IL★2 STURMOVIK

Mission Editor and Multiplayer Server Manual

Pre-Release Edition One

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Sources for Design Ideas

Random Switch (pg. 294): Coconut

References

Payloads list, dependences on unlocks, by Han, 1CGS Project Manager
IL-2 Sturmovik Forum → IL-2 Sturmovik → Mission Making and Mission Editor
http://forum.il2sturmovik.com/topic/21045-payloads-list-dependences-unlocks/#entry333139

Chapter 1: Getting Started

Get Around in This Manual

You can get to the information that you want in this manual quickly.

Do any of the following:

- Click on an entry in the Table of Contents.
- Open the PDF bookmarks and click on a bookmark.
- Click on any of the hyperlinks in the content.
- Press Alt+Left Arrow (back)or Alt+Right Arrow (forward) to jump between pages that you accessed by clicking a hyperlink.

Start Using the Mission Editor

You can start the mission editor, learn about the interface and various mission elements, learn basic mission editing skills, create singleplayer and multiplayer missions, and set up your own multiplayer mission server.

Important! The mission designs in this manual do not necessarily show the only way to accomplish your goals. Experienced mission designers often come up with improved designs that make missions run more efficiently and provide new features. As you gain experience, you will be able to understand more complex missions and develop your own mission designs.

Do the following:

1. Run STEditor.exe, which is in your game folder under \bin\editor.

   The mission editor starts.
2. Learn basic information about the mission editor (pg. 2).
3. Learn the skills in Chapter 2: Learning Basic Mission Editor Skills (pg. 13).

   Important! Learn the basic mission editor skills before proceeding to the rest of this manual. You can skip topics that include a note indicating that the skill is optional. Where topics show several methods to accomplish a task, learn the method that works best for you.

4. Start learning the icons for command MCUs (pg. 236), translator MCUs (pg. 247), and trigger MCUs (pg. 274).

   Learning the mission editor icons has these benefits:

   - You can create short icon labels, which reduces clutter in the View Port.

     For example, you can change the default "Translator Mission Begin" label to "Begin" for a mission begin translator

   - You can create icon labels that indicate what the icon does rather than what the icon is.

     For example, you could change the default "Trigger Timer" to "Delay Repair:15m" for a 15-minute delay prior to triggering the repair of a bridge. You could also just name the timer trigger "15m" if its purpose is easy to understand.

5. (Optional) Install the sample missions and groups (pg. 11), which are available along with this manual.
6. Create a singleplayer mission (pg. 33).

   Important! Because there is no "Undo" function in the editor, consider saving work-in-progress versions of your missions that you can go back to in case of major problems.

7. (Optional) Create a Multiplayer Mission (pg. 38).

   You can run your mission on an existing multiplayer server or you can proceed to the next step if you want to create and run your own server.

8. (Optional) Set up your own multiplayer mission server by following the procedures in Chapter 11: Running Multiplayer Missions (pg. 167).

For help, see the following:

- Chapter 12: Tips (pg. 177)
- Chapter 13: Troubleshooting (pg. 179)
- Chapter 14: Reference (pg. 191)
- The IL-2 Sturmovik mission editing forum at http://forum.il2sturmovik.com/forum/92-mission-making-and-mission-editor/

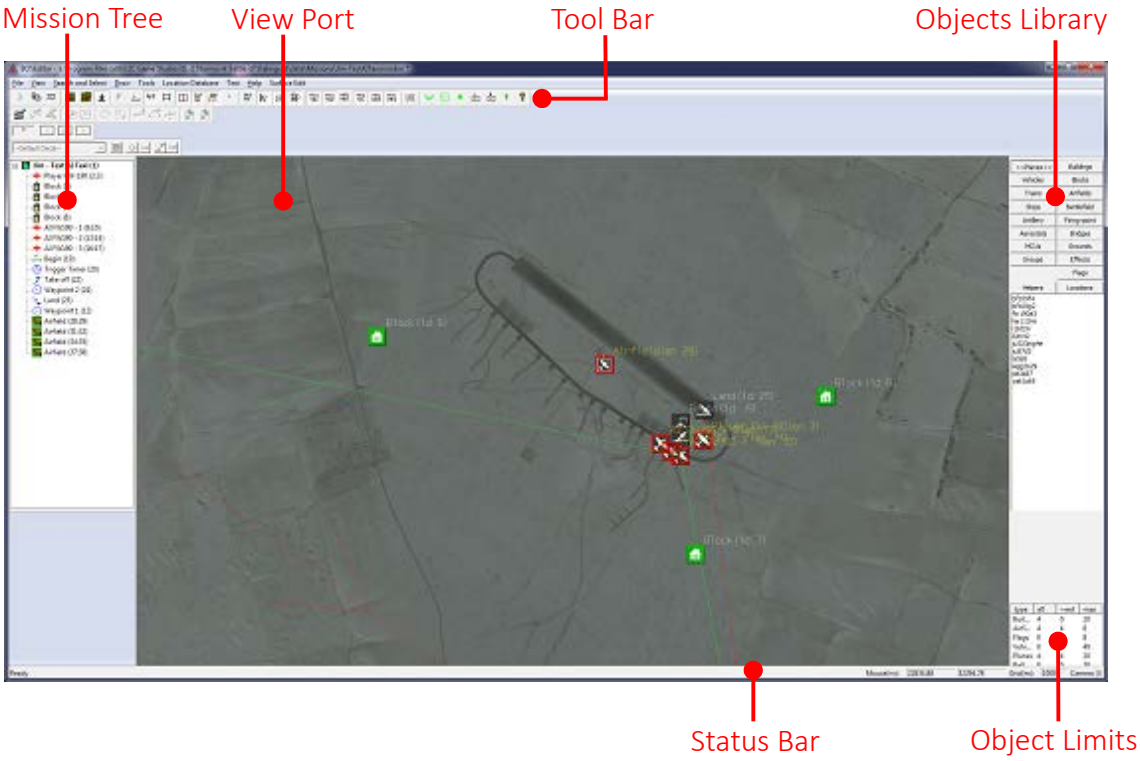
About the Mission Editor

The mission editor for IL-2 Sturmovik lets you create singleplayer and multiplayer missions. These missions can include computer-controlled (or "AI") objects such as planes or vehicles.

A new mission starts with some terrain that includes features like runways, roads, railway tracks, forests, and rivers. You can specify mission parameters such as the time-of-day and the weather. Then, you can place icons for various objects and effects (pg. 6) such as buildings, planes, vehicles, fire, or smoke on the terrain. Next, you can specify how your mission works by placing MCUs (pg. 7) or Mission Control Units on the terrain and using links (pg. 8) to connect them with each other and with objects.

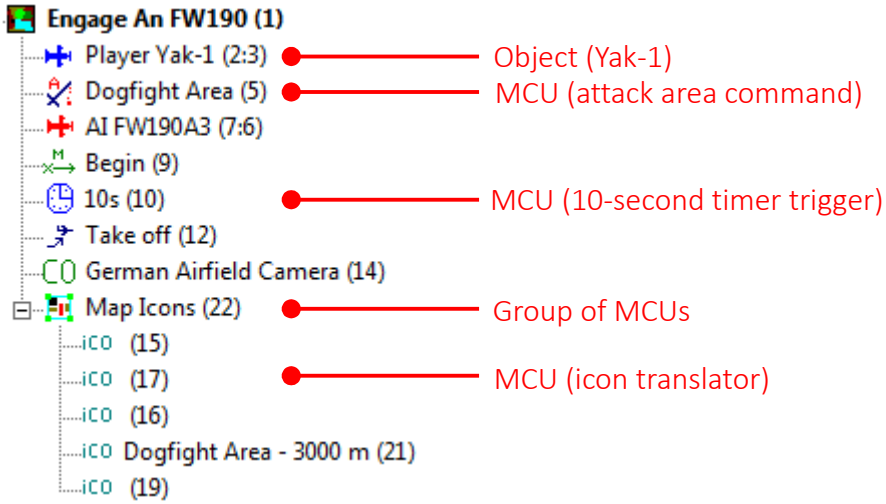
Mission Editor Interface

Here is the mission editor interface:



Mission Tree

Shows all of the objects, effects, MCUs, and groups (pg. 7) of objects in your mission. Here is an example of a Mission Tree:



You can open the properties for a mission, an object, or an MCU (pg. 18) from the Mission Tree or the View Port.

You can right click on an item in the mission tree to display a context menu (pg. 194).

Each item in the tree is followed by a unique identifier number or two identifier numbers separated by a colon. The first number (object ID or MCU ID) is automatically assigned when you place an object icon or MCU icon in the View Port (pg. 15). The second number (entity ID) is assigned if you make an object a linked entity (pg. 17). For example:

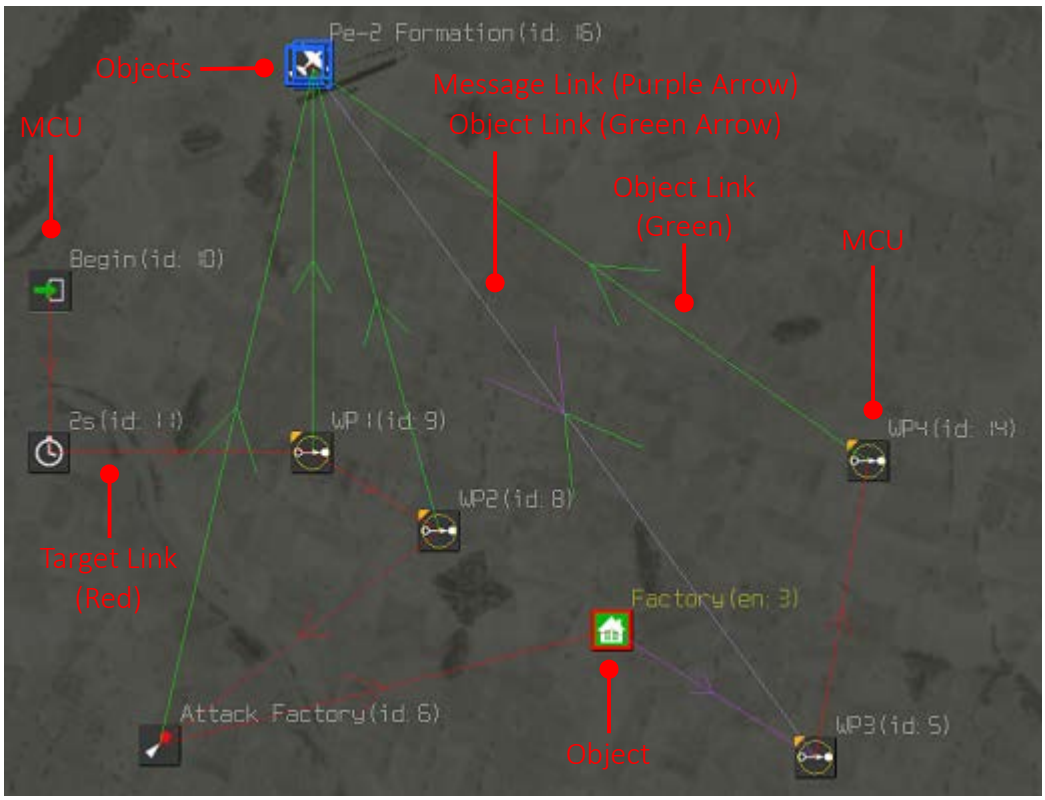
- "Player Yak-1" is a linked entity object with object ID 2 and entity ID 3.
- "Dogfight Area" is an MCU with MCU ID 5.

View Port

Displays the following items:

- Terrain
- Icons for objects, effects, and MCUs
- Links between icons
- A "GUI map", which is a navigational map that the flight crew can refer to

Here is an example of the View Port showing terrain, icons, and links:



Here is an example of part of the GUI map in the View Port:

Tool Bar

Provides the functions detailed in Tool Bar (pg. 196).

Objects Library

Contains categories for objects, effects, MCUs, and groups that you can choose and place in the View Port.

Note:

- There are no objects available in the Aerostats, Battlefield, and Firing-Point categories.
- The Helpers and Locations categories are not covered in this manual. These categories are used for terrain editing.

Status Bar

The Status Bar shows information regarding the map view, the map grid, and the mouse cursor.

Camera (X Z Zoom) | Camera (X Z Height)

The position and zoom level of your view of the map.

Note: Camera values are not visible in the current editor version with the window maximized. If your desktop spans multiple monitors, you can "Restore Down" the window and drag the right side of it outwards until you see the camera values.

The first box (X) shows the view position (in meters) relative to the bottom of the map.

The second box (Z) shows the view position (in meters) relative to the left side of the map.

The third box (Zoom|Height) shows the view zoom level for the 2-D view and the view height (in meters) above sea level for the 3-D view.

Grid(m)

The distance (in meters) between grid lines at the current zoom level

To view the grid, click the "Draw Grid" icon in the Tool Bar.

Mouse(m)

2-D view only. The position of the mouse cursor.

The first box shows the cursor position in meters relative to the bottom of the map.

The second box shows the cursor position in meters relative to the left side of the map.

Object Limits

Not useful in the current editor version.

Objects and Effects

An object icon represents a physical entity in the View Port. For example, you can create a plane object, a vehicle object, an artillery object, or a building object.

An effect icon represents a visual or audible effect in the View Port. For example, you can create a fire, smoke from a chimney, or the sound of an air-raid siren.

Note: For simplicity, when this manual refers to "objects", assume that this includes effects.

An object can interact with MCUs or with other objects through connections called links (pg. 8). For example, AI planes in a formation are target linked to the formation leader and a take off command (pg. 246) MCU is object linked to the formation leader, which causes the formation to take off. You must first make an object a linked entity (pg. 17) before you can create links to it or from it.

Objects and effects are available in the Objects Library part of the Mission Editor Interface.

Related Information

Place an Object Icon or MCU Icon in the View Port (pg. 15)

Open the Properties for a Mission, an Object, or an MCU (pg. 18)

MCUs

MCU (Mission Control Unit) icons in the View Port provide functionality to a mission. For example, a take off command (pg. 246) MCU tells a plane to take off and the timer trigger (pg. 283) MCU can provide a time delay in the mission before another event occurs.

MCUs are available in the Objects Library part of the Mission Editor Interface.

MCUs can interact with other MCUs or with objects through connections called links (pg. 8). For example, the take off command is object linked to the AI planes that you want to take off and a timer trigger can be target linked to the take off command to delay the takeoff for some specified time.

MCUs are divided into the following types:

- Command MCUs (pg. 236)
- Translator MCUs (pg. 247)
- Trigger MCUs (pg. 274)

Trying to describe what each MCU type does is not useful because MCUs of each type do a wide variety of things. Also, some MCUs of different types do similar things. For example, both the complex trigger translator (pg. 252) and the check zone trigger (pg. 276) can detect objects entering a zone. Some MCUs of one type can also act like another type. For example, when a waypoint trigger (pg. 285) is triggered, it commands an object to fly towards it. When the object reaches the waypoint, the waypoint can trigger other MCUs.

Related Information

Place an Object Icon or MCU Icon in the View Port (pg. 15)

Open the Properties for a Mission, an Object, or an MCU (pg. 18)

Groups

You can group together selected objects and MCUs, which are then represented by a group icon in the View Port. The group items appear in the Mission Tree under the group name.

Related Information

Select Icons (pg. 16)

Group and Ungroup Icons (pg. 24).

Make a Group the Current Working Group (pg. 25)

Find the Group Containing an Icon That You Want to Select (pg. 25)

Add Objects or MCUs to a Group (pg. 28)

Links

Links are connections between MCUs, between objects, or between MCUs and objects. These connections help determine how your mission works.

Note:

- This topic has many references to other topics in the manual that help you understand links. You can read those topics now or later, depending on how much detail you want.
- Creating links is discussed in Manage Connections Between Mission Icons (pg. 19).
- The documentation for each MCU shows the required and optional input and output links.

Target Link

A target link connects an MCU to an MCU, an object to an object, or an MCU to an object. The link is shown as a red line with an arrow pointing from one icon to another.

A target link does the following:

- Defines the direction in which mission events progress

  For example, a target link points from a timer trigger (pg. 283) to a take off command (pg. 246) so that after the time expires, the take-off command is triggered. For details, see Make a Plane Take Off, Fly a Route, and Land (pg. 61).
- Defines the relationship of objects in a formation

  For example, a target link points from a wingman plane object to the formation leader plane object. For details, see Manage Object Formations (pg. 74).
- Connects one icon translator (pg. 255) to another

  Connections between icon translators show as lines on the GUI map. For details, see Mark Locations and Draw Shapes on the Flight Crew's Map (pg. 151).
- Specifies an object that another object acts upon

  For example, a target link points from an attack command (pg. 236) to the object that must be attacked. An object link points to the attacking object. For details, see Make an Object Attack Another Object (pg. 119).
- Specifies an MCU that can be deactivated or activated during a mission by the deactivate trigger (pg. 280) or the activate trigger (pg. 274)

  For details, see Deactivate or Activate Mission Functions (pg. 105).

Object Link

An object link connects an MCU to an object, animation operator translator (pg. 247), camera operator translator (pg. 251), complex trigger translator (pg. 252), or influence area translator (pg. 265). The link is shown as a green line with an arrow pointing toward an object or translator.

An object link does the following:

- Specifies the object that an MCU acts upon

  For example:

  - An object link from a take off command points to a plane so that when the command is triggered, the plane takes off.

    For details, see Make a Plane Take Off, Fly a Route, and Land (pg. 61).
  - Object links from a check zone trigger (pg. 276) to specific objects make the trigger detect only those objects when they are in the zone.

    For details, see Detect Objects In Relation to a Defined Area (pg. 81).
- Specifies an object that can be activated or deactivated during a mission by the activate trigger (pg. 274) or deactivate trigger (pg. 280)

  For details, see Deactivate or Activate an Object While a Mission is Running (pg. 114).

Event Message Link

An event message link connects an object or certain MCUs to an MCU. The link is shown as a purple line with an arrow pointing toward the MCU.

An event message link triggers an MCU when a specified event occurs. For example, an "OnPlaneTookOff" event message link from a plane can trigger a waypoint trigger (pg. 285) when the plane takes off. The plane then flies toward the waypoint. For details, see Make a Plane Take Off, Fly a Route, and Land (pg. 61).

Events are listed in the On Event Properties Dialog (pg. 221), which also lists the MCUs from which you can create event message links.

Note:

- If there is also a (green) object link from the MCU to the object, the resulting link appears light purple. The link appears turquoise if you select the object and light green if you select the MCU.
- Multiple event or report message links to an MCU are shown as one link.

Report Message Link

A report message link is like an event link, but it also includes the MCU that acts upon the object. In this case, the object activity is called a report rather than an event.

A report message link consists of two parts:

- The first part of the link is a connection from one of the following MCUs to an object:
  - Attack command (pg. 236)

    The first part of the report link goes to the object to be attacked.
  - Attack area command (pg. 237)
  - Land command (pg. 244)

- Spawner trigger (pg. 282)
- Take off command (pg. 246)

The object can be a plane, ship, train, or vehicle.

- The second part of the link is a connection from the object to a second MCU that is triggered by the object activity.

Both parts of the link are shown as a dark blue line with an arrow for each connection. The arrow for the first connection points to the object. The arrow for the second connection points to the second MCU.

Reports are listed in the On Report Properties Dialog (pg. 224).

Note:

- If there is also a (green) object link from either MCU to the object, the resulting connection appears light blue. The connection appears turquoise if you select the MCU and dark blue if you select the object.
- Multiple event or report message links to an MCU are shown as one link.

Here is an example of a report message link:

In this example, a red target link from another MCU triggers the "Spawn FW190" spawner trigger (pg. 282), which can create an object while a mission is running. When the FW190 is spawned, the waypoint is triggered, causing the plane to fly towards it.

The first part of the report message link is the light blue connection from "Spawn FW190" to the plane object "AI FW190". The connection is light blue because there is also a green object link from the spawner trigger to the object.

The second part of the report message link is the light blue connection from the FW190 to the waypoint trigger "Waypoint". The connection is light blue because there is also a green object link from the waypoint trigger to the object.

Avoid Command Conflicts When Creating Links

If you trigger two commands or a command and a waypoint trigger (pg. 285) at the same time for the same object, the commands will conflict and will not work properly.

Do one of the following:

- Use a timer trigger to create a one or two-second delay between the commands or between a waypoint and a command.

  See the example in Make a Vehicle Follow a Route (pg. 67).
- Use an event message link or report message link to detect when one command is complete before triggering another one or triggering a waypoint.

  See the example in Make a Plane Take Off, Fly a Route, and Land (pg. 61).

Note: The waypoint trigger acts like a command when it is triggered. It commands an object to move towards it.

Related Information

Manage Connections Between Mission Icons (pg. 19)

On Event Properties Dialog (pg. 221)

On Report Properties Dialog (pg. 224)

Sample Missions and Groups

A .zip file containing sample missions and groups is available along with this manual. The sample file includes a "readme" text file with installation instructions.

The sample file includes singleplayer and multiplayer missions for most of the examples in this manual.

The groups in the sample file are for custom mission functions (pg. 287), which can be made available in the "Groups" category of the Objects Library. For more details on installing groups from files, see Access Saved Objects, MCUs, and Groups in the Object Library (pg. 30).

Chapter 2: Learning Basic Mission Editor Skills

Select Views and Move Around in the View Port

There are various ways in the editor to view the View Port and move around on it.

You can view the View Port from above (called "2-D" view or "Ortho View" for Orthogonal View) or from any other angle (called "3-D" view).

You can also move or look up, down, and in any direction.

You can store views, which makes it easy to jump around to various points of interest in your View Port. The stored views are called “cameras” and they are available in the editor only. You can use another type of camera to create views that a mission participant can see (pg. 53).

Toggle Between the 2-D (Ortho) View and the 3-D View

Do one of the following:

- Click the "Toggle Camera" button.

- Press F9.
- Right-click in the View Port and choose "Ortho View".

Move Left/Right and Forward/Backward in the View Port

Do either of the following:

- Right click in the View Port and drag to move the view in the desired direction.
- Click the Mini GUI Map icon on the Toolbar and drag the black square in the mini map in the desired direction.

  The area outlined by the black square represents the area shown in the View Port at the current zoom level. If you cannot see the black square, zoom in to the View Port a little bit.

Move Up/Down in the 3-D View

Turn your mouse wheel backward to go up and forward to go down.

Look in Any Direction in the 3-D View

Left-click in the View Port and drag to look in the desired direction (including up and down).

Zoom In and Out in the 2-D View

Turn your mouse wheel forward to zoom in and backward to zoom out.

To zoom to the point under your mouse cursor, click the "Zoom to Cursor" Toolbar button before turning the mouse wheel. Otherwise, you zoom to the center of the window.

Zoom In and Out in the 3-D View

Move your view forward/backward and up/down to zoom in and zoom out.

Zoom to a Selected Icon

Select an icon and click the "Focus on Selection" Toolbar button.

Move to a Specified Location

Right click in the View Port and choose "Move Camera to".

The Move Camera to Dialog (pg. 209) opens, which allows you to move the view to a specified location in the View Port.

View the Environment from a Selected Object or MCU

Right-click the object or MCU and choose "Selected Object Menu" > "Look from this object" from the context menu (pg. 194).

View a Map (Called a "GUI Map") in the View Port

Click the GUI map button in the toolbar.

Store a View

In the View Menu (pg. 191), choose "Add Camera" and specify the new camera name.

Manage Stored Views

In the View menu, choose "Cameras".

The Cameras Dialog (pg. 200) opens.

Go to a Stored View

Do either of the following:

- Press Ctrl+1, Ctrl+2...Ctrl+9, or Ctrl+0 to choose one of your cameras.
- In the View menu, choose "Go To Camera" and choose the camera that you want to go to.

Find Distances and Headings in the View Port

Note: This skill is optional.

You can find distances and headings between points in the View Port. This ability helps you to place mission elements precisely.

Do either of the following:

- Click the Measure Mode button.

- Click the Draw Grid button.

For details, see Tool Bar (pg. 196).

Related Information

Find Distance and Flight Time for a Route in the View Port (pg. 18)

Place an Object Icon or MCU Icon in the View Port

You can choose an object or an MCU and place the icon in the View Port.

Do the following:

1. In the Object Library, click an object category button or click the MCUs button.
2. Select the object or MCU that you want from the list below the object category buttons.

   A cursor with "P" beside it appears when you move your mouse to the map.
3. If you want to create multiple copies of an object or an MCU, press and hold CTRL.
4. Click in the View Port where you want to place the objects or MCUs.
5. For objects that you want to place on the ground, click the "Set on Ground" button in the Toolbar.

Note:

- To cancel the creation of an object or MCU, press the ESC key.
- You can also create or delete an object while a mission is running (pg. 107).

Select Icons In the View Port

You can select one or more icons for objects or MCUs. If you select multiple objects or MCUs, you can manipulate them as a group (for example, move them, rotate them, delete them).

Do any of the following:

- Click on the object or MCU in the View Port.

  For a large object, make sure that you select the object icon.
- Press CTRL and click on multiple objects or MCUs in the View Port.
- Press CTRL + A to select all objects and MCUs in the View Port.
- Click and drag around the objects or MCUs that you want to select.
- Right-click on the entry for the object or MCU in the Mission Tree and choose “Select”.
- Choose one of the selection choices in the Search and Select menu.

A green frame appears around each selected icon in the View Port.

A blue frame appears around multiple selected icons in the View Port.

Note: If you cannot select an icon in the View Port, select it in the Mission Tree instead.

Related Information

Group and Ungroup Icons (pg. 24)

Make a Group the Current Working Group (pg. 25)

Move and Rotate an Icon

Using your keyboard or mouse, you can move or rotate icons for objects and MCUs in the 2-D view or the 3-D view of the View Port. For example, you can rotate a plane object to point in the desired starting direction and you can rotate a land command MCU to point in the desired landing direction for a plane. You can also move or rotate multiple objects that you selected.

Note:

- You can determine the direction of an object (except the airfield object) by zooming in to see the actual object represented by the icon or checking "Orientation" in the Object Properties Dialog (pg. 217).
- An airfield object has no physical representation but it represents a location where multiplayer mission participants can occupy planes ("spawn in") and a reference point for defining an AI plane taxi path. The airfield direction is shown by a yellow line on the icon and it is indicated by the "Orientation" field in the Object Properties Dialog. For more details on using airfield objects, see Create a Multiplayer Mission (pg. 38) and Make a Plane Taxi to and From a Runway (pg. 63).
- All MCUs can be rotated, but the direction only matters for certain MCUs, such as the

land command or camera operator translator. If the direction matters for an MCU, the direction is shown by a yellow line on the icon.

Move an Icon

Select the icon and do one of the following:

- (2-D view) Click and drag the object with your mouse.
- (3-D view) Press SHIFT and click and drag the object with your mouse.
- Press CTRL+arrow keys to move in small amounts.
- Press arrow keys to move in medium amounts.
- Press SHIFT+arrow keys to move in large amounts.
- Open the object or MCU properties and adjust the X, Y, or Z settings under "Position".

  Note: If you select multiple icons and change X or Z, all of those icons are moved to the new position of the selected icon that was created first. For example, if you add 10 to X and Z, all the icons are moved on top of one another at the new position of the icon that was created first.

Rotate an Icon or Selected Icons

Select the icon and do one of the following:

- (2-D view) Click and drag the red square in the object selection frame with your mouse.

  If you cannot see the red square, zoom into the icon.
- (3-D view) Press CTRL and click and drag the object with your mouse.

  An "R" appears beside the icon while it is rotating.
- Press CTRL+comma (,) or CTRL+period (.) to rotate in small amounts.
- Press comma (,) or period (.) to rotate in medium amounts.
- Press SHIFT+comma (,) or SHIFT+period (.) to rotate in large amounts.
- Open the object or MCU properties and adjust the AX, AY, or AZ setting under "Orientation".

  Note: If you select multiple icons and change AX, AY, or AZ, all of those icons are rotated to the new orientation of the selected icon that was created first. For example, if you add 10 to AY, all the icons are rotated to the new direction of the icon that was created first.

Make an Object a Linked Entity

You must make an object a linked entity to do the following:

- Enable the object to interact with the mission by linking to other objects and MCUs
- Access the Object Advanced Properties Dialog (pg. 209)

To make an object a linked entity, click the "Create Linked Entity" button in the Object Properties Dialog (pg. 217).

Note:

- A linked entity has a yellow icon label. Non-linked entities have a white icon label.
- The following objects must be linked entities to appear in a mission: airfield, artillery, effect, plane, train, and vehicle.
- The following objects appear in a mission regardless of whether they are linked entities or not: building, block, bridge, flag, and ground

Open the Properties for a Mission, an Object, or an MCU

You can access basic properties and advanced properties dialogs for objects and MCUs.

Access Object and MCU Basic Properties

Do either of the following:

- Click on an entry in the Mission Tree.
- Select an object or MCU, right click on it, and choose Properties.

Access Object and MCU Advanced Properties

Double click on an object or MCU.

Related Information

Object Properties Dialog (pg. 217)

Object Advanced Properties Dialog (pg. 209)

MCU Basic Properties Dialog (pg. 204)

MCU advanced properties are documented in each MCU topic, for example, Waypoint Trigger (pg. 285).

Find Distance and Flight Time for a Route in the View Port

Note: This skill is optional.

In the View Port, you can find the distance and flight time required to fly a specified route at a specified airspeed. This procedure is useful to determine the time required for an AI plane to fly a route. An AI route is defined using Waypoint Triggers (pg. 285), but you can specify any route that you want in the View Port.

Do the following:

1. Place a plane object in the View Port or select an existing plane object.

   You can use any plane object that you want. Specifying the route to find distance and time has no effect on the plane.
2. Follow the directions under "Route Time" field in the Object Advanced Properties Dialog (pg. 209).

Related Information

Make a Plane Take Off, Fly a Route, and Land (pg. 61)

Find Distances and Headings in the View Port (pg. 15)

Copy, Paste, Cut, or Delete an Icon

You can copy and paste, cut, or delete icons for objects or MCUs using standard Windows methods. This procedure works for single icons or multiple selected icons.

Do any of the following:

- Use CTRL+c to copy an icon.
- Use CTRL+v to paste an icon.
- Use CTRL+x to cut an icon.
- Use DEL to delete an icon.
- Right-click the icon and choose Copy, Paste, or Cut from the context menu.

Important!

- When you copy an object or MCU, the advanced properties of the copy may be reset to default values. For example, if you copy a Check Zone Trigger (pg. 276) the "Plane Coalitions" and "Vehicle Coalitions" values in the copy are set to False.
- If you copy the human-controlled plane (the "player" plane) in a singleplayer mission, the copy automatically becomes the new player plane and the original becomes a computer-controlled plane (the "AI" plane). This change can cause a problem if you are unaware of it. For more details, see The Player Cannot Enter a Plane in a Singleplayer Mission (pg. 185).

Manage Connections Between Mission Icons

You can use links (pg. 8) to create connections between MCUs, between objects, and between MCUs and Objects. These connections help determine how your mission works.

Note: You must make an object a linked entity (pg. 17) before you can connect it to other objects or MCUs using links.

Create a Target Link Using the Keyboard

Do the following:

1. Select an icon in the View Port.
2. Press Shift+T.

   Your mouse cursor changes to a "TARGET" cursor.
3. Click on another icon.

   If the second icon can accept a target link from the first icon, a red line connects the two icons. The arrow indicates the direction of the link.

Create a Target Link Using the MCU Basic Properties Dialog

Do the following:

1. Open the Basic Properties dialog for an MCU.
2. To create the target link using your mouse, do the following:
   a) Click on the "Find Target" button.
      If the icon can output a target link, your mouse cursor changes to a "TARGET" cursor.
   b) Click on another icon.
      If the second icon can accept a target link from the first icon, a red line connects the two icons. The arrow indicates the direction of the link.
3. To create the target link using a dialog, do the following:
   a) Double-click an empty row in the "Targets" list.
      The "Select MCU Targets" dialog appears, showing MCUs that can accept target links from the current icon.
   b) Double-click a target in the list.
      A red line connects the two icons. The arrow indicates the direction of the link.

Create an Object Link Using the Keyboard

Do the following:

1. Select an icon in the View Port.
2. Press Shift+O.
   Your mouse cursor changes to an "OBJECT" cursor.
3. Click on another icon.
   If the object can accept an object link from the first icon, A green line connects the two icons. An arrow on the line indicates the direction of the link.

Create an Object Link Using the MCU Basic Properties Dialog

Do the following:

1. Open the Basic Properties dialog for an MCU.
2. To create the object link using your mouse, do the following:
   a) Click on the "Find Object" button.
      If the icon can output an object link, your mouse cursor changes to a "OBJECT" cursor.
   b) Click on another icon.
      If the second icon can accept a target link, a green object link connects the two icons. The arrow indicates the direction of the link.

3. To create the object link using a dialog, do the following:
   a) Double-click an empty row in the "Objects" list.
      The "Select MCU Objects" dialog appears, showing MCUs that can accept object links from the current icon.
   b) Double-click an object in the list.
      A green line connects the two icons. The arrow indicates the direction of the link.

Create an Event Message Link Using the Object Context Menu

Do the following:

1. Select and right click an object icon in the View Port.
   A context menu (pg. 194) opens.
2. In the "Selected Object Menu", choose an option ending in "Event".
   The events are described in the On Event Properties Dialog (pg. 221).
3. Your mouse cursor changes to a "TARGET" cursor.
4. Click on another icon.
   If the second icon can accept an event message link from the first icon, a purple line connects the two icons. The arrow indicates the direction of the link.

Create an Event Message Link Using the Object Advanced Properties Dialog

Do the following:

1. Select an object icon in the View Port and open the Advanced Properties dialog.
2. Click the "Add Event" button.
   The On Event Properties Dialog opens.
3. Choose an event from the Type drop-down list.
4. Click the "Find Target" button.
   The "Select Target for Event" dialog opens.
5. Double-click the target for the event message link and click OK.
   The event message link is added to the "On Events Table" list in the Object Advanced Properties dialog.
6. Click OK in the Object Advanced Properties dialog.
   A purple line connects the two icons. The arrow indicates the direction of the link.

Create a Report Message Link Using the Object Context Menu

Do the following:

1. Select and right click an object icon in the View Port.
   A context menu opens.
2. In the "Selected Object Menu", choose an option ending in "Report".
   Your mouse cursor changes to a "CMD" cursor.
3. Click on the MCU that acts upon the object (for example, a spawner trigger).

After a second or two, your mouse cursor changes to a "TARGET" cursor.

4. Click on the MCU that is triggered by the report message link (for example, a waypoint trigger).

   A blue line connects the first MCU to the object and the object to the second MCU. The arrows indicate the direction of the link.

Create a Report Message Link Using the Object Advanced Properties Dialog

Do the following:

1. Select an object icon in the View Port and open the Advanced Properties dialog.
2. Click the "Add Report" button.

   The On Report Properties Dialog (pg. 224) opens.
3. Choose a report from the Type drop-down list.
4. Click the "Find Command" button.

   The "Select Command for Report" dialog opens, showing the MCUs that can act upon an object for the report message link (for example, a spawner trigger).
5. In the dialog list, double-click the MCU that you want to use in the report message link and click OK.

   The command appears in the "Command Name" box.
6. Click the "Find Target" button.

   The "Select Target for Event" dialog opens, showing the MCUs that can be triggered by the report message link (for example, a waypoint trigger).
7. In the dialog list, double-click the MCU that you want to use in the report message link and click OK.

   The command appears in the "Target Name" box.
8. Click OK.

   The report message link is added to the "On Reports Table" list in the Object Advanced Properties dialog.
9. Click OK in the Object Advanced Properties dialog.

   A blue line connects the first MCU to the object and the object to the second MCU. The arrows indicate the direction of the link.

Create a Target Link or Object Link To or From an Icon In a Group

Creating a group is explained in Group and Ungroup Icons (pg. 24).

To create a target link or object link to or from an icon in a group, use the dialog method within the following procedures in this topic:

- Create a Target Link Using the MCU Basic Properties Dialog
- Create an Object Link Using the MCU Basic Properties Dialog

By using the procedure just listed, you avoid having to make a group the current working group (pg. 25) in order to use the other link creation methods. You only require the ID of the

icon that you want to link to.

Simplify Links From Distant Icons to Multiple Local Icons

If you target link or message link a distant icon in the View Port to multiple local icons, this can make the mission layout cluttered and difficult to understand. You can simplify your mission logic by using a timer trigger (pg. 283) as a connector to the local icons.

Do the following:

1. Place a timer trigger near the local icons that you want to link the distant icon to.
2. Target link the timer trigger to the local icons.
3. In the timer trigger advanced properties, set the time to zero seconds.
   If you want a delay too, you can set the timer trigger to greater than zero seconds.
4. Link the distant icon to the timer trigger.

Delete a Target Link or Object Link From An MCU

Do the following:

1. Right-click the MCU and choose Properties from the menu.
2. Select an item in the Targets table or Objects table and press the Del key.

Delete a Target Link From An Object

A target link from an object points to the leader of a formation.

Do the following:

1. Double-click the object.
   The object Advanced Properties dialog opens.
2. Click the "Clear" button and then click OK.

Delete an Event or Report Message Link From An Object

Do the following:

1. Double-click the object.
   The Advanced Properties dialog opens.
2. Select an item in "On Events Table" or "On Reports Table" and press the Del key.

Delete All Output Links From An Object or MCU

To delete all output links from an object or MCU, right-click the icon and choose Selected Object Menu > Delete all output links

Group and Ungroup Icons

You can group together selected icons in the View Port, which are then represented by a group icon and listed in the Mission Tree. Creating groups helps you to simplify the icons displayed in the View Port and organize the elements of complex missions.

For example, you could group together the following:

- Block objects that make up an airfield or a town.
- Objects that do not play a primary role in your mission

  Grouping together non-primary items makes your primary objects and MCUs easier to see.
- Related mission elements such as the following:
  - Icon translators (pg. 255) for front lines and zones
  - Airbase defence objects and MCUs
  - Mission event scheduling MCUs (for example, timer triggers or date time triggers)
  - Mission objective-related MCUs (that is, mission objective translators and their associated MCUs such as counter triggers and timer triggers)

Group Objects and MCUs

Do the following:

1. Select the objects or MCUs that you want to include in the group.
2. Right-click on the group and choose “Group Objects”.

Ungroup Objects and MCUs

Do the following:

1. Select the group icon.
2. Right-click the group icon and choose “Ungroup”.

Note:

- You can assign a name to the group icon in the Group Properties dialog and move and rotate the icon in the View Port.
- You cannot connect a group icon to an MCU or object. The group icon only represents MCUs and objects, which can be connected.
- You can expand the group in the Mission Tree to see the Objects and MCUs that make up the group. You can also show and hide icons in a group (see Show or Hide Icons, Text, Links, and Terrain on pg. 30).
- To access the icons in a group, you must make that group the current working group (pg. 25).

Make a Group the Current Working Group

To access the icons in a group, you must make that group the current working group.

Do any of the following:

- Select the group icon, right-click on it, and choose “Set Group as Working”.
- Right-click the group name in the Mission Tree and choose “Set Group as Working”.

  The top level in the tree is itself a group and you can set that level as the working group.
- Right-click a clear area in the View Port and choose “Reset Working Group”.

  "Reset Working Group" makes the top level in the Mission Tree the working group.

  Important! Once you finish editing the current working group, choose "Reset Working Group", otherwise any new icons that you add are added to the current group.

The current working group is indicated by a yellow box in the View Port and it is shown in bold in the Mission Tree.

The working group icon is hidden and all the icons within the working group are shown. In addition, icon translators (pg. 255) and mission objective translators (pg. 271) are shown. All other icons in the View Port are hidden.

Note: You cannot access groups that are within the current working group unless you make that sub-group the working group.

Find the Group Containing an Icon That You Want to Select

Note: This skill is optional.

You can find the group that contains an icon that you want to select in the View Port. This procedure is useful because you cannot select an icon that is part of a group unless you find that group and make it the working group. The group that an icon belongs to is not always obvious in the View Port.

Do the following:

1. In the View Port, note the ID number of the icon that you want to select.

   The ID may be an MCU ID, object ID, or an entity ID (the ID for a linked entity object). Linked entities have a yellow label in the View Port. For more details about IDs, see "Mission Tree" in Mission Editor Interface (pg. 3).
2. In the "Search and Select" menu, choose "Find Mission Objects".

   The Find Mission Objects Dialog (pg. 201) opens.
3. Select the icon type under Filter and select "Select in mission tree" under "Double click result option".
4. Click the "Find" button.

   MCU IDs or object IDs for the selected icon type are shown in the left pane. Entity IDs

are not shown but this procedure will help you find the object ID that goes with the entity ID.

5. In the find results box, click the ID heading to sort by ID.
6. Scroll down in the find results box until you see one of the following:
   - The MCU ID or object ID that you noted in step 1
   - The unique name of the linked entity object that you noted the ID of in step 1
   - An object ID that is close to the entity ID that you noted in step 1

     The object ID is generally within plus or minus 20 of the entity ID.

     You can also check the object name to narrow down the possible object ID choices.
7. Double click the row with the ID that you just found.

   The Mission Tree scrolls so that the ID is shown in the pane.
8. Close the "Find Mission Objects" dialog and find the ID in the Mission Tree.

   For linked entities, look for the ID in the first number (object ID) of the number pair beside the object entry. If the second number (entity ID) of the number pair is not the ID that you noted in step 1, do one of the following:
   - Look for the entity ID in one of the nearby Mission Tree entries.
   - Return to steps 6 and choose another object ID that is close to the entity ID that you noted in step 1.
9. Scroll the Mission Tree up until the group containing the MCU or object that you found appears.
10. Right click on the group and choose "Set as Working Group".

    You can now select the icon in the View Port.

Example: Find the Group Containing a Vehicle Icon That You Want to Select

This example shows how to find the group for the vehicle icon that is part of a group so it cannot be selected without making the group the working group.

The following screenshot shows that the vehicle ID is 4775 and it is a linked entity because the label is yellow. The Mission Tree will show the object ID followed by the entity ID, 4775.

In the "Find Mission Objects" dialog, "Vehicle" is selected under filter and "Select in mission tree" is selected under "Double click result option". Here are some partial result list values after the Find button is clicked, the list is sorted by ID, and the list is scrolled down to object ID numbers that are close to the entity ID 4775:

4590	Vehicle	Vehicle
4630	Vehicle	Vehicle
4632	Vehicle	Vehicle
4674	Vehicle	Vehicle
4676	Vehicle	Vehicle
4726	Vehicle	Vehicle
4728	Vehicle	Vehicle
4778	Vehicle	Vehicle
4780	Vehicle	Vehicle
4828	Vehicle	Vehicle
4830	Vehicle	Vehicle

Object ID 4778 is close to entity ID 4775, so that entry is double-clicked. Here is the lower part of the resulting Mission Tree:

In the Mission Tree, object ID 4778 matches with entity ID 4775 beside the vehicle icon. Now, the Mission Tree can be scrolled up to the group containing the icon and the group can be set to the working group. The vehicle can then be selected in the View Port.

Add Objects or MCUs to a Group

You can add objects or MCUs to the current working group.

Do the following:

1. Make a group the current working group (pg. 25).
2. Choose the object or MCU that you want to add to the group and place it anywhere.

   The object or MCU is automatically added to the current working group. The yellow box that indicates the working group expands to include the new object or MCU.

Save Objects, MCUs, and Groups

Note: This skill is optional.

You can select icons in the View Port and save your selection to a file. You can later import this file to any mission or make the file available under "Groups" in the Objects Library. These abilities help mission builders create complex missions without having to create all the mission elements from scratch.

Do the following:

1. Select the icons that you want to save.
2. (Optional) Make your selection into a group.
3. Right click your selection and choose “Save Selection to File”.

   Here are your options for saving the file:

   - Save the file in the following IL-2 Sturmovik directories:

     \data\Missions

     \data\Multiplayer\Dogfight

     You can create a subdirectory of the directories just mentioned if you want.

With this option, you can access saved objects, MCUs, and groups in the Object Library (pg. 30).

This option is best for a relatively small number of icons that you may place in multiple locations and move around in the View Port. For example, you can place the files for the Custom Mission Functions (pg. 287) in the IL-2 Sturmovik directories mentioned and access them in the Object Library.

- Save the file anywhere.

  With this option, you can import saved objects, MCUs, and groups (pg. 29)

  This option is best for a relatively large number of objects, MCUs and groups that you import once and that you do not move. For example, you can import a file to populate the View Port with buildings and other objects (pg. 51).

The file is saved with a .group suffix.

Related Information

Group and Ungroup Icons (pg. 24)

Import Saved Objects, MCUs, and Groups

Note: This skill is optional.

You can import a file containing objects, MCUs, and groups that were selected and saved from any mission. This ability helps mission builders create complex missions without having to create all the mission elements from scratch.

This procedure is best for a relatively large number of objects, MCUs and groups that you import once and that you do not move. For example, you can import a file to populate the View Port with buildings and other objects (pg. 51).

The alternative to this procedure is to access saved objects, MCUs, and groups in the Object Library (pg. 30).

Do the following:

1. In the Mission Tree, right-click the top entry or some other group and choose "Set Group as Working".
2. In the File menu, choose “Import From File”, navigate to the file location and open the group file.

   The file contents are placed in the group that you chose.

   Note:

   - Although the file has a .group suffix, no group icon is placed in the View Port unless the file included a group in the first place. You see only icons for the objects, MCUs, and groups that were saved in the file.
   - It is best to import a file that was saved on the same map terrain as the current map, otherwise, the terrain could appear black in the View Port. When you import a file, the icons are placed at the same coordinates they were at when

they were saved. If you use a different map terrain, the icon coordinates may not be on your current map, which causes the View Port to appear black.

Access Saved Objects, MCUs, and Groups in the Object Library

Note: This skill is optional.

You can take a file containing objects, MCUs, and groups that were selected and saved from any mission and make it available under "Groups" in the Objects Library. You can then choose the group and place it in the View Port. This ability helps mission builders create complex missions without having to create all the mission elements from scratch.

This procedure is best for a relatively small number of objects, MCUs, and groups that you may need to create multiple times and move around in the View Port.

The alternative to this procedure is to import saved objects, MCUs, and groups (pg. 29).

Do the following:

1. If you have not done this already, place the saved file (suffix .group) in any of the following IL-2 Sturmovik directories (including sub-directories):
   - \data\Missions
   - \data\Multiplayer\Dogfight
2. From "Groups" in the Object Library, choose the group with the same name as the file and place it in the View Port.

   Note: Although the file has a .group suffix, no group icon is placed in the View Port unless the file included a group in the first place. You see only icons for the objects, MCUs, and groups that were saved in the file.

Show or Hide Icons, Text, Links, and Terrain

You can show or hide icons for objects and MCUs, icon labels, links, and the terrain in the View Port. This ability helps you focus on the mission elements that you are interested in viewing or editing.

This procedure uses the Toolbar for most tasks but you can also use the Draw Menu.

Show or Hide All Icons

Click the “Draw Icons” button on the Toolbar.

Note: The actual object underneath a hidden object icon is still shown.

Show or Hide Certain Icons

Click the “OBJ FILT” button on the Toolbar, which opens the Mission Editor Object Filter Dialog (pg. 207).

Show or Hide Icon Labels

Click the “Draw Icon Text” button on the Toolbar.

Show or Hide Icons in a Group

Do either of the following:

- Click on the “GRP” button on the Toolbar.

- In the Draw Menu, choose “Draw Icons in Group”.

For an object icon in a group (or outside of a group), the actual object under the icon is always displayed.

For more information, see Group and Ungroup Icons (pg. 24).

Show or Hide Links or Arrows on Links

Do any of the following on the Toolbar:

- For object links, click the “MCU OBJ” button.

- For Target Links, click the “MCU TAR” button.

- For Message Links, click the “MCU MES” button.

- For arrows on links, click the “MCU ARW “ button.

Hide the Terrain

Hiding the terrain in the View Port can make icon labels easier to read.

Press Alt+F9 to hide the terrain.

Press F9 to show the terrain again in 3-D view and press F9 again to show the 2-D view.

Chapter 3: Creating and Editing a Mission

Create a Singleplayer Mission

You can create a mission to be flown by a single player. The mission can include both AI opponents and AI friendly forces.

Do the following:

1. Under the File Menu, choose New and specify the mission properties in the Mission Properties Dialog (pg. 208).

   Set "Mission Type" to "Single".

   Important! Make sure that the map selected in "GUI Map" matches the terrain selected in "Terrain Presets". The map and terrain names may not be exactly the same.
2. Save the mission to your game folder under \data\Missions or a sub-folder of that folder.

   The editor generates mission files (pg. 324) in the selected folder and the mission appears in the "Missions" list in IL-2 Sturmovik.

   It is a good idea to make a separate sub-folder for each mission, which makes it easy to organize missions and move them around.

   Important! If you move a mission, be sure that you move the required files. Moving the .mission file is optional because you can still edit a mission without the mission source file (pg. 48).
3. (Optional) Enhance your mission environment by following any of the procedures in Chapter 4: Creating the Mission Environment (pg. 51).

   Important!

   - Implement the enhancements sparingly because some of them can slow down a mission or use up too much memory.
   - If you want to populate the View Port with buildings and other objects (pg. 51), it is best to do it before you add any other mission-related objects and MCUs.
4. Place a plane object on a runway, airfield parking area, or another location (for airborne starts) in the View Port.
5. Make the plane object a linked entity and specify the plane object properties (pg. 217) and advanced properties (pg. 209).

   Set the AI field in the advanced properties to "Player".

   You can start any AI plane or player plane in the air by doing the following:

   - Specify the altitude in the Y field of the plane properties.
   - Choose "In Air" from the starting location drop down list at the top right of the plane advanced properties.

   You can stop here if you like and just fly the plane.

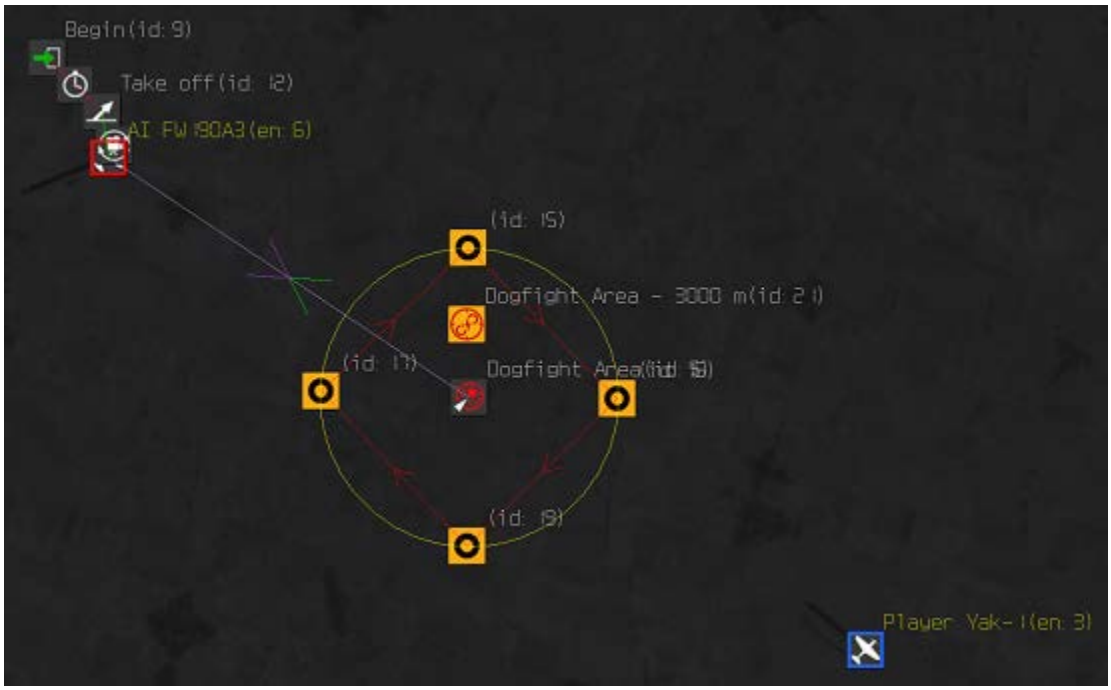
6. Consult the other chapters in this manual to add more elements to your mission.
7. (Optional) Provide a mission in various languages (pg. 49).
8. Save the mission.

Example: Engage an FW190

In this example, the player can take off in a Yak-1 from Lapino airfield and proceed to the dogfight area (marked by a red circle in the screenshot following). In the dogfight area, the player can engage an AI FW190 at 3,000 meters. The AI FW190 takes off from Yantar airfield 10 seconds after the mission starts, proceeds to the dogfight area, and patrols for 20 minutes. While on patrol, the AI plane engages any enemy planes in the dogfight area.

Here is the GUI map for the player:

Here is an overview of the icons and links for the mission (a closeup of the top left area comes later):



The player Yak-1 at the bottom right is placed on the runway at Lapino and is made into a linked entity. Values are set in the Object Advanced Properties Dialog (pg. 209) as follows:

- AI: Player
- Country: Russia
- Starting Condition Drop-Down List (Top-Right of Dialog): On Runway

The AI FW190 at the top left is placed on the runway at Yantar and is made into a linked entity. Here are the advanced properties for the FW190:

- AI: Normal
- Country: Germany
- Starting Condition Drop-Down List (Top-Right of Dialog): On Runway
- On Events Table:

Event Type	Target ID
OnPlaneTookOff	5 (ID for "Dogfight Area" attack area command)

  This table entry creates an event message link to the attack area command. The link is discussed later in this example.

The dogfight area, at the center of the overview screenshot, is defined with an attack area command (pg. 237). Here are the properties and advanced properties for the command:

- Name: Dogfight Area
- Position Y: 3000
- Priority: High
- Attack targets: "Attack Air Targets" selected only
- Attack Area: 2000
- Time: 20

The attack area command is object linked (green arrow) to the AI FW190 at the top left of the View Port. From the AI FW190, an OnPlaneTookOff event message link (purple arrow) connects to the attack area command. When the FW190 takes off, the OnPlaneTookOff event message triggers the attack area command, causing the plane to fly towards the attack area and start patrolling.

Because an attack area command boundary is not shown on GUI maps, four icon translators (pg. 255) are placed on the boundary to mark the dogfight area (yellow circle). Here are the properties and advanced properties for the translators:

- Name: Blank
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: None
- Line Type: Zone Type 1
- Coalitions: Allies and Neutral are True and Axis is True or False

The four icon translators are target linked as shown in the second screenshot.

Another icon translator is placed within the attack area command boundary to label the dogfight area. Here are the properties and advanced properties for the translator:

- Name: Dogfight Area – 3000 m
- Background color RGB: 0, 0, 0
- Enabled: Selected
- Icon ID: Attack Enemy Fighter Patrol Flight
- Line Type: Anything
- Coalitions: Allies and Neutral are True and Axis is True or False

Here is a close-up view of the icons around the AI airfield (Yantar) at the top left of the View Port:

The "Begin" mission begin translator (pg. 270) triggers a 10 second timer trigger (pg. 283). After 10 seconds, the take off command (pg. 246) is triggered and the AI FW190 takes off.

A camera operator translator (pg. 251) called "German Airfield Camera" allows you to watch the AI plane take off. To watch the take off, press F12 and then F11 to enable you to move the view around with your mouse. In the camera operator advanced properties, Camera Operator Type is Default.

Create a Multiplayer Mission

You can create a mission to be run on a dedicated server (called a DServer) and flown by one or more participants. The mission can include both AI opponents and AI friendly forces. Once the mission is started on the DServer, it shows up on the list in the IL-2 Sturmovik Multiplayer screen.

Do the following:

1. Under the File Menu, choose New and specify the mission properties in the Mission Properties Dialog (pg. 208).

   Set "Mission Type" to "Deathmatch".

   Important! Make sure that the map selected in "GUI Map" matches the terrain selected in "Terrain Presets".
2. Save the mission to your game folder under \data\Multiplayer\Dogfight or a sub-folder of that folder.

   The editor generates mission files (pg. 324) in the selected folder.

   It is a good idea to make a separate sub-folder for each mission, which makes it easy to organize missions and move them around.
3. (Optional) Enhance your mission environment by following any of the procedures in Chapter 4: Creating the Mission Environment (pg. 51).

   Important!

   - Implement the enhancements sparingly because some of them can slow down a mission or use up too much memory.
   - If you want to populate the View Port with buildings and other objects (pg. 51), it is best to do it before you add any other mission-related objects and MCUs.
4. Place an airfield object on a location where you want players to be able to join the mission ("spawn in") and make it a linked entity.

