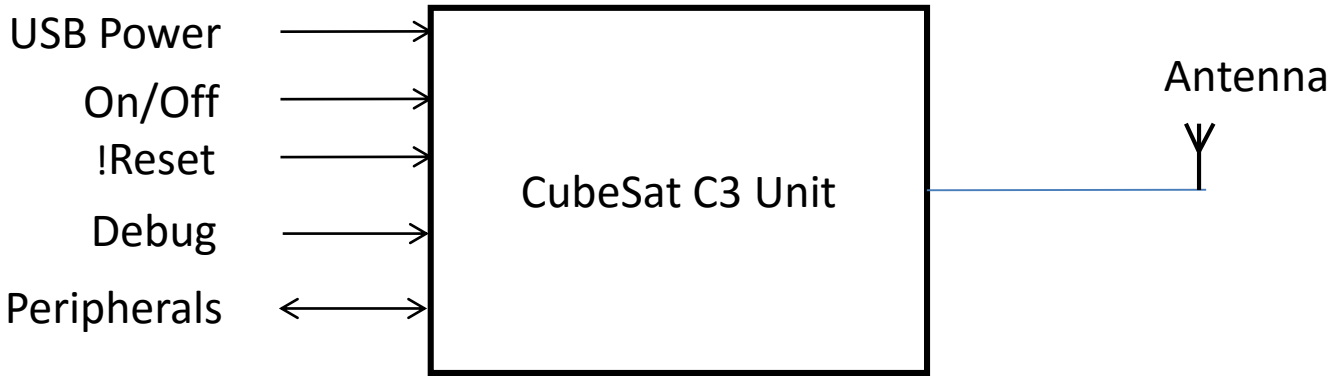
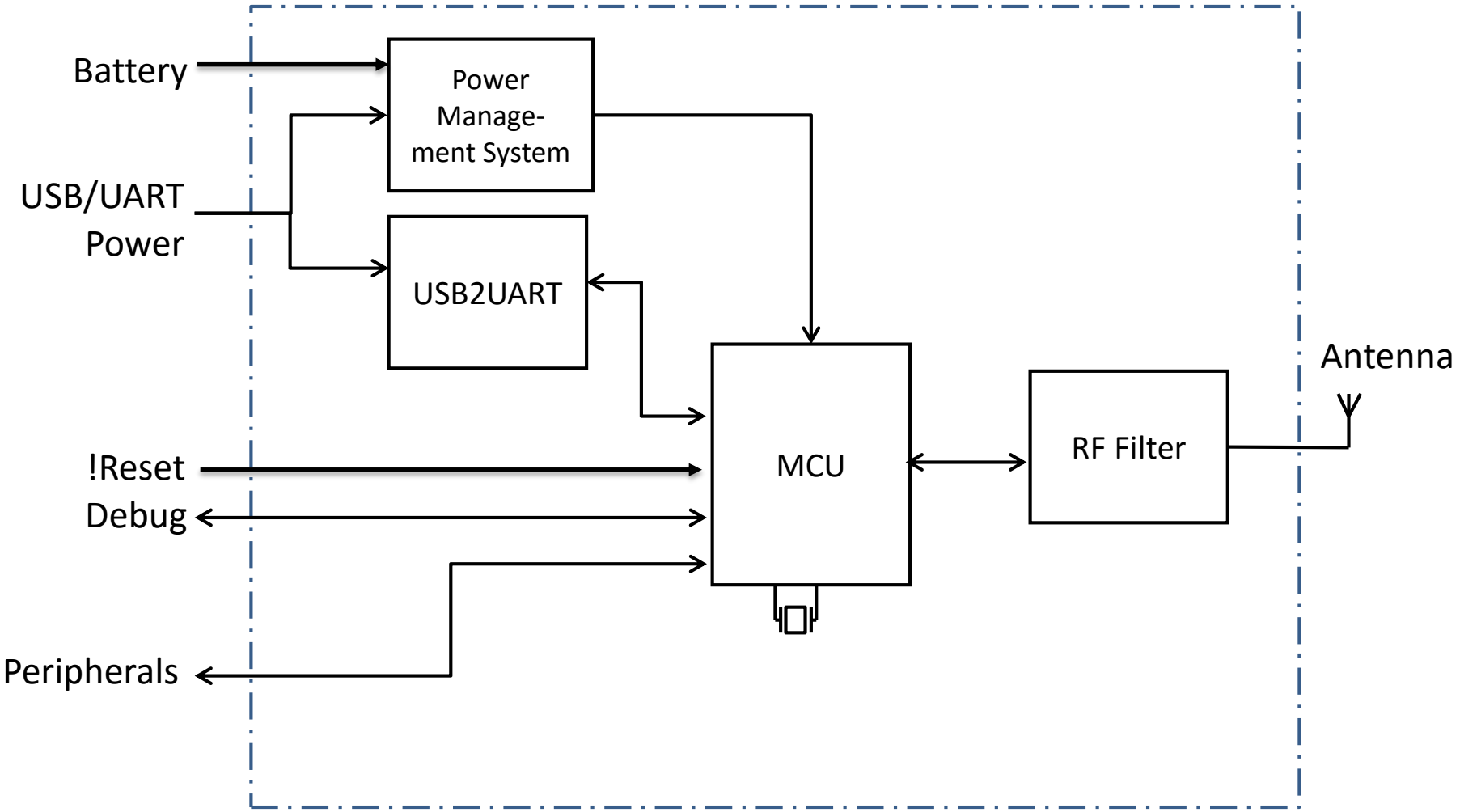
CubeSat C3 Unit Level 0

