

# ***MANTECH Tray Editor*** Documentation

**MANTECH**  
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## Glossary of Terms

**.GTY:** File extension for tray file type used with Gilson robots (AM73, AM122, AM197).

**.CSV:** File extension for tray file type used with MANTECH robots (AM354, AM372, AM390).

**X Axis:** Left/right direction. (see below)

**Y Axis:** Backwards/forwards direction. (see below)

**Z Axis:** Upwards/downwards direction. (see below)

**Bed:** Visual representation of the available X/Y travel of a robot.

**Rack:** A grouping of zones, typically representing a physical rack. Used for MANTECH robots only.

**Zone:** A group of vessels, typically of the same type, numbered 1,2,3,...

**Vessel:** An individual target location for the robot probe. Given a diameter to visually represent the physical vessel, *e.g.* tube, beaker, cup *etc.*



## Program Description

The *MANTECH Tray Editor* is a stand-alone program intended for the creation, visualization, or modification of tray files for Gilson or MANTECH robots. Gilson robots use .GTU tray files and MANTECH robots use .CSV tray files. These files are not interchangeable between robots.

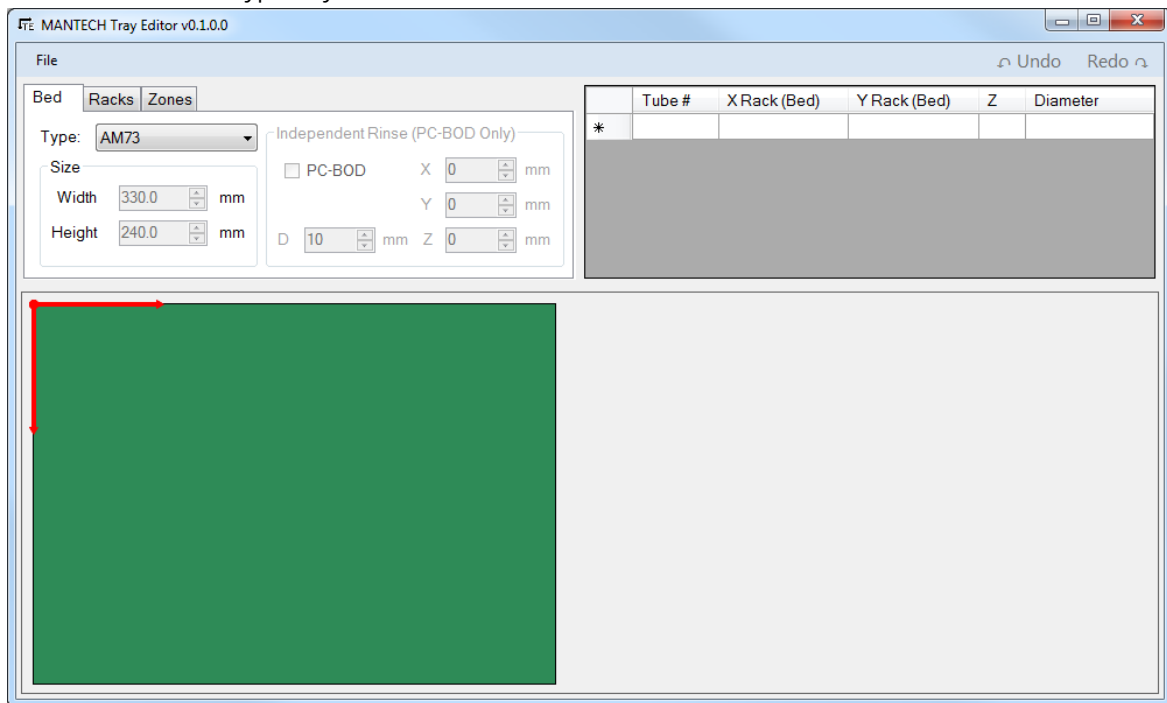
## Installation

### Requirements

- Compatible with Windows: XP, Vista, 7, 8, 10 and both 32/64-Bit Systems.
- Requires: .NET Framework 3.5 or later.
  - Typically already installed as part of base Windows installation.
- The utility is a stand-alone program that can be launched directly, and requires no additional installation steps.

