# MARKSMANSHIP AUTHORING & TARGET IMPORT USER MANUAL

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# I. INTRODUCTION

The purpose of this manual is to outline and explain the processes involved with authoring custom V-Marksmanship courses of fire, and importing custom V-Marksmanship targets.

## A. MARKSMANSHIP AUTHORING

The V-Marksmanship Authoring application allows users to author custom V-Marksmanship courses of fire, using common logical scripting constructs like, variables, branching, and looping, as well as domain specific constructs like target creation and movement.

## B. TARGET IMPORT

The V-Marksmanship Target Import application allows users to import custom paper target images from common file types, and make them useable in the V-Marksmanship simulator. Target hit-zones can either be painted directly within the V-Marksmanship Target Import application, or they can be imported from well-formatted images produced from third party applications like Adobe Photoshop.

## C. USER INTERFACE

Figure 1 shows the user interface for File menu in V-Marksmanship Authoring. From this view users can:

1. Selecting the "***Marksmanship Authoring***" header button opens the user interface show in Figure 1 used to create/modify courses of fire.
2. Selecting the "***New Course***" button (shaped like a +) creates an empty course of fire.
3. Selecting the "***Open Course***" button (file folder) opens a file dialog where users can open a previously saved course of fire.
4. Selecting the "***Save Course***" button (disc shape) opens a save file dialog where users can save a currently opened course of fire. The disc with a downward arrow is ***"Save As."***
5. Selecting the ***"Upload"*** button (upward arrow) uploads what you have created into Marksmanship to run the course of fire.
6. Selecting the ***"Target Creation"*** button (shaped like a target on left side) allows target creation.
7. Selecting the "***Target Import***" button (arrow with folder) opens the user interface used to create/modify custom paper targets. Must be on "Target Creation" to access.

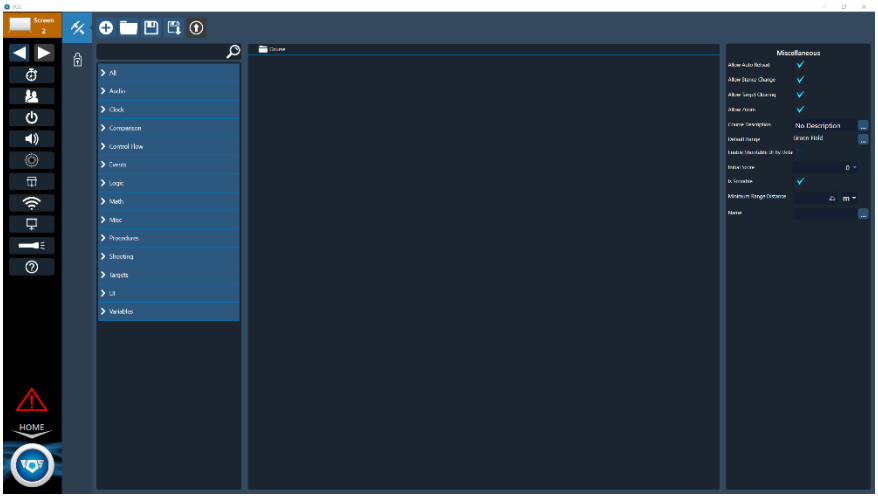


*Fig. 01: V-Marksmanship Authoring user interface*

# II. MARKSMANSHIP AUTHORING

## A. USER INTERFACE

Figure 2 shows the user interface for the Course Authoring menu in V-Marksmanship Authoring. From this view users can:

1. The “Operations” section provides a searchable list of all commands, or operations, available for use in the course of fire (e.g., “New Stage,” “Move Target,” etc.). These operations can be added to the course of fire by selecting the add button (“+” symbol).

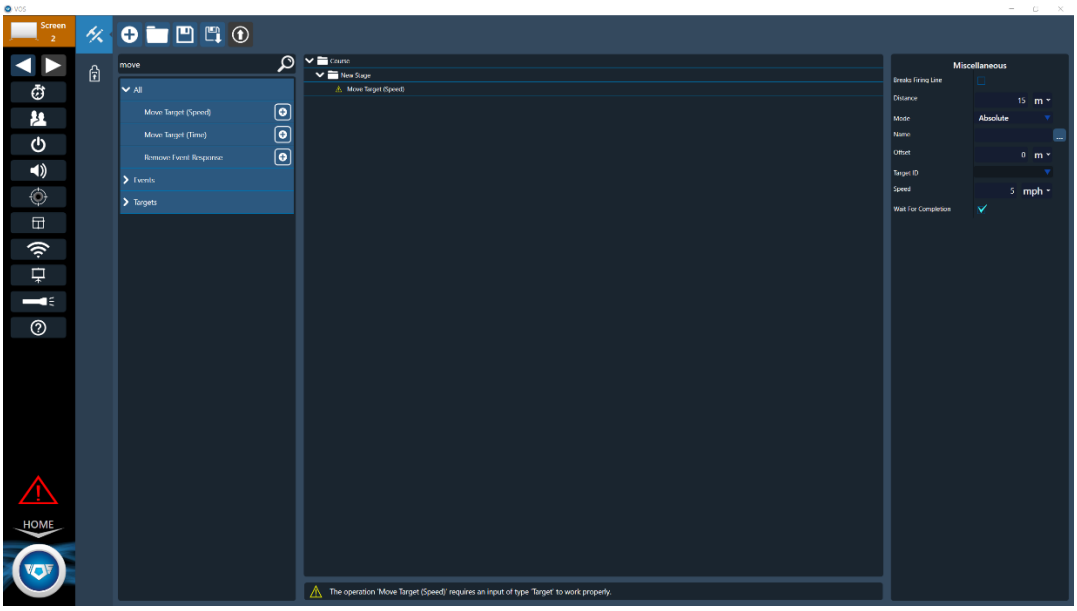


*Fig. 02: Course Authoring User Interface*

2. By selecting an operation from the operations list, the description of the operation appears. The available settings, or properties, can be viewed in the Miscellaneous window.

3. The “Outline” section provides a hierarchical view of the course of fire, making it simple to navigate to different stages and logical branches. Clicking any item in the outline will give you the option to move items up or down using arrows, copy the item, or delete it. It will also bring up the Miscellaneous window to fill in the variable options. Additionally, any warning notifications are also displayed next to the name of the items in the outline. At the bottom, the description of the warning is displayed.

4. The “Miscellaneous” section provides a tabular set of configurable settings for an operation. In each row the left column provides the name of the property, and right column contains the interface for configuring the property value.

5. Operations that have been added to the currently selected stage in the course hierarchy are visible in the design stage. Each item is displayed in the order they were added, unless reorganized. To organize operations inside the design stage: Select-and-move up or down an operation until the selected operation is in the desired position. The currently selected operation is highlighted in orange, all other operations remain dark.

# B. BASIC USAGE

This section covers basic usage of the Course Authoring portion of the V-Marksmanship Authoring application. See Section C: “Advanced Usage” for more advanced course authoring topics.

## 1. Configuring the Course of Fire

To configure the course of fire, select the “course” in the operations window. This can be seen in Figure 3.

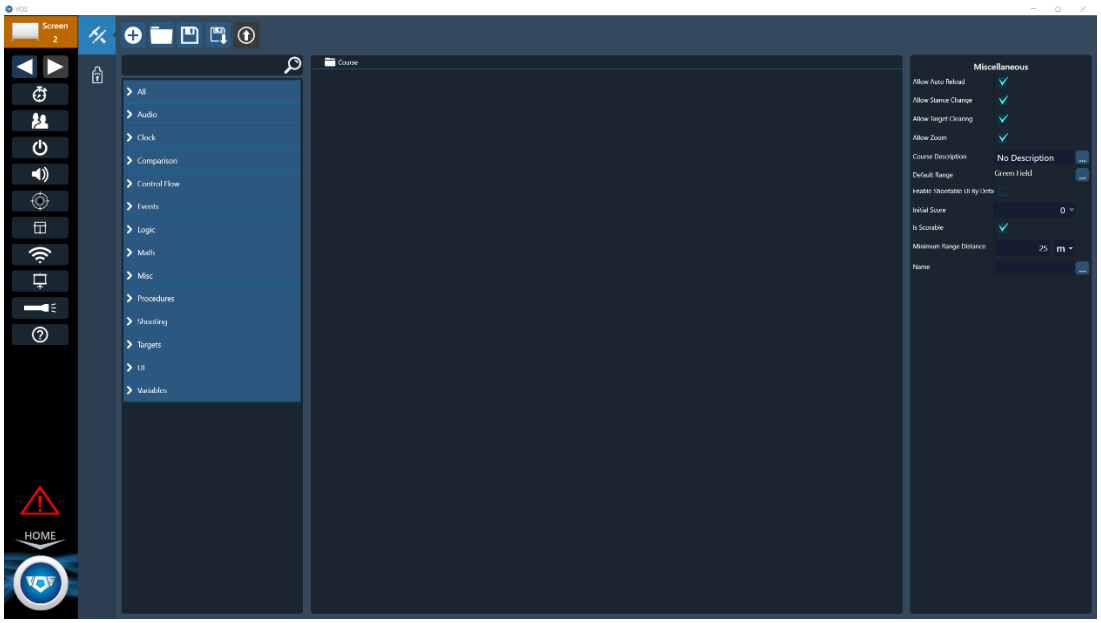


*Fig. 03: Course Outline*

**Note: If the course of fire has been renamed the root element will appear as having that name.**

For the course of fire to work properly it must have a unique name and a range environment.

