PBS How to generate pdf Abacus.

Version 1.26

Table of content

[1 Prerequisites 2](#_Toc178331745)

[2 Manual check 2](#_Toc178331746)

[3 Automatic generation of the Abacus pdf file 5](#_Toc178331747)

[3.1 Generate the script #1 5](#_Toc178331748)

[3.2 Generate the Abacus 5](#_Toc178331749)

[3.3 Generate the script #2 5](#_Toc178331750)

[3.4 Convert html to pdf 5](#_Toc178331751)

[3.5 Merge pdf files 5](#_Toc178331752)

[4 Files contents 5](#_Toc178331753)

# Prerequisites

The Rifle, Mounting device, Sight, Amo, Bullet, Zeroing conditions and Shooting conditions are well known.

The CSV files have been created accordingly.

Zeroing has been done and the zero.csv file has been updated accordingly.

# Manual check

Create a Shooting with all options (except Zeroing), a Target distance of 1000m, Wind 6 m/s coming from II (2) hours. For Coriolis use a shooting direction of 180° and for the Horizontal Angle use 15°.

Use ICAO Atmosphere (Alt. = 0m, Pressure = 1013.25 hPa, Temp. = 15°C, Relative Humidity =0%) and a latitude of 46°22’25” N.

0.308 190 772 1000 180 Y 6 2 Y 0.0001 N 15 Y G1 1 C

Reset all options to none, Wind speed to 0, Shooting Direction to 0, Horizontal Angle to 0.

Set generate Abacus to Y.

0.308 190 772 1000 0 N 0 2 N 0.0001 N 0 N G1 1 Y

Generate the Abacus.

Check that the Elevation and Windage for the 1000m distance given by the Shooting card and by the Abacus, the result should be close.

Shooting Card example:

A close-up of a card

Description automatically generated

Abacus example:

A table with numbers and letters

Description automatically generated

Cross check :

**Shooting Card**

Target Distance = 1000m

Elevation:

For distance 1’000m = +174.5 Up

Shooting Angle 15° : Elevation = -17.3

Aerodynamic Jump : Elevation = -1.3

Elevation: 174.5 - 17.3 - 1.3 = 155.9 clicks, rounded to **+156 Up**

Windage:

Spind Drift : -3.0

Cross Wind : 35.3

Corriolis Latéral : -1.2

Windage: - 3 + 35.3 - 1.2 = 31.1 clicks, rounded to **+31 Right**

**Abacus**

Target Distance = 1’000m , Elevation= +167 Up

Shooting Angle: 15° for Elevation is 10° = -5 for 20° = -20 average is (-5-20)/2=-12.5

Pressure: 1’013.25 hPa Elevation is 0

Temperature: 15°C Elevation is 0

Wind:

Speed: 6 m/s

Direction: 2h

For II/IV O’clock Elevation is 2 Windage 35 and Aerodynamic Jump (Elevation) -1

Windage for Spin Drift is -3

Finally:

Elevation: 167 - 12.5 + 0 + 0 + 2 - 1 = 155.5 clicks, rounded to **+155 or +156 Up**

Windage: 35 - 3 = **32 clicks**

**Comparison**

|  |  |  |
| --- | --- | --- |
| **Method** | **Elevation** | **Windage** |
| Card | 156 | 31 |
| Abacus | 155/156 | 32 |
| Difference  (Card-Abacus) | +1/0 | -1 |
| Comments | Coriolis is not taken into account in Abacus | Coriolis is not taken into account in Abacus |

**Applied Ballistic:** (iPhone or Kestrel)

For AB as only one value is possible we have taken the average value BC\_G1 0.524

