Bachem Ba-349 Natter

Experimental DCS Module

Version 0.9 Beta

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https://tnnvk.com/bachem-ba-349-natter-dcs-module/

Table of Contents

Quick Start

There are actually 2 modules, the Natter Module and Launch Platform module.

Ba-349.zip

BachemLaunchPlatform.zip

Unzip both and put them in the **[User]\Saved Games\DCS\Mods\Aircraft** folder

[User]\Saved Games\DCS\Mods\Aircraft\Ba-349

[User]\Saved Games\DCS\Mods\Aircraft\BachemLaunchPlatform

To quickly Launch the Natter there are already misson files whith all necessary LUA scripts to spawn the Launch Platform configured. The mission files are:

[User]\Saved Games\DCS\Mods\Aircraft\Ba-349\Missions\EN\QuickStart\Bachem Ba-349 Natter Takeoff And Interception.miz

[User]\Saved Games\DCS\Mods\Aircraft\Ba-349\Missions\EN\QuickStart\Bachem Ba-349 Natter Takeoff.miz

The first one required the WWII asset pack (for the B-17 bombers). The second is just a take-off with no interception and does not require the WWII asset pack.

The missions should also be available in the “Instant Action” menu from the DCS main screen.

Pick one of the above and start the mission

1. The Natter should appear in the runaway unpowered over a wooden support structure
2. Use the following keys to move the Natter around and adjust the azimuth for launch:
    - Move Left: **LALT + Q**
    - Move Right: **LALT + E**
    - To change azimuth (rotate) press:
    - Rotate Left: **LALT + A**
    - Rotate Right: **LALT + D**
3. Press the key to spawn the platform:
   RCTRL + P

   The platform will appear and the Natter would start to connect to the platform. It will be pushed up and then rotate 90 degrees and moved forward to connect to the platform. The process should take more or less 1 minute and 10 seconds. Wait for it to finish.

If the platform does not show up in front of the Natter then the LUA scripts have failed. Probably you need to setup the scripts yourself in your mission file. For this follow the steps in the Section "**Scripts configuration tutorial for Platform spawning**".

4. After the Natter is connect vertically to the platform you can start the power up and ignition process. Press:

1. Key "**O**" (Oscar) for switching the ON the main fuel circuit valve
2. Key "**BACKSPACE**" to turn ON electric power

3. To start the Engine: Make sure the throttle is all the way BACK (otherwise the ignition process will start and fail)
4. Press "**RSHIFT+Home**"

5. Wait until:

1. The **pump RPM indicator** (lower left in the instrument panel) indicator goes up to **120%** (U / min)
2. **Pump pressure indicator** goes to **6 Kgf/cm2** (lower center indicator in the panel)

6. Now you can move the throttle. Move it to FULL and watch that **chamber pressure indicator** goes to maximum **25 Kgf/cm2** and back a few times to test engine response. The Natter is ready to takeoff.

The takeoff is by default with **AUTOPILOT ON**.

Dont move stick or peddals during the initial climb.

7. For takeoff **move the throttle to FULL**. Press the key "**B**" to release the Natter.

8. Climb: the initial climb is automatic on Autopilot. You can change autopilot setting:

- Increase pitch setting angle **LSHIFT + H**
- Decrease pitch setting angle **LCTRL + H**

9. Wait until normal attitude is reached: around 8000 meters disengage autopilot by pressing the key "**A**". Put the stick forward gently to level the airplane to zero pitch angle horizontal attitude flight.

10. During flight:

Reduce throttle to around 50% or the speed will rapidly increase to dangerous values.

The Natter will loose elevator response around Mach 0.8 were also buffeting due compressibility effects will start to appear.

There is an audible warning ring when the maximum speed is reached.

Close to mach 1 the airframe can desintegrate. Watch the throttle carefully

11. If you are flying the "**Bachem Ba-349 Natter Takeoff And Interception.miz**" when reaching 8000 meters disengage autopilot and turn around 100 degrees to the left to pursue the incoming B-17 Bombers (or use F10 map view)

12. Weapons control:

- Master Arm: **Press P** or Joystick button
- Switch Salvo mode: **Press T** or Joystick button to switch between **SINGLE** fire (sequential) or **ALL**

Pay attention to select SINGLE (by pressing T key) or ALL the rockets will be fired at once

- Fire rocket(s): **Press R** or Joystick button

Front nose cap is ejected on the first rocket fire.

Approach the bombers from behind at lower altitudes and then climb almost vertically to fire rockets avoiding the the bombers defensive fire.

