Day 1 - Project Initialization & Environment Setup

RTL-SDR Signal Processing & Antenna Systems Project

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Objective

Establish the initial project structure, define scope and major subsystems, set up the computational environment, identify required hardware and materials, and initiate long-lead item procurement.

Activities Performed

1. Project Skeleton Creation
   - Created the master project directory structure to support hardware, software, documentation, and verification artifacts.
   - Established an initial organizational hierarchy to enable incremental system development and documentation.
2. MATLAB Environment Setup
   - Configured the MATLAB environment for signal processing and data analysis
   - Verified availability of required toolboxes for numerical computation and signal analysis.
   - Established a working directory structure for scripts, data, and figures.
3. MATLAB Environment Verification
   - Executed test scripts to confirm MATLAB functionality.
   - Verified numerical operations, plotting, and basic signal processing

functions operate as expected.
- Confirmed the environment is suitable for future DSP development and analysis.

4. Initial Bill of Materials (BOM)
- Created an initial high-level BOM identifying major hardware components and materials.
- Identified required subsystems, including:
  - SDR Receiver
  - Antenna Materials
  - Feedline and connectors
  - Host computing resources
- Noted missing or pending items and long-lead components

5. Documentation Initialization
- Created the initial README file describing project purpose, high-level scope, and planned direction
- Established documentation as a first-class artifact to be maintained alongside technical development.

6. Hardware Procurement
- Selected the RTL-SDR v4 as the primary SDR receiver based on frequency coverage, community support, and suitability for receive-only RF experimentation
- Ordered the RTL-SDR v4 to initiate hardware acquisition, recognizing it as a long-lead dependency for RF validation.

Observations

- Project scope and direction were clarified early, reducing risk of uncontrolled expansion
- MATLAB environment verification confirms readiness for DSP development prior to hardware arrival.
- Hardware procurement initiated early to avoid schedule delays in RF bring-up.

Open Items/Risks Identified

- Antenna feedline and connector details to be finalized.
- Antenna design and validation pending hardware arrival
- Verification and test planning to be formalized in subsequent phases.

Day 1 Exit Criteria

- Project repository structure established
- MATLAB environment confirmed functional
- Initial BOM created
- README drafted
- RTL-SDR v4 ordered

All Day 1 objectives met

End of Day 1 Log