## Creating a new Gilson Tray File

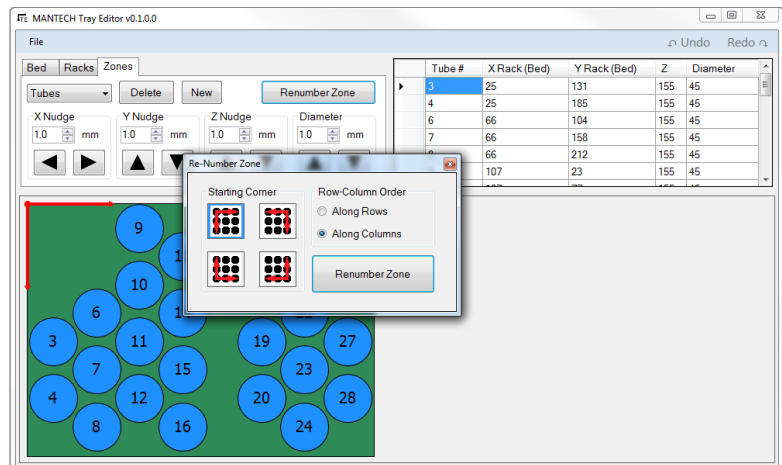
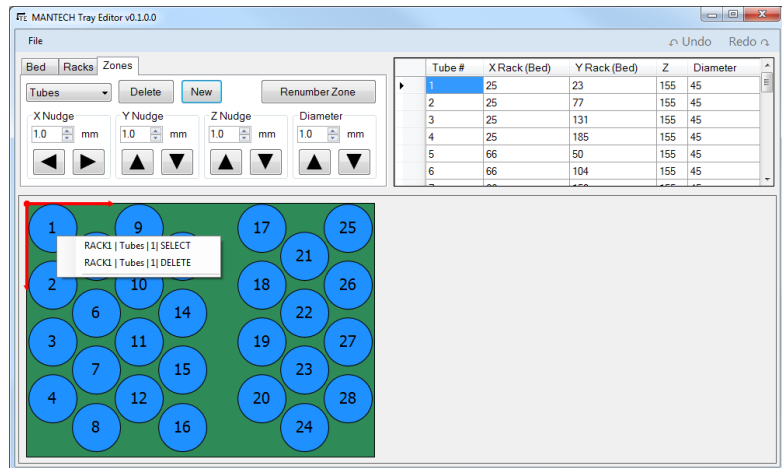
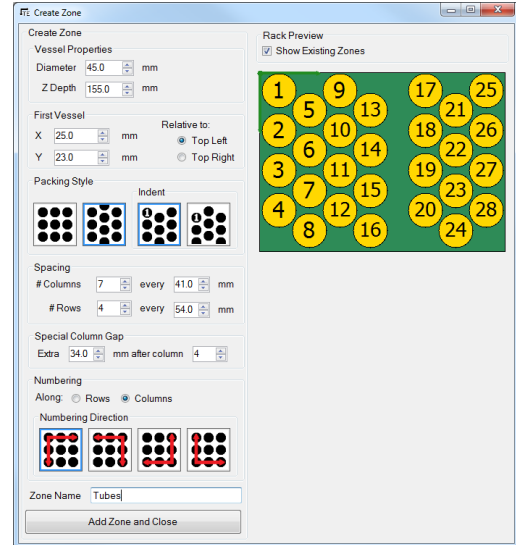
1. Launch the MANTECH Tray Editor.exe
2. Click the New Gilson .GTY Tray button.
3. The main editor will launch, and the default bed will be the AM73.
4. Select the desired bed type from the drop down.
  - a. Note the **red arrows** in the top left corner, indicating the origin (X=0, Y=0) position in the **top left** corner, and the direction of positive value increase (forward and right), note the opposite X positive direction as compared to the MANTECH type tray file.



5. Note:
  - a. On the *Racks* tab, notice that "Rack1" is selected, placed at 0,0 with a width and length matching the bed size.
  - b. The controls are disabled because the Gilson type tray file can only have one rack, so the program matches it to the bed size.
  - c. MANTECH type tray files can have multiple racks, and will be discussed in the next section.