   You can place multiple airfield objects at any airfield location on the terrain (for example, runways and airfield parking areas. You can also place airfield objects at any location on the terrain to provide airborne spawn locations.

   The type of airfield object that you choose determines the spawn pattern. Looking in the direction that the airfield object is oriented, here is how planes can spawn:

   - The fakefield object spawns planes in a single row, starting from the left.
   - The fakefield_rnwspawn object spawns planes in multiple rows, starting from the front, left.

   In the Object Library, the spawn patterns and sizes are shown below the object that you choose.

   Once the pattern for an airfield object is full in a running mission, a player that spawned has to move to open up a space for another player to spawn (provided there are still planes remaining). To provide more room, you can place more airfield objects (provided you have enough room near your spawn location).

5. In the airfield object properties dialog click the "Planes" button and specify the planes for multiplayer participants in the Planes Dialog (pg. 226).

   For an air start, you set the altitude for each plane in the Planes dialog, not in the Position Y field of the airfield object properties dialog.
6. Specify the airfield object properties (pg. 217) and advanced properties (209).
7. Repeat Steps 4 to 6 for other locations where you want players to spawn.

   Each object is displayed separately on the multiplayer map, so give each location a unique name in the Planes Dialog field "Name". For example, the Lapino field could have two airfield objects: "Lapino Ramp A" and "Lapino Ramp B". You could also name the airfield objects for the task that the planes will undertake, for example, "Kalach Supply Flight" and "Kalach Bomber".

   An airfield object can include many plane types, even multiple instances of the same plane type. For example, airfield object "Lapino Ramp A" could include planes called "Yak-1 CAP", "Yak-1 Ground Attack", and "IL-2 Ground Attack".
8. Consult the other chapters in this manual to add more elements to your mission.
9. (Optional) Provide a mission in various languages (pg. 49).
10. Save the mission.

Example: Destroy Two Factories

In this example, multiplayer mission participants must destroy two enemy factories within 45 minutes to win the round, otherwise, the result is a stalemate. The mission takes place on the Lapino map. Both fighters and bombers are available. The mission environment includes buildings and other structures throughout the map.

To start, the Lapino landscape and Lapino-summer GUI map are chosen in the Mission Properties Dialog and the season is set to Summer.

The next step is to populate the View Port with buildings and other objects (pg. 51), using the Lapino_ALL.Group template file. The result is many groups of objects and some stand-alone objects.

Once the template objects are imported, they are all selected (by dragging the mouse cursor around them) and made into a group called "Misc" (or any suitable name for objects that are not central to the mission).

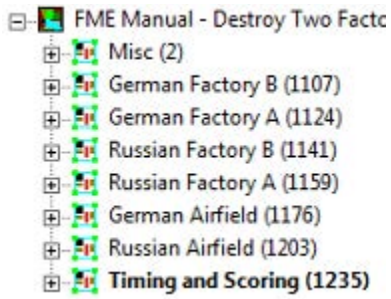
The following screenshot shows all of the Lapino template objects in group "Misc", along with the mission-specific MCUs and objects added after the Misc group is created:

As you can see, the View Port looks crowded and confusing. You can simplify the view by clicking "Draw Icons in Group" in the toolbar so that the icons within each group are hidden. The result is shown in the following screenshot:

The simplified screenshot shows the "Misc" group (in the middle) and the mission-specific

groups, which are discussed later in this example.

The following Mission Tree shows all of the groups:



By using well named and well organized groups, the View Port and Mission Tree are simplified, which makes complex missions much easier to analyze, maintain, and adapt.

Here is the setup for the "German Factory A" group, located on the road just South of Alekseevka:

The "Factory Destroyed:1x" counter trigger (pg. 278) has Counter set to 1 and "Reset After Operation" cleared in the advanced properties.

Here are the properties and advanced properties for the "German Factory A" object (block object "vl_factory"):

- Durability: 2000 (this value makes the factory easy to destroy for test purposes only)
- Delete After Death: Cleared
- On Events Table: OnKilled, 1128 (ID for "Factory Destroyed:1x" counter trigger)

Event Type	Target ID
OnKilled	1128 (ID for "Factory Destroyed:1x" counter trigger)

  This table entry creates an event message link to the counter trigger. The link is discussed later in this example.

Here are the advanced properties for the "German Factory A Destroyed" subtitle translator (pg. 273):

- Coalitions: All true
- Duration: 7
- Horizontal Align: Right
- Vertical Aliign: Top
- Text color RGB: 255,0,0
- Text: German factory A destroyed!

To mark the factory on the GUI map, there are four icon translators (pg. 255). The two icon translators with a red symbol mark a target to attack for the Allies and the other two with the blue symbol mark a target to defend for the Axis. The labels indicates whether the target has been destroyed or not.

Here are the advanced properties for the icons translators with the red symbol:

- Enabled: Selected for "German Factory A", cleared for "German Factory A - DESTROYED"
- Icon ID: Attack Enemy Buildings
- Coalitions: True for Allies, False for Neutral and Axis

Here are the advanced properties for the icons translators with the blue symbol:

- Enabled: Selected for "German Factory A", cleared for "German Factory A - DESTROYED"
- Icon ID: Cover Friendly Buildings
- Coalitions: True for Axis, False for Neutral and Allies

If "German Factory A" is destroyed, it generates an OnKilled event message, which triggers the "Factory Destroyed" counter. The counter then triggers the following:

- "German Factory A Destroyed", subtitle translator, which announces the destruction to everyone
- "Original Icons Off" deactivate trigger (pg. 280), which deactivates the icon translators

that mark the undamaged factory

- "Destroyed Icons On" activate trigger (pg. 274), which activates the icon translators that mark the damaged factory
- "German Factories Destroyed:2x" counter trigger in the "Timing and Scoring" group, discussed later in this example.

"German Factory B" is set up the same way as factory A except that "B" replaces "A" in the labels and in the subtitle translator text.

"Russian Factory A" and "Russian Factory B" are set up in the same way as the German factories except for the following:

- The icon translator with the red symbol has coalitions set to True for Axis and False for Neutral and Allies.
- The icon translator with the blue symbol has coalitions set to True for Allies and False for Neutral and Axis.

Here is the setup for the "German Airfield" group, located at Rodnik:

The two red airfield icons provide multiplayer spawn points for Bf109 G2s and Ju-87s. Each fakefield airfield object is oriented so that planes can spawn in a single row, from left to right in the ramp areas. Here are the settings in the Planes Dialog (pg. 226) for both airfield objects:

- Name: "Bf109-G2 Ramp Start" for the left-hand airfield object, "Ju-87 Ramp Start" for the airfield object in the middle
- Unlabeled Drop-Down List Under "AI Level": On Parking (aircraft engines are off)

The green icons are signs (block object arf_sign_right) that point the way to the active runway. In this case, the arrows on all the signs point to the right.

Where the taxiway meets the active runway, there is a check zone trigger (pg. 276) called "Detect First Plane". This check zone detects when the first plane enters the runway and starts the 45-minute mission time period. The mission begin translator triggers "Detect First Plane" at the start of the mission so that it is ready to detect planes. The check zone trigger

is target linked to deactivate trigger "Check Zone Off" and to a timer trigger (pg. 283) called "Start Mission Timer" in the "Timing and Scoring" group. "Check Zone Off" is target linked back to the check zone trigger so that when the check zone is triggered, it is then deactivated.

Here are the advanced properties for "Detect First Plane":

- Zone (m): 20
- Zone Type: Selected (Cylinder)
- Distance Type: Selected (Closer)
- Plane Coalitions: True for Axis, False for Neutral and Allies

At the Russian airfield, there is a similar check zone trigger setup to the German airfield. The "Timing and Scoring" group detects the first plane of either side to reach an active runway and starts the 45-minute time period.

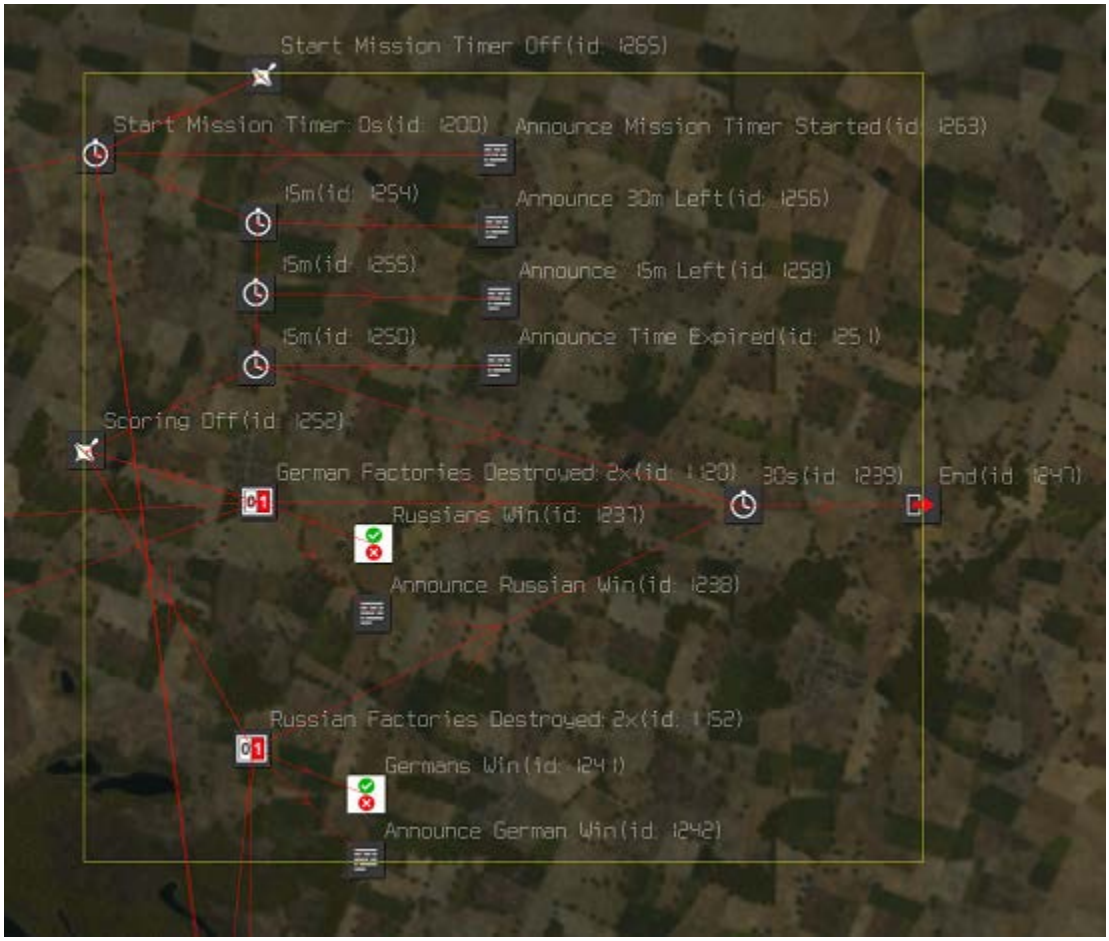
Here is the setup for the "Russian Airfield" group, located at Nagibaevka:

Similar to the German airfield, the two blue airfield icons provide multiplayer spawn points for Yak-1s and IL-2 m42s.

Because the Yaks need to turn left from the ramp to reach the active runway, the direction signs (green icons) at the top of the screenshot are arf_sign_left block objects.

The airfield has two runways, so there are two check zone triggers to detect the first Yak-1 to enter the top runway or the first IL-2 to enter the bottom runway. The "Plane Coalitions" advanced property for both check zone triggers is set to True for Allies and False for Neutral and Axis. As with the German airfield, both check zone triggers are target linked to "Start Mission Timer" in the "Timing and Scoring" group.

Here is the setup for the "Timing and Scoring" group:



The "Timing and Scoring" group does the following:

- Implements a 45-minute mission time limit and displays the time remaining every 15 minutes
- Determines which side reaches the goal of destroying two factories first, announces the winner, and ends the mission

At the top left of the "Timing and Scoring" group screenshot, timer trigger "Start Mission Timer" is triggered by one of the three check zone triggers described earlier in this example. This zero-second timer is just a connector into the timing and scoring logic. When it is triggered, the timer does the following:

- Triggers the first 15-minute timer (ID:1254), which is part of the 45 minute countdown implemented by the three 15-minute timers
- Triggers subtitle translator "Announce Mission Timer Started"
- Triggers the "Start Mission Timer Off" deactivate trigger, which deactivates the timer to prevent any further signals from the airfield check zone triggers

Here are the advanced properties for the subtitle translators in the "Timing and Scoring" group:

- Coalitions: True for all coalitions
- Duration:
  - 7 for the time remaining announcements
  - 15 for the timer started, time expired, and the winner announcements
- Horizontal Align: Center
- Vertical Align:
  - Top for the timer started and time remaining announcements
  - Center for the time expired announcement and winner announcements
- Text color RGB: 255,0,0
- Text:
  - Announce Mission Timer Started:

    "Mission timer started! You have 45 minutes to destroy both enemy factories."
  - Announce Mission 30m Left:

    "30 minutes left in mission."
  - Announce Mission 15m Left:

    "15 minutes left in mission."
  - Announce Time Expired:

    "Stalemate! Time has expired. The mission will end in 30 seconds."
  - Announce Russians Win:

    "The Russian side wins! The mission will end in 30 seconds."
  - Announce Germans Win:

    "The German side wins! The mission will end in 30 seconds."

As each of the 15-minute timers fires, it triggers the associated subtitle translator to announce the time remaining or that the time has expired.

If the time has expired, the last 15-minute timer (ID:1250) triggers the "Scoring Off" deactivate trigger, which then deactivates the counters "German Factories Destroyed:2x"

and "Russian Factories Destroyed:2x" so that they can no longer be triggered.

Counter trigger "German Factories Destroyed:2x" is triggered by the "Factory Destroyed:1x" counters in the two German factory groups. "German Factories Destroyed:2x" has Counter set to 2 and "Reset After Operation" cleared in the advanced properties. Once "German Factories Destroyed:2x" fires, it triggers the following:

- Deactivate trigger "Scoring Off", which then deactivates the counters "German Factories Destroyed:2x" and "Russian Factories Destroyed:2x" so that they can no longer be triggered
- Mission objective translator "Russians Win", which causes IL2 Sturmovik to display "Victory Axis" in the post-mission statistics screen
- Subtitle translator "Announce Russian Win"
- A 30-second timer (ID:1239), which then triggers the mission end translator (pg. 270) "End"

Here are the advanced properties for "Russians Win":

- Task Type: Primary Task
- Success/Failure: Success
- Coalition: Allies
- Icon Type: Undefined

Counter trigger "Russian Factories Destroyed:2x" works in a similar way to "German Factories Destroyed:2x".

The "Germans Win" mission objective translator is set up like "Russians Win", except that the Coalition is set to "Axis".

Related Information:

- Install and Update a Multiplayer Mission Server (pg. 167)
- Configure a Multiplayer Mission Server to Run Missions (pg. 169)
- Run Multiplayer Missions (pg. 171)
- Control a Multiplayer Mission Server From Any PC (pg. 173)

Create Player-Controlled Tanks

You can add player-controlled tanks to a mission.

Create a Player-Controlled Tank in a Singleplayer Mission

Do the following:

1. In the Object library, select a vehicle object with a name starting with an underscore (for example, _t34-76stz), place the object in the View Port, and make it a linked entity.
2. Specify the plane properties (pg. 217) and advanced properties (pg. 209).
   Set the AI field in the advanced properties to "Player".

Create a Spawn Point for Player-Controlled Tanks in a Multiplayer Mission

Do the following:

1. In the Object library, select the airfield object "fakevehiclefield", place the object in the View Port, and make it a linked entity.

   Looking in the direction that the fakevehiclefield object is oriented, tanks spawn in a single row, starting from the left. In the Object Library, the spawn pattern and size is shown below the fakevehiclefield object.

   Once the pattern for a fakevehiclefield object is full in a running mission, a player that spawned has to move to open up a space for another player to spawn (provided there are still tanks remaining). To provide more room, you can place more airfield objects (provided you have enough room near your spawn location).
2. Click the "Vehicles" button and specify the tanks for multiplayer participants in the Vehicles Dialog (pg. 233).
3. Specify the fakevehiclefield object properties (pg. 217) and advanced properties (209).
4. Repeat steps 1 to 3 for other locations where you want players to spawn in tanks.

Edit the Mission That You Just Played

You can edit a mission that you just played, which is useful if you want to edit the following:

- A mission generated by the IL-2 Sturmovik Quick Mission Builder (QMB)
- An IL-2 Sturmovik built-in single mission or campaign mission

Do the following:

1. In the mission editor, open _gen.mission, which is in your game folder under \data\Missions.

   Note: _gen.mission is the latest mission that you played.
2. In the Mission Properties Dialog (pg. 208), specify a new name in the Name field and change the other properties as needed.
3. Save the mission under a new name.

Edit a Mission Without the Mission Source File

If you do not have the source file (.mission) that the editor works with, you can still edit a mission. You need only the following:

- The mission binary file (.msnbin), which is what actually runs in IL-2 Sturmovik.
- The localization files (.eng, .fra, .ger, and so on) if the mission is translated into various languages.

  For more details on localization, see Provide a Mission in Various Languages (pg. 49).

Note: A multiplayer mission on a mission participant's computer normally does not include the .mission file. The .mission file is left out of the DServer mission download directory in

order to save download time.

Do the following:

1. In the editor File menu, click Open.
2. Type *.* in the File Name box and press Enter.
3. Navigate to your game folder and then to the directory containing the mission that you want to edit.

   The singleplayer directory is \data\Missions.

   The multiplayer directory is \data\Multiplayer\Dogfight.
4. Choose your mission file that ends with .msnbin and click Open.

   The editor opens the binary file. You can now edit the mission.
5. Save the mission with the original name or a new name.

   Your mission is saved with a .mission suffix.

Provide a Mission in Various Languages

You can provide a mission in any or all of the languages available in IL-2 Sturmovik under Settings > Game > Language. This process is called "localization". When a player starts or joins a mission, they see the following text in the language that they chose in IL-2 Sturmovik:

- Mission name
- Mission description
- Subtitle translator messages
- Icon translator name (shown beside the icon on the GUI map)
- Icon translator description (shown when you mouse over the icon on the GUI map)

  Note: The description is not shown in the current version of IL-2 Sturmovik.

Localize a Mission

Do the following:

1. Create the mission in your native language and save the final version.

   This method is the most efficient but you can also translate text as you work on the mission.
2. In the Tools menu, click on "Select Localization" and choose a language.
3. Open the "Mission Properties" dialog and change the mission name and mission description to the language that you chose.

   Note: Leave the Mission Properties dialog open.
4. In the "Search and Select" menu, choose "Find mission objects".

   The "Find Mission Objects" dialog opens.
5. Select "translator subtitle", "translator icon", "Move camera to object", and "Select object".

6. Click the Find button.

   All of the MCUs matching the types selected are listed.
7. Do the following for all the translator icons in the list:
   a) Double-click on a translator icon in the list and close the "Find Mission Objects" dialog.
   b) Click on the selected translator icon and change the translator name and the contents of the "Description" box to the language that you chose.
   c) Reopen the "Find Mission Objects" dialog and click on the Find button.
8. Do the following for all the translator subtitles in the list:
   a) Double-click on a translator subtitle in the list and close the "Find Mission Objects" dialog.
   b) Double-click on the selected translator subtitle and change the contents of the "Text" box to the language that you chose.
   c) Re-open the "Find Mission Objects" dialog and click on the Find button.
9. Repeat steps 2 to 8 for each language that you want to support.

Important!

- Always edit a mission using an editor that is set to the language in which the mission was created. For example, use the English editor to edit missions that were created in English and then use that editor to create and update any translations from English.
- If you move a mission that has been localized, be sure to include the localization files for each language (.eng, .fra, .ger, and so on). To determine the languages for which a mission is localized, check the content of the localization files in a text editor such as NotePad. Non-localized files contain these three lines at the start:

  0:<no name>
  1:<empty desc>
  2:<empty author>

The first three lines of localized files contain appropriate text for the specific language plus additional numbered lines for any subtitle translators and icon translators in the mission.

Fix Corrupt Localization Files

The line numbers in the localization files are called "Localization Indexes" and they must match between each localization file that contains actual mission-related text. For example, if line 6 in the English file is for icon translator "Russian Factory A", then the translation for that icon must appear in line 6 of the localization files for all the languages that you want to support. If the lines do not match properly across files, you can fix the files so that the lines do match.

To fix corrupt localization files, open the Tools menu and click "Clear and Reenumerate Localization Indexes".

Chapter 4: Creating the Mission Environment

Populate the View Port with Buildings and Other Objects

You can import miscellaneous groups of buildings and other objects that make your mission environment more realistic. There are templates available for import that contain objects for the various terrain presets that you can load in the Mission Properties Dialog (pg. 208).

Important! It is best to follow this procedure before you add your mission-related objects and MCUs. By importing miscellaneous objects first, you can easily select and then group those objects. Grouping the miscellaneous objects makes it easier to see your mission-related objects and MCUs in the Mission Tree and View Port.

Do the following:

1. In the Mission Tree, right-click the top entry and choose "Set Group as Working".
2. In the File menu, choose “Import From File” and navigate to the IL-2 Sturmovik directory and the \data\Template sub-directory.
3. Choose an object group that corresponds to the current terrain in the View Port and click Open.

   All of the objects in the group appear in the Mission Tree. With large maps, it may take a few minutes for the objects to load.
4. (Optional) Delete objects that are outside of the area related to your mission.

   In large maps, deleting objects that are never seen by players saves memory. You can click and drag to select many objects at a time for deletion.
5. Select all the objects that you just imported and make them a group, with a name such as "Scenery".

   Grouping non-mission related objects makes it easier to work with the mission-related objects, MCUs, and groups.
6. (Do any time before testing mission) For a multiplayer mission with "Friendly Fire Notification" enabled on the server, do the following for objects that are near a potential target and likely to be hit:
   a) Make the object a linked entity.
   b) In the object advanced properties, change the country from "Neutral" to the same country as the target.
   c) In the object properties, click "Delete Linked Entity".

      The country that you specified remains for the object. You can verify the country by making the object a linked entity again and checking the advanced properties.

   This step avoids erroneous "fired on a friendly" chat messages. These messages can occur because an object country defaults to "Neutral", which is considered friendly to human players and an enemy to AI objects. If a player hits the neutral object while

attacking an enemy object, the friendly fire chat message is displayed.

Place a Stationary Object in the View Port

You can place certain stationary planes or vehicles in the View Port while minimizing the use of mission resources. Adding stationary objects makes your mission environment more realistic.

Do the following:

1. Choose a "Blocks" object starting with “static”.

   Static objects use less mission resources than other objects but static objects are limited to certain planes and vehicles.
2. If you want the static object to interact with the mission, make it a linked entity.
3. (Do any time before testing mission) For a multiplayer mission with "Friendly Fire Notification" enabled on the server, do the following for non-linked-entity objects that are near a potential target and are likely to be hit:
   a) Make the object a linked entity.
   b) In the object advanced properties, change the country to the same country as the target.
   c) In the object properties, click "Delete Linked Entity".

      The country that you specified remains for the object. You can verify the country by making the object a linked entity again and checking the advanced properties.

   This step avoids erroneous "fired on a friendly" chat messages. These messages can occur because an object country defaults to "Neutral", which is considered friendly to human players and an enemy to AI objects. If a player hits the neutral object while attacking an enemy object, the friendly fire chat message is displayed.

Related Information

Configure a Multiplayer Mission Server to Run Missions (pg. 169)

Make a Chimney Smoke

You can make smoke come out of a chimney (or anywhere you want). This effect makes your missions more realistic.

Note: Do not use too many smoke effects because that can use up a lot of mission resources.

Do the following:

1. Place a "house_smoke" effect object at the top of a chimney and make the effect a linked entity.
2. Object link an effect command (pg. 241) to the effect.
3. Trigger the effect command with a target link from another MCU or a message link from an object.

Related Information

Make Areas Smoke Due to Damage (pg. 130).

Populate an Airfield With Soldiers

You can populate an airfield with soldiers that move around various objects. This ability can make your missions more realistic.

Do the following:

1. Place block objects starting with the following prefixes:
   - arf_ammo
   - arf_caponiers
   - arf_dugouts
   - arf_hangers
   - arf_nets
   - arf_tower
2. (Do any time before testing mission) For a multiplayer mission with "Friendly Fire Notification" enabled on the server, do the following for the objects that are near a potential target and are likely to be hit:
   a) Make the object a linked entity.
   b) In the object advanced properties, change the country to the same country as the target.
   c) In the object properties, click "Delete Linked Entity".
      The country that you specified remains for the object. You can verify the country by making the object a linked entity again and checking the advanced properties.

   This step avoids erroneous "fired on a friendly" chat messages. These messages can occur because an object country defaults to "Neutral", which is considered friendly to human players and an enemy to AI objects. If a player hits the neutral object while attacking an enemy object, the friendly fire chat message is displayed.

Related Information

Configure a Multiplayer Mission Server to Run Missions (pg. 169)

Create Views That a Mission Participant Can See

You can create views that a pilot can see at various points around the mission area. You can activate or deactivate different views at various times during a mission.

Do the following:

1. Place a camera operator translator (pg. 251) in every location where you want a view available and specify the basic properties and advanced properties.
   In the advanced properties, set the "Camera Operator Type" to "Default".

2. (Optional) Do the following to check and reposition the camera view:
   a) Right-click the camera operator translator and choose "Selected Object Menu" > "Look from this object" from the context menu (pg. 194).
   b) Use your mouse to change the view from the camera (including height) in the same way as you change your view in the View Port.
   c) Once you are satisfied with the view, right click in the View Port and choose "Selected Object Menu" > "Copy Camera Position and Orientation to Object " from the context menu.

      Sometimes the context menu may be empty. If this is the case, repeat step 2 from the beginning.
3. (Optional) For each camera operator translator, use the activate trigger (pg. 274) and deactivate trigger (pg. 280) to control when the view is available.

   See the example in this topic.

Note: Pilots can cycle through the currently available views using the key assigned to "Camera operator: friendly" (default key is F12) in IL-2 Sturmovik. Once they access a particular view, pilots can press the key assigned to "Camera Free" (default key is F11) and then use the assigned camera movement controls to look around.

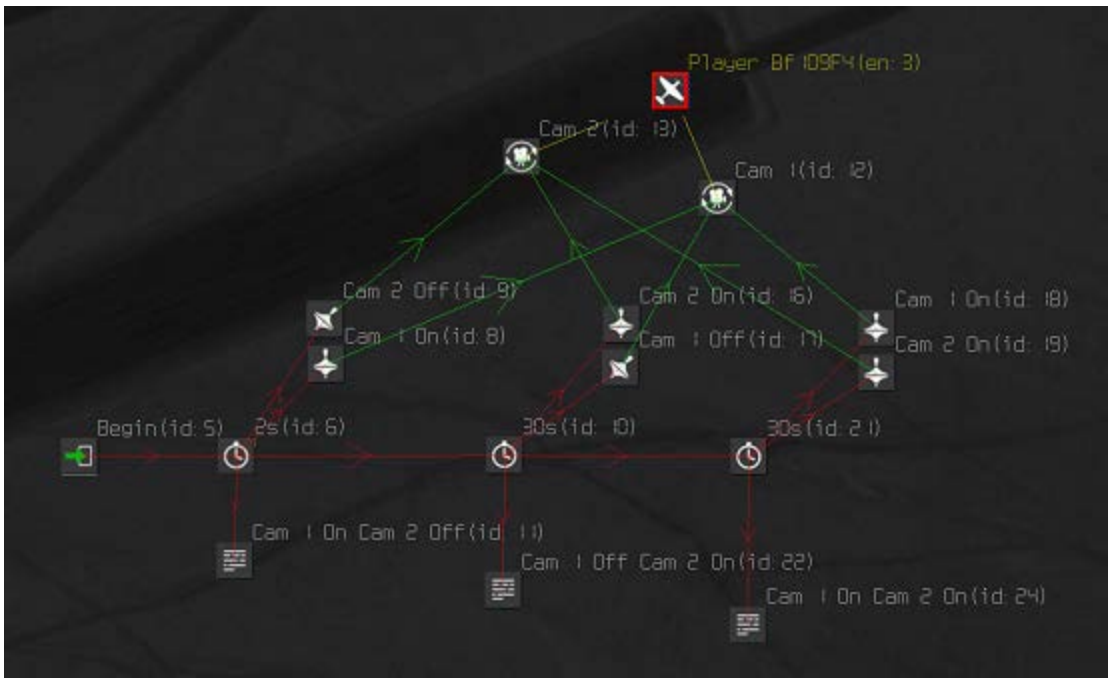
In addition to the example in this topic, there are other examples of specifying a single view that a mission participant can see in the following topics:

- Make a Plane Take Off, Fly a Route, and Land (pg. 61)
- Make a Train Follow a Route (pg. 70)
- Trigger an Event at a Point in Time in a Mission (pg. 100)
- Create a "Capture-the-Flag" Scenario (pg. 137)
- Make an Object Attack Another Object (pg. 119)
- Play Audio (pg. 154)

Example: Demonstrate Multiple Views

In this example, cameras provide two views of the player's plane. The cameras are activated and deactivated in various combinations at 30-second intervals. The player can access the currently available views by pressing F12. In some cases where cameras are being activated and deactivated the player may see a general external view and must press F12 again to see the camera view.

The following screenshot shows the mission design:



Two seconds after the beginning of the mission, timer "2s" (ID 6) triggers activate trigger "Cam 1 On" (ID: 8) and deactivate trigger "Cam 2 Off" (ID: 9). So, the only external view available is the side view provided by Cam 1. Subtitle translator "Cam 1 On Cam 2 Off" announces the current camera status.

After 30 seconds, timer "30s" (ID: 10) triggers the MCUs that turn Cam 2 on and Cam 1 off and announce the new status.

After another 30 seconds, timer "30s" (ID: 21) triggers the MCUs that turn both cameras on and announce the new camera status.

Fire a Flare to Signal Players to Take Off

You can make a plane or vehicle fire a flare to signal human players to take off on a mission.

Do the following:

1. Place a plane or vehicle (even a train or artillery object) on or near an airfield, and make it a linked entity.
2. Object link a flare command (pg. 241) to the object that you just placed.
3. Trigger the flare command with a target link from another MCU or a message link from an object.

Help Pilots Find an Airbase and a Runway

You can use various methods to enable a pilot on the ground or in the air to find an airbase and a runway.

Mark the Direction to the Active Runway

You can use various methods to mark the direction from parking areas to the active runway. The active runway should be chosen to allow takeoffs into the wind (or as close as possible). In no-wind conditions, designating an active runway helps to prevent collisions.

Note: Remember that the wind setting in Mission Properties specifies the direction that the wind is blowing to. The wind report in the bomb sight view gives the direction that the wind is blowing from.

Do one of the following:

- Place the following block objects along the correct path to the runway:
  - arf_sign_forward
  - arf_sign_left
  - arf_sign_noway
  - arf_sign_right
- Position a windsock near the parking area (good for medium to high-wind missions).
- Place a bonfire or a light near the start of the correct route to the active runway.

  See more details on using bonfires and lights in this topic.
- Place ground vehicles to block the wrong path to the runway.
- Document the active runway in the mission description.
- Create your own method of marking the path to the runway.

Mark a Runway With Bonfires

You can mark the edges of a runway with bonfires to help pilots find it at night.

Do the following:

1. Place "landfire" effect objects along the edges of the runway and make them linked entities.
2. Object link two effect commands (pg. 241) to the effects.
3. In the effect command advanced properties, set Action Type to "Start" for one command and "Stop" for the other command.

   If you stop a fire, you can see the glowing embers.
4. Trigger the effect commands with target links or message links from other mission elements.

   For example, you can start or stop the bonfires based on the presence of a plane in the area. See Detect Objects In Relation to a Defined Area (pg. 81) for more information.

The screenshot following shows the bonfire setup and an effect command to start the bonfires:

Mark a Runway With Lights

You can mark the edges of a runway with lights to help pilots find it at night.

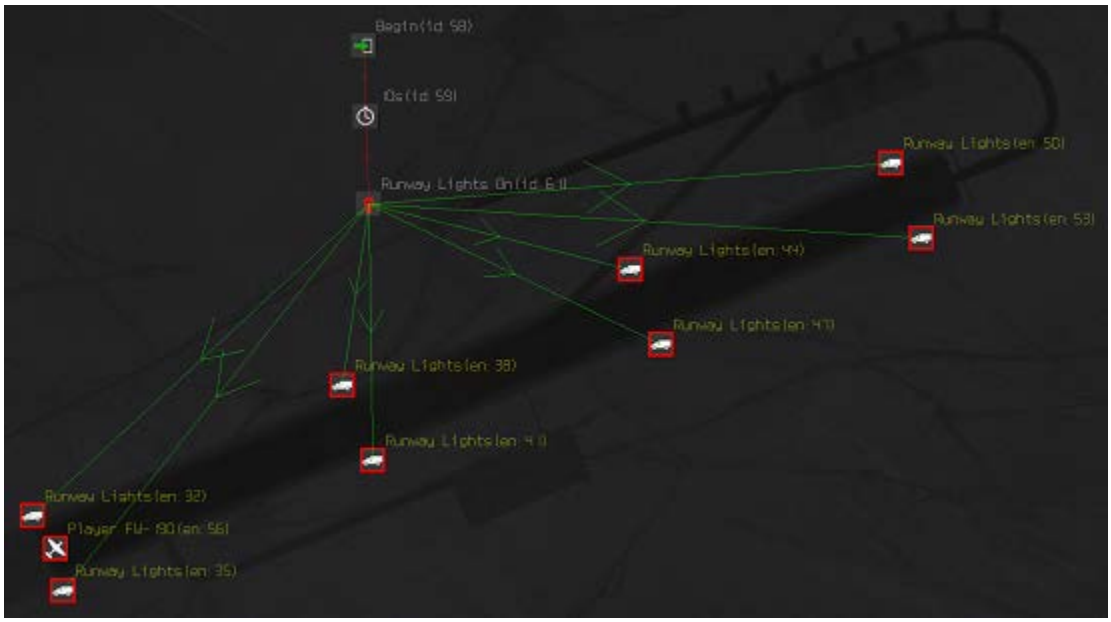
Do the following:

1. Place "landlightger" (German) or "landlightsu" (Soviet) effect objects along the edges of the runway and make them linked entities.

   Orient the icons in the direction in which you want the light to fall.
2. Object link two force complete commands (pg. 242) to the effects.
3. In the force complete command advanced properties, set Priority to "Low" (lights on) for one command and "Hi" (lights off) for the other command.
4. Trigger the force complete commands with target links or message links from other mission elements.

   For example, you can turn the lights on or off based on the presence of a plane in the area. See Detect Objects In Relation to a Defined Area (pg. 81) for more information.

The screenshot following shows the lighting setup and a force complete command to turn the lights on:



Mark the Airfield with a Flare

You can make an object fire a flare to allow pilots to find an airfield.

Do the following:

1. Place a plane or vehicle (even a train or artillery object) on or near an airfield, and make it a linked entity.
2. Object link a flare command (pg. 241) to the object that you just placed.
3. Trigger the flare command with a target link from another MCU or a message link from an object.

   For example, you can fire a flare based on the presence of a plane in the area. For details, see Detect Objects In Relation to a Defined Area (pg. 81).

Mark the Airfield with a Radio Homing Beacon

You can place a radio beacon on or near an airfield to allow friendly pilots to find the airfield by using a radio homing receiver. You can mark other locations with a beacon too.

Do the following:

1. Place vehicle object "ndb" (non-directional beacon) on or near an airfield and make it a linked entity.
2. In the Advanced Properties, set Country to the friendly pilot's country, Beacon channel to 1, and other fields according to your requirements.

3. Place an icon translator (pg. 255) near the beacon and do the following in the advanced properties:
    - In the Coalitions table, set the friendly coalitions to True and the enemy coalitions to False.
    - Set the name and the other advanced properties appropriately.

Note:

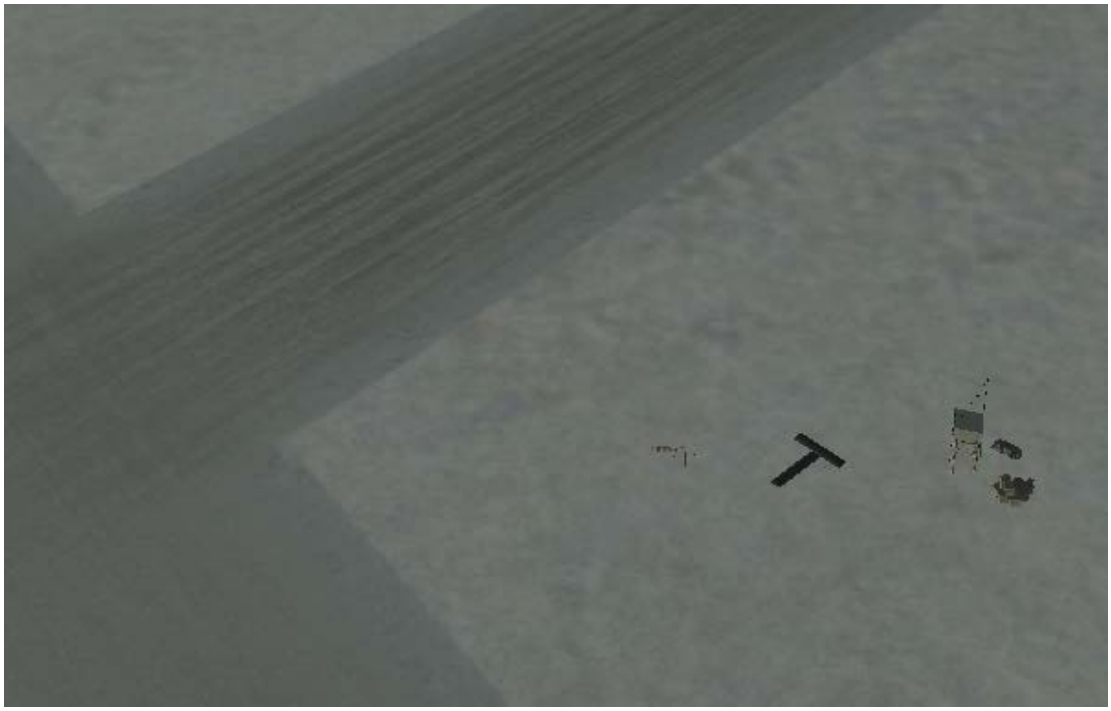
- Where multiple friendly beacons are available, the pilot's radio detects the closest one.
- Enemy pilots cannot detect a friendly beacon.
- You can place a friendly beacon in enemy territory. For example, you could create a clandestine transmitter near a target.

Indicate the Landing Direction

Place two "land_canvas" vehicle objects in the shape of a T on the airfield.

The T is a standard signal, indicating that the landing direction is from the bottom of the T towards the top. On an airfield without designated runways, the T indicates the direction into the wind (the ideal landing direction).

Typically, the T is placed near the control tower. Here is an example of a signal T:



In this case, pilots must land toward the top right of the scene shown. To the left of the T in the screenshot, the windsock indicates a strong right cross-wind.

Help Pilots Fly a Route

For a singleplayer mission, you can help pilots fly a route by marking points along the route as follows:

- Mark each point with an icon on the GUI map and draw a line between the icons.
- Mark the next point that the pilot will encounter along the route with a yellow teardrop symbol in the air and on the GUI map. The distance to the next point is displayed in the air, beside the symbol.

Mark Each Point Along the Route With an Icon On the GUI Map

Place an icon translator (pg. 255) at each point on the route and target link the translators to one another in the direction of flight.

Mark the Next Point Along On the Route

Do the following:

1. Place waypoint triggers (pg. 285) to define the route and target link each trigger to the next one along, in the direction of travel.
2. Object link all the waypoint triggers on the route to the player plane.

Note: To see the yellow teardrop symbol for the next point on the route, the player must do the following:

- Enable the HUD (in-game control is "Show/hide entire HUD") and show the navigation markers (in-game control is "Show/hide instrument panel, navigation and map markers").
- Enable navigation markers for the mission.

  To enable navigation markers, the player must go to the IL-2 Sturmovik mission list, click the "Realism" button, and select the "Navigation Markers" check box.

Related Information

Mark Locations and Draw Shapes on the Flight Crew's Map (pg. 151)

Chapter 5: Making Objects Move

Make a Plane Take Off, Fly a Route, and Land

You can make an AI plane fly an entire route automatically, from take off to landing.

Important! Avoid overusing this feature because it could slow down your mission.

Do the following:

1. Place a plane object at the start of a runway and make it a linked entity.
2. Specify the object properties (pg. 217) and object advanced properties (pg. 209) for the plane.
3. Place a take off command (pg. 246) anywhere and object link it to the plane.
4. Trigger the take off command with a target link from another MCU or a message link from an object.
5. Place waypoint triggers (pg. 285) to define the route and target link each waypoint to the next one along, in the direction of travel.

   Note: Make the waypoint area about 200m to ensure that the plane flies through the waypoint. Also, set the desired altitude and airspeed for each waypoint.
6. Object link all the waypoints on the route to the plane.
7. In the plane object advanced properties, click "Add Event".
8. In the On Event Properties Dialog (pg. 221), add event OnPlaneTookOff, click "Find Target", and choose the first waypoint on your route.
9. Click OK to close the dialog and click OK again to close the advanced properties dialog.

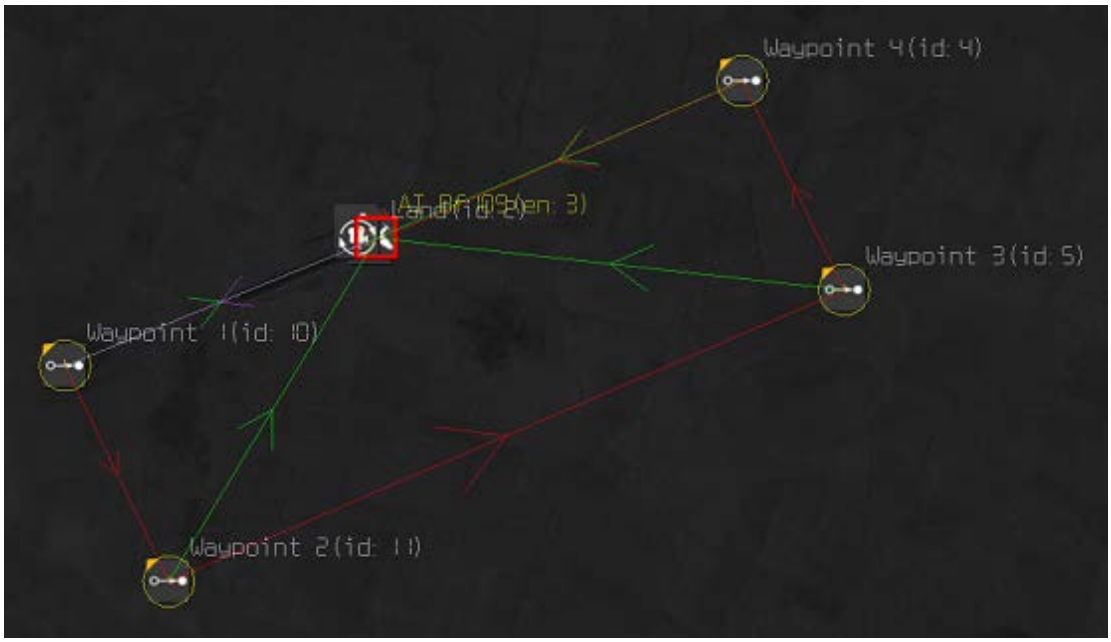
   A message link is added from the plane to the waypoint.
10. Place a land command (pg. 244) at the desired touch-down point on the runway, point it in the landing direction, and object link it to the plane.
11. Link the last waypoint on your route to the land command.

    After reaching the last waypoint, the plane proceeds to the landing point and flies a wide circuit of the field before landing. This behaviour is built in to the AI plane.

Example: Make a Bf109 Fly a Circuit of the Field

In this example, a Bf109 takes off, flies a circuit of the field, and lands.

The following screenshot shows an overview of the waypoint setup (the airfield setup at the red icon is covered in the second screenshot):



The plane takes off to the South-West and climbs to Waypoint 1 and then Waypoint 2. The plane levels off and proceeds to Waypoint 3. At Waypoint 3, the plane descends to Waypoint 4 and turns South-West again to land. The plane proceeds to the landing point and flies a wide circuit of the field before landing.

For this example, the desired altitudes above ground level (AGL) and desired airspeeds for waypoint 1,2,3,and 4 are 250m/250kph, 500m/250kph, 500m/250kph, and 250m/200kph, respectively. Since the airfield in this example is at 110m above sea level (ASL), 110m is added to the desired altitude for each waypoint. Here are the altitudes ASL and air speeds set for each waypoint:

- Waypoint 1: 360m ASL and 250 kph
- Waypoint 2: 610m ASL and 250 kph
- Waypoint 3: 610m ASL and 250 kph
- Waypoint 4: 360m ASL and 200 kph

The following screenshot shows the details of the takeoff and land command setup at the airfield:

The "Begin" mission begin translator triggers a 2 second timer that waits for IL-2 Sturmovik to start the mission. The timer then triggers a take-off command, which is object linked to the AI Bf109.

The AI Bf109 has an "OnPlaneTookOff" event message link to "Waypoint 1". Once the plane takes off, it flies toward the waypoint.

The land command is object linked to the AI Bf109 and "Waypoint 4" (the final one) is target linked to the land command. When the plane reaches the waypoint, the plane flies another circuit of the airfield and then it lands.

A camera operator translator (pg. 251) called "Camera" allows you to watch the AI plane take off, fly the route, and land. To watch the take off, press F12 and then press F11 to enable you to move the view around with your mouse. In the camera operator advanced properties, the Camera Operator Type is Default.

Related Information

Manage Object Formations (pg. 74)

Make a Plane Taxi to and From a Runway

You can make an AI plane automatically taxi out to the runway before takeoff and taxi from the runway after landing. This ability can help make your missions more realistic.

Important! Avoid overusing this feature because it could slow down your mission.

AI planes taxi to the runway after receiving a take off command and taxi from the runway after receiving a land command and landing. The AI do not start to taxi until the entire path to the runway is clear.

Do the following:

1. Place an AI plane in an available parking area and make it a linked entity.

   For an AI formation, place the leader closest to the runway, based on the intended taxi path. Otherwise, when the leader moves, a wing man can start taxiing and block the leader's way. For more details on formations, see Manage Object Formation (pg. 74).
2. Place an "airfield" object halfway down the runway and rotate it so that it is oriented in the takeoff direction.

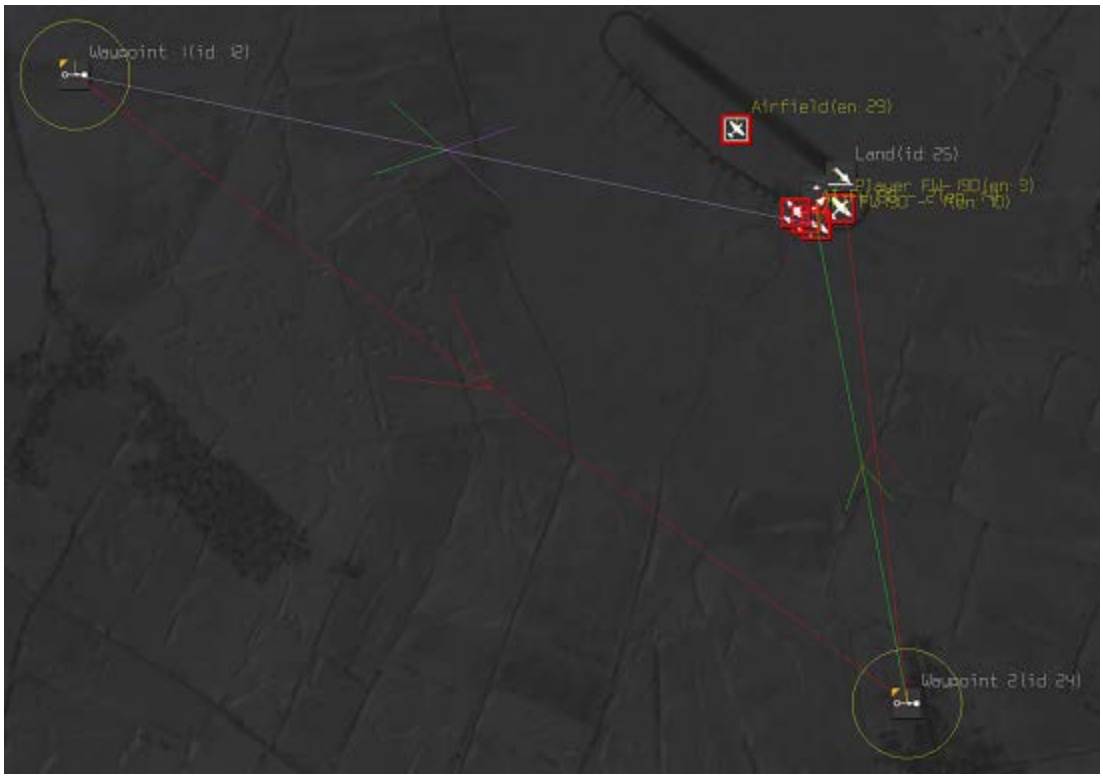
   You will use the airfield object to define a taxi path for the AI plane. In a multiplayer mission, you can use one of the existing airfield objects where players spawn in instead of placing a new airfield object. In this case, you may need to edit the taxi path a bit more than you would for a new airfield object placed on the runway.
3. Open the airfield object properties and make it a linked entity.
4. Click the "Add Chart" button and edit the taxi path in the Airfield Chart Editing Dialog (pg. 199).
5. Place a take off command (pg. 246) anywhere and object link it to the AI plane.
6. Place a land command (pg. 244) at the desired touch-down point on the runway, point it in the landing direction, and link it to the AI plane.
7. Create a route for the AI plane to follow, including landing back at the airfield.

   For details, see Make a Plane Take Off, Fly a Route, and Land (pg. 61).

Example: Make an AI Formation Taxi To and From the Runway

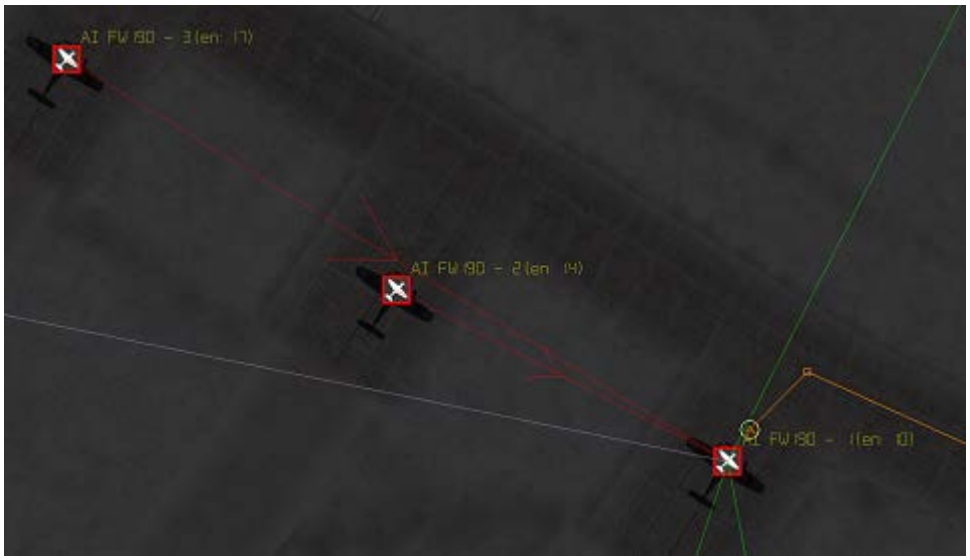
In this example, a three-plane formation taxis from a parking area to the runway. It then takes off and flies a circuit of the airfield. Finally, it lands and taxis from the runway to a parking area. The planes separate and land individually due to the pre-defined AI landing routine in IL-2 Sturmovik. Because of the landing routine, the planes end up taxiing to the parking area individually.

The following screenshot shows the overall view, including the airfield runway, taxiway, and parking areas:

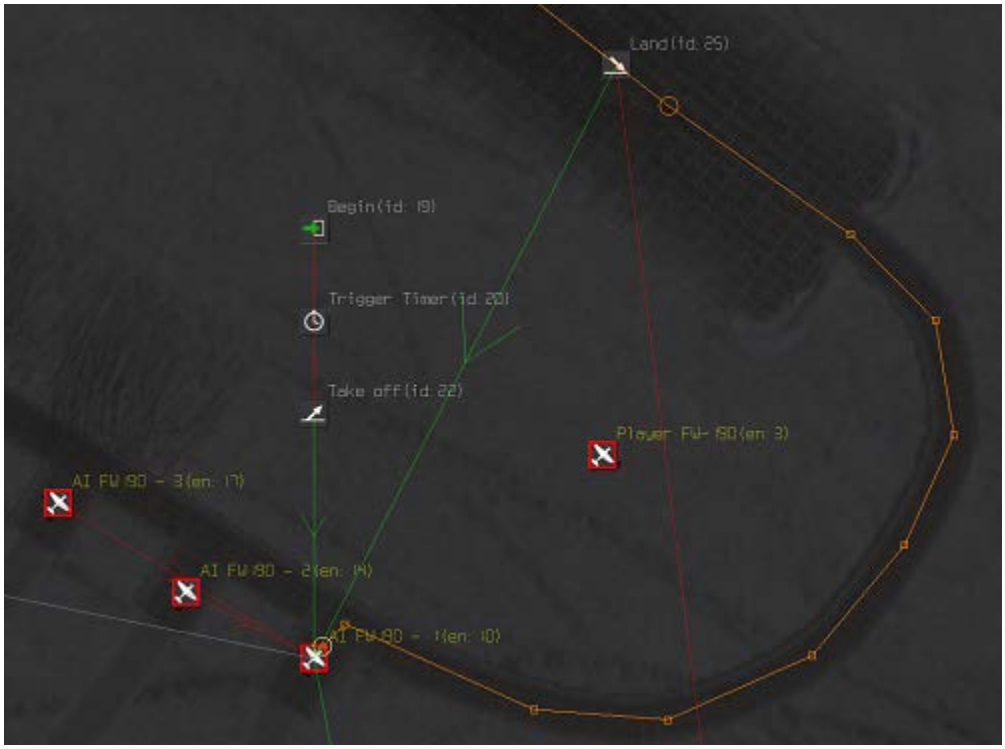


The "Airfield" icon contains the taxi path definition. The two waypoints have object links to the formation leader and the first waypoint receives an OnPlaneTookOff message link from the formation leader.

The following screenshot shows the formation in the initial parking locations. The first taxi point, PARK, is placed just in front of the leader (FW190-1).

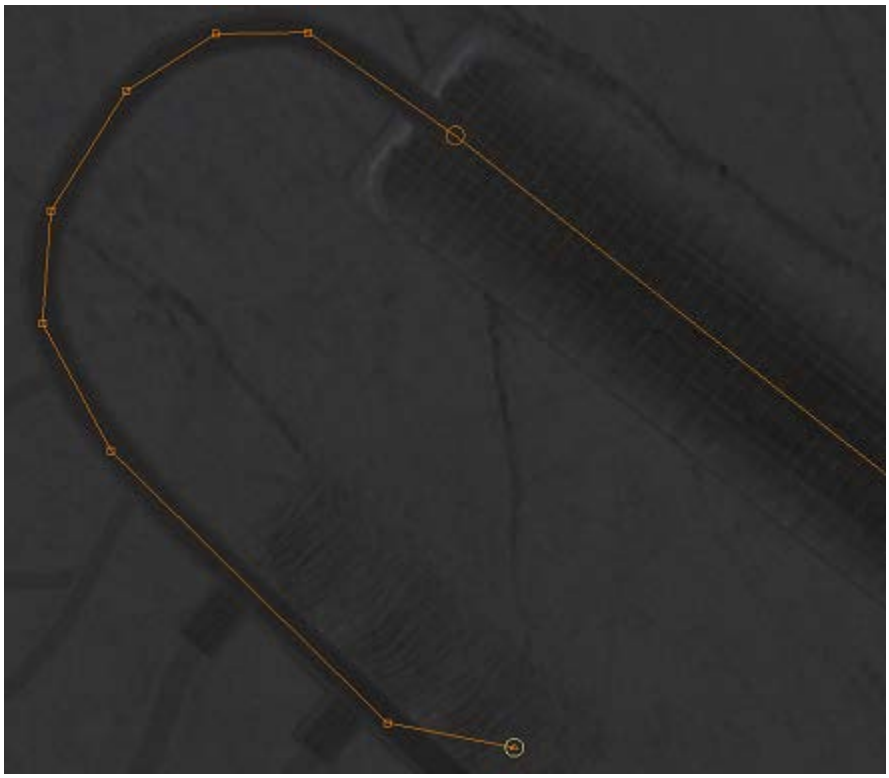


The following screenshot shows the taxi path leading to the first VPP taxi point, on the runway:



When the leader reaches the first VPP, it then carries out a predefined AI takeoff routine (pause and take off).

