Mission description

Connecting NVIDIA JETSON ORIN NANO KIT to a Orange cube pilot, SIYI ZT6A gimbal, and SIYI HM30 air unit
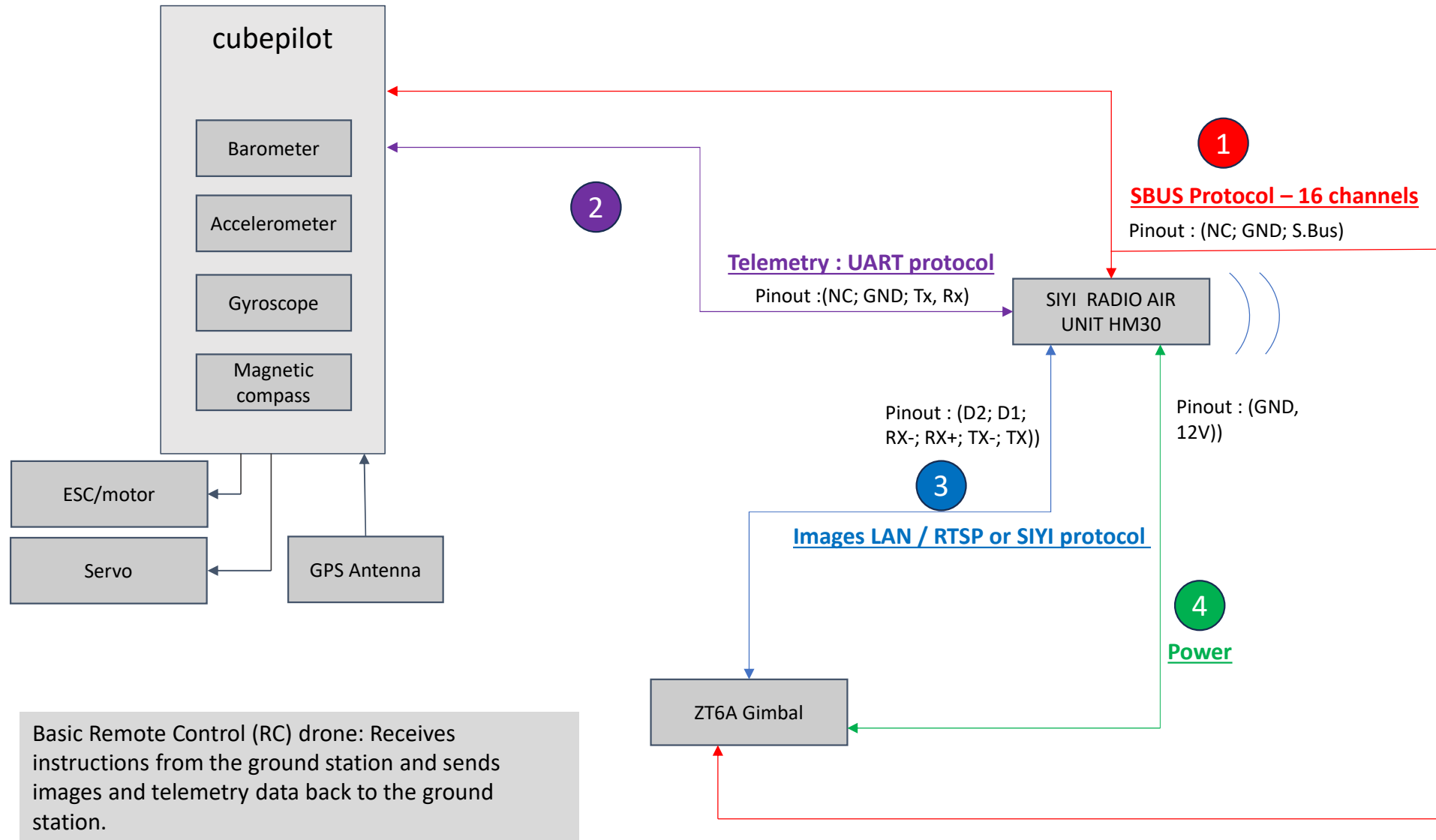
Objective of the mission

Current set up (refer to slide 3): We possess a compact VTOL drone, essentially an RC plane. Instructions are transmitted from the human pilot to the drone, routed from the HM30 ground station to the ORANGE CUBEPILOT via the HM30 air unit radio. Additionally, the human pilot can send instructions to the SIYI ZT6A gimbal using the same radio. The SIYI ZT6A gimbal relays images back to the ground station.