13. End of the mission:

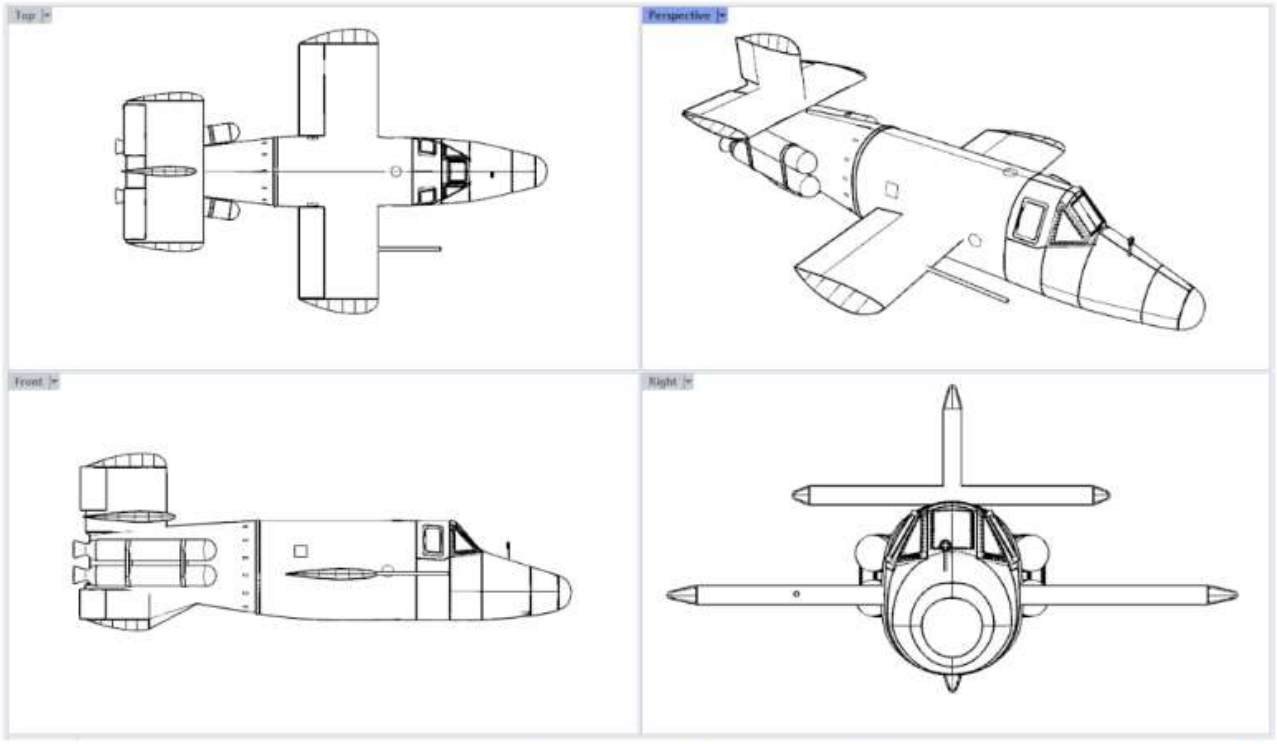
Engine fuel will last 3 to 5 minutes depending from consumption rates. When the fuel is about to end and the engine will shutdown an audible warning alarm will start.

To eject: put the airplane at the leveled horizontal flight attitude around 500 Km/h (if there is too much speed bleed energy by climb or making turns before leveling)

Press "**CTRL+E**" 3 times to start ejection sequence.