In the following screenshot, the second VPP in the taxi points list starts the taxi path to a parking area after the AI planes have landed:



The last taxi point entry, PARK, is marked with the yellow circle.

Make a Vehicle Follow a Route

You can create a vehicle and make it follow a route along roads and off roads.

Do the following:

1. Place a vehicle object on a road or in a field and make it a linked entity.

   Roads and railway tracks are well-defined lines in the View Port. Zoom in to ensure that you see the road texture rather than the cross-ties that indicate railway tracks.
2. Set the vehicle object properties (pg. 217) and object advanced properties (pg. 209).
3. Place waypoint triggers (pg. 285) to define the route and target link each waypoint to the next one along, in the direction of travel.

   If you want to keep the vehicle on a road, you only need a waypoint for the destination.
4. Object link all the waypoints on your route to the vehicle.

5. Trigger the first waypoint on the route with a target link from another MCU or a message link from an object.
6. If you want the vehicle to travel on a road, do the following:
   a) Object link a formation command (pg. 243) to the vehicle and set "Formation Type" in the command advanced properties to "Vehicle: On Road Column".
   b) Trigger the formation command from a waypoint on the road or from some other MCU or object in your mission. See the example in this topic for details.

      Note: The vehicle must be moving before you issue the formation command.
   c) Where there are gaps in the road at rivers, add road bridge objects.

   The vehicle follows the road automatically to the next waypoint on the road. The vehicle stays on the road no matter how far the next waypoint is and how many curves the road has.
7. If you want the vehicle to travel off road, do the following:
   a) Object link a formation command to the vehicle and set "Formation Type" in the command advanced properties to "Vehicle: Off Road Column".
   b) Trigger the formation command from a waypoint on the road or from some other MCU or object in your mission. See the example in this topic for details.

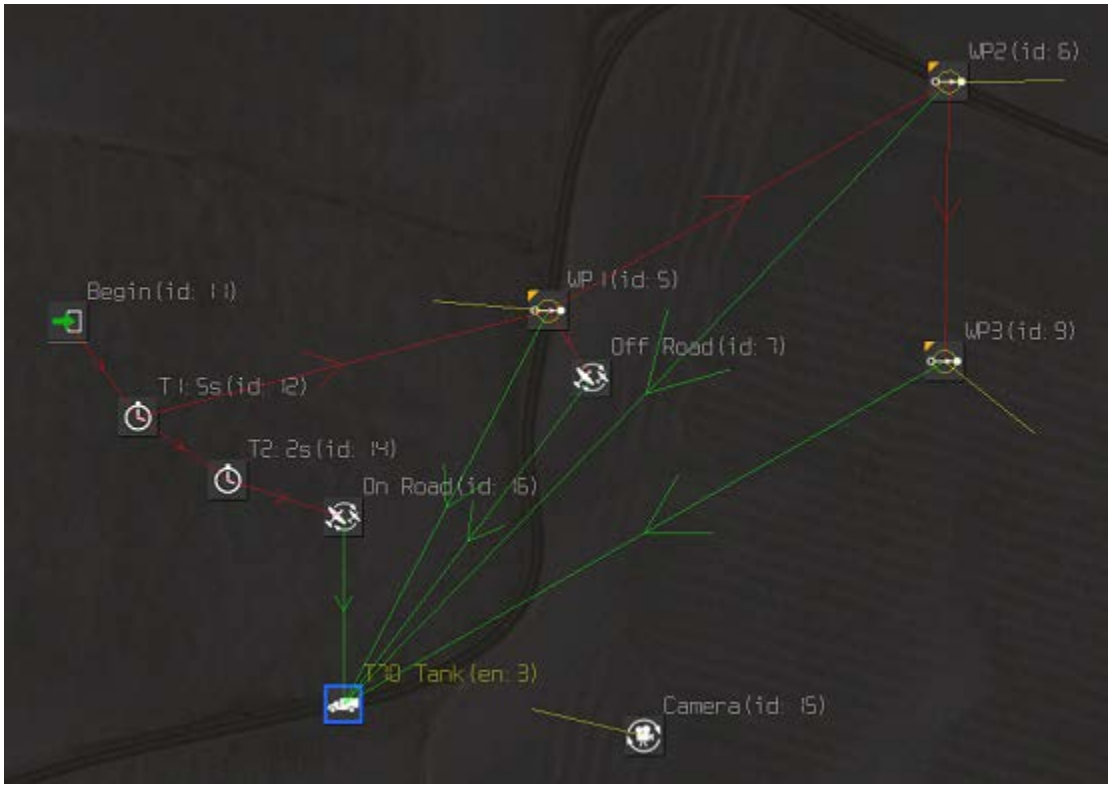
      Note: The vehicle must be moving before you issue the formation command.

Example: Make a Vehicle Follow an On-Road and Off-Road Route

In this example, a vehicle travels by road to a waypoint, leaves the road, and then travels to two more waypoints.

Note: This example shows the use of the formation command on a single vehicle, not a formation. If you want to use a vehicle formation, all object links in this example must point to the lead vehicle. For more details on formations, see Manage Object Formations (pg. 74).

In the following screenshot, the first waypoint (WP1) is triggered 5 seconds after mission start and the T70 tank moves toward it. After a 2 second delay, the tank receives the "On Road" formation command (type "Vehicle: On Road Column") and so it stays on the road to WP1.



Once the vehicle reaches WP1, the waypoint triggers WP2 and the "Off Road" formation command (type "Vehicle: Off Road Column"). The vehicle leaves the road and proceeds across the field to WP2. At WP2, the vehicle turns South and proceeds to WP3.

Make a Train Follow a Route

You can create a train and make it follow a route that includes stops along the way.

Do the following:

1. Place a train engine object at the desired starting location on a railway track and make it a linked entity.

   If you display the GUI map in the View Port, railway tracks are shown as black and white dashed lines. If you hide the GUI map, you can find railway tracks and roads by looking for well-defined lines in the View Port. If you zoom in on a railway track, you can see the cross-ties that support the rails.
2. In the train object properties, click the "Carriages" button and add carriages using the Train Carriages Dialog (pg. 232).
3. Set the train object advanced properties (pg. 209).
4. Except for the final stop, place timer triggers (pg. 283) near each stop along the route and set each timer to the length of the stop.
5. Place waypoint triggers (pg. 285) at each stop after the departure station, set each waypoint area to 5 m, and set each waypoint speed to whatever you require.

   The train slows down and stops after reaching the waypoint, so place the waypoint before the point where you want the train to stop. The following table tells you roughly how far to place the waypoint before the stop point for selected train speeds:

Train Speed (kph)	Distance of Waypoint Before Stop Point (m)
20	5
30	37
40	74
50	113
60-80	142

   For example, if the train speed is 40 kph, place the waypoint 74 m before the stop point that you want. Test the train stop point and adjust the waypoint placement if you want.
6. Object link each waypoint to the train and target link each waypoint to the nearby timer.
7. Target link the timer at each stop on the route to the waypoint of the next stop.
8. Trigger the first waypoint on the route with a target link from another MCU or a message link from an object.
9. Where there are gaps in the track at rivers, add railroad bridge objects.

Example: Make a Train Follow a Route

In this example, a train departs from Pravoe Station (map grid 0204-6) at 40 kph and stops at Alexei Station (fictional location at map grid 0204-2). The train then continues on to Stepnoye Station (map grid 0204-1) at 60 kph. As the train arrives at each station, the engine stops in line with the far end of the station.

There are cameras along the route to allow you to monitor the train's progress. You access each camera by pressing F12. To move the camera view around, you press F11 and then move the mouse. You can also move the mouse wheel to zoom in and out.

The following screenshot shows the setup at Pravoe Station, the departure point:

The train consists of the engine (train object "et") and the following carriages:

- platformaa-flak38
- 2 x boxb
- tankb
- tanknb
- 2 x pass
- platformnb
- platformaa-flak38

The station (green icon) is a block object called vl_n2station.

The orange icon translator marks the station on the GUI map. In the advanced properties, Icon ID is set to "Waypoint".

The "Cam1" camera operator translator lets you view the train at Pravoe Station. In the advanced properties, Camera Operator Type is set to "Default".

After the start of the mission, the two 15 second timers trigger the subtitles at the left of the screenshot. The second 15 second timer also triggers the first waypoint at Alexei Station (in the next screenshot), causing the train to depart Pravoe station. The green object links to the train come from the waypoints that define the two stops on the route.

The following screenshot shows the setup for Alexi Station, the first stop on the route:

In the advanced properties for waypoint "Train WP 1", Area is set to 5 m (to cover the track area) and the speed is set to 40 kph. To stop a train going 40 kph, the waypoint is placed about 74 m before the stop point, marked by the orange icon translator.

The "Cam4" camera operator lets you view the train arriving at Alexei Station.

The waypoint triggers a 30 second timer, which governs the length of the stop. The timer then triggers the waypoint at the next station down the line, Stepnoye Station.

The following screenshot shows the setup for Stepnoye Station, the last stop on the route:

Waypoint "Train WP 2" is configured like the previous waypoint, except the speed is increased to 60 kph. To stop a train going 60 kph, the waypoint is placed about 142 m before the stop point, marked by the orange icon translator.

The "Cam6" camera operator lets you view the train arriving at Stepnoye Station.

The destination waypoint does not trigger a timer because there are no more waypoints to trigger.

There are other cameras along the route. "Cam2" and "Cam 3" are along the route from Pravoe Station to Alexei Station. "Cam5" is along the route from Alexei Station to Stepnoye Station.

Make a Ship Follow a Route

You can create a ship and make it follow a route along a river.

Do the following:

1. Place a ship object on a river and make it a linked entity.
2. Set the ship object properties (pg. 217) and object advanced properties (pg. 209).
3. Place a waypoint trigger (pg. 285) at the destination on the river and at bends in the river.

   If you only place a waypoint at the destination, the ship automatically follows the river. However, the ship changes course rapidly left and right at the bends as it tries to keep close to the shore. It is up to you whether the rapid course changes are acceptable or

not.

4. Object link the waypoints to the ship and target link each waypoint to the next one along the route.
5. Trigger the first waypoint with a target link from another MCU or a message link from an object.

Note: See an example of using multiple waypoints in Make a Plane Take Off, Fly a Route, and Land (pg. 61).

Make an Object On a Route Change to Another Route

While an object is following a particular route, you can cause it to change to another route.

Note: This procedure assumes that you have created the old route and new route.

Do the following:

1. (Optional) Place a deactivate trigger (pg. 280) anywhere and target link it to all the waypoints on the old route that the object has not yet reached.

   Follow this step if the object is likely to reach any of the waypoints on the old route after it completes the new route. The old waypoints can still fire unless they are deactivated.
2. From another MCU or object in your mission, trigger the following:
   - The first waypoint on the new route.
   - The deactivate trigger, if you set one up.

Manage Object Formations

You can create and manage a formation of objects (such as planes, vehicles, or artillery) in the View Port. Wing men follow the leader and they respond to commands that are directed at the leader.

Note:

- The order in which you link each wing man establishes the formation order. The leader is always #0 in the formation and wing men are #1, #2, and so on. The order of an object in a formation is indicated by the "# in Formation" field of the object advanced properties.
- When the leader starts moving on the ground, the wing men then start moving in order (#1, then #2, and so on). Place the wing men so that each one has a clear path when they start moving. For example, do not place wing man #2 in front of #1.

Create a Formation or Add an Object to a Formation Using a Target Link

Target link an object to the formation leader object.

The formation leader ID appears in the "Target ID" box of the advanced properties of the object that you added to the formation.

Create a Formation or Add an Object to the Formation Using a Dialog

Do the following:

1. In the advanced properties for an object, click the "Add by Dialog" button

   The "Select Connected Entity" dialog opens.
2. Double click the row for the formation leader object.

   The formation leader ID appears in the "Target ID" box of the advanced properties.

   The "Add by Dialog" button changes to a "Set by Dialog" button (used in "Change the Formation Leader for an Object" in this topic).
3. Click OK.

   A target link appears from the new object to the formation leader.

Establish the Initial Formation Type and Change the Formation Type

After you make a formation move, you have to specify an initial formation type (for example, V formation). You can also change the formation type at any point on the formation's route.

Do the following:

1. Place a formation command (pg. 243) anywhere and object link it to the formation leader.
2. Set the formation command advanced properties as required.
3. Trigger the formation command with a target link from another MCU or a message link from an object.

   Important! An object must be moving before you can trigger a formation command, except for the "Continue Moving" formation type.

Check an Object's Order in a Formation

Open the advanced properties for the object and check the formation position from the "# in Formation" box.

Change an Object's Order in a Formation

1. Open the advanced properties for the formation leader and click the "Change Formation" button.
2. In the "Formation Numbers" dialog, change the order of the wing men.

Change the Formation Leader for an Object

1. Open the advanced properties of the object for which you want to change the formation leader and click the "Set by Dialog" button.

   The "Select Connected Entity" dialog opens.
2. Double click the row for the new formation leader object.

   The new formation leader ID appears in the "Target ID" box of the advanced properties.

Remove an Object from a Formation

Do the following:

1. In the advanced properties for the object that you want to remove, click the "Clear" button

   The formation leader ID is replaced by -1 in the "Target ID" box.
2. Click OK.

   A target link is removed from the object to the formation leader.

Example: Follow an AI Formation Flight

In this example, a player can practice formation flying in a BF109 F4. Starting in the air, the player can follow a formation of three AI Bf109 F4s as they fly a route

The route is defined by waypoint triggers (pg. 285). The next waypoint that the player will encounter on the route is marked in the air and on the GUI map with a yellow teardrop symbol, assuming the following:

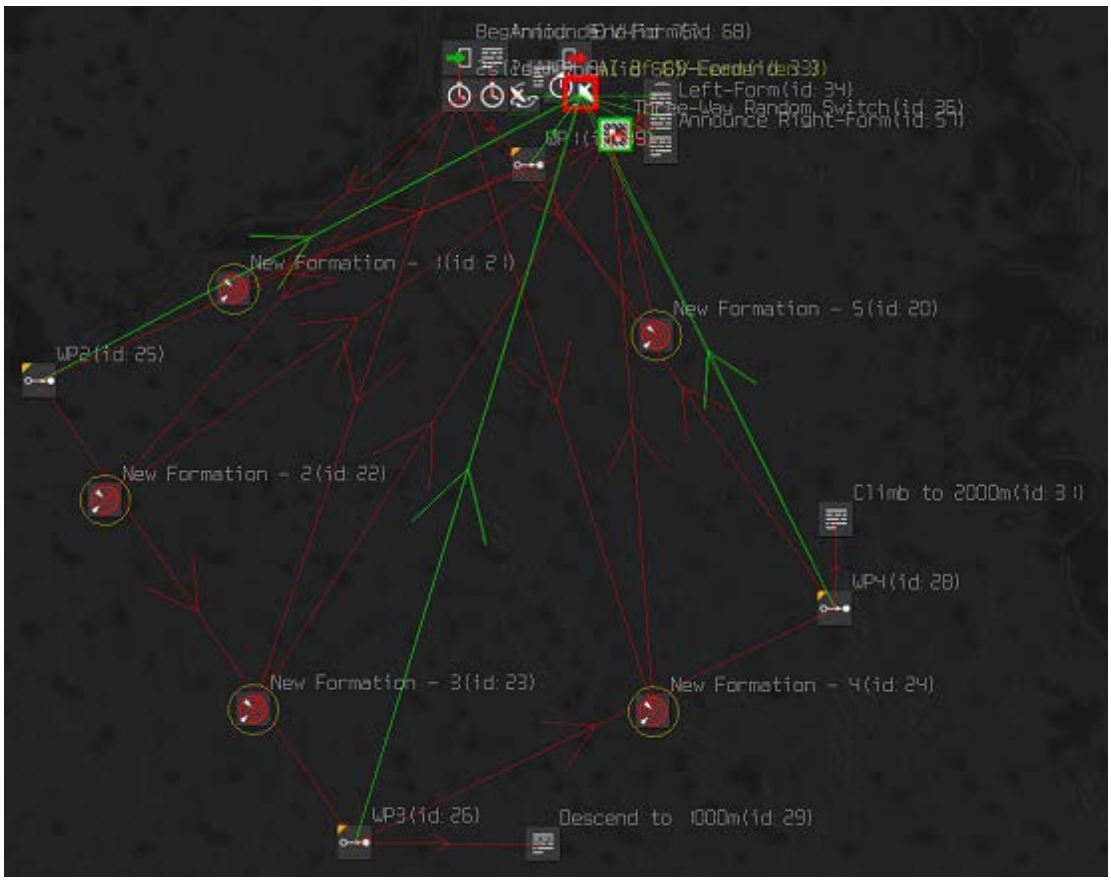
- The player has enabled the HUD (in-game control is "Show/hide entire HUD") and has the navigation markers showing (in-game control is "Show/hide instrument panel, navigation and map markers").
- The player has enabled navigation markers for the mission

  To enable navigation markers, the player must go to the IL-2 Sturmovik mission list, click the "Realism" button, and select the "Navigation Markers" check box.

At various points along the route, the AI planes change to a formation chosen at random (sometimes the current formation is chosen again).

The AI planes fly the same route again and again. The mission ends automatically when the AI planes reach their "bingo fuel" (low fuel) state. The player can end the mission at any time.

Here is an overview of the MCUs and objects for this example:



The planes and the first waypoint trigger on the route, "WP1", are in the cluster of icons at the top (shown in detail later in this example). Proceeding counter-clockwise, the next waypoints on the route are WP2, WP3, and WP4. All the waypoints are object linked to the formation leader and to the player plane. The links to the player plane generate the yellow waypoint marker. The waypoints are also target linked to the next waypoint along. WP4 is target linked to WP1 so that the planes keep flying the route continuously.

Here are the waypoint properties and advanced properties:

- Y (altitude): 2000 for WP1, WP2, and WP3; 1000 for WP4
- Area: 200
- Speed: 300

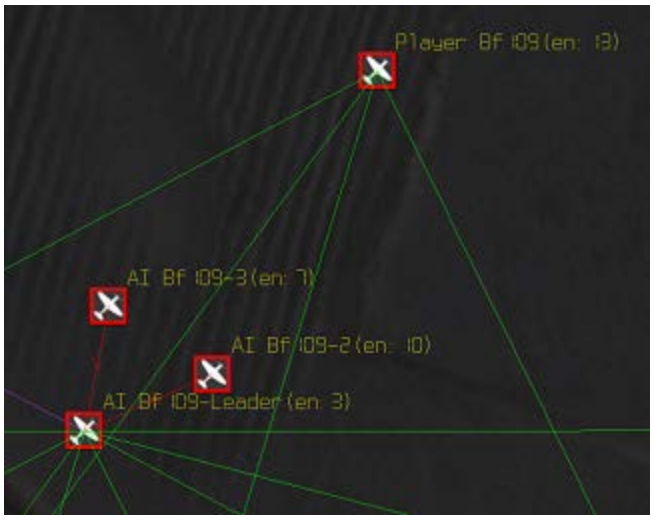
At WP3, the AI planes descend to 1,000m (announced by the nearby subtitle translator (pg. 273)).

At WP4, the AI planes climb to 2,000m (announced by the nearby subtitle translator).

Along the route, there are check zone triggers (pg. 276) called "New Formation 1" up to

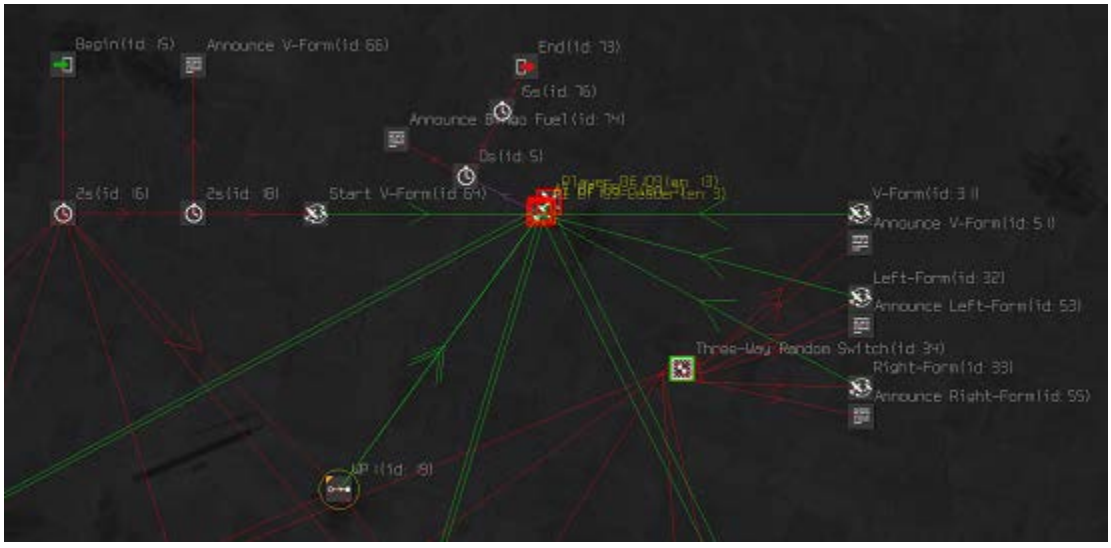
"New Formation 5". As the formation flies through a check zone trigger, it triggers MCUs that randomly choose a new formation. To enable the check zone triggers, there are target links from a two-second timer that fires after the start of the mission. Both the two-second timer and the random selection MCUs are shown later in this example.

Here are the planes involved in the example:



To establish the formation relationships, the AI wingmen are target linked to the formation leader, "AI Bf109-Leader". The planes are placed heading South West, at an altitude of 2,000m.

Here is the detail from the top of the first screenshot of this example:



The first waypoint, WP1, is shown at the bottom, left of the screenshot. Two seconds after the mission starts, a timer trigger (id:16) triggers the following:

- WP1, which causes the formation to fly towards it.
- The check zone triggers along the route, which allows them to detect the formation when it passes through.

The second timer trigger (id: 18) allows time for the formation to start moving and then it triggers the following:

- The "Start V-Form" formation command, which is object linked to the formation leader.

  "Start V-Form" establishes the initial V formation for the AI planes while they fly to WP1.
- The "Announce V-Form" subtitle translator, which announces the initial formation.

All of the check zone triggers on the route are target linked to the input of the three-way random switch (pg. 294) group at the bottom, right of the screenshot. The switch randomly selects one of three formations.

The outputs of the random switch group are target linked to the following:

- The formation commands on the right of the screenshot ("V-Form", "Left Form", and "Right Form").

  In the advanced properties of each formation command, "Formation Type" is set appropriately and "Formation Density" is set to "Dense". All the formation commands are object linked to the formation leader.
- The subtitle translators on the right of the screenshot, which announce the new formation that was selected.

If the AI planes run low on fuel, an OnPlaneBingoFuel event message link from the formation leader triggers a zero-second timer (id:5). The timer is just a connector that triggers the following:

- A subtitle translator that announces "Bingo fuel" and the end of the mission.
- A 15-second timer trigger, which then triggers the mission end translator (pg. 270) "End".

Chapter 6: Detecting Objects

Detect Objects In Relation to a Defined Area

You can detect specified objects based on their position relative to a defined area.

Detect Objects Entering an Area or Already In an Area

Note: This procedure allows you to specify objects to detect by coalition or specify individual objects to detect.

Do the following:

1. Place a check zone trigger (pg. 276) anywhere and set the advanced properties as follows:
   - Distance Type: Closer
   - Plane Coalitions/Vehicle Coalitions: "True" for coalitions of objects that you want to detect

     Note: You can specify coalitions to detect or you can follow step 2, but not both.
   - Zone/Zone Type: As required
2. If you did not specify a coalition to detect in step 1, object link the check zone trigger to the objects that you want it to detect.
3. Trigger the check zone trigger with a target link from another MCU or a message link from an object.

For examples of using the check zone trigger to detect objects entering an area, see the following topics:

- Manage Object Formations (pg. 74)
- Create or Delete an Object While a Mission is Running (pg. 107)
- Create Target Defences (pg. 125).
- Display a 3-D Object That Can Be Animated (pg. 159)
- Target Defence Switch (pg. 298)

Detect Objects Exiting an Area or Already Out of an Area

Note: This procedure allows you to specify objects to detect by coalition or specify individual objects to detect.

Do the following:

1. Place a check zone trigger (pg. 276) anywhere and set the advanced properties as follows:
   - Distance Type: Further
   - Plane Coalitions/Vehicle Coalitions: "True" for coalitions of objects that you want to detect

     Note: You can specify coalitions to detect or you can follow step 2, but not both.
   - Zone/Zone Type: As required
2. If you did not specify a coalition to detect in step 1, object link the check zone trigger to the objects that you want it to detect.
3. Trigger the check zone trigger with a target link from another MCU or a message link from an object.

For examples of using the check zone trigger to detect objects exiting an area, see the following topics:

- Create or Delete an Object While a Mission is Running (pg. 107)
- Create Target Defences (pg. 125).
- Target Defence Switch (pg. 298)

Detect Objects Entering or Exiting an Area

Note: This procedure provides more options than the other procedures in this topic. Here are your options:

- You can specify objects to detect as follows:
  - Objects with a specific type, for example, any Bf109e7 or any T70 tank
  - Objects from specific countries
  - An object with a specific name

  Detection occurs for each of the specified objects. For example, if five planes leave the area, five detections occur.
- You can trigger one MCU when an object enters the area and another MCU when an object leaves the area.

Important! Although this procedure gives you more options than the other ones in this topic, it also results in greater resource use. Avoid using this procedure too much.

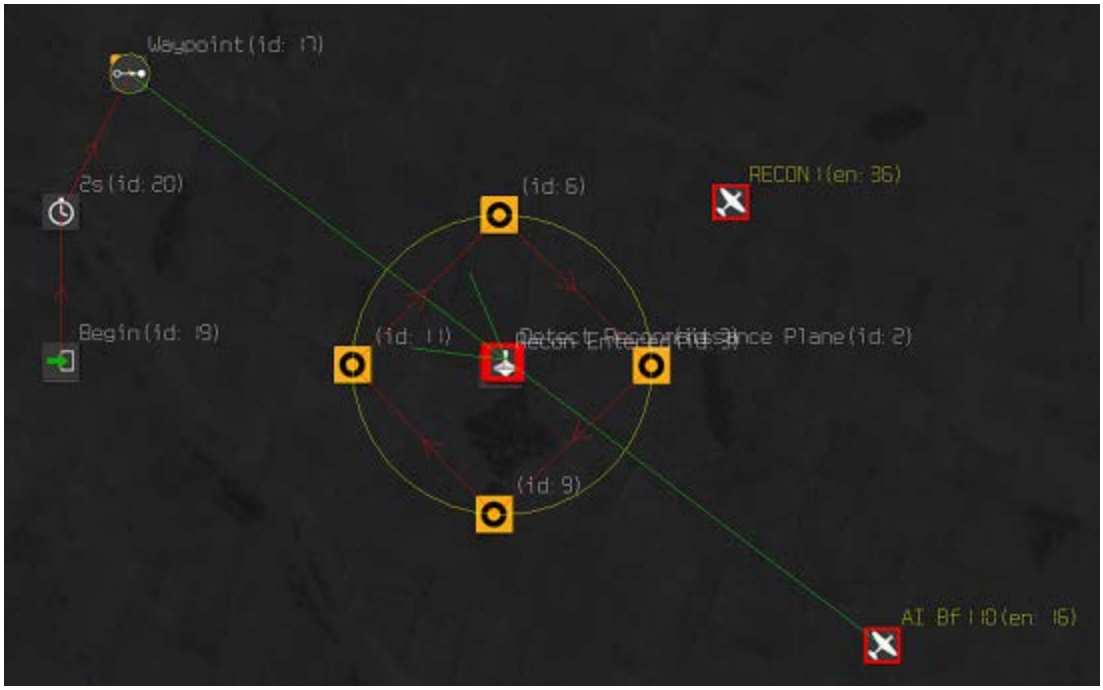
To detect objects entering or exiting an area, place a complex trigger translator (pg. 252) anywhere and set the advanced properties as follows:

- Enabled: Selected to activate detection right away and cleared to activate detection later in the mission. For details, see Deactivate or Activate Mission Functions (pg. 105).
- Other properties on the left side of the advanced properties dialog: Set as required
- Events Filter/On Events Table:
  - To detect entry, select "Object Entered" or "Object Entered Alive" in the Events Filter and add OnObjectEntered or OnObjectEnteredAlive to the On Events Table.
  - To detect exit, select "Object Left" or "Object Left Alive" and add OnObjectLeft or OnObjectLeftAlive to the On Events Table.

Example: Detect a Reconnaissance Plane Entering and Exiting an Area

In this example, a player flies a Bf109 reconnaissance plane called RECON1, looking for a Russian tank column. For demonstration purposes, the column is within a red circle marked on the GUI map. When the player flies into the circle, a target icon appears inside of it, indicating that the target has been spotted. Also, a message appears when the player enters and exits the circle. However, an AI Bf110 that enters and exits the circle does not produce a target icon or any messages because it is does a name reserved for reconnaissance planes.

Here is an overview of the mission:



At the start of the mission, the "Begin" mission begin translator (pg. 270) triggers a two-second timer trigger that waits for IL-2 Sturmovik to start the mission. After two seconds,

the timer then triggers a waypoint trigger (pg. 285) The waypoint is object linked to "AI Bf110", which causes the Bf110 to fly to the waypoint.

The yellow target circle is defined by a complex trigger translator, which is part of the cluster of icons in the center of the circle. The icons in the cluster are shown in detail later in this example.

Because the zone for a complex trigger translator is not shown on a GUI map, four icon translators (pg. 255) are placed on the boundary to mark the zone. Here are the properties and advanced properties for the translators:

- Name: Blank
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: None
- Line Type: Sector Type 1
- Coalitions: Axis is True and Allies and Neutral are True or False

The four icon translators are target linked as shown in the preceding screenshot.

Here is a closeup of the icon cluster at the center of the target circle:

The tank column shown at the top of the screenshot does not affect this demonstration mission and can be set up in any way. In this case, T70-1 is the leader and all the other tanks are object linked to it.

Here are the advanced properties for complex trigger translator "Detect Reconnaissance Plane":

- Enabled: Selected
- On Cylinder / off -sphere: Selected (cylinder)
- Radius: 1500
- Check Vehicles: Cleared
- Check Entities: Selected
- Object names list:

  RECON1

  RECON2

  RECON3

  Note: The RECON2 and RECON3 planes are not present in this example but you could add them to an airfield object in a multiplayer mission or as AI planes in a singleplayer mission or multiplayer mission.
- Events Filter: "Object Entered" and "Object Left" selected
- On Events Table:

OnObjectEntered	3 (ID for "Recon Entered" subtitle translator)
OnObjectLeft	4 (ID for "Recon Exited" subtitle translator)
OnObjectEntered	5 (ID for "Target Found" activate trigger)

Here are the advanced properties for the yellow target icon at the center of the screenshot:

- Enabled: Cleared
- Icon ID: Attack Enemy Tank Platoon
- Coalitions: Axis is True, Neutral and Allies are False

If the player plane (called "RECON1") enters the target circle, "Detect Reconnaissance Plane" produces event messages that trigger the following:

- The "Target Found" activate trigger, which activates the yellow target icon
- The "Recon Entered" subtitle translator, which displays a message announcing the entry of the reconnaissance plane to the target circle

If the player plane exits the target circle, "Detect Reconnaissance Plane" produces an event message that triggers the "Recon Exited" subtitle translator. The translator displays a message announcing the exit of the reconnaissance plane from the target circle.

Because the Bf110 is not called RECON1, RECON2, or RECON3, it is not detected by the complex trigger translator.

Related Information

Detect Events from Objects Inside an Area (pg. 86)

Detect Events from Objects Inside an Area

You can detect when specified plane or vehicle objects within a defined area cause a specified event to occur. For example, you can detect when planes within an area are spawned, drop bombs, or finish their flight.

Note: You can specify objects as follows:

- Objects with a specific type, for example, any Bf109e7 or any T70 tank
- Objects from specific countries
- An object with a specific name

Important! This procedure results in greater resource use so avoid using it too much.

To detect events from objects inside an area, place a complex trigger translator (pg. 252) anywhere and set the advanced properties as follows:

- Enabled: Selected to activate detection right away and cleared to activate detection later in the mission. For details, see Deactivate or Activate Mission Functions (pg. 105).
- Other properties on the left side of the advanced properties dialog: As required
- Events Filter/On Events Table: Select the filters for the events that you want to detect for the specified objects and set up the matching events in the On Events Table.

Show Objects Within a Defined Area on the GUI Map

You can define a circular area around certain objects that acts like a radar. Mission participants who join on the same side as the object see the area as a dashed circle on the GUI map. Icons are shown for all planes, artillery, ships, trains, and vehicles within the circle except those objects named "NOICON" (for details, see Hide the Icon and Label for an Object in a Mission (pg. 90)).

Icons within the circular area are colour coded as follows:

- A black plane icon represents the player's plane.
- Red and blue plane icons and squares (for ground-based objects) represent enemy and friendly objects according to the colours that are set in IL-2 Sturmovik under Settings > Flight Interface.

For a large radius circle, objects first appear grey and then gradually turn red or blue, depending on which side they are on. This matches how object icons look from the cockpit as you approach them.

You can define a radar circle around planes, artillery, ships, trains, and vehicles. Planes have a built-in 10,000m radar circle but you can reduce this radius if you want by using this procedure.

Note: To see the spotter circle and the objects within it, players must do the following:

- Run a singleplayer mission that includes a plane for them or select a plane or a gunner position in a multiplayer mission.

  You do not have to be in the cockpit to see the circle on the GUI map.
- Enable the HUD (key for "Show/hide entire HUD") and enable map markers (key for "Show/hide instrument panel, navigation and map markers").

Do the following:

1. Place a plane, artillery, ship, train, or vehicle object at the center of the area in which you want to show objects.
2. In the object advanced properties, select the "Spotter" or "Spotter Radius" option and specify the size of the radius.

Detect the Proximity of Objects to One Another

You can have your mission detect when specified objects are either inside a specified distance from one another or outside a specified distance from one another. Once one of these conditions is met, another mission event can be triggered.

Do the following:

1. Place a proximity trigger (pg. 281) anywhere.
2. Do one of the following:
   - Object link the trigger to a single object, open the trigger advanced properties, and specify TRUE for coalitions that include the other plane or vehicle objects that you want to detect.

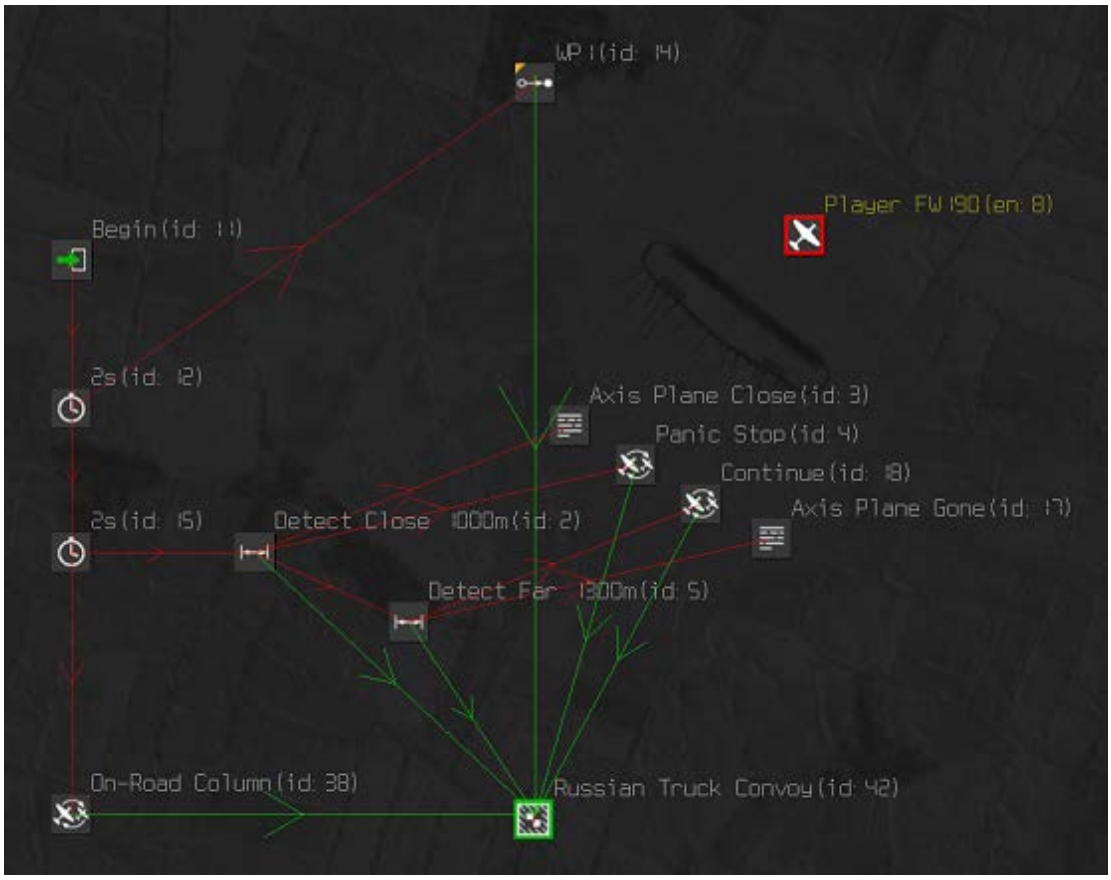
     In this case, the trigger detects the distance of the single object to any of the objects in the specified coalitions.
   - Object link the trigger to specific planes or vehicles.

     In this case, the trigger detects the distances between all the linked objects.
3. In the advanced properties, set the Proximity Type and Distance.
4. Trigger the proximity trigger with a target link from another MCU or a message link from an object.
5. Target link the proximity trigger to other MCUs that you want to trigger after object proximity detection.

Example: Attack a Russian Truck Convoy

In this example, a player in an FW190 can attack a Russian truck convoy on the road to the town of Lapino. When the convoy spots the FW190 nearby, the convoy leaves the road and stops. An AA truck at the rear of the convoy engages the plane. When the player flies away from the convoy, the convoy resumes its journey to Lapino.

The following screenshot shows the setup for the scenario:



All of the green object links shown go to the leader of the vehicle formation in group "Russian Truck Convoy" (shown later in this example).

Here are the advanced properties for the proximity triggers "Detect Close" and "Detect Far":

- Proximity Type: Selected for "Detect Close", cleared for "Detect Far"
- Distance: 1000 for "Detect Close", 1300 for "Detect Far"

  The distances are different to avoid the triggers firing rapidly if the plane is flying along the edge of the detection zone.

  The proximity trigger distances are relatively small in this example so that when the plane gets close to the convoy, the pilot can easily see the reaction of the vehicles.
- Plane Coalitions: Axis is True, all other coalitions are False
- Vehicle Coalitions: All False

Two seconds after the beginning of the mission, the first two-second timer trigger (id: 12) triggers waypoint WP1 (at Lapino), causing the Russian truck convoy to start its journey.

Two seconds after the convoy starts moving, the second timer trigger (id: 15) triggers the following:

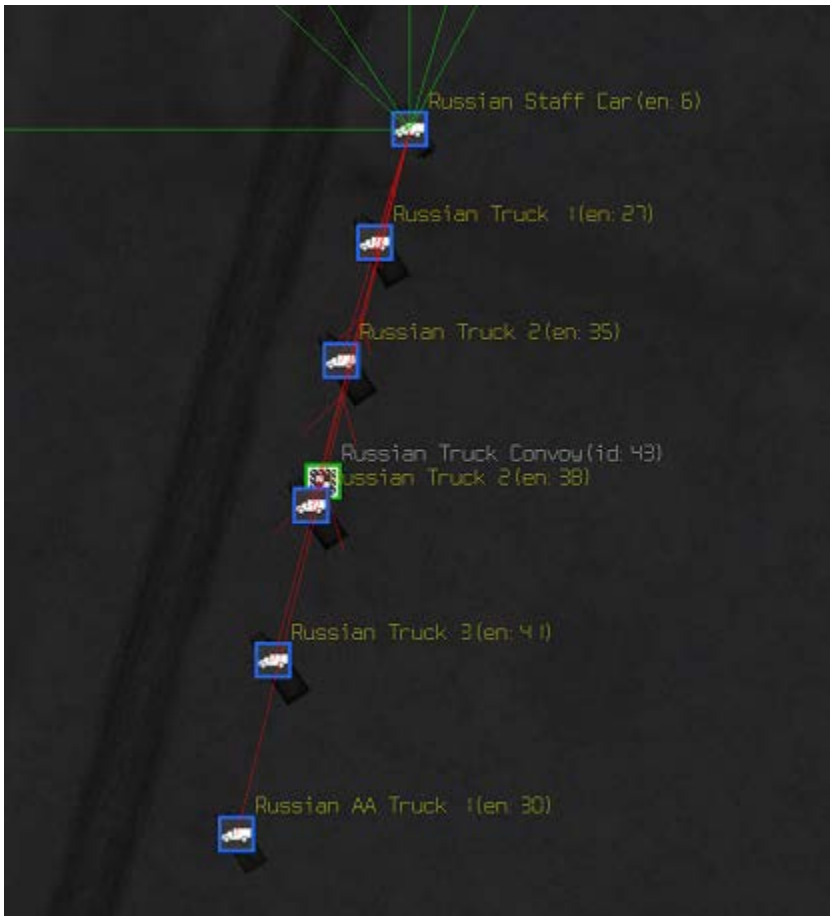
- Proximity trigger "Detect Close", which begins detecting Axis planes that fly within 1,000m of the vehicle formation leader
- Formation command "On-Road Column", which makes the convoy stay on the road to Lapino.

If the plane flies within 1,000m of the convoy, "Detect Close" triggers the following:

- Formation command "Panic Stop", which causes the convoy to pull off of the road and stop
- Subtitle translator "Axis Plane Close", which announces the proximity of the player FW190
- Proximity trigger "Detect Far", which begins detecting Axis planes that fly more than 1,300m away from the vehicle formation leader.

If the plane flies further than 1,300m from the convoy, "Detect Far" triggers formation command "Continue" and subtitle translator "Axis Plane Gone". In this case, the convoy resumes its journey to Lapino.

Here is a close-up screenshot of the convoy:



All of the trucks are target linked to the formation leader, "Russian Staff Car".

Related Information

Make a Vehicle Follow a Route (pg. 67)

Manage Object Formations (pg. 74)

Hide the Icon and Label for an Object in a Mission

You can hide the following for an object in a mission:

- The icon for that object on the GUI map
- The label next to the actual object

Do one of the following:

- In a singleplayer mission, specify "NOICON" in the Name field of the object properties.
- In a multiplayer mission, do the following:
  - For planes in airfield objects, specify "NOICON" in the Name field of the Plane Settings Dialog (pg. 226).
  - For AI planes and objects, specify "NOICON" in the Name field of the object properties.

Note: Icons and labels for objects with names other than NOICON are visible if a player enables the HUD (key for "Show/hide entire HUD") and enables map markers (key for "Show/hide instrument panel, navigation and map markers").

Make a Ground Object Label Appear Sooner

You can increase the distance at which a ground object label first becomes visible to players.

To make a ground object label appear sooner, specify "FARICON" in the Name field of the object properties.

Note: Icons and labels for objects are visible if a player enables the HUD (key for "Show/hide entire HUD") and enables map markers (key for "Show/hide instrument panel, navigation and map markers").

Chapter 7: Controlling How a Mission Progresses

Specify What Occurs at the Start of a Mission

You can specify what events occur at the start of a mission by triggering the MCUs responsible for those events. For example, you can trigger a check zone trigger (pg. 276) right after the mission starts so that it is ready to detect objects.

Do the following

1. Place mission begin translators (pg. 270) at convenient locations near the MCUs that you want to trigger when the mission starts.
2. Place a one or two-second timer trigger (pg. 283) near each mission begin translator.

   The timer provides a short delay to allow IL-2 Sturmovik to start the mission before your own mission events occur.
3. Target link each mission begin translator to the nearby timer.
4. Target link each timer to any nearby MCUs that you want to trigger at mission start.

For an example of using the mission begin translator, see "Example: Engage an FW190" in Create a Singleplayer Mission (pg. 33).

Stop a Mission

You can stop a mission, which results in the following:

- In a singleplayer mission, the mission list screen is displayed.
- In a multiplayer mission, the mission statistics screen is displayed.

Do the following:

1. Place mission end translators (pg. 278) at convenient locations near the MCUs or objects that you want to trigger the end of the mission.
2. Trigger each mission end translator with a target link from the nearby MCU or a message link from the nearby object.

For an example on using the mission end translator, see "Example: Destroy Two Factories" in Create a Multiplayer Mission (pg. 38).

Wait Before Triggering an Event

You can delay the triggering of a mission event for a specified time interval. For example:

- If you specify what occurs at the start of a mission (pg. 93), you must create a short delay (a second or so) after the mission begin translator. This delay allows IL-2 Sturmovik to complete mission-start processing and then your own mission start events can occur.
- Delay the take-off of an AI bomber until a certain time in the mission.
- Establish the mission length, using a long-running timer that triggers a mission end translator (pg. 270).
- Introduce a short time delay so that certain MCUs are not triggered simultaneously with other MCUs. The example in Make a Vehicle Follow a Route (pg. 67) shows a delay between triggering waypoint "WP 1" and triggering the "On Road" formation command.

Do the following:

1. Place a timer trigger (pg. 283) anywhere and target link it to the MCU that you want to trigger after the delay.
2. Trigger the timer trigger with a target link from another MCU or a message link from an object.

Trigger an Event Based on How Many Times Other Events Occur

You can trigger an event based on the following:

- The first time that other events occur

  For example, when the first building in a factory complex is damaged or destroyed, you can trigger a subtitle translator once only to announce the raid on the complex.
- When one or more events occur one time each

  For example, when three factories are destroyed, you can display a message announcing the success of a mission.
- When another event occurs multiple times

  For an example, see the "50% Damage" counter in the damage display switch (pg. 287). The counter is set to 4 and it is triggered only by the "ALL" timer trigger whenever one of the eight objects attached to the switch is destroyed. Once four of the eight objects are destroyed, the counter triggers the linked activate and deactivate triggers, which in turn cause icon translators to display the damage level on the map.

Trigger an Event the First Time That Other Events Occur

Do the following:

1. Place a counter trigger (pg. 278) anywhere and target link it to the MCU that you want to trigger after the counter trigger fires.
2. In the counter trigger advanced properties, specify 1 for "Counter" and clear the "Reset

After Operation" check box.

3. Trigger the counter trigger with a target link from other MCUs or a message link from one or more objects.

See "Example: Announce an Attack on a Factory Complex" in this topic.

Trigger an Event When One or More Events Occur One Time Each

Note: This procedure includes a way to handle events that may occur simultaneously, but where you want to count each event separately. For example, two buildings right next to each other can be destroyed by a single large bomb and the destruction could be counted once only. You can set up the mission so that each building is counted when it is destroyed.

Do one of the following:

- If the input events can not occur simultaneously, set up counter triggers (pg. 278) as shown in the example "Destroy Three Factories", in this topic.
- If the input events are likely to occur simultaneously, set up a multi-input counter (pg. 292) as shown in the example "Destroy a Factory Complex", in this topic.

Trigger an Event When Another Event Occurs Multiple Times

Do the following:

1. Place a counter trigger (pg. 278) anywhere and target link it to the MCU that you want to trigger after the counter trigger fires.
2. In the counter trigger advanced properties, specify the value that you want for "Counter" and clear the "Reset After Operation" check box.
3. Trigger the counter trigger with a target link from another MCU or a message link from an object.

Example: Announce an Attack on a Factory Complex

In this example, the player flies a Ju-87 and attacks a factory complex consisting of two large buildings and a water tower. When any one of those structures is even slightly damaged, a message appears announcing the attack on the factory complex.

Here is the layout for the factory complex part of the mission:

The player Ju-87 is placed about 5 km West of the complex at 1500 m altitude, but it can be placed anywhere.

The factory complex consists of the following objects:

- Two "vl_factory" block objects ("Russn Factory A" and "Russn Factory B")
  In the properties dialog, Durability is set to 10000.
- One "watertower" block object ("Russn Factory C")
  In the properties dialog, Durability is set to 7000.

Here are the advanced properties for all three objects:

- Damage: Selected (Threshold)
- Damage Report: 95 (detects 95% object life remaining)
- Delete After Death: Cleared
- On Events Table: Add event OnDamaged, target ID 5 (the "Detect Attack:1x" Counter)
  The OnDamaged message is generated when damage reduces object life to 95% (the Damage Report value)

The factory location is marked on the GUI map by the orange icon translator (pg. 255). Here are the properties and advanced properties for the icon translator:

- Name: Russian Factory Complex
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: Attack Enemy Buildings
- Coalitions: Axis is True, Allies and Neutral are False

The "Detect Attack:1x" counter trigger is triggered by an OnDamaged event message link from the factory complex objects. Here are the counter trigger advanced properties:

- Counter: 1
- Reset After Operation: Cleared

The counter trigger fires once only, so that it ignores multiple OnDamaged event messages from a single factory complex object or simultaneous OnDamaged event messages from two or more factory complex objects.

The counter triggers the "Russn Factory Under Attack" subtitle translator (pg. 273), which displays a message to announce the attack.

Example: Destroy Three Factories

In this example, the player flies a Ju-87 and attacks Russian factories in three different locations. When all three factories are destroyed, a message appears announcing the success of the mission. In this case, assume that simultaneous destruction of multiple factories in different locations never occurs, so the multi-input counter is not necessary.

Here is the MCU and object layout for the three factories:

The player Ju-87 is placed 4 km North West of Factory A at 1500 m altitude.

The factories are "vl_factory" block objects, with Durability set to 10000 in the Properties dialog.

Here are the advanced properties for the three factory objects:

- Delete After Death: Cleared
- On Events Table: Add event OnKilled and choose the target ID of the counter nearest the factory.

  An OnKilled message is generated when each factory is destroyed.

The factory locations are marked on the GUI map by orange icon translators (pg. 255). Here are the properties and advanced properties for the icon translators:

- Name: Russian Factory A, Russian Factory B, Russian Factory C
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: Attack Enemy Buildings
- Coalitions: Axis is True, Allies and Neutral are False

The counter triggers "A Destroyed:1x", "B Destroyed:1x", and "C Destroyed:1x" are triggered by OnKilled event message links from the related factory objects. Here are the advanced properties for the counter triggers just mentioned:

- Counter: 1
- Reset After Operation: Cleared

Each counter trigger fires once only, so it ignores multiple OnKilled event messages from the related factory object.

The three counter triggers just mentioned trigger the "Three Factories Destroyed:3x" counter trigger. Here are the advanced properties for that counter trigger:

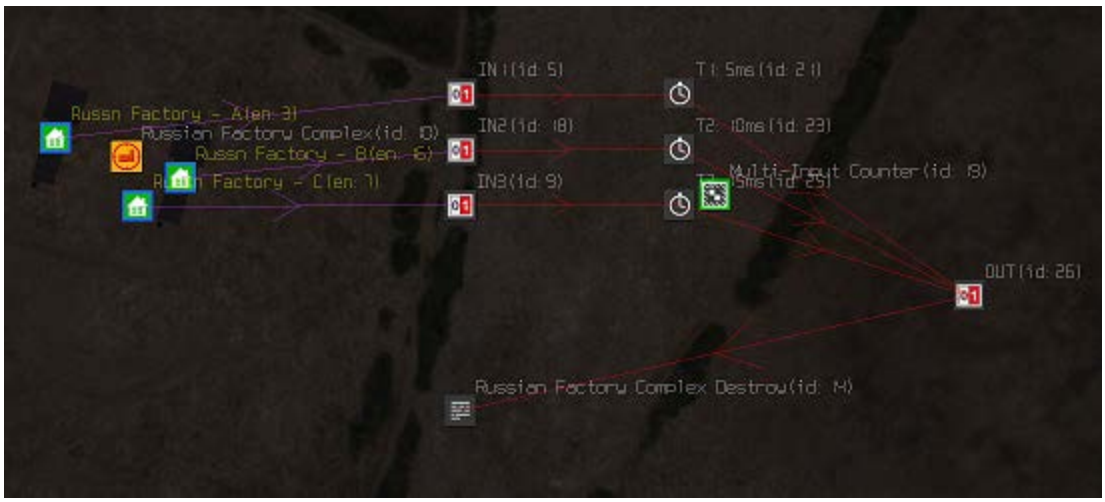
- Counter: 3
- Reset After Operation: Cleared

When "Three Factories Destroyed:3x" fires, it triggers the "Announce Factories Destroyed" subtitle translator, which displays a message to announce the success of the mission.

Example: Destroy a Factory Complex

In this example, the player flies a Ju-87 and attacks a Russian factory complex consisting of two large buildings and a water tower. When all three buildings in the complex are destroyed, a message appears announcing the success of the mission. In this case, simultaneous destruction of multiple buildings in the complex (most likely factory B and the water tower) are likely to occur, so the multi-input counter is necessary.

Here is the layout for the mission:



In this example, the player Ju-87 is placed about 5 km West of the complex at 1500 m altitude, but it can be placed anywhere.

The multi-input counter MCUs are in the top-middle and right side of the screenshot. Because this example only requires three inputs, counter triggers IN4-IN8 and timer triggers T4-T8 are deleted from the "Multi-Input Counter" group in the View Port.

The factory complex consists of the following objects:

- Two "vl_factory" block objects ("Russn Factory A" and "Russn Factory B")
  In the properties dialog, Durability is set to 10000.
- One "watertower" block object ("Russn Factory C")
  In the properties dialog, Durability is set to 7000.

Here are the advanced properties for all three objects:

- Delete After Death: Cleared
- On Events Table:
  - For factory object A: OnKilled 5 (id of counter trigger IN1)
  - For factory object B: OnKilled 18 (id of counter trigger IN2)
  - For factory object C: OnKilled 9 (id of counter trigger IN3)

  The OnKilled message is generated by each building in the factory complex when it is destroyed.

The factory complex location is marked on the GUI map by the orange icon translator (pg. 255). Here are the properties and advanced properties for the icon translator:

- Name: Russian Factory Complex
- Background color RGB: 255, 0, 0 (red)

- Enabled: Selected
- Icon ID: Attack Enemy Buildings
- Coalitions: Axis is True, Allies and Neutral are False

The multi-input counter counts each time a building in the complex is destroyed. Once all three buildings are destroyed, the OUT counter trigger fires and triggers subtitle translator "Russian Factory Complex Destroyed" to announce the success of the mission.

Trigger an Event at a Point in Time in a Mission

You can trigger a mission event once a specified point in time is reached in a running mission. For example, you can command bombers to take off at sunset or display a "Start the attack!" message at 3:00 pm, mission time.