**Note: If the course of fire is named the same as any other course of fire, the previous course will be overwritten when this course is saved. Only name it identically if the intent is to overwrite the previous course.**

By default, the course of fire has the name “Course,” and no range environment selected. This can be observed by looking at the properties window shown in Figure 4:

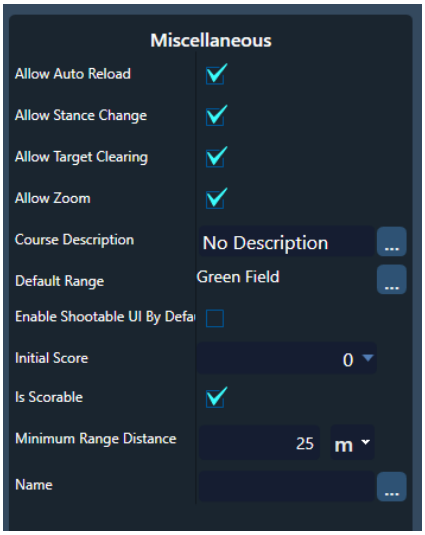


*Fig. 04: Properties Window*

As indicated by the warning notification (see Figure 5), the default range must be changed. This can be accomplished by selecting the ellipsis button in the column to the right of "Default Range;" doing so will open a range environment selection menu (see Figure 6). From this menu select the range environment that is desirable for the course of fire, and then select the "Close" button.

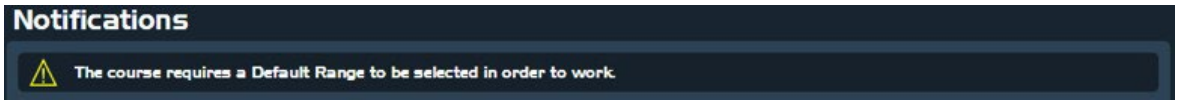


*Fig. 05: Warning Notification*

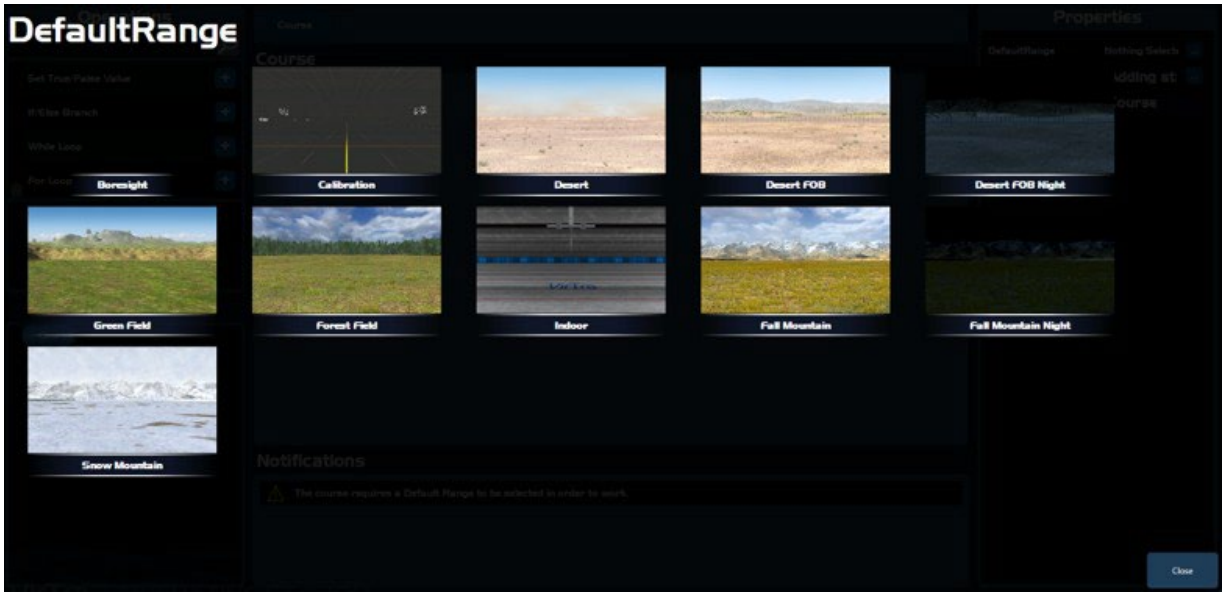


*Fig. 06: Range Environment Selection Menu*

Observe that once the range has been selected, the warning notification for this problem disappears.

**Note: A course of fire is invalid if any warning notifications are present.**

After the “Default Range” property has been set, the course “Name” property can be changed appropriately (e.g., “Shapes Drill,” see Figure 7).

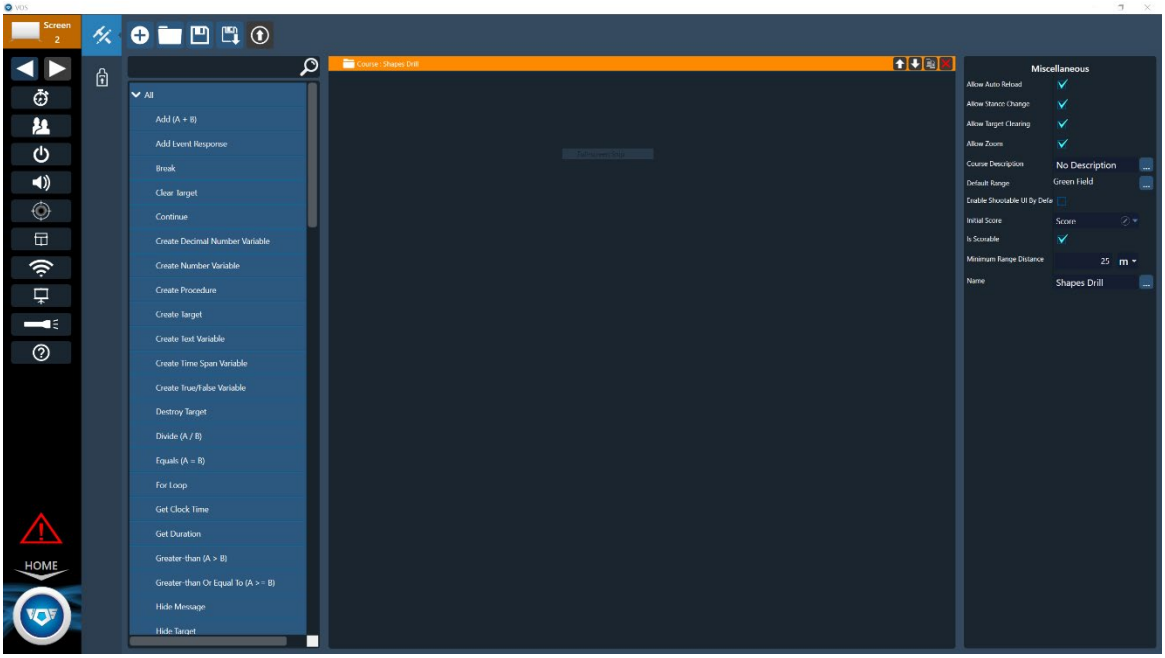


*Fig. 07: Shapes Drill*

Once the course “Name” property is set, this change is reflected throughout the user interface. This is true for changing the “Name” property on any operation in the course of fire.

