Reloader
European Distributor

Instructions

Manual

BULLETSEEKER mach4

By Longseeker sro

most advanced air gun radar

BULLETSEEKER is an LONGSEEKER.com brand

ask your local air gun dealer

BULLETSEEKER is a LONGSEEKER.com brand

Introduction

The *BULLETSEEKER mach4* is the most advanced gun radar.

BULLETSEEKER **mach4**   for speeds up to 1200 m/s – 4000 fps

BULLETSEEKER is an amazing piece of technology. Developed by a team of German and Czech Engineers. Case design in the Netherlands, mathematics and programming in Berlin and Prague. Tested by gunners in the Czech Republic , Italy, Canada and the UK. The radar beam formed by incredible lenses with an aluminium foam filter (patented) in Bohemia. The heart is a 120 GHz radar SiR-chip – made in Germany.

All made in Europe

The core components, the 120 GHz radar chip and the beamforming lens, empower us to generate the biggest radar cross section of bullets and pellets on the market. This results in an extremely high accuracy and with a lot of detections in the first meter. The **BULLETSEEKER mach4** is detecting the bullet up 1000 times in the first 100 cm. This is the true muzzle speed and it is not affected much by wind and air pressure. The reason for this is the very short wavelength of only 2.5 mm - competitors are using 10 times longer radar waves.

Chronometers with light barriers have 2 measuring points only. The **BULLETSEEKER mach4** has 20 to 1000 measuring points. We are measuring up to 1000 detections with very high precision. The typical mistake of light barrier systems is the gun position and the firing angle as well as problems with light conditions. This is solved by the *BULLETSEEKER* mach4 due to the radar technology, the small size, its light weight and the ability to mount it on the gun like a flashlight.

Enjoy accuracy, enjoy **BULLETSEEKER**

radar horn

battery cover

front foil with on/off
button and LED area

On / Off

- Press the switch for a second

- LED is flashing for 3x in orange

- LED flashing is changing to blue search for BLUETOOTH pairing

- LED is shining green, BT is established

- LED is switching between green and blue if target (bullet) is detected

- LED is switching to red by charging via USB-C

    - USB connector is for charging only, no data transfer

- Press the switch again to turn Off

    - switching OFF with the timer, set in the APP settings

    - Battery charging by USB-C connector on battery cover

picatinny rail adapter

Mounting

- a Picatinny rail counterpart is mounted on the *BULLETSEEKER*

- a universal V-holder is part of the delivery

- it can be attached to the barrel with an elastic band or stand alone beside the gun
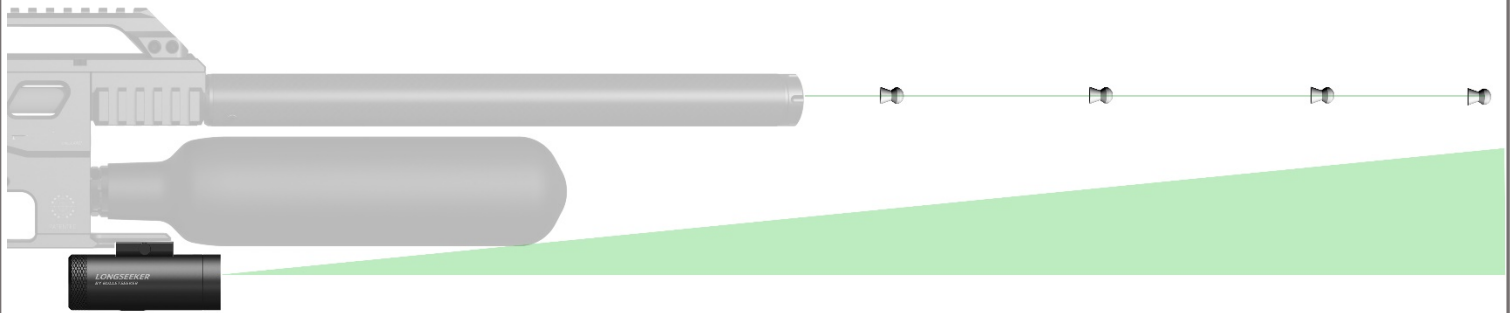
Positioning

- Beware of radar shadow

- Closer to the muzzle is better

- Find the right position on your gun by testing

- Beam forming is set to 22 degrees mid of the lens

- Do not cover the lens and the aluminium foam filter

Picture by Michael Andrew Photography

Positioning *BULLETSEEKER* mach4

Explosive ammunition creates a muzzle cloud from hot gases and metallic abrasion. This cloud of plasma and metal splinters is electrically conductive. It can interfere with the radar waves and wipe out the signal.