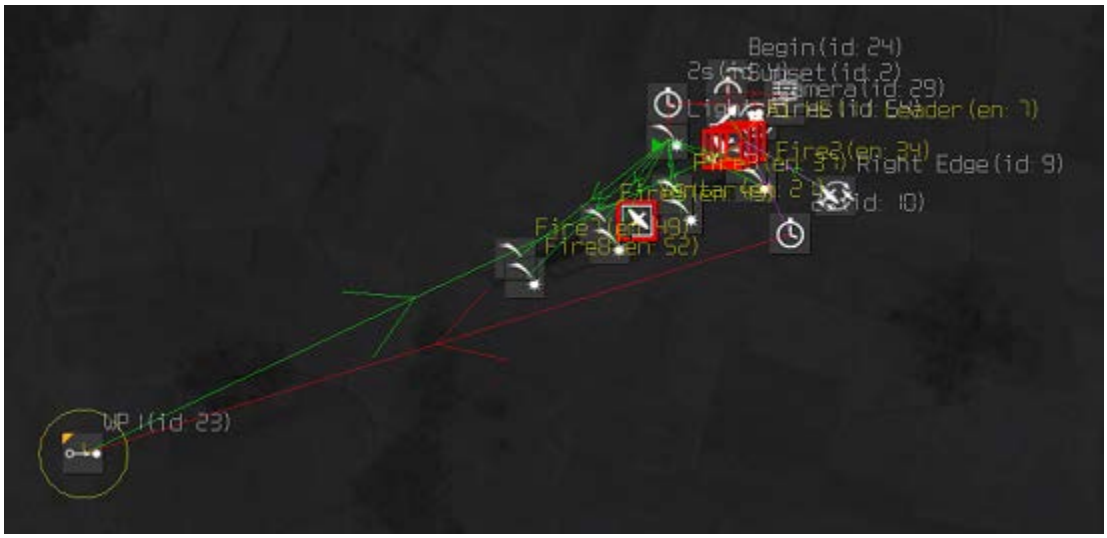
Do the following:

1. Place a date time trigger (pg. 279) anywhere and target link it to an MCU that you want to trigger at a certain time.
2. Set the date time trigger advanced properties.
3. Trigger the date time trigger with a target link from another MCU or a message link from an object.

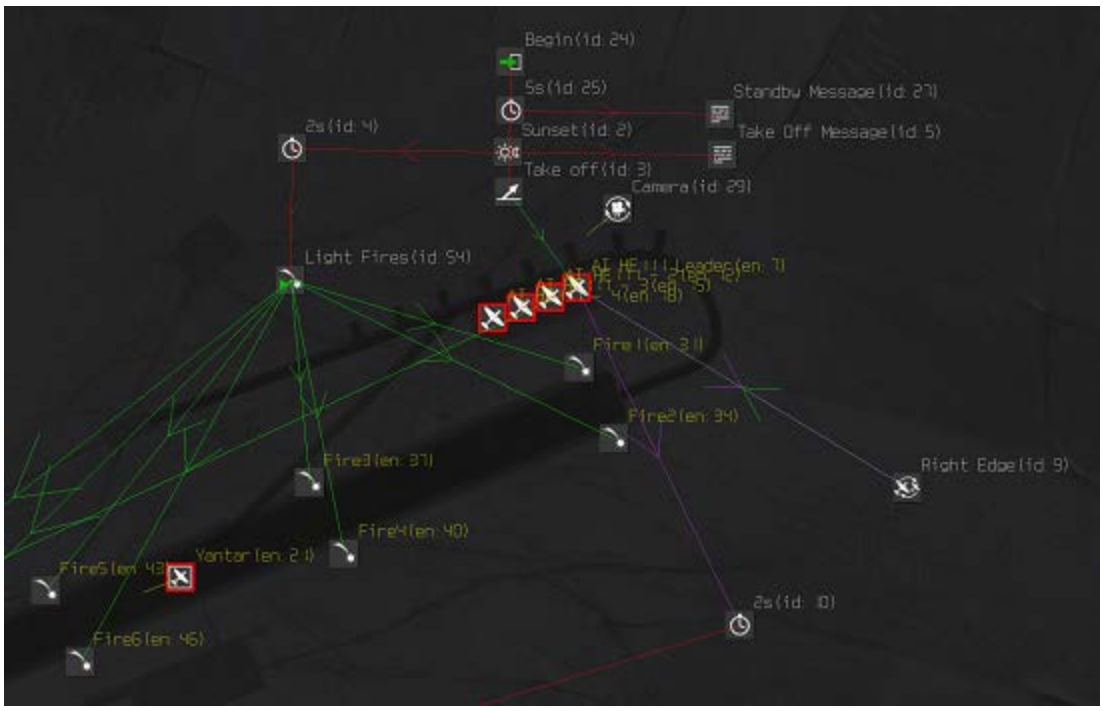
Example: Command Bombers to Take Off at Sunset

In this example, a formation of He111s sets out on a raid at sunset. The bombers start up, taxi out to the runway, take off, and proceed to a waypoint, which is where the example ends. The runway is lined with bonfires, which are lit at sunset.

The following screenshot shows an overview of the mission setup. WP1 is the waypoint trigger (pg. 285) to which the bombers fly. The cluster of icons at the top right is the airfield area, which is shown in detail on the second screenshot.



The following screenshot shows the airfield area.



The red icons in the center are the He111s. The formation leader is the red icon on the right. The formation is shown in detail later in this example. Note the green object link coming from the waypoint (off screen, bottom left) to the formation leader.

After mission start, the five-second timer (top center) triggers the following:

- Date time trigger "Sunset"
- Subtitle translator "Standby Message", which displays "Standby" on the screen

Here are the advanced property settings for "Sunset":

- Type: Sunset
- Config: daytime.cfg (file is in your game folder under \data)

In the Mission Properties Dialog (pg. 208), the date is set to 1942-11-19 and the time is set to 17:34:40 (5:34:40 pm), which is 20 seconds before sunset. The sunset time is determined by the following entry in the daytime.cfg file:

```
[Daytime]
        period="11.18","11.25"
        sunrise="07.40"
        sunset="17.35"
```

The entry shows that for the period of Nov. 18 to Nov. 25, sunset is at 17:35 (5:35 pm).

At sunset, the date time trigger fires, which triggers the following:

- The "Take off" command, which causes the He111s to start their engines and taxi out to the runway.

  Defining the AI taxi path to the runway is covered later in this example.

  The He111s take a minute or so to start their engines and begin taxiing. The last plane to enter the runway takes a little while to get into position before the leader starts the take-off roll.
- The "Take Off Message" subtitle translator, which announces the take off command
- A two-second timer (id: 4), which triggers the "Light Fires" effect command (pg. 241) to light the bonfires along the runway.

  For more information on using bonfires, see Help Pilots Find an Airbase and a Runway (pg. 56).

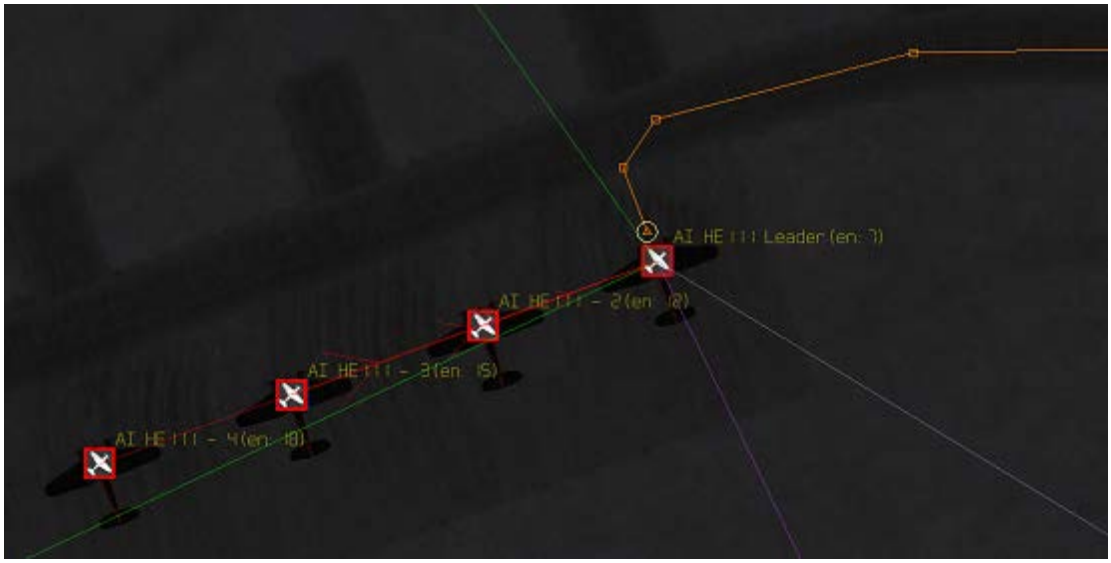
After take off, OnPlaneTookOff event message links from the bomber leader trigger the following at the bottom right of the screenshot:

- The "Right Edge" formation command, which is object linked back to the formation leader, causing the He111s to adopt a right-edge formation
- A two-second timer trigger (id:10), which waits for the "Right Edge" formation command to take effect and then triggers the waypoint, causing the bombers to fly towards it

The "Camera" camera operator translator (pg. 251) near the He111s allows you to watch them taxi out and take off. Pressing F11 allows you to move the view around with your mouse. In the camera operator advanced properties, the Camera Operator Type is Default.

The red airfield object "Yantar" (bottom left) is used to define taxi paths to the runway for the He111s. For more information on taxi paths, see Make a Plane Taxi to and From a Runway (pg. 63).

The following screenshot shows the He111s. Each wingman is target linked to the formation leader on the right. The orange taxi path (defined in the airfield object) starts right in front of the leader and proceeds to the runway.



Randomly Choose an Event to Trigger

You can randomly trigger one of many mission events. This ability can help make your missions less predictable and more interesting.

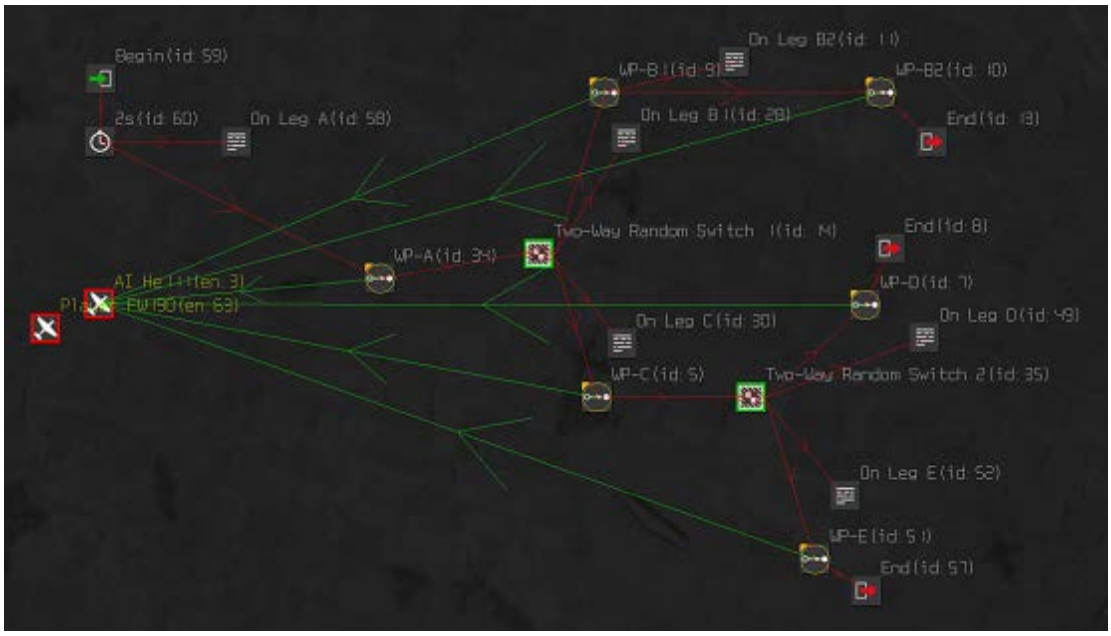
1. Create a random switch (pg. 294) anywhere.

   Use the random switch that handles the number of mission events that you want to choose from. For example, use a three-way switch to randomly choose from among three events.
2. Trigger the random switch with a target link from another MCU or a message link from an object.
3. From the random switch, use a target link to trigger each event that you want to choose.

Example: Randomly Choose a Route for an Object to Follow

This example shows how to use the two-way random switch to send a bomber on a randomly chosen route.

Here is the layout for the mission:



The player starts in an FW190 at 3,000m, following the bomber, "AI He111".

The possible routes are defined by waypoint triggers, each object linked to the bomber. Here are the possible routes, which are determined by random switches:

- WP-A to WP-B to WP-B2
- WP-A to WP-C to WP-D
- WP-A to WP-C to WP-E

Two seconds after the mission begins, the He111 flies toward waypoint WP-A. That waypoint triggers "Two-Way Random Switch 1". The random switch triggers either waypoint WP-B1 or WP-C, causing the He111 to change course accordingly. Each route has a 50% chance of being chosen, but you can edit the switch to change the probabilities.

If the bomber flies to WP-C, that waypoint triggers "Two-Way Random Switch 2". That second random switch triggers either waypoint WP-D or WP-E, causing another course change for the He111.

Several subtitle translators, such as "On Leg A", announce the current leg on which the bomber is flying.

End mission translators at the end of each possible route terminate the mission.

Allow a Multiplayer Server Administrator to Trigger an Event

You can allow a multiplayer server administrator to trigger an event in a running mission. For example, the administrator can trigger an end mission translator to end a mission early or trigger a subtitle translator to display a message.

Do the following:

1. Ensure that the multiplayer server administrator is able to use the Remote Console to control a multiplayer mission server from any PC (pg. 173).
2. Place a server input translator (pg. 273) anywhere and give it a name that describes the action that the server administrator can trigger.

   Here are some examples of names: EndMission to end the mission or TenMinutes to display the message "Mission ends in ten minutes".
3. Target link the server input translator to an MCU that you want to allow a multiplayer server administrator to trigger.
4. Repeat steps 2 and 3 for any other events that you want to allow a multiplayer server administrator to trigger.

   Make each server input translator name unique.
5. Give the exact name (including capitol letters) and the effect of each server input translator to the server administrator.
6. Instruct the server administrator that they can trigger a server input translator by sending the "Server Input" command from the Remote Console. For more details about commands, see "Command Menu" in Remote Console Interface (pg. 336).

Related Information

Allow a Multiplayer Server Administrator to Send a Chat Message (pg. 175)

Allow a Multiplayer Server Administrator to Save a Chat Log (pg. 175)

Deactivate or Activate Mission Functions

You can deactivate or activate mission functions provided by certain MCUs during a mission. For example, you can deactivate a check zone trigger to stop detecting objects in a zone and then activate it later on to start detecting objects in the zone again.

Deactivate an MCU

Do the following:

1. Place a deactivate trigger (pg. 283) anywhere and target link it to the MCU that you want to deactivate.
2. Trigger the deactivate trigger with a target link from another MCU or a message link from an object.

Activate an MCU

Do the following:

1. Place an activate trigger (pg. 274) anywhere and target link it to the MCU that you want to activate.
2. Trigger the activate trigger with a target link from another MCU or a message link from an object.

Cancel a Command Issued to an Object

You can cancel the current command that was issued to an object. For example, you can cancel the attack command issued to a Pe-2 when the factory it is attacking is destroyed or the PE-2 runs out of bombs.

Do the following:

1. Place a force complete command (pg. 242) anywhere and object link it to the object for which you want to cancel the current command.
2. Trigger the force complete command with a target link from another MCU or a message link from an object.

For an example of using the force complete command, see Make an Object Attack Another Object (pg. 119).

Chapter 8: Managing Objects in a Running Mission

Create or Delete an Object While a Mission is Running

You can create ("spawn") or delete certain objects while a mission is running. For example, you can spawn an AI fighter when the player enters a zone and delete it when the player exits the zone (assuming that the player does not shoot down the fighter). Spawning and deleting objects in this way can help your missions run better by using resources only when they are needed.

Note: You can only spawn objects that have the "Enabled" option available in the object advanced properties. That is, you can spawn artillery, planes, ships, trains, and vehicles.

Create an Object While a Mission Is Running

Do the following:

1. Place an object that you want to spawn in the View Port and make it a linked entity.
2. Specify the object properties (pg. 217) and object advanced properties (pg. 209) for the new object.

   Clear the "Enabled" check box in the advanced properties.
3. Place a spawner trigger (pg. 282) anywhere, specify the advanced properties, and object link it to the object that you want to spawn.
4. Trigger the spawner trigger with a target link from another MCU or a message link from an object.

Delete an Object While a Mission Is Running

Do the following:

1. Place a delete trigger anywhere and object link it to the object that you want to delete.
2. Trigger the delete trigger with a target link from another MCU or a message link from an object.

Example: Spawn an AI Fighter Whenever a Player Enters a Zone

In this example, the player starts in an FW190 at 2,000 meters, South West of an AI Yak-1 patrol zone. If the player is detected near the patrol zone, the Yak is spawned at 2,000m and begins patrolling the zone for enemy aircraft.

If the Yak is destroyed, the player must exit the zone and re-enter again to re-spawn a new Yak.

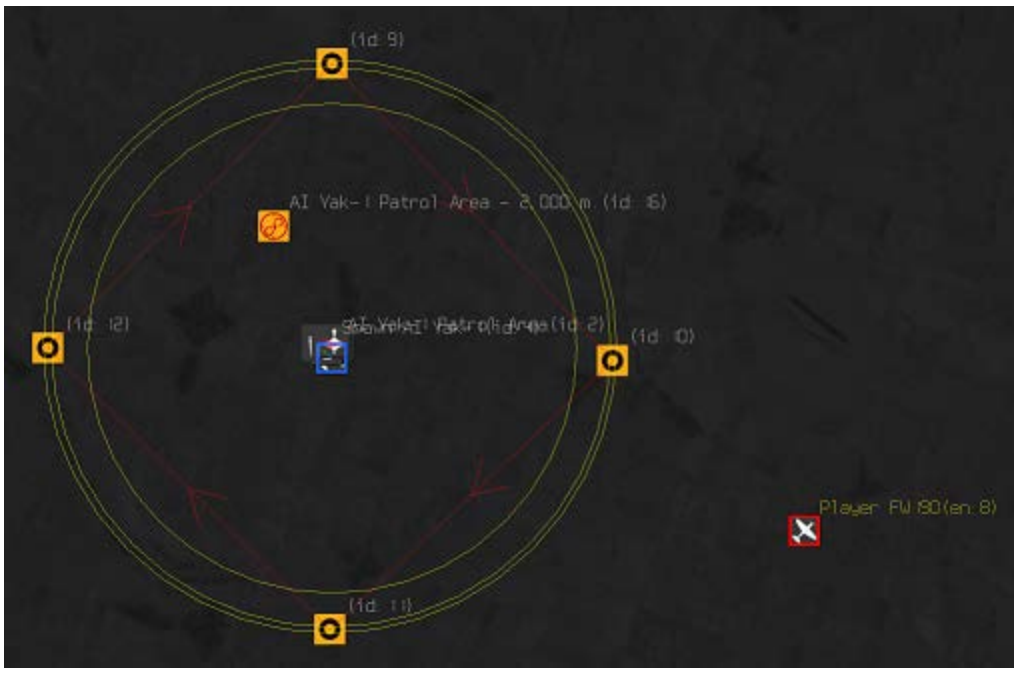
If the player exits the zone before destroying the Yak, it is deleted and a new one is spawned when the player re-enters the zone.

Here is the GUI map for the player:

Note the icon at the top left of the zone saying "AI Yak Patrol Area – 2,000m".

The red circle represents the zone where the player plane is detected. The Yak-1 patrol zone is a little smaller than the detection zone, which gives the player space to react to the enemy plane spawning.

Here is an overview of the mission:



The outermost yellow circles define two detection zones, one slightly larger than the other. The smaller detection zone causes the AI fighter to spawn when the player enters the zone. The larger detection zone causes the AI fighter to be deleted (if it has not been destroyed already) when the player leaves the zone. If the zones were the same size, the AI fighter would keep appearing and disappearing if the player was flying along the edge of the zone. The MCUs for creating the zones are explained later in this example.

Because the detection zones are not shown on the GUI map, four icon translators (pg. 255) are placed to mark them with a single red circle. Here are the properties and advanced properties for the translators:

- Name: Blank
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: None
- Line Type: Zone Type 1
- Coalitions: Axis is True, Neutral and Allies are True or False

The four icon translators are target linked as shown in the screenshot. The links create the red circle.

Another icon translator named "AI Yak Patrol Area – 2,000m" is placed within the patrol area to mark it on the GUI map. Here are the advanced properties for the translator:

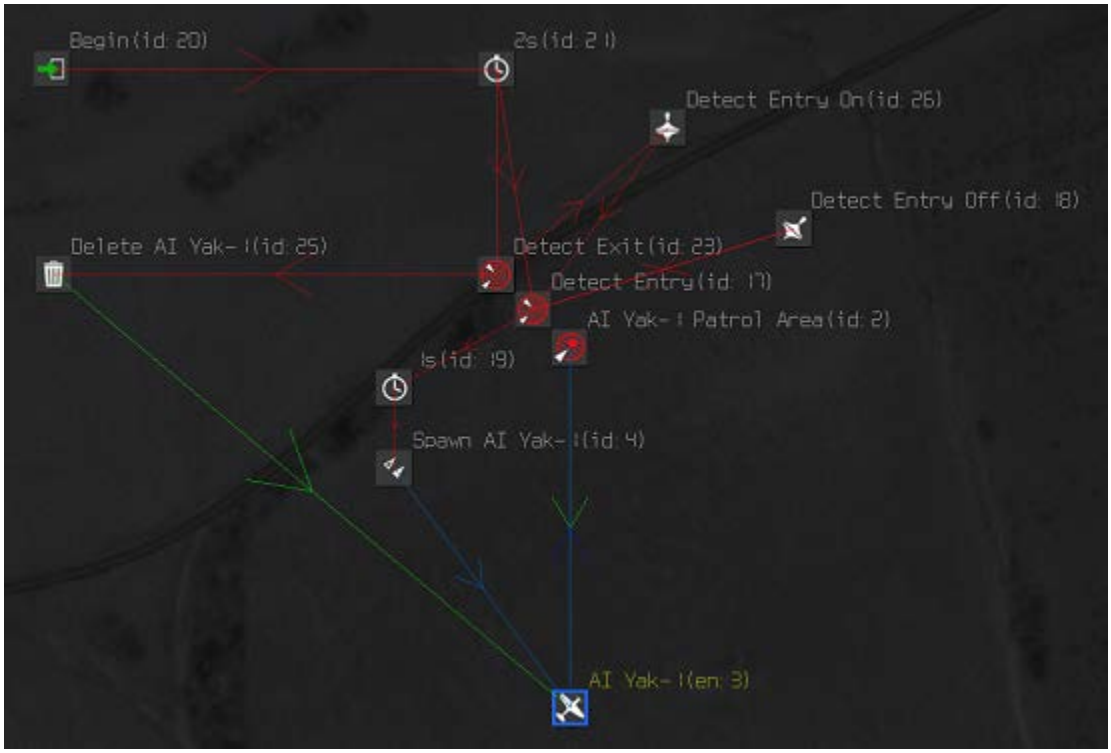
- Background color RGB: 0, 0, 0
- Enabled: Selected
- Icon ID: Attack Enemy Fighter Patrol Flight
- Coalitions: Axis is True, Neutral and Allies are True or False

The inner yellow circle marks the limit of the AI fighter patrol area. The MCU for creating this area is explained later in this example.

Here are the properties and advanced properties for red object "Player FW190":

- Position Y: 2000 (altitude)
- AI: Player
- Country: Germany
- Starting Location Drop Down List: In Air

Here is a close-up view of the icons at the center of the patrol zone:



The entry detection zone is created with the red "Detect Entry" check zone trigger (pg. 276). Here are the advanced properties for the trigger:

- Zone: 4000
- Zone Type: Selected (Cylinder)
- Distance Type: Selected (Closer)
- Plane Coalitions: Axis is True, all other coalitions are False

The exit detection zone is created with the red "Detect Exit" check zone trigger. Here are the advanced properties for the trigger:

- Zone: 4100
- Zone Type: Selected (Cylinder)
- Distance Type: Selected (Further)
- Plane Coalitions: Axis is True, all other coalitions are False

Note: "Detect Entry" and "Detect Exit" check zone triggers are placed close together so that the smaller zone is almost centered within the larger zone. Placing one icon on top of another is not necessary and it would make it harder for another editor to understand your mission.

Here are the properties and advanced properties for plane object "AI Yak-1":

- Position Y: 2000 (altitude)
- AI: Normal
- Country: Russia
- Starting Location Drop Down List: In Air
- On Reports Table:

Report Type	Command ID	Target ID
OnSpawned	4 (Spawn AI Yak-1)	2 (AI Yak-1 Patrol Area)

  The resulting report link consists of the two blue lines entering "AI Yak-1".

The Yak-1 patrol area is created with the "AI Yak-1 Patrol Area" attack area command (pg. 237). Here are the advanced properties for the command:

- Priority: High
- Attack Air Targets: Selected
- Attack Area: 3500

"AI Yak-1 Patrol Area" is object linked to "AI Yak-1".

When the mission begins, the two second timer trigger (id:21) triggers both "Detect Entry" and "Detect Exit" so that they can detect Axis planes.

When the player FW190 enters the "Detect Entry" zone, the zone triggers a one-second timer trigger (id: 19) and the "Detect Entry Off" deactivate trigger (pg. 280). Because "Detect Entry Off" is target linked back to "Detect Entry", it deactivates that check zone trigger. The one-second timer waits for "Detect Entry" to be deactivated and then it triggers the "Spawn

AI Yak-1" spawner trigger. Deactivating the zone first prevents the spawner from creating multiple planes if the player flies in and out of the zone, along it's edge.

When the Yak-1 spawns, the OnSpawned report link triggers the "AI Yak-1 Patrol Area" attack area command, causing the plane to start patrolling.

When the player exits the zone, "Detect Exit" triggers the "Delete Yak-1" delete trigger and the "Detect Entry On" activate trigger (pg. 274). The Yak-1 is deleted (assuming that it was not shot down) and "Detect Entry" is enabled again.

Example: Spawn an AI Fighter at Random Locations Whenever a Player Enters a Zone

As in the preceding example, the player starts in an FW190 at 2,000 meters and flies into an AI Yak-1 patrol zone. As the player enters the zone, the AI Yak-1 is spawned at random in one of four places and altitudes and begins patrolling the zone for enemy aircraft.

If the Yak-1 is destroyed, the player must exit the zone and re-enter again to spawn a new Yak-1.

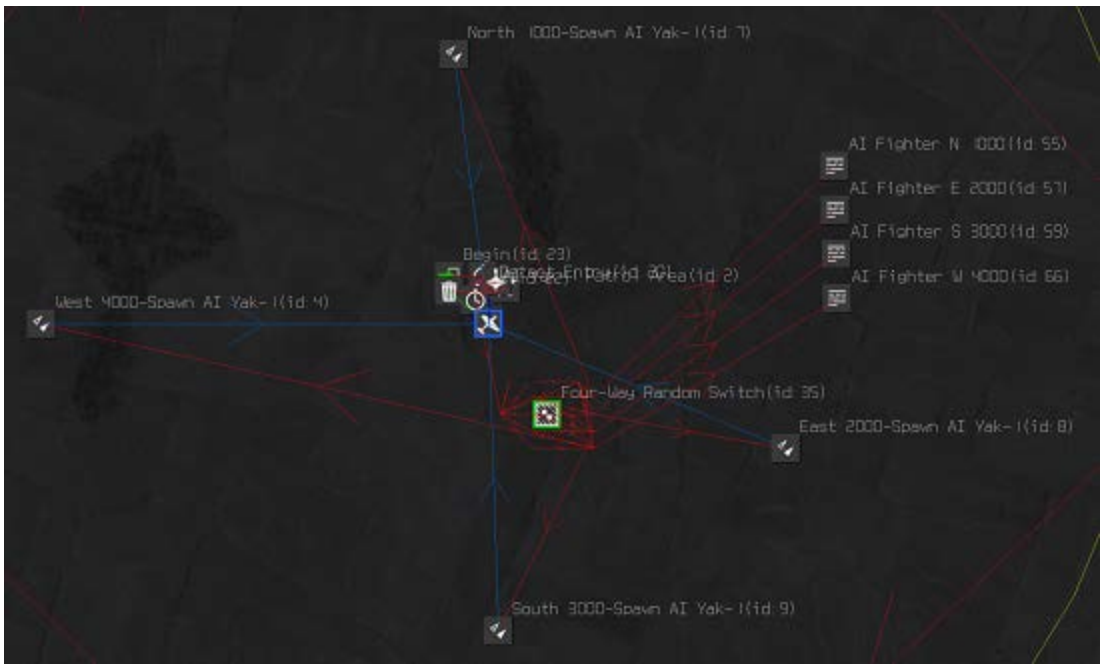
If the player exits the zone before destroying the Yak-1, it is deleted and a new one is spawned when the player re-enters the zone.

This mission is set up the same as the preceding example, except for the following items:

- Four spawner triggers, with "Spawn at me" selected in the advanced properties

  The four spawner triggers replace the single spawner trigger in the preceding example. By selecting "Spawn at me" in the four spawner triggers, you can spawn a single object at the location and altitude of any of the triggers. You could also spawn the object at all locations at the same time if you like.
- A four-way random switch (pg. 294), which is used to trigger one of the four spawner triggers at random
- Four subtitle translators to announce where the AI Yak-1 was spawned

Here is a view of the icons inside the patrol zone:



In the preceding example, the "Detect Entry" check zone trigger triggers a one second timer that in turn triggers the single spawner. In this example, the one second timer triggers a timer called "In", which is part of the "Four Way Random Switch" group in the screenshot.

Each of the four output timer triggers of the random switch group (Out 1, Out 2, Out 3, and Out 4) are target linked to the following

- One of the four spawner triggers placed at the North, East, South and West locations of the patrol zone at altitudes of 1,000m, 2,000m, 3,000m, and 4,000m respectively.
- One of the four subtitle translators on the top right of the patrol zone

  The subtitle translators announce where the AI Yak has spawned.

For example, Out 1 is target linked to spawner "North 1000-Spawn AI Yak-1" and to subtitle translator "AI Fighter N 1000". The subtitle translator text is "AI Fighter in North part of defence zone at 1000m!".

An "OnSpawned" report message link is created from each spawner trigger to the AI Yak-1 and then to the attack area command "AI Yak-1 Patrol Zone".

Object links are created from each spawner trigger to the Yak-1 and from the attack area command to the Yak-1.

Deactivate or Activate an Object While a Mission is Running

You can deactivate or activate objects, which affects the their ability to interact with a mission (that is, respond to commands and interact with objects and MCUs). For example, you can activate AAA defences when enemy planes approach and deactivate the defences when the planes leave. Deactivating the defences can save mission resources, which makes your mission run more efficiently.

You can deactivate or activate any object that includes the "Enabled" option in the object advanced properties (that is, artillery, planes, ships, trains, and vehicles).

Deactivate an Object

Do the following:

1. Place a deactivate trigger (pg. 283) anywhere and object link it to the object that you want to deactivate.
2. Trigger the deactivate trigger with a target link from another MCU or a message link from an object.

Activate an Object

Do the following:

1. Place an activate trigger (pg. 274) anywhere and object link it to the object that you want to activate.
2. Trigger the activate trigger with a target link from another MCU or a message link from an object.

Important! Before issuing a command to an object that has just been activated, add a one or two-second delay using a timer trigger. This delay gives the object time to activate. Here is an example of a delay before the take off command is issued:

For an example of activating and deactivating objects, see Create Target Defences (pg. 125).

Change Object Properties While a Mission is Running

You can change certain items listed in the Object Advanced Properties Dialog (pg. 209) and the Plane Settings Dialog (pg. 226) while a mission is running. For example, you can change the "AI" property of a plane to vary the AI skill level or you can change the "Country" property of an airfield object when enemy forces reach it to signify that it is captured.

Do the following:

1. Place a behaviour command (pg. 238) anywhere and object link it to the object that you want to change the properties for.
2. In the behaviour command advanced properties, select the properties that you want to change and, where applicable, specify the new property value.
3. Trigger the behaviour command with a target link from another MCU or a message link from an object.

See examples of the behaviour command in the following topics:

- Replenish or Change the Planes Available In a Multiplayer Mission (pg. 115)
- Manage Airfield Availability (pg. 131)
- Change Control of an Airfield to the Enemy (pg. 132)

Replenish or Change the Planes Available In a Multiplayer Mission

Replenish Planes That Are Returned Intact to an Airfield

You can require a multiplayer mission participant to return a plane undamaged to a specified area at the departure airfield before the available count for that plane type is incremented again. Otherwise, the plane count decreases each time the plane type is used, regardless of whether players return the plane undamaged.

Do the following:

1. Open the Object Advanced Properties Dialog (pg. 209) of the airfield object.
2. Select the "Return Planes" option.
3. In the "Maintenance Radius" field, specify the radius of the circle in which players must stop their planes for the planes to be replenished.

   The Maintenance Radius is not shown in the editor or on the GUI map. Use the Measure Mode (Shift+M) tool to measure the radius that you want to set. Make the radius cover an obvious location on the GUI map, such as a parking ramp or even the entire airfield runway and taxiway area.

Replenish a Plane at an Airfield, Regardless of the Condition of the Plane

You can Replenish the available count for a particular plane at an airfield after a player exits the plane or the plane is destroyed. No matter how many planes are exited or destroyed, replenishment is done one plane at a time, with the specified time period occurring between each replenishment.

To replenish a plane at an airfield, regardless of the condition of the plane, open the Plane Settings Dialog (pg. 226) for the plane, select the Renewable option, and specify a time in "Renew Time".

Change the Planes That Are Available at an Airfield

At any time during a multiplayer mission, you can change the planes that are available to participants. For example, you can switch plane types, add new plane types, change the number of planes available, or just change the settings for the current plane types.

This procedure involves creating "plane sets", with each set reflecting the changes that you want to make to the available planes. You can then make each set available or unavailable during the mission, depending on your requirements.

Do the following:

1. In the airfield object properties, click the "Planes" button and do the following in the Planes Dialog (pg. 226):
   a) Click the "Add" button.

      The Plane Settings Dialog opens.
   b) Specify the plane properties and specify a plane set number in the "Set Index" field.

      A plane set number groups together rows in the Planes Dialog into a set that can be made available or unavailable during a mission. Planes in set 0 are available from the beginning of the mission. Planes in set 1, 2, and so on, can be made available later.

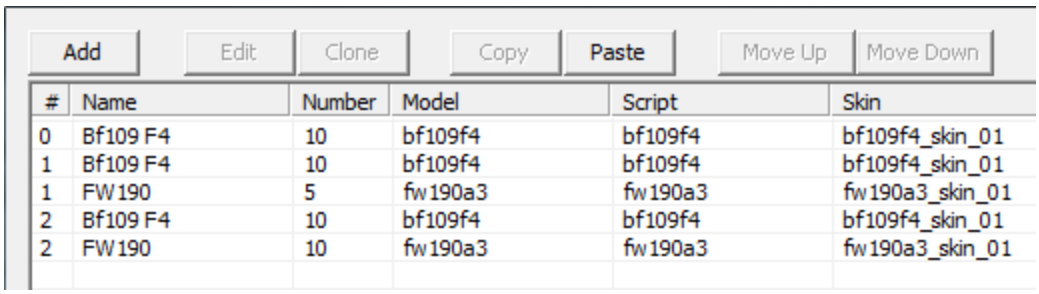
      If you just want to change the settings for existing planes, you can copy the rows in a set (using the Clone button), assign a new set number to the copies, and make the changes in the new set.
   c) Repeat steps a and b for each plane that you want to add to the current plane set.
   d) Repeat steps a to c for each new plane set that you want to create.
2. Place a behaviour command (pg. 238) anywhere and object link it to the airfield object.
3. In the behaviour command advanced properties, select "Float Param" and specify a plane set number that you want to make available.
4. Trigger the behaviour command with a target link from another MCU or a message link from an object.

   When the trigger fires, the current plane set is made unavailable, and the new plane set that you specified is made available.
5. Repeat step 2 to 4 for each plane set that you want to make available at various times.

Example: Add FW190s to an Airfield

In this example, an airfield starts with 10 Bf109 F4s. After 30 minutes, the airfield receives five new FW190s, in addition to the original planes. In another 15 minutes, the airfield receives an additional five FW190s.

Here is the Planes Dialog for the airfield object:

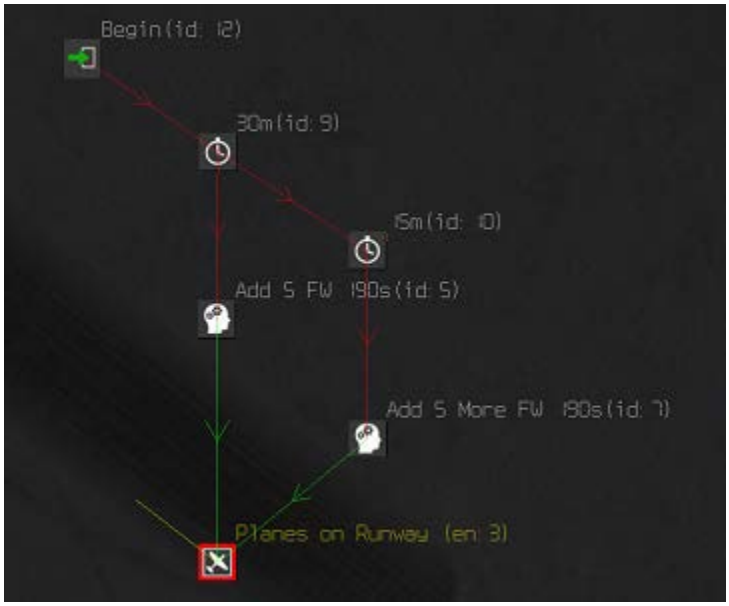


Add | Edit | Clone | Copy | Paste | Move Up | Move Down

#	Name	Number	Model	Script	Skin
0	Bf109 F4	10	bf109f4	bf109f4	bf109f4_skin_01
1	Bf109 F4	10	bf109f4	bf109f4	bf109f4_skin_01
1	FW190	5	fw190a3	fw190a3	fw190a3_skin_01
2	Bf109 F4	10	bf109f4	bf109f4	bf109f4_skin_01
2	FW190	10	fw190a3	fw190a3	fw190a3_skin_01

The # column shows that there are three plane sets (0, 1, and 2). Set 0 is available from the beginning of the mission and set 1 and 2 are made available later.

Here is the layout for this example:



The 30 minute timer triggers behaviour command "Add 5 FW 190s", which has "Float Param" set to "1". Set 0 is now unavailable and set 1 is available. Now there are 10 Bf109 F4s and five FW190s.

The 15 minute timer triggers behaviour command "Add 5 More FW 190s", which has "Float Param" set to "2". Set 1 is now unavailable and set 2 is available. Now there are 10 Bf109 F4s and 10 FW190s.

Chapter 9: Attacking and Defending

Make an Object Attack Another Object

You can command one or more objects to attack another object. For example, you can command a bomber to attack a factory or command patrolling fighters to attack a bomber formation.

Important! Avoid overusing this feature because it could slow down your mission.

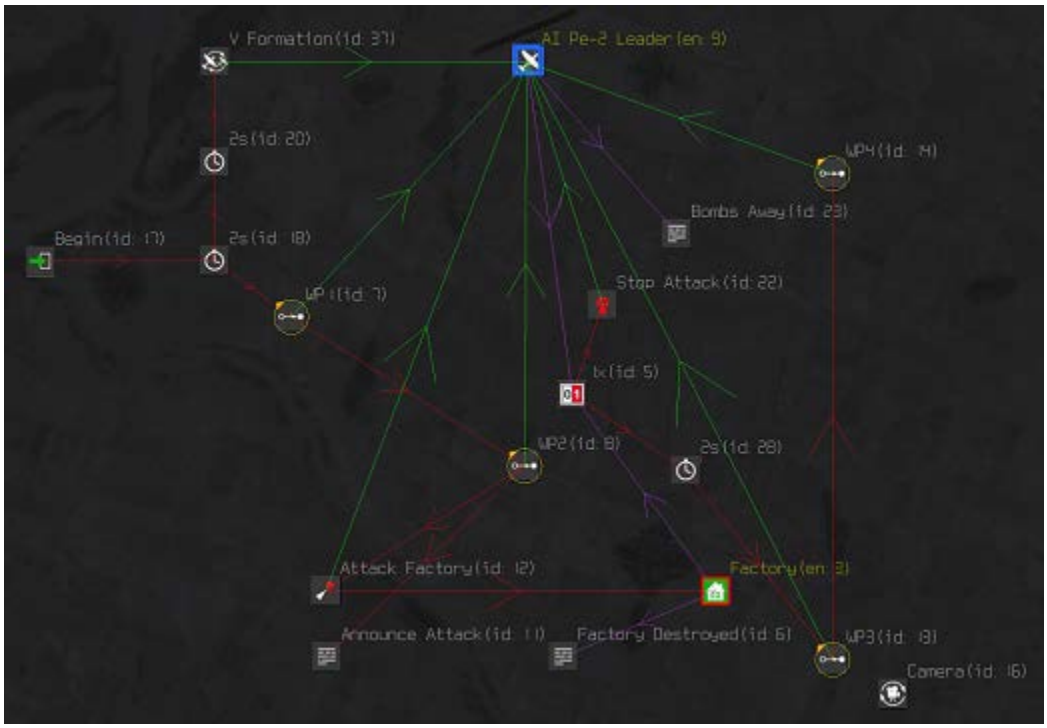
Do the following:

1. Place an attack command (pg. 236) anywhere, object link the command to the attacking object, and target link the command to the object that will be attacked.
2. Set the attack command properties and advanced properties.
3. Trigger the attack command with a target link from another MCU or a message link from an object.

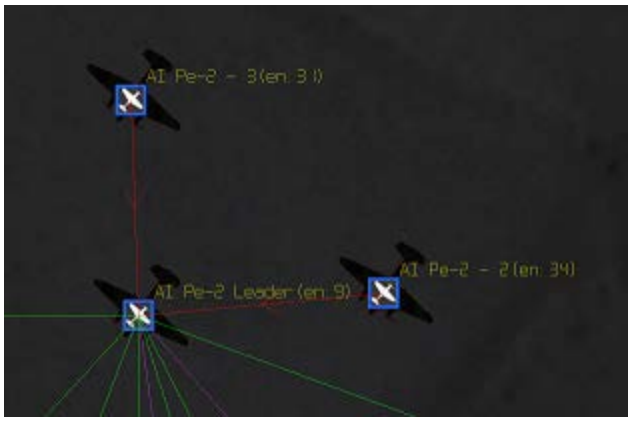
Example: Attack a Factory

In this example, a formation of Pe-2s flies towards a factory, circles once near it, bombs the factory, and then flies away. The circling behaviour is built into the AI plane objects when they are commanded to attack an object.

The following screenshot shows the setup for the mission:



The following screenshot is a closeup of the Pe-2 formation, which is set to fly at 1,000m:



At the start of the mission, the "Begin" mission begin translator triggers a two-second timer (id:18) to allow IL-2 Sturmovik to start the mission. After two seconds, the timer triggers the following:

- Waypoint trigger (pg. 285) WP1, which causes the bombers to fly towards it
- Another two-second timer (id: 20), which waits two seconds for the bombers to start flying towards the waypoint and then triggers formation command (pg. 243) "V Formation"

  "V-Formation" ensures that the bombers hold the V formation that they were placed in initially.

The bombers fly to waypoint WP1 and then to WP2. All the waypoints in the mission are set to 1,000m high. Here are the advanced properties for all of the waypoints:

- Priority: High
- Area: 200
- Speed: 270

WP2 triggers the attack command "Attack Factory" and subtitle translator (pg. 273) "Announce Attack". The attack command causes the bombers to circle once and then proceed to the factory to bomb it. Here are the advanced properties for "Attack Factory":

- Priority: High
- Attack Group: Cleared

The "1x" counter trigger (pg. 278) is triggered by an OnBingoBombs (out of bombs) event message link from the lead bomber or an OnKilled event message link from the factory. The OnBingoBombs and OnKilled messages also trigger subtitle translators "Bombs Away" and "Factory Destroyed", respectively. Here are the "1x" counter advanced properties:

- Counter: 1
- Reset After Operation: Cleared

The counter trigger is triggered once only, which ignores multiple instances of the same event messages from either the Pe-2 leader or the factory. The "1x" counter triggers the following:

- "Stop Attack" force complete command (pg. 242), which cancels the attack command issued to the Pe-2 leader.
- Two-second timer (id:28), which waits two seconds for the cancel command to work and then triggers waypoint WP3.

When WP3 is triggered, the bombers fly towards it and then on to WP4.

The "Camera" camera operator translator (pg. 251) allows you to watch the attack on the factory. Pressing F11 allows you to move the view around with your mouse. In the camera operator advanced properties, the Camera Operator Type is Default.

Related Information

Make an Object Attack Enemy Objects Within an Area (pg. 122)

Make an Object Attack Enemy Objects Within an Area

You can make an object attack any enemy object in a specified area. For example, you can make a fighter patrol for enemy planes in an area, make AAA defend a target area against planes, or make artillery attack an area.

Do the following:

1. Place an attack area command (pg. 237) anywhere and object link it to the attacking object or the leader of an attacking formation.
2. Set the attack area command properties and advanced properties.
3. Trigger the attack area command with a target link from another MCU or a message link from an object.

See an example in Create a Singleplayer Mission (pg. 33).

Related Information

Create Target Defences (pg. 125)

Make an Object Protect Another Object

You can make an object protect another object from attack by enemy objects. For example, you can make a fighter formation protect a bomber formation.

Do the following:

1. Place a cover command (pg. 239) anywhere, object link it to the object that provides protection, and target link it to the object that requires protection or the leader of a formation that needs protection.
2. Set the cover command properties and advanced properties.

   If a formation needs protection, select the "Cover Group" option in the advanced properties.
3. Trigger the cover command with a target link from another MCU or a message link from an object.

Example: Protect a Russian Bomber Formation

In this example, the player leads a formation of two Pe-2 bombers at 3,000m altitude to attack a factory to their North West. A formation of two Yak-1s at 3,300m provide cover for the bomber formation. A formation of two FW190s at 3,000m patrol to protect the factory.

Here is the setup for the Russian forces, which can be placed at any distance from the factory:

The "Cover Pe-2s" cover command is object linked to the leader of the two Yaks that provide protection and target linked to the leader of the Pe-2 formation (the player). Here are the advanced properties for the cover command:

- Priority: High
- Cover Group: Selected

Here is the setup for the factory defence area:

The attack area command (pg. 237) "Defend Factory" is object linked to the leader of the FW190 formation and triggered 2 seconds after the mission starts. The command defines the area that the FW190s are to defend. The FW190s are set to fly at 3,000 meters. Here are the advanced properties for the command:

- Priority: High
- Attack targets: "Attack Air Targets" selected only
- Attack Area: 6000
- Time: 30 minutes

The orange "Factory" icon translator (pg. 255) at the top left of the screenshot marks the factory on the GUI map so that the player can find the target. Here are the advanced properties for the translator:

- Background color RGB: 255, 0, 0
- Enabled: Selected
- Icon ID: Attack Enemy Buildings
- Line Type: Anything
- Coalitions: Allies is True and Axis and Neutral are True or False

Related Information

Manage Object Formations (pg. 74)

Make an Object Attack Enemy Objects Within an Area (pg. 122)

Mark Locations and Draw Shapes on the Flight Crew's Map (pg. 151)

Create Target Defences

You can create gun and searchlight defences for targets and deactivate those defences when enemy objects are not around. Deactivating target defences saves mission resources, which makes your mission run efficiently.

Do the following:

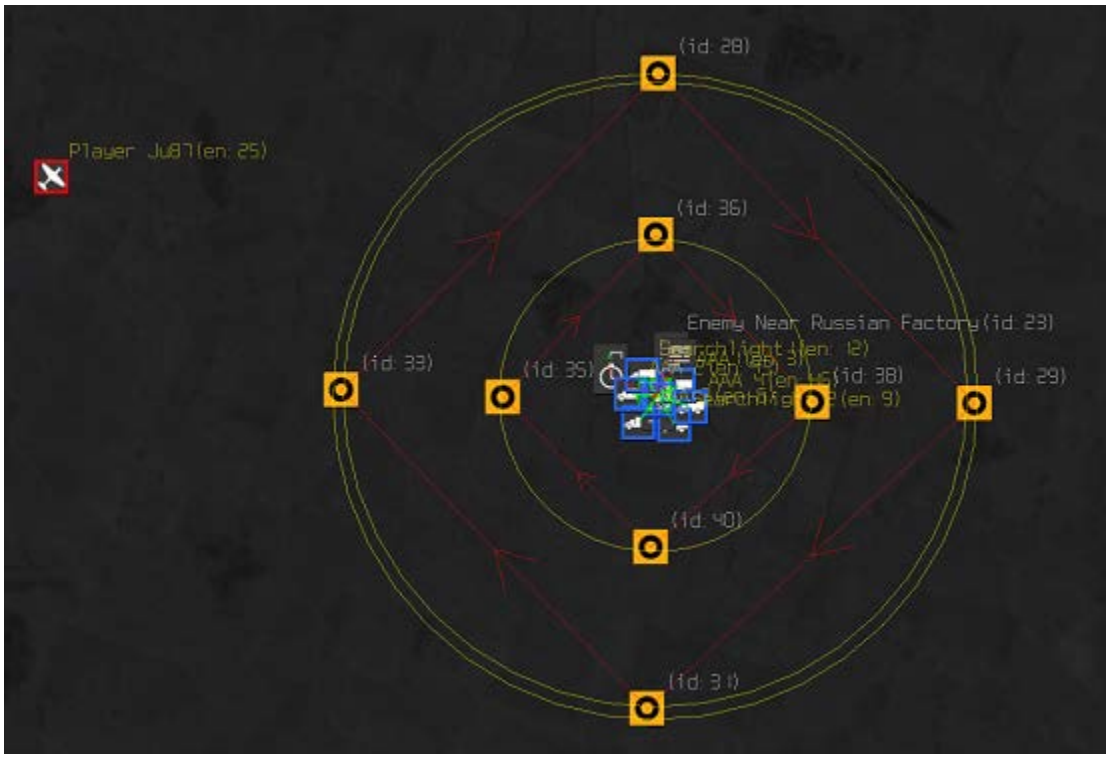
1. Place guns and searchlights near the target that must be defended.

   Important! If the mission takes place late in the day, add one or more searchlights to the defensive objects. After dusk, the guns do not fire without searchlights.
2. In the advanced properties of all the defensive objects, clear the "Enabled" check box.
3. Place a target defence switch (pg. 298) close to the target and configure it according to the instructions for the switch.

Example: Attack a Defended Factory

In this example, the player can attack a defended Russian factory in a Ju-87 that is invulnerable and has unlimited ammunition. The factory defences only appear when the player is inside a defined zone. The factory defences disappear when the player is outside a defined zone, which is slightly larger than the first zone mentioned.

Here is an overview of the target area:



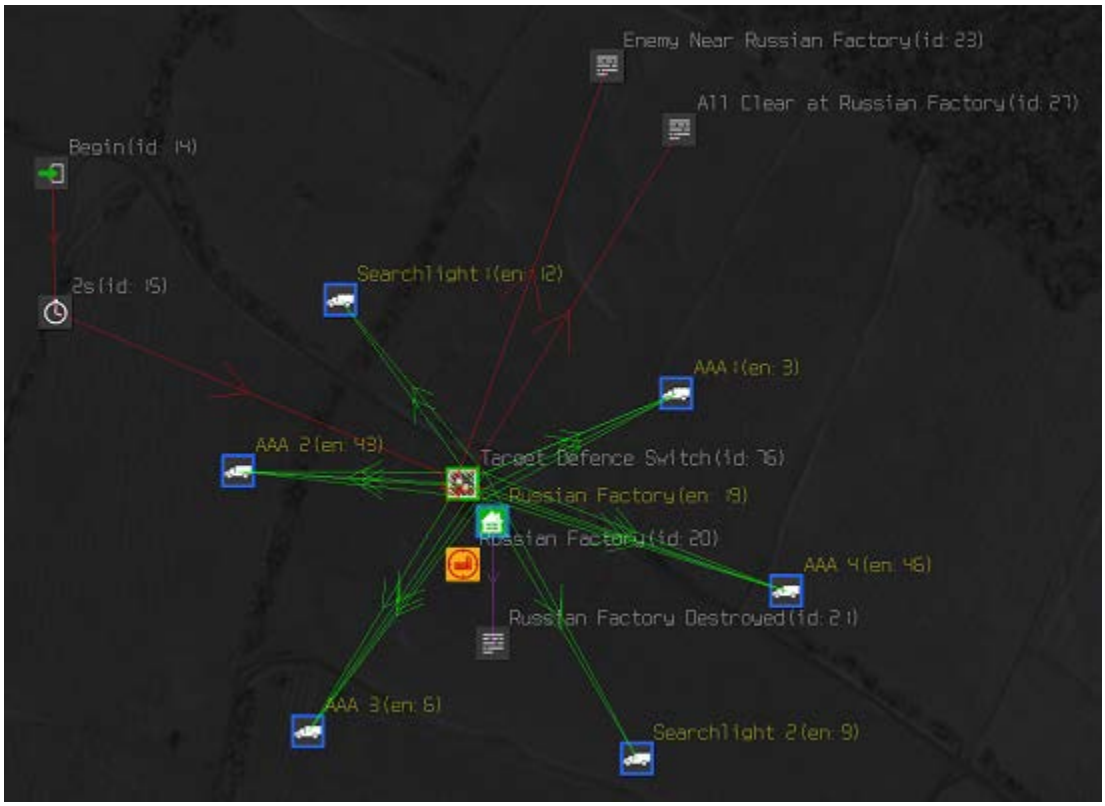
At the top left of the screenshot is the player Ju-87, which is at 1,500m altitude.

The three yellow circles are the zones defined by three MCUs that are part of the target defence switch. The outer yellow circle is the zone defined by the "Detect Out of Zone" check zone trigger (pg. 276). The next yellow circle in is the zone defined by the "Detect In Zone" check zone trigger. The innermost yellow circle is the zone defined by the "Output Defence Area" attack area command (pg. 237).

For demonstration purposes in this example, icon translators (pg. 255) are placed on the zone boundaries and target linked together to mark the zones on the GUI map. Here are the properties and advanced properties for the translators:

- Name: Blank
- Background color RGB: 255, 0, 0 (red)
- Enabled: Selected
- Icon ID: None
- Line Type: Sector Type 1
- Coalitions: All are True

Here is a closeup screenshot of the cluster of icons at the center of the first screenshot in this example:



A Russian factory is placed in the View Port and a target defence switch is placed near to it.

An orange icon translator is placed right next to the factory to indicate the factory location on the GUI map. Here are the properties and advanced properties for the translator:

- Name: Russian Factory
- Background color RGB: 0, 0, 0
- Enabled: Selected
- Icon ID: Attack Enemy Buildings
- Line Type: Anything
- Coalitions: All are True

Object links come from the target defence switch to the AAA guns and searchlights.

At the beginning of the mission, the two-second timer trigger (id:15) waits and then it triggers the "Input Enable Switch" timer trigger in the target defence switch.

The subtitle translators (pg. 273) at the top right of the screenshot announce the player location. They are triggered by target links from the check zone trigger in the target defence switch. "Detect In Zone" triggers "Enemy Near Russian Factory" and "Detect Out of Zone" triggers "All Clear at Russian Factory".

If the factory is destroyed, an "OnKilled" event message link from the Russian factory triggers the "Russian Factory Destroyed" subtitle translator.

Create an Air Raid Siren

You can create an air raid siren to warn players of an approaching enemy raid.

Do the following:

1. Place the effect object "siren" near where players spawn in and make the effect a linked entity.

   For the best volume, try to place the siren within 100m of spawn areas. You can place multiple sirens if you have multiple spawn areas that are far apart.
2. Object link two effect commands (pg. 241) to the effect.
3. In the effect command advanced properties, set Action Type to "Start" for one command and "Stop" for the other command.
4. Trigger the effect commands with target links or message links from other mission elements.