With the course uniquely named and a default range set, the course of fire is ready to be authored and saved for use.

## 2. Creating a Target

Before a target can be moved, it must be created. To create a target, follow these steps (see Figure 8):

1. Type “Target” into the operations list search text box.
2. Scroll through the list until “Create Target” appears.
3. Select the “+” button.
4. Clear the text from the operations list search text box.

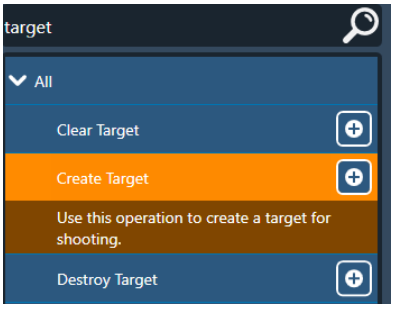


*Fig. 08: Create Target*

Observe that the “Create Target” operation has been added to the design stage (see Figure 9).


*Fig. 09: Design Stage*

For this operation to work properly, the “Target” property must be set. To do this, select the newly created “Create Target” operation in the design stage and click the ellipsis button to the right of the “Target” property in the Miscellaneous window (see Figure 10); this will open a target selection window (see Figure 11). Select the desired target, and then select the “Close” button.

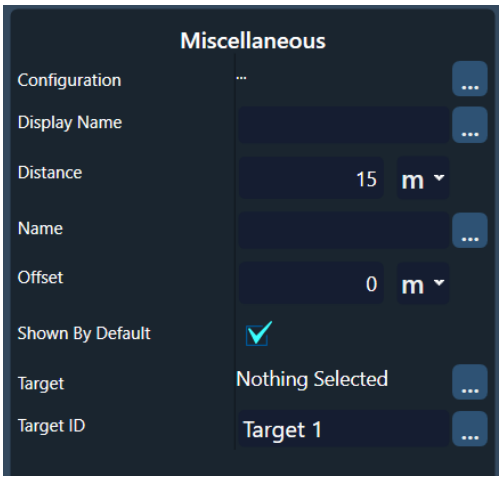


*Fig. 10: Properties Window*

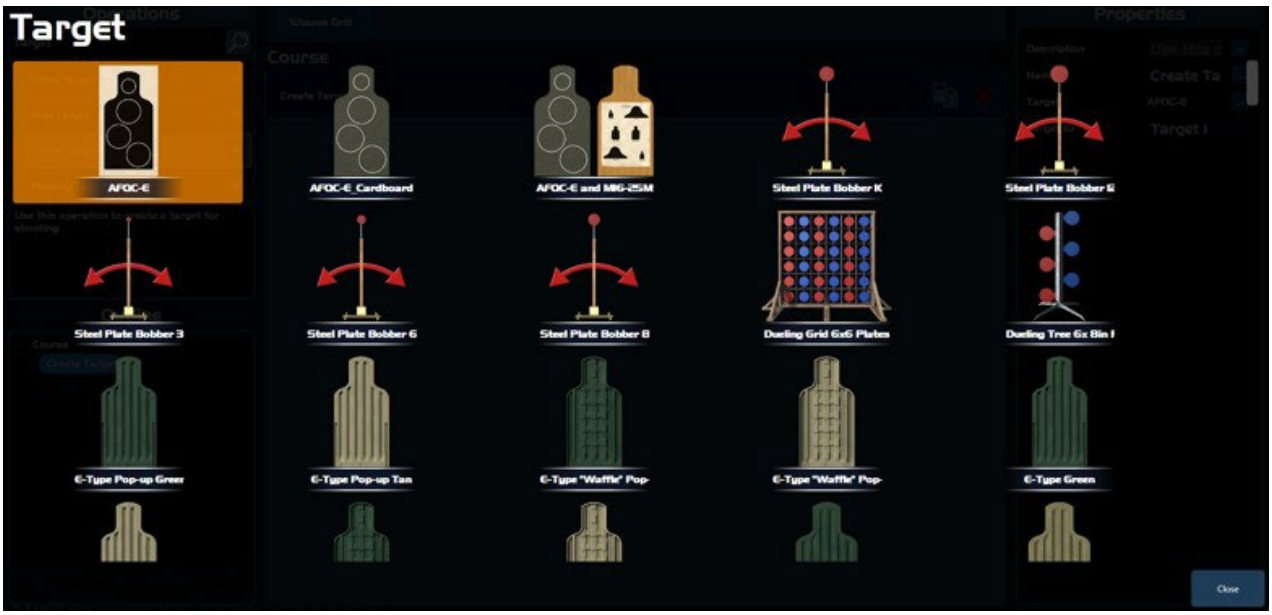


*Fig. 11: Target Selection Window*

**Note: At this point the target has been created, but the target will not appear when the course of fire is run. This is because the target needs to be positioned down range before it can be used. Targets that are created, and not positioned down range can cause undesired effects during training. Make sure to always position targets downrange immediately after they are created.**

To position the newly created target, add the “Move Target (Time)” operation to the design stage (see Figure 12). Observe that there is a new warning notification that reads: “The operation ‘Move Target (Time)’ requires an input of type ‘Target’ to work properly.” This means that there is a property on the newly added “Move Target (Time)” operation that requires a target. In the case of the “Move Target (Time)” operation, the property that requires a resource link to a target is named “Target ID” (see Figure 13). To fix this problem, select the “Move Target (Time)” operation, and set the “Target ID” property to “Target 1.”

**Note: Resources and links to resources are explained in more detail in Section C: Advanced Usage. For now, it is sufficient to understand that some operations depend on knowing about which target they are affecting during the course of fire.**