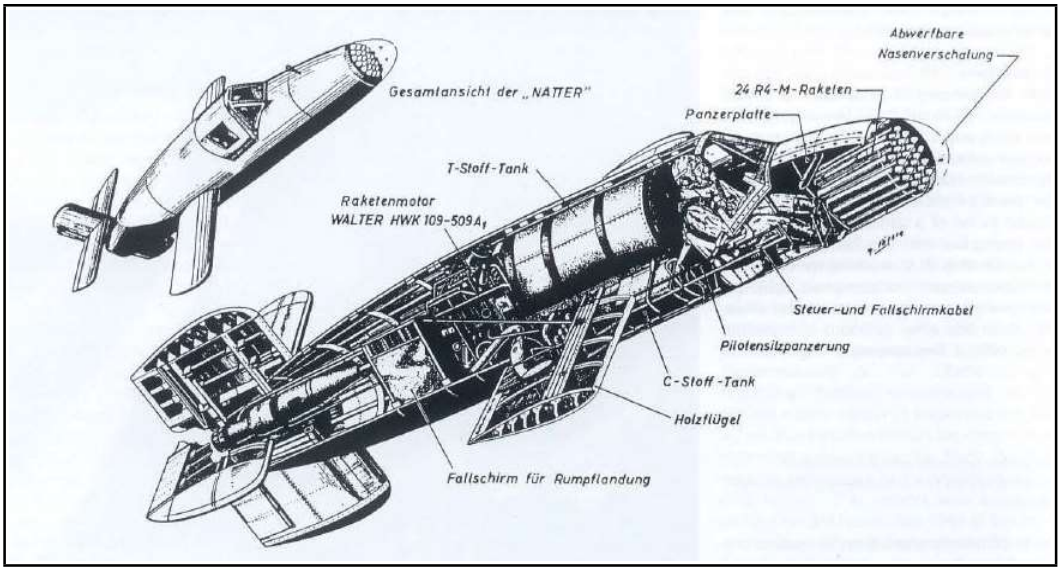
The Bachem Ba-349 Natter

The Bachem Natter project was a incredible effort for the part of the Germans to create a high performance interceptor to counter allied bombing in WWII. It was designed to solve many different problems: easy of fabrication, high performance and quick pilot training. The pilot was supposed to bail out at the end of the mission, so there was no manned landing, however the airframe and power plant were recoverable by parachute.



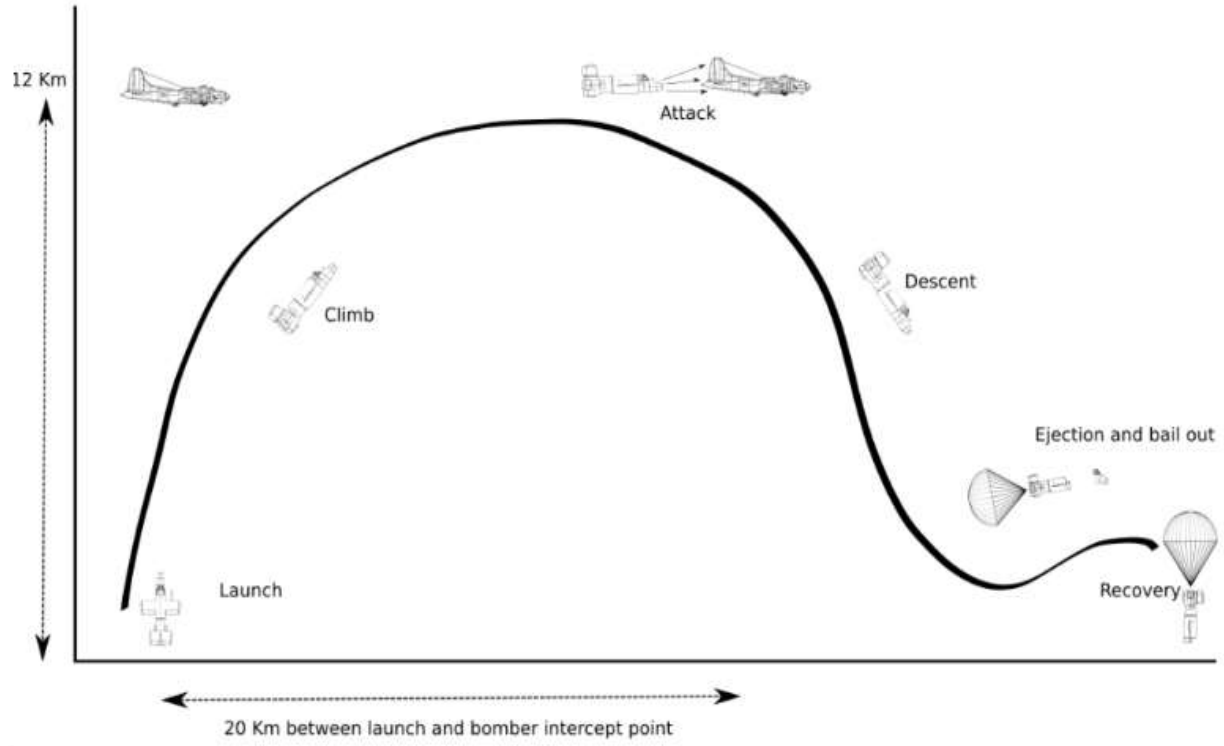
The Bachem Natter 3D Model created in Rhino for the DCS Module

The mission profile of the Natter was comprised of the launch, climb, attack on the bombers formation and then a descent following the separation of the cockpit forward section and parachute deployment to recover the airframe. The pilot landed by parachute separately.



Mission profile

Expected maximum velocity could be up to 1000 Km/h. During the climb phase the plane should get to around 12 Km of altitude in less than 2 minutes. Powered flight time was 3 to 5 minutes depending from the rocket engine propellant flow rate.



