

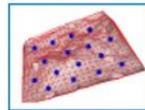
User Manual

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BMX BoreholeFinder



**User Manual
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1 Introduction

The *BMX BoreholeFinder* is used to set the position of *Borehole Collars* on a 3D model interactively by the computer mouse. The position of *Borehole Collars* are finally confirmed in the *BMX BlastPlanner* and are further used for the generation of the *Drill Patterns*. The software is tightly connected with the *BMX BlastSiteGenerator3D* (definition of geometric borders of the *Blast Site*) and the *BMX BlastPlanner* (generation and optimization of *Drill Patterns*).

This user manual addresses all topics related to the *BMX BoreholeFinder* i.e. installation, user interfaces, features and operations. Let us know if we can support you, and give us your valuable feedback. Only this way it remains possible to keep the system both, flexible enough for broad usage and sufficiently specific for your applications.

We wish you success with the *BMX BoreholeFinder*.

The Team of 3GSM

Graz, October 2024

2 General

The *BMX BoreholeFinder* is part of the *BlastMetriX* package and is not available as a stand-alone program. The installation takes place during the installation of *BlastMetriX* and is described in the corresponding user manuals.

3 User Interface

The user interfaces of the *BMX BoreholeFinder* (Figure 1) comprising the menu bar, the toolbar, the navigation bar, the 3D viewer and the thumb wheels.



- 1 Menu bar
- 2 Toolbar
- 3 Navigation bar
- 4 3D viewer
- 5 Thumb wheels

Figure 1: User interface of the *BMX BoreholeFinder*

4 Features

This section describes the available functions of the *BMX BoreholeFinder*.

4.1 Context menu of the 3D viewer

The context menu of the 3D viewer allows the change in the display of the 3D model. A click on the right mouse button in the viewer opens a pop up window and several options can be chosen:

<i>Draw as is</i>	The 3D topography is completely overlaid by the digital photograph (3D model)
<i>Wireframe</i>	A Triangulated red coloured point cloud is forming the topography
<i>Wireframe overlay</i>	The 3D model and a red coloured overlay of the wireframe is forming the topography
<i>Points</i>	The point cloud of the scene according to the topography is shown
<i>All Points</i>	All available points of the 3D model according to the photograph are shown
<i>Show Axes</i>	Turns the co-ordinate axes on and off
<i>Show Bounding Box</i>	Turns the bounding box surrounding of the 3D model on and off

4.2 Menu bar

File Edit Help

The menu bar comprises three main menus. The menu commands are accessible using the mouse cursor. The following paragraphs describe the structure and commands of the three main menus (*Fil*, *Edit* and *Help*).

Menu File

<i>Load 3D Model</i>	Opens a 3D model (".jm3 file")
<i>Load Blast Site</i>	Loads the corresponding <i>Blast Site</i> (".smb" file)
<i>Save Blast Site</i>	Saves the <i>Blast Site</i> (".smb" file)
<i>Save Blast Site as</i>	Renames and saves the <i>Blast Site</i> (".smb" file)
<i>Exit</i>	Closes <i>BMX BoreholeFinder</i>

Menu Edit

<i>Undo</i>	Revokes the previously executed commands step by step
<i>Redo</i>	Redoes commands revoked by the "Undo" function step by step
<i>Add Boreholes</i>	Activates the positioning of <i>Borehole Collars</i>
<i>Move Boreholes</i>	Displaces the position of <i>Borehole Collars</i>

Deletes Boreholes Removes the position of *Borehole Collars*

Delete all Boreholes Deletes all positions of *Borehole Collars*

Menu Help

User Manual Opens the manual of the software component

Units Displays the units used by the software

About BoreholeFinder Displays version and release information of the software component

4.3 Toolbar



Load 3D Model



Opens a 3D model (“.jm3 file”)

Load Blast Site



Loads the corresponding *Blast Site* (“.smb” file)

Save Blast Site



Saves the *Blast Site* (“.smb” file)

Undo



Revokes the previously executed commands step by step

Redo



Redoes commands revoked by the “*Undo*” function step by step

Add Borehole



Activates the positioning of *Borehole Collars*

Move Borehole



Displaces the position of *Borehole Collars*

Delete Borehole



Deletes all positions of *Borehole Collars*

Annotation Size



Changes the size of the marker in the 3D viewer

4.4 Navigation bar

Hint:

The *BMX BoreholeFinder* toggles between the *Edit* and *Navigate* mode by pressing the “Esc” key.

Edit



Performs actions within the 3D model such as marking annotations, etc. (active = blue)

Navigate



Controls the motion and inspection of a 3D model (active = blue)

Seek to a Selected Point



Zooms towards the selected location on the 3D model

Move to Home Position



Sets the viewer to its initial position

Zoom out / Zoom in



Zooms out from the current view. Zooms to the previous view again.

Top Down View



Orientates the 3D model from the camera view (top down).

Auto Rotate (fixed or view)



Rotates the 3D model from a fixed point (top down) or from the current point of view

Toggle Perspective/Parallel Projection



Toggles between perspective and parallel projection

Thumb wheels

The thumb wheels are used for rotation and zooming

4.5 Navigation mode

The devices used in the *Navigate* mode are the mouse and/or the keyboard.

Mouse navigation

- Rotation: The left mouse button rotates the 3D model. Just keep the left button pressed and move the mouse around to see the 3D model rotating.
- Context menu: The right mouse button opens a context menu where the representation of the 3D model can be influenced.
- Panning: The middle mouse button is used to pan the 3D model. The same can be done by pressing “Ctrl” or “Shift” and using the left mouse button.
- Zooming: Pressing the left and middle mouse button at the same time is used to zoom. The same can be done by pressing “Ctrl” and “Shift” and using the left mouse button. When turning the wheel of a wheel mouse the 3D model is also zoomed.