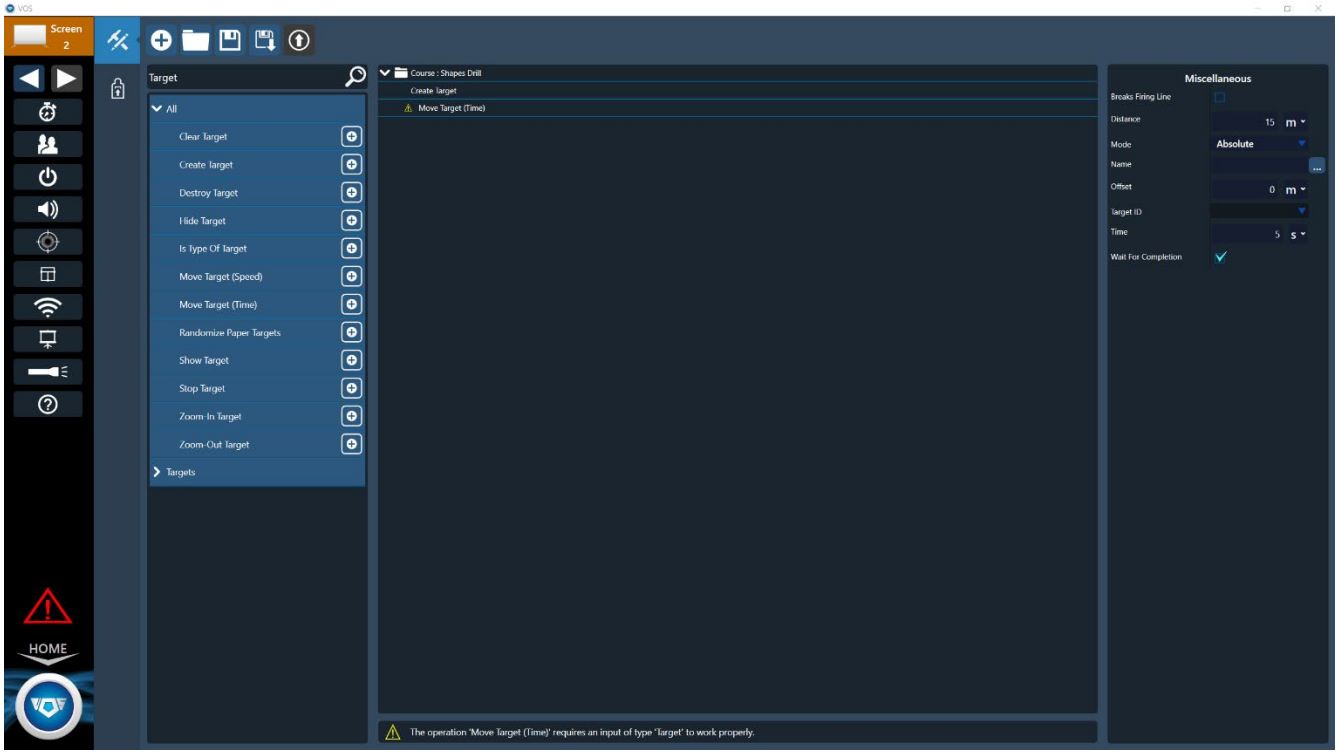


*Fig. 12: Move Target to Design Stage*

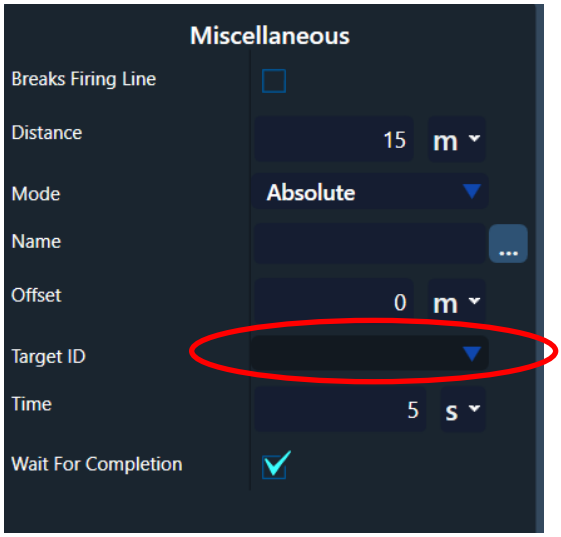


*Fig. 13: Target ID Within Properties Window*

Once the “Target ID” property has been set on the “Move Target (Time)” operation, the warning notification for this problem disappears.

The next step is to change the time it takes for the target to arrive at the desired down-range position. By default, it takes five seconds for the target to gradually move to the desired down-range position. Both the “Distance” property, and the “Time” property are configurable (see Figure 14).


*Fig. 14: Properties - Distance and Time*

In the case of moving a target after it has been created, the best practice is to move the target to a distance down range that is at least the distance from the trainee to the projected image (firing line distance), and with a time of zero seconds (see Figure 15).

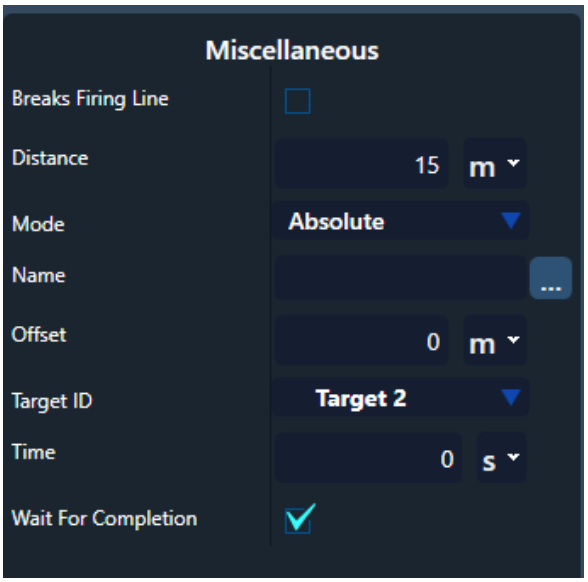


*Fig. 15: Properties - Set time to 0 seconds*

Save & run the course of fire. Observe that the target has been created and moved to the distance specified in properties of the “Move Target (Time)” operation.

The process for moving a target at a later point in the course of fire is exactly the same. It may seem more intuitive to move a target to its desired location at a given speed and not over a period of time. To do this create a “Move Target (Speed)” operation, and configure its “Speed” property appropriately (see Figure 16). Notice that the “Time” property does not exist on the “Move Target (Speed)” operation, and instead has been replaced by a “Speed” property with a default value of five miles per hour.


*Fig. 16 Properties - Configure Speed Property*

## 3. Displaying Messages & Instructions

In V-Marksmanship Course Authoring, you can display a message or instructions to trainees. This can be done by showing "Messages."

Type "Message" into the operations list search text box. Observe that the resulting set of operations (see Figure 17) are all related to showing and hiding messages. When a message is shown to the trainee it appears on screen until it is hidden. In the case of a timed message, the message is hidden after the passing of some specified amount of time. For an input message, the message is hidden after the instructor has selected to continue the course of fire.

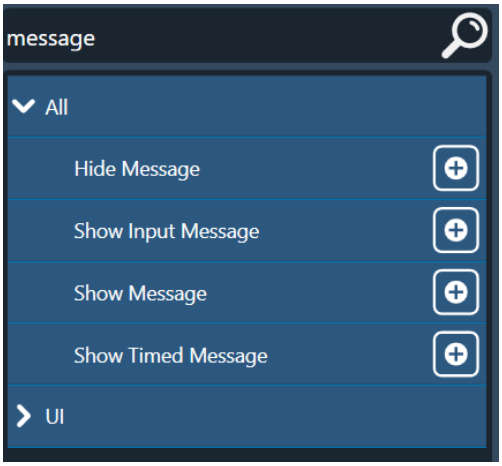


*Fig. 17: Properties - Type "Message" into the operations search box*

To show a message to the trainee, add the "Show Input Message" to the course of fire. Then, select the operation. Observe the properties for this operation (see Figure 18). Notice the "Message" property. This property is editable via a text box; this is where the message text is entered, and whatever text is entered here will be displayed to the trainee. Select the ellipsis button will open an expanded text editor for editing a larger amount of text (see Figure 20).

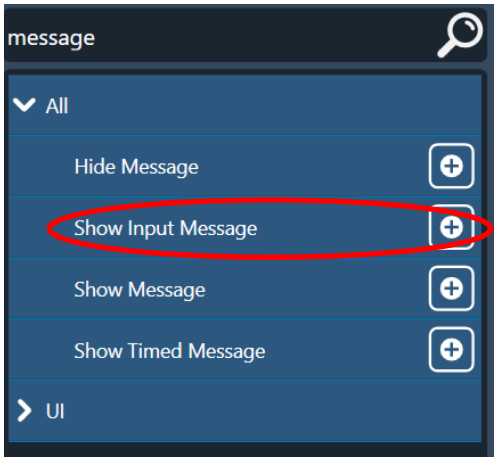


*Fig. 18: Properties - Message*

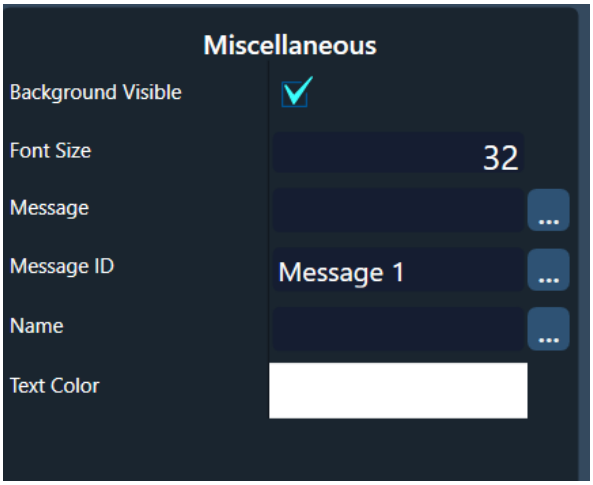


*Fig. 19: Properties - Enter Message to Trainee*

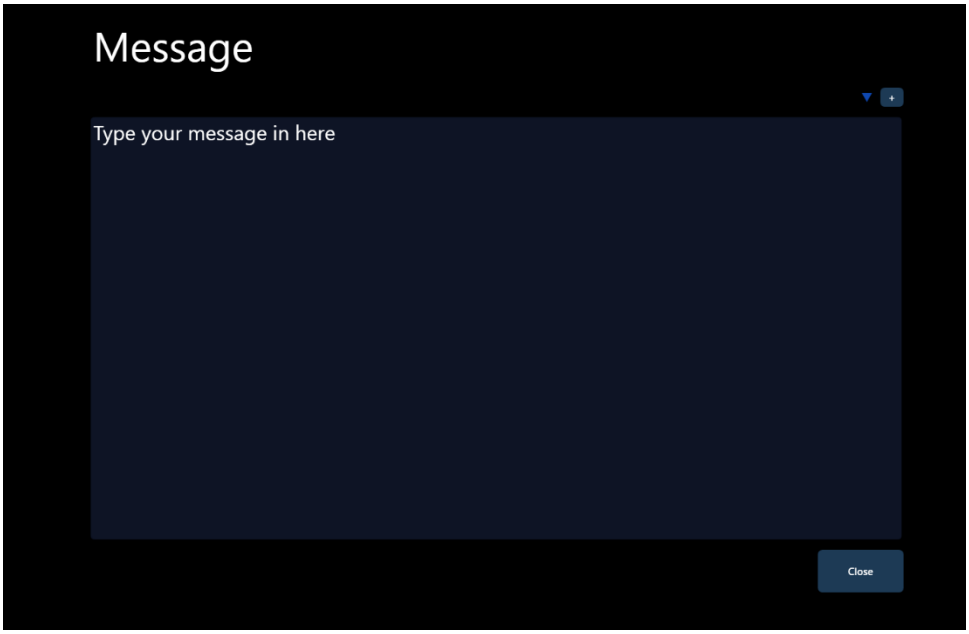


*Fig. 20: Properties - Expanded Text Editor*

Save & run the course of fire. Observe that the message entered in the “Text” property of the “Show Input Message” operation appears and only disappears when the instructor “Continue” command is given.