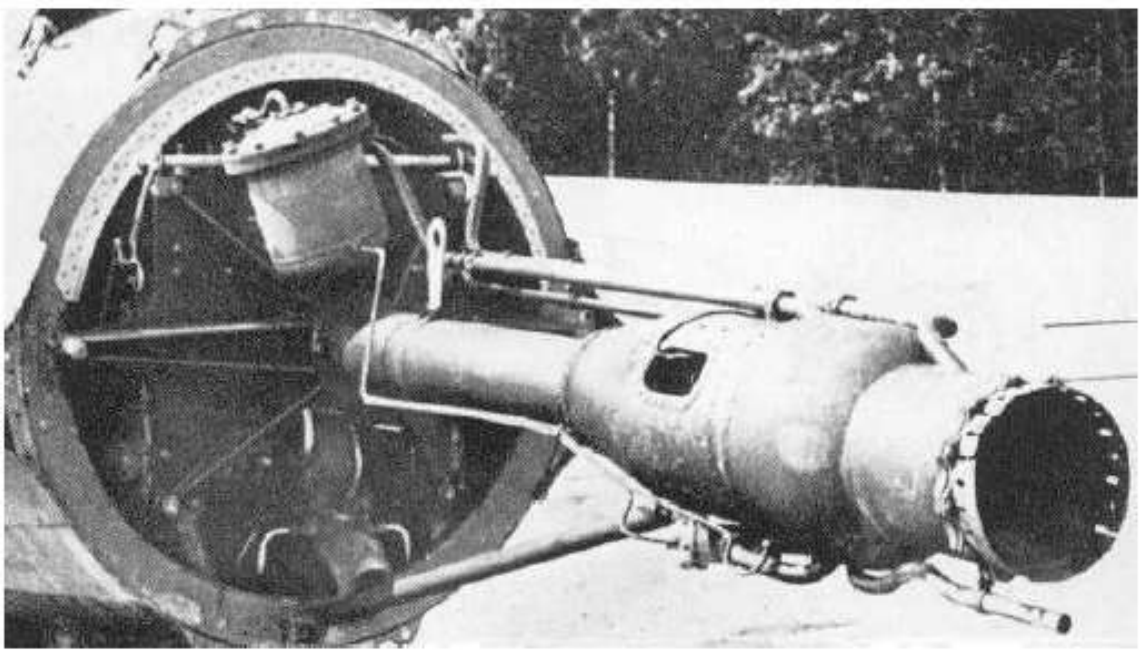
The Engine

The Walter Rocket Engine was a remarkable, pioneering rocket engine developed during the 30s by Helmut Walter using high concentration hydrogen peroxide as propellant. Helmut Walter pioneering the use of hydrogen peroxide, also know as **Hight Test Peroxide** or **HTP** in US, for rocket propulsion.

In Germany hydrogen peroxide was called **T-Stoff**. This type of fuel can be used as a mono-propellant, when combined with a catalyst such as a solution of potassium permanganate, know as **Z-Stoff** in Germany.

Walter built a series of rocket engines based on T-Stoff and Z-Stoff. Those engines rely only in the high heat of the decomposition of the Hydrogen Peroxide with the catalyst Z-Stoff and are know as “cold” engines. Cold in the sense that the excess oxygen produced by the peroxide decomposition was not used in any combustion process inside the chamber, so the high temperature steam produced is colder than the gas produced if a combustion process occurred, which is not the case for this type.

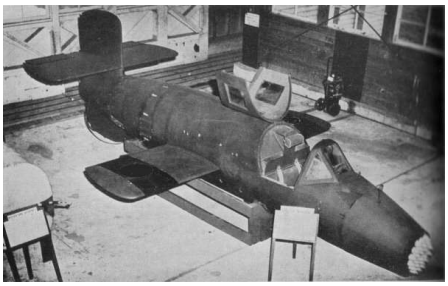
Later on Walter developed the more powerful tri-propellant “hot” engine. In this engine a third propellant, the fuel, was injected in the chamber to burn the excess oxygen from the decomposition of the hydrogen peroxide, this fuel being a combination of **50 / 50 hydrazine hydrate and methyl alcohol** in aqueous solution and was called **C-Stoff**. The effect of injecting this fuel in the chamber was to greatly increase thrust and temperature through combustion, and importantly, reduce the propellant mass flow (because of the higher resulting specific impulse) and therefore increase powered flight time. The first “hot” engine type was the RII-209, then the derived RII-211 and the HWK 109-509, all correlated developments. The final version was the HWK 109-509B dual chamber engine. The hot engine produced up to **1700 Kgf** of thrust. The engine used in the Natter was the **HWK 109-509**.

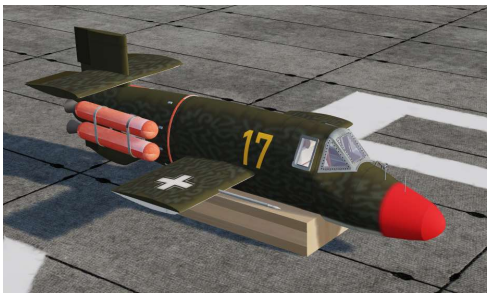


A standard HWK 109-509 engine

Flight preparation

The Natter needs a platform for takeoff. When starting a new mission from scratch in the Mission editor place the Ba-349 Natter as “take off from runaway”. The airplane will be at runaway with engines off supported by a horizontal wood ground support structure.