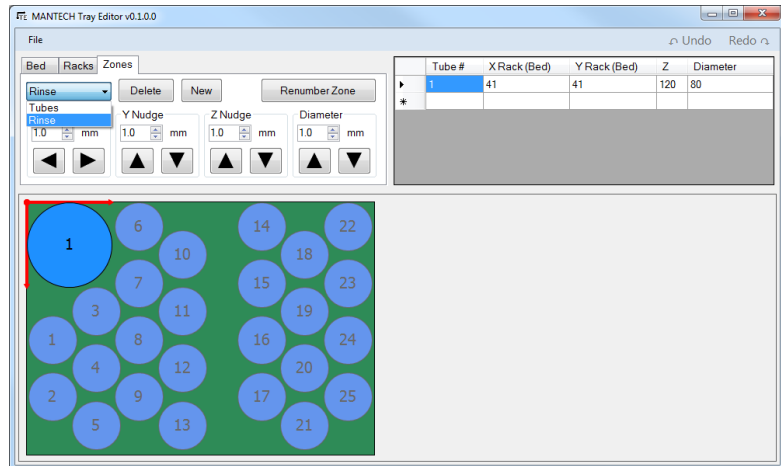
## Zone Creation

- On the *Zones* tab. Click on the “New” button to create a new zone. This will launch the *Create Zone* window.
- Some default values are pre-populated. Proceed from top-to-bottom, setting the appropriate values as you proceed downward.
  - Note: there is no visual indication of the “Z Depth”, so be sure in setting its value. For Gilson type robots, 0 is as low as the arm can travel, and a larger positive number will move the arm upwards.
- Once complete, click the *Add Zone and Close* button to add the zone to the main window view.
- To remove a specific vessel from the bed, either:
  - Right-click on the vessel and select the DELETE option.
  - Or, left click on the vessel (the colour will change to gold) and press the delete key.
- Once the desired vessels are deleted, the zone should be renumbered. Click on the “Renumber Zone” button. Select the desired starting position/direction of numbering. Then click “Renumber Zone” to apply the change.
- To add an additional zone, simply click the “New” button, as in the original zone creation. Again, make the appropriate selections, then add the Zone to the main window. Use the drop-down in the *Zones* tab to select between the zones. Note that when a zone is selected, the vessels contained within become darker, and the non-selected zone(s) become lighter, and the top-right table lists only the vessels in the selected zone.

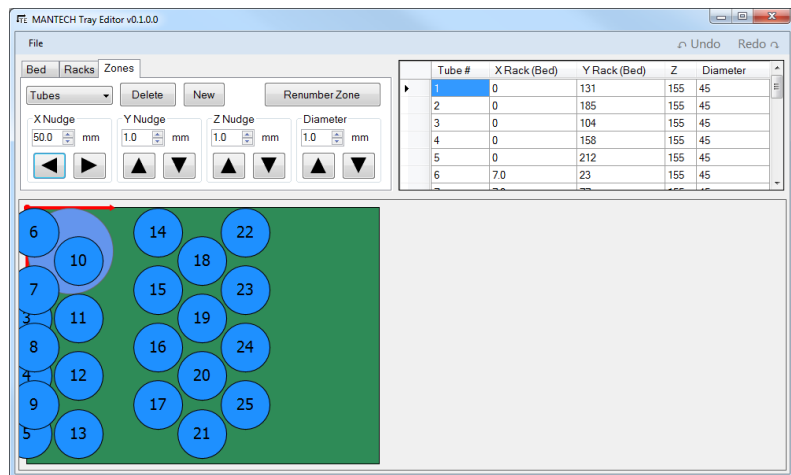


## Adjusting Vessels

1. Left clicking on a vessel will select its zone, and indicate the specific vessel in gold.
2. To edit a specific vessel in a specific zone, its X,Y,Z, and Diameter values can be manually edited in the table.
3. To adjust an entire zone:
  - o With the zone selected in the drop down list, use any of the arrow buttons to adjust the entire zone values by the amount in the corresponding number box.



- o Note that vessels can be nudged positively outside the bed limits, but not negatively. If the nudged value would put a vessel negative, the value will be set to zero. This can break zone spacing patterns. For example if the Tube zone was nudged 100 mm to the left, vessels 6-25 moved as expected but 1-5 start to "bunch up" on the left. This example is an exaggeration, but be careful when nudging near the limits, as a small change will be less visually obvious.