We have tested different muzzle brakes. Muzzle brakes with a guided gas jet such as star or spiral shape allow the radar signals to pass through very well. Find the right position on your gun by testing.

$$R = K_\alpha \cdot \sqrt[4]{\frac{P_S \cdot G^2 \cdot \lambda^2 \cdot A_z \cdot t_i}{K \cdot T_0 \cdot n_R \cdot (4\pi)^3 \cdot d}} \cdot \sin\left(\frac{2\pi \cdot h_m}{\lambda} \sin\gamma\right) \cdot e^{-0,115\delta_R \cdot R_e}$$

Data processing

- Data processing is fully automatic
- All data can be saved to your mobile phone and processed by yourself as well
- Data are saved in the folder "DOWNLOADS" with the file name "BS + time stamp" as a .log file, readable with a text editor
- The file name is a proposal only, you can rename it
- The angle γ between BULLETSEEKER and muzzle is important and falsifies the results of the first 3-10 detections (first 10 cm) per shot
- The initial speed is measured in the first meter
- You can evaluate and correct the data. In the app you can manage the data by scrolling with your finger tip

Application *BULLETSEEKER* **mach4**   Android 9 and higher

- **SETTINGS**
- adjust the time for switch off
- adjust velocity range for your gun for better detections.
- speed range is

  BULLETSEEKER **mach4** 250-1200 m/s , 820 – 4000 fps
- *BULLETSEEKER* **mach4**   has 3 preset speed ranges

  Handgun 250 - 400 m/s , 820 – 1300 fps

  Shot gun 300 – 600 m/s , 1000 – 2000 fps

  Rifle   500 – 1200 m/s ,   1600 - 4000 fps
- adjust the magnitude (sensitivity). Lower is more sensitive. The best detections are between 0 -300. It varies depending on your environment. For higher speeds it is better to use a higher sensitivity , beginning at 0 (zero) .
- Sound output is in the language of your cell phone
- Status F/N is showing connection status

BULLETSEEKER mach4

HOME	PROFILES	SETTINGS

Interface

Language   English (United States)

Sound   ⬤

Keep screen on   ⬤

Bluetooth Device

Firmware version

Status   F

Switch off after [sec]   300

Extend switch off period after shot   ⬤

Switch off device on exit   ⬤

Sound on device on/off   ⬤

Velocity Range

Handgun	Shotgun	Rifle
250 - 400 m/s	300 - 600 m/s	500 - 1200 m/s
820 - 1310 fps	980 - 1970 fps	1640 - 3940 fps

Sensitivity min. (100-25500)   100

Device Name   B-SEEKER

Connectivity

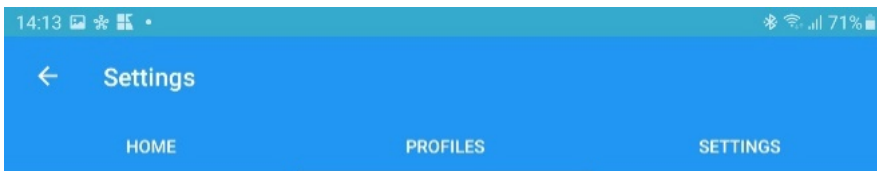Status   Disconnected

CONNECT

III   ◯   <

PROFILES

- Set your own profile
- Metric or US
- press **E** for edit

- press ✚ for additional profile
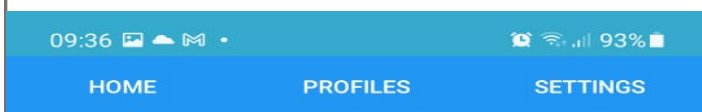
- **HOME**
- Press **CONNECT** for Bluetooth pairing
- After a shot, data will be shown on the screen
- Press **C** to clean all data from screen
- Press **S** to save all data to DOWNLOADS \BS+ time stamp

