1. Project Context

1.1. STRATHcube

1.2. DVB-S2 Modulation

The Digital Video Broadcasting - Satellite - Second Generation (DVB-S2) standard defines a modulation scheme specifically designed for satellite communications. To improve the efficiency of the system, the modulation constellation and coding rate can be adapted based on channel conditions using Adaptive Coding and Modulation (ACM). Despite what the name may imply, the standard is not limited to video broadcasting and can be used for transmission of any packetised data, the data carried by the system is referred to as a stream. There are three main types of data stream: Transport, Generic Packetised and Generic Continuous. Each of these are defined by their User Packet Length (UPL), being the number of bytes in a packet. Figure 2 shows the full possible system diagram for a DVB-S2 system, while Figure 3 shows the condensed version for a Generic Packetised stream.

A Generic Packetised stream may have a UPL between 1 and 65535 Bytes. Variable UPL, or sizes greater than 65535 Bytes are treated as a Generic Continuous Stream. The data stream is then sliced into Data Fields of size Data Field Length (DFL). After a header is inserted, this comprises a Baseband Frame (BBFRAME).

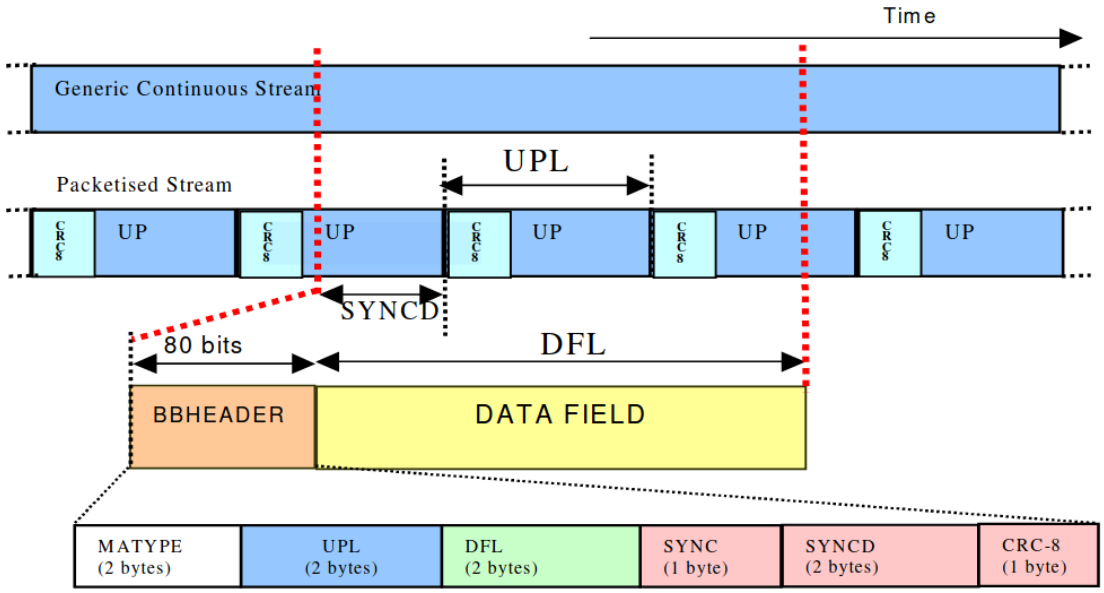

Figure 1: DVB-S2 Slicing Diagram[1]