Then you can move the Natter around and change azimuth angle before spawning the platform for takeoff.

For moving the Natter while with the support structure press:

Forward: **LSHIFT + Q**
Backward: **LSHIFT + E**

Move Left: **LALT + Q**
Move Right: **LALT + E**

To change azimuth (rotate) press:

Rotate Left: **LALT + A**
Rotate Right: **LALT + D**

To spawn the platform some specific LUA scripts needed to be inserted into the mission file. Also the platform model mod needs to be placed in the **[user]/SavedGames/DCS/Mods/Aircraft** folder. Please check session “**Scripts configuration tutorial for Plarform spawning**” below for a tutorial on how to do that.

Before connected to the platform the engine cant be started. After position and azimuth are at the desired location and values press **RCTRL + P** to spawn the platform. The airplane will be automatically moved and rotated to be placed vertically connected to the platform.

1. Airplane will be lifted up
2. Airplane will rotate 90 degrees
3. Airplane will be moved horizontally to the platform

Then the process for takeoff then can be initiated.

Engine start

1. Press backspace to turn ON main battery power
2. Press O switch ON the main propellant shutoff valve
3. Move the throttle all the way back. If not full at back the engine may start and quit, in this case the whole process needs to be repeated.
4. With the throttle full back press RSHIFT + HOME to start engine
5. Wait until Pump RPM reaches **past 100% and stabilize**. Keep the throttle back. If the throttle is moved forward before the pump is at above the 100% and stable the engine will quit.

Takeoff

ONLY after the pump RPM is stable (not moving) **above 100%** and pump pressure is stable at **6 Kgf/cm2**:

- Push throttle forward until the maximum and check chamber pressure reaches **25 kgf/cm2**. Slowly pull throttle back and forth and check if the engine response is ok. For takeoff keep the throttle at the maximum position.

Airplane is ready. For takeoff press **B.** The airplane will be released from the tower. Don't move stick or pedals while during the initial climb. Default takeoff is with **Autopilot ON.**

The two **Schmidding SG 34** lateral boosters will be ignited at the release and will add extra 4800 kgf of thrust during 10 seconds and then will be **automatically jettisoned.**

Climb

The Natter have an autopilot system based on a special modified group of **Siemens K4ü Autopilot** systems for the different axis put together. The climb can be initiated with autopilot ON or OFF. If the K4 system is ON the Natter will be put automatically on a 50 degree climb angle.

Autopilot control:

- Enable / Disable Autopilot: Press **A** (when enabled will hold current pitch angle)
- Enable / Disable Bank roll hold: Press **H** (will hold on the current roll angle)
- Increase pitch angle **LSHIFT + H**
- Decrease pitch angle **LCTRL + H**

Weapons system

Weapons system consist of a rack of 26 (twenty six) **Rheinmetall-Borsig RZ 65 (Föhn) unguided rockets** in the nose.

- Diameter: 73 mm
- Length: 262 mm
- Weight: 2 kg
- Warhead: 156 g of TNT

Weapon system control

- Master Arm: **Press P** or Joystick button
- Switch Salvo mode: **Press T** or Joystick button for **SINGLE** (sequential) or **ALL**
- Fire rocket(s): **Press R** or Joystick button

Front nose cap is ejected on the first rocket fire.

Scripts configuration tutorial for Platform spawning

For the platform to be avaiable in the game please install the Platform mod in the **[User]/SavedGames/DCS/Mods/Aircraft** folder.

The platform mod folder is **BachemLaunchPlatform** copy it to the folder above so the resulting path will be:

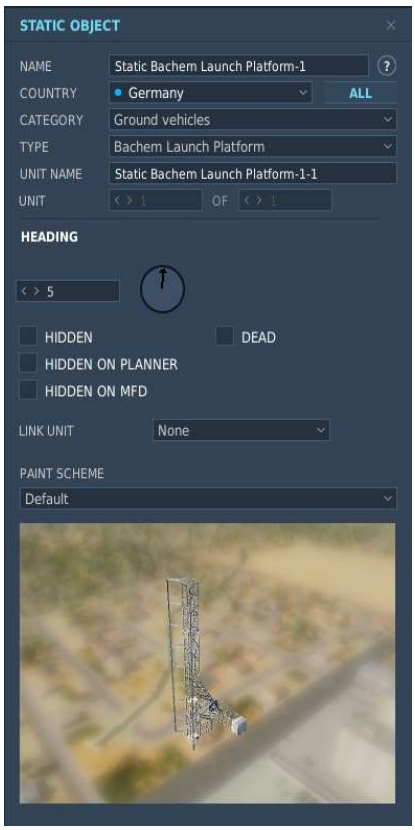
[User]/SavedGames/DCS/Mods/Aircraft/ BachemLaunchPlatform

If the installation is correct the platform will be avaiable in the mission editor in the “Ground Vehicles category” Type “Bachem Launch Platform” (as show in the figure below).