Data are saved in the folder DOWNLOADS with the file name "BS_ time stamp" as a .log file, readable and editable with a text editor. In the APP PRO version, you have a data diagram to handle the data with a finger tip slider. This enables you to evaluate and correct the data. (see angle γ between BULLETSEEKER and muzzle)

09:36			93%
HOME	PROFILES		SETTINGS

829.8
Speed [fps]

722.1 Min	32.0 J	09:35:20 Time
829.8 Max	776.0 Average	82 % Battery

CHART	HISTORY

Speed [fps]

800
600
400
200

488 DETECTIONS

09:35			93%
HOME	PROFILES		SETTINGS

839.0
Speed [fps]

722.1 Min	32.7 J	09:35:20 Time
839.0 Max	780.6 Average	82 % Battery

CHART	HISTORY

Speed [fps]

800
600
400
200

488 DETECTIONS
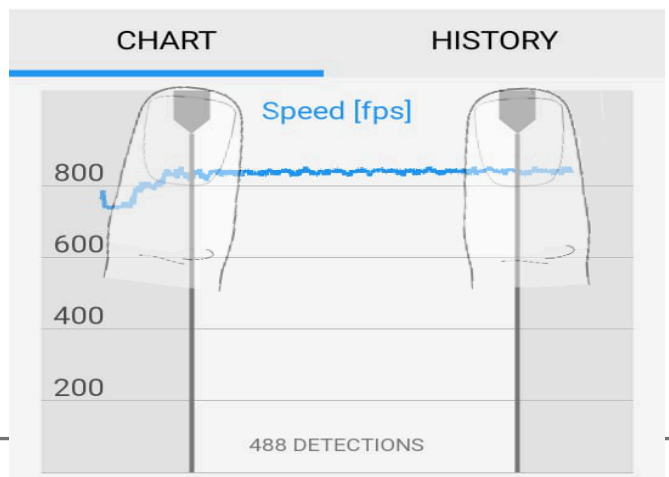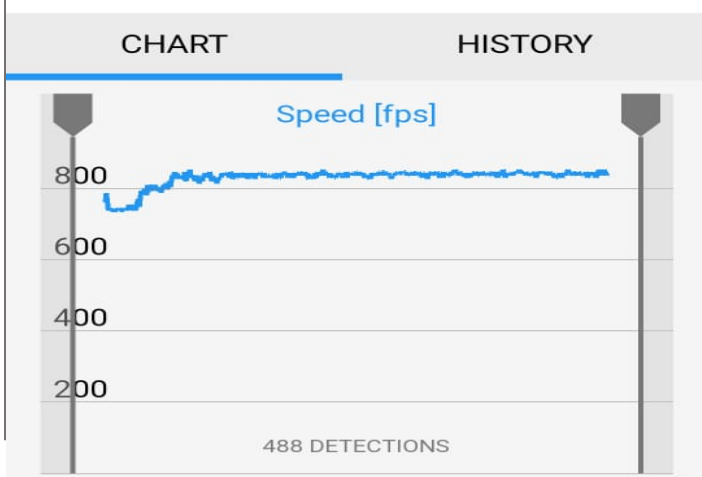
SAME SHOT

Data export

save data
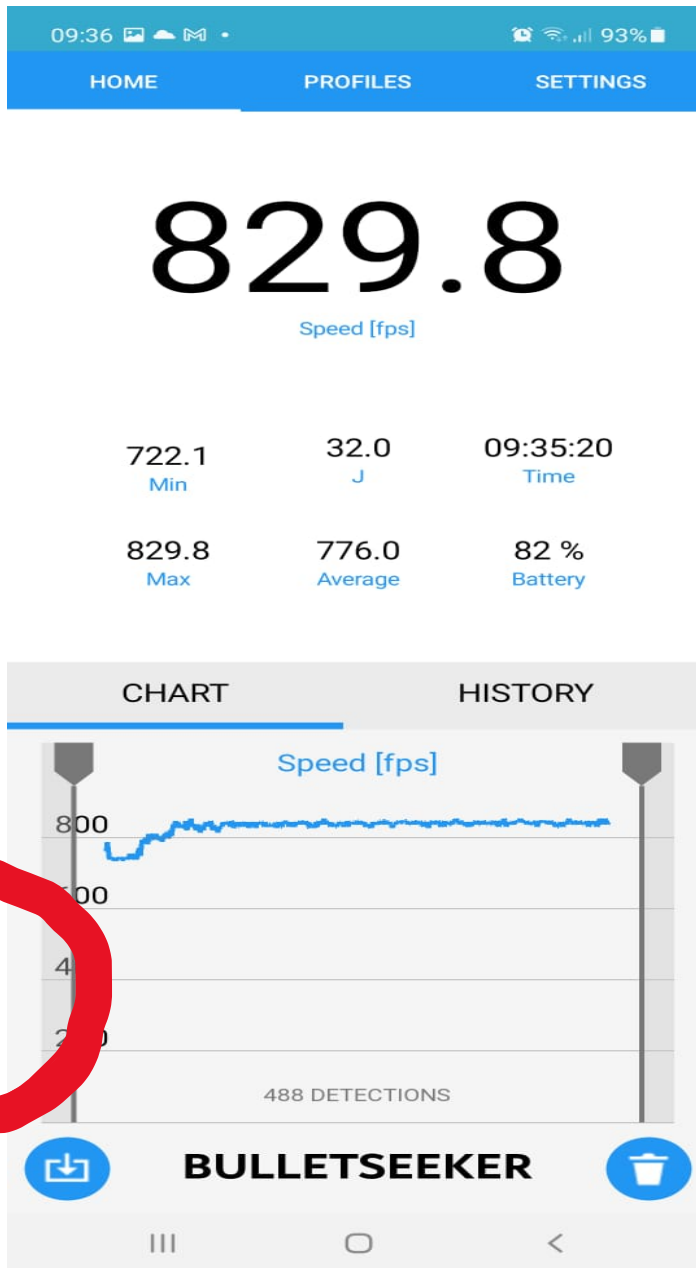
Press the data download button

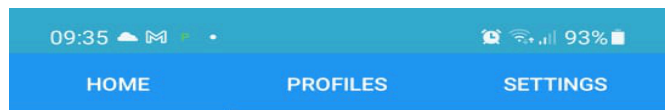Save it , standard file name is " BS _time stamp" . You can also enter a different name there. Data are saved in the folder DOWNLOADS with the file name "BS_ time stamp" as a .log file, readable and editable with a text editor.

Evaluate data   *BULLETSEEKER* **mach4**   version

Typical log file looks like below:

BS_ 2022-04-15 cink - Notepad

File   Edit   View

```
15.04.2022 16:59:20
 772,3 m/s
 Num.   Speed   TargetMag.   MeanMag.
    0     771             0          0
    0     768             0          0
    0     769             0          0
    0     771             0          0
    0     773             0          0
    0     771             0          0
    0     773             0          0
    0     769             0          0
    0     768             0          0
    0     769             0          0
    0     768             0          0
    0     768             0          0
    0     769             0          0
    0     769             0          0
    0     771             0          0
    0     769             0          0
    0     769             0          0
    0     771             0          0
    0     771             0          0
    0     769             0          0
    0     769             0          0
    0     771             0          0
    0     769             0          0