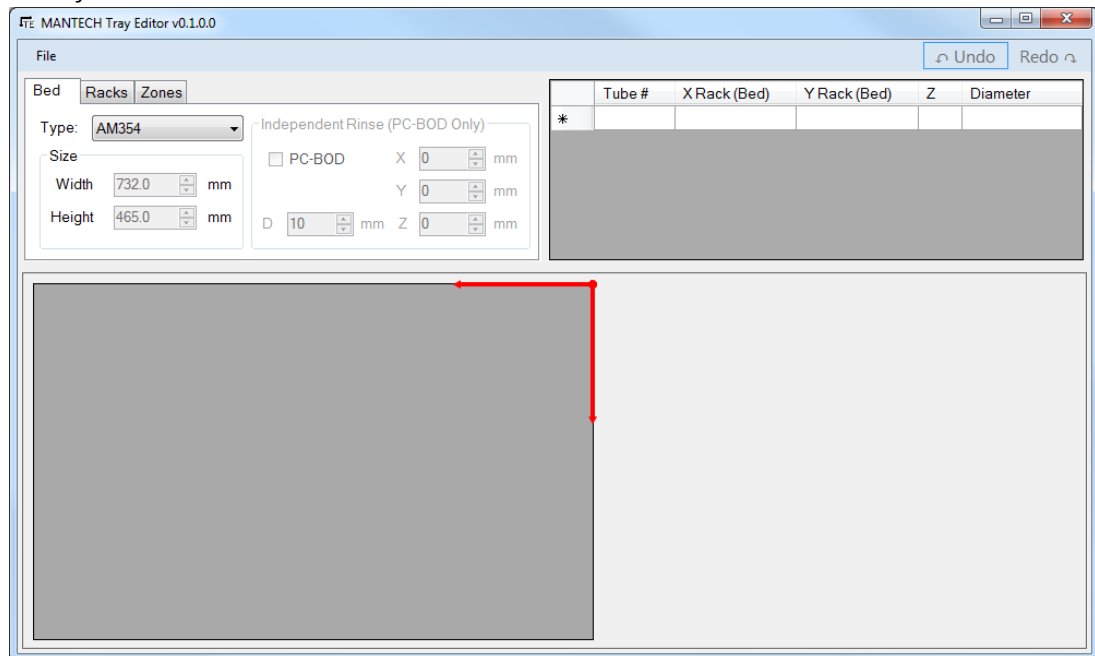
to "bunch up" on the left. This example is an exaggeration, but be careful when nudging near the limits, as a small change will be less visually obvious.

## Saving the Tray File

Select **File>Save As...** to save the tray file as a new file, or to overwrite an existing file. Note that the files must be "Saved As" every time.

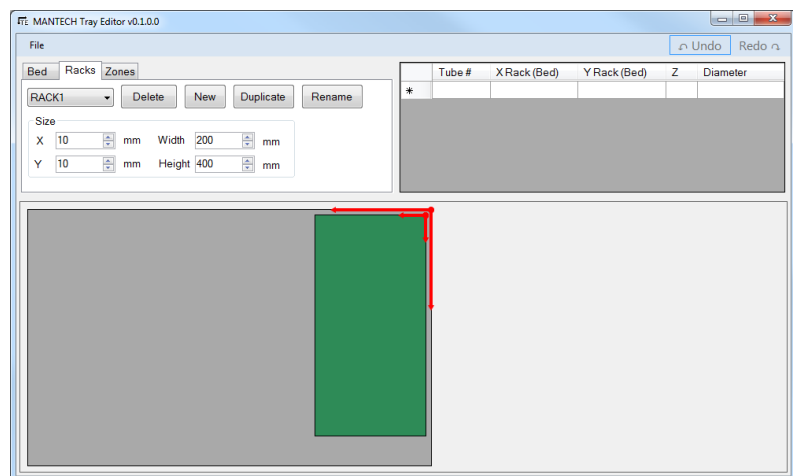
## Creating a new MANTECH Tray File

1. Launch MANTECH Tray Editor.exe
2. Click the New MANTECH .CSV Tray button.
3. The main editor will launch, and the default bed will be the AM354.
4. Select the desired bed type from the drop down selection.
  - a. Note the **red arrows** in the top right corner, indicating the origin (X=0, Y=0) position in the **top right** corner, and the direction of positive value increase (forward and left), note the opposite X positive direction as compared to the Gilson tray file.