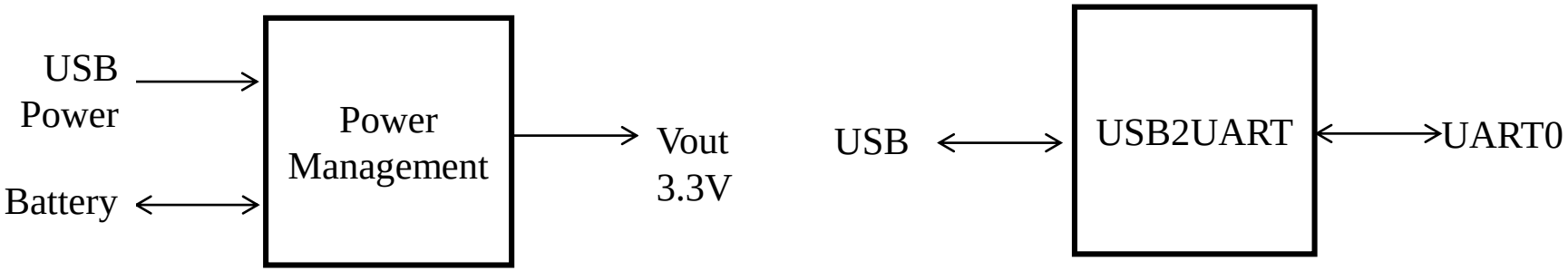


Module	**Power Management**
Input	1) Power: USB or Battery 2) On/Off: Enables and Disables the Voltage Regulator 3) !Reset: Reset Button 4) Debug: Debug with JTAG
Bi-Directional (Input-Output)	1) Antenna: Radio Antenna with 436.5MHz passband 2) Peripherals: At discretion of user, breakout pins
Functionality	This module is a subsystem of a larger satellite CubeSat system. The main function of this subsystem is to receive and transmit high frequency data signal using Wi-Fi protocol. At the heart of this module is a microcontroller that takes commands via USB, GPIO, and JTAG configurations and uses radio frequency to communicate messages from and to another similar module.

CubeSat C3 Unit Level 1



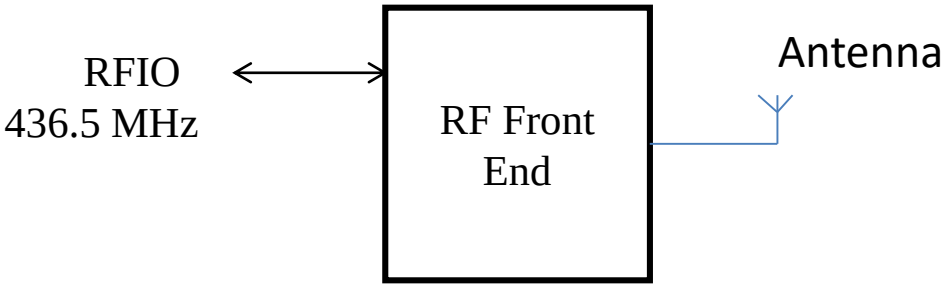
Level 1 Breakdown



Module	**Power Management**
Input	USB Power : 4.5~5.5V DC
Output	Vout: Outputs 3.3 V DC
Bidirectional (Input –Output)	Battery: 3.9V 1000mAH
Functionality	The function of this unit is to manage the power system. It is powered through USB connection. It consists of voltage regulator and a battery pack that stores voltage and outputs constant 3.3V.