    0     771             0          0
    0     769             0          0
    0     771             0          0
    0     771             0          0
    0     773             0          0
    0     771             0          0
    0     771             0          0
    0     771             0          0
    0     769             0          0
    0     771             0          0
    0     768             0          0
    0     769             0          0
    0     771             0          0
```

A special APP version with additional data such as signal strength etc. can be ordered for instructors, developers of weapons and ammunition.

BS_ 2021-12-01 hsv19 calc corrected.txt - Notepad

File   Edit   Format   View   Help

```
12/1/2021 5:09:24 PM
 814.9 fps
 Num.   Speed   TargetMag.   MeanMag.
19038    242            73            0
   19    238            82            2
16964    242            78            2
   20    240           110            2
15682    240            98            2
   20    240           152            3
12888    238           144            3
   20    242           184            3
11774    238           174            4
   20    242           188            4
12902    240           212            4
   20    248           193            4
15660    245           212            4
   20    247           182            4
21176    245           222            4
   20    242           164            4
15005    248           202            4
   21    247           205            4
18326    248           185            4
   20    248           194            4
21014    250           146            4
   21    250           176            3
12413    250           138            4
   21    253           122            3
17712    247           112            3
   21    253            82            4
26936    252            85            3
   21    242            72            3
30410    263            78            2
   21    263            76            2
32186    265            92            2
   21    267            84            2
30545    267            73            2
   21    263            89            2
    0    260            85            2
```

In the first two rows are the date and the average speed.

