

Retro Remakes

Missile Defence



impact gamers : inspiring makers

This document is part of a series of Clickteam Fusion 2.5 tutorials.
To access the additional video, play the game, download fusion files and assets visit

<https://impactgamers.net/retro/md>



Based on Atari's 1980 hit "Missile Command" in this remake we'll look at replicating some of the great aspects this arcade game had to offer.

MAIN GAME MECHANICS

- Mouse/Trackball control
- Rotating objects
- Targeting/Looking in direction of
- Spawning missiles/enemies
- Collisions/Hit Masks
- Scoring mechanics



REUSABLE SKILL
When a skill is first described



REUSABLE SKILL
When a skill reused



DOWNLOADS
Use files from the website download



BUG
When there is an error in the game

01

SECTIONS

A) Setting up [0:36]

- A1) Adding a Backdrop
- A2) Adding a Quick Backdrop
- A3) Adding a String (text)
- A4) Title Coding

B) Creating the game [6:56]

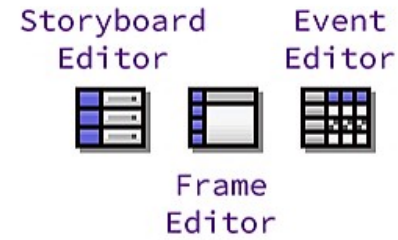
- B1) Backdrop and Cursor
- B2) Adding the Turret
- B3) Adding Others Actives
- B4) Difficulty Counter

C) Main Coding [19:48]

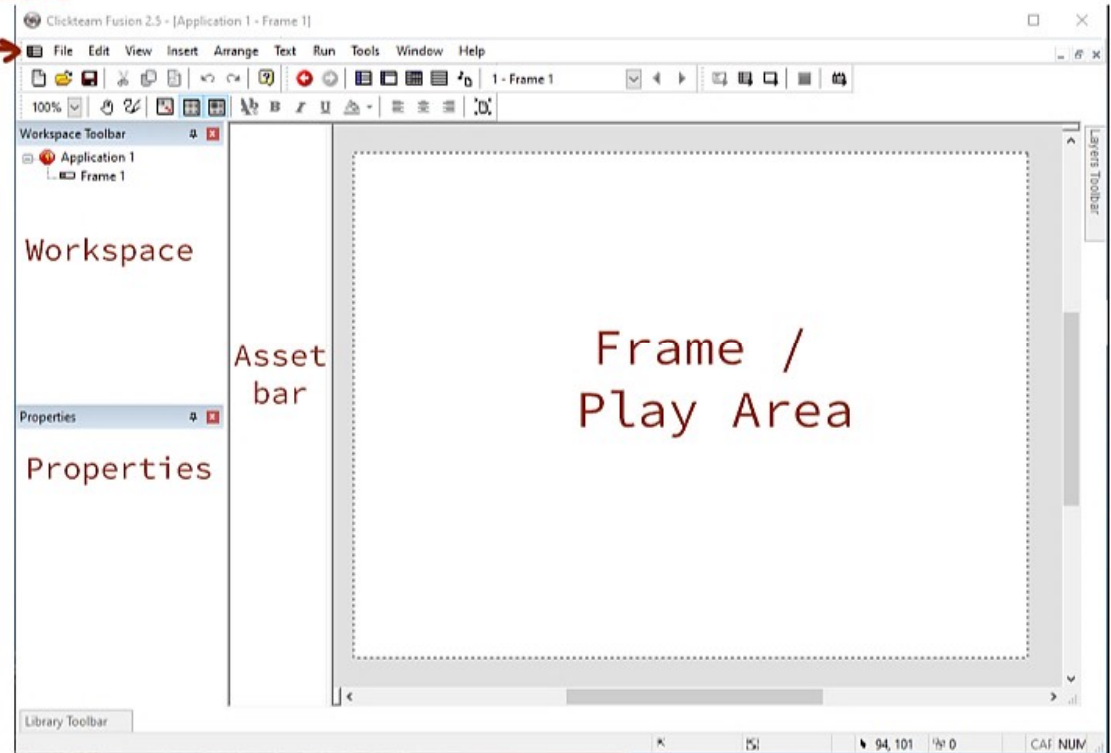
- C1) Cursor and Target
- C2) Enemy Spawning
- C3) Enemy Collisions and Cities
- C4) Game Over

D) Optional [35:19]

- D1) Bonus Points
- D2) Trails
- D3) Sound Effects
- D4) Advanced Game



Top menu





Load up Clickteam Fusion 2.5

From the top menu select 'File' > 'New Application'



You are now in the 'Storyboard Editor'

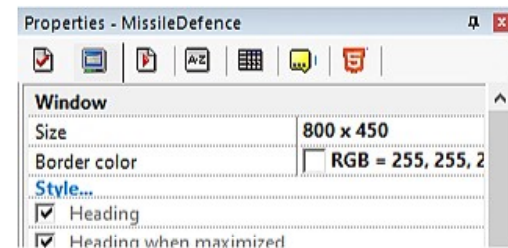
Select the application from the top of the Workspace Toolbar to load its Properties

From the Properties window select the 'Window' category

Click and type in the 'Size' "800" x "450" and press Enter

When prompted about changing the frame sizes also, click 'Yes'

Click on the blank white preview of Frame 1 to select it



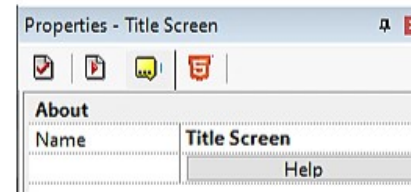
[Reusable Skill - Rename]

From the Properties window select the 'About' category


Click on the current name and type in "Title Screen"