### 4. Waiting for Instructor Input & Time

There are two ways to pause the execution of operations within a running course of fire: the first is to use a “Wait” operation, which will pause execution for a specified amount of time; the second is to use a “Wait for Input” operation, which will pause execution until the instructor has provided input to continue execution.

To illustrate how “Wait for Input” and “Wait” operations work, follow the provided steps:

1. Type “Wait” into the operations list search text box.
2. Add a “Wait for Input” operation to the course of fire.
3. Add a “Show Message” operation and set its “Message” property to “Hello.”
4. Add a “Wait” operation to the course of fire and set its “Time” property to 5 seconds.
5. Add a “Hide Message” operation and set its “Message ID” property equal to the “Message ID” property in the “Show Message” operation.
6. Add a “Show Message” operation and set its “Message” property to “World.”

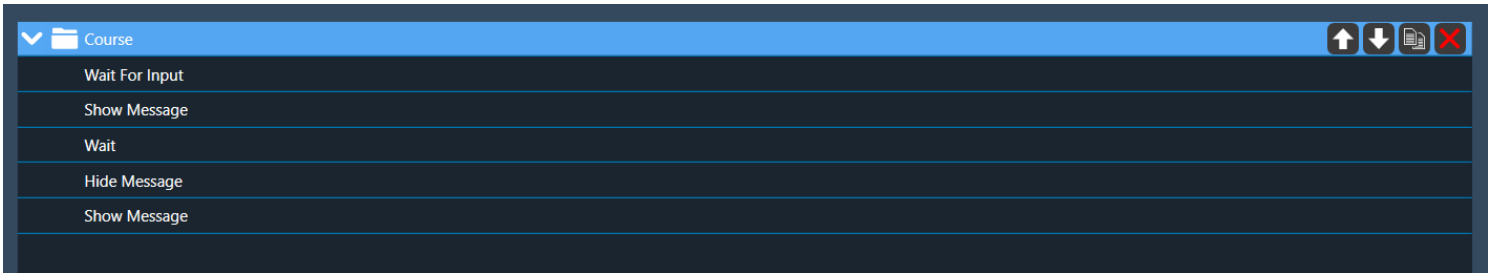


*Fig. 21: Completed Operation*

Save & run the course of fire. Observe that at first nothing is happening. Provide instructor input by selecting the “Continue” button in VOS. The message “Hello” will appear, then after 5 seconds, the message “World” will appear.

### 5. Showing & Hiding Targets

Paper targets, and some special targets (e.g. Ivans), can be programmed to turn-&-face, pop-up, etc. To do this, the “Show Target” and “Hide Target” operations are used. These operations require a link to a target, so one must have already been created in the course of fire before being used by these operations (see Creating & Moving Targets).

An example course of fire can be seen in Figure 22. In this example the following will occur:

1. The target will appear turned away on screen at the specified distance (default is 15 meters).
2. The course of fire will pause until instructor input is provided.
3. After instructor input is provided, the target will turn-&-face the trainee.

A “Wait for Input” operation is not the only option; a simple “Wait” operation could have been used to wait for some amount of time. This example illustrates that courses of fire can be programmed to allow instructors to decide when a target should turn-to-face or turn away from the shooter.

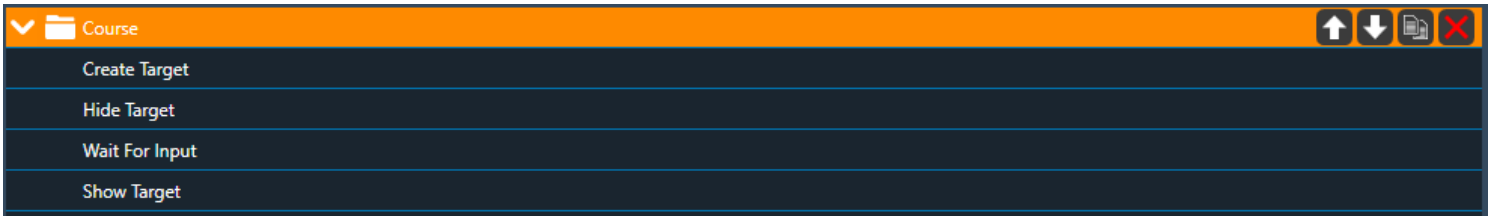


*Fig. 22: Example Course of Fire*

### 6. Zooming In/Out Targets

Often, after a trainee has completed a shooting drill, it is useful to present the target for review. To do this the “Zoom-In Target” and “Zoom-Out Target” operations are used. Searching the operations list search text box for “Zoom” will reveal these operations. These operations require a link to a target, so one must have already been created in the course of fire before being used by these operations (see Creating & Moving Targets).

An example course of fire can be seen in Figure 23. In this example the following will occur:

1. The target will appear facing the trainee on screen at the specified distance (default is 15 meters).
2. The course of fire will pause until instructor input is provided. During this waiting period the trainee can engage the target.
3. After instructor input is provided, the target will be presented for review, and the course of fire will be paused until further instructor input is provided.
4. After instructor input is provided again, the target will appear down range and is ready to be engaged by the trainee.

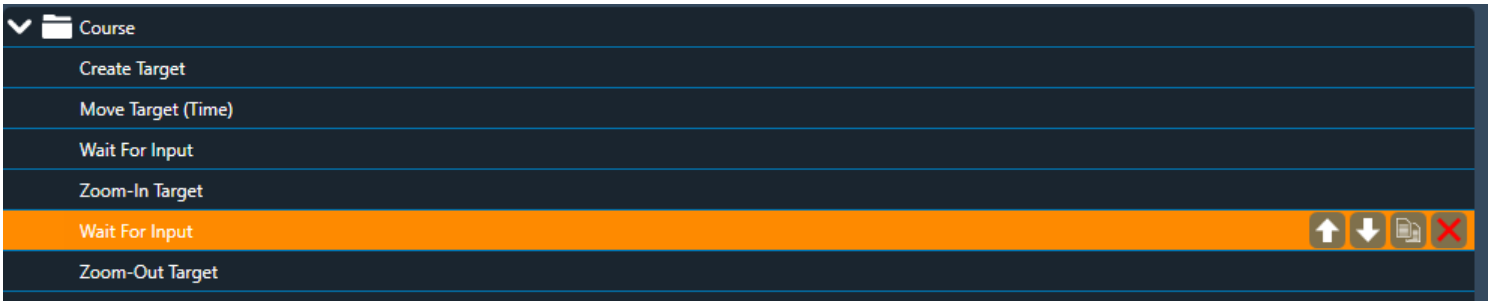


*Fig. 23: Example Course of Fire*

## 7. Changing Trainee Stance

In V-Marksmanship the trainee's stance (Standing, Kneeling, or Prone) affect both the perspective and ballistic accuracy of the simulation. To change the trainee's stance the "Set Trainee Stance" operation is used, and the "Stance" property is set to "Standing," "Kneeling," or "Prone."


*Fig. 24: Example Trainee Stance*

## 8. Basic Shooting

To require a trainee to shoot a certain number of rounds before continuing the remainder of the course of fire, use the "Require Shooting" operation and set its' "Number of Rounds" property to the number of shots appropriate for the course of fire (see Figure 25).