## Rack Creation

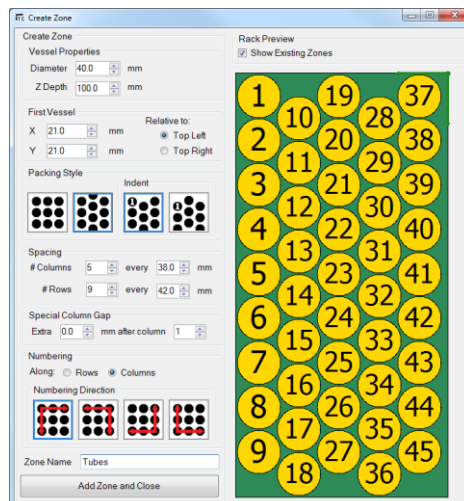
1. On the *Racks* tab, notice that unlike when creating a Gilson tray file, no rack is automatically generated and the controls in this tab are **not** disabled. MANTECH tray files support the use of multiple racks.
2. Click on the *New* button to create a new rack. Set the width/length as well as the X/Y position, noting that this value is relative to the top-right of the rack/bed.





## Zone Creation

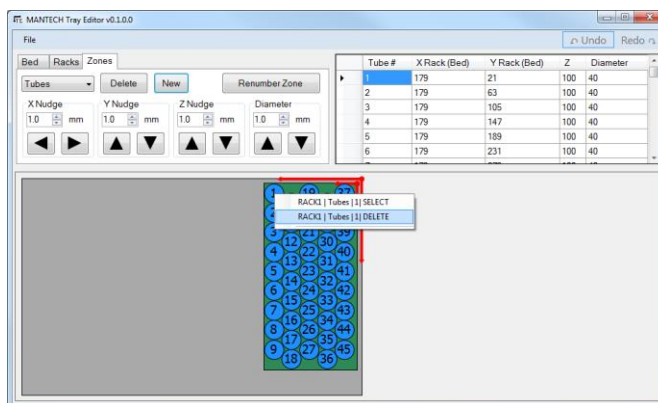
- On the *Zones* tab, click on the *New* button.
  - This will launch the Zone Creation tool.
- Some default values are pre-populated. Proceed from top-to-bottom, setting the appropriate values as you proceed downward. Note that there is no visual indication of the “Z Depth”, so be sure in setting its value. For MANTECH type robots, 0 is as high as the arm can travel, and a larger positive number will move the arm downwards.
  - Note: the positions are relative to the rack, not the bed.
  - Once complete, click the *Add Zone and Close* button to add the zone to the main window.



## Removing Vessels

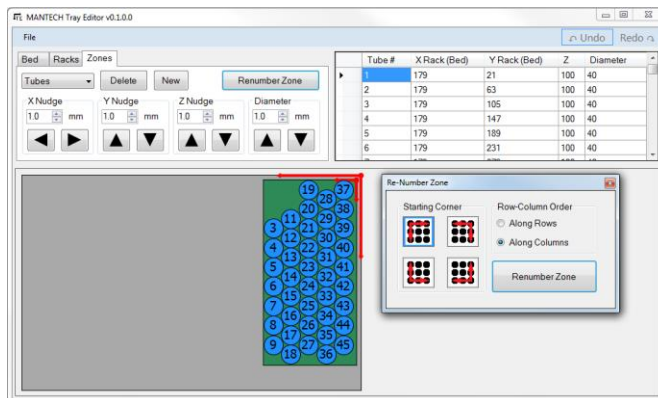
In some cases it may be desirable to remove specific vessels from the pattern generated by the zone creation tool. To remove a specific vessel from the bed in the main window either:

- Right-click on the vessel and select the **DELETE** option.
- Or, left click on the vessel (the colour will change to gold) and press the keyboard delete key.



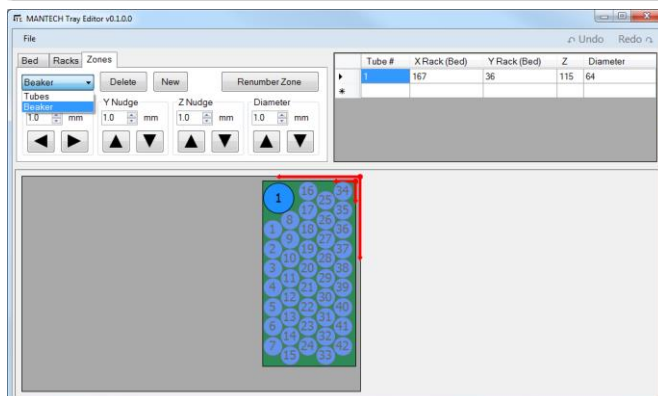
## Renumbering Vessels in a Zone

- Once the desired vessels are deleted, the zone should be renumbered. Click on the *Renumber Zone* button.
- Select the desired starting position/direction of numbering. Then click “Renumber Zone” to apply the change.