Press Enter to accept your new name

[End Skill]



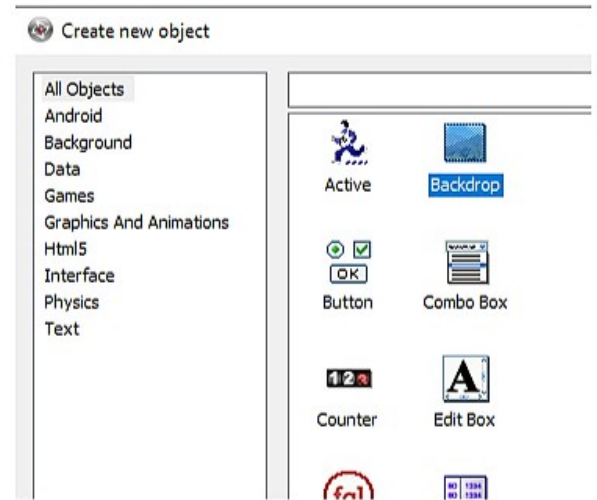
 Click on the number '1' on the first frame to enter the "FRAME EDITOR"


 [Reusable Skill - Inserting an Object]
From the top bar click 'Insert' > 'New Object'


Click on Backdrop (Available from 'All Objects' or 'Backgrounds' category)

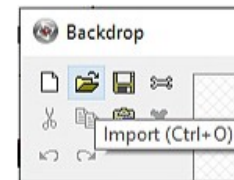
Click 'OK'
[End Skill]

Click on the frame to drop down the Backdrop Object



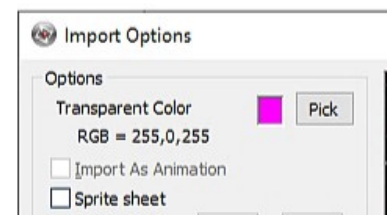
 [Reusable Skill - Importing Artwork]
Right-Click on the Object and click 'Edit' for Image Editor

 Find and select the image 'bg title.png' and click 'OK'



For this object we don't want black to be transparent (see through) so double click on the colour and choose an used colour (such as pink).

Click 'OK'
[END]



!Tip! If we did want a specific colour to be transparent we can use the colour picker tool, works well with PNG files, not well with JPG

Make sure the Backdrop is selected (blue square around it) if not, click on it



[Reusable Skill - Position Property]
In the Properties Window select the 'Size / Position' category

Type in the co-ordinates you want 'X' = 0 , 'Y' = 0 and press Enter

NB: The 'Height' and 'Width' are already set to 800, 450 for that image so they don't need changing
[End]



[Rename] Rename the Backdrop to "bg title screen"



Size / Position	
Position	
X	0
Y	0
Size	
Width	800
Height	450
Rotation	
Angle	0



[Insert an Object] Insert a "Quick Backdrop" into the frame



[Reusable Skill - Drag to Resize]
Click on the Quick Backdrop to show the resizing squares

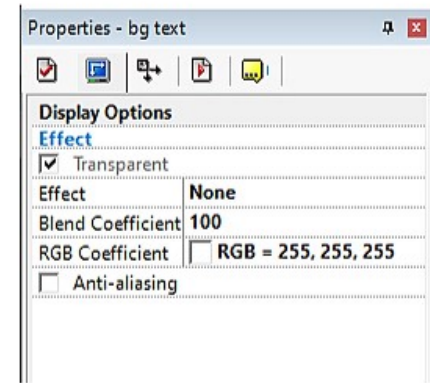
Drag the square it to fill an area under the green Missile Defence title
[End]


To make is slightly transparent


In the Property Window under the 'Display Options' category
Change the 'Blend Coefficient' to 100



[Rename] Rename the Backdrop to "bg text"




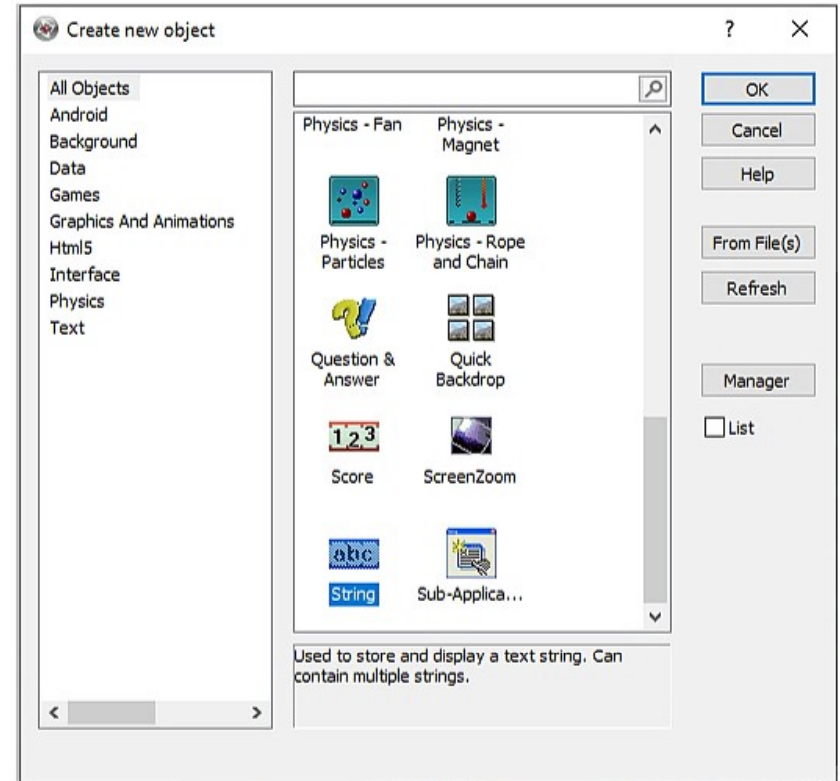
 [Insert an Object] Insert a "String" object into the frame (found in 'All Objects' or 'Text')

 [Drag to Resize] Click on it to then resize it, make it fit over the 'Quick Backdrop'

Change the Properties 'Text Options' category change the colour to White and the Font to size 18 bold.