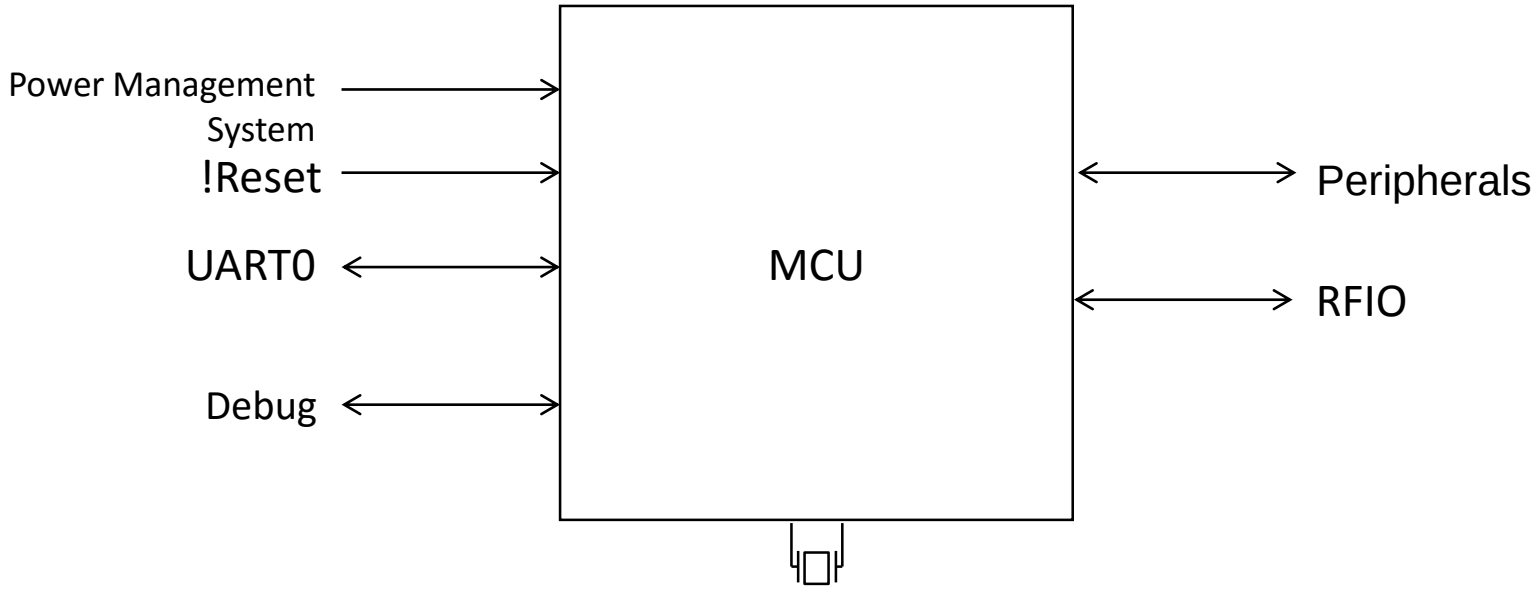
Module	**USB2UART**
Bidirectional (Input –Output)	USB : USB connection (D+ and D- lines) UART0: RX and TX lines to MCU UART0 pin
Functionality	This unit consists of USB-to-UART Bridge controller that converts USB signals to RS-232 and vice-versa.