*Fig. 25: Number of Rounds*

## 9. Timed Shooting

The "Require Timed Shooting" operation sets a required time limit for the user to fire a certain number of rounds. Figure 26 shows an example using the "Require Timed Shooting" operation.

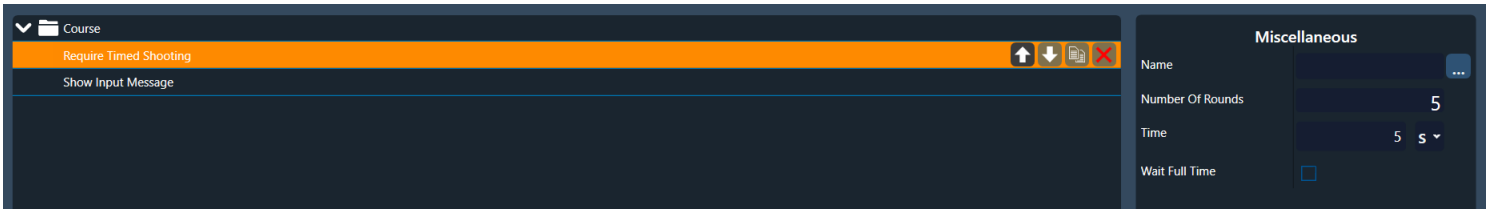


*Fig. 26: Timed Shooting Example*

Notice the "Require Timed Shooting" operation still requires a "Number of Rounds" to be set, but additionally requires the "Time" property to be set.

## C. ADVANCED USAGE

This section covers advanced usage of the Course Authoring portion of the V-Marksmanship Authoring application.

### 1. Resources & Stages

In V-Marksmanship Authoring, understanding the concepts of resources and stages are critical to programming advanced courses of fire.

A resource is a type of data that encapsulates important course programming related information. Listed below are the resources supported by V-Marksmanship Authoring and a description of each.

| RESOURCE | DESCRIPTION | EXAMPLE |
|---|---|---|
| **TARGET** | Targets are physically simulated entities within the V-Marksmanship simulator. These are the paper, steel, etc. that trainees shoot at during training. | E-9 Silhouette,<br>E-Type,<br>F-Type,<br>Steel Torso<br>Pepper Popper |
| **MESSAGE** | Messages are the pop-up user interfaces that appear in front of the trainee during training. Typically, these are used to present instructions. | A user interface displaying instructions like: “When the target turns and faces, fire three rounds center mass.” |
| **AUDIO/SOUND** | Sounds are custom audio files that can be loaded into the course of fire and played. Typically, these are verbal instructions, or signal sounds for target-turns, shooting, etc. | Any well formatted audio file containing a custom sound. |
| **NUMBER** | Numbers are a course programming construct where any integer number value can be stored in a named value (variable), and used later via a resource link. | X = 1,<br>Y = 2,<br>Shots = 3,<br>Some Variable Name = 4 |
| **DECIMAL NUMBER** | Decimal Numbers are a course programming construct where any real number value can be stored in a named value (variable), and used later via a resource link. | X = 2.35<br>Y = 3.56<br>Shots = 3.67<br>Some Variable Name = 3.67 |
| **TRUE/FALSE** | True/False is a course programming construct where any Boolean value can be stored in a named value (variable), and used later via a resource link. | X = True<br>Y = False<br>Successful = True<br>Hit Target = False |
| **TEXT** | Text is a course programming construct where any textual value can be stored in a named value (variable), and used later via a resource link. | X = “Hello”<br>Y = “World”<br>Instruction1 = “Holster”<br>Instruction2 = “Reload” |

An example of a resource and resource linking can be seen in Creating & Moving Targets; the target that is created by the "Create Target" operation is a resource, and the operation "Move Target" uses the target via a resource link. This resource link is established via a property drop-down on the "Move Target" operation, in this case it is the "Target ID" property.

**Note: Generally, any instance of "ID" after a property name (e.g., Target ID) indicates that this property is establishing a link to a resource.**

A stage is an operation that has one or more sub-operations. For example, the root "course" node in the course of fire hierarchy shown in the outline is a stage. Sub-stages can be added by adding "New Stage" operations, which in turn can have sub-stages.

When the course of fire is executed, it completes these stages in the order they are defined. Stages define a scope of work to be executed in the course of fire. Scope is a programming concept that lies outside the scope of this manual. However, it is important to know that resources created inside a stage are destroyed when the stage is completed.

## 2 Logical Branching

In certain cases, it can be useful to perform one set of operations instead of another based on some logical input. V-Marksmanship Authoring exposes this functionality in the form of logical branching via "If/Else Branch" operations which have a "Condition" property that links to a "True/False" variable.

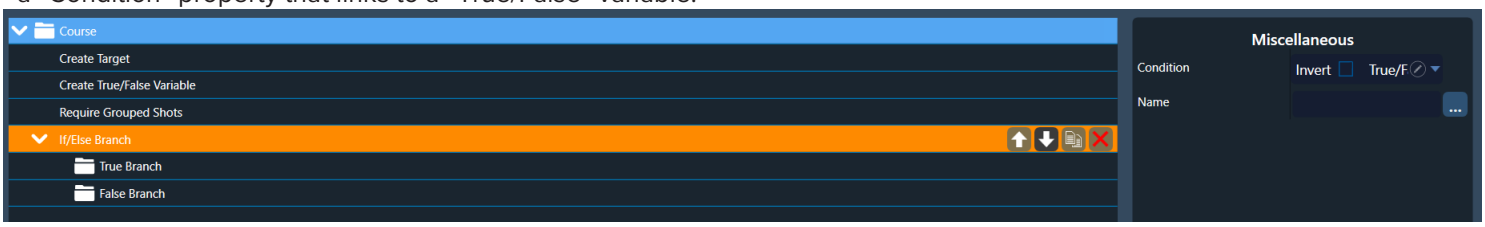


*Fig. 27: Logical Branching*

In Figure 27 the "If/Else" branch has two new buttons: "True Branch" and "False Branch." Selecting one of these buttons navigates the design stage to editing the true/false sub-stage.

## 3. Repeat/Looping Mechanisms

When a course of fire should repeat certain operations the “While Loop” and “For Loop” operations are used. The “While Loop” will continue to execute a set of operations for as long as the condition is true (see Figure 28). The “For Loop” will execute operations a set number of times (see Figure 29).

