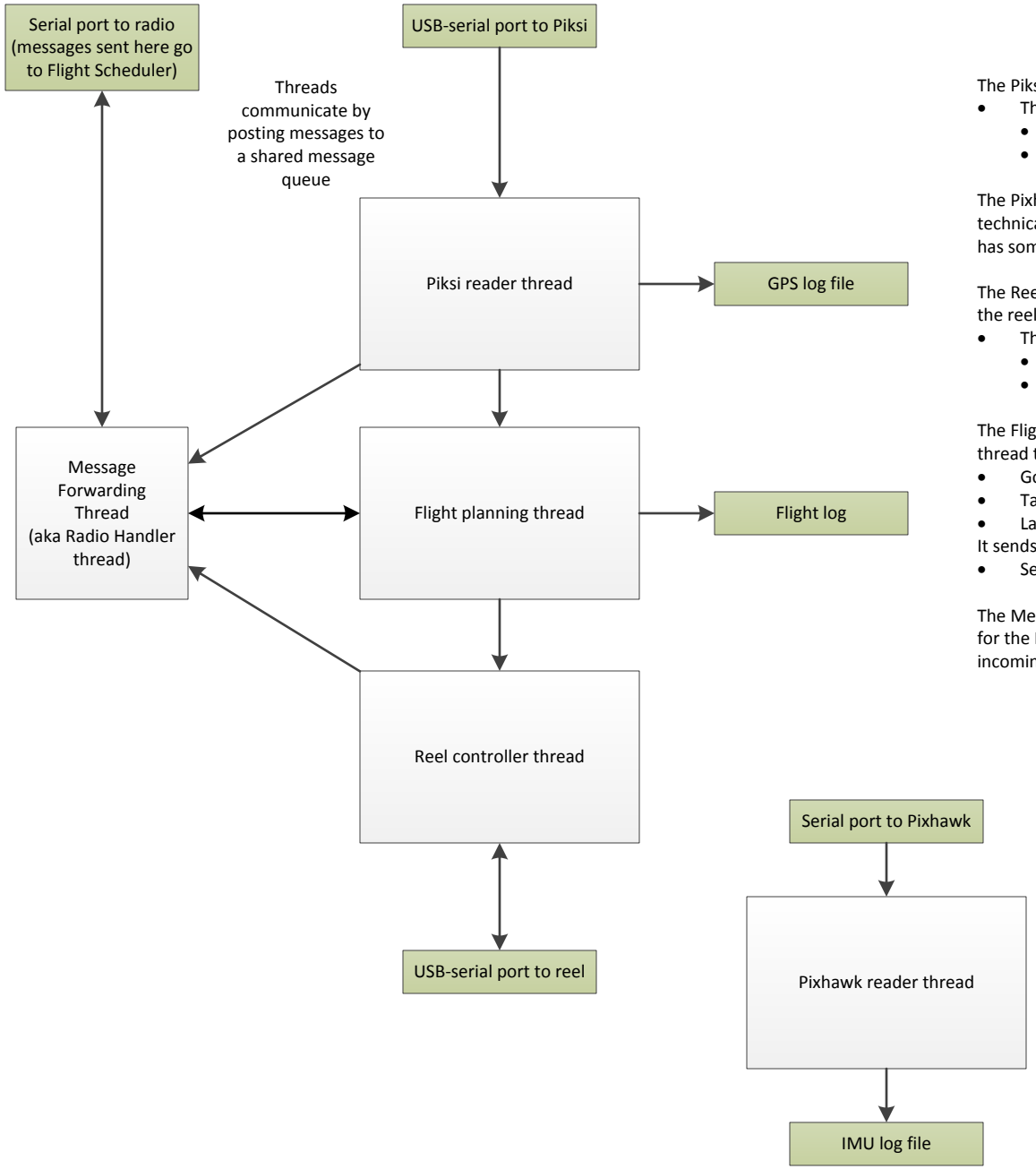
Ground Control Station main process



The Piksi Reader Thread listens to Piksi messages, and sends:

- The pseudo-absolute position of the reel
  - Destined for the Flight Scheduler and the Flight Planning Thread
  - Picked up by the Message Forwarder and sent over the radio

The Pixhawk Reader Thread listens to Pixhawk messages, and logs the attitude. It could technically be a process of its own if we wanted it to be, but keeping it in the main process has some advantages.