However there is no need to place the platform in the map in the mission editor because the LUA trigger scripts will spawn the platform for you.

For this you will need to create 3 triggers in the mission editor and also we'll need the **mist_4_3_74.lua** that can be download from here:

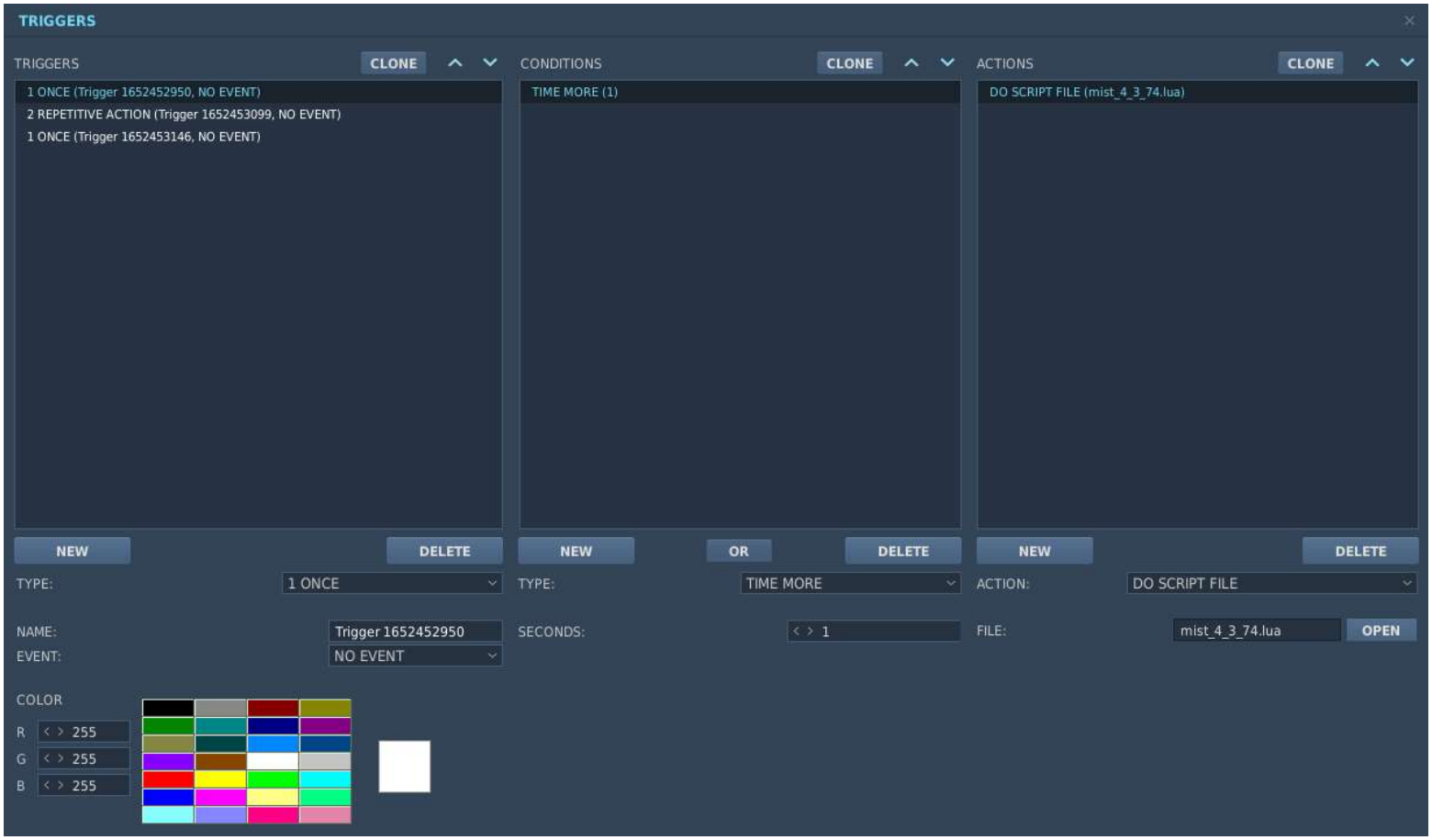
https://github.com/mrSkortch/MissionScriptingTools/releases