For PBS BC\_G1 is function of speed

If speed is higher than 689 m/s then BC\_G1 = 0.533

If speed is between 689 m/s and 525 then BC\_G1 = 0.525

And If speed is lower than 525 m/s then BC\_G1 = 0.515

Other parameters are as in the simulation for a Card with PBS

Elevation: 137U

Windage: 33R

A screenshot of a computer

Description automatically generated

**Impact Balistic :** ( Abacus but for a 175gr bullet, 800m/s )

Target Distance = 1000m , Elevation: 143

Shooting Angle: 15° for Elevation is 10 = -2 for 20 = -8 average is (-2-8)/2=-5

Pressure: 1’013.25 hPa 1000 = -2 1050 = +5 delta is +7 for 50 hPa

Elevation is -2 + (7/50)\*15 = 0.1

Temperature: 15°C Elevation is 0

Wind:

Speed: 6 m/s

Direction: 2h

For II/IV O’clock Windage 36 and Aerodynamic Jump (Elevation) -1

Windage for Spin Drift is -3

Finally:

Elevation: 143-5+0.1+0-1 = 137.1, rounded to +137

Windage: 36-3 = 33

A white paper with black text

Description automatically generated

|  |  |  |
| --- | --- | --- |
| **Method** | **Elevation** | **Windage** |
| PBS Card | 156 | 31 |
| PBS (Abacus) | 155/156 | 32 |
| Applied B | 137 | 33 |
| Impact B (Abacus) | 137 | 33 |
| Comments | Coriolis is not taken into account in Abacus | Coriolis is not taken into account in Abacus |

# Automatic generation of the Abacus pdf file

Automatic generation of the Abacus pdf file is a multiple steps process.

## Generate the script #1

To generate the bash script ( PBS\_Abacus\_Creation.bsh ) type this command in a terminal.

./PBS\_Abacus\_Script\_Creation.bash

## Generate the Abacus

As soon as the new file is generated, this command in a terminal.

time ./PBS\_Abacus\_Creation.bsh

All the html file are generated.

./PBS\_Abacus\_Creation.bsh 114.89s user 1.09s system 58% cpu 3:16.57 total

## Generate the script #2

To generate the bash script ( PBS\_Abacus\_HTML2PDF.bsh ) to convert the html files into pdf files, type this command in a terminal.

./PBS\_Abacus\_htmlToPDF.bash

## Convert html to pdf

To convert the html files into pdf files, type this command in a terminal.

./PBS\_Abacus\_HTML2PDF.bsh

## Merge pdf files

A finally to merge all the pdf files into one single pdf file, type this command in a terminal.

python3 ./pdf-merge.py

# Files contents

This bash file is used to generate another bash script, which itself will create all the html Abacus files.

If required, edit the file and change the version of PBS ( highlighted bellow ).

To launch the script enter : ./PBS\_Abacus\_Script\_Creation.bash

cat ./PBS\_Abacus\_Script\_Creation.bash

#!/bin/bash

Echo "PBS Abacus Creation"

Str1="python3 ./PBS-v126.py 0.224 43 800 "

Str2=" 200 N 0 6 N 0.0001 N 0 N G1 1 Y"

Dist=100

echo "#!/bin/bash" >./PBS\_Abacus\_Creation.bsh

while [ $Dist -le 1600 ]

do

Cmd="$Str1$(printf "%d" $Dist)$Str2"

echo $Cmd

echo $Cmd >>./PBS\_Abacus\_Creation.bsh

echo "sleep 5" >>./PBS\_Abacus\_Creation.bsh

echo "wait" >>./PBS\_Abacus\_Creation.bsh

Dist=$[$Dist+100]

done

This bash file was generated automatically and is used to generate all the html Abacus files.

Execution time 18+5=23 secondes \* number of distance to be processed.

We have 100 to 1500 => 15 distances, total duration 23\*15=354 seconds, roughly 6 minutes.

To launch the script enter : time ./PBS\_Abacus\_Creation.bsh

time is not mandatory but it gives the total time of execution of the script when it ended.

cat ./PBS\_Abacus\_Creation.bsh

#!/bin/bash

python3 ./PBS-v119.py 0.224 43 800 100 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 200 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 300 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 400 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 500 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 600 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 700 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 800 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 900 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1000 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1100 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1200 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1300 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1400 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1500 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

python3 ./PBS-v119.py 0.224 43 800 1600 200 N 0 6 N 0.0001 N 0 N G1 1 Y

sleep 5

wait

This bash file is used to generate another bash script, which itself will convert all individual html file into pdf.