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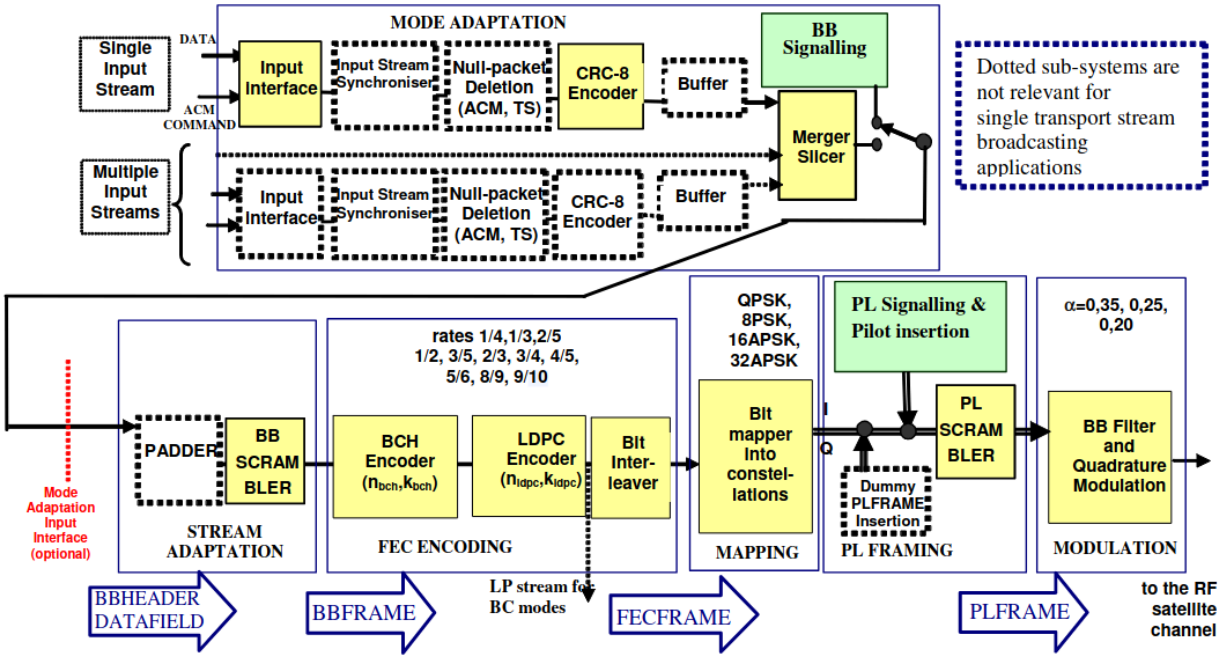


Figure 2: DVB-S2 System Diagram[1]