In the first column are in the airgun version a counter of detections. In the these version are there radar detection values to generate a fine detection calculation – for radar developer use only.

The second column shows the speed at each detection.

The third and fourth column shows data with which the quality of the signal acquisition can be assessed. This can be used to improve the positioning.

You can import this log file into a spreadsheet such as Excel.

A typical graph in Excel looks like below;
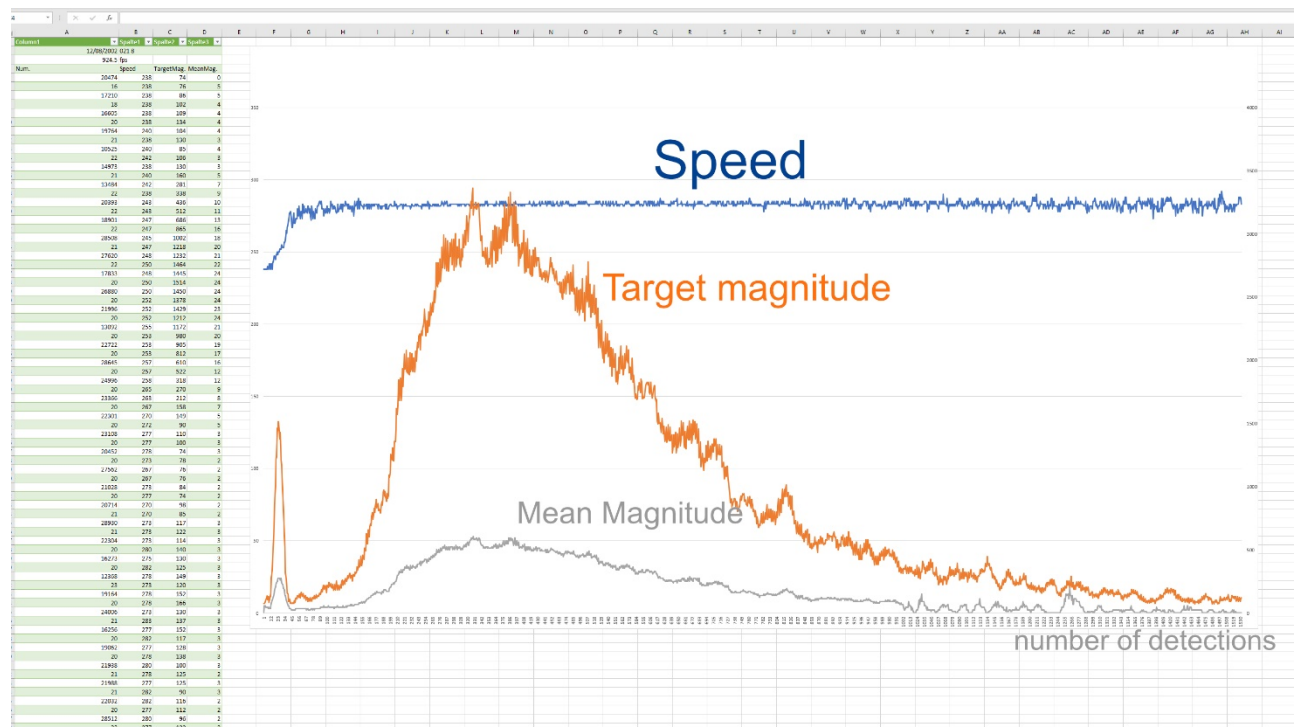
The rising graph, in the beginning, is a positioning issue as described in POSITIONING.

BULLETSEEKER detects and measures the shot in the first 80 cm and thus delivers the real V_0.

BULLETSEEKER *is a brand of* *Longseeker.com*

BULLETSEEKER is developed manufactured and produced by Longseeker sro

Longseeker sro

Všetatská 307, Chrást, 277 15 Tišice

Czech Republic

Certified with:

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