Wohler B Mark III

Testbed Kit turbo-drone

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Content :

1. Content :

(fig.1 & fig.2)

      a. **Complete Wohler B MarkIII (1) and US telemetry (2)**

      b. **RC Taranis X7 (3)**

      c. **Spare parts for frame (4)**
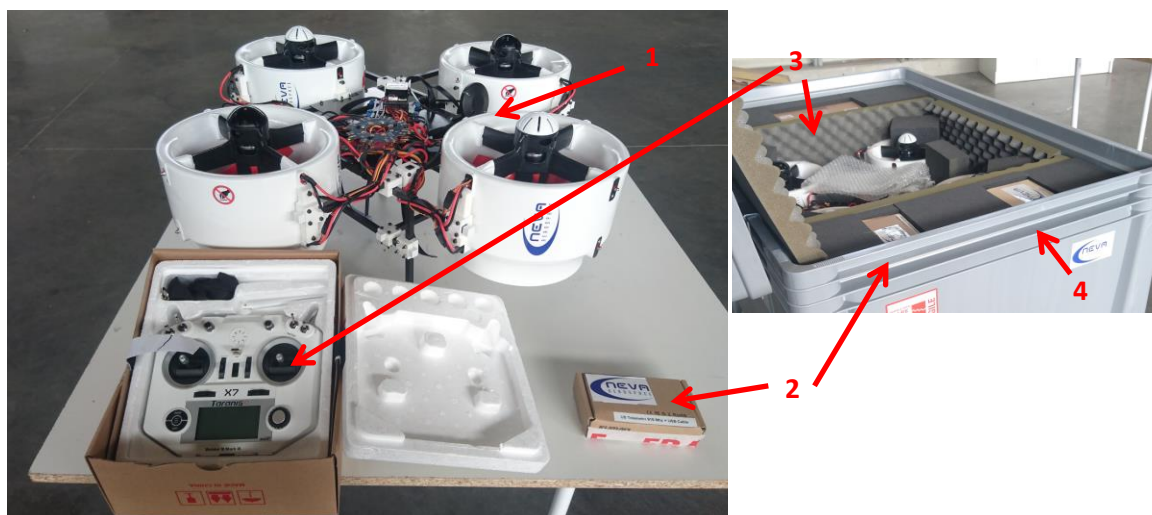
Figure 1 & 2 : contents

2. Before starting

      a. **Mission Planner (donwload + install for ground station)**

The flight controler settings and the groundstation are using software Mission Planner for Windows.
It is necessary to download and install it :

- ✓ Software: firmware.ardupilot.org/Tools/MissionPlanner/MissionPlanner-latest.msi
- ✓ Install documentation : http://ardupilot.org/planner/docs/common-install-mission-planner.html
- ✓ Global documentation : http://ardupilot.org/ardupilot/

d. Battery (Gens Tattu 22000mAh + scratch as show on photo)

Wohler B Mark III is optimized for working with **Tattu 22000mAh 22.2V 25C 6S1P Lipo Battery Pack :**
http://www.gensace.de/tattu-22000mah-22-2v-25c-6s1p-lipo-battery-pack.html

To use this battery, it is necessary to prepare it by putting scratch at the right place :

- ✓ one 1 cm width band of scratch on each side as showed figure 3
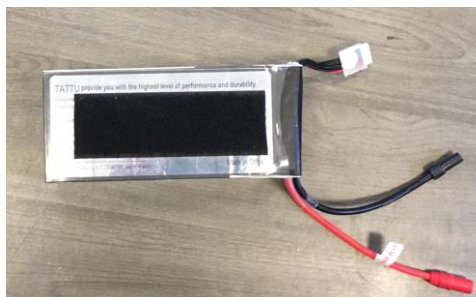- ✓ one big band one the other side as showed figure 4

Figure 3 : 1 big band

Figure 4 : 2 x 1cm scratch band

 (Battery(ies) NOT supplied)

3. Configuration :

a. Positioning battery

The battery is positioned under the central plate, big scratch band up, as centered as possible. The battery is maintain by attaching it with the 2 scratches straps

b. Mission planner

i. Cable- plug Wohler

After installed Mission Planner, plug the Wohler flight controller (Pixhawk) to the computer by using the right wire, micro USB – USB wire, possible to use a standard one or this given with the telemetry.

The data speed transfer for wire connection is 115200 baud

Connect Wohler to mission planner to check. Note that the flight controller is already set and you don't have to setting it or modify the parameters.

You should have parameters as showed figure 5 and figure 6
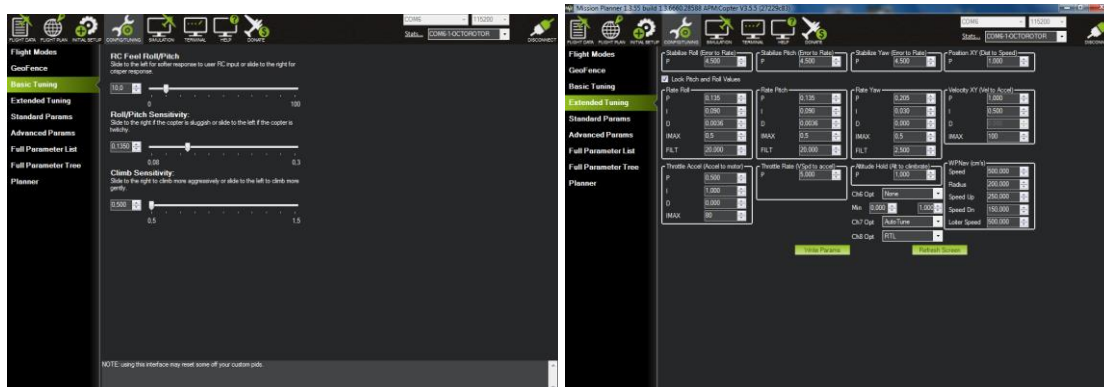
Figure 5 & 6: Basic parameters and extended tuning