The Reel controller thread takes commands like “Make the reel length ___” and commands the reel motor to pay out or take in the appropriate amount of line. It sends:

- The present length of the line, and its tension
  - Destined for the Flight Scheduler
  - Picked up by the Message Forwarder and sent over the radio

The Flight planning thread reads a file containing a list of waypoints, and is the “main” thread that initiates action by the vehicle. It sends these commands to the Flight Scheduler:

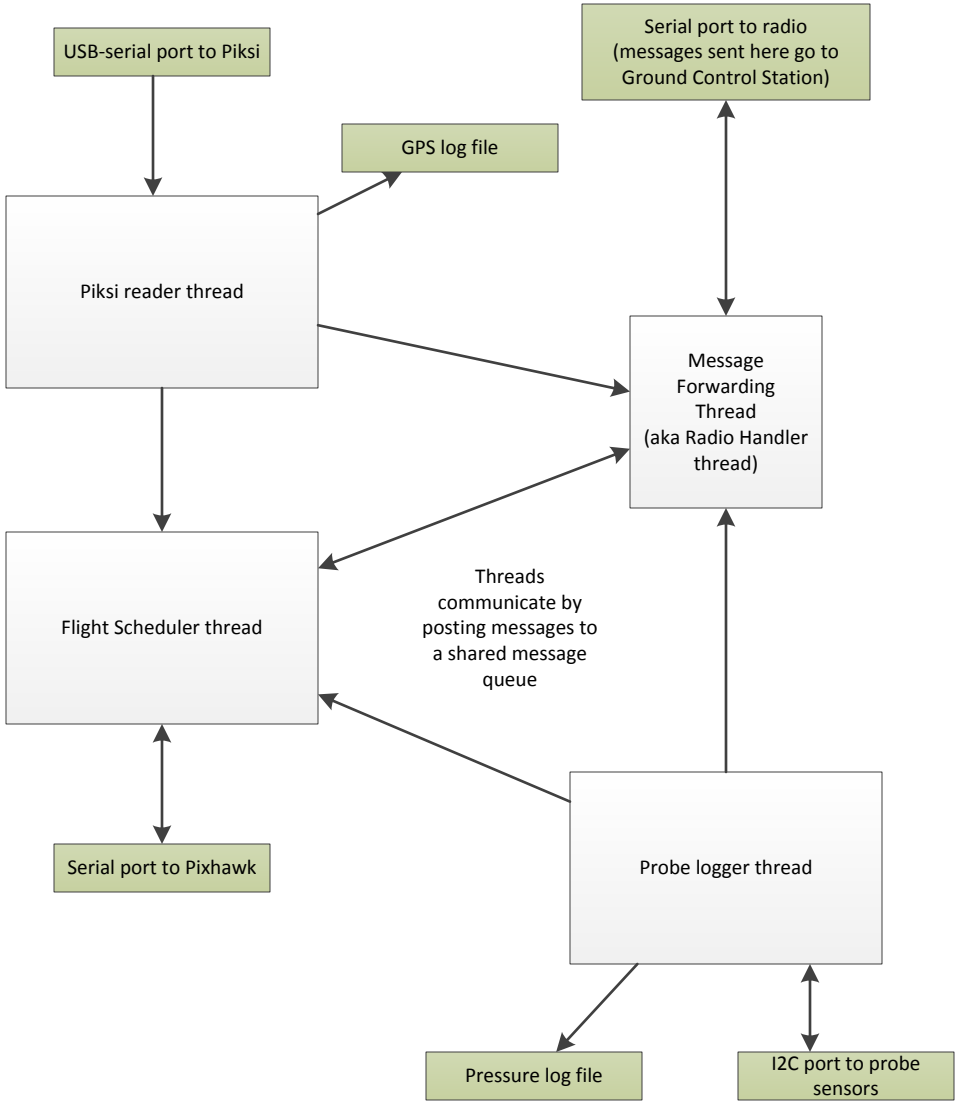
- Go to this waypoint
- Take off?
- Land?

It sends these commands to the Reel Controller thread:

- Set line length to ___, with max payout rate of ___

The Message Forwarding thread monitors the shared message queue for messages destined for the Flight Scheduler, and sends them over the radio. It also monitors the radio for incoming messages, and places them in the shared message queue.

Flight Scheduler main process



Piksi Reader Thread listens to Piksi messages, and sends:

- The pseudo-absolute position of the reel
  - Destined for the Flight Scheduler, and the Ground Control Station
  - Picked up by the Message Forwarder and sent over the radio

The Probe Logger thread runs at a high rate (200Hz) and logs pressure readings to a file. It also sends at a lower rate (~1Hz):

- The approximate airspeed vector at this moment (magnitude and direction)
  - Used by the Flight Scheduler
  - Useful to have on the ground as a debugging measurement

The Flight Scheduler thread does most of the work. It commands the Pixhawk to maintain a specific attitude, based on the vehicles current location and destination waypoint. It sends the following messages to the Flight Planning thread on the Ground Control Station:

- The current status of the Flight Scheduler thread
  - Currently seeking a waypoint, reached waypoint, etc
- The current attitude of the vehicle (largely as a debugging measurement)
- What else would we want to know on the ground?

The Message Forwarding thread monitors the shared message queue for messages destined for the Ground Control Station, and sends them over the radio. It also monitors the radio for incoming messages, and places them in the shared message queue.