CHAPTER **5**
SENSING DEVICES PACK

This is your camera, 'the eye' of your sculpture.

This sensor measures air temperature and air pressure

Sensing Devices Pack

Solar-powered battery pack

Memory card with a Raspbian operating system

You can also 'power in' via a mini USB, which allows you to run your Rasberry Pi without batteries.

Aerocene EXPLORER
For more information, please visit www.aerocene.org. How can we improve our instructions? Please email your suggestions, comments, or questions to info@aerocene.com

Now open your web browser and
type in the following web address:

172.24.1.1

There you can see all the incoming data from the sensor in real time. It will be stored on the USB memory stick.

If you type in this web address

xxxx.xxxx.xxxx
you will get a livestream from
the camera on your device.

time 00:00:20 temperature: 18c°
time 00:00:30 temperature: 19c°
time 00:00:40 temperature: 19c°

Sensing Devices:
How they work

When your Aerocene sculpture is floating through the air, its sensing devices are constantly recording air quality, temperature, humidity, and pressure.

Open your web browser and type in the following web address: 172.24.1.1
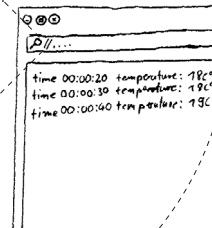
To have a look what is going on up there, take out your smartphone, search for

Aerocene Wi-Fi,
and connect to it.

Aerocene Explorer kit

Raspberry Pi

Solar battery pack

Raspberry Pi

Solar battery pack
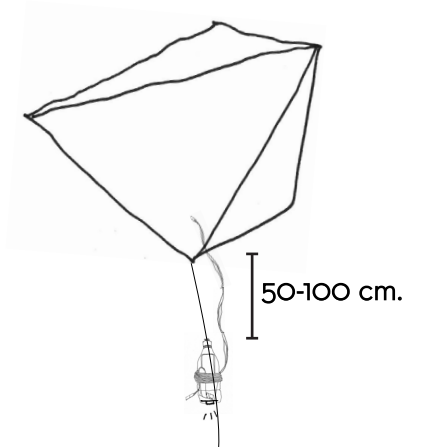
Mini SD card socket
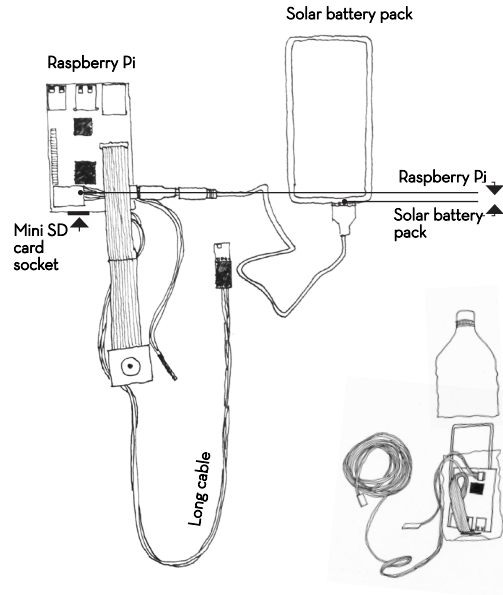
Long cable