In any time, it is possible to load these parameters using the "FullParam_WohlerBMarkIIIv2.param" file.

ii. Telemetry plug Wohler

To use the telemetry, plug the telemetry to your computer using the given wire.

The data speed transfer using the telemetry is 57600 baud

c. Mandatory configuration and check

i. Compass calibration

It is necessary to make a compass calibration to take in account the potential modifications after delivery.

ii. Check RC

The RC is already setting with : (figure 7)

- ✓ Power and yaw : left stick (A)

- ✓ Pitch and roll : right stick (B)
- ✓ Flight mode : stabilize / Altitude Hold / Loiter (C)
- ✓ RTL (D)
- ✓ Autotune (E)

Flight Mode:
- Stabilize : up position
- AltHold : middle position
- Loiter : Down Position

RTL:
- RTL Off: down position
- RTL On : up position

Autotune :
- Autotune Off : up and middle position
- Autotune On : down position

Note that the starting position is:

- A stick down (power off)
- B stick in middle
- C up posision (stabilize mode)
- D down, no RTL
- E up, no Autotune

The RC is configurated by using Open TX softaware (Compagnion2.2 software) : http://www.open-tx.org/downloads.html

It is possible to modify and/or add function using this software.

Note : you can load the original settings by using the "WohlerBMarkIII_TaranisX7_Parameters.otx" file

4. Before first flight – start up

a. Wohler Frame check

Battery disconnected	OK	Comments
Propellers		
All there		Visual check
Well positionned		According to the Wholer documentation
Structure :		
Complete and well fixed		All frame parts locked, no possible movement
GPS		present
Flightcontroleur		present
Telemetry		present
Receptor		present
Batteries:		
Full charged		
Correctly attached		
Plugs visible and reachable		

b. Ground station, telemetry and RC check

Battery Connected	OK	Comments
RC		
Battery is charged		Enough for the flight
Turn On		
All Switch and Stick on right place		
Mission Planner:		
Open		
Telemetry connected		
GPS		active
Arming		Without any power, Armed written on screen*
Disarming		Disarmed written on screen
Altold		AltHold written on screen
Loiter		Loiter written on screen
Stabilize		Stabilize written on screen
Autotune		Error msg on screen
RTL		RTL written on screen
With RC or Mission Planner		
Turn on all the turbine motors		No more than 10%, no strange noise or vibration

*Note that when it is Armed, turbines turn in an idle speed

c. Run-up

Wholer B Mark III MUST BE ATTACHED WITHOUT POSSIBILITY OF MOVING

- ✓ Attach rope(s) and lock each 4 arms & attach points must on the carbon frame (NOT on the carbon central plate)
- ✓ Battery connected
- ✓ Power up to full power gradually in around 10 seconds
- ✓ Stabilize full power for around 5 seconds
- ✓ Power down up to 0 in around 10 seconds
- ✓ Refresh procedure (cf. Turbine manual)

d. Take off

- ✓ Detach Wohler B Mark III from ground
- ✓ Increase power up to the take-off without taking off
- ✓ Stabilize around 2 seconds
- ✓ Decrease power up to 0
- ✓ Idle speed without disarm
- ✓ Power up to take off
- ✓ Flight

Note : procedure consisting of increased the power up to take off, stabilize 2 seconds, decreasing up to 0 and keep idle speed less than disarm time is called **Short Run Up**

5. Check list for all flights

a. One time per flight session

- ✓ Frame check (cf.4.a)
- ✓ Groundstation check (cf.4.b)
- ✓ Telemetry check (cf.4.b)
- ✓ RC check (cf.4.b)
- ✓ Run up (cf.4.c)

b. Before each flight

- ✓ Visual check of Wohler B Mark III
- ✓ Groundstation check (cf.4.b)
- ✓ Telemetry check (cf.4.b)
- ✓ RC check (cf.4.b)
- ✓ Short Run up (cf. 4.d)

c. After flight

- ✓ Refresh the system by alternating idle speed and little power (less than 6 amps total consumption) for 3 minutes
- ✓ Disarm
- ✓ Unplug battery
- ✓ By hand:
    - o Temperature check for battery
    - o Temperature check for power board
    - o Temperature check for motor (cf. turbine manual)
- ✓ Frame check:
    - o No part moved
    - o All parts are fixed and can't move
    - o No major failure on part
- ✓ Turbine check : according to turbine End User Manual

READING AND UNDERSTANDING THE TURBINE END USER MANUAL IS MANDATORY BEFORE FLYING A UAV WHICH IS POWERED WITH NEVA ELECTRIC TURBINES.

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