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This document details the +X panel

+X Panel

Design Document

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# Introduction

This document details the design of the +X panel printed circuit board. It explains how the +X Panel schematic meets all requirements.

## Functions

The +X panel is responsible for the following:

* Bi-directional low gain antenna for communicating with the ground station (with deployment mechanism)
* GPS Patch Antenna
* Photodiode sensor for attitude control (ADCS)

## Requirements

The system requirements can be viewed [here](https://github.com/CougsInSpace/CougSat1-Readme/blob/master/CougSat1-Requirements.pdf).

# Detailed Description

This section references the +X Panel [schematic](https://github.com/CougsInSpace/CougSat1-Hardware/blob/master/CougSat1-RadioBoard/ElectricalDesign/%2BXPanel.sch). Page numbers will be listed and may have coordinates listed (number and letter combination found around the frame).

## Functional Block Diagram

The block diagram can be found on the first page of the schematic.

### Low-Gain Antenna

The low-gain antenna will be deployed via high-power resistors burning through a monofilament. This is referenced in the schematic as the Antenna Deploy Release. Once deployed, the low-gain antenna will be used to transmit/receive data from the ground station. Transmission from this antenna will consist of lower speed data transfers to the ground. Larger transmissions, such as sending images, will be handled by the high-gain antenna on the -Z panel.

### GPS Patch Antenna

The GPS antenna will be used to receive GPS information for the attitude control ([ADCS](https://github.com/CougsInSpace/CougSat1-Hardware/tree/master/CougSat1-AvionicBoard/ElectricalDesign)) subsystem.

### Photodiode Sensor

The +X panel board will contain one photodiode sensor which will be used to send data pertaining to the position of the sun to the ADCS subsystem via I2C.

## Schematic