## Additional Zones

- To add an additional zone, simply click the “New” button, as in the original zone creation.
- Again, make the appropriate selections, then add the Zone to the main window.
- Use the drop-down in the *Zones* tab to select between the zones.
  - Selected zone shown darker, non-selected zone(s) shown lighter. Table lists only the vessels in the selected zone.



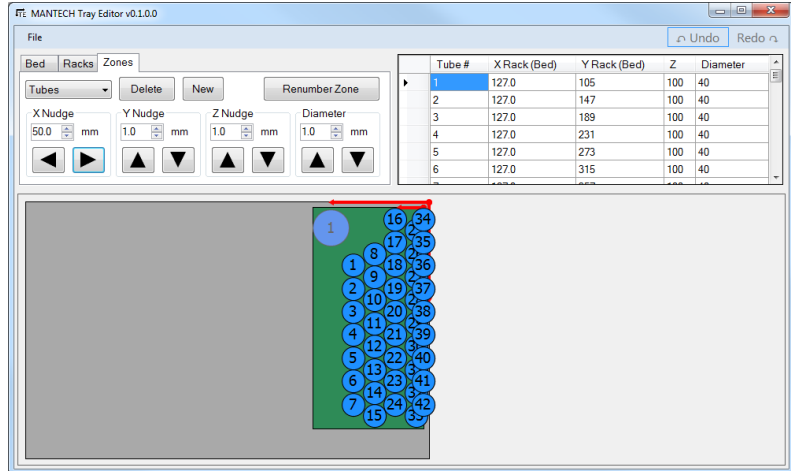
### Editing Vessels

1. Right click on a vessel(s), and from the menu click on the SELECT option of the desired vessel, it will be indicated in gold.
2. To edit a specific vessel in a specific zone, its X,Y,Z, and Diameter values can be manually edited in the table.
  - a. Note that the value for vessel X/Y is relative to the rack origin not the bed.

### Adjusting Entire Zone

1. With the zone selected in the drop down list, use any of the arrow buttons to adjust the entire zone values by the amount in the corresponding number box.

2. Note that vessels can be nudged positively outside the rack limits, but not negatively. If the nudged value would put a vessel negative, the value will be set to zero. This can break zone spacing patterns. For example if the Tube zone was nudged too far to the right, vessels 1-33 moved as expected but 34-42 start to "bunch up" on the right. This example is an exaggeration, but be careful when nudging near the limits, as a small change will be less visually obvious.



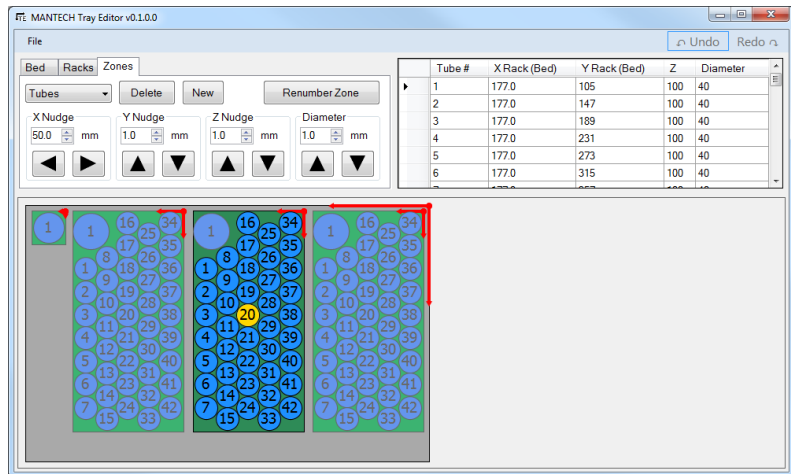
### Create Additional Racks

Once the rack is correct, return to the *Racks* tab, where you can create a new rack, then repeat the Zone creation process or simply click the *Duplicate* button to create a copy of the selected rack, and then position it appropriately using the number boxes on the *Racks* tab.

### Editing Zones

When multiple racks are involved, to edit a specific zone:

1. Go to the *Rack* tab, select the appropriate rack, then go to the *Zone* tab, and select the appropriate zone.
  - a. Or, right-click on a vessel in the desired rack/zone then chose the SELECT option and the rack/zone dropdown will be automatically selected appropriately.
2. The unselected racks/zones will be dimmed, so that the currently selected rack/zone is apparent.