Double click on the 'String and' type "Click to start", this will become our instructions later

 [Rename] Rename the 'String' to "Instructions"

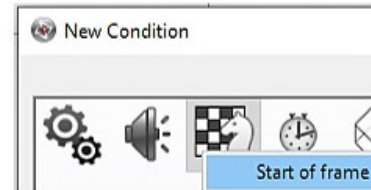


Retro Remakes

Missile Defence A4) Title Screen Coding



Click on the 'Event Editor' icon to go to the EVENT EDITOR



[Reusable skill - Background Music]

Click on 'New Condition' > 'Storyboard Controls' > 'Start of Frame'

Add an action by right-clicking under the 'Sound' column on the line of the condition you just made.

Click > 'Sound' > 'Play and Loop a sample' > 'Browse' (From File, not another application) >

Select 'Music - Satellite Loop.mp3' > 'OK' > Type 0 (continuous loop) > Click 'OK'

[End skill]

Click on 'New Condition' > Mouse pointer + Keyboard' > 'The mouse' > 'User Clicks' > Select "Left Button" and "Single Click" > Click 'OK'

Add an action by right-clicking under the 'Storyboard' column on the line of the condition you just made.

Click 'Next Frame'

All the events							
1	• Start of Frame		✓				
2	• User clicks with left button			✓			
3	• New condition						Next frame




[Reusable skill - Test]

From the top menu click 'Run' > 'Frame' (Or 'Application', as there is only one frame)

If the window is still open after you have tested your code, close it, otherwise it will restrict your work in the 'Frame Editor'

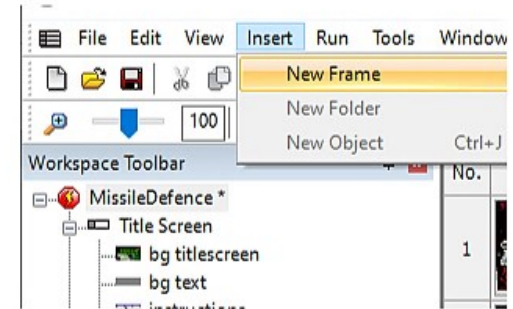
[End]

 Click on the 'Storyboard Editor' icon to go to the STORYBOARD EDITOR

From the top bar click 'Insert' > 'New Frame'

[Rename] Rename the new frame to "Game"

Click on the number next to the frame (2) to go to the FRAME EDITOR



[Insert an Object] Insert a Backdrop object (Not a Quick Backdrop)

[Import Artwork] "bg mountains.png"

[Rename] Rename the backdrop "bg mountians"



[Insert an Object] Insert a Quick Backdrop object (Not a normal Backdrop)

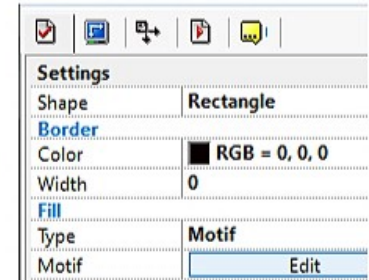


In the Properties 'Settings' category, change 'Fill Type' to 'Motif', then click 'Edit below'

[Import Artwork] "bg stars.png"

[Position Property] Set position X = 0, Y = 0, Width = 800, = Height 450

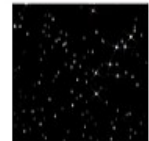
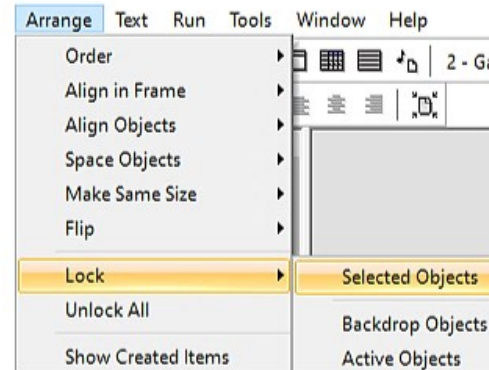
[Rename] Rename the backdrop "bg stars"



!BUG! The stars are covering the mountians

From the top menu click 'Arrange' > 'Order' > 'To Back'

Then to stop it being selected or moved accidentally click 'Arrange' > 'Lock' > 'Selected Objects'





[Insert an Object] Insert an Active Object (In category 'All Objects' and 'Graphics and Animation')
Make sure the Hot Spot is set to centre.