If required, edit the file and change the caliber, ammo brand, bullet weight and date ( highlighted bellow ).

To launch the script enter : ./PBS\_Abacus\_htmlToPDF.bash

cat ./PBS\_Abacus\_htmlToPDF.bash

#!/bin/bash

Echo "PBS Abacus html files conversion to pdf"

Str0="python3 h2p-v100.py"

Str1=" Abacus-308\_GGG\_175\_"

Str2="\_2024-09-25.html"

Str3=" Abacus-308\_GGG\_175\_"

Str4=".pdf"

Dist=100

echo "#!/bin/bash" >./PBS\_Abacus\_HTML2PDF.bsh

while [ $Dist -le 1600 ]

do

Cmd="$Str0$Str1$(printf "%d" $Dist)$Str2$Str3$(printf "%d" $Dist)$Str4"

echo $Cmd

echo $Cmd >>./PBS\_Abacus\_HTML2PDF.bsh

echo "wait" >>./PBS\_Abacus\_HTML2PDF.bsh

Dist=$[$Dist+100]

done

This bash file was generated automatically and is used to convert all individual html Abacus files into pdf (New files are created).

To launch the script enter : ./PBS\_Abacus\_HTML2PDF.bsh

cat ./PBS\_Abacus\_HTML2PDF.bsh

#!/bin/bash

python3 h2p-v100.py Abacus-308\_GGG\_175\_100\_2024-09-25.html Abacus-308\_GGG\_175\_100.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_200\_2024-09-25.html Abacus-308\_GGG\_175\_200.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_300\_2024-09-25.html Abacus-308\_GGG\_175\_300.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_400\_2024-09-25.html Abacus-308\_GGG\_175\_400.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_500\_2024-09-25.html Abacus-308\_GGG\_175\_500.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_600\_2024-09-25.html Abacus-308\_GGG\_175\_600.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_700\_2024-09-25.html Abacus-308\_GGG\_175\_700.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_800\_2024-09-25.html Abacus-308\_GGG\_175\_800.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_900\_2024-09-25.html Abacus-308\_GGG\_175\_900.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1000\_2024-09-25.html Abacus-308\_GGG\_175\_1000.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1100\_2024-09-25.html Abacus-308\_GGG\_175\_1100.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1200\_2024-09-25.html Abacus-308\_GGG\_175\_1200.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1300\_2024-09-25.html Abacus-308\_GGG\_175\_1300.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1400\_2024-09-25.html Abacus-308\_GGG\_175\_1400.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1500\_2024-09-25.html Abacus-308\_GGG\_175\_1500.pdf

wait

python3 h2p-v100.py Abacus-308\_GGG\_175\_1600\_2024-09-25.html Abacus-308\_GGG\_175\_1600.pdf

wait

This python script is used to merge all the pdf file into one pdf file.

To modify the name of the output file, or input file (the caliber, ammo brand, bullet weight) edit the file and change the name (highlighted bellow).

To launch the script enter : python3 ./pdf-merge.py

cat pdf-merge.py

from pypdf import PdfWriter

OutputFile="Abacus-Ruger-308\_GGG\_175.pdf"

Str1="Abacus-308\_GGG\_175\_"

Str2=".pdf"

Dist=100

i=0

pdfs = []

while Dist <= 1600:

FileName= Str1+str(Dist)+Str2

pdfs.append(FileName)

# print("FileNAme [",i,"] = ",pdfs[i])

Dist += 100

i+=1

# merger = PdfMerger()

print(" Merging pdfs...")

merger = PdfWriter()

for pdf in pdfs:

merger.append(pdf)

merger.write(OutputFile)

merger.close()