### Saving the Tray File

Select **File>Save As...** to save the tray file as a new file, or to overwrite an existing file. Note that the files must be "Saved As" every time.

## Editing an Existing Gilson Tray File

1. Launch *MANTECH Tray Editor.exe* and press the button *Load Existing Tray* from the splash screen or if the main window is already open use File>Load Existing Tray.
  - o Both Gilson .GTY files and MANTECH .CSV files can be opened from this same dialogue.
2. Once the file is opened several options are available for editing, either by zone or by individual vessel.

### Zone Editing

#### Adjusting All Vessels in a Zone

- On the *Zones* tab, select the desired zone from the drop down.
- Enter the desired magnitude to adjust all the vessels in the appropriate axis input.
- Click the appropriate directional arrow button to apply the adjustment.

#### Adding a New Zone

- On the *Zone* tab, press the *New* button.
- The *Create Zone* window will appear, pre-populated with default values.
- From top to bottom, make the desired selections.
  - o The tool creates zone patterns of vessels.
  - o If pattern deviations are required/desired (*i.e.* removing several vessels where the rinse will

be) these changes can be made from the main program after the basic pattern is created. See: *Adjusting/Deleting above.*

#### Deleting a Zone

- On the *Zones* tab, select the desired zone from the drop down.
- Click on the *Delete* button.

#### Renumbering Vessels Within a Zone

- On the *Zones* tab, select the desired zone from the drop down.
- Click the *Renumber Zone* button.
- A new window will appear. Select the direction and row/column ordering preference and press the *Renumber Zone* button to apply the renumbering.

### Individual Vessel Editing

#### Adjusting a Vessel

- Find the desired vessel by scrolling down in the table or by left clicking on the vessel in the image view. If selected via clicking on the image, the selected vessel will become gold, and the table will automatically scroll to that vessel.
- In the table, on the appropriate line, simply edit the value in the appropriate column (except for vessel #). Commit the value change by pressing the enter key, which will also update the visual.

**TIP:** In the visual view, selecting any vessel will automatically select the appropriate zone from the dropdown.

#### Deleting a Vessel

##### *Using the visual representation*

- Right click the vessel.
- A menu shows the **RACK|ZONE|VESSEL's** which were under the mouse. This selection method is useful when vessels are overlapping. Left click on the appropriate vessels "delete" menu option.
- Or, if a vessel is left clicked on (shown gold to indicate it is selected) press the delete key.

##### *Using the table*

- Find the appropriate vessel by scrolling down the table.
- Left click on the cell directly to the left of the Vessel # column in the row desired to be deleted. This will highlight the whole row blue.
  - o Or click and drag in this column to select multiple vessels simultaneously.
- Press the delete key.

## Editing an Existing MANTECH Tray File

1. Launch *MANTECH Tray Editor.exe* and press the button *Load Existing Tray* from the splash screen or if the main window is already open use File>Load Existing Tray.
  - o Both Gilson .GTY files and MANTECH .CSV files can be opened from this same dialogue.
2. Once the file is opened several options are available for editing: BOD Rinse, Racks, Zones, Individual vessels.

### BOD Rinse

Only used with PC-BOD software.

- On the *Bed* tab, check the PC-BOD checkbox to enable the special rinse, and unlock the X,Y,Z,D value boxes.

### Racks

#### Adding a New Rack

- On the *Racks* tab press the *New* button.
- This creates a rack, automatically named with the next available RACK#.
- The size is defaulted to that of the currently selected rack, and is placed slightly offset from that rack.