Drop the active object in the grey just the left hand side of the Frame.
Active object can move, be destroyed and store values



[Import Artwork] "cursor.png"



Click on the 'Event Editor' icon to go to the EVENT EDITOR for this frame (2)



[Reusable Skill - Insert an Event Group]

From the top menu Event editor insert group of event "Target"

[End]

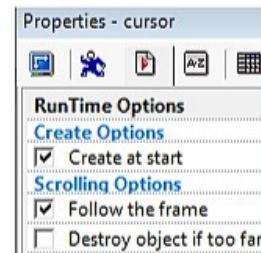
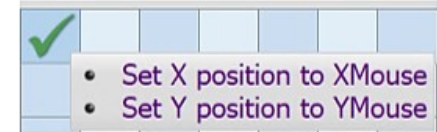
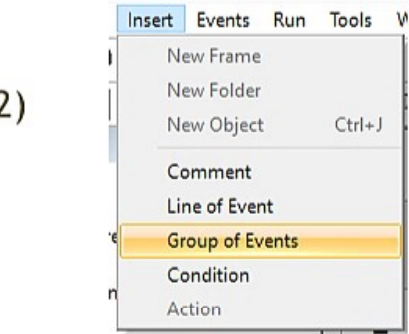
Event groups help keep the events (code) tidy and clear to understand

In the "Target" Event Group click 'New Condition' > 'Special' > 'Always'
[Add an action] For the Cursor 'Position' > 'Set X position' and click on "

In the "Target" Event Group click 'New Condition' > 'Storyboard controls' > 'Start of Frame'
[Add an action] 'The Mouse Pointer and Keyboardrd' > 'Hide Windows Mouse Pointer'

[Test] Run the Frame

!BUG! You'll notice that if the cursor moves too far from the Frame
it is destroyed. To fix this close test application,
Select the 'Cursor' object in the 'Workspace Toolbar' and in the Properties
'Runtime properties' category un-check 'Destroy if too far from frame'



 Click on the 'Frame Editor' icon to go back to the FRAME EDITOR

!TIP! Save your work, from the top menu 'File' > 'Save'



[Insert an Object] Insert an active object
[Import Artwork] 'turret.png'



[Reusable Skill - Hot Spot/Action Point Position]

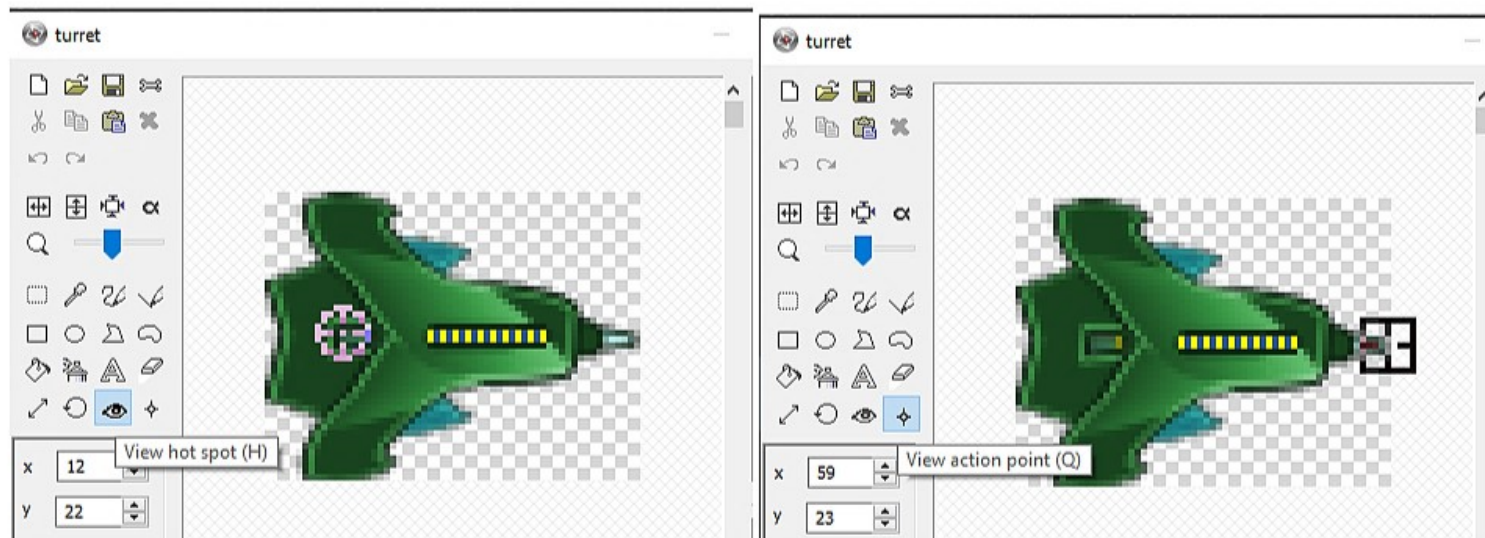
While in the Image Editor/Edit view, click on the 'Eye Logo' to see the 'Hot Spot' (Rotation and reference point for an object)

Click on the left hand side of the turret in the centre to reposition the 'Hot Spot'

Click on the 'Target Logo' to see the 'Action Point' (spawn point for created and launched objects also an alternative reference point for an object)

Click on the right hand side of the turret in the centre to reposition the 'Action Point'

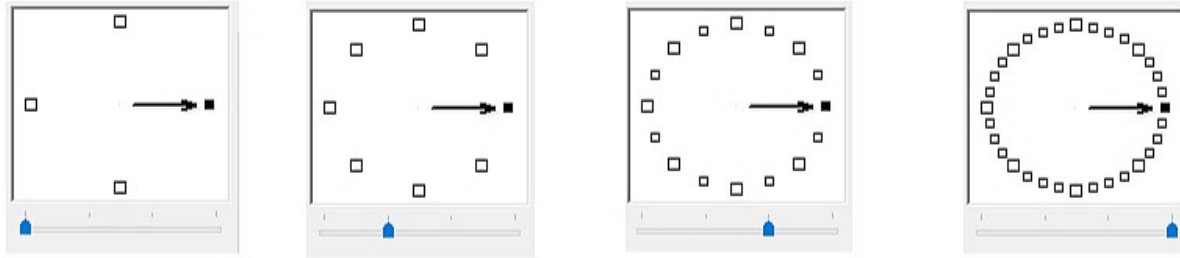
[End Skill]



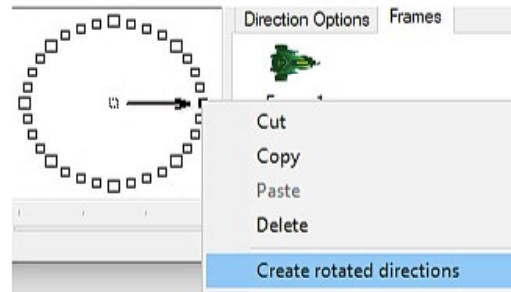


[Reusbale Skill - Create animation directions]

Still in the Image Editor/Edit view, pull the blue slider under the directions view to the right to increase the number of available direction animations to 32 (the maximum).