In the “Triggers” section of the mission editor

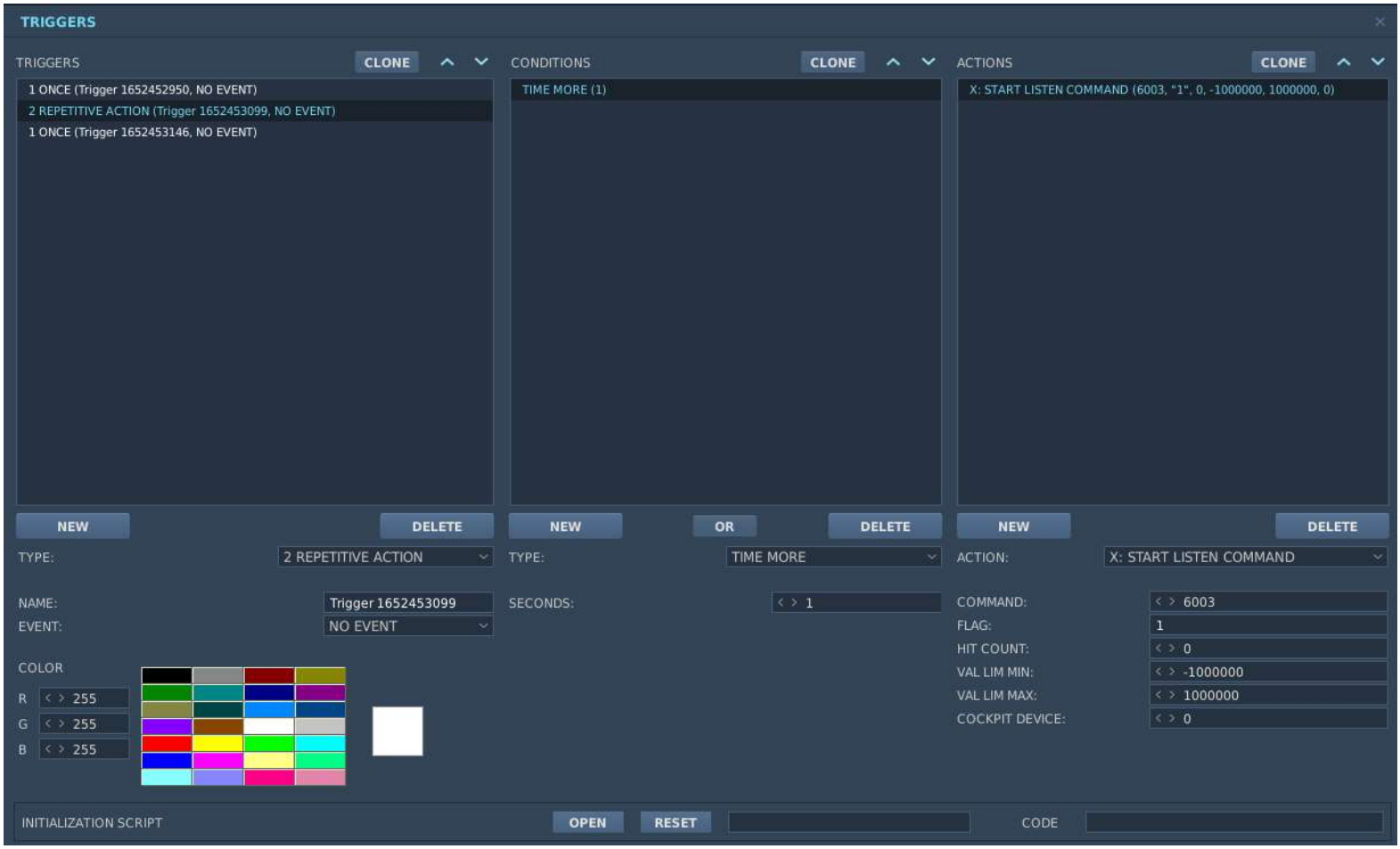
Create the first trigger

Triggers, Click New, Type: 1 ONCE
Conditions: Type: TIME MORE, Seconds: 1
Actions: DO SCRIPT FILE, **mist_4_3_74.lua**