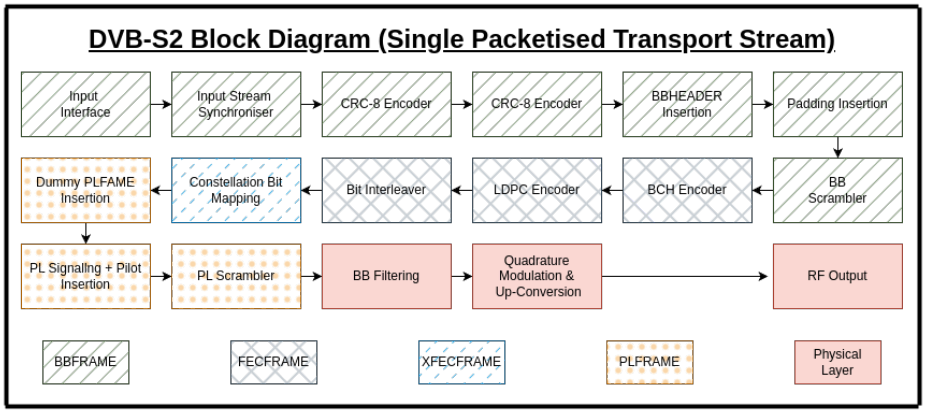


Figure 3: DVB-S2 System Diagram

1.3. Packet Handling

1.3.1. XTCE Standard

1.3.2. System Architecture

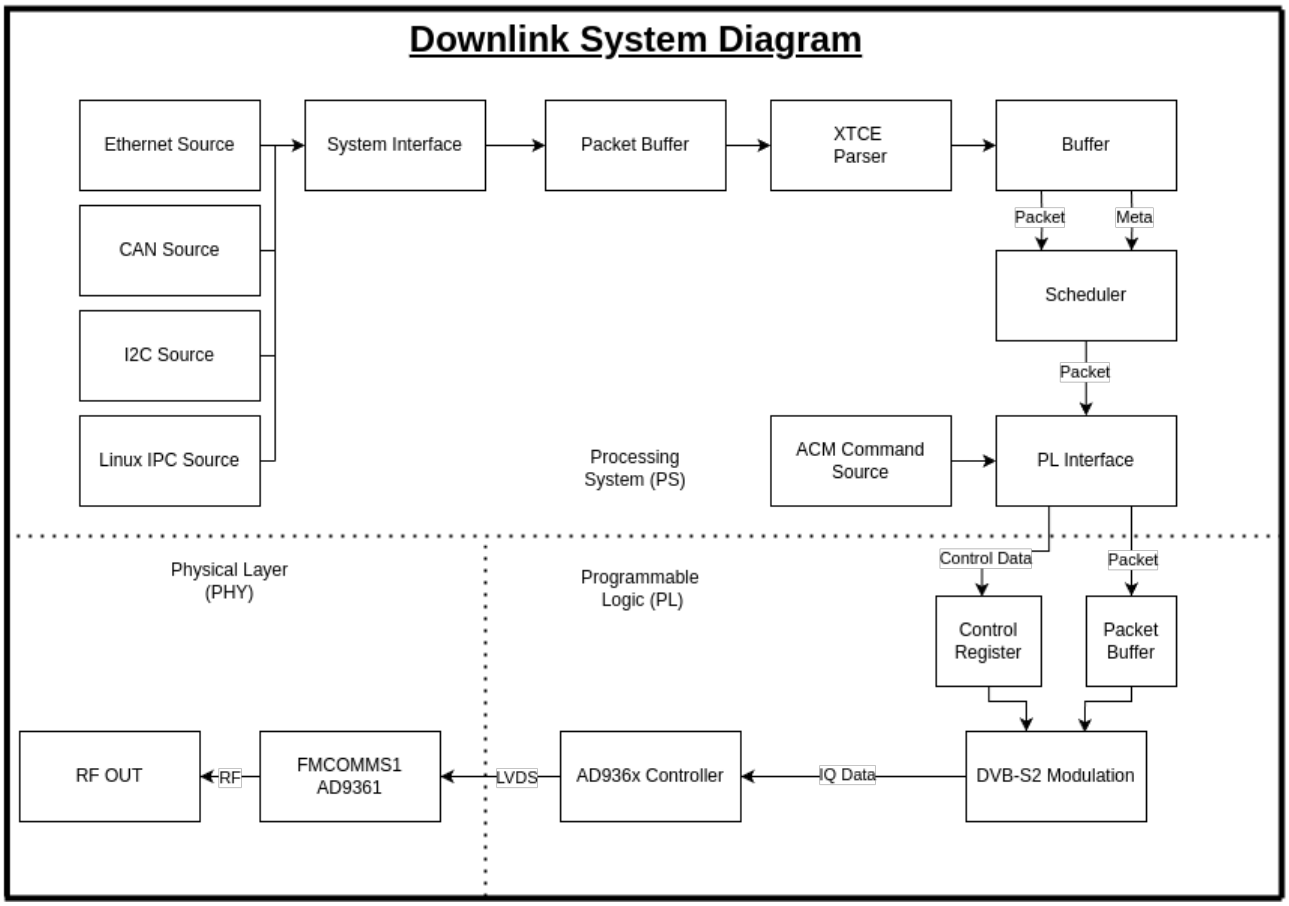
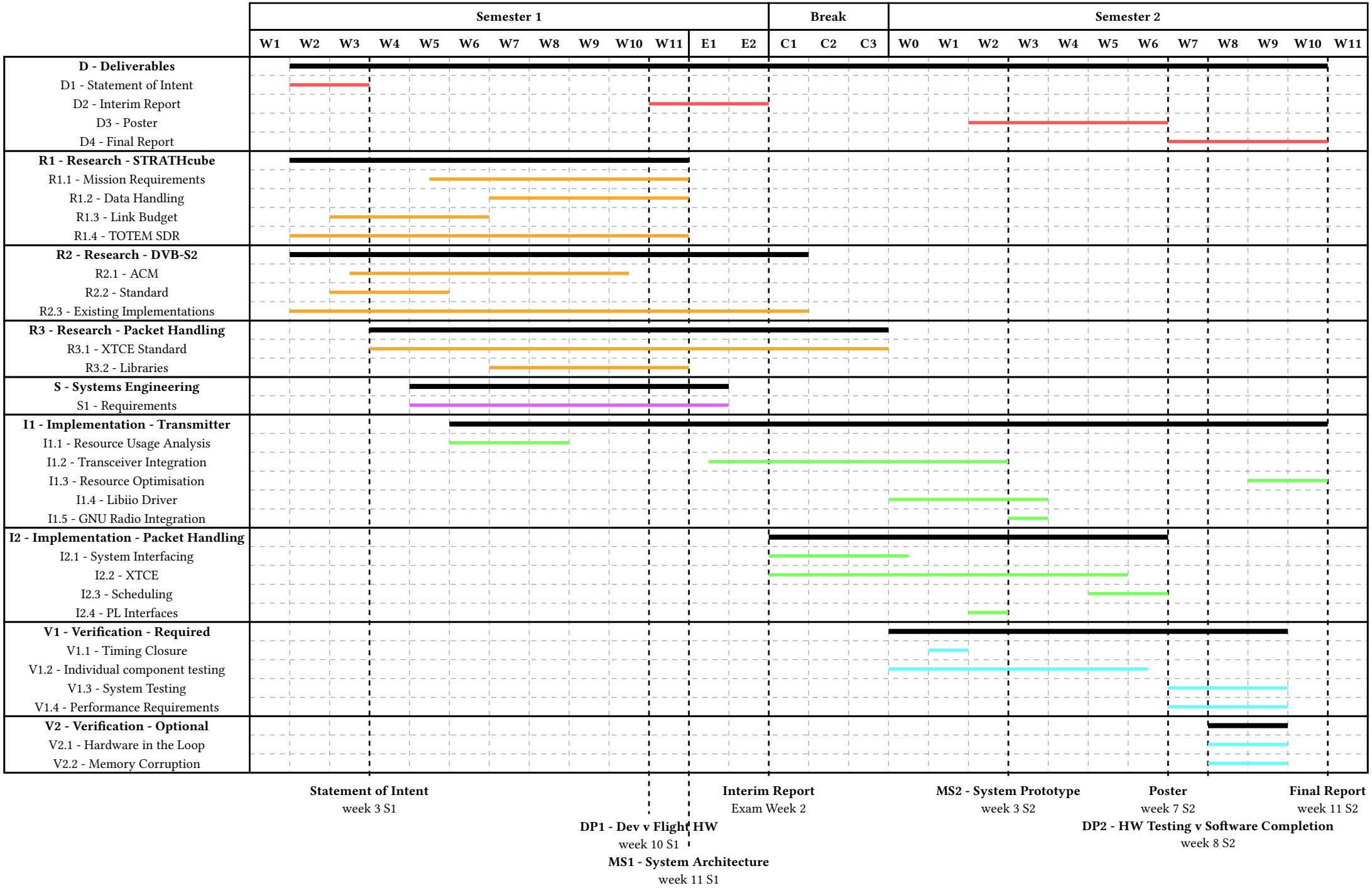


Figure 4: System Diagram

2. Project Timeline



3. EDI

4. References

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[2] “MATLAB DVB-S2 HDL Transmitter.” Accessed: Dec. 03, 2024. [Online]. Available: https://uk.mathworks.com/help/satcom/ug/dvbs2-hdl-transmitter.html

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[5] Gavin Medley, Michael Chambliss, and Greg Lucas, “space_packet_parser.” Accessed: Dec. 03, 2024. [Online]. Available: https://github.com/medley56/space_packet_parser