Right-click on the black box that the direction arrow is pointing to and click on 'Create rotated directions'



[End]

[Rename] 'Turret'



[Position Property] X = 400 Y = 450

Click on the 'Event Editor' icon to go back to the EVENT EDITOR

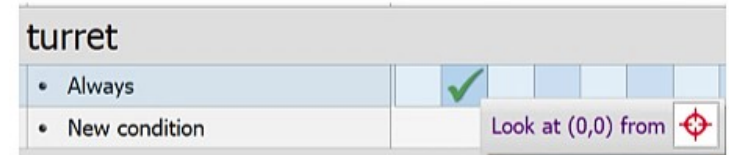


[Insert an Event Group] 'Turret'

Click 'New Condition' > 'Special' > 'Always'

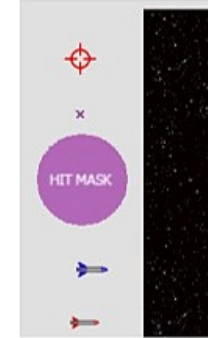




Right-Click in the 'Turret' object column on that line, Click 'Direction' > 'Look in direction of' > Click 'Relative to' > Click the 'Cursor' object > 'OK'

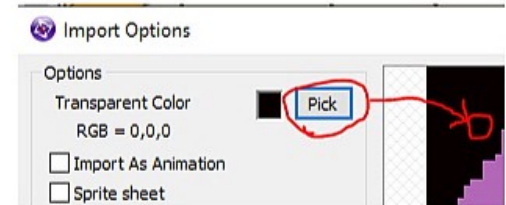





 Click on the 'Frame Editor' icon to go back to the FRAME EDITOR

 [Insert an Object] Insert an active object to the left hand side of the frame
[Import Artwork] 'target.png', Hot Spot set for centre 
 [Rename] "Target"




 [Insert an Object] Insert an active object to the left hand side of the frame
[Import Artwork] 'hit mask.png', Use the color 'Pick' button and click on the black in the corner of the image, and set the Hot Spot set for centre
 [Rename] "Hit Mask"

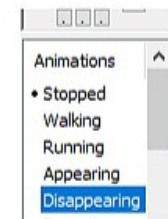


 [Insert an Object] Insert an active object to the left hand side of the frame
[Import Artwork] 'missile.png'
 [Hot Spot/Action Point] Place the 'Hot Spot' on the missiles tail 
[Create animation directions] Create and fill 32 directions

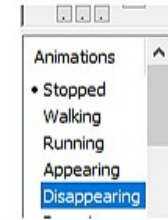


 [Reusable Skill - Change Animation]
'Active objects' have many animations built in.
We are going to change the 'Disappearing' animation.
This automatically plays when the object is destroyed.

In the Image Editor ('Edit') click on the 'Animations' category 'Disappearing'
[End]



Still in the Image Editor/Edit, in the 'Disappearing' Animation for 'Missile'.



[Reusable Skill - Import Animation]

Click 'Import'

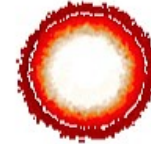
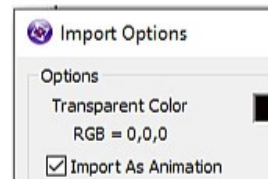
Select your first image file from the animation "missile-disappearing_1.png"

Check 'Import as Animation'

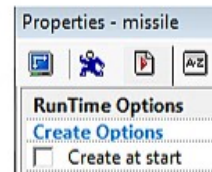
Click OK to close the import window

Click OK to save changes to the Image Editor

[End]



In the 'Missile' Properties 'Runtime options' category, un-check "Create at Start"

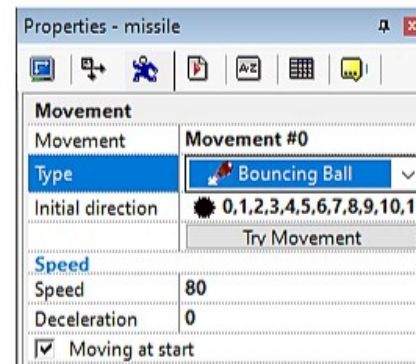


[Reusable Skill - Movement Property]

In the Properties window 'Movement' Category in 'Type' select > 'Bouncing ball' * (not Physics bouncing ball)

Set the 'Speed': 80

[End]



[Rename] "Missile"

*Bouncing ball movement allows things to move in straight lines. We won't be using the bouncing functionality.