   For example, you could do the following with the target switch used in the example in Create Target Defences (pg. 125):
   - Target link the "Detect In Zone" check zone trigger to the air raid siren "Start" effect command
   - Target link the "Detect Out of Zone" check zone trigger to the air raid siren "Stop" effect command

Mark a Target as Damaged or Destroyed

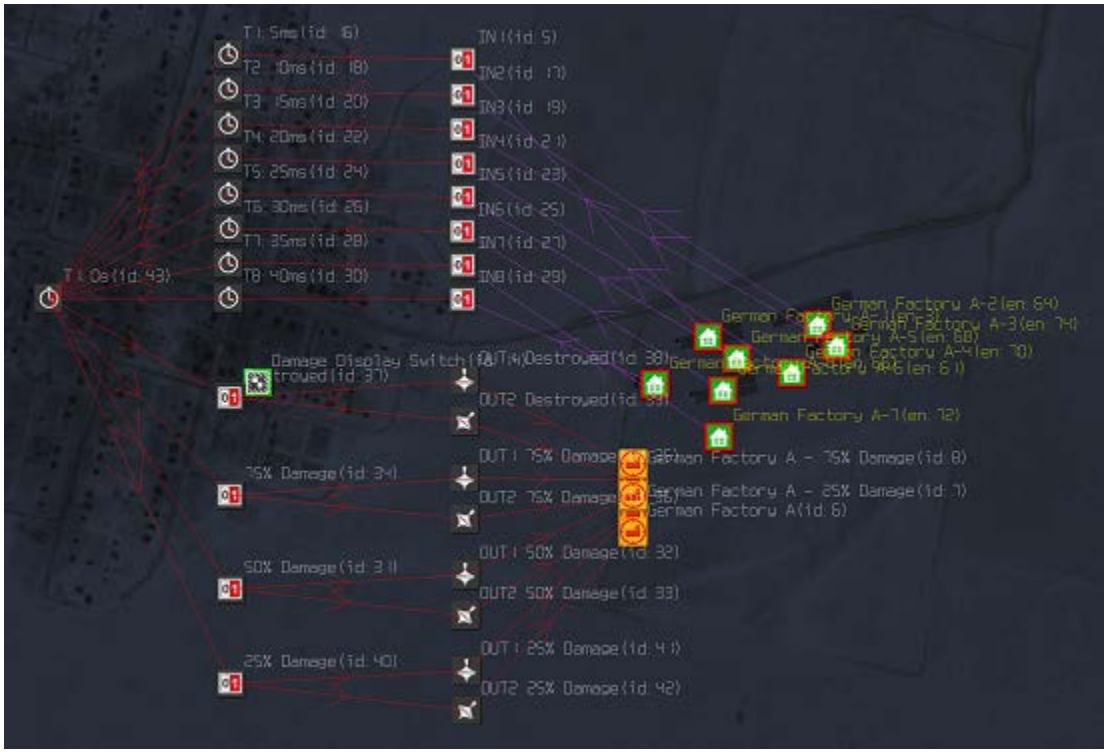
You can mark the GUI map with the level of damage that a target (such as a factory complex) has sustained. This ability allows pilots to see the current damage to each target on the GUI map and prioritize their missions accordingly.

To mark a target as damaged or destroyed, use a Damage Display Switch (pg. 287) in combination with icon translators (pg. 255), as shown by the example in this topic.

Example: Display Damage to a Factory Complex

This example shows how to use the damage display switch to display damage levels for a factory complex target consisting of eight building objects.

Here is the overview of the target area:



A Russian player plane suitable for attacking the target is placed somewhere nearby.

The left side of the screenshot shows the icons in the damage display switch group, along with the green group icon for the switch. You can show or hide the switch icons by clicking "Draw Icons in Group" in the toolbar.

On the right side of the screenshot, there are eight icons for the building objects that make up the factory complex target. Also on the right side are orange icon translators, which mark the target and indicate the target damage level on the GUI map.

Here is a close-up of the icon translators and factory objects:

The purple event message links pass OnKilled event messages from each object in the factory complex to the damage display switch input counters (IN1 to IN8). For example, object "German Factory A-1" links to the "IN 1" counter of the switch and "German Factory A-2" links to the "IN 2". It does not matter which object links to which input counter, but each counter must accept only one object.

The red target links are from the damage display switch "OUT1" activate triggers and the "OUT2" deactivate triggers. For example:

- Activate trigger "OUT 1 25% Damage" is target linked to icon translator "German Factory A – 25% Damage" (the icon for a 25% damaged factory complex).
- Deactivate trigger "OUT 2 25% Damage" is target linked to icon translator "German Factory A" (the icon for an undamaged factory complex).

So, when 25% of the factory objects are destroyed, the icon on the GUI map changes from the undamaged factory icon to the 25% factory damage icon.

Here is a sample of the damage levels displayed on the GUI map:

Make Areas Smoke Due to Damage

You can make smoke rise from an area that has been damaged.

Note: Do not use too many smoke effects because that can use up a lot of mission resources.

Do the following:

1. Place the effect object "city_fire", "city_firesmall", or "villagesmoke" on an area that can be damaged and make the effect a linked entity.
   Note: city_fire is the only effect mentioned here that shows the flames that produce the smoke.
2. Copy the effect object and place the copy right next to the original.
3. Link an effect sustainer (pg. 290) to the effects.
4. Trigger the effect sustainer start and stop functions with a target link from another MCU or a message link from an object.

Specify Conditions for Multiplayer Mission Success

For each side in a multiplayer mission, you can specify objectives that must be met for mission success. For example, you can specify that if the Russians destroy a German factory, the Russians win the mission and a victory message is displayed in the post-mission statistics screen. Optionally, you can also deduct points from the opposing side for each mission objective met.

Do the following:

1. Place a mission objective translator (pg. 271) anywhere and specify the properties and advanced properties.
   The mission objective translator allows you to signal that one or more mission tasks have been completed successfully. The options that you specify in the advanced properties determine whether points are deducted when objectives are met.
2. Trigger the mission objective translator with a target link from another MCU or a

message link from an object.

For example, a target link from a counter trigger can trigger a mission objective translator if the counter counts two factories destroyed.

For examples of using the mission objective translator, see the following topics:

- Create a Multiplayer Mission (pg. 38)
- Create a "Capture-the-Flag" Scenario (pg. 137)

Manage Airfield Availability

In a multiplayer mission, you can change the availability of an airfield. For example, you may want to make an airfield unavailable until a certain number of supply aircraft land there. You may also want to make an airfield unavailable after it is destroyed and make it available again once it is repaired.

The icon for an unavailable airfield location is a grayed-out question mark. In this case, nobody can spawn in at that location.

Make an Airfield Unavailable

Do the following:

1. Place a behaviour command (pg. 238) anywhere and object link it to all the airfield objects in the airfield area.
2. In the behaviour command advanced properties, do one or both of the following:
   - Select Country and choose Neutral from the drop-down list.
   - Select "Float Param" and specify -1 for the value.

   When the command is triggered, the airfield icon turns gray and nobody can spawn in at the airfield. If you mouse over the icon, the airfield country is shown.
3. Trigger the behaviour command with a target link from another MCU or a message link from an object.

Make an Airfield Available

Do the following:

1. Place a behaviour command (pg. 238) anywhere and object link it to all the airfield objects in the airfield area.
2. In the behaviour command advanced properties, do one or both of the following:
   - Select Country and choose the desired country from the drop-down list.
   - Select "Float Param" and specify the number for the plane set that you want to make available. See the "#" column in the Planes Dialog (pg. 226).

   When the command is triggered, the airfield icon turns to the color of the airfield country and players can spawn in at the airfield. If you mouse over the icon, the airfield country is shown.
3. Trigger the behaviour command with a target link from another MCU or a message link

from an object.

Change Control of an Airfield to the Enemy

In a multiplayer mission, you can change control of an airfield to the enemy side. This change allows enemy pilots to select planes from that airfield. The conditions for airfield take-over are up to you. For example, you could switch control when a tank column reaches a certain point or when a certain number of supply flights reach an airfield that was destroyed.

Do the following:

1. For each airfield object in the airfield area, click the "Planes" button in the properties dialog and create at least one plane set for each country that can control the airfield.

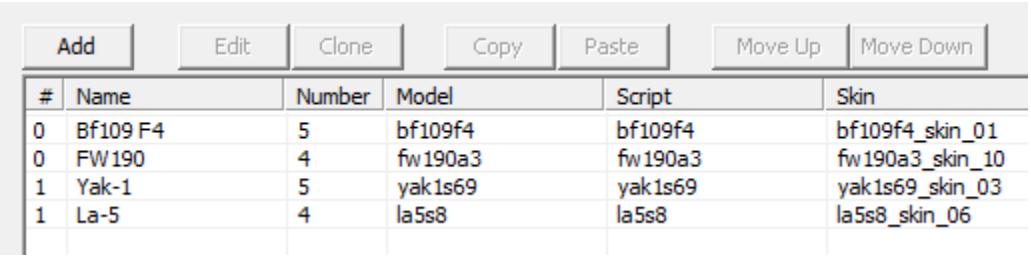
   Plane sets are identified by the "#" field in the Planes Dialog (pg. 226).

   For example, you can create set 0 for the Germans (the owners at the start of the mission) and set 1 for the Russians (used if they take control of the airfield). See the example in this topic.
2. Place a behaviour command (pg. 238) anywhere and object link it to all of the airfield objects in the airfield area.
3. In the behaviour command advanced properties, do the following:
   - Select Country and choose the country that now has control from the drop-down list.
   - Select Float Param and specify the plane set number for the country that now has control.
4. Trigger the behaviour command with a target link from another MCU or a message link from an object.

Example: Russians Take Over a German Airfield

In this example, the Russians can take over a German airfield. Russian pilots would then be able to fly Russian planes from the field. The Germans can also take back the airfield and resume flying German planes from there.

Here is the Planes Dialog for the airfield object:



#	Name	Number	Model	Script	Skin
0	Bf109 F4	5	bf109f4	bf109f4	bf109f4_skin_01
0	FW190	4	fw190a3	fw190a3	fw190a3_skin_10
1	Yak-1	5	yak1s69	yak1s69	yak1s69_skin_03
1	La-5	4	la5s8	la5s8	la5s8_skin_06

The # column shows that plane set 0 provides German planes and plane set 1 provides Russian planes. Set 0 is provided when the mission begins.

Here is the layout for this example:

The behaviour command "Russians Control Airfield" has Country set to Russia and "Float Param" set to 1 (the Russian plane set).

The behaviour command "Germans Control Airfield" has Country set to Germany and "Float Param" set to 0 (the German plane set).

Damage or Repair an Object

You can cause damage before or during a mission and repair the damage caused during a mission. For example, you can damage a fuel depot or bridge during a mission to simulate sabotage by partisans and repair those objects later on. You can also repair damage resulting from attacks by players or AI objects.

Damage an Object Before a Mission

You can apply damage to block, bridge, or building objects before the mission starts. You cannot repair damage applied in this way.

For the object that you want to damage, add entries to the "Damage" field in the Object Properties Dialog (pg. 217).

Damage or Repair an Object During a Mission

You can apply damage to any object while a mission is running.

Do the following:

1. Place a damage command (pg. 240) anywhere and object link it to the objects that you want to damage or repair.
2. Set the damage command properties and advanced properties.
3. Trigger the damage command with a target link from another MCU or a message link from an object.

Note:

- Damage affects all the members of a formation.
- Repair does not work on objects that were created with damage already applied. See the "Damage" field in the Object Properties Dialog.
- Repair does not work on plane objects, but it does work on static planes (in the block object library) that are linked entities.

Example: Practice Dive Bombing Bridges

In this example, the player can practice bombing two bridges in a Ju-87 on the Lapino summer map. The bridges are automatically repaired one minute after they are damaged or destroyed. To demonstrate the destruction and repair cycle, one of the bridges is automatically destroyed and repaired at the beginning of the mission.

The following screenshot shows an overview of the mission:

The two icon clusters at the top and middle of the screenshot are the bridge areas, which are shown in detail in this example.

The following screenshot shows the Spas Bridge area, which is at the top of the preceding screenshot.

Here are the advanced properties for the Spas Bridge:

- Damage: Selected (Threshold)
- Damage report: 50
- Country: Russia
- On Events Table (Event Type, Target ID):
  - OnKilled 8 ("Delay Repair" timer trigger)
  - OnDamaged 8 ("Delay Repair" timer trigger)

Either the OnKilled or the OnDamaged event messages from the Spas Bridge object triggers the "Delay Repair" timer trigger, which delays the repair for one minute. After one minute, damage command "Repair Spas Bridge" repairs any damage. Here are the advanced properties for the damage command:

- Damage Type: Repair
- Damage Level: Complete

The orange icon translator (pg. 255) marks the bridge location on the GUI map. Here are the advanced properties for the icon translator:

- Enabled: Selected
- Icon ID: Attack Enemy Bridges
- Coalitions: Axis set to True

The following screenshot shows the Zarubovka Bridge area, at the middle of the first screenshot in this example.

The Zarubovka Bridge consists of four separate pontoon bridge objects. Each object has the same repair logic as the Spas bridge, discussed earlier in this example. As in the Spas case, the bridge location is marked by an icon translator.

To demonstrate the destruction and repair cycle at the start of the mission, a 15-second timer (id:29) triggers the "Warning" Subtitle Translator (pg. 273) and also a 30-second timer. The warning message provides a 30-second warning of the bridge destruction. After 30 seconds, damage command "Damage Zarubovka Bridge" is triggered, which damages object "Zarubovka Bridge 3". Here are the advanced properties for the damage command:

- Damage Type: Damage
- Damage Level: Complete

Create a "Capture-the-Flag" Scenario

You can create a multiplayer scenario where players can capture a flag by flying at a specified distance from it until it changes to the flag representing the player's side. When one side has more planes near the flag than the other side, the flag moves down the pole, changes to the capturing side's flag, and moves up the pole again.

To create a "capture-the-flag" scenario, use a flag object, as demonstrated in the example in this topic.

Example: Capture the Flag For Ten Minutes

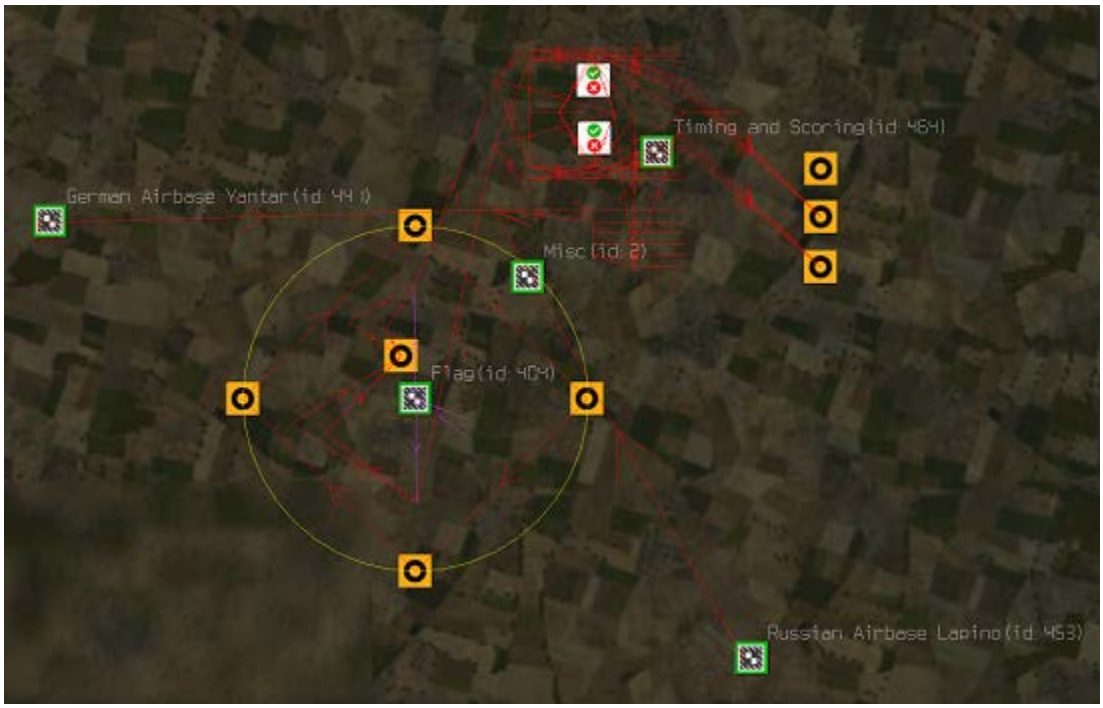
In this multiplayer mission example, players on the Lapino map must capture the flag just North of Polevoye for an accumulated time of 10 minutes (for example, they can capture it multiple times for short periods or capture it once for 10 minutes). The first plane to take off starts a 30 minute mission timer. If neither side meets the goal before 30 minutes are up, the mission is scored as a stalemate.

On the map, mission status is shown NE of the flag and the side that captured the flag is shown in the flag area. Players can press F12 to view the flag close up.

To capture the flag, a player must fly within a 2,500m radius zone around the flag at any altitude. The flag goes down the pole, changes into the player's flag, and a message appears saying that the player's side captured the flag. The flag then goes up the pole to the top. The flag takes four minutes for the round trip from top to bottom to top again.

The flag stops if there are an equal number of planes from each side in the flag zone. If one side gains an advantage of planes in the zone, the flag starts going down and will change to that side's flag if it reaches the bottom.

Here is an overview of the mission:



To make the mission easier to understand, the objects and MCUs are organized into the following groups (green icons):

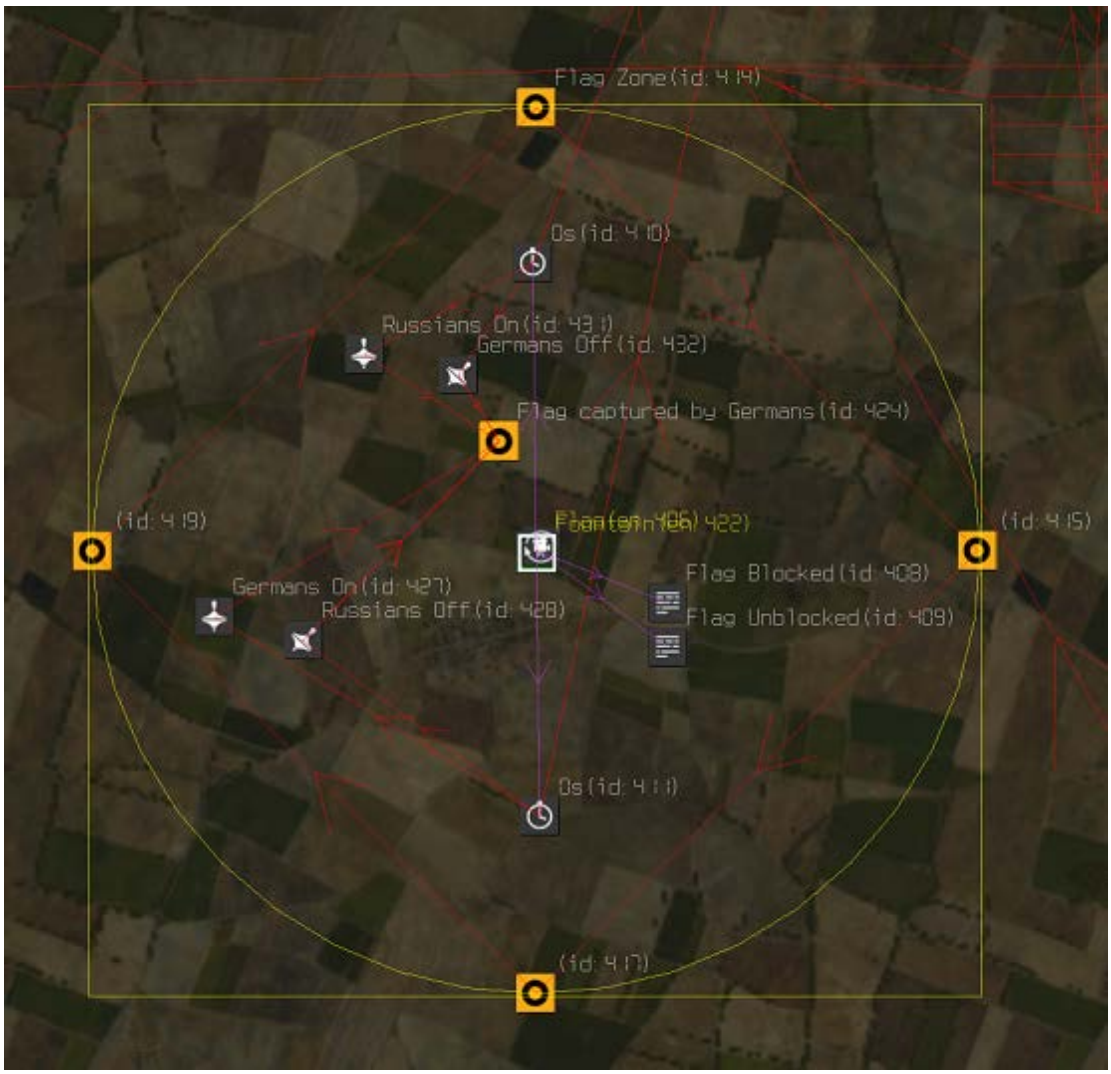
- Flag

  This group includes the yellow icon translators on and within the yellow circle created by the flag object.
- German Airfield Yantar
- Russian Airfield Lapino
- Timing and Scoring

  This group includes the yellow icon translators at the top right of the View Port.
- Misc

  This group includes the miscellaneous objects, such as buildings, bridges, and aircraft revetments, that are not directly related to the mission. For details on adding miscellaneous objects to your mission, see Populate the View Port with Buildings and Other Objects (pg. 51).

Here is a detailed view of the Flag group:



The flag itself, along with a fountain and the F12 flag view camera are clustered at the center of the Flag Group. The flag zone is shown by the yellow circle.

The four icon translators (pg. 255) on the yellow circle are target linked together to show the flag zone on the GUI map. Here are the properties for those icon translators:

- Name: "Flag Zone" (top icon translator only)
- Background color RGB: 0, 102, 0 (dark green)
- Enabled: Selected
- Icon ID: None

- Line Type: Sector Type 1
- Coalitions: All True

The icon translator near the middle of the flag zone is actually a stack of three icon translators. Only one translator in the stack is enabled at a time to show on the GUI map the side that has currently captured the flag. Here are the settings for each icon translator:

- Name:
  - "Flag not captured yet"
  - "Flag captured by Russians"
  - "Flag captured by Germans"
- Enabled: Only the "Flag not captured yet" icon translator is selected
- Coalitions: All True

Here is a detailed view of the flag area at the center of the Flag group:

Here are the flag object advanced properties (described in Object Advanced Properties Dialog (pg. 209)):

- Start Height: 1 (top)
- Speed Factor: 1 (4-minute round trip)
- Block Threshold: 0.5 (halfway down pole)
- Radius: 2500
- Flag Type: Cylinder
- Count Planes: Selected
- Count Vehicles: Cleared
- Country: Neutral

- On Events Table (Event Type, TargetID):
  - OnFlagBlocked 408 (icon translator "Flag Blocked")
  - OnFlagUnblocked 409 (icon translator "Flag Unblocked")
  - OnFlagCapturedBy01 (captured by Russians) 410 (0-second timer near top of flag zone)
  - OnFlagCapturedBy02 (captured by Germans) 411 (0-second timer near bottom of flag zone)

The fountain block object near the flag helps players spot the flag from the air.

Near the flag, a camera operator translator (pg. 251) called "Flag Camera" allows players to monitor the current state of the flag by pressing F12. In the camera operator advanced properties, Camera Operator Type is Default.

If a Russian pilot flies in the zone long enough for the flag to make it to the bottom of the pole, the flag changes to Russian and event message OnFlagCapturedBy01 triggers the 0-second timer near the top of the zone. Then, the timer triggers the following:

- The "Russians On" activate trigger (pg. 274), which activates icon translator "Flag captured by Russians".
- The "Germans Off" deactivate trigger (pg. 280), which deactivates icon translators "Flag not captured yet" and "Flag captured by Germans".
- 0-second timer "Flag to Russians" in the Timing and Scoring group, which starts the Russian flag capture timers (more about timing and scoring later in this example).

The process works in a similar way for a German pilot capturing the flag. In this case, event message OnFlagCapturedBy02 triggers the 0-second timer near the bottom of the zone. Then, the timer triggers the following:

- "Germans On", which activates "Flag captured by Germans".
- "Russians Off", which deactivates "Flag not captured yet" and "Flag captured by Russians".
- 0-second timer "Flag to Germans" in the Timing and Scoring group.

When the flag is halfway to the bottom, it generates event message OnFlagBlocked, which triggers the "Flag Blocked" subtitle translator (pg. 273) to announce the event occurrence. The announcement is for demonstration purposes. OnFlagBlocked has no effect on the flag but can be used to trigger other MCUs in the mission.

When the flag is halfway to the top, it generates event message OnFlagUnblocked, which triggers the "Flag Unblocked" subtitle translator to announce the event occurrence. The announcement is for demonstration purposes. OnFlagUnblocked has no effect on the flag but can be used to trigger other MCUs in the mission.

Here is an overview of the Timing and Scoring group (detailed screenshots and explanations follow):

The red and blue boxes indicate the scoring MCUs, which track how long the Germans or Russians have captured the flag. Common scoring MCUs are between the boxes.

The mission timing MCUs are below the scoring MCUs (more details later in this example).

The scoring MCUs enable and disable the yellow icon translators at the bottom right of the screenshot. The icon translators show the mission status on the GUI map.

The top icon translator shows a heading for the mission status. Here is are the properties:

- Name: "Mission Status"
- Enabled: Selected
- Coalitions: All True

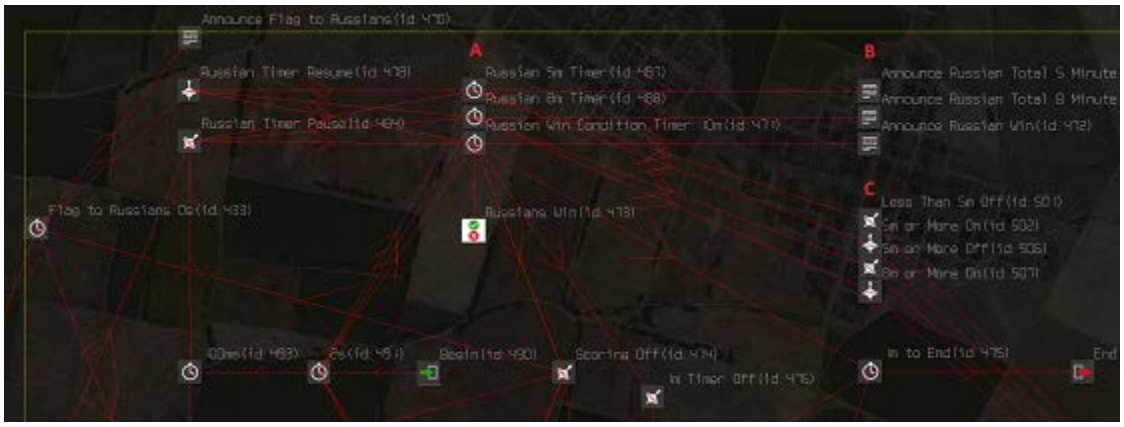
The bottom two icon translators are actually two stacks of three icon translators each and they show the Russian status and the German status. Only one translator in each stack is enabled at a time to show the current status for the Russians and Germans. Here are the properties for the three Russian icon translators:

- Name:
  - "Russians: Less than 5 minutes"
  - "Russians: 5 minutes or more"
  - "Russians: 8 minutes or more"

- Enabled: Only the "Russians: Less than 5 minutes" icon translator is selected
- Coalitions: All True

The German status icon translators have similar settings to the Russian ones.

Here is a detailed view of the Russian scoring MCUs plus the common MCUs (at the bottom):



Here is a detailed view of the German scoring MCUs plus the common MCUs (at the top):

The labels A, B, and C in each scoring detail screenshot mark the following:

- A: Three timer triggers to accumulate the flag capture time for each side

  To accumulate flag capture time, the timers can be started and stopped repeatedly by the activate trigger and deactivate trigger to the left in the screenshot.
- B: Three subtitle translators to announce the current flag capture time for each side

  The subtitle translators are triggered by the timer triggers at label A.
- C: Two activate triggers and two deactivate triggers to control the status icon translators mentioned earlier

  The activate and deactivate triggers are triggered by the timer triggers at label A

(more detail to follow).

Here are the properties for the three subtitle translators at label B:

- Name:
  - "Announce Russian Total 5 Minute"
  - "Announce Russian Total 8 Minute"
  - "Announce Russian Win"
- Coalitions: All True
- Duration: 10
- Font Size: 24
- Horizontal Align: Right
- Vertical Align: Top
- Text Color RGB: 255,0,0 (red)
- Text:
  - "Russians captured flag for 5 minutes!"
  - "Russians captured flag for 8 minutes!"
  - "Russians win! The mission will end in one minute."

Before the timer triggers at label A can be started and stopped to accumulate time, they must be started for a short time and then paused. Here is the process to prepare the timer triggers:

1. The "Begin" mission begin translator triggers a 2-second timer, which waits for IL-2 Sturmovik to start the mission.
2. The two-second timer triggers the timer triggers at label A and a 100 millisecond timer trigger.
3. The 100ms timer triggers the "Russian Timer Pause" and "German Timer Pause" deactivate triggers to stop the timer triggers at label A.

Now the timers are ready to start accumulating capture time.

If the Russians capture the flag, the 0-second "Flag to Russians" timer on the left side of the screenshot is triggered, which then triggers the following:

- "Announce Flag to Russians" subtitle translator

  Properties:
  - Coalitions: All True
  - Duration: 10
  - Font Size: 24
  - Horizontal Align: Center
  - Vertical Align: Top
  - Text Color RGB: 255,0,0 (red)
  - Text: "Flag captured by Russians!"

- "Russian Timer Resume" activate trigger, which causes all three Russian flag capture timers to start accumulating capture time.
- "German Timer Pause" deactivate trigger, which causes all three German flag capture timers to stop accumulating capture time.

After five minutes of capture time, "Russian 5m Timer" at label A triggers the following:

- "Announce Russian Total 5 Minute" subtitle translator at label B
- "Less Than 5m Off" deactivate trigger at label C, which deactivates icon translator "Russians: Less than 5 minutes"
- "5m or More On" activate trigger at label C, which activates icon translator "Russians: 5 minutes or more"

After eight minutes of capture time, "Russian 8m Timer" at label A triggers the following:

- "Announce Russian Total 8 Minute" subtitle translator at label B
- "5m or More Off" deactivate trigger at label C, which deactivates icon translator "Russians: 5 minutes or more"
- "8m or More On" activate trigger at label C, which activates icon translator "Russians: 8 minutes or more"

After 10 minutes of capture time, the Russians win the mission. "Russian Win Condition Timer: 10m" at label A triggers the following:

- "Announce Russian Win" subtitle translator at label B

  Properties:
  - Coalitions: All True
  - Duration: 10
  - Font Size: 24
  - Horizontal Align: Center
  - Vertical Align: Center
  - Text Color RGB: 255,0,0 (red)
  - Text: "Russians win! The mission will end in one minute."
- "Russians Win" mission objective translator (pg. 271), which causes the victory to be announced in the post-mission statistics screen

  Properties:
  - Task Type: Primary Task selected
  - Success/Failure: Success selected
  - Coalition: Allies
- "Scoring Off" deactivate trigger, which disables further scoring by deactivating the following:
  - "Flag to Russians" 0-second timer
  - "Flag to Germans" 0-second timer
  - "German Win Condition Timer"

- "1m Timer Off" deactivate trigger, which deactivates the "1m" timer in the mission timing section

  The "1m" timer triggers a "Stalemate" message after the last minute of the mission, so it must be deactivated if one side wins during that last minute.
- "1m to End" timer trigger, which triggers the "End" mission end translator one minute after the win announcement.

If the Germans capture the flag, the result is similar to the one just described for the Russians.

Below the Russian and German scoring MCUs are the mission timing MCUs, shown here in detail:

The subtitle translators on the right announce the time left in the mission and announce that the mission is a stalemate after the time has run out.

Here are the properties for the five subtitle translators that announce the time remaining:

- Name:
  - "30 Minutes Left"
  - "20 Minutes Left"
  - "10 Minutes Left"
  - "5 Minutes Left"
  - "1 Minute Left"
- Coalitions: All True
- Duration: 30 for the first translator, 15 for the rest
- Font Size: 24
- Horizontal Align: Left
- Vertical Align: Top
- Text Color RGB: 255,0,0 (red)
- Text:
  - "Mission clock started! 30 minutes left!"
  - "20 minutes left!"

- "10 minutes left!"
- "5 minutes left!"
- "1 minute left!"

Here are the properties for the subtitle translator that announces a stalemate:

- Name: "Announce Stalemate"
- Coalitions: All True
- Duration: 15
- Font Size: 24
- Horizontal Align: Center
- Vertical Align: Center
- Text Color RGB: 255,0,0 (red)
- Text: "Stalemate! Mission ends in one minute."

The 0-second timer called "Start Mission Timer" is triggered when a plane from either side starts to take off. The take-off detection logic at each airfield is explained later in this example. "Start Mission Timer" triggers the following:

- "Start Mission Timer Off" deactivate trigger, which deactivates "Start Mission Timer" so that the mission timing logic only starts once
- "30 Minutes Left" subtitle translator
- The topmost "10m" ten-minute timer in the screenshot, which triggers subtitle translator "20 minutes left" after ten minutes of mission time

The other timers below the first ten-minute timer are triggered one by one and they each trigger an accompanying subtitle translator to announce the time remaining.

The final timer in the mission, "1m", at the bottom of the screenshot, triggers the following:

- "Announce Stalemate" subtitle translator
- "Scoring Off" deactivate trigger, which is in the scoring section covered earlier
- "1m to End" timer, which is in the scoring section covered earlier

Here is a detailed view of the "Russian Airbase Lapino" group:

The fakefield airfield objects "Russian Spawn 1" and "Russian Spawn 2" are positioned along the edges of the runway and are facing across the runway. The Country drop-down list is set to Russia for both objects. Here are the settings in the Plane Settings Dialog (pg. 226) for both objects:

- Model: Entries added for yak1s69, lagg3s29, la5s8, mig3s24, and p40e1
- Name: NOICON (see Hide the Icon and Label for an Object in a Mission (pg. 90))
- Fuel: 0.3
- Starting Condition Drop-Down List (Under AI Level Drop-Down List): On Runway

The check zone trigger "Russians Start Mission Timer" is placed on the runway to detect the first Russian plane to take off. Here are the advanced properties for the check zone trigger:

- Zone: 50
- Zone Type: Selected (cylinder)
- Distance Type: Selected (closer)
- Plane Coalitions: Allies True, others coalitions False
- Vehicle Coalitions: All False

Two seconds after the beginning of the mission, timer "2s" (ID: 465) triggers "Russians Start Mission Timer". When the check zone trigger detects a plane, it triggers the following:

- 0-second timer "Start Mission Timer" in the Timing and Scoring group
- Deactivate trigger "Russian Detection Off", which deactivates "Russians Start Mission Timer" so that no more planes are detected.

Here is a detailed view of the "German Airbase Yantar" group:

The German airbase is set up in a similar way to the Russian airfield, except that in the Plane Settings dialog for the two airfield objects, entries are added for model bf109e7, bf109f2, bf109g2, fw190a3, and mc202s8.

Chapter 10: Managing Multimedia

Show Text Messages

You can show text messages on the screen in a running mission. These messages are good for introducing a mission, requesting protection for a target under attack, informing pilots about mission status, and so on. For example, you can display "Lupino airfield under attack!" to all friendly pilots when a check zone trigger detects an enemy aircraft.

Note: Flight crew cannot see text messages if they are viewing the GUI map.

Do the following:

1. Place a subtitle translator (pg. 273) anywhere and set the advanced properties as required.
2. Trigger the subtitle translator with a target link from another MCU or a message link from an object.

Mark Locations and Draw Shapes on the Flight Crew's Map

You can mark up the GUI map to help a player fly a planned route, find enemy territory, locate targets, identify offensives, and so on. To meet these needs, you can do the following:

- Place icons to identify locations
- Draw lines, arrows, and enclosed areas

You can enable and disable each shape that you create at any time during a mission. For example, you can draw several front lines and enable each one in turn as forces make gains or experience losses.

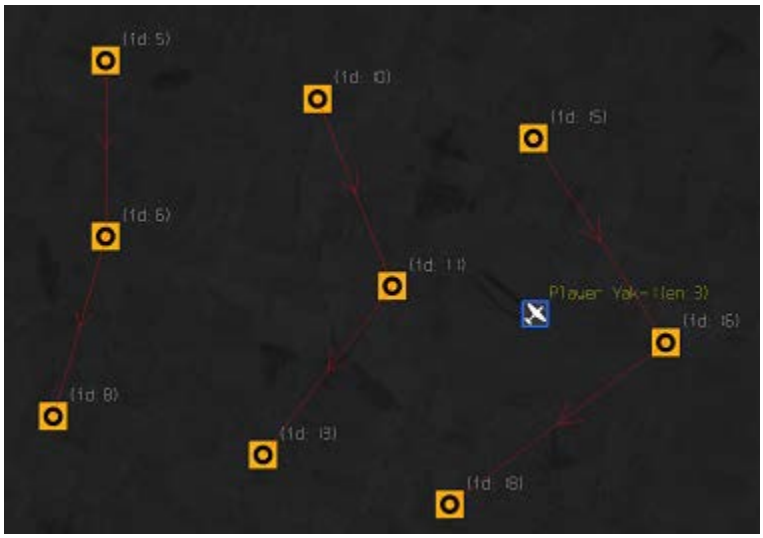
To mark locations and draw shapes on the flight crew's map, place icon translators (pg. 255) in the View Port according to the icon translator documentation.

Example: Create a Moving Front Line

This example shows you how to mark up the GUI map with a front line that moves Eastward in steps to reflect gains made by the Germans.

Note: Due to the complexity of the setup for moving front lines, consider making all of the MCUs involved into a group. You can hide the icons in a group, making it easier to see the other elements in your mission.

Here are the three front lines, created using target linked icon translators:

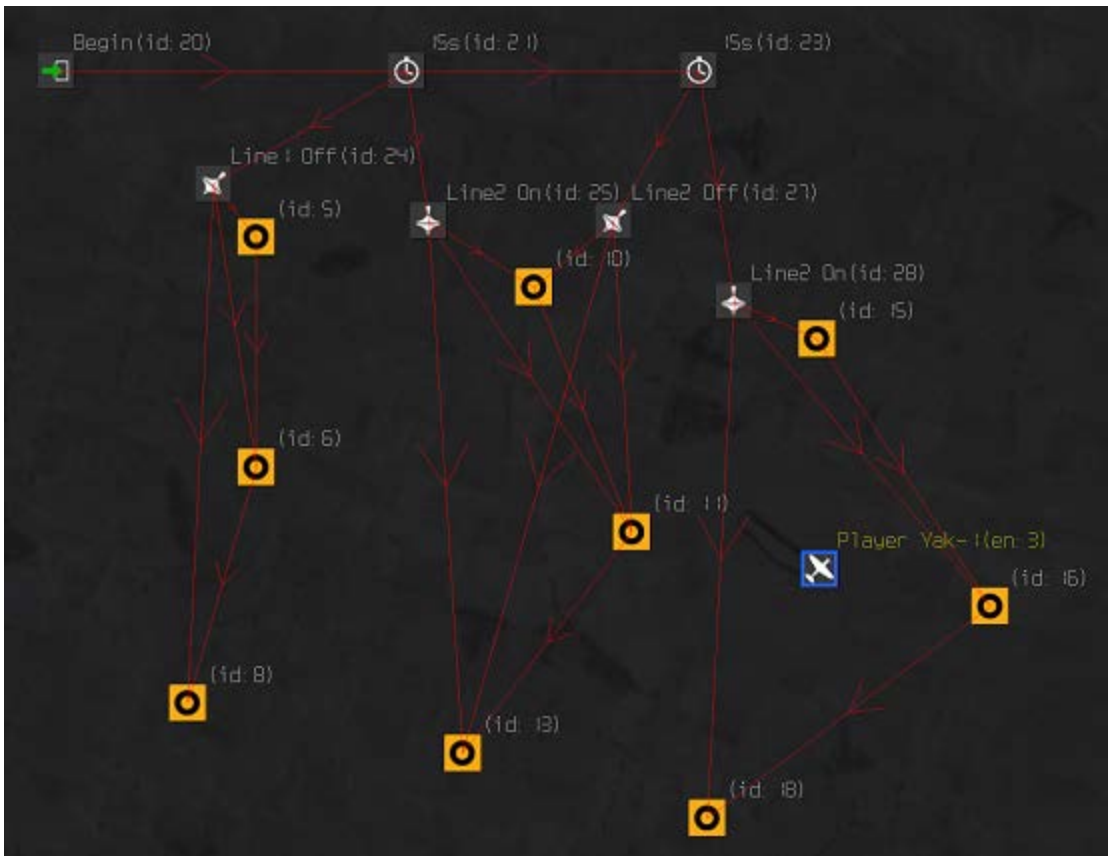


Here are the advanced properties for the icon translators:

- Enabled: Selected for the three icon translators on the left of the screenshot, cleared for all the other icon translators.

  Only the enabled icons can be seen on the GUI map.
- Icon ID: None
- Line Type: Positions Type 0
- Coalitions: All True

Here are the front-line icons along with other icons that cause the front line to move:



For demonstration purposes, the two 15-second timers at the top cause the lines to move. However, you can use any logic that you want to trigger line movement, such as when you change control of an airfield to the enemy (pg. 132).

At the start of the mission, the player is seated in a Yak-1 and must access the GUI map to see the left-hand line that is currently enabled. After 15 seconds, deactivate trigger "Line1 Off" and activate trigger "Line2 On" are triggered, which disables the left-hand line and enables the middle line. After another 15 seconds, the middle line is disabled and the right-hand line is enabled.

It is best to keep the related activate and deactivate triggers close to each line rather than space them out to see each target link. This technique allows you to see the different lines clearly. If you understand the purpose of the MCUs in this example, it is not as important to see each individual target link clearly.

Here are the results on the GUI map as the front line moves from left to right:

Related Information

Mark a Target as Damaged or Destroyed (pg. 128)

Change Control of an Airfield to the Enemy (pg. 132)

Show a Picture

You can show a picture on the screen in a running mission. The picture is shown to all pilots in the mission. A picture can be useful in mission introductions and can be shown in combination with other media such as text and music.

Important! Be careful about when you show a picture. For example, do not show a picture when pilots are taking off, landing, or in the middle of a dogfight.

Do the following:

1. Place a media translator (pg. 268) anywhere.
2. In the advanced properties, set "Media Type" to "Image" and set the remaining properties as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

See an example in the media translator topic.

Play Audio

You can play an audio track in a running mission. The audio track is played to all pilots in the mission.

Important! Be careful about when you play an audio track. For example, make sure that an audio track does not interrupt voice communications between players in the middle of a multiplayer dogfight.

Play an Audio Track with the Media Translator

Do the following:

1. Place a media translator (pg. 268) anywhere.
2. In the advanced properties, set Media Type to "Play Sound" and set the remaining properties as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

Note:

- You can trigger several media translators at the same time. For example, you can play both music and voice audio tracks while you show a picture (pg. 154) or play video (pg. 158).
- Do not specify the same audio track in more than one media translator. Only the first media translator to be triggered will play the track.
- You can stop all the media translators in a mission at any time. You cannot stop a single media translator while leaving other ones playing. For details, see "Stop a Media Translator Audio Track From Playing", in this topic.

Stop a Media Translator Audio Track From Playing

Note: This procedure stops all media translators in the mission from playing any media.

Do the following:

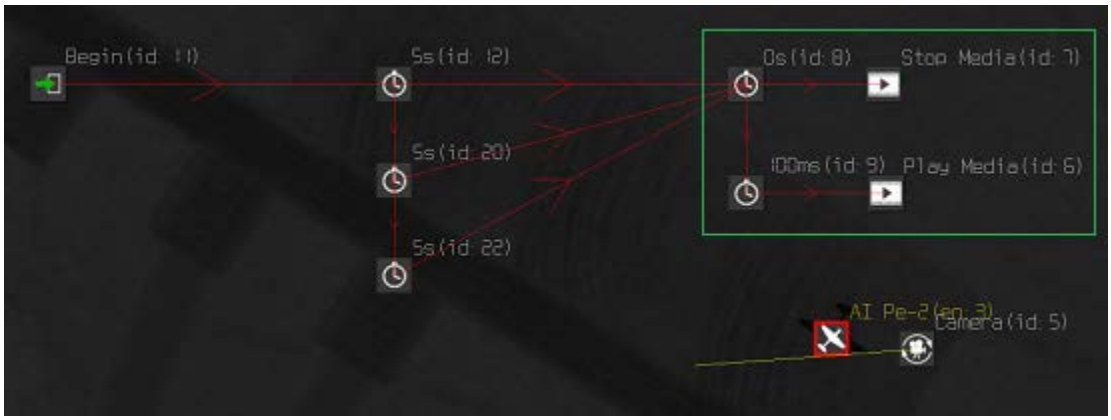
1. Place a media translator (pg. 268) anywhere.
2. In the advanced properties, set Media Type to "Stop Media" and set the remaining properties as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

Example: Play a Media Translator Audio Track Multiple Times

This example demonstrates how to play an audio track multiple times, from the beginning. If the track is playing, you can cut it off and replay it from the beginning.

For the purpose of this demonstration, you must provide an mp3 audio file.

Here is the MCU layout for the demonstration:



The MCUs that play the audio track multiple times are indicated by the green box. The rest of the MCUs control the demonstration. The zero-second timer (id:8) acts as a connector, with no time delay. However, you can set the timer to a non-zero time if you need a delay before playing the audio track.

After the mission begins, the five-second timers are triggered one after another, at five-second intervals. The zero-second timer is triggered three times, once after each five-second interval.

The zero-second timer triggers a 100 millisecond timer and the "Stop Media" media translator. "Stop Media" stops all running media translators in the mission. In the translator advanced properties, "Media Type" is set to "Stop Media".

After 100ms, media translator "Play Media" is triggered and it plays the audio track that you specified in the translator advanced properties.

A camera operator translator (pg. 251) called "Camera" allows you to watch a twilight scene that includes a Pe-2 parked on a ramp while you listen to the audio track. Press F11 to move the view around with your mouse. In the camera operator advanced properties, the Camera Operator Type is Default.

You can also use an animation operator translator (pg. 247) to play an audio track multiple times. Here are the MCUs that you need in place of the ones in the green box in the first screenshot:

This topic includes more details on playing and audio track using the animation operator translator.

Play an Audio Track with the Animation Operator Translator

Do the following:

1. Place an animation operator translator (pg. 247) anywhere and specify the advanced properties.
2. Object link a play sound command to the animation operator.
3. Trigger the play sound command with a target link from another MCU or a message link from an object.
4. (Optional) Create an OnSoundStopped event message link from the animation operator translator to any MCU that you want to trigger when either of the following occurs:
    - The audio track completes.
    - Another play sound command triggers the animation operator translator.

Note:

- You can trigger several animation operator translators at the same time. For example, you can play a music track and a voice track while you display a 3-D object that can be animated (pg. 159). You can combine an audio track and an animation in the same animation operator translator
- Do not specify the same audio track in more than one animation operator translator. Only the first animation operator translator to be triggered will play the track.
- You can stop an individual animation operator translator from playing an audio track. For details, see "Stop an Animation Operator Translator Audio Track From Playing", in this topic.

Stop an Animation Operator Translator Audio Track From Playing

Note: This procedure stops a single animation operator translator from playing an audio track and also disables the translator. The disabled translator does not respond to a play sound command.

Do the following:

1. Place a deactivate trigger (pg. 280) anywhere and object link it to the animation operator translator that plays the audio track that you want to stop.
2. Trigger the deactivate trigger with a target link from another MCU or a message link from an object.

See an example of stopping an audio track in the animation operator translator topic.

Enable an Animation Operator Translator to Play an Audio Track

Note: If you stop an animation operator translator from playing an audio track, the translator is disabled and does not respond to a play sound command. This procedure enables the operator to respond to the play sound command once again.

Do the following:

1. Place an activate trigger (pg. 274) anywhere and object link it to the animation operator translator that you want to enable to play an audio track.
2. Trigger the activate trigger with a target link from another MCU or a message link from an object.

To play the enabled audio track, follow procedure "Play an Audio Track with the Animation Operator Translator", in this topic.

See an example of enabling the playing of an audio track in the animation operator translator topic.

Mute Sound from IL-2 Sturmovik

You can mute the sound from IL-2 Sturmovik to a volume level that you specify. The IL-2 Sturmovik sounds are muted for all pilots in the mission. The ability to mute IL-2 Sturmovik is useful in mission introductions that include a voice sound track.

Important! Be careful about when you mute IL-2 Sturmovik sounds. For example, do not completely mute IL-2 Sturmovik sounds while pilots are flying because they need to hear the engine and other important sounds.

Do the following:

1. Place a media translator (pg. 268) anywhere.
2. In the media translator advanced properties, set "Media Type" to "Simulation Mute", set the volume to the desired level, and set the remaining parameters as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

Play Video

You can play a .bik (Bink) format video on the screen in a running mission. The video is played to all pilots in the mission.

Important! Be careful about when you play video. For example, do not play video when pilots are taxiing or flying.

Do the following:

1. Place a media translator (pg. 268) anywhere.
2. In the media translator advanced properties, set "Media Type" to "Video" and set the remaining parameters as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

Display a 3-D Object That Can Be Animated

You can display a 3-D object at any position and altitude, and animate it. The object is visible to all pilots that are near it. For example, you can create a training flight path using 3-D rings.

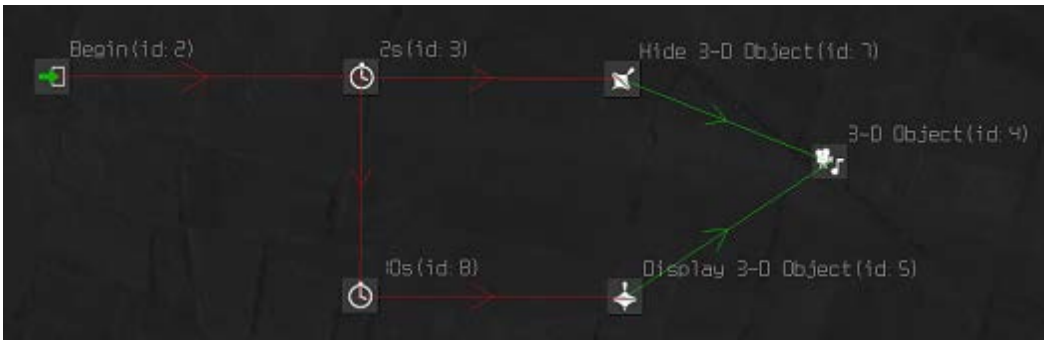
Do the following:

1. Place an animation operator translator (pg. 247) at the desired position of the 3-D object and specify the properties and advanced properties.

   Specify the altitude and orientation of the 3-D object in the Properties dialog.

   The 3-D object is visible at the start of the mission.
2. (Optional) If you want to hide the 3-D object until later in the mission, do the following:
   a) Object link a deactivate trigger (pg. 280) and an activate trigger (pg. 274) to the animation operator translator.
   b) Hide the 3-D object by triggering the deactivate trigger with a target link from another MCU or a message link from an object.
   c) Show the 3-D object by triggering the activate trigger with a target link from another MCU or a message link from an object.

   This screenshot shows how to hide a 3-D object at the beginning of the mission and show it 10 seconds later:



   You can hide and show the 3-D object at any time and as many times as you like.
3. (Optional) If an animation is available for the object, do the following:
   a) Object link a play animation command (pg. 245) to the animation operator and choose an animation in the command advanced properties.
   b) Trigger the play animation command with a target link from another MCU or a message link from an object.

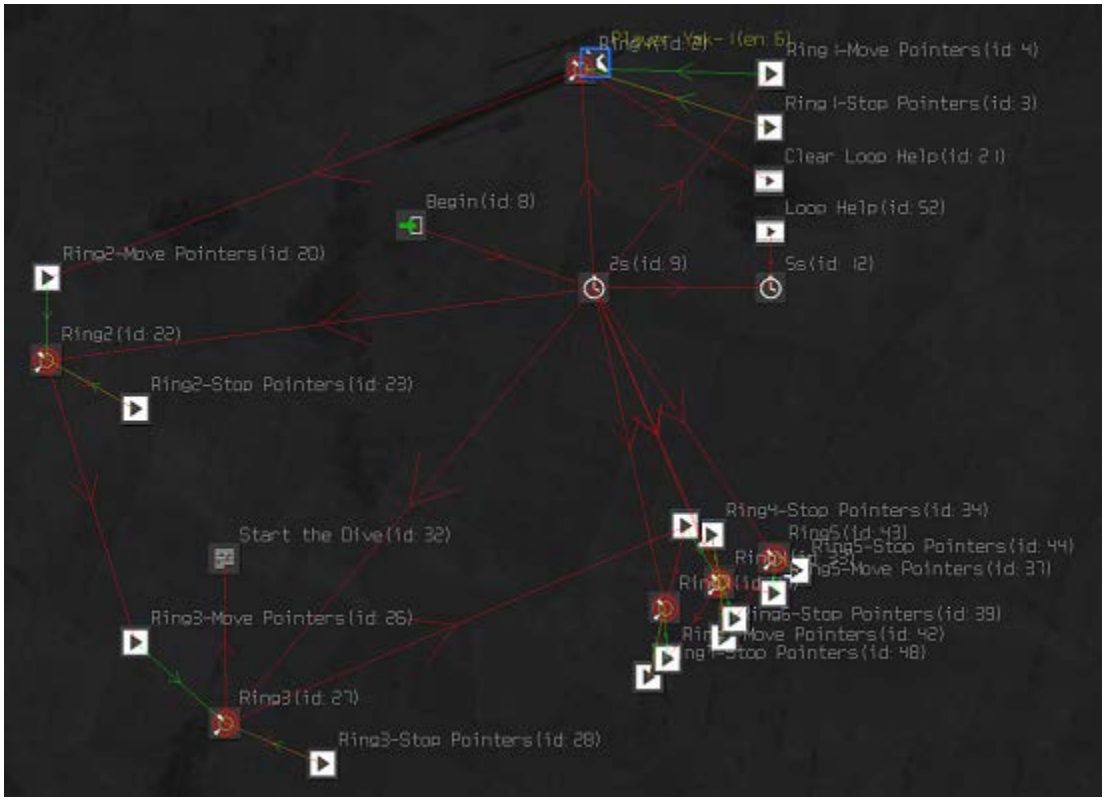
   Note: You can check the animation by playing it in the editor to check it. Select the play animation command, right click it, and choose Selected Object Menu > Play. To stop the animation, press the Esc key.

4. (Optional) Create an OnAnimationStopped event message link from the animation operator translator to any MCU that you want to trigger when either of the following occurs:
   - The animation completes.
   - Another play animation command triggers the animation operator translator.

Example: Practice a Loop

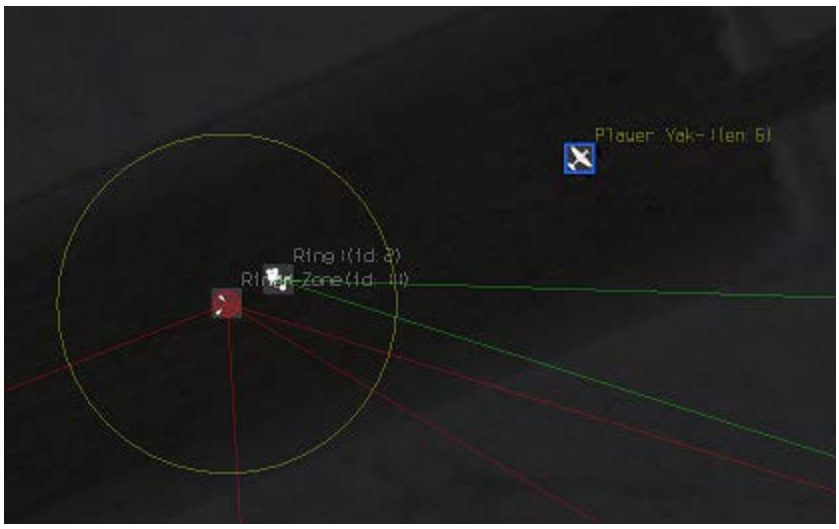
In this example, you can takeoff in a Yak-1 and practice loops, using 3-D rings as a guide.

