




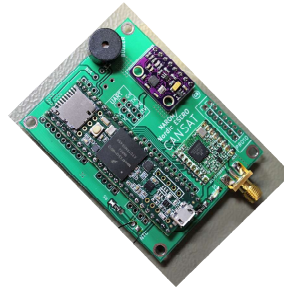


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Introduction to

-  The CanSat concept
-  The NAROM 2018 CanSat kit
- and
-  Soldering

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The CanSat Concept

Can soda can

Sat: satellite – *a satellite in a can*

Robert Twiggs started 1990 in the USA

A small satellite in a soda can:

contains all parts included in a real satellite:

electronic payload with sensors or servos, radio etc.



To be dropped from balloon/rocket/drone in attached parachute

Sends telemetry-signals to pc (ground station) when descending





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The CanSat Concept

A CanSat project includes

- ▮ Primary mission: *Mandatory*
- ▮ Secondary mission: *Free choice*

In general: Free choice on structure, radio frequency, computer/ programming language ...

BUT: Max. 66 mm in diameter and 115 mm in height.
Mass: 300 – 350 g

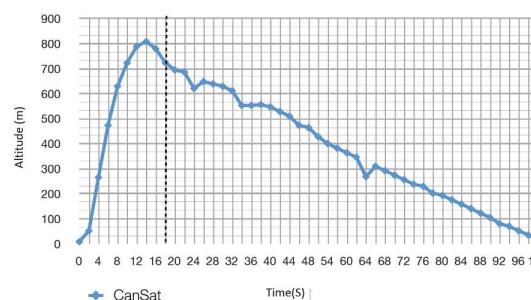
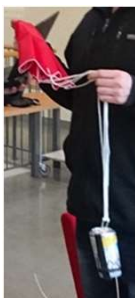


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The CanSat Concept

The Primary mission:

- ▮ Put together the CanSat (solder, build, attach parachute)
- ▮ Program the Arduino
- ▮ Test and calibration
- ▮ Transmit and analyse pressure and temperature.
- ▮ Calculate altitude from T and P

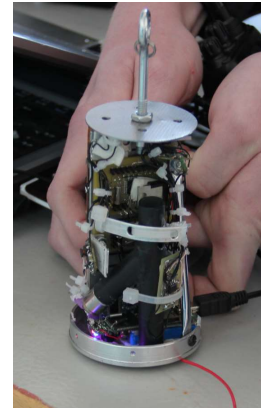
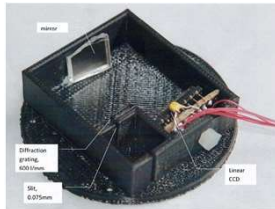




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The CanSat Concept

- Airbag-system for safe landing
- Accelerometer
- GPS
- Advanced telemetry (two-way communication)
- Magnetometer for orientation
- Gass-sensors (CO₂ and other types)
- A Camera (IR?) (or 2 for 3D pictures)
- “Chemical” experiments (what happens with... as the can accelerates?)



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esero

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The NAROM 2018 CanSat kit

Based on

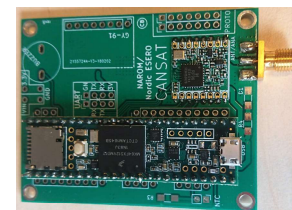
- Teensy 3.5 (Arduino programming)
- NTC Temperature sensor
- GY-91 (digital sensor module)
 - Pressure sensor (BMP280)
 - 3-axis accelerometer
 - 3-axis gyro
 - 3-axis magnetometer
- RFM96 Radio module

And a buzzer, light diode, mount for microSD memory card, ...

The CanSat:



The Ground Station:



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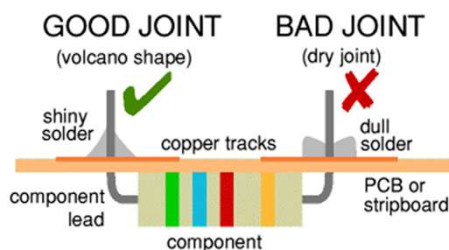
Short introduction to soldering



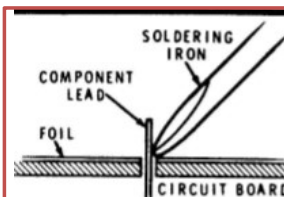
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Short introduction to soldering

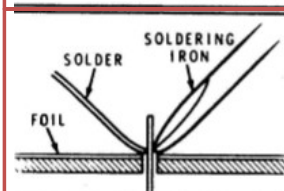
3 steps to get good soldering
“through hole” components:



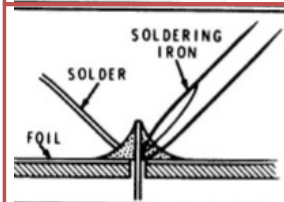
<http://www.kpsec.freeuk.com/solder.htm>



1.
Soldering iron on
(2-3 sec)



2.
Put solder on



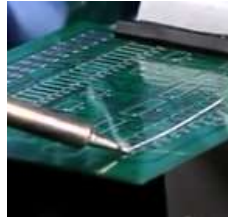
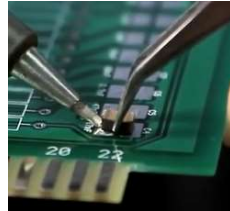
3.
When enough
melted solder:
remove the
solder BEFORE
the iron



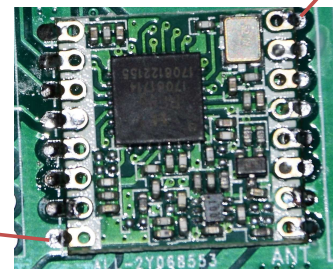
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Short introduction to soldering

How to solder “surface mounted” components:



1: Solder one corner



2: Solder opposite corner



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Short introduction to soldering

Follow the instructions in The CanSat book: http://bit.ly/construct_NAROM2018

at-book/v2018/constructing-the-narom-2018-cansat-shield/



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Constructing the NAROM 2018 CanSat shield

Assembling the Components and Constructing the NAROM 2018 CanSat-shield

This section will show you step by step how to assemble the components for the NAROM 2018 CanSat shield.

A list of components and link suggestions for ordering the components can be found [here](#).Parts list
Teensy 3.5

Assembling guide

Note that the pictures shown in this section was taken of a previous version of the NAROM 2018 kit. You will find a few discrepancies from your version, but will be able to assemble the board anyway. The resistors in the pictures may not have the same value or number as stated in the text, so in case of discrepancies follow the instructions in the text.

1.

Solder the voltage regulator to the backside of the board. Position: U1

Both the three pins on one side of the regulator and the larger ground plane on the other side of the voltage regulator has to be soldered to the board as shown in the figure to the right.



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