[Insert an Object] Insert an 'Active object' to the left hand side of the frame
[Import Artwork] 'enemy.png'



[Hot Spot/Action Point] Place the 'Hot Spot' on the enemy's missile tail
[Create animation directions] Create and fill 32 directions



[Change Animation] Select the 'Disappearing' Animation
[Import Animation] "enemy-disappearing_01.png"

In the 'Enemy' Properties 'Runtime options' category, un-check "Create at Start"

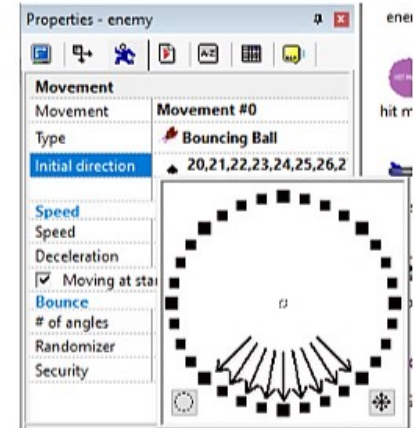
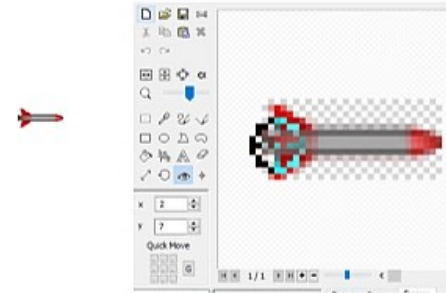
In the Properties window 'Movement' Category in 'Type' select > 'Bouncing ball'
(not Physics bouncing ball)

Set the 'Speed': 14

Click 'Initial direction' click the reset button,

Select directions 20 to 28

[Rename] "Enemy"



Missile Defence B4) Difficulty Counter



[Insert an Object] Insert a 'Counter' object to the left hand side of the frame
(In 'All Objects' and 'Data' categories)

In the Counter's Properties 'Settings' Category set the 'Initial value': 2

[Rename] "difficulty"





Click on the 'Event Editor' icon to go to the EVENT EDITOR for this frame (2)

Missile Defence C1) Missile Targeting 1/2

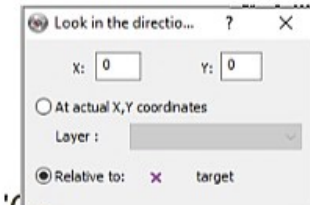
In the 'Target' group click 'New Condition' > 'Mouse Pointer and Keyboard' > 'The Mouse' > 'User clicks' > 'left click', 'single click' > Click 'OK' to finish that first action

On the 'Create object' column for that same row right click for a second action > 'Create object' > 'Target' > Click 'Relative to' > Select the 'Cursor' object > Click OK to close the object list > Click 'OK'

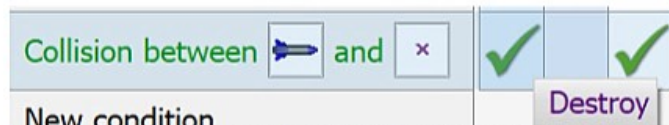
(On the same check mark) Right click on the 'Create object' column > 'Create object' > 'Target' > Click 'Relative to' > Select the 'Cursor' object > Click 'OK' to close the object list > Click 'options' > "options" Originating from "Action point" > (Make sure offset X and Y is 0) > Click 'OK'

Click 'New Condition' > 'Special > 'Always' condition

Right-click for an under the 'Missile' column > 'Direction' > 'Look in direction of' > 'Relative to' > 'Target' object > Click OK to close the object list > Click 'OK'



Click 'New condition', Click 'Missile' > 'Collision' > 'Another object' > 'Target' object > 'On' Right-click on the 'Create new object' column for that line. Click 'Hit mask' > Click 'Relative to' > Select the 'Target' object > Click OK to close the object list > Click 'OK'



Right-click on the 'Missile' column for that line and click 'Destroy'
Right-click on the 'Target' column for that line and click 'Destroy'



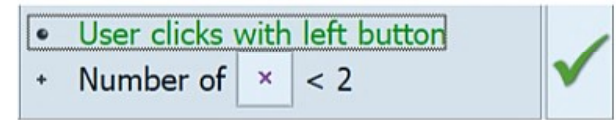
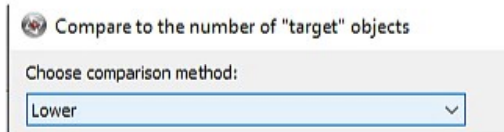
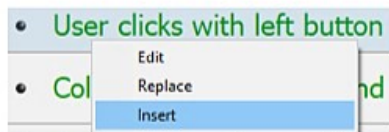
[Test] Run the frame



!BUG! When clicking near to the turret quickly missiles can get confused about what target to fly to once theirs is destroyed by another. (Also Hit Masks are visible and stay; we will fix this later.)

We will limit the amount of missile than can be made

Right click on the words of the condition 'User clicks with left button' > Click 'Insert' > 'Target' Object > 'Pick or count' > 'Compare to the number of target objects' > Change 'Equal' to 'Lower' > choose a number for the maximum missiles 1,2 or 3 e.g. 3. > Click 'OK'

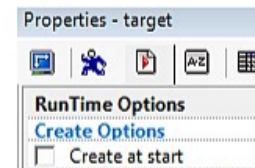


[Test] Test the new target/missile limit when you run the frame



!BUG! You can only shoot one less than your limit you set before.

This is due to the 'Target' added to the side of the Frame still existing.