Level 1 Breakdown



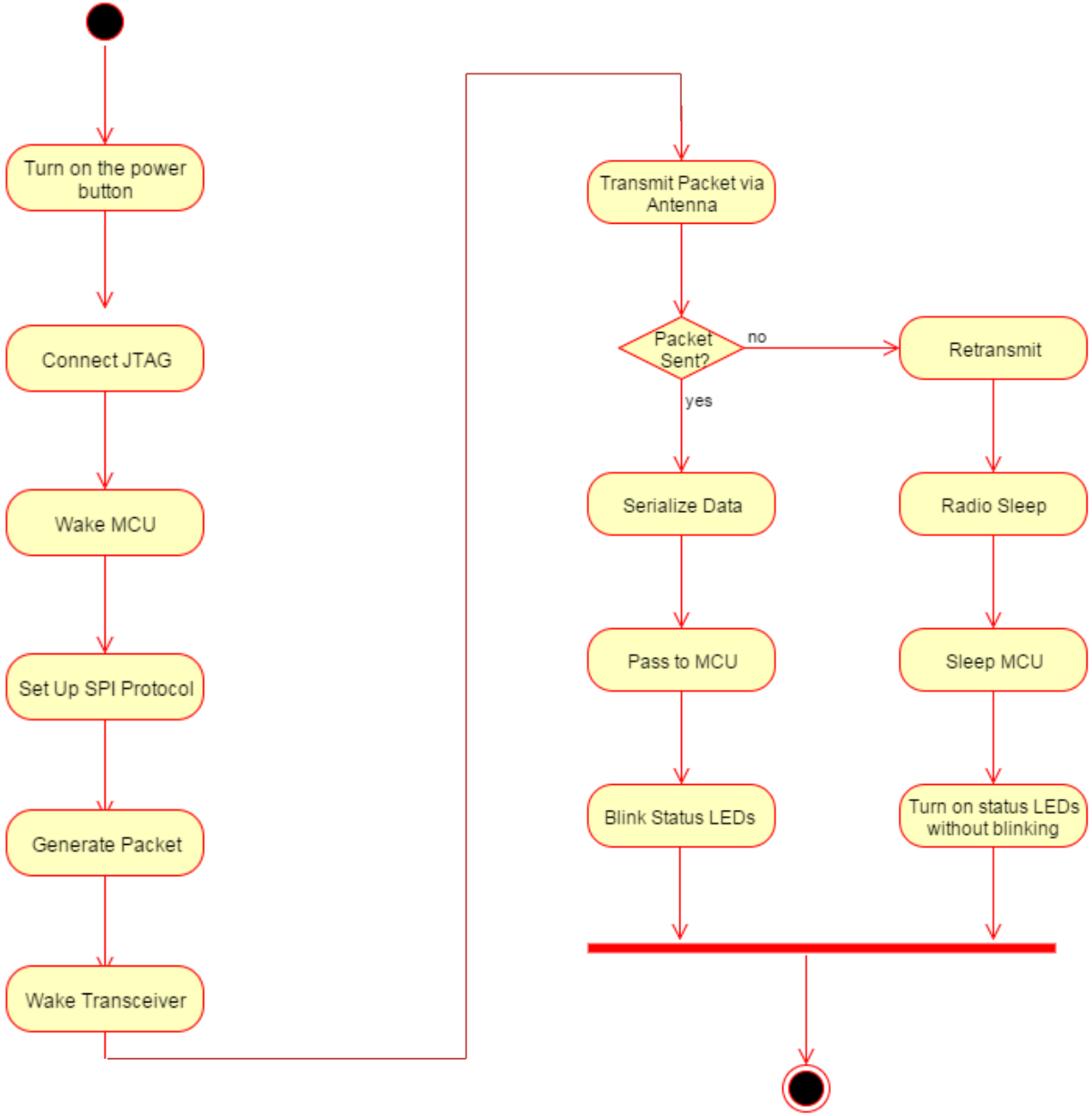
Module	**RF Filter**
Bidirectional (Input –Output) Output	RFIO: 0-13dB power signals at 436.5 MHz Antenna: Signal goes through antenna
Functionality	The main purpose of this module is to receive and transfer radio signals at a passband frequency of 436.5 Hz.

Level 1 Breakdown



Module	**MCU**
Input	1) Power Management System 2) !Reset: Reset button
Bi-directional (Input-Output)	1) Peripherals: Connection to peripherals which are at users discretion 2) Debug: Connection to 10-pin JTAG interface 3) RFIO: Radio input-output channel at 436.5 MHz passband 4) UART0: Rx and Tx lines for UART0 port on MCU
Functionality	This is the main microcontroller unit in the system. It uses a real-time operating system.It has a resonator connected to it that clocks at 32MHz. This unit monitors radio signals, as well as provides multiple interfaces , for eg.GPIO, JTAG, SPI, I2C etc., to transmit and receive data.

UML Activity View of CubeSat C3 Unit



UML Sequence Diagram
View of CubeSat C3 Unit