STEP 1
Connect the Raspberry Pi to the solar-powered battery pack

Long cable

STEP 2
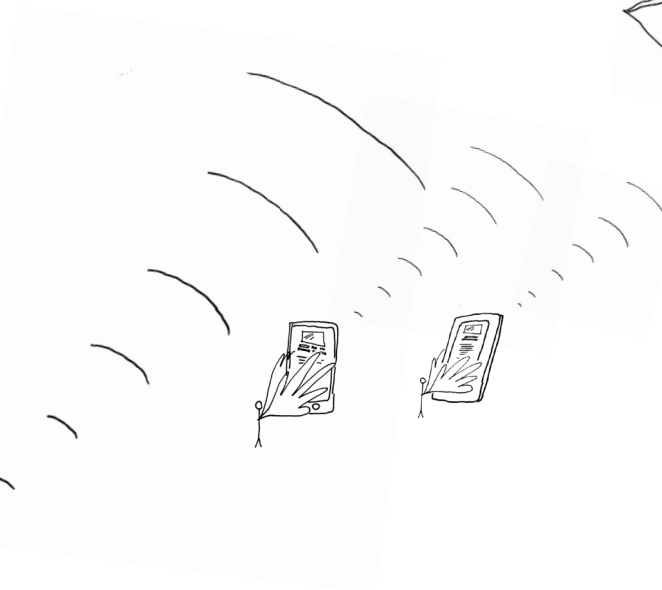Connect the long cable to the inside part of the sculpture and switch on solar-powered battery pack

50-100 cm.

STEP 3
Place the pack of sensing devices about 50-100 cm. underneath the sculpture

Aerocene EXPLORER

STEP 4
Using your smartphone, turn on your Wi-Fi and connect to
Wi-Fi name :"Aerocene Explorer"

STEP 5
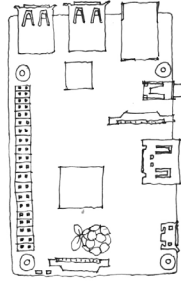Open your web browser and typ
172.24.1.1 in the address bar

STEP 6
If you want to take a photo:
Record images < Download videos
and images < choose frame <
download < save image

STEP 7
Click the "atmosphere observation"
box to check the atmospheric data
as it records in real time

Aerocene EXPLORER

What is your A.A.Orbiter ?

1 Raspberry Pi (Controller unit)

The Raspberry Pi is a one-chip pc developed to teach people basic programming. "Pi" stands for python interpreter and is also the program language used to run the parts on the Orbiter. Our Orbiter can be powered by batteries or via a micro-USB port.

If you plug in a monitor at the HDMI port and a keyboard via the USB, the Pi can be used like a normal Linux desktop PC.

After the first start the Pi asks you to login.
Just use the standard login and type:

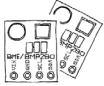> Login as user: pi
> password: raspberry

Then, start with your first command: startx
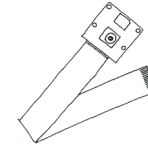
2 Raspberry Pi camera (Camera module)

The Raspberry Pi camera has 5.0 MP resolution and a wide angle lens. This makes it great for taking pictures from above.

In video mode it can capture up to 90 frames per second.

Aerocene EXPLORER

3 BME280 (Pressure and temperature sensor)

The BME280 sensor is a small chip from Bosch that is able to sense the pressure and temperature of the surrounding air.
The chip needs a 3,3 V Volt power connection from the Raspberry Pi to start working.

To read the recorded data, we use the I2C protocol, which operates over the pins SDA and SLC on your Raspberry Pi. This protocol allows you to put many different sensors in row on just one pin and read them seperately through their addresses.

In the data we read out from the module is raw, that means we need to format it into comparable data.

4 Solar Battery Pack

A solar-powered battery pack will keep the sensing devices charged while the Explorer is traveling through the air.
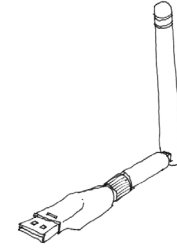
However, it is recommended to plug the battery pack into an electrical outlet to completely charge before each launch.

5 SD card

This is the internal memory of your Raspberry Pi. It comes with the pre-installed Raspbian OS, which is specifically designed for the Raspberry Pi Debian Linux operating system.

Additionally we installed a program that allows you to connect your phone with the Raspberry Pi and stream from the camera and the logfile.

6 WLAN Stick USB 2.0

Aerocene EXPLORER

Aerocene EXPLORER
For more information, please visit www.aerocene.org. How can we improve our instructions? Please email your suggestions, comments, or questions to info@aerocene.com