To fix this close your test application window, click on the 'Target' in the 'Workspace Toolbar' In the 'Properties' 'Runtime' category uncheck 'Create at Start'



[Save] save your work



[Insert an Event Group] Insert new group of events, called "Enemy"

Click 'New condition' in this new enemy group,
Click 'Special' > 'X chances out of Y random' >

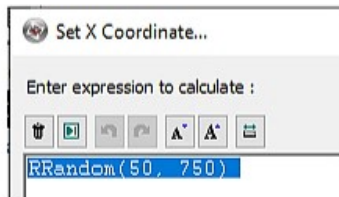
In 'Enter Number of chances' expression editor
click on the 'Difficulty' counter below and chose 'current value',
this will write the expressions as "value("difficulty")"
and click 'OK'



In 'Enter Total Number of chances' expression editor type in 1000 and click 'OK'

Right-click in the 'Create an object' column > Click the 'Enemy' object > And set X:0 Y:-60 (off screen)

Right-click in the 'Enemy' column for this line, Click 'Position' > 'Set X coordinate' > Click 'Random Range'
and fill in the expression be RRandom(50, 750) click 'OK'



Now lets get the difficulty to increase.

Click 'New condition' > 'The Timer' > 'Every' > 5 seconds > Click 'OK'
Right-click on the 'Difficulty' counter column on that line >
Click 'Add to counter' > Type in 1 in the expression editor > Click 'OK'

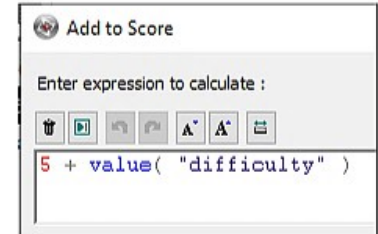
[Test] Run the frame
!Bug! Enemies are unstoppable, we will fix that next





Still in the EVENT EDITOR

Click 'New condition' > 'Hit mask' object > 'Collision with another object' > 'Enemy'
Right-click on the 'Enemy' column for that line, click 'Destroy'
Right-click on the 'Player 1' joystick icon > 'Add to score' > type 5 or
for more advanced add the difficulty current value e.g. $5 + \text{value}(\text{"difficulty"})$



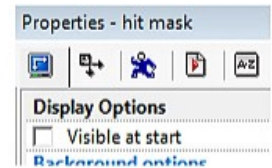
[Test] Run the frame
!BUG! Hit Masks stay forever, Hit Masks are still visible, Score isn't shown

Click 'New condition' > 'Hit mask' object > 'Overlapping another object' > 'Enemy'
Right click on the word 'overlapping' and click 'Negate' to get a red cross
Right-click on the 'Hit mask' column for that line, click 'Destroy'

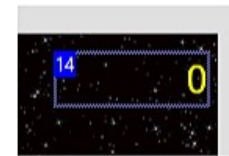


Click on the 'Frame Editor' icon to go back to the FRAME EDITOR

Click on the 'Hit mask' in the Properties 'Display options' category un-check 'visible at start'.



[Insert an Object] Insert new object, "Score" object (In 'All objects' and 'Game')
Change to the 'Settings' Category of the Score Properties > Change 'Type': Text
'Text Options' > 'Color' > Choose White (Or a bright colour)
'Text Options' > 'Font' > 'Size': 16 (or bigger)
Click and drag the score to move it to the top right of the screen



[Test] Run the frame





[Insert an Object] Insert new 'Active' object



[Import Artwork] 'city-stopped.png'

[Change Animation] Select 'Disappearing' animation

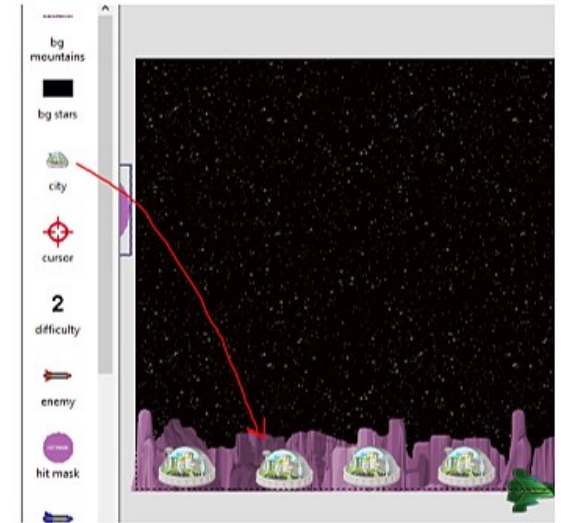


[Import Animations] 'city-disappearing_1.png' as animation

[Rename] "City"



Pull the 'city' icon in from the asset bar more cities and line them along the bottom of the screen.



Click on the 'Event Editor' icon to go back to the EVENT EDITOR

New condition in the "enemy group" enemy collision with city, A

Add the actions, 'destroy' to the 'enemy' object and 'destroy' to the 'city' object .

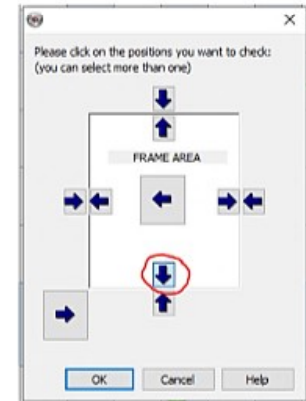
New condition in the "enemy group" enemy collision with turret,

Add the actions, 'destroy' to the 'enemy' object and 'destroy' to the 'turret' object .

New condition "enemy"> "Position" > "Test position"

Select the bottom arrow pointing down.

Add the action 'destroy' to the 'enemy' object.