#### Deleting a Rack

- On the *Racks* tab, select the desired rack.
- Click the *Delete Button*

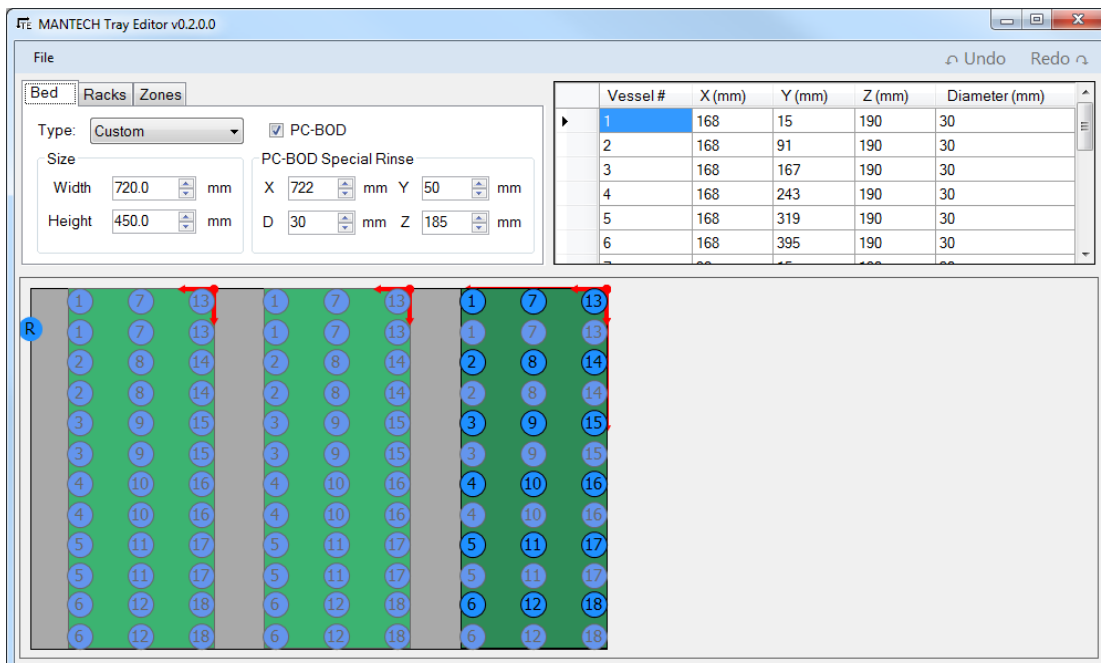
#### Duplicating an Existing Rack

This option will create a copy of the currently selected rack, including all zones within that rack.

- On the *Racks* tab, select from the dropdown the rack you want to duplicate.
- Click on the *Duplicate* button.
- Adjust the position of the new rack.

#### Adjusting a Rack

- On the *Racks* tab, select from the dropdown the rack you wish to adjust.
- Change the desired value.



## Zones

### Deleting a Zone

- On the *Racks* tab select the parent rack.
- On the *Zones* tab select the desired zone.
- Click the *Delete* button.

### Adding a New Zone

- On the *Racks* tab select the parent rack.
- On the *Zones* tab click the *New* button
- The *Create Zone* window will appear, pre-populated with default values.
- From top to bottom, make the desired selections.
- The tool creates zone patterns of vessels. If pattern deviations are required/desired (*i.e.* removing several vessels where the rinse will be) these changes can be made from the main program after the basic pattern is created.

### Adjusting All Vessels in a Zone

- On the *Racks* tab select the parent rack.
- On the *Zones* tab select the desired zone.
- Enter the desired magnitude to adjust all the vessels in the appropriate axis input, then click the appropriate directional arrow button to apply the adjustment.

### Renumbering Vessels Within a Zone.

- On the *Racks* tab select the parent rack.
- On the *Zones* tab select the desired zone.
- Click the *Renumber Zone* button.
- A new window will appear. Select the direction and row/column ordering preference and press the *Renumber Zone* button to apply the renumbering.

## Individual Vessels

### Adjusting a Vessel

- On the *Racks* tab select the parent rack.
- On the *Zones* tab select the desired zone
- Find the desired vessel by scrolling down in the table or by left clicking on the vessel in the image view. If selected via right-clicking on the image, the selected vessel will become gold, and the table will automatically scroll to that vessel.
- In the table, on the appropriate line, simply edit the value in the appropriate column (except for vessel #). Commit the value change by pressing the enter key, which will also update the visual.

**TIP:** In the visual view, selecting any vessel will automatically select the appropriate rack/zone from the dropdowns.

### Deleting a Vessel

*Using the visual representation:*

- Right click the vessel.
- A menu shows all the **RACK|ZONE |VESSEL's** which were under the mouse. This selection method is useful when vessels are overlapping. Left click on the appropriate vessels "delete" menu option.
- If a vessel is left clicked (shown gold to indicate it is selected) press the delete key.

*Using the table:*

- On the *Racks* tab select the parent rack.
- On the *Zones* tab select the desired zone
- Find the vessel by scrolling down the table.
- Left click on the cell directly to the left of the Vessel # column in the row desired to be deleted. This will highlight the whole row blue.
- Or click and drag in this column to select multiple vessels simultaneously.
- Press the delete key.