The following screenshot shows an overview of the mission:



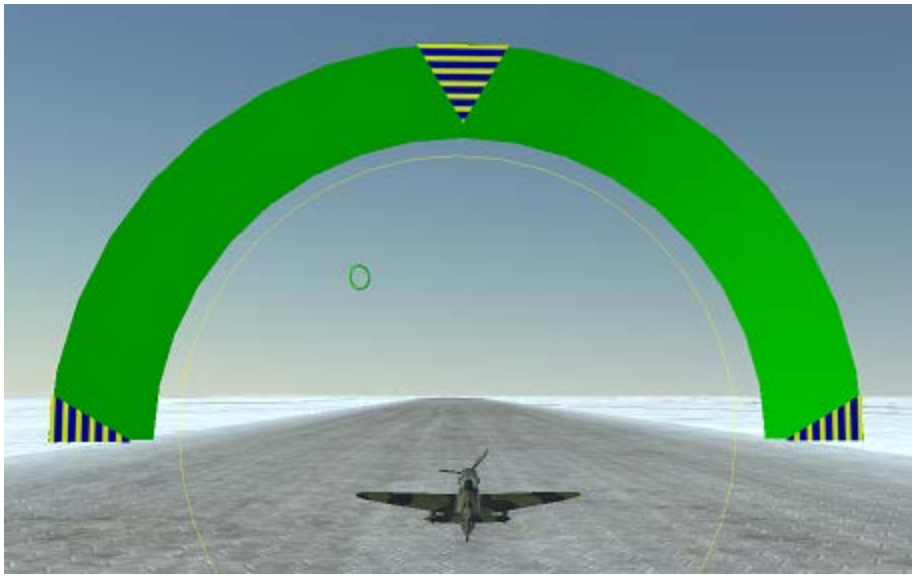
The cluster of MCUs at the bottom right of the screenshot define the loop. The loop is shown in detail later in this example.

The player plane is on the runway, in the cluster of icons at the top, center of the screenshot. Here is the setup on the runway:



The player, in a Yak-1, is facing South West. In front of the player is a 3-D ring, created by animation operator "Ring1". Just past the ring on the takeoff path is a check zone trigger (pg. 276), "Ring1-Zone". The trigger detects when the plane has passed through the ring. All of the rings along the flight path in this example have a similar check zone trigger after them.

Here is a view of the Yak-1 and Ring1 in the editor:



You can also see Ring2 in the distance, near the center of the screenshot.

Here are the properties and advanced properties for Ring1:

- Position Y: 108.58 (ground level, which places half of the ring underground)
- Orientation:
  - AX: 0
  - AY: 249 (the runway direction)
  - AZ: 0
- Speed: Any value (no effect on the animation for this 3-D object)
- Config: graphics\helpers\waypoint.chr

  The ring object is "waypoint.chr".

Each ring in this example is green on one side and red on the other. In this example, green indicates the correct side of the ring to fly through.

There are four animated triangles spaced around each ring that move inwards and outwards relative to the center of the ring. As the player flies through each ring, the animation is started on the next ring along the flight path to indicate to the player which ring to fly through.

The animation is started with a play animation command object linked to the animation operator and "no_idle" selected in the command advanced properties. For example, "Ring1-Move Pointers" (top right in the first screenshot) starts the pointer animation for Ring1.

The animation is stopped with a play animation command object linked to the animation operator and "idle" animation selected in the command advanced properties. For example, "Ring1-Stop Pointers" stops the pointer animation for Ring1.

Here are the properties and advanced properties for the "Ring1-Zone" check zone trigger:

- Position Y: 108.58 (ground level)
- Zone: 40
- Zone Type: Cleared (Sphere)
- Plane Coalitions: True for all.

Referring to the first screenshot, the begin mission translator "Begin" triggers a two-second timer, which then triggers the following:

- Play animation command "Ring1-Move Pointers", which starts the animation for Ring1.
- All of the check zone triggers in the mission, which enables detection by these zones.
- A five-second timer (id:12), which then triggers the "Loop Help" media translator (pg. 268), which displays a picture of the instructions for doing a loop.

Here are the advanced properties for "Loop Help":

- Media Type: Image
- Browse/Set: missions\fme manual - sp missions\practicealoop-help.jpg

  The .jpg picture specified is included in the sample missions and groups (pg. 11) package that is available along with this manual.

The "PracticeALoop-Help.jpg file is a screenshot of the following help text:

> In this exercise, you'll practice loops, using 3-D rings as a guide.
>
> Here's how to do a loop:
>
> 1. Dive to pick up speed to about 500kph.
> 2. Smoothly pull back on the stick to about 3 or 4 Gs.
> 3. To avoid rolling or yawing, immediately look left or right and keep your wingtip a constant distance from the point on the horizon that your plane is rotating around.
> 4. 1/3 of the way through the loop, look over your head to view the horizon while you smoothly reduce the back pressure on the stick.
> 5. 2/3 of the way through the loop, smoothly reduce the power to idle and smoothly pull back on the stick, but pull back a little less than you did when you entered the loop.
>
> This guide will disappear after you start your take off roll.

When the player starts the takeoff roll and enters Ring1-Zone, the zone triggers the following:

- The "Clear Loop Help" subtitle translator, which removes the help from the player's screen. The Media Type for the translator is "Stop Media"
- The "Ring1-Stop Pointers" play animation command
- The "Ring2-Move Pointers" play animation command

The Ring2 animation operator is like Ring1 except it is at 575m high and it is facing 204 degrees. It also has a check zone trigger (Ring2-Zone) right after it, at 575m high.

When the player passes through Ring2 and enters Ring2-Zone, the zone triggers the following:

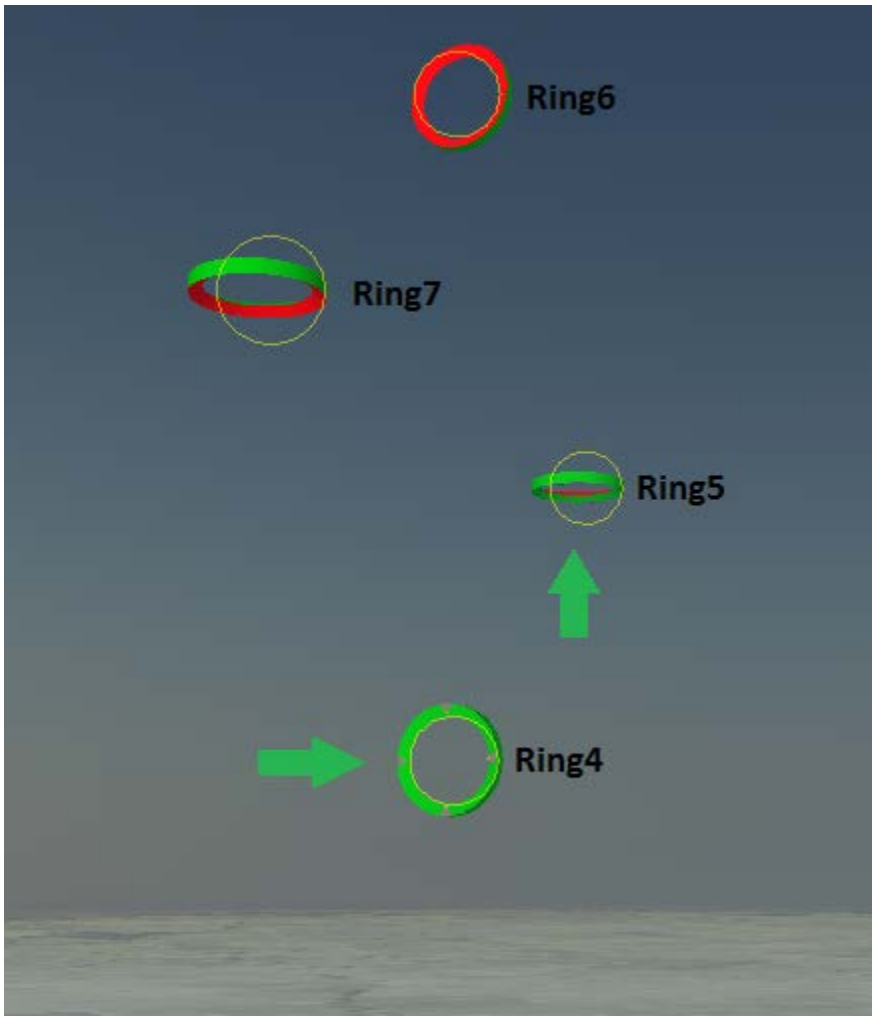
- The "Ring2-Stop Pointers" play animation command
- The "Ring3-Move Pointers" play animation command

Ring3 and Ring3-Zone are 728m high and the ring faces 114 degrees. The check zone triggers the following:

- The "Ring3-Stop Pointers" play animation command
- The "Ring4-Move Pointers" play animation command (at the bottom of the loop)
- The "Start the Dive" subtitle translator, which displays the following message:

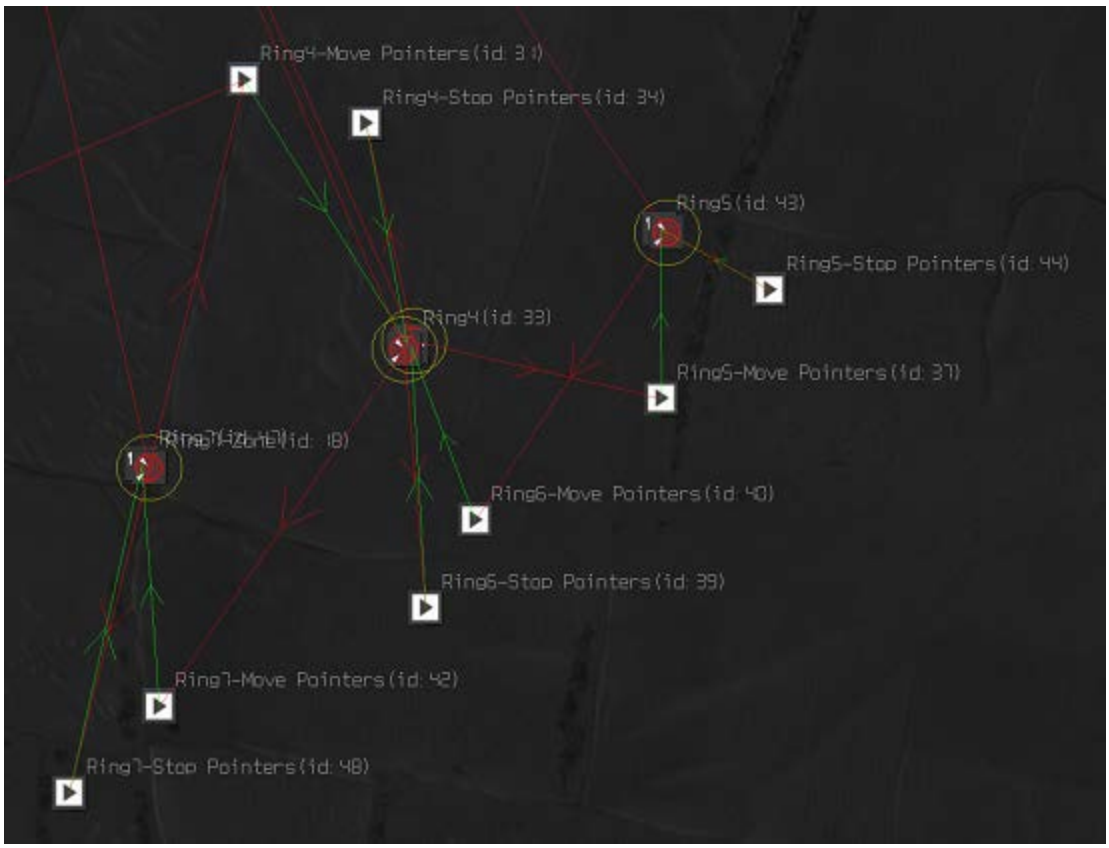
  "OK, dive to about 500kph. Remember, pull hard to start, then ease off at the top, then power back and pull hard again."

Here is a view in the editor of the rings that define the loop:



The green arrows (not part of the mission) indicate the direction that the player should fly into the loop.

Here is a closeup view of the MCUs used to define the loop:



In the closeup screenshot, Ring6 is placed on top of Ring 4 in the View Port, Ring7 is on the bottom left, and Ring5 is on the top right.

The rings, zones, and animation controls for the loop are set up like the first three rings in the example except that the orientation and altitudes differ. Here are the properties for each ring in the loop:

Ring4

- Position Y: 408
- Orientation:
  - AX: 0
  - AY: 69
  - AZ: 0

Ring5

- Position Y: 728
- Orientation:
  - AX: 0
  - AY: 69
  - AZ: 90 (facing up)

Ring6

- Position Y: 1028
- Orientation:
  - AX: 0
  - AY: 249
  - AZ: 0

Ring7

- Position Y: 728
- Orientation:
  - AX: 0
  - AY: 69
  - AZ: 270 (facing down)

Again, a check zone trigger is placed after each ring in the loop, along the flight path that the player should fly. The check zones trigger the animations for the loop rings as the player passes through each ring. After the player passes through Ring7, Ring7-Zone triggers the animation for Ring4 again.

Make the Screen Look Like an Old Movie

You can apply an "old movie" effect to the screen in a running mission. The effect applies a sepia tone and scratches to the screen, such as you would see if you were watching an old movie. The effect is visible to all pilots in the mission and it can be used to create an historic look to mission introductions, in combination with media such as subtitles and music.

Important! Be careful about when you apply the old movie effect. For example, you do not want the effect to show when someone is taking off, landing, or in the middle of a dogfight.

Do the following:

1. Place a media translator (pg. 268) anywhere.
2. In the advanced properties, set "Media Type" to "Post Effect Movie" and set the remaining parameters as required.
3. Trigger the media translator with a target link from another MCU or a message link from an object.

Chapter 11: Running Multiplayer Missions

Install and Update a Multiplayer Mission Server

You can install and update a free dedicated server (called a "DServer") to run multiplayer missions. You can install the server on a remote PC or on a local PC, including the same PC that IL-2 Sturmovik runs on.

Note:

- There is already a DServer in your IL-2 Sturmovik game directory under \bin\game. However, you cannot run that server and fly IL-2 Sturmovik at the same time. By installing a separate DServer, you can run it and IL-2 Sturmovik at the same time. If you just want to run the DServer included with IL-2 Sturmovik, proceed to Configure a Multiplayer Mission Server to Run Missions (pg. 169).
- Running IL-2 Sturmovik and a DServer at the same time, on the same PC, can reduce the DServer performance. Performance reductions can cause visual problems and other adverse effects in the mission. The more complex the mission and the more players that join, the more the DServer performance is reduced.

Create a DServer Account

Before you can obtain and run a DServer, you must create a DServer account. The account allows you to download and use a free, limited version of IL-2 Sturmovik that includes the DServer software. This procedure shows you how to obtain the DServer account from 1C Game Studios customer service.

Do the following:

1. Log in to your IL-2 Sturmovik account (the one that you purchased, not another DServer account) at http://il2sturmovik.com.
2. Click the "Support" link and then click "I have not found a solution in the FAQ".
   A "Contacting Customer Support" page appears.
3. Choose subject "Other (please specify)".
4. Under "Enter a subject", type "Dserver please"
5. Under "Describe the problem", type the following:
   "Please, provide me with a special account that I would like to use to host a dedicated server. I know that such account would not let me play the game and that it doesn't have planes on it, and I acknowledge that such account is the property of 1C Game Studios."
6. Click "Send" to submit the request.

7. When you receive an email in reply to your request, do the following:
   a) Create your DServer account at http://il2sturmovik.com.
      You must use a different email address for the DServer account than the one that you used for your paid IL-2 Sturmovik account.
   b) From your reply email, copy the DServer account activation key.
   c) Go to the Profile page for your DServer account and click "License keys".
   d) In the License Keys page, paste the activation key into the "Key Activation" field and press the Activate button.

Obtain and Install the DServer

Do the following:

1. Log in to your DServer account at http://il2sturmovik.com/ and click the Profile link on the top right of the page.
2. Click the Download link on the right side.
   The DServer version of IL-2 Sturmovik is downloaded.
3. Install the DServer version of IL-2 Sturmovik on the PC that will run the DServer.
   If you want to install the DServer on the same computer that you fly IL-2 Sturmovik on, create a separate directory for the DServer install. For example, create directory C:\Program Files (x86)\1C Game Studios\DServer.
4. (Optional) Create a desktop shortcut for DServer.exe, launcher.exe, and RConClient.exe.
   DServer.exe and launcher.exe are in your new DServer directory under \bin\game.
   DServer.exe starts the DServer interface (pg. 325).
   launcher.exe starts the IL-2 Sturmovik Launcher interface to update the DServer (covered later in this topic). You may want to name the shortcut to launcher.exe something like "DServer Update" for clarity.
   RConClient.exe is in your new DServer directory under \bin\console. This program is also included with IL-2 Sturmovik under \bin\console.
   RConClient starts the Remote Console, which allows you to control a multiplayer mission server from any PC (pg. 173). In addition to providing the control functions that the DServer interface has, the Remote Console provides functions that the DServer interface does not have. For example, you can allow a multiplayer server administrator to send a chat message (pg. 175) using the Remote Console.

Update the DServer

DServer updates are released periodically. The DServer that comes with IL-2 Sturmovik is updated when you update IL-2 Sturmovik. You must update the stand-alone version of the DServer separately.

Do the following:

1. Run launcher.exe (or whatever shortcut you assigned to this program), which is in the directory for your DServer under \bin\game.

   An IL-2 Sturmovik Launcher interface appears and applies any DServer updates that are available.
2. Once the updates are complete, close the IL-2 Sturmovik Launcher interface.

   Note: If you click "Play", an IL-2 Sturmovik main screen appears. However, you cannot fly because the DServer install is not a full version of IL-2 Sturmovik.

Configure a Multiplayer Mission Server to Run Missions

This procedure shows you how to configure the DServer by editing an .sds file or by loading the .sds file into the DServer Interface (pg. 325) and setting the configuration there. You can use both configuration methods if you want.

You can create multiple .sds files for various DServer configurations and mission selections. You can then choose the file with the desired configuration and missions when you run multiplayer missions (pg. 171).

Do the following:

1. Copy the mission files (pg. 324) for the mission that you want to run to the appropriate directory on the DServer PC.

   Important! You must copy the mission files to the same folder path on the DServer as the path they were saved in on the original PC. For example, assume that you save your mission to folder \data\Multiplayer\Dogfight\MyMissionFolder on your IL-2 Sturmovik PC. The DServer copy must be in folder \data\Multiplayer\Dogfight\MyMissionFolder. The contents of the .list file for your mission specify the exact folder in which you must locate your mission on the DServer PC.

   Note: Do not copy the .mission file (the source file) to the DServer, unless you want players to have a copy of that file for editing. The .mission file is not used to run the mission and leaving it out can save a lot of file download time for each player. Players can still edit a mission without the mission source file (pg. 48).
2. Copy the default file, "Dserver_dogfight_default_config.sds", and give the copy any name that you want followed by the .sds suffix.

   The default .sds file is in your DServer installation directory under \data\Multiplayer.

   Important! Do not edit the default file because you may want to refer back to it.

   You can place the new .sds file anywhere that you want on the DServer PC.

3. (Optional) Edit the DServer settings in the new .sds file, using an advanced text editing program such as NotePad++ (free download) rather than NotePad.

   Using a text editor like NotePad++ helps avoid potential text formatting issues that could affect the .sds file.

   The default .sds file includes details about each line of the file. For more details, see the following:

   - DServer Mission Settings Versus IL-2 Sturmovik Realism Settings (pg. 334)
   - Control a Multiplayer Mission Server From Any PC (pg. 173)

     This topic discusses how to configure and use the "Remote Console" referred to in the .sds file.

   You can stop here or continue, to check the configuration in the DServer interface and make changes there.
4. Run DServer.exe, which is in your DServer installation directory, under \bin\game.

   The DServer Main Window (pg. 325) opens but the DServer itself is not started.

   Note: Each time you run DServer.exe, a new .log file, starting with"DServer", is created. The log file is created in your DServer installation directory, under \bin\game. Entries are created in the log each time you open an .sds file to run a mission or close an .sds file to terminate a mission.
5. In the File menu, click "Manage SDS".

   The Configuration Dialog (pg. 326) opens.
6. Click the "Load" button and choose the new .sds file.

   The Configuration dialog is populated with the configuration settings from the .sds file.
7. Specify the DServer configuration settings that you want.
8. Click the "Save and Close" button to save your changes to the .sds file.
9. (Optional) If you want to configure the DServer for higher performance, do the following:
   a) Open the control panel and click on System and Security > Power Options.
   b) Select the "High Performance" power plan.

      Note: The high performance plan may use more power.

Related Information

Create a Multiplayer Mission (pg. 38)

The IL-2 Sturmovik forum at
http://forum.il2sturmovik.com/forum/83-multiplayer-servers-and-hosting/

Run Multiplayer Missions

Once you install and configure a multiplayer mission server, you can run a multiplayer mission or run several multiplayer missions one after another. The currently running mission is listed along with missions from other servers when players click "Multiplayer" in the IL-2 Sturmovik main menu.

Note:

- When you test a multiplayer mission, remember that the mission is started by the DServer before you can join in IL-2 Sturmovik. By the time you join, some mission events may have occurred already, such as introductory text messages.
- If you run the DServer on the same PC as IL-2 Sturmovik and you use a head tracking application such as TrackIR, do not start that application until your mission is running on the DServer.
- When players join the server, the mission files are downloaded to their game folder under \data\Multiplayer\Dogfight (or a sub-folder if the files from the DServer files are in a subfolder).

Do the following:

1. Ensure that the multiplayer missions that you want to run are in the location specified in the .sds file that you are using.
2. Run DServer.exe, which is in the directory for your DServer installation, under \bin\game.

   The DServer Main Window (pg. 325) opens but the DServer itself is not started.

   Note: Each time you run DServer.exe, a new .log file, starting with"DServer", is created. The log file is created in your DServer installation directory, under \bin\game. Entries are created in the log each time you open an .sds file to run a mission or close an .sds file to terminate a mission.
3. In the File menu, click Open and open the .sds file that you want the DServer to start with.

   The DServer starts and displays status messages in the status box.

Here is an example of the status messages:

```
=====     DeathMatch mode       =====
=====     Dedicated server      =====
Brief info:
  Max clients = 4
  TCP: 28000, UDP: 28000, Downloader: 28100, U/D Limits = 1000/1000
  Login with UserName 'johndoe@myisp.com'
... Login success
  Server is being created
... Server name 'My DServer Test'
  Loading mission 'Multiplayer/Dogfight\mytest.mission'
(Multiplayer/Dogfight\mytest)...
  Server listener IP = '192.0.2.123'
... Mission loaded successfully
Server succesfully registered on master server
```

The mission is now listed in the IL-2 Sturmovik multiplayer mission list.

4. When you want to stop the DServer, click Close in the File menu.

Reconfigure a Multiplayer Mission Server While a Mission Is Running

You can change and save the DServer configuration settings while a mission is running. You can use the new settings right away, but the current mission is terminated when the server restarts to load the new settings.

1. In the DServer file menu, click Manage SDS
   The Configuration Dialog opens.
2. Click the Load button and choose the .sds file that you want to use.
3. Specify the DServer configuration settings that you want.
4. (Optional) Select the "Reload server config now" checkbox.
   If you followed this step, the next step restarts the server.
5. Click the "Save and Close" button.
   The configuration settings are saved. If you selected "Reload server config now", the currently running mission is terminated and the server restarts with the new configuration settings.

Control a Multiplayer Mission Server From Any PC

You can control a DServer from a remote PC or a local PC by using the Remote Console. The Remote Console is included with IL-2 Sturmovik and with the separate DServer mentioned in Install and Update a Multiplayer Mission Server (pg. 167).

In addition to providing the control functions that the DServer interface has, the Remote Console provides functions that the DServer interface does not have. For example, you can allow a multiplayer server administrator to send a chat message (pg. 175) using the Remote Console.

You control the DServer by sending commands from the Remote Console to the DServer. For more details about the Remote Console, see the following:

- Remote Console Interface (pg. 336).
- The Remote Console file readme.txt in the IL-2 Sturmovik game directory under \bin\console

Important! Communication between the Remote Console and the DServer is not encrypted. For example, the login ID and password to connect the Remote Console to the DServer are transmitted in plain text. To protect Remote Console to DServer communications, you must use a secure channel, such as a VPN.

Configure Communication Between the Remote Console and the DServer

Do the following:

1. In the DServer Configuration Dialog (pg. 326), click the "Remote Console" button.
   The Remote Console Settings Dialog (pg. 335) opens.
2. Specify the required information and select the "Enable Remote Console" check box.
3. (Optional) Copy sample Remote Console configuration file _rconClient.cfg (in the IL-2 Sturmovik game directory under \bin\console) and in the copy, specify the same information as in step 2.
   The configuration file allows you to connect to the DServer using the "Open cfg" option rather than the "Connect" option in the Remote Console File menu. If you choose "Connect", you must then send the "Auth" command before every other command that you send from the Remote Console. "Auth" is not required if you choose "Open cfg".
   You can place the new Remote Console configuration file anywhere that you want on the DServer PC.

Connect the Remote Console to the DServer

Do the following:

1. Ensure that the DServer is running an .sds file configured for communication with the Remote Console and that you see the following message in the DServer Status History box:

   "Remote Console service started on *ipaddress* port *portnum*."
2. Run RConClient.exe, which is in the IL-2 Sturmovik game directory, under \bin\console.

   The Remote Console Interface opens.
3. In the Remote Console File menu, do one of the following:
   - Click on Connect, specify the IP address and port of the DServer (specified in the Remote Console Settings dialog), and click on the Connect button.

     Note: If you use this method to connect to the DServer, you must send the "Auth" command before every other command that you send from the Remote Console.
   - Click on "Open cfg", browse for the configuration file that you created earlier, and open it.

   If the connection to the DServer is successful, you get the following:
   - A "CLIENT: Connected" message and STATUS=1 message in the "Server output" box of the Remote Console.
   - The following message in the DServer Status History box:

     "RCON: New incoming connection [*connectionnum*]: *ipaddress*: *portnumber"*

Send a Command from the Remote Console to the DServer

Do the following:

1. If you connected to the DServer using the Remote Console "Connect" option in the File menu, do the following:
   a) In the Command menu, choose "Auth".

      The "Auth Command dialog opens.
   b) Specify the login ID and password for the DServer and click OK.

      The "Auth" command appears in the Command box.
   c) Click on the SEND button.

      If the Auth command is successful, you get STATUS=1 in the Server Output box.
2. In the Command menu, choose the command that you want to send.

   The command that you choose appears in the Command box.
3. Click on the SEND button.

   If the command is successful, you get STATUS=1 in the Server Output box.

Allow a Multiplayer Server Administrator to Send a Chat Message

You can allow a multiplayer server administrator to send a message to the chat window in a running mission.

Do the following:

1. Ensure that the multiplayer server administrator is able to use the Remote Console to control a multiplayer mission server from any PC (pg. 173).
2. Instruct the server administrator that they can send a message by issuing the "Send Chat Msg" command from the Remote Console. For more details about commands, see "Command Menu" in Remote Console Interface (pg. 336).

Allow a Multiplayer Server Administrator to Save a Chat Log

You can allow a multiplayer server administrator to save the contents of the chat window during a running mission. After you save the chat log, subsequent chat window entries are saved to a new log when you stop the current mission.

Do the following:

1. Ensure that the multiplayer server administrator is able to use the Remote Console to control a multiplayer mission server from any PC (pg. 173).
2. Instruct the server administrator that they can save the chat window contents by issuing the "Cut Chat Log" command from the Remote Console. For more details about Remote Console commands, see "Command Menu" in Remote Console Interface (pg. 336).

Chapter 12: Tips

Arranging MCUs

You can arrange MCUs to help make your mission logic easier to scan and understand.

Where possible, use the following guidelines for arranging MCUs that do not not need to be placed at exact locations in the View Port:

- Align MCUs (particularly related MCUs) horizontally, vertically, or diagonally.
- Arrange MCUs to minimize links that cross over each other or that appear very close to each other.
- Place related MCUs and objects close together and consider making them into a group.

Important! Be careful not to move MCUs that must be placed in an exact location in the View Port. For example, do not move an attack area command, a land command, an icon translator, or a spawner trigger (if "spawn at me" is selected).

Sometimes you may want to ignore the guidelines. For example, if related objects and MCUs have a well-defined function, consider placing them very close to each other so as to take up less space in the View Port. For example, see the target defence switch (pg. 298) group, which is used in the example for Create Target Defences (pg. 125).

Analyzing a Mission

The following are methods that you can use to help you analyze a complex mission:

- Reduce the clutter of icons and links in the View Port by using the Toolbar functions for hiding, showing, and selecting various mission elements.

  For example, click the "Draw Icons in Group" button to hide the icons in a group.
- Look for Mission Begin translators in the Mission Tree and analyze the MCUs and objects close to each one.
- If icon labels occur on top of one another, zoom in further or rearrange objects and MCUs that can be moved to uncover the labels.

  Important! Be careful not to move objects and MCUs that must be placed in an exact location in the View Port. For example, do not move an attack area command, land command, icon translator, or a spawner trigger (if "spawn at me" is selected).
- After you understand basic mission building, look in detail at the Custom Mission Functions (pg. 287). Understanding these functions can help you to understand complex mission logic in general.

Chapter 13: Troubleshooting

Editor Interface Problems

Cannot Start the Editor

There may be various reasons why you cannot start the Mission Editor. This topic lists one symptom and the solution.

Note: The solution may work for other messages that are displayed when the editor cannot start.

Message:

m_pd3dDevice->Reset(&m_d3dpp)
E_INVALIDARG

Do one of the following:

- Do the following:
  1. Open NotePad and type the following line:
     reg delete "HKCU\Software\1CGS" /f
  2. Save the file as IL2RegEdit.cmd or some other appropriate name.
  3. Double-click on the file that you saved.
     The .cmd file runs and deletes the registry specified in step 1.
     The deleted registry entry is rebuilt when you start the mission editor.
- In Windows Registry, delete the folder HKEY_CURRENT_USER\Software\1CGS.
  Important! Do not rush. Be very careful to delete the exact folder specified and no other folders. Deleting the wrong folder deletes registry entries for other programs.
  The deleted registry entry is rebuilt when you start the editor.

Editor Crashes

There may be various reasons why the Mission Editor crashes. This topic lists the messages and possible solutions.

Cannot Create Various Graphic Elements

Messages:

Can not create m_prtScreenNormal color surface
Can not create m_prtScreenDepth color surface
Can not create m_psurfScreenDepth depth surface

Possible Solutions:

- Restart the editor.
- In the Tools menu, choose "Start Integrity Check" on mission to see if there is a problem.
- Review your mission for excessive complexity and memory usage.
- If you started the Windows Task Manager by pressing "Ctrl+Alt+Del and selecting the manager, next time right click the Windows Task Bar and select "Start Task Manager".
- Try the solution in Cannot Start the Editor (pg. 179).

Cannot Find a Mission in the Open Dialog

If you try to open a mission but you can't find it in the Open dialog, it may be because there is no .mission file (the "source" file) available. Instead, you can edit a mission without the mission source file (pg. 48).

Cannot Open a Mission in the Editor

If you cannot open a mission in the editor, try one of these solutions:

- After confirming that you have a .mission file for the mission, delete the existing .msnbin file for the mission and try opening the mission again.

  The .msnbin file is recreated when you save the mission.

  For more details, see Mission Files (pg. 324).
- In the Tools menu, choose "Resave All Missions in a Folder", and navigate to the folder where your mission is located.

The View Port Terrain Appears Black

If the View Port terrain appears black, try the following solutions:

- The terrain may be hidden. Press F9 to show the terrain again in 3-D view and press F9 again to show the 2-D view. For more details, see Show or Hide Icons, Text, Links, and Terrain (pg. 30)
- If you are trying to view the GUI map, try zooming in or out a little bit.
- If you import saved objects, MCUs, and groups (pg. 29) that were saved from a different map terrain than the current terrain, your view may be centered in a black area that is outside of the current terrain. Do the following:
  1. Select the imported items and cut them.
  2. In the View menu, choose "Move camera to" and specify 0 (zero) for X and Y.

     Your view shifts to the lower left corner of the map for the current terrain.
  3. Move your view to where you want the imported items and paste them in the View Port.

Cannot See the GUI Map

When you display the GUI map, it may not be visible at first. To see the map, zoom in or out.

GUI Map Does Not Match the Terrain in the View Port or Terrain Appears to Be Corrupted

If the GUI map features do not match the terrain features in the View Port or the terrain appears to be corrupted, do the following:

1. Click the top entry in the Mission Tree to open the Mission Properties Dialog (pg. 208).
2. Do the following:
   - If the terrain in the View Port is correct, select the matching map from the "GUI Map" drop-down list.
   - If the GUI map in the View Port is correct, click the "Terrain Presets" button and choose the terrain to match the GUI map.

Cannot Zoom in to the Center of the Screen

Sometimes you may try to zoom in to an icon at the center of the screen but the zoom function takes you somewhere else. This happens because you have "Zoom to Cursor" enabled, which zooms to wherever your mouse cursor is placed. Do one of the following:

- Place your mouse cursor over the object before zooming.
- Click the "Zoom to Cursor" button on the Toolbar so that function is disabled.
  

Cannot See Icons in the View Port

If you cannot see some or all of the icons in the View Port, try the following solutions:

- Click the Toolbar button "Draw Icons".
  
- Right-click in the View Port and choose "Reset Working Group".
  For details, see Make a Group the Current Working Group (pg. 25).
- Select the icons that you want to see in the Mission Editor Object Filter Dialog (pg. 207).

Cannot See Icons Labels in the View Port

If you cannot see the icons labels in the View Port or they are hard to see, try the following solutions:

- Click the Toolbar button "Draw Icon Text".
  
- If there is another icon near an icon with a non-visible label, zoom in or move either icon slightly and see if a hidden label is revealed.

  Important! Be careful not to move objects and MCUs that must be placed in an exact location in the View Port. For example, do not move a flak gun in a separate protective structure, an attack area command, a land command, an icon translator, or a spawner trigger (if "spawn at me" is selected).

- Press Alt+F9 to hide the terrain. For more details, see Show or Hide Icons, Text, Links, and Terrain (pg. 30)
- Open the mission properties and set the time to later in the day or earlier in the day.
  This method increases the contrast between the icon labels and the background.
  Important! Remember to reset the time to the desired mission time before saving the mission.

Cannot Select an Icon in the View Port

If you cannot select an icon in the View Port, try one of the following solutions:

- For a large object, make sure that you select the object icon.
- If the icon is part of a group, see Make a Group the Current Working Group (pg. 25).
  Check in the Mission Tree to see where the icon is in relation to the groups listed there.
  If you have trouble finding what group an icon is part of, see Find the Group Containing an Icon That You Want to Select (pg. 25).
- Look in the Mission Tree for the entry with the same ID number in parenthesis. Right-click on the entry and choose “Select”.
  For more details about IDs, see "Mission Tree" in Mission Editor Interface (pg. 3).

Cannot See the Red Square Used to Rotate an Icon

If you cannot see the red square that you click and drag to rotate an icon, you may be zoomed out too far or zoomed in too far. Zoom in or out until you can see and click on the red handle.

Cannot See the Actual Object Represented by an Icon

If you cannot see the actual object that is represented by an icon, try the following solutions:

- Zoom further in to the icon.
- Hide the icon by clicking the "Draw icons" button in the Toolbar.

- The height for the object may be set so that the object is underground. Select the icon and click "Set on Ground" in the Toolbar.

Error Message "Enter a number between 0 and 359.99999999999"

The message "Enter a number between 0 and 359.99999999999" applies to an "Orientation" value in an Object Properties Dialog (pg. 217). Correct the value.

Cannot Link to an Object

If you cannot create an object link to an object, make sure that the object is a linked entity.

Cannot See Links in the View Port

If you cannot see links in the View Port, check the settings of the Tool Bar (pg. 196) buttons from MCU OBJ over to MCU UNSE.

Note: If MCU SEL and MCU UNSEL are disabled, links are hidden, even if MCU OBJ, MCU TAR, and MCU MES are enabled.

Mission Start Problems

Cannot Find a Mission in the IL-2 Sturmovik Singleplayer Missions List

If you save a mission but you cannot find it in the IL-2 Sturmovik singleplayer missions list, check the following:

- The mission name in the "Name" field of the Mission Properties Dialog (pg. 208) may be the default ("My Mission") or it may be the name of an old mission that you copied to create the new mission. The Name field value is shown in the IL-2 Sturmovik singleplayer missions list. If you leave the Name field blank, the mission list shows the mission file name without the .mission suffix.
- You may not own the version of IL-2 Sturmovik with the map being used in the mission.
- A singleplayer mission may have "Deathmatch" selected in the "Mission Type" drop down list of the mission properties. Select "Single" instead.
- You may need to refresh the IL-2 Sturmovik cache files that store mission names.

  To refresh the cache files, do the following:

  1. Close IL-2 Sturmovik and the Mission Editor.
  2. In your games folder, under the data subfolder, delete the files ctreecache.eng and mtreecache.eng.

     Important! Be careful not to delete other IL-2 Sturmovik files.

     The cache files are rebuilt when you start IL-2 Sturmovik.

  Note: If you save an existing mission under a new name. You can avoid the cache problem by changing the Name field in the Mission Properties Dialog before you save the mission.

Players Cannot Join a Multiplayer Mission, No Error Message

Sometimes when a player tries to join a multiplayer mission, the mission starts to load, but then player is returned to the list and no error message is displayed.

Try the following solutions:

- Make sure the mission is saved in the correct folder on the DServer PC. The .list file for the mission shows the correct folder to save the mission in on the DServer PC.
- Resave the mission, copy it to the DServer, and restart the mission.

Error Message "#10016 : Unable To Save File To Disk"

Make sure the mission is saved in the correct folder on the DServer PC. The .list file for the mission shows the correct folder to save the mission in on the DServer PC.

Error Message "File Transfer Error #10017"

Make sure the mission is saved in the correct folder on the DServer PC. The .list file for the mission shows the correct folder to save the mission in on the DServer PC.

Error Message "!!! ERROR: COULDN'T LOAD MISSION" for Multiplayer Mission

Try the following solutions:

- Make sure that "Deathmatch" is selected in the "Mission Type" drop down list of the mission properties.
- Make sure that the correct IP address is specified in the DServer configuration.
  For details, see the "Server IP" field in Configuration Dialog (pg. 326).

Error Message: "!!! ERROR INET thread: MIS_REQUEST_FAILED: MIST_SERVERNOTIFYPROXY"

Try the following solutions:

- Restart the DServer.
- Check if there is a problem with the master server, which is a remote server to which the DServer connects to register your missions on the multiplayer mission list.
  An empty IL-2 Sturmovik multiplayer missions list may indicate a master server problem.
- Check if your firewall and antivirus software is blocking the connection from your DServer.

Note: Sometimes you may also see error message
"!!! ERROR INET thread: MIS_REQUEST_FAILED: MIST_KEEPALIVESERVER"

Mission In-Progress Problems

The Player Cannot Enter a Plane in a Singleplayer Mission

If a player cannot enter a plane in a singleplayer mission, check the following:

- If the player enters the plane briefly and ends up out of the plane and looking at the ground, see Player Enters Plane and Is Kicked Out or Plane Is Destroyed or Goes Underground (pg. 186).
- Check the advanced properties of the player plane to see if it has been changed to an AI plane.

  The AI field in the plane advanced properties can be set to "Player" (for human-controlled planes) or to a skill level (for AI planes). If you copy a player plane, the copy automatically becomes the player plane and the original becomes an AI plane. If you do not notice this change and you set an AI skill level in the copy, you are left with two AI planes and no player plane.
- In the mission properties, check that the GUI map matches the terrain preset.

  This problem can occur if you are editing in the GUI map view and the map covers an area larger than the terrain. If you place a plane on an area of the map that does not have matching terrain, the plane does not exist in the running mission. For more details, see GUI Map Does Not Match the Terrain in the View Port or Terrain Appears to Be Corrupted (pg. 181).

A Player Cannot Enter a Plane in a Multiplayer Mission

If a player cannot enter a plane in a multiplayer mission, check the following:

- If the player enters the plane briefly and ends up out of the plane and looking at the ground, see Player Enters Plane and Is Kicked Out or Plane Is Destroyed or Goes Underground (pg. 186).
- The "Coalition balancer" check box is selected in the DServer Advanced Settings Dialog (pg. 331). The player must choose a plane on the side with fewer participants.

  If you want the coalition balancer to be enabled, inform the player that they have to wait for a space to open up or else change sides.
- All of the available planes for the airfield object have been taken.

  Note: You can replenish or change the planes available In a multiplayer mission (pg. 115).
- The airfield object may be unavailable or it has changed to enemy control.

  For more details, see the following:
  - Manage Airfield Availability (pg. 131)
  - Change Control of an Airfield to the Enemy (pg. 132)
- The airfield country may be set to "Neutral".

Player Enters Plane and Is Kicked Out or Plane Is Destroyed or Goes Underground

When a player enters a plane, they could be taken immediately to an external view or the plane may blow up or end up underground. To solve this problem, try opening the .mission file and checking if SeasonPrefix is set to blank. If SeasonPrefix is blank, set it to an appropriate two-letter value as follows:

- wi– winter
- su–summer, autumn

Taxiing, Taking Off, and Landing Problems

If AI planes have problems taxiing, taking off, or landing, check the following:

- Ensure that the take off command and land command are object linked to the AI plane.
  In the case of a formation, the object link must go to the formation leader.
- For making AI planes taxi, ensure that the airfield object is set to the country of the planes that are taxiing.

Formation Problems

If you have problems with formations of objects, consider the following:

- Do not spawn formations, they do not work properly.
- Make sure that all formation commands are object-linked to the formation leader only.
- Use the formation command to establish a reliable initial formation when the formation starts moving. Do not rely on the initial placement of objects in the View Port to determine the initial formation because the planes do not keep the formation properly. See the example in Manage Object Formations (pg. 74), where the "Start V-Form" formation command establishes the initial formation.

Object Does Not Follow Waypoints

If an object does not follow the waypoints that are assigned to it, try the following solutions:

- For planes, ensure that the waypoint radius is around 200m or more.
  Small waypoints are hard for AI planes to find.
- Ensure that you do not create sharp turns with waypoints that are close together.
- Make sure that all waypoints on the route have object links to the object following the route.

Plane Descends While Flying Towards a Waypoint

If a plane descends while flying towards a waypoint, you may not have assigned an altitude above ground level to the waypoint. The default waypoint altitude is ground level.

Cannot Make An Object Attack Another Object

If an AI object does not attack an enemy object, try the following solutions:

- In the advanced properties for both objects, do the following:
  - Check the Country setting and check the coalition that each country belongs to in Mission Countries Dialog. Objects must be in opposing coalitions before they will attack each other.
  - Check that "Engageable" is selected.
- If AA are not firing at planes except at close range, it may be late in the day and you need to add a searchlight. See the example in Create Target Defences (pg. 125).

Friendly Objects Are Attacking Each Other

If presumably friendly objects are attacking each other, they may not actually be on the same side. Friendly objects must belong to the same country or they must be in the same coalition. Check the following:

- The Country setting in the advanced properties of each object.
- The coalition that each country belongs to in the Mission Countries Dialog.

Note: The Neutral country and coalition is an enemy to AI objects in the Axis or Allies coalition but it is a friendly to the player. See Chat Message "Fired on a friendly" When Player Attacks An Enemy Target (pg. 187).

Chat Message "Fired on a friendly" When Player Attacks An Object

A player can get a "Fired on a friendly" message in the chat box for the following reasons:

- They attacked an object from the same country as them or a country in the same coalition as them. You may have set the country incorrectly for an object that was meant to be a legitimate target.
- They attacked an object that was set to country Neutral, which is friendly to players but an enemy to AI objects. Also, the player may have hit a target that is set to the correct country, but they also damaged nearby objects that are set to neutral. Always set objects near a target to the same country as the target, even if the objects are not linked entities.

  Note: Objects that are not linked entities are neutral by default. To change the country and still keep the object as a non-linked entity, do the following:

  a) Make the object a linked entity.
  b) In the object advanced properties, change the country from "Neutral" to the same country as the target.
  c) In the object properties, click "Delete Linked Entity".

  The country that you specified remains for the object. You can verify the country by making the object a linked entity again and checking the advanced properties.

Cannot See an Object in the Mission

If you cannot see an object in the mission, try the following solutions in the editor:

- Confirm that the object is a linked entity.

  See Make an Object a Linked Entity (pg. 17).
- Confirm that the object is active at the point in the mission in which you are looking for it.

  See the "Enabled" check box in Object Advanced Properties Dialog (pg. 209) and also see Deactivate or Activate an Object While a Mission is Running (pg. 114).
- Select the object icon and click "Set on Ground" in the Toolbar.

Cannot See Icons or Lines Created by Icon Translators On the GUI Map

If a player cannot see the icons or lines created by icon translators on the GUI map, check the following items in the icon translator advanced properties:

- "Enabled" is selected or the icon translator is currently enabled in the mission by an activate trigger.

  See Deactivate or Activate Mission Functions (pg. 105).
- The coalition that the player is flying for is set to "True" in the "Coalitions" list of each icon translator.

Check Zone Trigger Problems

If a check zone trigger is not detecting objects and firing, do the following:

- Make sure that some other MCU in the mission has triggered the check zone trigger to enable it to detect objects.
- Make sure that the trigger has not been deactivated by a deactivate trigger.
- Make sure that the object to be detected is object-linked to the check zone trigger or the object's coalition is set to "True" in the check zone trigger advanced properties.
- Check the size and shape of the detection zone to see if the object is within that zone. For example, say you specify Zone Type "Closer" and a 2000m sphere. Assume that a plane flies 1900m vertically and 1900m horizontally away from the check zone trigger. The plane is actually 2,687m (diagonally) away from the translator, so it is not detected.

See Detect Objects In Relation to a Defined Area (pg. 81).

Complex Trigger Translator Events Are Not Triggered

If the events that you specify in a complex trigger translator are not triggered when you think that they should be, check the following:

- Check that "Enabled" is selected in the advanced properties or that the translator is currently enabled in the mission by an activate trigger.

  See Deactivate or Activate Mission Functions (pg. 105).
- Check whether your detection area is a cylinder or a sphere and determine whether objects are inside or outside the area.

  For example, say you specify a 2,000m radius sphere and a plane is 1,900m vertically and 1,900m horizontally away from the complex trigger translator. In this case, the plane is actually 2,687m diagonally away from the translator, so it is not detected.
- Check that "Damage Report" and the damage check box below it are set appropriately.

  For example, assume that you selected "Object Damaged" and specified Damage Report 75 (75% object life remaining). If the object is only 20% damaged (80% life remaining), the complex trigger translator does not fire.
- Check that the correct objects are being detected as follows:
  - "Check Vehicles" or "Check Entities" (planes) or both are selected, depending on your requirements.
  - "Object scripts list", "Countries", and "Object names list" are set to detect the correct objects.
- Check that the translator "On Events Table" includes an entry matching the selected event in the "Events Filter" list. Make sure that the target in the Events Table is the one that you expect to be triggered.

See the following:

- Detect Objects In Relation to a Defined Area (pg. 81)
- Detect Events from Objects Inside an Area (pg. 86)

Chapter 14: Reference

Menu Bar

This section documents selected items from the mission editor menus.

File Menu

Save Selection to File

Allows you to save objects, MCUs, and groups (pg. 28)

Import From File

Allows you to import saved objects, MCUs, and groups (pg. 29)

View Menu

Add Camera / Cameras / Go To Camera

Allows you to save the current view in the View Port and manage the views that you have saved. For example, you can save close-up views (including 3-D views) of various locations on the map and also views of grouped mission logic, such as the timing and scoring logic of the example in Create a Multiplayer Mission (pg. 38). For more information, see Select Views and Move Around in the View Port (pg. 13).

Do not confuse a View Port view camera with the camera implemented by the camera operator translator (pg. 251). The translator camera is actually part of a mission.

Focus on Selection Center

Zooms in on the area covered by multiple icons that you select.

Move Camera to...

Opens the Move Camera to Dialog (pg. 209), which allows you to move the view to a specified location in the View Port.

Toggle Ortho View

Toggles between the 2-D (Ortho) view and the 3-D view.

Zoom to Cursor

2-D view only. Enables you to zoom to the point under your mouse cursor. Otherwise, you zoom to the center of the window. Your mouse wheel controls the zoom.

Related Information

Select Views and Move Around in the View Port (pg. 13).

Search and Select Menu

Find Mission Objects

Opens the Find Mission Objects Dialog (pg. 201)

Find Location Objects

Used for terrain editing, which is not covered in this manual.

Select All Objects

Selects all the objects and MCUs in the View Port. Objects hidden using the Mission Editor Object Filter Dialog (pg. 207) are also selected and stay selected after you make them visible again.

Select All Visible Objects

Selects all the visible objects and MCUs in the View Port. Objects and MCUs hidden using the Mission Editor Object Filter Dialog (pg. 207) are not selected, even when you make them visible again.

Select All Objects in Mission

Selects all objects and MCUs in the View Port, including objects and MCUs hidden using the Mission Editor Object Filter Dialog (pg. 207).

Draw Menu

For details, see the corresponding icons in the Tool Bar (pg. 196).

Tools Menu

Some of the Tools Menu items are also available in the Tool Bar (pg. 196).

Capture Joystick/Joystick Options

This option will be documented in a later edition of this manual.

Clear and Reenumerate Localization Indexes

Fixes the mission localization files so that each translation has the same line number ("Localization Index") in each localization file. For more information, see Provide a Mission in Various Languages (pg. 49).

Convert Missions to Binary in Folder

Generates the binary files for all the missions that are in a folder (including subfolders) that you select. The mission binary file (.msnbin) is what actually runs in IL-2 Sturmovik. A binary file is also generated each time that you save a single mission in the mission editor.

You can use this option to resave your mission binary files if the developers change the editor binary format.

Generate GUI Map

For developer use.

Measure Mode

See the corresponding icon on the Tool Bar.

Objects Filter

Opens the Mission Editor Object Filter Dialog (pg. 207).

Resave All Groups in a Folder

Saves all the groups that are in a folder that you select.

For details, see Save Objects, MCUs, and Groups (pg. 28).

Resave All Missions in a Folder

Saves all the missions that are in a folder that you select and also generate the binary files for them. The mission binary file (.msnbin) is what actually runs in IL-2 Sturmovik. A binary file is also generated each time that you save a single mission in the mission editor.

You can use this option to resave your mission binary files if the developers change the editor binary format.

Select Localization

Opens a dialog so that you can select a language for the localization process. For details, see Provide a Mission in Various Languages (pg. 49).

Set Objects on Ground

See the corresponding icon on the Tool Bar.

Start Integrity Check/Check Integrity On Save/Load

Checks the mission for errors immediately or every time that you save a mission or load a mission. For example, you get an error if a take off command or a waypoint trigger is not linked to an object. You may want to turn this option off while you are building a mission and you are still linking icons. You can still check the mission as you go by clicking "Start Integrity Check".

Location Database Menu

This menu is used for terrain editing, which is not covered in this manual.

Test Menu

This menu is used for terrain editing, which is not covered in this manual.

Surface Edit Menu

This menu is used for terrain editing, which is not covered in this manual.

Context Menu

The Context Menu appears if you right click the View Port or any object or MCU in the View Port or Mission Tree.

Add Camera / Cameras / Go To Camera

See View Menu (pg. 191).

Advanced Properties

Opens the advanced properties for the selected icon.

Focus on Selection Center

Zooms in on a selected icon or on the center of the selected icons.

Move Camera to...

See View Menu (pg. 191).

Move Camera to Object

Moves the camera to the item selected in the Mission Tree.

Ortho View

Displays the 2-D view. Clear this option to display the 3-D view.

Properties

Opens the basic properties for the selected icon.

Reset Camera FOV

This option will be documented in a later edition of this manual.

Reset Camera Z

This option will be documented in a later edition of this manual.

Save Selection to a File

Saves selected icons in the View Port to a file. For more details, see Save Objects, MCUs, and Groups (pg. 28).

Selected Object Menu

Add...Event

Adds the chosen event message link from the selected object. For example, you can choose "Add OnPlaneTookOff Event" from a selected plane. For more details, see Links (pg. 8) and Manage Connections Between Mission Icons (pg. 19).

Add Object

Changes your cursor to "Object", allowing you to click on another icon and add an object link.

Add...Report

Adds the chosen report message link from the selected object. For example, you can choose "Add OnSpawned Report" from a selected plane. For more details, see Links (pg. 8) and Manage Connections Between Mission Icons (pg. 19).

Add Target

Changes your cursor to "Target", allowing you to click on another icon and add a target link.

Copy Camera Position and Orientation to Object

Saves the current position and orientation for the selected camera operator translator. You set the camera position and orientation and save it as follows:

1. Select the camera operator translator and then right click it.
2. From the context menu, choose "Look from This Object".
3. Use the procedures in Select Views and Move Around in the View Port (pg. 13) to position and orient the camera.
4. Right click anywhere and select "Copy Camera Position and Orientation to Object" from the context menu.

   The current camera position and orientation is saved in the MCU Basic Properties Dialog (pg. 204) for the camera.

   Note: Sometimes the "Copy..." option is not shown. In this case, try repeating this procedure from the start.

Delete all output links

Deletes all of the links coming out of the selected icon to other icons.

Look from This Object

Changes to the 3-D view, looking from the selected object or MCU.

If you select a camera operator translator, you can then alter the camera position and orientation and choose context menu option "Copy Camera Position and Orientation to Object".

Set Group as Working/Reset Working Group

Makes the currently selected group the working group or resets the current working group to the top level in the Mission Tree. Making a group the current working group

allows you to access the icons in the group. For more details, see Make a Group the Current Working Group (pg. 25).

Tool Bar

Note: Toolbar icons that are not listed here are for editing terrain, which is not covered in this manual. The terrain defines the landscape features and elevations.

Measure Mode (Shift+M). Allows you to draw lines between points and display the distance and heading of each line. The lines are displayed in the editor only.

Do the following:

1. Once you activate measure mode, click a point in the View Port.
2. Move your mouse to another point in the View Port and click.

   The following data is displayed beside each point that you plot:
   - D – Distance (in meters) from the previous point to the current point.
   - L – Distance (in meters) from the first point to the current point.
   - HDG – Heading (strictly speaking, the "course") from the previous point to the current point.
3. Do one of the following:
   - To plot another line from where you last clicked, repeat Step 2.
   - To delete the current line, press the BACK key.
   - To exit Measure Mode, press the Esc key.

     The lines that are currently displayed appear the next time you click the Measure Mode icon.

Displays the GUI Map, which the flight crew can use for navigation.

Displays a mini GUI map with a black square in it. Click in the black square and drag it to scroll around in the View Port. The area outlined by the black square represents the area shown in the View Port at the current zoom level. If you cannot see the black square, zoom in on the View Port a little bit.

Toggle Camera. Toggles between the 2-D view and the 3-D view.

Focus on Selection. Zooms in on a selected icon or on the center of the selected icons.

Set on Ground. Places the selected objects on the ground. You should use this function

whenever you place or move an object because sometimes the object ends up above or below ground level.

Zoom to Cursor. 2-D view only. Enables you to zoom to the point under your mouse cursor. Otherwise, you zoom to the center of the window. Your mouse wheel controls the zoom.

Draw Grid. Displays a grid over the map. The distance (in meters) between grid lines at the current zoom level is indicated beside “Grid(m)” at the bottom of the window.

Draw Icons. Displays all of the icons in the View Port.

Draw Icon Text. Displays of all the text that is beside icons in the View Port.

Draw Icons in Group. Displays the icons included in each group in the View Port. For more information, see Group and Ungroup Icons (pg. 24).

Draw compass. Displays a circle at the top left of the map that indicates the following, depending on the view:

- 2-D View–The circle displays lines that indicate North and the direction that the ground-level wind is blowing towards.

  If the wind is blowing towards the North or there is no wind, a green line indicates North and the wind direction.

  If the wind is blowing in any direction but North, a blue line indicates North and a green line indicates the wind direction.
- 3-D view–Same as the 2-D view except that the circle also displays a number that indicates the direction (in degrees) that you are looking and grey lines that indicate your field of view.

Objects Filter. Opens the Mission Editor Object Filter Dialog (pg. 207).

Mission Tree. Opens the Mission Tree on the left side of the main window.

Objects Library. Opens the Objects Library on the right side of the main window.

Property Dialog. Opens the appropriate properties dialog, depending on the icon that is selected. The dialogs are as follows:

- No icons selected – Mission Properties Dialog
- Object Icon – Object Properties Dialog
- MCU – MCU Basic Properties Dialog.

Draw MCU object links. Displays all the Object Links in the View Port.

Draw MCU target links. Displays all the Target Links in the View Port.

Draw MCU OnMessage links. Displays all the Message Links in the View Port.

Draw MCU links for selected objects. Displays the outgoing links from the selected objects or MCUs. Outgoing links have an arrow that points away from the icon.