The objective of your mission (refer to slide 4): Integrate an NVIDIA JETSON ORIN into the drone. The NVIDIA JETSON ORIN will enable the drone to operate in two pilot modes:
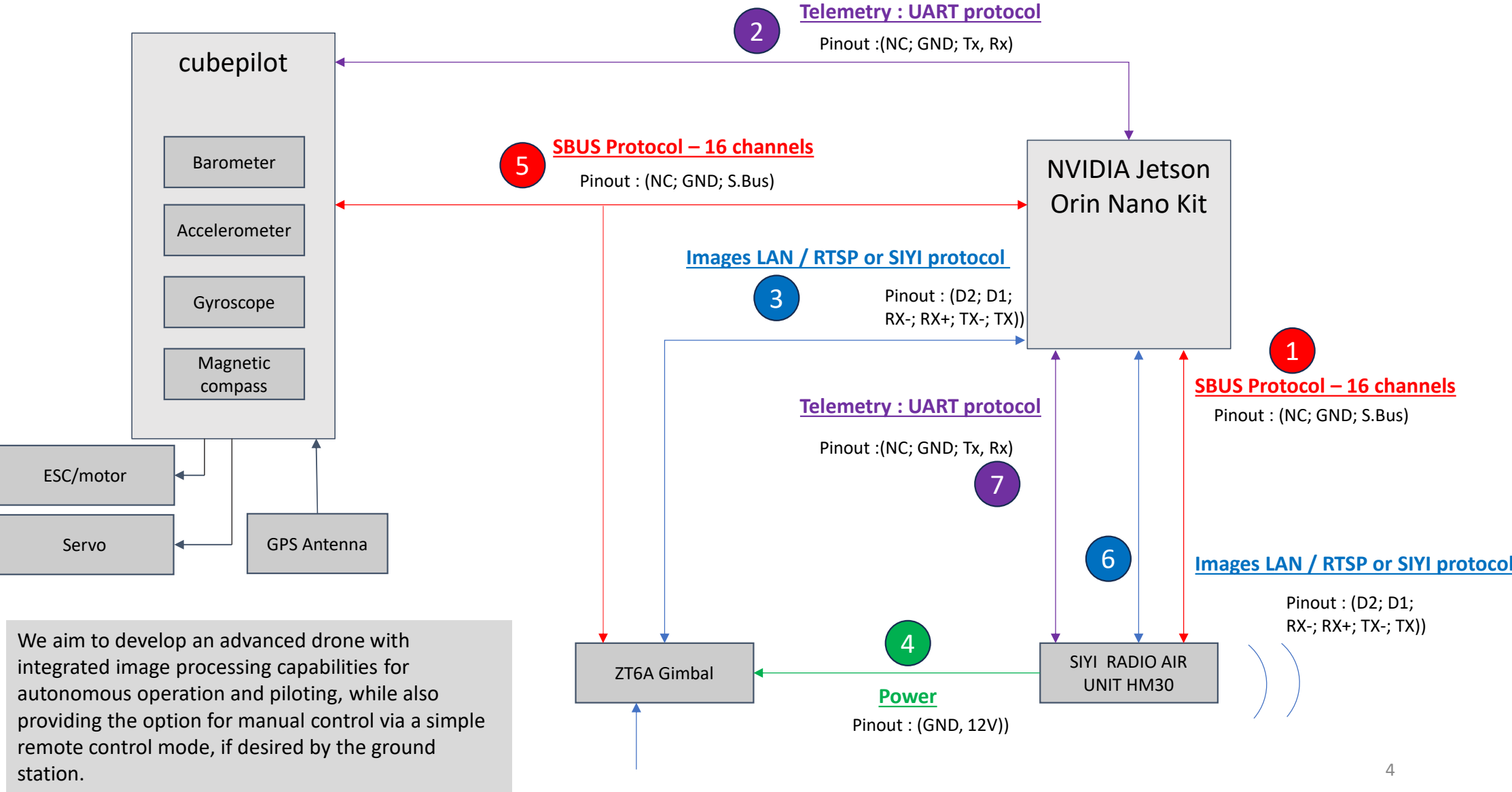- Mode 1: Manual RC control, simply relaying instructions from the ground station to the gimbal and Orangecube pilot.
- Mode 2: Autonomous operation, sending instructions directly to the gimbal and drone.