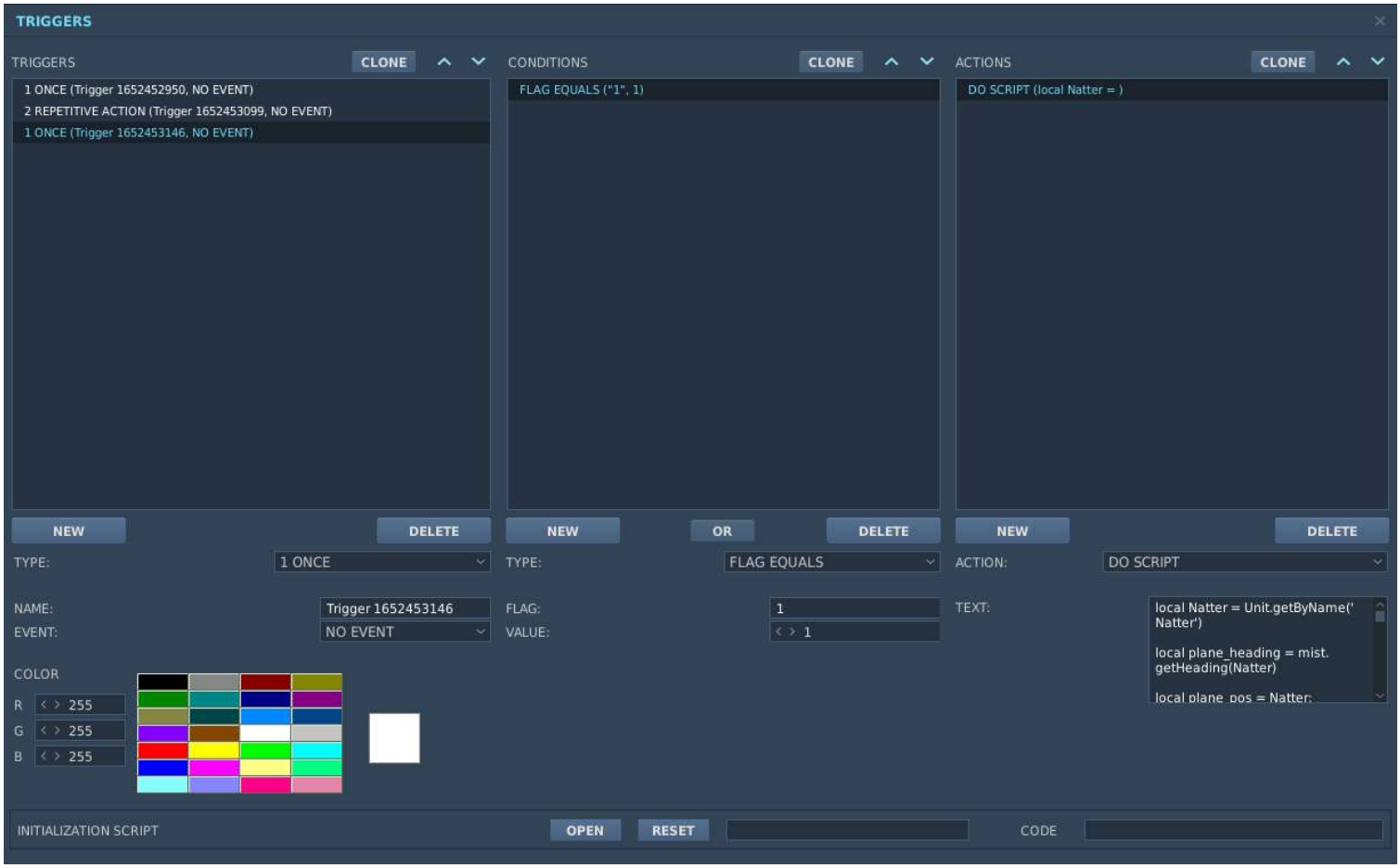
Create the second trigger

Trigger Click New, Type: 2 REPETITIVE ACTION
Conditions: Type: TIME MORE, Seconds: 1
Action: X:START LISTEN COMMAND, Comand: <> 6003, Flag: 1, Hit Count: 0, VAL LIM MIN: 10000, VAL LIM MAX: -10000, Cockpit Device: 0



Create the third trigger

Trigger, Click New, Type: 1 ONCE
Conditions: Type FLAG EQUALS, Flag: 1, Value: 1
Action: DO SCRIPT



On the Text field paste code text below:

```
local Natter = Unit.getByName('Natter')

local plane_heading = mist.getHeading(Natter)

local plane_pos = Natter:getPosition().p

trigger.action.outText("Natter X="..tostring(plane_pos.x),10)
trigger.action.outText("Natter Y="..tostring(plane_pos.y),10)
trigger.action.outText("Natter Z="..tostring(plane_pos.z),10)
trigger.action.outText("Natter Heading="..tostring(plane_heading),10)

local vars =
{
 type = "Bachem_Launch_Platform",
 country = 'Germany',
 category = "Ground vehicles",
 x = plane_pos.x,
 y = plane_pos.z,
```

```
 name = "Bachem_Launch_Platform-1",
 heading = plane_heading - 1.50,
}

mist.dynAddStatic(vars)

trigger.action.outText("Platform Spawned", 3)
```

And thats all. During the game, before takeoff if you press **RCTRL + P** the platform will be spawned in front of the Natter and the vehicle will lifted, rotated and connected to the platform for takeoff.