Draw MCU links for non-selected objects. Displays the outgoing links from objects or MCUs that are not selected. Outgoing links have an arrow that points away from the icon.

Draw MCU link arrows. Displays the link direction arrow on all links (object, target, message) in the View Port.

Opens a dialog to select a language for localization. For details, see Provide a Mission in Various Languages (pg. 49).

Opens the "About BOSEditor" dialog

Dialogs

Airfield Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Airfield Chart Editing Dialog

How to Open: Click "Edit Chart" in the airfield object properties.

The Airfield Chart Editing dialog allows you to add and edit an AI plane taxi path. Using a taxi path, an AI plane can automatically taxi to and from the runway. AI planes can taxi to the runway upon receiving a take off command and taxi from the runway once they land after receiving a land command.

The dialog contains a default taxi path, which is shown in orange in the View Port. An orange arrow over the airfield icon shows the takeoff direction.

You can select points on the path and drag them around to place them on the actual parking areas, taxiways, and runways shown in the View Port.

To select a point, select a row in the dialog table or double-click the point in the View Port.

#

The order of the taxi point in the taxi path. An AI plane proceeds toward each taxi point in the defined order.

Invert Graph

Reverses the order of entries in the dialog table.

Type

The type of point. The values are as follows:

PARK

The first PARK in the list marks the initial parking location for an AI plane, before takeoff. The second PARK in the list marks the final parking location for an AI plane, after landing.

PARK points are shown as orange triangles in the View Port.

Place the first PARK point just in front of the AI plane.

TAXI

A point along the taxi route for an AI plane.

TAXI points are shown as orange squares in the View Port.

Do not place TAXI points too far apart or the AI planes may skip the remaining points and proceed directly to the runway.

When you place the last two TAXI points before the takeoff VPP point, align them as close as you can to the direction of takeoff. This placement allows the AI plane

to align itself properly for takeoff.

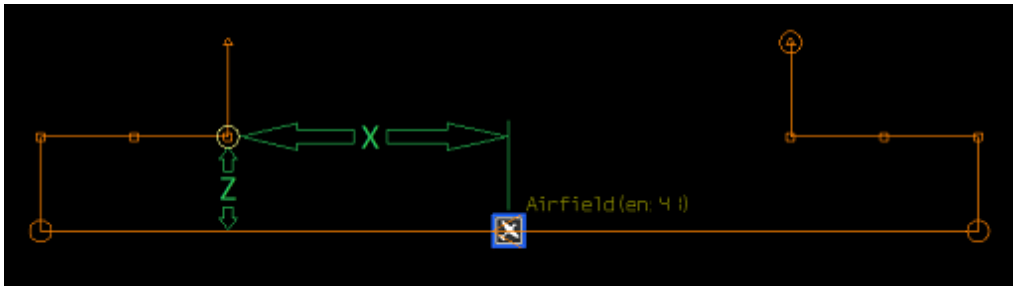
VPP

The first VPP in the list marks the end of the taxi path before takeoff. The second VPP in the list marks the start of the taxi path after landing.

VPP points are shown as orange circles in the View Port

X/Z

The location of the current point relative to the airfield icon and the takeoff path. The diagram shows X and Z in green for the selected point (circled in yellow). The airfield icon is located along the takeoff path. An orange arrow over the airfield icon shows the takeoff direction (in this case, right to left).



X (in meters) is positive for points after the airfield icon along the takeoff path and negative for points before the icon.

Z (in meters) is positive for points to the right of the takeoff path and negative for points to the left of the takeoff path.

Note: Try to avoid placing taxi paths where player planes go. If the AI plane is taxiing and another object (AI or player) gets in the way, the taxiing AI stops if it has enough space. However, this behaviour is not always reliable. The AI does not stop if it is too close to another object, such as when it is following behind a player plane.

For an example of using this dialog, see "Example: Make an AI Formation Taxi To and From the Runway" in Make a Plane Taxi to and From a Runway (pg. 63).

Airfield Properties

See Object Properties Dialog (pg. 217)

Cameras Dialog

How to Open: Right-click in the View Port and choose Cameras.

The Cameras dialog displays the View Port views that you have stored. The stored views are called “cameras” and they make it easy to jump around to various points of interest in the View Port. For more Information, see View and Move Around in the View Port (pg. 13).

You can select a camera in the list and use the up/down arrow buttons to specify the order that you want the camera to show up in the View menu "Go To Camera" list. The buttons

beside the arrows provide other options for the selected view.

Camera Info

View type (Ortho (2-D) or 3-D) and custom information about the view, which you type in the text box.

X

View position (in meters) relative to the bottom of the map

Y

3-D view only. View height (in meters) above sea level.

Z

View position (in meters) relative to the left side of the map

Zoom

2-D view only. The zoom level, which is also given in the Status Bar box for "Camera (X Z Zoom)".

Block Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Block Properties Dialog

See Object Properties Dialog (pg. 217)

Note: This dialog is used for both building objects and block objects.

Bridge Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Bridge Properties Dialog

See Object Properties Dialog (pg. 217)

Effect Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Effect Properties Dialog

See Object Properties Dialog (pg. 217)

Find Mission Objects Dialog

How to Open: In the "Search and Select" menu, choose "Find mission objects".

The Find Mission Objects dialog allows you to specify search criteria to find objects and MCUs.

Note: The "Helper..." filter items and "...Helpers" buttons are for terrain editing, which is not

covered in this manual.

Do the following:

1. Specify search criteria in the "Find by Name" box, Filter section, and "Find options" section.
2. Click the Find button.

   The search results appear in the list box.
3. To start a new search, click the Clear All button and go to Step 1.

Add to Selection Objects Selected in Found List

This button will be documented in a later edition of this manual.

Description

The description of an object or MCU that was found. You can specify a description in the properties dialog for the object or MCU.

Double click result options

The options in this section take effect when you double click an item in the search results list.

Add Object to Selection

Adds the object or MCU that you double click to the selected icons in the View Port. The blue box around the selected objects expands to include the object or MCU that you double click.

Close Dialog

Closes the "Find Mission Objects" dialog when you double click an item. This option is useful in combination with other options in "Double click result options".

Move camera to object

Moves your view to the item that you double click

Select in Mission Tree

Scrolls the Mission Tree pane so that the item that you double click appears somewhere in the pane

Set Working Group

Sets the working group to the group that includes the item that you double click

Show Properties

Shows the basic properties for the item that you double click

Note: The properties dialog for any object or MCU must be open before you can view the properties of the item that you double click.

Filter

The objects or MCUs to find. You can also use the buttons on the top right to select or

clear the check boxes for multiple items in the Filters section.

Find by Name

The name of an object or MCU to find. Object and MCU names are displayed beside their icons in the View Port.

Objects or MCUs whose name includes the text that you specified and whose type is selected in the Filter section are listed in the results box.

ID

The ID of an object or MCU that was found. For more information, see the ID field in the MCU Basic Properties Dialog (pg. 204) and the Object Properties Dialog (pg. 217).

Name

The name of an object or MCU that was found

Search Working Group

Restricts the search to the current working group

Type

The type of an object or MCU that was found. The types are listed in the Filter section of this dialog.

Flag Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Flag Properties Dialog

See Object Properties Dialog (pg. 217)

Ground Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Ground Properties Dialog

See Object Properties Dialog (pg. 217)

Group Properties Dialog

See Object Properties Dialog (pg. 217)

MCU Basic Properties Dialog

How to Open: Select an MCU, right-click on it, and choose Properties.

Description

A description of the current MCU. Limited to 31-characters (any extra characters are deleted when you reopen the properties dialog).

Find target

Allows you to create a target link to an MCU or object. For detail, see Manage Connections Between Mission Icons (pg. 19).

Find object

Allows you to create an object link to an object icon. For detail, see Manage Connections Between Mission Icons (pg. 19).

ID

MCU ID, which is a unique numeric identifier for the MCU. The MCU ID is displayed beside the MCU in the mission tree and in the View Port.

Name

The MCU name, which is displayed beside the MCU in the mission tree and in the View Port.

Orientation

Note: Orientation is ignored for some MCUs because they do not need to be oriented. For example, the take off command and mission begin translator do not need to be oriented but the camera operator translator and land command do need to be oriented.

AX

Roll angle (in degrees) to the right, for example:

- 0 = level
- 45 = roll right 45 degrees
- 180 = roll right 180 degrees (upside down)
- 315 = roll right 315 degrees (same as roll left 45 degrees)

This field applies to the following MCUs:

- Animation operator translator
- Camera operator translator

AY

Direction (in degrees), relative to North

This field applies to the following MCUs:

- Land command
- Animation operator translator
- Camera operator translator

AZ

Pitch angle (in degrees) upward, for example:

- 0 = level
- 45 = pitch up 45 degrees
- 180 = pitch up 180 degrees (upside down)
- 315 = pitch up 315 degrees (same as pitch down 45 degrees)

This field applies to the following MCUs:

- Animation operator translator
- Camera operator translator

Position

The coordinates of the MCU in the View Port

X

Position (in meters) relative to the bottom of the map

Y

Height (in meters) ASL (above sea level)

Z

Position (in meters) relative to the left side of the map

Mission Atmosphere Options Dialog

How to Open: Click the "Atmosphere options" button in the Mission Properties Dialog (pg. 208).

The Mission Atmosphere Options dialog allows you to set the weather conditions for the mission.

Clouds

The amount and type of cloud in the sky and whether there is morning and evening ground fog present. You interpret the values in the drop-down list as follows:

- The words clear, light, medium, heavy, and overcast represent the amount of low-level cumulus (puffy) clouds in the sky.
- The last number represents the amount of high-level cirrus (wispy) clouds in the sky (higher number = more cloud). If the number is odd, morning and evening

ground fog is present and can be seen from the air.

Level

Altitude of the bottom of the cumulus clouds

Height

Height from the bottom to the top of the cumulus clouds

The allowed heights vary as follows:

Clouds	Allowed Heights
01_Light_00	400 to 800
01_Light_01	300 to 500
01_Light_02	300 to 700
01_Light_03	300 to 500
01_Light_04	300 to 600
01_Light_05	400 to 800
01_Light_06	300 to 600
01_Light_07	300 to 700
01_Light_08	400 to 800
01_Light_09	400 to 800
02_Medium_00	500 to 1000
02_Medium_01	500 to 1000
02_Medium_02	500 to 1000
02_Medium_03	300 to 700
02_Medium_04	500 to 1000
02_Medium_05	500 to 1000
02_Medium_06	400 to 850
02_Medium_07	500 to 1000
02_Medium_08	400 to 900
02_Medium_09	600 to 1200
03_Heavy_00	600 to 1200
03_Heavy_01	600 to 1300
03_Heavy_02	600 to 1200
03_Heavy_03	600 to 1200
03_Heavy_04	600 to 1200
03_Heavy_05	600 to 1200
03_Heavy_06	700 to 1400
03_Heavy_07	600 to 1200
03_Heavy_08	600 to 1200
03_Heavy_09	700 to 1500
04_Overcast_00	150 to 300
04_Overcast_01	200 to 500
04_Overcast_02	200 to 500

Clouds	Allowed Heights
04_Overcast_03	200 to 600
04_Overcast_04	200 to 600
04_Overcast_05	200 to 500
04_Overcast_06	300 to 600
04_Overcast_07	200 to 600
04_Overcast_08	200 to 500
04_Overcast_09	200 to 600

Direction

The direction that the wind is blowing to. For example, a value of 90 means that the wind is blowing from the West (270 degrees) to the East (90 degrees).

Important! The weather report that is available in the in-game bomb sight view gives the direction that the wind is blowing from. For example if you specify 90 degrees (to) in Direction, the bomb sight report gives the wind as 270 degrees (from).

Precipitations, Level

The intensity of precipitation. The range is 0 to 10.

Temperature and Pressure, Level

The height (in meters) above sea level for the specified temperature and pressure.

Mission Countries Dialog

How to Open: Click the "Countries" button in the Mission Properties Dialog (pg. 208).

The Mission Countries dialog allows you to assign various countries to various coalitions (for example, the allies coalition). This assignment defines who is an enemy, who is friendly, and who is neutral.

When you place objects in the View Port, you specify what country they are from. Then, when objects encounter other objects, they behave according to the coalition each country belongs to.

To chose a coalition for a country, double-click on the coalition entry beside that country and chose the value from the drop-down list.

Mission Editor Object Filter Dialog

How to Open: Click the “OBJ FILT” button on the Toolbar.

The Mission Editor Object Filter dialog allows you to show or hide various types of icons in the View Port. This ability helps you focus on the mission elements that you are interested in viewing or editing.

Do the following:

1. Select the check box beside the icon types that you want to show.
2. Clear the check box beside the icon types that you want to hide.

Related Information

Show or Hide Icons, Text, Links, and Terrain (pg. 30)

Mission Properties Dialog

How to Open: Click the top entry in the Mission Tree.

Atmosphere Options

Open the Mission Atmosphere Options Dialog (pg. 205).

Countries

Open the Mission Countries Dialog (pg. 207).

Date/Time

The date and time when the mission takes place.

Note: Also, specify the season using the "Season" drop down list in this dialog.

Description

A mission description, which is displayed in the following places:

- Beside the mission when it is selected in the IL-2 Sturmovik missions list
- In the map screen when the mission loads or when the player opens the mission briefing

You can use HTML to format the text.

GUI Map

The map that the flight crew can use for navigation.

Important! Make sure that the map matches the terrain selected in Terrain Presets.

Landscape Info

Indicates the landscape files that are automatically loaded for the selection that you make in "Terrain Presets".

If you are familiar with terrain editing, you can browse for another Height Map, Textures, and Forests and then click the "Apply" button to apply your choices. This manual does not cover terrain editing.

Mission Type

Select “Single” for a singleplayer mission or “Deathmatch” for a multiplayer mission.

Do not select mission types other than those listed here.

Name

The name that is displayed on the "Missions" list in the game.

If you leave this field blank, the mission file name is displayed in the Missions list.

Terrain Presets

Open a drop-down list, where you select the terrain on which the mission takes place.

The items under "Landscape info" are automatically loaded for the selection that you make in Terrain Presets.

Important! Make sure that the map selected in "GUI Map" matches the terrain selected here.

Move Camera to Dialog

How to Open: Right click in the View Port and choose "Move Camera to".

The "Move Camera to" dialog allows you to move the view to a specified location in the View Port.

X

The position (in meters) relative to the bottom of the map.

Y

The position (in meters) relative to the left side of the map.

Object Advanced Properties Dialog

How to Open: Select an object and double-click it.

This dialog is available only if you make an object a linked entity (pg. 17).

 # in Formation

The order of the object in the formation. The leader is #0 in the formation and wing men are #1, #2, and so on.

AI

If the object is controlled by the AI, this drop-down list specifies the AI skill level. Specify "Player" for a plane object that is controlled by a human.

You can use the behaviour command (pg. 238) to change this option during a mission.

Important:

- Because AI-controlled objects use a lot of resources (especially multi-crew planes), avoid creating too many of them in large missions.
- If you copy a "Player" plane, the copy automatically becomes the new "Player" plane and the original becomes an AI plane. This change can cause a problem if you are unaware of it. For more details, see The Player Cannot Enter a Plane in a Singleplayer Mission (pg. 185).

AI Return to Base Decision

Make an AI plane return to the nearest friendly airfield object under the following conditions:

- The plane is critically damaged (50% damage or more)

  In this case, the plane generates an OnPlaneCriticalDamage event message.
- The plane runs out of ammunition.

  In this case, the plane generates an OnPlaneBingoMainMG event message for the main (pilot-controlled) guns and an OnPlaneBingoTurrets event message for the turret guns.
- The plane has only enough fuel to return to the nearest friendly airfield object.

  In this case, the plane generates an OnPlaneBingoFuel event message.

Note:

- Place the airfield object at the point on the runway where you want the plane to stop after landing and orient the airfield object in the landing direction. If you have other airfield objects on ramps though, the plane could head toward those instead.
- If you select this option, check the location of any airfield objects that you create to allow players to spawn in the air. You may want to place those airfield objects at locations over runways or open fields. If an AI plane is near one of your air spawn airfield objects, it lands on the ground under that object.
- This option works with an object in a formation, but the reactions of the other formations members is unpredictable. Sometimes one or more members follow the plane that is returning to base and sometimes none of them do.

Beacon Channel

For vehicle object "ndb" (non-directional beacon) only. Enables (value 1) or disables (value 0) direction-finding radio transmissions from the object.

See Help Pilots Find an Airbase and a Runway (pg. 56).

Block Threshold

For a flag object. The position at which the flag going down generates event message OnFlagBlocked and the flag going up generates event message OnFlagUnblocked. For example, 0.5 means that the event messages are generated when the flag passes the halfway point, going up or down.

Callsign, #

The radio call sign and call number used for ground control radio messages that appear in the IL-2 Sturmovik chat window.

Note: If you leave the call number as zero, only the call sign is used in radio messages.

Change Formation

Available for the formation leader only. Opens the "Formation numbers" dialog, where

you can change the order of the formation members.

Country

The country to which the object belongs.

Note: An object's coalition, not it's country, determines whether it is a friend or an enemy of another object. You can assign a country to a coalition (for example, allies) in the Mission Countries Dialog (pg. 207).

You can use the behaviour command (pg. 238) to change this option during a mission.

Cooperative Start

Not implemented

Count Planes

Include planes in the total count of objects for each side that are in a flag object zone. The side with the most objects in the zone captures the flag.

Count Vehicles

Include vehicles in the total count of objects for each side that are in a flag object zone. The side with the most objects in the zone captures the flag.

Damage Report

Specifies a percent damage level that determines when an OnDamaged event message is produced by the object. You set up the OnDamaged event message in the "On Events Table" section of the dialog.

The damage level is a percentage of the object's "Durability" value, which is set in the Object Properties Dialog (pg. 217). Durability defines how much damage an object can take before it is destroyed. Objects other than airfield, block, bridge, and building have built-in durability values.

The percent damage specified in this field represents either a damage threshold or step-by-step damage amounts. For details, see the "Damage: (Threshold|Step)" option in this topic.

Damage: (Threshold|Step)

Determines whether the "Damage Report" field represents either a damage threshold or step-by-step damage amounts.

Selecting the Damage check box gives you "Damage: (Threshold)". In this case, the OnDamaged message is sent once the percentage of durability remaining falls below the value in "Damage Report". For example, if "Damage Report" is 75, then OnDamaged is sent when 75% of the durability is left. After the threshold is passed, additional damage produces additional OnDamaged messages.

Clearing the Damage check box gives you Damage: (Step). In this case, the OnDamaged message is sent every time the percentage of durability lost exceeds the value in "Damage Report". For example, if "Damage Report" is 20, then OnDamage is sent every time another 20% of the durability is lost.

Delete After Death

Delete the object about seven or eight minutes after it is destroyed.

If you want to delete the object sooner, use the delete trigger (pg. 280).

Description

Not implemented. Use the "Description" box in the Object Properties Dialog (pg. 217) instead.

Enabled

Makes the object available at the start of a mission. Otherwise, you can make the object available or unavailable later in the mission. For details, see the following:

- Create or Delete an Object While a Mission is Running (pg. 107)
- Deactivate or Activate an Object While a Mission is Running (pg. 114)

Engageable

The object is subject to attack by enemy AI objects.

You can use the behaviour command (pg. 238) to change this option during a mission.

Flag Type

The shape of the detection zone for a flag object. When an object enters the flag zone, the flag starts to move down the pole and the flag can be blocked, unblocked, and captured.

The "LandedOnly" flag type option is for a circular area on the ground.

The bottom of the cylinder shape and the center of the sphere shape are located at the ground level. The cylinder extends upwards to an unlimited altitude. Half of the sphere is under ground and half of it is above ground.

Note: Object-detection problems with flag objects can be due to the shape of the zone. Say you specify a flag with Flag Type "Sphere", and Radius "500". A plane that is 400m vertically and 400m horizontally away from the flag is 566m diagonally away from it, so the plane is not detected.

Fuel

The fuel on board the plane. Specify a number between 0 and 1.
For example, 0=empty, 0.5=half full, 1=full.

Hydrodrome

Not implemented

Limit Ammo

Limit the amount of ammunition available to the object.

You can use the behaviour command (pg. 238) to change this option during a mission.

Linked Translator ID / Linked TR ID

Entity ID, which is a unique numeric identifier for an object that is a linked entity. The

entity ID is displayed in these places:

- Beside the object in the mission tree, after the object ID (see the ID field in the Object Properties Dialog (pg. 217)).
- Beside the object in the View Port

  For linked entities, the object label and entity ID are yellow.

Maintenance Radius

For an airfield object. Defines the radius within which the "Return Planes" option in this dialog works.

Name

Not implemented

On Events Table

Opens the On Event Properties Dialog (pg. 221), which allows you to define an event message link from the object to an MCU.

On Reports Table

Opens the On Report Properties Dialog (pg. 224), which allows you to define a report message link from certain MCUs to the object and from the object to another MCU.

Payload

The default combination of basic weapons, armor, and modifications to make available to the player. Modifications are selected using the WeaponMods option in this dialog. The number beside Payload identifies the unique combination that you chose.

Note: Set the WeaponMods values in this dialog before you select the Payload value. Some WeaponMods change the Payload values that are available to select.

The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302).

Players can change the payloads in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Radius

The radius of the detection zone for a flag object. When an object enters the flag zone, the flag starts to move down the pole and the flag can be blocked, unblocked, and captured.

Rearm Friendlies

For an airfield object. Not implemented.

Refuel Friendlies

For an airfield object. Not implemented.

Repair Friendlies

For an airfield object. Not implemented.

Return Planes

For an airfield object. Require a multiplayer mission participant to return a plane undamaged to the departure airfield before the available count for that plane type is incremented again. Otherwise, the plane count decreases each time the plane type is used, regardless of whether players return the plane undamaged.

For this option to work, the player must exit the plane within the area specified by the Maintenance Radius field of this dialog.

Note: You can also replenish planes, regardless of their condition, by selecting the Renewable option in the Plane Settings Dialog (pg. 226). The "Return Planes" option overrides the Renewable option if a player returns a plane intact. In this case, the plane is added to the available count immediately rather than after the time period specified in "Renew Time".

Route Time

Indicates the time (in minutes) required for any plane to fly a route that you specify at an airspeed that you specify. This field is useful to determine the time required for an AI plane to fly a route defined by waypoint triggers, but you can specify any route that you want in the View Port, independent of waypoint triggers.

Note: This field has no effect on the current plane object; it is used only to find a route time for any plane.

Do the following:

1. Click the "Calc" button.

   The "Set plane speed" dialog opens.
2. Specify the airspeed (in km/h) maintained on the route and click OK.

   Your mouse cursor changes to a square with "R" and "T" in it.
3. Plot the route using the same techniques as those used with the "Measure Mode" button in the Tool Bar (pg. 196).

   The following data is displayed beside each point that you plot:

   - D – Distance (in meters) from the previous point to the current point.
   - L – Distance (in meters) from the first point to the current point.
   - T – Time (in minutes) from the previous point to the current point.

   You can plot any route that you want, independent of where the plane object is placed.
4. After you plot the last point on your route, press "Enter".

   The "Route Time" field is updated to indicate the time required to fly the route that you plotted. When you click OK, the route plot is deleted.

Script

A script that determines the object's behaviour. This field is filled in automatically.

Skin

The design used to paint the plane

Speed Factor

A multiplier for the speed at which the flag on a flag object moves down the pole and then up the pole after the flag is captured. Here are some sample speed factors and times for the flag to make the round trip:

Speed Factor 1–Four minutes

Speed Factor 2–Two minutes

Speed Factor 3–One minute, 20 seconds

Speed Factor 4–One minute

Speed Factor 5–48 seconds

Note: In the current version of IL-2 Sturvovik, speed factors greater than 1 are unreliable. Test your flag to check the round trip time and ensure that the time is equal when either side captures the flag.

Spotter / Spotter Radius

Specifies the size (in meters) of a circular area around certain objects that acts like a radar. Mission participants who join on the same side as the object see the area as a dashed circle on the GUI map. Icons are shown for all planes, artillery, ships, trains, and vehicles within the circle, except those objects named "NOICON" (for details, see Hide the Icon and Label for an Object in a Mission (pg. 90)).

The icons within the circular area are colour coded as follows:

- A black plane icon represents the player's plane.
- Red and blue plane icons and squares (for ground-based objects) represent enemy and friendly objects, according to the colours that are set in IL-2 Sturmovik under Settings > Flight Interface.

For a large radius circle, objects first appear grey. As the objects get closer to the spotter object, they gradually turn red or blue, depending on which side they are on. This colour change matches how object icons look from the cockpit as you approach them.

You can define a radar circle around planes, artillery, ships, trains, and vehicles. Planes have a built-in 10,000m radar circle but you can reduce this radius if you want by selecting this option and specifying a radius. A plane spotter circle can be seen only by the player in that plane.

When a player-controlled plane enters the spotter radius of a friendly, ground-based object, the object generates an OnSpottingStarted event message and a ground control radio message appears in the chat box.

Note: To see the spotting circle and the objects within it, players must do the following:

- Run a singleplayer mission that includes a plane for them or select a plane or a gunner position in a multiplayer mission.

  Players do not have to be in the cockpit to see the circle on the GUI map.
- Enable the HUD (key for "Show/hide entire HUD") and enable map markers (key for "Show/hide instrument panel, navigation and map markers").

Start Height

The starting height on the pole of the flag on a flag object. For example, value 1 means that the flag is at the top, 0.5 means that the flag is halfway up the pole, and 0 means that the flag is at the bottom of the pole.

Note: As a flag is captured, it goes to the bottom of the pole and then to the top, even if the start height is below the top of the pole.

Starting Condition Drop-Down List (Top-Right of Dialog)

Located beside the Cooperative Start check box. The initial location of the plane (on the ground or in the air) and the initial state (on or off) of the engine on a plane.

In Air

The engine is on and the plane is in the air.

On Parking

The engine is off and the plane is anywhere on the ground (including the runway).

On Runway

The engine is on and the plane is anywhere on the ground (including parking areas).

Target ID

The object entity ID of the formation leader if the current object is part of a formation. The entity ID for the current object is indicated in the "Linked TR ID" field of this dialog. The Target ID is -1 for the formation leader and for objects that are not part of a formation.

For more details, see Manage Object Formations (pg. 74).

Vulnerable

The object is vulnerable to damage.

You can use the behaviour command (pg. 238) to change this option during a mission.

WeaponMods

The default modifications to add to the basic weapon and armor options. The WeaponMods field shows a code that represents the modifications that you chose. The resulting combinations of modifications, basic weapons, and armor can be selected in the Payload field of this dialog.

Note: Set the WeaponMods values before you select the Payload value in this dialog.

Some WeaponMods change the Payload values that are available to select.

The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302)

Players can select modifications in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Object Properties Dialog

How to Open: Select an object, right-click on it, and choose Properties.

The Object Properties dialog allows you to specify properties that apply to the object regardless of whether it is a linked entity or not. If you make an object a linked entity (pg. 17), you can specify additional properties in the Object Advanced Properties Dialog (pg. 209).

Where indicated, some properties apply to certain types of objects only.

To set the object properties for a number of similar objects (for example, a few planes), select the objects, right-click on them, and choose Properties. The properties dialog shows the number of selected objects in the title bar.

>

Open the advanced properties dialog box for the object.

Add Chart

For airfield objects only. Opens the Airfield Chart Editing Dialog (pg. 199).

Carriages

For train objects only. Opens the Train Carriages Dialog (pg. 232).

Create Linked Entity

Does the following:

- Allows the object to interact with the mission by linking to other objects and MCUs
- Allows you to access the Object Advanced Properties Dialog (pg. 209)

The following objects must be linked entities to appear in a mission: airfield, artillery, effect, plane, train, and vehicle.

The following objects appear in a mission regardless of whether they are linked entities or not: building, block, bridge, flag, and ground

Note:

- If you need to place stationary planes, vehicles, or certain other objects, try to use an object starting with “Static” under the “Blocks” category rather than making an object into a linked entity. Static objects do not need to be linked entities to appear in a mission, so they use less mission resources. However, static objects do not interact with a mission.
- The country of a non-linked entity object is neutral by default. If you place a non-

linked entity object near a mission target, review the troubleshooting topic Chat Message "Fired on a friendly" When Player Attacks An Object (pg. 187).

Damage

For block, bridge, and building objects only. Allows you to apply damage to various parts of an object before a mission starts. For example, for a bridge with three spans between supports, you can destroy the middle span and that is how the bridge appears when the mission starts.

Note: You can also damage or repair an object (pg. 133) during a mission.

To add a damage entry, click the "Add" button.

To edit an existing damage entry, double-click it.

When you click "Add" or double-click an existing damage entry, the "Edit Damage Level" dialog opens, where you can specify the following:

- Structure ID–The numeric identifier for the structure to be damaged (for example, 0, 1, 2)

  Some simple objects have one structure with ID 0 or ID 1.

  To determine which structures correspond to each ID, do the following:

  1. View the object in the 3-D view.

     See "View the environment from a Selected Object or MCU" in Select Views and Move Around in the View Port (pg. 13).
  2. Apply damage to a particular structure ID and observe the results in the View Port.
- Damage Level–The amount of damage to apply to the specified structure

  Values from 0 to 0.5 apply no damage.

  Values greater than 0.5 apply complete damage.

To delete an existing damage entry, select it and press the Delete key.

Delete Linked Entity

Does the following:

- Prevents the object from interacting with the mission by linking to other objects and MCUs
- Prevents you from accessing the Object Advanced Properties Dialog (pg. 209)

Description

A description that you can specify for the object. The description is not displayed in the running mission. The description is limited to a maximum of 31 characters. You can enter more than 31 characters but the extra ones are discarded the next time that you open the properties dialog.

Durability

For airfield, block, bridge, and building objects only. Specifies how much damage an object can take before it is destroyed. Each successful attack on the object reduces the

remaining durability points. Once the remaining points reach zero, the object is destroyed. Objects other than airfield, block, bridge, and building have built-in durability points.

Edit Chart

For airfield objects only. Opens the Airfield Chart Editing Dialog (pg. 199).

ID

Object ID, which is a unique numeric identifier for the object.

If the object is not a linked entity, the object ID is displayed beside the object in the Mission Tree and in the View Port.

If the object is a linked entity, the object ID is displayed beside the object in the Mission Tree, followed by a colon and then the entity ID. The entity ID is displayed beside the object in the View Port and in the "Linked Translator ID" field in the Object Advanced Properties Dialog (pg. 209).

For example, here is the Mission Tree entry for a factory block object that is a linked entity:

The Russian factory has object ID 18 and entity ID 19. In the View Port, 19 is displayed beside the factory object.

Model

The location of the file that defines the shape of the object. A model is automatically specified for each object (except for Effects).

Name

The object name, which is displayed in the following places:

- In the mission tree and beside the object in the View Port.
- Beside a circular icon on the map in IL-2 Sturmovik, in the case of an airfield object.

  When a multiplayer participant clicks on the icon in IL-2 Sturmovik, a pop-up dialog displays the planes that are available for the associated airfield object.

Note:

- If you give an object the name "NOICON", then players cannot see the following:
  - The icon for that object on the GUI map
  - The label next to the actual object in the air or on the ground
- If you give a ground object the name "FARICON", then players can see the object label sooner.

Orientation (Planes, Effects, Grounds Objects)

The orientation of the object.

AX

Roll angle (in degrees) to the right, for example:

- 0 = level
- 45 = roll right 45 degrees
- 180 = roll right 180 degrees (upside down)
- 315 = roll right 315 degrees (same as roll left 45 degrees)

AY

Direction (in degrees), relative to North

AZ

Pitch angle (in degrees) upward, for example:

- 0 = level
- 45 = pitch up 45 degrees
- 180 = pitch up 180 degrees (upside down)
- 315 = pitch up 315 degrees (same as pitch down 45 degrees)

Note: You cannot edit AX and AZ for a plane unless the plane is started in the air. You select an air start in the starting location drop down list of the Object Advanced Properties Dialog (pg. 209).

Orientation (Objects Other than Planes, Effects, Grounds)

The direction (in degrees) of the object, relative to North

Note: For an airfield object, set the heading to accommodate how aircraft spawn on the airfield. The aircraft spawn pattern is indicated below the Object Library when you choose the airfield object in the library.

Planes

For airfield objects only. Opens the Planes Dialog (pg. 226), which is simply labeled "Dialog".

Position

The coordinates of the object in the View Port

X

Position (in meters) relative to the bottom of the map

Y

Height (in meters) above sea level (ASL)

Note: You can edit Y for planes only.

Z

Position (in meters) relative to the left side of the map

Script

For airfield, flag, and effect objects only. The location of a script file for the object, which is automatically specified.

Vehicles

For the airfield object "fakevehiclefield" only. The fakevehiclefield object allows multiplayer mission participants to join in player-controlled tanks. Opens the Vehicles Dialog (pg. 233).

On Event Properties Dialog

How to Open: Click "Add Event" in the advanced properties for the following items:

- Objects (except effects)
- Animation operator translators
- Camera operator translators
- Complex trigger translators
- Media operator translators

The On Event Properties Dialog allows you to define an event message link. The link that you define is created when you click OK in the advanced properties dialog. For more details, see Links (pg. 8).

Note: The OnPlaneTookOff and OnPlaneLanded event messages have equivalent report messages called OnTookOff and Onlanded. For details, see On Report Properties Dialog (pg. 224).

Find Target

Opens a list of MCUs from which you can select to create the event message link. Double-click on a row to select an MCU.

Target ID / Target Name

The ID and name of the MCU to which the event message link connects. ID 0 (zero) means that you have not chosen an MCU yet. The MCU ID comes from the "ID" field of

the MCU Basic Properties Dialog (pg. 204).

Type

The event that sends a signal on the event message link. Here are the events that require an explanation:

- OnAnimationStopped—From an animation operator translator. The animation has completed or another play animation command has triggered this translator.
- OnCameraCompleted—From a camera operator translator.

  This event will be documented in future editions of this manual.
- OnDamaged—The percent life remaining in an object after damage has fallen below the value specified in the object advanced properties "Damage Report" field.
- OnDamaged—This event is generated in the following cases, depending on the setting of the "Damage: (Threshold|Step)" field of the object advanced properties:
  - Damage: (Threshold)–The percent life remaining in the object damage has fallen below the value specified in the object advanced properties "Damage Report" field.
  - Damage: (Step)–The percentage of life lost for the object exceeds the value in the object advanced properties "Damage Report" field.

    For example, if "Damage Report" is 20, then OnDamaged is sent every time another 20% of an object's life is lost.
- OnFlagBlocked—From a flag object. On its way down the pole, the flag has reached the point specified by "Block Threshold" in the Object Advanced Properties Dialog (pg. 209). This event has no effect on the flag but can be used to trigger MCUs.
- OnFlagCapturedBy00...OnFlagCapturedBy16—From a flag object. A particular country captured the flag.

  These are the currently implemented values:
  - OnFlagCapturedBy01–Russia
  - OnFlagCapturedBy02–Germany
- OnFlagUnblocked—From a flag object. On its way up the pole, the flag has reached the point specified by "Block Threshold" in the Object Advanced Properties Dialog. This event has no effect on the flag but can be used to trigger MCUs.
- OnFlashDialogAction00...OnFlashDialogAction15—From a media translator. Detects a Flash button being clicked on the IL-2 Sturmovik screen.
- OnKilled–The pilot is dead or the plane can no longer operate (for example, the plane is on fire, out of fuel, or critically damaged). See also "OnPlaneDestroyed".
- OnMediaStopped—From a media translator. The media has completed or another media translator has been triggered.

- OnMovedTo—Not implemented
- OnObjectCriticallyDamaged—From a complex trigger translator. The object is 50% damaged or more.
- OnObjectDamaged—From a complex trigger translator. This event is generated in the following cases, depending on the setting of the "On Damage Threshold / off – Step" field of the translator advanced properties:
  - Threshold–The percent life remaining in the detected object after damage has fallen below the value specified in the translator advanced properties "Damage Report" field.
  - Step–The percentage of life lost for the detected object exceeds the value in the translator advanced properties "Damage Report" field.

    For example, if "Damage Report" is 20, then OnObjectDamaged is sent every time another 20% of the detected object's life is lost.
- OnObjectDroppedBombs—From a complex trigger translator. Not implemented.
- OnObjectEntered—From a complex trigger translator. An object has entered the zone defined by the translator.
- OnObjectEnteredAlive—From a complex trigger translator. An object has entered the zone defined by the translator and it has not been killed.
- OnObjectFinished—From a complex trigger translator. An AI or player-controlled object has finished its flight or drive, regardless of its condition or velocity.
- OnObjectFinishedAlive—From a complex trigger translator. An AI or player-controlled object has finished its flight or drive and it is alive.
- OnObjectFinishedStationaryAndAlive—From a complex trigger translator. Not implemented.
- OnObjectFiredFlare—From a complex trigger translator. Not implemented.
- OnObjectFiredRockets—From a complex trigger translator. The plane has fired one or more rockets (event signal takes about 15 seconds to occur)
- OnObjectKilled—From a complex trigger translator.

  Note: This event will be documented in a later edition of this manual.
- OnObjectLeft—From a complex trigger translator. An object has left the zone defined by the translator.
- OnObjectLeftAlive—From a complex trigger translator. An object has left the zone defined by the translator and it has not been killed.
- OnObjectRepaired—From a complex trigger translator. Not implemented.
- OnObjectSpawned—From a complex trigger translator. An AI-controlled object or player-controlled object has spawned in a singleplayer mission or a multiplayer mission.
- OnObjectStationaryAndAlive—From a complex trigger translator. The object is not moving and it has not been killed.

  For example, this message can be generated for a plane before take-off, after a

normal landing, or after a successful crash landing.

- OnOutOfPlanes—There are no more planes available in the current airfield object.
- OnPlaneAdded—A plane was added to the available planes in the current airfield object. This event occurs if you select the Renewable option in the Plane Settings Dialog (pg. 226) for the airfield object.
- OnPlaneBingoBombs—The plane has no more bombs.
- OnPlaneBingoFuel—The plane is low on fuel and will return to the nearest airbase object.
- OnPlaneBingoMainMG—The pilot-controlled machine guns have no more ammunition.
- OnPlaneBingoTurrets—The gunner-controlled machine guns have no more ammunition.
- OnPlaneCriticalDamage—The plane is 50% damaged or more.
- OnPlaneDestroyed—The plane can no longer operate, regardless of whether the pilot was killed. See also "OnKilled".
- OnPlaneSpawned—From a multiplayer airfield object. A multiplayer participant spawned in.

  Note: To detect an AI object spawned by a spawner trigger, select the OnSpawned report in the AI object.
- OnSoundStopped—From an animation operator translator. The sound track has completed or another play sound command has triggered this translator.
- OnSpottingStarted—From artillery, ship, train, and vehicle objects. This event occurs if a player-controlled plane enters the spotter radius set in the object advanced properties. Also, a radio message appears in the chat box.

On Report Properties Dialog

How to Open: Click "Add Report" in the advanced properties of a plane, vehicle, train, ship, artillery, or bridge object.

The On Report Properties Dialog allows you to define a report message link. The link that you define is created when you click OK in the advanced properties dialog. For more details, see Links (pg. 8).

Note: The OnTookOff and Onlanded report messages have equivalent event messages called OnPlaneTookOff and OnPlaneLanded. For details, see On Event Properties Dialog (pg. 221).

Command ID / Command Name

The ID and name of the MCU from which the first part of the report message link connects to the object.
0 (zero) means that you have not chosen an MCU yet. The MCU ID comes from the "ID" field of the MCU Basic Properties Dialog (pg. 204).

You can choose one of the following MCUs for the first part of a report link:

- Attack command (pg. 236)
  The first part of the report link goes to the object to be attacked.
- Attack area command (pg. 237)
- Land command (pg. 244)
- Spawner trigger (pg. 282)
- Take off command (pg. 246)

Find Command

Opens a list of MCUs from which you can select to create the first part of the report message link. Double-click on a row to select an MCU.

Find Target

Opens a list of MCUs from which you can select to create the second part of the report message link. Double-click on a row to select an MCU.

Target ID / Target Name

The ID and name of the MCU to which the second part of the report message link connects from the object.
0 (zero) means that you have not chosen an MCU yet. The MCU ID comes from the "ID" field of the MCU Basic Properties Dialog (pg. 204).

Type

The report that sends a signal on the report message link. Here are the reports that require an explanation:

- OnAreaAttacked—The object attacked the area defined by an attack area command.
  Note: The OnAreaAttacked report works only with the "Attack Ground" option of the attack area command.
- OnSpawned—The object was spawned by the spawner trigger.
  Note: To detect a multiplayer participant spawning in, select the OnPlaneSpawned event in an airfield object.
- OnTargetAttacked—The object that is object linked to an attack command has attacked the target.

Plane Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Planes Dialog

How to Open: Click "Planes" in the airfield object properties.

The Planes Dialog (simply labeled "Dialog") allows you to make planes available at the selected airfield for use by multiplayer participants.

The column headings in the Planes dialog are described in Plane Settings Dialog (pg. 226). Some field names are different between this dialog and the Plane Settings Dialog. Here is a table with the field differences:

Planes Dialog	Plane Settings Dialog
#	Set Index
Number	Planes Number
Start in Air	Unlabeled drop-down list at bottom left
Callnum	# (to the right of Callsign)

Add Button

Opens the Plane Settings Dialog (pg. 226), which allows you to add to the list of available planes.

You can also double-click an existing row to open the Plane Settings Dialog.

Clone Button

Creates a copy of an existing plane that you select in the list.

Plane Settings Dialog

How to Open: In the Planes Dialog (pg. 226), click Add or double-click an existing list entry.

The Plane Settings dialog allows you to specify the details of a plane that you can add to the list in the Planes dialog.

AI Level

The skill level of the AI autopilot. Players can enable the AI autopilot by pressing the key for "AI-autopilot on/off".

AI RTB Decision

If the AI autopilot is on, make the plane return to the nearest friendly airfield object under the following conditions:

- The plane is critically damaged (50% damage or more).
- The plane runs out of ammunition.
- The plane has only enough fuel to return to the nearest friendly airfield object. In this case, the plane generates an OnPlaneBingoFuel event message.

Note: If you select this option, check the location of any airfield objects that you create to allow players to spawn in the air. You may want to place those airfield objects at locations over runways or open fields. If an AI plane is near one of your air spawn

airfield objects, it lands on the ground under that object.

Altitude

The altitude (in meters) for the current plane. You can set a different altitude for each plane in the Plane Settings list.

Note: This field is valid only if the starting condition drop-down list (Under the "AI Level" Drop-Down List) is set to "In Air".

Available Mods

The modifications that a player can choose to add to the basic weapon and armor options rather than using the default modifications specified in the WeaponMods field of this dialog. Players can select one of the specified modifications in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Important!

- Specify values for the Available Payloads field first and then specify the required modifications for those payloads in this field.

  The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302).
- To enable the functionality of this field, choose Server Type "Custom" in the DServer Configuration Dialog (pg. 326), and select the "Lock weapon mods" check box in the DServer Advanced Settings Dialog (pg. 331).

Format:

- Digits–Numbers corresponding to the modifications available for the current plane.

  Modification numbers and descriptions are listed in Modifications and Payloads for Planes (pg. 302).

  0 (zero) means that players can choose to have no modifications.

  If you want, you can include the numbers for the default modifications specified in the WeaponMods field.
- Slash symbols (/)–A delimiter between each number or range of numbers
- Double periods (..)–A range between two modification numbers. All modifications in the range are allowed.

Example:

0/3..5 means that a player can choose to have no modifications (0) or modification 3, 4, or 5

Available Payloads

The combinations of basic weapons, armor, and modifications that a player can choose from rather than using the default payload specified in the Payload ID field of this dialog. Players can select one of the specified payloads in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Important!

- Specify the available payloads in this field first and then specify the required modifications for those payloads in the Available Mods field.

  The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302).
- To enable the functionality of this field, choose Server Type "Custom" in the DServer Configuration Dialog (pg. 326), and select the "Lock payloads" check box in the DServer Advanced Settings Dialog (pg. 331).

Format:

- Digits–Numbers corresponding to the payloads available for the current plane.

  Payload numbers and names are listed in Modifications and Payloads for Planes (pg. 302).

  If you want, you can include the number for the default payload specified in the Payload ID field.
- Slash symbols (/)–A delimiter between each number or range of numbers
- Double points (..)–A range between two payload numbers. All payloads in the range are allowed.

Example:

0/20..50/65 means that a player can choose to have payload 0, any payload between 20 and 50, or payload 65.

Available Skins

The plane paint designs that a player can choose from rather than using the design specified in the Skin field of this dialog

Format:

- Digits–Numbers corresponding to the order in which the skins appear in the Skin drop-down list for the current plane.

  0 (zero) is the first skin in the list, 1 is the second skin, and so on.

  If you want, you can include the number for the skin specified in the Skin field.
- Slash symbols (/)–A delimiter between each number or range of numbers
- Double points (..)–A range between two skin numbers. All skins in the range are allowed.

Example:

0/3..5/10 means that a player can choose to have the first skin (0), any skin between the forth (3) and sixth (5) skin, or the eleventh (10) skin.

Callsign, #

The radio call sign and call number used for ground control radio messages that appear in the IL-2 Sturmovik chat window

Note: If you leave the call number as zero, only the call sign is used in radio messages.

Engageable

The plane is subject to attack by enemy AI objects.

Limit Ammo

Limit the amount of ammunition available to the plane.

Model

The type of plane to make available to players

Name

(Optional) A name that is displayed above the plane model in the plane selection dialog for the airfield. The plane selection dialog appears when a player clicks an airfield icon in a multiplayer mission.

One use for Name is to distinguish between different roles for the same type of plane within a plane set. For example, you could create 10 Yaks-1s named "CAP" (combat air patrol) and 5 Yak-1s named "Ground Attack" in the same plane set and configure the payloads accordingly. For details about plane sets, see the "Set Index" field in this topic.

Note: If you give the plane the name "NOICON", then players cannot see the following:

- The icon for that object on the GUI map
- The label next to the actual object

Payload ID

The default combination of basic weapons, armor, and modifications that players get if they choose the current plane. Modifications are selected using the WeaponMods option in this dialog.

Note:

- Set WeaponMods in this dialog before you select the Payload ID value. Some WeaponMods change the Payload ID values that are available to select.

  The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302).
- Players can change the payloads in the IL-2 Sturmovik Plane Settings screen, Setup tab unless you lock the payloads. You lock the payloads by choosing Server Type "Custom" in the DServer Configuration Dialog (pg. 326), and selecting the "Lock payloads" check box in the DServer Advanced Settings Dialog (pg. 331).

  If you lock the payloads, players can choose only the payload that you set and any additional payloads that you specify in the Available Payloads field.

Planes Number/Unlimited

The number of planes of the current type that you want to make available at the airfield.

Select the "Unlimited" field to provide an unlimited number of planes. In this case, a value of -1 appears under "Number" in the Planes dialog.

Renewable/Renew Time

Replenish the available count for the current plane after a player exits the plane or the plane is destroyed. No matter how many planes are exited or destroyed, replenishment is done one plane at a time, with the specified time period occurring between each replenishment.

Renew Time (minutes and seconds) for the current plane starts when a player spawns in that plane.

For example, assume that a runway spawn point has two Yak-1s available and Renew Time is set to 5 minutes. Two players spawn at the same time and immediately takeoff together. Here are some possible scenarios:

- If both players crash on takeoff, one Yak becomes available five minutes after the players spawned in and the second Yak becomes available five minutes after that.
- If both players crash five minutes or more after takeoff, one Yak becomes available immediately and the second Yak becomes available five minutes after that.

Note: This option is overridden if you select "Return Planes" in the Object Advanced Properties Dialog (pg. 209) for the airfield object and a player returns the plane to the airfield intact. In this case, the plane is added to the available count immediately.

Route Time

Not implemented. However, "Route Time" is implemented in the Object Advanced Properties Dialog (pg. 209).

Script

A script that determines the object's behaviour. This field is filled in automatically.

Set Index

A number that defines which plane set the current row in the table belongs too. All planes with the same Set Index number belong to a plane set. You can specify which plane set is available at an airfield while a mission is running. For details on using plane sets, see "Change the Planes That Are Available at an Airfield" in Replenish or Change the Planes Available In a Multiplayer Mission (pg. 115).

All planes in set 0 are available from the beginning of the mission.

Skin

The design used to paint the plane

Starting Condition Drop-Down List (Under AI Level Drop-Down List)

The initial location of the plane spawn area (on the ground or in the air) and the initial state (on or off) of the engine on each plane spawned.

In Air

The engine is on and the plane spawn area is in the air.

Parking

The engine is off and the plane spawn area is on the ground (including the runway).

Runway

The engine is on and the plane spawn area is on the ground (including parking areas).

The pattern in which multiple planes spawn depends on the airfield object that you choose. Looking in the direction that the airfield object is oriented, here is how planes can spawn:

- The fakefield object spawns planes in a single row, starting from the left.
- The fakefield_rnwspawn object spawns planes in multiple rows, starting from the front, left.

In the Object Library, the spawn patterns and sizes are shown below the object that you choose.

Once the pattern for an airfield object is full in a running mission, a player that spawned has to move to open up a space for another player to spawn. To provide more room, you can place more airfield objects (provided you have enough room near your spawn location).

Vulnerable

The plane is vulnerable to damage.

WeaponMods

The default modifications to add to the basic weapon and armor options. Click the ">>" button to open the "Weapon Mods Dialog", where you can choose the modifications to make available. The WeaponMods field shows a code that represents the modifications that you chose. The resulting combinations of modifications, basic weapons, and armor can be selected in the Payload ID field of this dialog.

Note:

- Set WeaponMods before you select the Payload ID value in this dialog. Some WeaponMods change the Payload ID values that are available to select.

  The payloads and the required modifications for each payload are listed in Modifications and Payloads for Planes (pg. 302).

- Players can change the modifications in the IL-2 Sturmovik Plane Settings screen, Setup tab, unless you lock the weapons modifications in the DServer. You lock weapon modifications by choosing Server Type "Custom" in the DServer Configuration Dialog (pg. 326), and selecting the "Lock weapon mods" check box in the DServer Advanced Settings Dialog (pg. 331).

  If you lock the weapon modifications, players can choose only the weapon modifications that you set and any additional modifications that you specify in the Available Mods field.

Plane Properties Dialog

See Object Properties Dialog (pg. 217)

Ship Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Ship Properties Dialog

See Object Properties Dialog (pg. 217)

Train Carriages Dialog

How to Open: Click "Carriages" in the train object properties.

The Train Carriages dialog allows you to add carriages to a train engine object.

Choose carriages from the right-hand pane and click the "<<<" button to move them to the train carriage list in the left-hand pane.

The left-hand pane lists the carriages in the order that they appear on the train. Use the Up and Down buttons to change the order of a selected carriage on the train.

Train Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Train Properties Dialog

See Object Properties Dialog (pg. 217)

Vehicle Advanced Dialog

See Object Advanced Properties Dialog (pg. 209)

Note: This dialog is used for both vehicle objects and artillery objects.

Vehicle Properties Dialog

See Object Properties Dialog (pg. 217)

Note: This dialog is used for both vehicle objects and artillery objects.

Vehicles Dialog

How to Open: Click "Vehicles" in the airfield object properties.

The Vehicles Dialog (simply labeled "Dialog") allows you to make player-controlled vehicles available at the selected "fakevehiclefield" airfield object location for use by multiplayer participants.

The column headings in the Vehicles dialog are described in Vehicle Settings Dialog (pg. 233). Some field names are different between this dialog and the Plane Settings Dialog. Here is a table with the field differences:

Vehicles Dialog	Vehicle Settings Dialog
#	Set Index
Number	Planes Number (actually the vehicles number in this case)

Add Button

Opens the Vehicle Settings Dialog (pg. 233), which allows you to add to the list of available vehicles.

You can also double-click an existing row to open the Vehicle Settings Dialog.

Clone Button

Creates a copy of an existing vehicle that you select in the list.

Vehicle Settings Dialog

How to Open: In the Vehicles Dialog (pg. 233), click Add or double-click an existing table entry.

The Vehicle Settings dialog allows you to specify the details of a player-controlled vehicle type that you want to add to the table in the Vehicles dialog.

The Vehicle Settings dialog allows you to specify the details of a vehicle that you can add to the list in the Vehicles dialog.

AI Level

The skill level of the AI autopilot for the vehicle. Players can enable the AI autopilot by pressing the key for "AI-autopilot on/off".

Available Payloads

Not implemented

Available Mods

Not implemented

Available Skins

Not implemented

Beacon Channel

Not implemented

Engageable

The vehicle is subject to attack by enemy AI objects.

Limit Ammo

Limit the amount of ammunition available to the vehicle.

Model

The vehicle model to make available to players

Choose a vehicle object with a name starting with an underscore (for example, _t34-76stz for a tank).

Name

(Optional) A name that is displayed above the vehicle model in the vehicle selection dialog for the airfield. The plane selection dialog appears when a player clicks an airfield icon in a multiplayer mission.

Note: If you give the vehicle the name "NOICON", then players cannot see the following:

- The icon for that object on the GUI map
- The label next to the actual object

Planes Number/Unlimited

The number of vehicles of the current type that you want to make available at the vehicle spawn point.

Select the "Unlimited" field to provide an unlimited number of vehicles. In this case, a value of -1 appears under "Number" in the Vehicles dialog.

Renewable/Renew Time

Replenish the available count for the current vehicle after a player exits the vehicle or the vehicle is destroyed. No matter how many vehicle are exited or destroyed, replenishment is done one vehicle at a time, with the specified time period occurring between each replenishment.

Renew Time (minutes and seconds) for the current vehicle starts when a player spawns in that vehicle.

For example, assume that a vehicle spawn point has two T34 tanks available and Renew Time is set to 5 minutes. Two players spawn at the same time and immediately set off on a mission together. Here are some possible scenarios:

- If both player's tanks are destroyed right away, one tank becomes available five minutes after the players spawned in and the second tank becomes available five minutes after that.
- If both player's tanks are destroyed five minutes or more after setting off, one

tank becomes available immediately and the second tank becomes available five minutes after that.

Note: This option is overridden if you select "Return Planes" in the Object Advanced Properties Dialog (pg. 209) for the airfield object and a player returns the vehicle to the spawn point intact. In this case, the vehicle is added to the available count immediately.

Script

A script that determines the object's behaviour. This field is filled in automatically.

Set Index

A number that defines which vehicle set the current row in the table belongs too. All vehicles with the same Set Index number belong to a vehicle. You can specify which vehicle set is available for an airfield object while a mission is running. Vehicle sets are similar to plane sets. For details on using plane sets, see "Change the Planes That Are Available at an Airfield" in Replenish or Change the Planes Available In a Multiplayer Mission (pg. 115).

All vehicles in set 0 are available from the beginning of the mission.

Spotter

Not implemented

Vulnerable

The vehicle is vulnerable to damage.

Related Information

Create Player-Controlled Tanks (pg. 47)

Command MCUs

Attack Command

The attack command makes an object attack another object. For example, you can command a bomber to attack a factory.

Important! Avoid overusing this feature for AI bombing because it could slow down your mission.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to the object that is to be attacked

An object link to all of the objects that are attacking or to the leaders of any formations that are attacking

(Optional) The first part of an OnTargetAttacked report message link, which is set up in the object that is attacking the target. The second part of the report message link goes from the object to another MCU that you want to trigger. For details, see On Report Properties Dialog (pg. 224).

Advanced Properties

Priority

The priority of the attack.

Low–The attacking objects can also attack nearby enemies.

Medium–The attacking objects can maneuver to defend themselves from attacks.

High–The attacking objects do nothing except attack the target.

Attack Group

If the object to attack is the leader of a formation, attack the entire formation. Otherwise, attack only the leader.

Related Information

Make an Object Attack Another Object (pg. 119).

Attack Area Command

The Attack Area Command does one of the following:

- Makes planes, artillery, or flak guns attack enemy objects that are within the attack area.
- Makes planes or artillery attack the attack area in general.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the object that is attacking, for example, planes, vehicles, or ground-based weapons.

(Optional) The first part of an OnAreaAttacked report message link, which is set up in the object that is attacking the area. The second part of the report message link goes from the object to another MCU that you want to trigger. For details, see On Report Properties Dialog (pg. 224).

Note: If you create an OnAreaAttacked report message link, you must select "Attack Ground" in the advanced properties.

Advanced Properties

Priority

The priority of the attack

Attack Targets

The type of targets to attack

Attack Air Targets–Attack enemy planes.