[Test]

!Bug! The game never ends

!TIP! Save your work, From the top menu click 'File' and then 'Save'

Retro Remakes

Missile Defence C4) Game Over

 The game should end when we lose all the cities or the turret,
In the EVENT EDITOR, under the 'Enemy' Group:

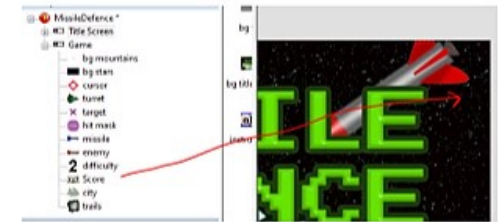
Click 'New condition' > 'City' object > 'Pick or count' > 'Have all 'City' been destroyed'
Right-click in 'The timer' column for the line > 'Fire event after given delay' > 3 seconds > Click 'OK' > event name "quit" (keep the speech marks) > Click 'OK'

Click 'New condition' > 'Turret' object > 'Pick or count' > 'Have all 'Turret' been destroyed' Right-click in 'The timer' column for the line > 'Fire event after given delay' > 3 seconds > Click 'OK' > event name "quit" (keep the speech marks) > Click 'OK'

Click 'New condition' > 'The Timer' > 'On Event' > "quit" (keep the speech marks)
Right-click in 'Storyboard Controls' column for the line controls > 'Jump to frame' (This will keep your score, instead of restarting the Application) > "Frame 1 - Title Screen" > 'OK'


 Click on the 'Storyboard Editor' icon to go back to the STORYBOARD EDITOR

 Click on the grey 1 to go to frame 1 FRAME EDITOR,
Add in a score, or from the 'Workspace Toolbar' drag the 'Score' object from Frame 2 on the 'Workspace Toolbar' into Frame 1



Double click to edit the 'Instructions' String, type in your instructions and who made the game.
Click away from it to save the changes

 [Save & Test] Run the Application (Not frame)

 !Bug! The score will not reset and will keep adding each new game.

To resolve this go into the EVENT EDITOR for Frame 2 and on the condition 'Start of frame'
Right-click under 'Player 1' column and click 'Set score' > 0 > 'OK' [Save & Test]

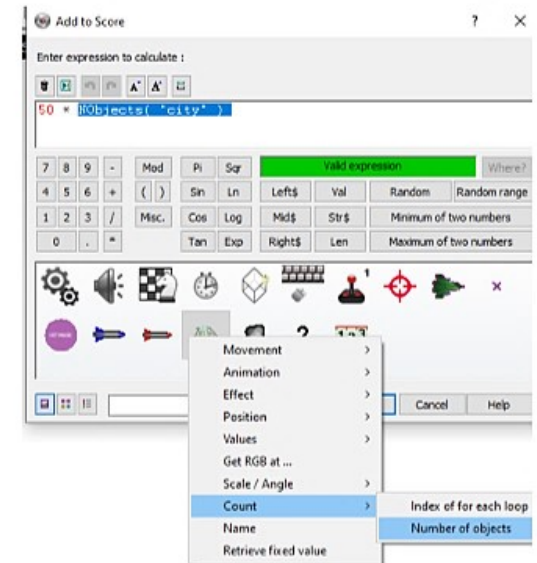
Missile Defence D1) City Bonuses

We can add a 50 point bonus every 30 seconds for each city that is saved

'Frame 2-Game' EVENT EDITOR

Add a condition 'The Timer' > 'Every' > 30 seconds > 'OK'

Add the action (right-click) 'Player 1' > 'Add to score' > $50 * \text{NOobjects}(\text{"city"})$



Missile Defence D2) Trails

Go into the FRAME EDITOR for 'Frame 2-Game' for insert an active object,
Edit the object and right-click on Animation Cell Frame 1 and delete it.

Select 'Disappearing' animation

Import "trail-disappearing_1.png" as animation with the hot spot centered,

Select 'direction options' and set speed to 5.

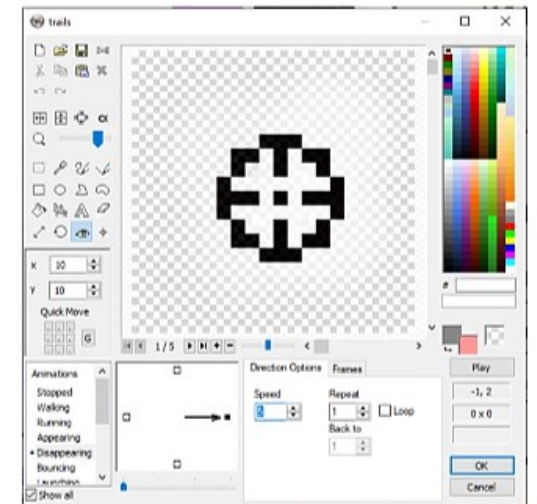
Rename the object to 'Trail'

Add the condition in the event editor "The Timer" every 10/100ths seconds
(Make sure 'Seconds' are set to 0)

Add an action (right-click) to 'Create New Objects' > 'Trail' > Relative to 'Enemy'.

Add an action (right-click) to the same line on the 'Trail' column > Destroy.

Add an action to (right-click) to the same line on 'Trail' object > 'Order' > 'To back'



Missile Defence D3) Sound Effects

You can also add sound effects. In the EVENT EDITOR on relevant conditions/events, Right-click on 'Sound' > 'Play Sample' > Browse from file > Select the relevant sound effect.

16	• Collision between  and 	<input checked="" type="checkbox"/>																			
17	• Collision between  and 	<input checked="" type="checkbox"/>																			<ul style="list-style-type: none"> • Play sample Enemy explodes • Play sample City explosion

Condition

Sound effect

Click to fire missile

Shoot.mp3

Missile hits target

Missile explode.mp3

Enemy is created

Enemy enters.mp3

Enemy missile destroyed*

Enemy explodes.mp3

City or Turret destroyed

City explosion.mp3

Start of Frame

Play and loop sample "Music - Action Strike.mp3" times "0" (infinite)



* Occurs on 4 different conditions

Missile Defence D4) Advanced Game

We've put together a more advanced and closer remake of Missile Command
See it here and download the MFA

<https://impactgamers.net/retro/md2>