Hint:

It is preferred to have a mouse with 3 buttons, or a wheel mouse. Usually the wheel acts as the third mouse button.

Keyboard navigation

- Straight motion is performed by pressing the corresponding arrow key *“Left”*, *“Right”*, *“Up”* or *“Down”*.
- Zooming is performed by pressing *“Shift”* simultaneously with the arrow key *“Up”* for zooming in and the arrow key *“Down”* for zooming out.
- Rotation of the 3D model in a desired direction is performed by pressing *“Ctrl”* simultaneously with the corresponding arrow key *“Left”*, *“Right”*, *“Up”* or *“Down”*.

5 Operation

5.1 Standard operation procedure

1. Load a 3D model (“.jm3” file) by clicking “File | Load 3D Model” in the menu bar or by the use of the according icon  in the toolbar.
2. Load the corresponding *Blast Site* by clicking “File | Load Blast Site” in the menu bar or by the use of the according icon  in the toolbar.

Note:

The corresponding *Blast Site* (“.smb” file) is automatically loaded by the *BMX BoreholeFinder* the name is equal name to the corresponding “.jm3” file and it is saved in the same directory on your computer.

Note:

The *BMX BoreholeFinder* shows the top level 3D data only. The top level area is defined by the *BMX BlastSiteGenerator 3D* (see corresponding user manual for further information).

3. Click on “Edit | Add Borehole” in the menu bar or use the according “Add Borehole”  icon in the toolbar to activate the positioning of *Borehole Collars*.
4. Set the positions of *Borehole Collars* with a click on the left mouse button in the 3D viewer (Figure 2).



Figure 2: Positioned Borehole Collars in the 3D viewer

Hint:

Change the perspective in the navigation bar by activating the *Navigate* mode. Be sure to activate the *Edit* mode again to add further positions of *Borehole Collars*.

Hint:

Adjust the size of the markers with the slider “*Annotation size*”  in the toolbar

5. Finish the standard operation procedure with:
 - a. Save the positions of the *Borehole Collars* in the *Blast Site* file (“*.smb*” file) with a click on “*File | Save Blast Site*” in the menu bar ore by the use of the according icon  in the toolbar.
 - b. Rename the Blast Site File (“*.smb*” file) and save the positions of the *Borehole Collars* with a click on “*File | Save Blast Site As*” in the menu bar.
6. Close *BMX BoreholeFinder* in the menu bar with “*File | Exit*”.

5.2 Edit Borehole Collars

Position of a Borehole Collar

The position of a *Borehole Collar* is edited by following procedure:

1. Click on “*Edit | Move Borehole*” in the menu bar or by the use of the according “*Move Borehole*”  icon in the toolbar.
2. Select the *Borehole Collar* with a click on the left mouse button. The active *Borehole Collar* changes the colour form blue into yellow (Figure 3).
3. Hold the left mouse button and displace the *Borehole Collar* to the desired position.
4. Release the left mouse button.



Figure 3: Borehole Collar activated (yellow) to edit

Delete Borehole Collars

The position of a *Borehole Collar* is deleted by following procedure:

1. Delete settled positions of *Borehole Collars* by clicking “*Edit | Delete Borehole*” or by the use of the according “*Delete Borehole*”  icon in the toolbar.
2. Select the *Borehole Collar* to delete (changes the colour from blue into red) with a click on the left mouse button (Figure 4).

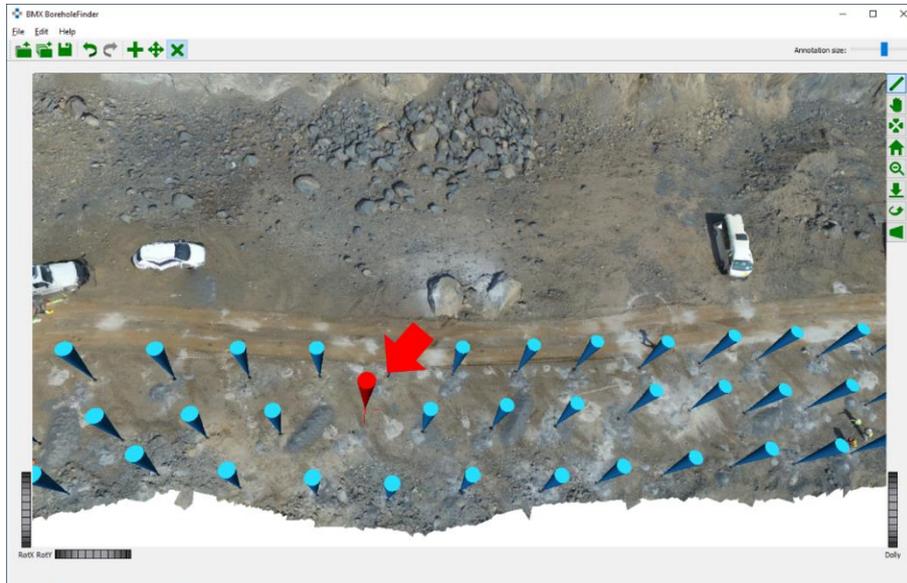


Figure 4: Borehole Collar activated (red) to delete

Hint:

The position of all *Borehole Collars* are deleted by clicking “*Edit | Delete all Boreholes*” in the menu bar.