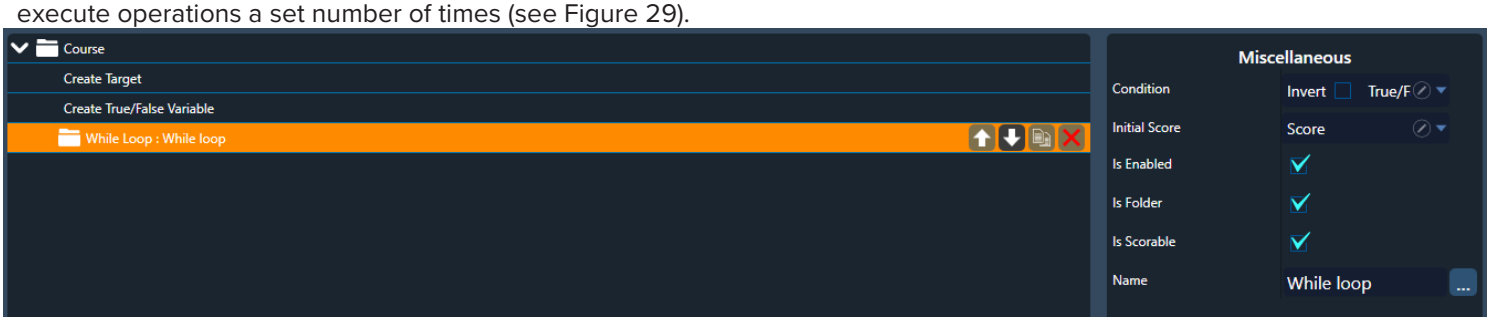


*Fig. 28: While Loop*

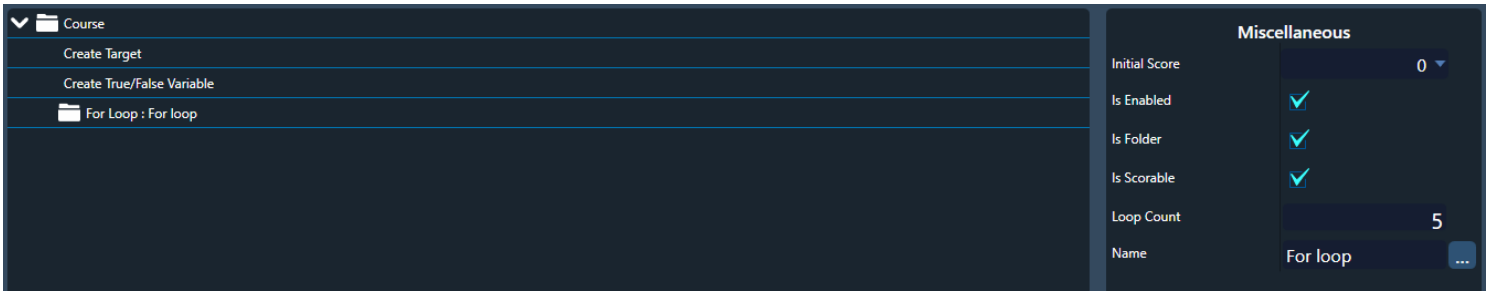


*Fig. 29: For Loop*

## 4. Grouped Shooting

When the course of fire requires a trainee to shoot shots within a specified group size, the “Require Grouped Shots” operation is used. This operation requires a link to a target, as well as a link to a true/false variable. This is because the operation will output whether or not the trainee successfully shot within the desired group size. Figure 30 shows a common usage of this operation.

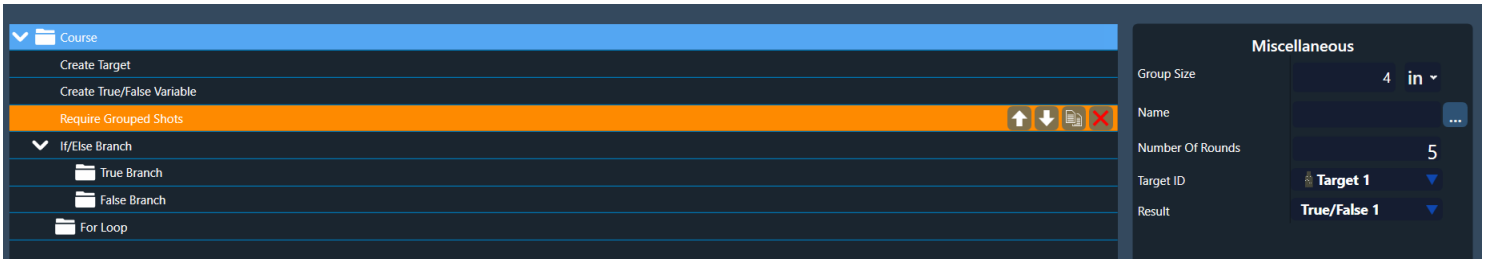


*Fig. 30: Require Group Shots*

## 5. Advanced Shooting Requirements

When the course of fire requires a trainee to shoot shots within a specified group size, the “Require Grouped Shots” operation is used. This operation requires a link to a target, as well as a link to a true/false variable. This is because the operation will output whether or not the trainee successfully shot within the desired group size. Figure 31 shows a common usage of this operation; an if/else branch is used to show a message for success/failure.

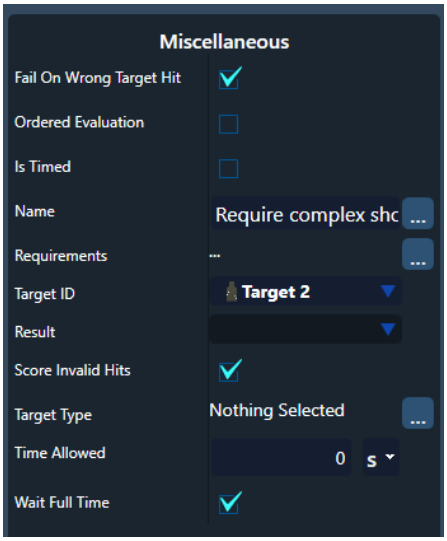


*Fig. 31: Complex Required Shooting*

The properties affect the required shooting in the following way:

| PROPERTY | DESCRIPTION |
|---|---|
| **FAIL ON WRONG TARGET** | When checked, this property creates a rule that if the shooter misses or hits a part |
| **WAIT FULL TIME** | When checked full time allowed elapses before continuing the course of fire. |
| **ORDERED EVALUATION** | When checked, indicates that if the required shooting order is 2-body 1-head, a shooting of 1-head and 2-body is a failure. |
| **IS TIMED** | When checked, indicates that the drill is timed, and failing to shoot the required parts within the time limit fails the drill. |
| **REQUIREMENTS** | The collection of target-parts and number of times to hit them. |
| **SCORE INVALID HITS** | Indicates whether score is counted when the wrong part of the target is hit. |
| **TIME ALLOWED** | The max time allowed to complete the shooting. |

# III. TARGET IMPORT

The V-Marksmanship Target Import application allows users to create and modify custom V-Marksmanship targets.

## A. USER INTERFACE

Figure 32 shows the user interface for the Course Authoring menu in V-Marksmanship Authoring. From this view users can:

1. Select existing targets and modify them.
2. Save targets.
3. Create new targets.
4. Delete selected targets.
5. Edit properties/settings of a custom target.
6. Edit the primary, secondary, or tertiary hit-zone layers of a target.
7. Select layer-parts and modify them.
8. Go into edit view of layer part.
9. Create new layer parts.
10. Delete selected layer part.
11. Toggle visibility of layer part in hit-zone painting canvas.
12. Paint hit-zones inside the hit-zone painting canvas with zoom, pan, and paint/erase functionality.

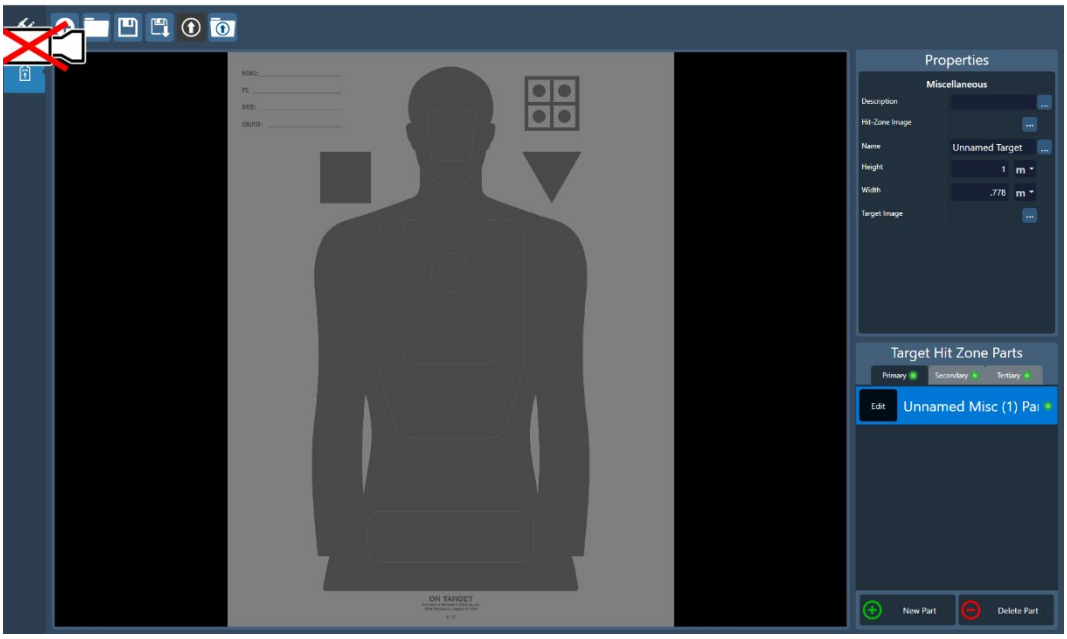


*Fig. 32: Course Authoring Interface*

## B. TARGET CONFIGURATION

The Properties window reflects the configuration settings for the currently selected target. Figure 33 provides a closer look at these properties:

1. Description: A description can be provided for targets, making them easier to understand their purpose in training.
2. Hit-Zone Image: Hit-Zone images are importable as well-formatted images made in programs like Adobe Photoshop.
3. Name: Targets should be named uniquely and so that they appropriately describe their application in training.
4. Height & Width: The physically simulated size of the target.
5. Target Image: Properly formatted images can be loaded from disk and used as targets. The hit-zone image needs to be the same size as the target image, which is only important if using a custom imported hit-zone.

