEFINED	The system shall provide the TBD Mode in the states and substates as shown in Table 5.
REF_UNDEFINED	The system shall provide the TBD Mode in the states and substates as shown in Table 5.

B.2 Key System Attributes

Table B.2: Key System Attribute Specifications

Specification	Key System Attribute
RQT_TBD	The system shall be capable of **...TBD...** capability.
RQT_TBD	The system shall be capable of **...TBD...** capability.
RQT_TBD	The system shall be capable of **...TBD...** capability.

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