The NVIDIA JETSON ORIN will run on a Linux operating system. It will empower AI developers to install AI programs and utilize Python for programming.

CURRENT SET UP – WORKING WELL

cubepilot

- Barometer
- Accelerometer
- Gyroscope
- Magnetic compass

ESC/motor

Servo

GPS Antenna

1 — **SBUS Protocol – 16 channels**
Pinout : (NC; GND; S.Bus)

2 — **Telemetry : UART protocol**
Pinout :(NC; GND; Tx, Rx)

SIYI RADIO AIR UNIT HM30

Pinout : (D2; D1; RX-; RX+; TX-; TX))

Pinout : (GND, 12V))

3 — **Images LAN / RTSP or SIYI protocol**

4 — **Power**

ZT6A Gimbal

Basic Remote Control (RC) drone: Receives instructions from the ground station and sends images and telemetry data back to the ground station.

NEW SET UP – CONNECTING NVIDIA JETSON ORIN NANO

cubepilot

- Barometer
- Accelerometer
- Gyroscope
- Magnetic compass

ESC/motor

Servo

GPS Antenna

2 — **Telemetry : UART protocol**
Pinout :(NC; GND; Tx, Rx)

NVIDIA Jetson Orin Nano Kit

5 — **SBUS Protocol – 16 channels**
Pinout : (NC; GND; S.Bus)

3 — **Images LAN / RTSP or SIYI protocol**
Pinout : (D2; D1; RX-; RX+; TX-; TX))

1 — **SBUS Protocol – 16 channels**
Pinout : (NC; GND; S.Bus)

Telemetry : UART protocol
Pinout :(NC; GND; Tx, Rx)

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6 — **Images LAN / RTSP or SIYI protocol**
Pinout : (D2; D1; RX-; RX+; TX-; TX))

ZT6A Gimbal

4 — **Power**
Pinout : (GND, 12V))

SIYI RADIO AIR UNIT HM30

We aim to develop an advanced drone with integrated image processing capabilities for autonomous operation and piloting, while also providing the option for manual control via a simple remote control mode, if desired by the ground station.

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NVIDIA JETSON ORIN

https://www.amazon.com.be/NVIDIA-Jetson-Orin-Nano-d%C3%A9veloppement/dp/B0BZJTQ5YP/ref=sr_1_2?crid=3SHDJH2DDESA0&dib=eyJ2IjoiMSJ9.fAJiW38UTHV-GACh3CcJxGZd5_Ec9GnOslTf8NZNi4LJtAcjoQQSxM2sYRFmM6lTdT2urY3KabzIkh0TZnJBZvRFdinoWPwt5Lym-n1vTYv2RbOy4OntfcrT_P1b_FHIRS1RlyDQe4PSDVoTchbI89F1b3dhbhiKgyiBMuCPHvJpVRCSUZcFKRQnRP8uacZeQJnC5qSoLAL7bOiglOSSKgnwqiFtdcllE32RhdLyTeLc0fD9PvJOURvWaAzl8eYKxGLNxkYKkDs31XeuVFA70JTZpHfWOzo7p97vgVlyycA.nGCUXwV9BdfuhW2I2cJFvDjH-OVECzjELhyMCAmFN3c&dib_tag=se&keywords=nvidia+nano&qid=1715606917&s=industrial&sprefix=nvidia+nano%2Cindustrial%2C93&sr=1-2

SIYI RADIO HM30

- https://siyi.biz/en/index.php?id=downloads1&asd=192

SIYI ZT6A GIMBAL

- https://en.siyi.biz/products/siyi-zt6

CUBEPILOT : Orange cubepilot

- https://ardupilot.org/copter/docs/common-thecubeorange-overview.html