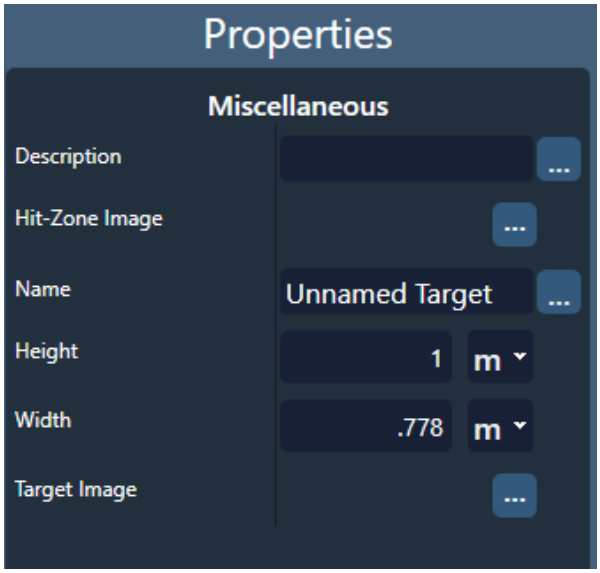


*Fig. 33: Target Configuration Properties*

## C. HIT-ZONE LAYERING & EDITING

To edit a hit-zone, select any one of the hit-zone layers: “Primary,” “Secondary,” or “Tertiary.” Once selected, new layer-parts can be added by selecting “New Part,” and layer-parts can be deleted by selecting “Delete Part.” With a layer-part created and selected, select the “Edit” button on that layer-part. The “Edit Mode Tools” window will replace the “Target Hit Zone Parts” window. With this new interface users can (see Figure 34, 35, & 36):

1. Paint with various brush sizes.
2. Erase with various brush sizes.
3. Pan-Zoom.

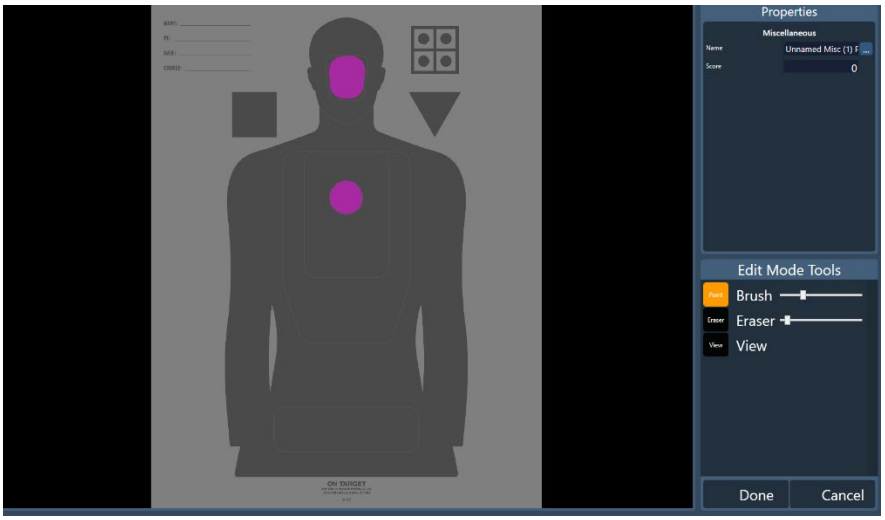


*Fig. 34: Edit Mode Tools: Brush*

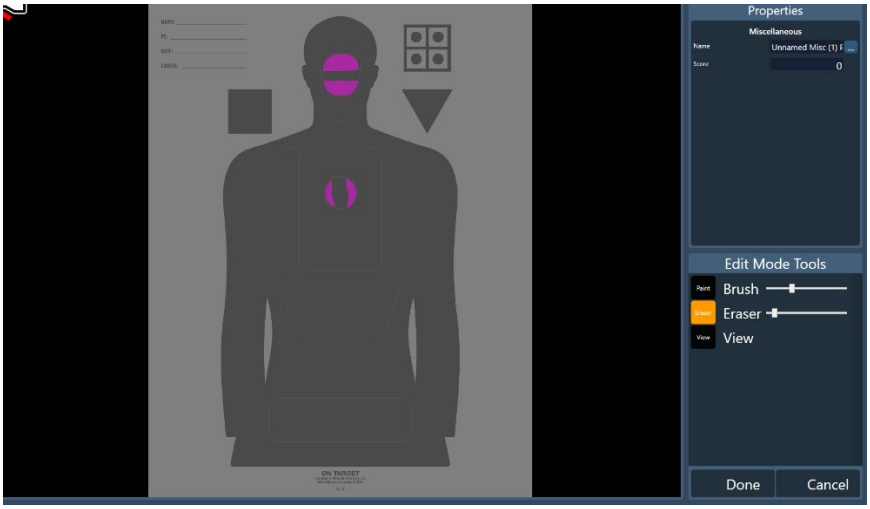


*Fig. 35: Edit Mode Tools: Eraser*

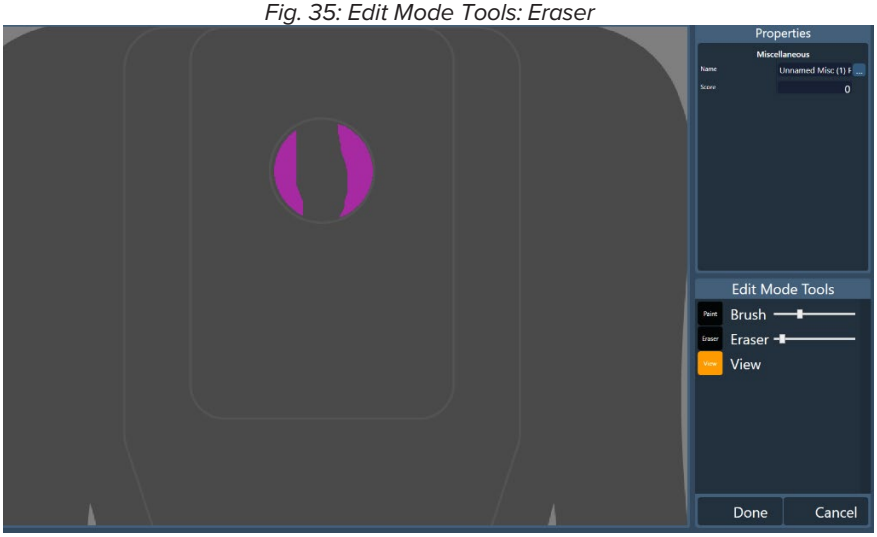


*Fig. 36: Edit Mode Tools: View (zoom)*

The parts of the target that are painted are visible in semi-transparent pink, green, and blue colors. These three colors help to identify the layer the user is editing (“Primary,” “Secondary,” and “Tertiary” respectively). If a bullet hits a part of the target that is painted, logic will be applied according the course of fire programming, and the score will be referenced from the settings in the layer-part properties window see in Figure 37.

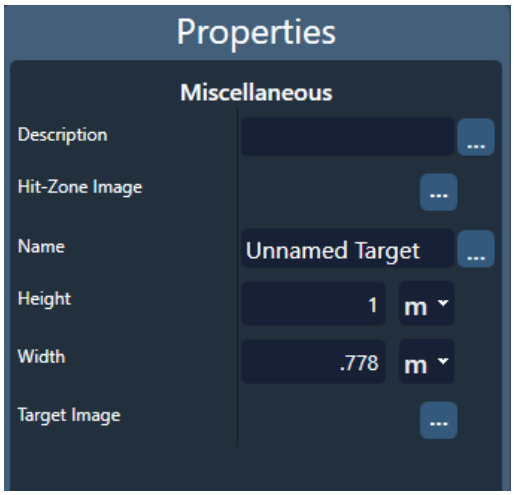


*Fig. 37: Layer Properties Window*

**Note: The name property should be unique to any other layer-parts within the same layer. The name is also used as a reference inside the Course Authoring programming tool’s “Require Complex Shooting” operation’s “Requirements” property.**

# IV. CONTACT VIRTRA

For any questions or additional help with troubleshooting as well as the location for sending any items in need of repair, please see information below.

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