Attack Ground–Attack the general area defined by the attack command.

Attack Ground Targets–Attack objects in area defined by the attack command.

Attack Area

The radius (in meters) of the circle representing the attack area

Time

The amount of time that the attacking object spends looking for and attacking targets.

Usage Notes

- If you want planes to attack, do the following:
  - In the attack command Basic Properties, set Position Y to the altitude from which you want the plane to attack.
  - Trigger the attack area command only when the attacking plane is airborne.
- If you want artillery to attack ground targets, set Position Y in the attack area command Basic Properties to an altitude at which the command icon is visible from the artillery. The guns need a direct view of the icon before they can fire. To check the command icon visibility, right-click an artillery icon and choose "Selected Object Menu" > "Look from this object".
- See an example of the attack area command in Create a Singleplayer Mission (pg. 33).

Related Information

Make an Object Attack Enemy Objects Within an Area (pg. 122)

Behaviour Command

The Behavior Command changes certain items in the Object Advanced Properties Dialog (pg. 209) and the Plane Settings Dialog (pg. 226) while a mission is running.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the object for which you want to change the behaviour

Advanced Properties

Except for the fields listed in this topic, the advanced properties fields are described in the Object Advanced Properties Dialog (pg. 209).

Filter

Specifies the items to change. Select the check box beside each item that you want to change and then set each item to the desired value.

Float Param

The plane set to make available in the linked airfield object. See the "#" field in the Planes Dialog.

For examples of using the behaviour command, see the following topics:

- Change Object Properties While a Mission is Running (pg. 115)
- Replenish or Change the Planes Available In a Multiplayer Mission (pg. 115)
- Manage Airfield Availability (pg. 131)
- Change Control of an Airfield to the Enemy (pg. 132)

Cover Command

The Cover Command causes an object to protect another object from attack by enemy objects. For example, you can command a fighter formation to protect a bomber formation.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to the object that requires protection

An object link to the object that provides protection

Advanced Properties

Cover Group

Protect all the members of any formation to which the object belongs.

Priority

The priority of the coverage.

Low–The covering objects can also attack nearby enemies.

Medium–The covering objects can maneuver to defend themselves from attacks.

High–The covering objects do nothing except cover the object requiring protection.

For an example of using the cover command, see Make an Object Protect Another Object (pg. 122).

Damage Command

The Damage Command is used to damage or repair an object. For example, you can damage a fuel depot or bridge to simulate sabotage by partisans and repair that object later on. You can also repair damage resulting from attacks by players or AI objects.

Icon

Input

A target link from another MCU or a message link from an object

Output

Object links to the objects that you want to damage or repair

Advanced Properties

Damage Level

The level of damage or repair to apply to the linked object

Damage Type

Damage–Apply damage to the linked object at the level specified in "Damage Level".

Multiple–You cannot select this option, but you can change the advanced properties for multiple damage commands at once. Do the following:

1. Select all of the damage commands that you want to change.
2. Right click on the selection and choose "Advanced Properties".
3. Set the advanced properties that you want for the selected commands and click OK.

Repair–Repair damage to the linked object at the level specified in "Damage Level".

Note:

- Damage affects all the members of an object formation.
- Repair does not work on objects that were created with damage already applied. See the "Damage" field in the Object Properties Dialog (pg. 217).
- Repair does not work on plane objects, but it does work on static planes (in the block object library) that are linked entities.

For an example of using the damage command, see Damage or Repair an Object (pg. 133).

Effect Command

The Effect Command allows you to start or stop an effect. Effects are available in the Objects Library part of the Mission Editor Interface.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the effect that you want to control

Advanced Properties

Action Type

Starts or stops the effect

For examples of using the effect command, see the following topics:

- Make a Chimney Smoke (pg. 52)
- Help Pilots Find an Airbase and a Runway (pg. 56)
- Create an Air Raid Siren (pg. 127)
- Make Areas Smoke Due to Damage (pg. 130)
- Effect Sustainer (pg. 290)

Flare Command

The flare command causes certain objects to fire a flare of a specified color.

Icon

Input

A target link from another MCU or a message link from an object.

Output

An object link to the object that fires the flare.

The object must be one of the following types: Planes, Vehicles, Trains, or Artillery.

Advanced Properties

Color

The color of the flare

Note: If you want an object to fire multiple flares in succession, you need at least a four-second delay between triggering each flare command.

Example: Mark an Airfield with a Flare Command

This example shows the flare command "Fire Location Flare" linked to a vehicle that fires a flare to mark the location of the airfield. The incoming target link could be from a check zone trigger that detects a friendly plane approaching the airfield to land.

Related Topics

Fire a Flare to Signal Players to Take Off (pg. 55)

Help Pilots Find an Airbase and a Runway (pg. 56)

Force Complete Command

The Force Complete Command can do the following:

- Cancel the current command that was issued to an object.
  For an example of canceling a command, see Make an Object Attack Another Object (pg. 119).
- Turn searchlight or landlight artillery objects on or off.
  For an example of turning lights on or off, see "Mark a Runway With Lights" in Help Pilots Find an Airbase and a Runway (pg. 56).

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the following:

- The object for which you want to cancel a command
- A searchlight or landlight that you want to turn on or off

Advanced Properties

Priority

Low

Turn a light on.

High

Turn a light off.

Formation Command

The Formation Command specifies a formation for objects to adopt. For example, you can command a formation of fighters to fly in a V formation.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the formation leader

Advanced Properties

Formation Type

The shape of the formation or the action of the formation. Here are the types:

- **Plane: Left Edge Form**—Planes fly diagonally to the left of the leader. Each plane flies behind and to the left of the plane ahead of them in the formation order.
- **Plane: None**—Line astern formation. Planes fly in a straight line behind the leader.
- **Plane: Right Edge Form**—Planes fly diagonally to the right of the leader. Each plane flies behind and to the right of the plane ahead of them in the formation order.
- **Plane: V-Form**—Planes fly in a V shape behind the leader. Referring to each

planes order number in the formation, even numbered planes fly left edge formation and odd numbered planes fly right edge formation.

- **Vehicle: Backward**—Vehicles travel facing backward straight to the next waypoint.
- **Vehicle: Continue Moving**—Vehicles continue to move toward the next waypoint. Use this type after using the "Vehicle: Panic Stop" type.
- **Vehicle: Forward**—Vehicles travel facing forward straight to the next waypoint. Use this type after using the "Vehicle:Backward" type.
- **Vehicle: Off Road Column**—Vehicles travel straight to the next waypoint, one vehicle behind the other.
- **Vehicle: Off Road User Form**—Vehicles travel straight to the next waypoint, in their current formation (which may be the formation they were in when they were placed in the View Port).
- **Vehicle: On Road Column**—Vehicles travel on the road to the next waypoint, one vehicle behind the other. The formation automatically follows any curves or turns in the road to get to the waypoint.
- **Vehicle: Panic Stop**—Vehicles pull off of the road in different directions and stop. This formation type is useful in response to an attack.
- **Vehicle: Set Direction and Stop**—Vehicles turn simultaneously to a specified direction and stop. For example, a column of tanks can turn and face an enemy on their flank. Specify the direction in the AY field of the formation command basic properties.

Important! An object must be moving before you can trigger a formation command, except for the "Continue Moving" formation type.

For examples of using the formation command, see the following topics:

- Manage Object Formations (pg. 74)
- Make a Vehicle Follow a Route (pg. 67)
- Detect the Proximity of Objects to One Another (pg. 87)

Land Command

The land command makes a plane turn on it's navigation lights, fly a wide circuit of the airfield, and then land where the icon is placed. The plane then turns off it's engine and navigation lights and disappears after 30 seconds.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the plane that you want to land

(Optional) The first part of an OnLanded report message link, which is set up in the plane that you want to land. The second part of the report message link goes from the plane to another MCU that you want to trigger. For details, see On Report Properties Dialog (pg. 224).

Use

Place the land command where you want the plane to touch down and set the icon direction to the direction in which you want the plane to land.

For examples of using the land command, see the following topics:

- Make a Plane Take Off, Fly a Route, and Land (pg. 61)
- Make a Plane Taxi to and From a Runway (pg. 63)

Move Command

The move Command is not implemented.

Icon

Play Animation Command

The play animation command plays an animation specified in an animation operator translator (pg. 247).

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to an animation operator translator

Advanced Properties

Animation Name

The animation to play

Usage Notes

To play a preview of the animation in the editor, select the play command, right click it, and choose Selected Object Menu > Play. To stop the preview playback, press the Esc key.

For an example of using the play animation command, see Display a 3-D Object That Can Be Animated (pg. 159).

Play Sound Command

The play sound command plays a sound specified in an animation operator translator (pg. 247).

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to an animation operator translator

Advanced Properties

Sound Name

Not implemented

For an example of using the play sound command, see Play Audio (pg. 154).

Take Off Command

The take off command makes a plane turn on it's navigation lights, pause for 30 seconds, start it's engine or engines, take off, and turn off it's navigation lights.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the plane that must take off

(Optional) The first part of an OnTookOff report message link, which is set up in the plane that is taking off. The second part of the report message link goes from the object to another MCU that you want to trigger. For details, see On Report Properties Dialog (pg. 224).

Note: You can also create an OnPlaneToolOff event message link from the plane to another MCU that you want to trigger. For details, see On Event Properties Dialog (pg. 221).

Usage Notes

Unlike the land command icon, you do not need to adjust the direction of the take off icon. The plane takes off in the direction in which it is pointed.

For examples of using the take off command, see the following topics:

- Make a Plane Take Off, Fly a Route, and Land (pg. 61)
- Make a Plane Taxi to and From a Runway (pg. 63)

Translator MCUs

AI POI Translator

The AI POI Translator will be documented in a later edition of this manual.

Icon

Animation Operator Translator

The animation operator translator can provide the following in a mission:

- A 3-D object that can be animated in various ways
- An audio track

Icon

Input

An object link from a Play Animation Command or a Play Sound Command or both

Output

(Optional) An OnAnimationStopped or OnSoundStopped event message link to another MCU that you want to trigger. For details, see On Event Properties Dialog (pg. 221).

Advanced Properties

Speed

The initial speed of the animation

Animations

A list of the animations that are available for the 3-D model. You specify the animation that you want to play in the advanced properties of the play animation command.

Config

The path and file name of a .chr file that contains a 3-D model and various animations for that model.

Note: You can find sample .chr files in your game folder under \data\graphics\Helpers.

Click the Set button to confirm your file specification. The "Animations" list is then populated with the animations available for the specified 3-D model.

Config is Sample

Always select the "Config is Sample" check box, which allows you to select an .mp3 file in "Sound Config".

Sound Config

The path and file name for an .mp3 audio track. Click "Browse" to select an .mp3 file. Click "Set" to confirm your file specification.

Sounds

Not implemented

On Events Table

Open the On Event Properties Dialog (pg. 221), which allows you to define a message link from the animation operator translator to another MCU.

Usage Notes

- If you specify a file in the "Config" field, set the height and orientation of the animation operator in the basic properties.
- The play animation command (pg. 245) can play any animation that is included with the 3-D object and the play sound command (pg. 246) plays the audio track. You can specify a 3-D object and an audio track in the same animation operator translator and play the animation and audio track together or separately. For details on playing animations and audio tracks, see the example in this topic.

- You can hide the 3-D object or stop the audio track by deactivating the animation operator with a deactivate trigger (pg. 280). By activating the animation operator translator with an activate trigger (pg. 274), you can make the 3-D object visible again or enable the audio track to be played again with the play sound command.

  The 3-D object for an animation is visible and stationary from the start of the mission, regardless of when the animation is to be played. You can hide the object at mission start and show it later on.

  For details on hiding and showing the 3-D object, see the example in this topic.

Example: Demonstrate the Animation Operator Translator

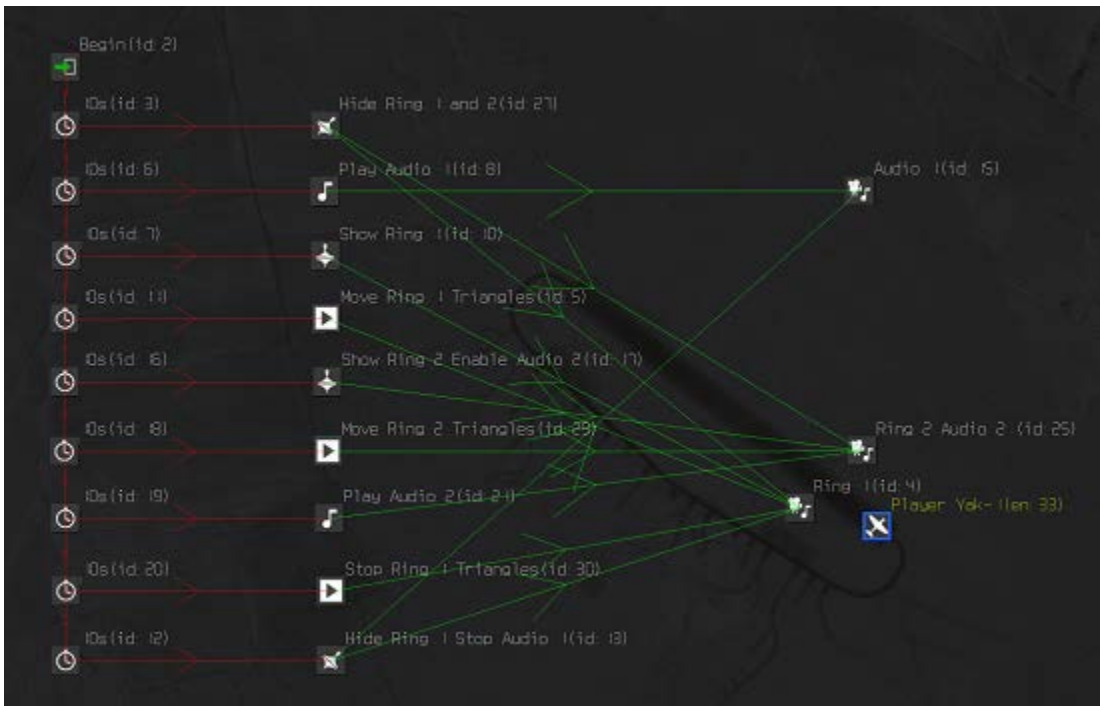
This example demonstrates the features of the animation operator as follows:

- Play multiple audio tracks separately and together, and stop those tracks at any time.

  For the purpose of this demonstration, you must provide two mp3 music files (or any mp3 audio files that play longer than 80 seconds).
- Show and hide two 3-D ring objects, and start and stop the animation included in the objects.

  There are four animated triangles spaced around each ring that move inwards and outwards relative to the center of the ring. A ring object is shown in Display a 3-D Object That Can Be Animated (pg. 159).

Here is the layout for the demonstration:



On the right side of the screenshot are the following MCUs:

- "Audio 1" animation operator translator

  Advanced Properties:

  - Sound Config: An mp3 audio file longer than 80 seconds
  - Config is Sample: Selected
- "Ring 1" animation operator translator

  This translator is placed near "Player Yak-1" so the player can easily see the ring object specified in the translator.

  Properties:

  Orientation AY: 270 (red side of the ring faces 270 degrees so that green side is visible to the player)

  Advanced Properties:

  "Config: graphics\helpers\waypoint.chr

  "waypoint.chr" is a ring object.
- "Ring 2 Audio 2" animation operator translator

  This translator combines an audio track and an animation that can be used together or separately.

  This translator is placed near "Player Yak-1" so the player can easily see the ring object specified in the translator.

  Properties:

  Orientation AY: 0 (red side of the ring faces 0 degrees so that green side is visible to the player)

  Advanced Properties:

  - The audio properties are the same as "Audio 1", but a different mp3 audio file is specified.
  - The animation properties are the same as "Ring 1".

The 10-second timer triggers on the left control the timing of the demonstration.

Here is the demonstration timeline:

- 0:00 Ring 1 and ring 2 are visible and the ring triangles are stationary.
- 0:10 Trigger the "Hide Ring 1 and 2" deactivate trigger.

  Both rings disappear.

  If you want the rings to be hidden at the start of the mission, shorten the time in the first timer trigger to about two seconds.
- 0:20 Trigger the "Play Audio 1" play sound command.

  Audio track 1 starts playing.
- 0:30 Trigger the "Show Ring 1" activate trigger.

  Ring 1 appears and the triangles are stationary.

- 0:40 Trigger the "Move Ring 1 Triangles" play animation command.
  Command Advanced Properties:
  Animation Name: no-idle
  The ring 1 triangles start moving.
- 0:50 Trigger the "Show Ring 2 Enable Audio 2" activate trigger.
  Ring 2 appears and audio track 2 is ready to play.
- 0:60 Trigger the "Move Ring 2 Triangles" play animation command.
  Command Advanced Properties:
  Animation Name: no-idle
  The ring 2 triangles start moving.
- 0:70 Trigger the "Play Audio 2" play sound command.
  Audio track 2 starts playing (audio track 1 is already playing).
- 0:80 Trigger the "Stop Ring 1 Triangles" play animation command.
  Command Advanced Properties:
  Animation Name: idle
  The ring 1 triangles stop moving.
- 0:90 Trigger "Hide Ring 1 Stop Audio 1".
  Ring 1 disappears and audio 1 stops (audio track 2 is still playing).

Camera Operator Translator

The Camera Operator Translator defines a camera view that you can allow players to access during a mission. You can place the camera at any location and altitude.

Note: Other camera capabilities will be documented in a future edition of this manual.

Icon

Input

(Optional) An object link from an activate trigger (pg. 274), deactivate trigger (pg. 280).

Output

None

Advanced Properties

Camera Operator Type

Default—A camera view that is accessible using the key that the player has assigned to the function "Camera operator: friendly" (default key is F12) in IL-2 Sturmovik.

You can set up multiple default cameras and the player can cycle through each view by pressing the assigned key. In each view, players can press the key that they assigned to "Camera: free" (default key is F11) and use the mouse to look around and zoom in and out.

To access an enemy default camera operator in a singleplayer mission, the player must open the Missions > Realism screen and do one of the following:

- Click the "Normal" button.
- Click the "Custom" button and select "Allow Spectators".

To allow a player to access an enemy default camera operator in a multi-player mission, Open the DServer Configuration dialog and do one of the following:

- Select the "normal" server type.
- Select the "custom" server type and select "Allow spectator" in the Advanced Settings dialog.

Usage Notes

You can enable or disable any default camera operator using the activate trigger or deactivate trigger. This allows you to activate different views as a mission progresses.

For an example of using the camera operator translator, see Create Views That a Mission Participant Can See (pg. 53).

Complex Trigger Translator

The complex trigger translator detects when the following events occur:

- Specified planes or vehicles either enter or leave a defined zone.
- Specified planes or vehicles that are within a defined zone cause a specified event to occur.

  For example, the translator can detect when planes within a zone are spawned, drop bombs, or finish their flight.

Note:

- Detection occurs for each of the specified planes or vehicles. For example, if five planes leave the zone, detection occurs five times.
- If you want to detect objects that are already inside or outside a zone (in addition to detecting objects entering or leaving a zone), use the check zone trigger (pg. 276).

Important! Because complex trigger translators use a lot of resources, avoid using too many of them in large missions. You may be able to use the check zone trigger (pg. 276) or proximity trigger (pg. 281) instead.

Icon

Input

(Optional) An object link from an activate trigger (pg. 274) or a deactivate trigger (pg. 280). For details, see the "Enabled" option in this topic.

Output

Event message links to other MCUs that you want to trigger.

Advanced Properties

Check Vehicles

Enables the complex trigger translator to detect vehicles.

Check Entities

Enables the complex trigger translator to detect planes (player-controlled or AI-controlled).

Countries

Specifies the countries to which objects must belong to be detected by the complex trigger translator. An object country comes from the plane or vehicle advanced properties.

The "…" button opens the "Edit Complex Trigger Object Countries List" dialog, where you specify the countries to detect

Damage Report

Specifies a percent damage level for an object specified in the complex trigger translator. This damage level determines when an OnObjectDamaged event message is produced by the translator. To set up the OnObjectDamaged event message, do the following:

- Select "Object Damaged" in the Events Filter" section of the dialog.
- Add the OnObjectDamaged event to the "On Events Table" section of the dialog.

The damage level is a percentage of the built-in durability of a plane or vehicle, which defines how much damage those objects can take before it is destroyed.

Note: The OnObjectDamaged event is separate from the OnDamaged event produced by an object, but they both work the same way.

The percent damage specified in this field represents either a damage threshold or step-by-step damage amounts. For details, see the "On Damage Threshold / off – Step" option in this topic.

Enabled

Makes the complex trigger translator active at the start of a mission. Otherwise, you can activate the translator later in the mission by using the activate trigger. You can deactivate the translator again with the deactivate trigger. For more details, see Deactivate or Activate Mission Functions (pg. 105).

Events Filter

Filters the events that can trigger the complex trigger translator. For each event filter that you select, you can add a corresponding event to the "On Events Table" to specify the MCU that is triggered by that event. For example, for filter "Object Took Off", you can add event "OnObjectTookOff" and specify an MCU to trigger.

For a description of the items in Events Filter, see the corresponding events in the On Event Properties Dialog (pg. 221).

Object Scripts List

Specifies scripts that objects must use to be detected by the complex trigger translator. An object script comes from the plane or vehicle advanced properties.

The "…" button opens the "Edit Complex Trigger Object Scripts List" dialog, where you specify the scripts to detect.

Script names starting with an underscore are used for player-controlled vehicles. For more details, see Create Player-Controlled Tanks (pg. 47).

Important! Do not specify scripts with "-c" after the first part of the object name. For example, specify he111h6 but not he111h6-c1-low.

Object Names List

Specifies the names that objects must have to be detected by the complex trigger translator. A name must match exactly but the case (upper case/lower case) does not matter. An object name comes from the plane or vehicle basic properties.

The "+" button opens the "Input Object Name" dialog, where you specify a name to detect. Press OK to add the name to the list.

The "-" button deletes the selected entry from the list.

The "Edit" button allows you to edit the selected entry in the list.

On Cylinder / Off - Sphere

The shape of the area in which objects are detected.

Select the check box to enable a cylindrical area, with unlimited height.

Clear the check box to enable a spherical area. The radius is specified in the "Radius" field. The center of the sphere is located at the complex trigger translator icon.

On Damage Threshold / off - Step

Determines whether the "Damage Report" field value represents either a damage threshold or step-by-step damage amounts.

Selecting the check box makes Damage Report a threshold value. In this case, the OnObjectDamaged message is sent once the percentage of life remaining for an object specified in the complex trigger falls below the value in "Damage Report". For example, if "Damage Report" is 20, then OnObjectDamaged is sent when 20% of an objects life remains. After the threshold is passed, additional damage

produces additional OnObjectDamaged messages.

Clearing the check box makes Damage Report a step-by-step value. In this case, the OnObjectDamaged message is sent every time the percentage of life lost for an object specified in the complex trigger exceeds the value in "Damage Report". For example, if "Damage Report" is 20, then OnObjectDamaged is sent every time another 20% of an object's life is lost.

On Events Table

The MCUs that are triggered by specified events. Click "Add Event" to open the On Event Properties Dialog (pg. 221). The events correspond to the filters in the Event Filter list.

To trigger multiple MCUs for a certain event, add that event multiple times and specify a different MCU for each entry.

Radius

The radius of the area in which planes or vehicles are detected

Usage Notes

Review Complex Trigger Translator Events Are Not Triggered (pg. 189) to avoid potential problems with the complex trigger translator.

For examples or using the complex trigger translator, see the following:

- Detect Objects In Relation to a Defined Area (pg. 81)
- Detect Events from Objects Inside an Area (pg. 86)

Icon Translator

The icon translator allows you to mark locations and draw shapes on the flight crew's map (pg. 151).

Because objects and MCUs are not shown on the GUI map, you can use icons to mark these items instead. For example, you can use an icon translator to show the location of a factory to attack. Also, you can place icon translators near waypoint triggers and draw a line between the icon translators to show the route defined by the waypoints. You can also use icon translators to indicate front lines and the direction of offensives.

Icon

Note: The icon shown is the default. You can select other icons in the MCU advanced properties.

Input

(Optional) Target link from an icon translator, which draws a line between the two

translators

(Optional) Target link from an activate trigger or deactivate trigger, which shows or hides the translator

Output

(Optional) Target link to another icon translator, which draws a line between the two translators

Advanced Properties

Background Color RGB

The RGB color of the line drawn between the current icon translator and the icon translator to which it is target linked. In the three boxes, type numbers between 0 and 255 to specify the red (R), green (G), and blue (B) components of the color. For example 255, 0, 0 is red, 0, 255, 0 is green, 0,0,0 is black, and 255, 255, 255 is white.

Coalitions

A list that determines whether a coalition can see icon translators and lines between icon translators on the GUI map. Double-click the value beside each coalition to set it to true (icons and lines visible) or false (icons and lines not visible).

Enabled

Makes the icon visible at the start of a mission. Otherwise, you can activate the icon later in the mission by using the activate trigger (pg. 274). You can deactivate the icon again with the deactivate trigger (pg. 280).

Icon ID

The icon to show on the GUI map. Use ID “None” if you want to draw lines between icons without showing the icons.

Line Type

The type of line to draw between two icon translators that are joined by a target link. For example, here are a couple of ways to target link icons together to make a line or an enclosed area:

In this case, the Name field is blank and the "Icon ID" field is set to "None" for all the icons.

Here are the GUI map results for a "Zone Type 1" line type:

In some cases, you may want to show the icons when you draw lines on the GUI map. For example, you can choose "Waypoint" in "Icon ID" to indicate the waypoints along a route that you defined using waypoint triggers.

For more about drawing lines, see the usage notes later in this topic.

Following are the line types, with examples based on the icon arrangements just shown (except for the "Attack" type).

Attack

The attack line type is used to create an arrow to show offensives on the GUI map. This shape requires at least four icon translators.

Here is an icon layout to create an arrow that sweeps upwards and from the right (tail) to the left (head):

You must target link the icons from the arrow tail towards the arrow head.

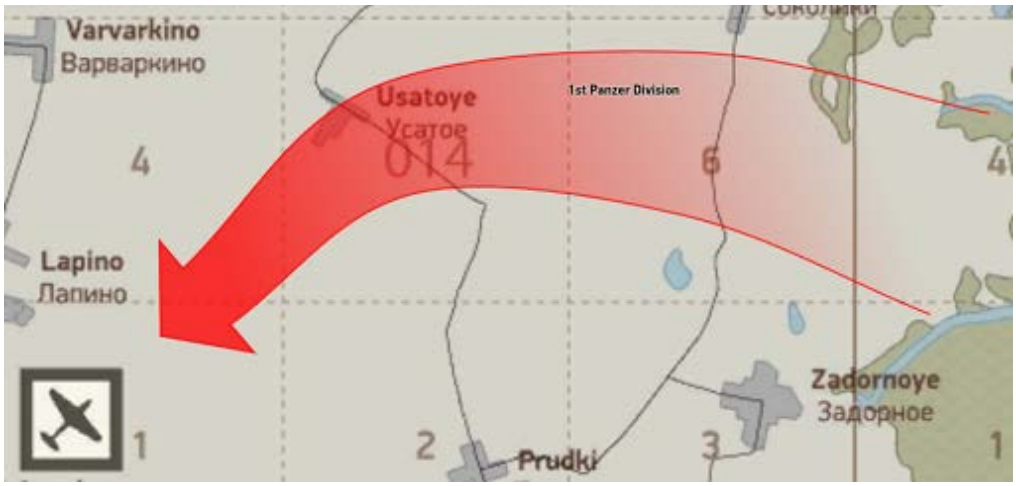
There is one icon labeled "1st Panzer Division", which appears inside the arrow on the GUI map. This icon is not target linked to any other icon.

Looking towards the arrow head, the last icon must be placed to the right of the second last icon and closer to the arrow tail (like a hook). The distance and angle of the two icons at the arrow head determines the size and shape of the head.

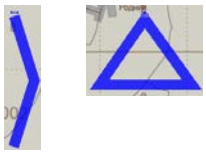
The distance between the two icons at the arrow tail determines the width of the tail.

The icons in between the two at the head and the two at the tail determine the curve of the arrow. You can place the "in between" icons wherever you like. A straight arrow requires just the first two icons and the last two icons.

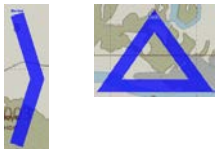
Here is the resulting arrow on the GUI map.



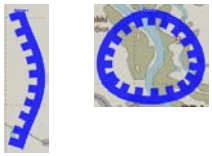
Bold



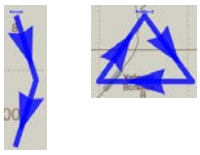
Border



Defence



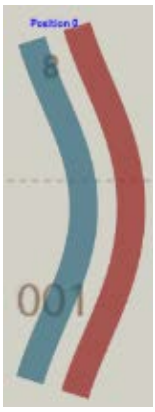
Normal

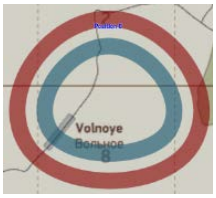


Positions Type

0 (In editor)

0 (In game)



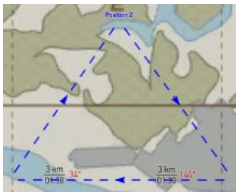


1

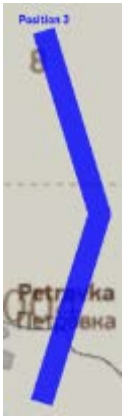

Position 1
8
3 km
01:23
163°
3 km
01:25
197°

2


Position 2
8
3 km
01:23
163°
3 km
01:25
197°



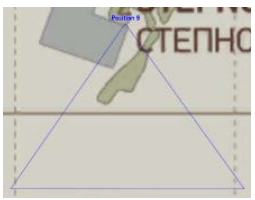
3 to 8


Position 3
8

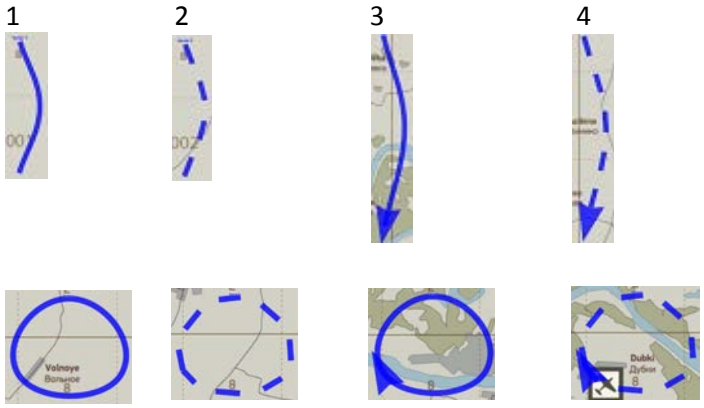
9


Position 9
8
017

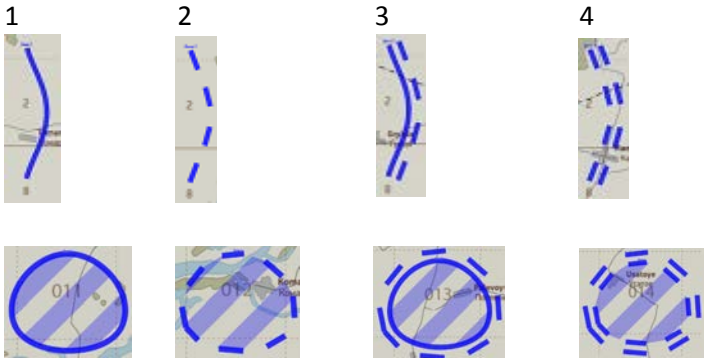

Dubki


Position 9
СТЕПНО

Sector Type



Zone Type



Usage Notes

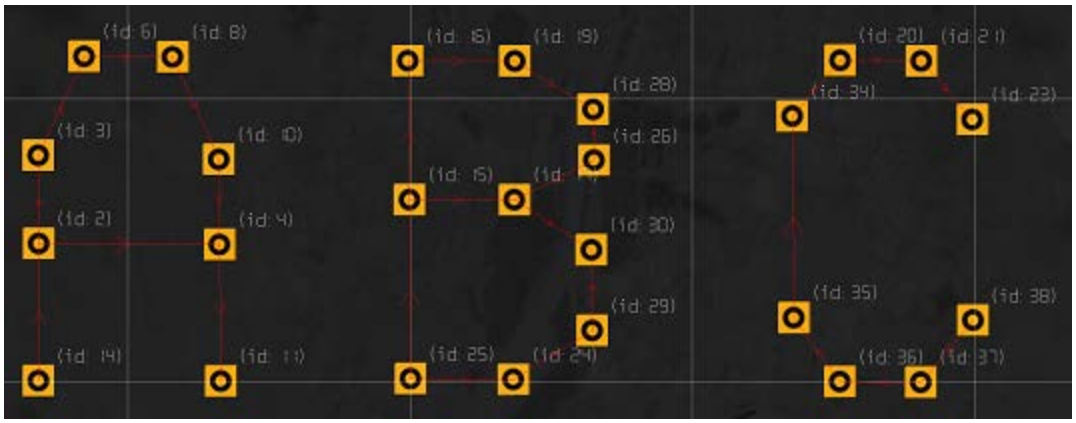
- If you display an enclosed area using three icon translators arranged in a triangle, the resulting area has boundaries that curve outwards. If you want the area boundaries to be flatter, add extra icons in between the existing icons as follows:

You can adjust the boundaries outwards or inwards by moving the extra icons farther from or closer to the center of the area.

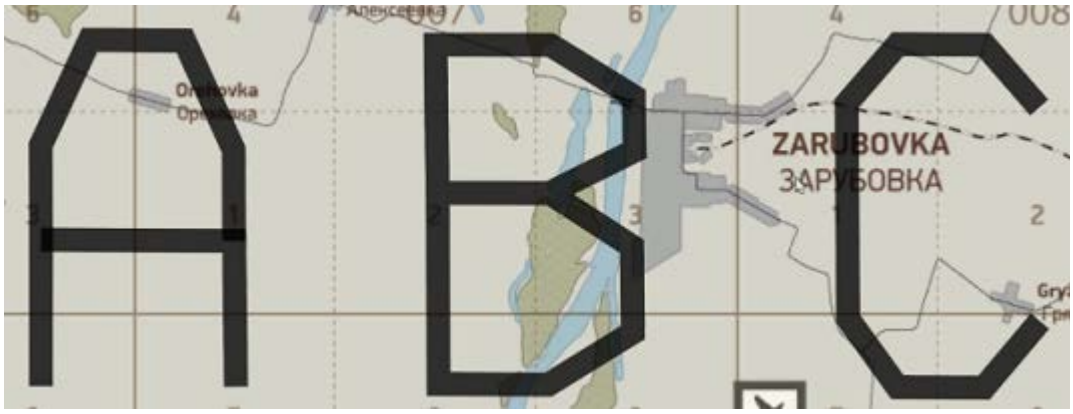
- Some lines have an orientation based on the direction in which you target link the icon translators. Here is an example using the Defence line type:

Here are the resulting lines and areas on the GUI map:

- You can use the bold line type to draw large letters on the GUI map. Here is an example of the letters A, B, and C:



Here is the result on the GUI map:



The direction in which you target link the icons affects how the more complicated letters look. In the letters A and B, note how the target links start from the lower left, go clockwise, and branch out along the way. For example, in A, icon "id 2" links to icon "id 3" and icon "id 4". If you link icon 4 to icon 2 instead, the letter is not formed correctly.

For examples of using the icon translator, see the following topics:

- Create a Singleplayer Mission (pg. 33)
- Create a Multiplayer Mission (pg. 38)
- Help Pilots Fly a Route (pg. 60)
- Make a Train Follow a Route (pg. 70)
- Trigger an Event Based on How Many Times Other Events Occur (pg. 94)
- Create or Delete an Object While a Mission is Running (pg. 107)
- Create Target Defences (pg. 125)

- Make an Object Protect Another Object (pg. 122)
- Damage or Repair an Object (pg. 133)
- Mark a Target as Damaged or Destroyed (pg. 128)
- Mark Locations and Draw Shapes on the Flight Crew's Map (pg. 151)

Related Information

Cannot See Icons or Lines Created by Icon Translators On the GUI Map (pg. 188)

Damage Display Switch (pg. 287)

Influence Area Translator

Note: The influence area translator does not work in the current editor version.

The Influence Area Translator defines an area that is controlled by a specified country in a multiplayer mission. If enemy pilots are forced down or otherwise land in the defined area, they are considered to be captured. The post-mission statistics show the number of times a player was killed or captured under the skull and cross-bones icon.

Note: Influence areas are not shown on the flight crew's map. You must mark influence areas on the flight crew's map using icon translators (pg. 255).

Icon

Input

Object link from activate trigger (pg. 274) or deactivate trigger (pg. 280)

Output

None

Advanced Properties

Country

The country that controls the influence area. An enemy that is forced down or otherwise lands in the influence area is considered to be captured.

Pilots are considered to be enemies if they belong to a different coalition (for example, allies or even neutral) than the country specified for the influence area. You assign countries to coalitions in the Mission Countries Dialog (pg. 207).

Enabled

Makes the influence area active at the start of a mission. Otherwise, you can activate the influence area later in the mission by using the activate trigger (pg. 274). You can deactivate the influence area again with the deactivate trigger (pg. 280).

How to Use

1. Place an influence area translator where you want to define the influence area.
2. Right-click on the icon and choose Selected Object Menu > Edit Influence Area Boundary.

   The blue triangle around the icon represents the current influence area boundary. The yellow circle is the current edit point.
3. Reshape the influence area with any of these methods:
   - Click and drag the current edit point.
   - Double-click on a corner of the boundary to make it the current edit point.
   - Select an existing edit point, press Ctrl, and click nearby and outside the influence area to add a new edit point.

     A new edit point is added to the line that comes after the current edit point (going clockwise around the influence area boundary).

     See the example in this topic.
   - Press Del to delete the current edit point.
4. Press Esc to stop editing the influence area boundary.

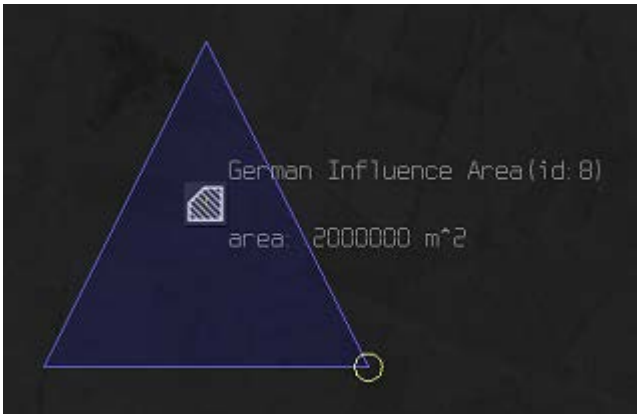
Note:

- Do not overlap influence areas unless one of the areas is currently disabled.
- You can leave a "no-man's land" between areas, where pilots can land without being captured.
- The influence area icon does not have to be inside the influence area boundaries. You can place the icon wherever it is convenient and then change the boundaries to anywhere that they are required. It is helpful to group all the influence area icons in one place, or at least close to MCUs that control when the areas are enabled and disabled. Grouping the influence area icons in this way makes it easy for other mission builders to find them.

Example: Adding an Edit Point to an Influence Area

This example shows how to add a new edit point to an influence area.

First, you select the edit point that comes before the line to which you want to add the new edit point (going clockwise around the influence area boundary). In the following screenshot, the new edit point will be added along the bottom line:



Next, you press Ctrl and click outside the influence area. The following screenshot shows the new edit point and the expanded influence area:

With the new edit point already selected, you can continue to add edit points quickly by pressing Ctrl and clicking near the next line along. This method is especially effective when you are editing the boundary to follow a river bank.

Media Translator

The media translator allows you to do the following:

- Show a picture.
- Play a video or audio track.
- Make the screen look like an old movie.
- Mute sounds from IL-2 Sturmovik, such as engine sounds.

  You can set a volume level to determine how much you want to mute the sound.
- Use Flash to display a button that triggers mission events.
- Stop all media translators that are currently triggered in the mission.

  For example, video stops, IL-2 Sturmovik is unmuted, and so on.

You can use several media translators to play different audio tracks together. For example, you can play music and voice audio tracks while you show a picture or video.

Note: Do not specify the same audio track in more than one media translator. Only the first media translator triggered will play the track.

Icon

Input

A target link from another MCU or a message link from an object

Output

(Optional) The following event message links to another MCU that you want to trigger:

- OnMediaStopped
- OnFlashDialogAction00 to OnFlashDialogAction15

For details, see On Event Properties Dialog (pg. 221).

Advanced Properties

Background Color RGB

The RGB color of the screen background to use if you choose "Image" in the "Media Type" drop-down list. In the three boxes, type numbers between 0 and 255 to specify the red (R), green (G), and blue (B) components of the color. For example 255, 0, 0 is red, 0, 255, 0 is green, 0,0,0 is black, and 255, 255, 255 is white.

Base Time

The length of time (in seconds) that the Media Type is in effect, excluding any fade-in and fade-out time. For example, Base Time specifies how long to display a picture or mute IL-2 Sturmovik sounds.

Browse, Set

Specifies the path and file name of a media file. Click the Set button to confirm the file that you chose.

Fade In, Fade Out

The length of time (in seconds) for the media to fade into view and fade out of view.

Media Type

The media, effect, or function that the media translator runs. Here are the options:

- Flash—Shows .swf files, which you can use to implement an on-screen button.
- Image—Shows .jpg and .dds (Direct Draw Surface) files
- Play Sound—Plays .mp3 files
- Post Effect Movie—Applies an "old movie" effect to the screen. The effect applies a sepia tone and scratches to the screen, such as you would see if you were watching an old movie.
- Simulation Mute—Mutes all sound from IL-2 Sturmovik to the level specified in the Volume field, leaving only the sound of any media that you add
- Stop Media—Stops all media translators in the mission
- Video—Shows .bik (Bink video) files

On Events Table

Opens the On Event Properties Dialog (pg. 221), which allows you to define an event message link from the media translator to another MCU.

For the "Flash" media type, choose an event from the range OnFlashDialogAction00 to OnFlashDialogAction15. You cannot use your choice in any other media translator that uses the Flash media type.

Opacity

The percent opacity of the media. 100 is opaque and 0 is transparent.

Volume

The percent volume level for the "Play Sound" and "Simulation Mute" media types.

For examples of using the media translator, see Play Audio (pg. 154) and Display a 3-D Object That Can Be Animated (pg. 159).

Related Information

Show a Picture (pg. 154)

Mute Sound from IL-2 Sturmovik (pg. 158)

Play Video (pg. 158)

Make the Screen Look Like an Old Movie (pg. 166)

Mission Begin Translator

The Mission Begin Translator can trigger other MCUs when a mission starts. For convenience, you can place multiple mission start translators wherever you need them in the View Port and have each one trigger nearby MCUs.

Important! You must target link each mission begin translator to a timer trigger with a short delay (one or two seconds) and then target link the timer to another MCU. The delay allows IL-2 Sturmovik internal mission-start processing to complete before your mission events occur.

Icon

Input

None

Output

Target link to another MCU

For an example of using the mission begin translator, see "Example: Engage an FW190" in Create a Singleplayer Mission (pg. 33).

Mission End Translator

The Mission End Translator stops a mission. When the mission stops, the following occurs:

- In a singleplayer mission, the mission list screen is displayed.
- In a multiplayer mission, the mission statistics screen is displayed.

Icon

Input

A target link from another MCU or a message link from an object

Output

None

Advanced Properties

Mission results

Not implemented.

For an example of using the end mission translator, see "Example: Destroy Two Factories", in Create a Multiplayer Mission (pg. 38).

Related Information

Stop a Mission (pg. 93)

Mission Objective Translator

The mission objective translator allows you to signal that one or more mission tasks have been completed successfully in a multiplayer mission. That signal has the following effects:

- A victory message is displayed in the post-mission statistics screen.
- Optionally, 50 points can be deducted from the remaining points for the opposing side.

  Note:

  - The point deduction is in addition to any points automatically deducted when objects are destroyed.
  - For Expert and Normal missions, the remaining points are displayed in the map screen during a mission. Points are not displayed for a Custom mission. For more information on mission types, see the DServer "Server Type" in Configuration Dialog (pg. 326).
  - The remaining points are displayed in the post-mission statistics screen for Expert and Normal missions.

For example, if a factory is destroyed, you can trigger a mission objective translator to signal that a mission objective was completed. You can also set up the translator to deduct 50 points from the opposing side.

Icon

Note:

- Use the left-hand icon shown for mission objective translators In the View Port. The right-hand icon (the default) is not a good choice because it resembles an icon translator. The left-hand icon appears if you choose "Undefined" in the advanced properties "Icon Type" drop-down list and the right-hand icon appears if you choose "None".

  There are other icons available in the "Icon Type" drop-down list but these are not good choices because they resemble other icons available for the icon translator.
- None of the mission objective translator icons appear on the GUI map in a mission. Use icon translators to mark mission objectives on the GUI map.

Input

A target link from another MCU or a message link from an object

Output

None

Advanced Properties

Task Type

Primary Task

Causes a victory message to be displayed in the post-mission statistics screen if the current mission objective translator is triggered.

Note: You can create multiple mission objective translators set to "Primary Task", but you only need to trigger one to cause a victory message.

Secondary Task 1...Secondary Task 15

Does the following if all of the mission objective translators with the same secondary task number are triggered:

- Causes a victory message to be displayed in the post-mission statistics screen
- Deducts 50 points from the remaining points for the opposing side

For example, assume that you create 5 mission objective translators set to "Secondary Task 1". All five translators must be triggered for that task to generate a victory message and deduct the 50 points.

Note: You can create multiple mission objective translators set to different "Secondary Task" numbers, but you only need to trigger one to cause a victory message and deduct the 50 points. However, 50 points is still deducted for each additional translator triggered.

Success/Failure

Success

Signifies that the objective was completed successfully.

Failure

Not implemented

Multiple

You cannot select this option, but you can change the advanced properties for multiple mission objective translators at once. Do the following:

1. Select all of the mission objective translators that you want to change.
2. Right click on the selection and choose "Advanced Properties".
3. Set the advanced properties that you want for the selected commands and click OK.

Coalition

The side to which the mission objective translator applies.

Icon Type

The icon displayed in the View Port for the mission objective translator. Set this option to "Undefined" to avoid confusion with icon translators.

For an example of using the mission objective translator, see "Example: Destroy Two Factories", in Create a Multiplayer Mission (pg. 38).

Related Information

Specify Conditions for Multiplayer Mission Success (pg. 130)

Next Mission Translator

The next mission translator will be documented in a later edition of this manual.

Icon

Server Input Translator

The server input translator can trigger other MCUs in a mission if it receives a command from the Remote Console, which is a program that allows you to control a multiplayer mission server from any PC (pg. 173). For example, you could end a mission by sending a command like "EndMission" from the Remote Console to a server input translator and have that translator trigger an end mission translator.

Icon

Input

Remote Console command "serverinput *translator_name*", where *translator_name* is the name of a server input translator in the mission.

Output

Target link to another MCU

Related Information

Allow a Multiplayer Server Administrator to Trigger an Event (pg. 105)

Subtitle Translator

The Subtitle Translator displays specified text on the screen. Text messages are useful to introduce a mission, request protection for a target under attack, and inform pilots about mission status. For example, you can display "Lupino airfield under attack!" to all friendly

pilots when a check zone trigger detects an enemy aircraft.

Note: Players cannot see text messages while they are viewing the GUI map. If the message duration is long enough, player can see the message when they return back to the cockpit view.

Icon

Input

A target link from another MCU or a message link from an object

Output

None

Advanced Properties

Coalitions

The coalitions that players must belong to in order to see the text message. Double click a row to set it to "True", which enables the display of the message to players in that coalition.

Duration

The length of time (in seconds) to display the text message

Text color RGB

The RGB color of the text message. In the three boxes, type numbers between 0 and 255 to specify the red (R), green (G), and blue (B) components of the color. For example 255, 0, 0 is red, 0, 255, 0 is green, 0,0,0 is black, and 255, 255, 255 is white.

Text

The message text. You can use HTML to format the text.

For an example of using the subtitle translator, see Create a Multiplayer Mission (pg. 38).

Trigger MCUs

Activate Trigger

The activate trigger enables certain deactivated objects and deactivated MCUs to interact with the mission again (that is, respond to commands and interact with objects and MCUs). An object or MCU can be deactivated in the following ways:

- They are deactivated by the deactivate trigger (pg. 280) during a mission.
- They are deactivated before the mission starts because the "Enabled" check box is

cleared in the advanced properties of the object or MCU.

Icon

Input

A target link from another MCU or a message link from an object

Output

Object link to any object that includes the "Enabled" option in the object advanced properties (that is, artillery, planes, ships, trains, and vehicles)

Target link to certain MCUs

Important! Before issuing a command to an object that has just been activated, add a one or two-second delay using a timer trigger before the command.

Note: You activate a formation of objects by activating the formation leader only.

Here are some examples of what you can deactivate and activate:

- Detection of objects entering or exiting a zone

  For examples, see the check zone triggers used in the following topics:

  - Detect Objects In Relation to a Defined Area (pg. 81)
  - Create or Delete an Object While a Mission is Running (pg. 107)
  - Create Target Defences (pg. 125)
  - Target Defence Switch (pg. 298)
- Locations of enemy and friendly lines

  See an example in Mark Locations and Draw Shapes on the Flight Crew's Map (pg. 151).
- Icons that display the current status of a target or a mission

  See examples involving icon translators used in the following:

  - Create a Multiplayer Mission (pg. 38)
  - Mark a Target as Damaged or Destroyed (pg. 128).
  - Create a "Capture-the-Flag" Scenario (pg. 137)
- Input or output connections for custom mission functions (pg. 287)

  For an example of input and output connections, see the timer triggers used in the Random Switch (pg. 294).
- Various camera views available to players in a mission

  For more details on camera views for players, see Create Views That a Mission Participant Can See (pg. 53).
- A counter trigger (pg. 278) that you want to prevent from firing until some time after the maximum count is reached.

For details, see "Usage Notes" in the counter trigger documentation.

Related Information

- Deactivate or Activate Mission Functions (pg. 105)
- Deactivate or Activate an Object While a Mission is Running (pg. 114)

Camera Point Trigger

The camera point trigger will be documented in a later edition of this manual.

Icon

Check Zone Trigger

The check zone trigger detects specified objects that are either inside of or outside of a defined zone, depending on how the Distance Type option is configured in the advanced properties.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to another MCU

(Optional) Object links to specific objects that you want to detect

Note: You can either create object links to specific AI planes or AI vehicles or you can specify plane and vehicle coalitions in the check zone trigger advanced properties, not both. To detect a player-controlled plane in a multiplayer mission, you must specify its coalition in the advanced properties.

Advanced Properties

Distance Type

The detection method used by the trigger

Closer–The trigger fires when the first of the specified objects enters the zone or if any of the objects are already inside of the zone. All of the specified objects must leave the zone before the trigger can once again detect a specified object entering the zone.

Further–The trigger fires when the last specified object leaves the zone or if all of the objects are already outside of the zone. At least one of the specified objects must enter the zone before the trigger can once again detect the last remaining specified object leaving the zone.

Plane Coalitions

Detect planes from coalitions that are set to "True". Double click a row to change the setting.

Note: You can either specify plane coalitions here or you can create object links to specific planes, not both.

Vehicle Coalitions

Detect vehicles from coalitions that are set to "True". Double click a row to change the setting.

Note: You can either specify vehicle coalitions to detect or set up object links to specific vehicles, not both.

Zone

The radius (in meters) of the trigger zone

Zone Type

The shape of the trigger zone

The bottom of the cylinder shape and the center of the sphere shape are located at the altitude and position of the check zone icon. For example, for an icon at ground level, the cylinder extends upwards only and the sphere is half under ground and half above ground.

Note: Object-detection problems with this trigger can be due to the shape of the zone. Say you specify a check zone trigger with Distance Type "Closer", Zone Type "Sphere", and Zone "2000". A plane that is 1,500m vertically and 1,500m horizontally away from the trigger is 2,121m diagonally away from it, so the plane is not detected.

Usage Notes

- Once you trigger a check zone trigger, it starts checking the zone and remains active for the entire mission, unless you use the deactivate trigger to deactivate the check zone trigger.
- Assume that you trigger a check zone trigger and then deactivate it. You can then use the activate trigger to activate the check zone trigger again and it is also triggered again at the same time.

For examples of using the check zone trigger, see the following topics:

- Manage Object Formations (pg. 74)
- Detect Objects In Relation to a Defined Area (pg. 81)
- Create or Delete an Object While a Mission is Running (pg. 107)
- Create Target Defences (pg. 125).
- Display a 3-D Object That Can Be Animated (pg. 159)
- Target Defence Switch (pg. 298)

Related Information

- Complex Trigger Translator (pg. 252)
- Proximity Trigger (pg. 281)

Counter Trigger

The counter trigger increments by one each time an input signal is received from objects or MCUs linked to it. The counter triggers fires when the count reaches a specified number.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to another MCU

Advanced Properties

Counter

The maximum value that the counter reaches before it fires

Reset After Operation

Resets the counter value to zero after it fires and accepts a new input signal. If you clear this check box, the counter does not respond to any more input signals after it fires.

Usage Notes

If you deactivate the counter using a deactivate trigger (pg. 280), the current value is still incremented when an input triggers the counter. However, the counter does not fire when the value reaches the maximum, but it does fire when the counter is activated again using an activate trigger (pg. 274).

For examples of using the counter trigger, see the following topics:

- Trigger an Event Based on How Many Times Other Events Occur (pg. 94)
- Make an Object Attack Another Object (pg. 119)
- Mark a Target as Damaged or Destroyed (pg. 128)
- Damage Display Switch (pg. 287)

Date Time Trigger

The date time trigger fires when a specified point in time is reached in a running mission.

Icon

Input

A target link from another MCU or a message link from an object

Output

Target link to another MCU

Advanced Properties

Type

Specifies when the trigger will fire

Sunset/Sunrise – Fire the trigger at sunrise/sunset

Time Mark/Date Mark – Fire the trigger at the specified time or at the specified date and time

Config

A file that determines sunrise and sunset times based on the date. Use the default file daytime.cfg in your game folder under \data.

See an example in Trigger an Event at a Point in Time in a Mission (pg. 100).

Deactivate Trigger

The deactivate trigger prevents certain objects and MCUs from interacting with other objects and MCUs in the mission.

Note: You can also deactivate certain objects or MCUs before the mission starts by clearing the "Enabled" check box in the advanced properties of the object or MCU.

Icon

Input

A target link from another MCU or a message link from an object

Output

Object link to any object that includes the "Enabled" option in the object advanced properties (that is, artillery, planes, ships, trains, and vehicles)

A target link to certain MCUs

Note: You deactivate a formation of objects by deactivating the formation leader only.

For examples of using the deactivate trigger and activate trigger, see Activate Trigger (pg. 274).

Related Information

- Deactivate or Activate Mission Functions (pg. 105)
- Deactivate or Activate an Object While a Mission is Running (pg. 114)

Delete Trigger

The delete trigger deletes a specified object while a mission is running. For example, you can use the spawner trigger (pg. 282) to spawn an AI fighter when the player enters a zone and use the delete trigger to delete it when the player exits the zone (assuming that the player does not shoot down the fighter). Spawning and deleting objects in this way can help your missions run better by using resources only when they are needed.

Icon

Input

A target link from another MCU or a message link from an object

Output

Object link to the object to be deleted

For examples of using the delete trigger, see Create or Delete an Object While a Mission is Running (pg. 107).

Related Information

Spawner Trigger (pg. 282)

Proximity Trigger

The proximity trigger detects specified objects that are in one of the following positions:

- Inside a specified distance from one another.

  Once triggered, the proximity trigger fires when any of the objects first move inside the specified distance from one another or are inside that distance already. Before the trigger can fire again, all of the objects must move outside the specified distance from one another.
- Outside a specified distance from one another.

  Once triggered, the proximity trigger fires when all of the objects are outside the specified distance from one another or are outside that distance already. Before the trigger can fire again, all of the objects must move inside the specified distance from one another.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to other MCUs that you want to trigger after object proximity detection

Object link to each object included in the proximity check

Note:

- If you object link the trigger to one object only, you must specify a coalition in the advanced properties.
- If you object link the trigger to multiple objects, any coalition chosen in the advanced properties is ignored.

Advanced Properties

Distance

The distance (in meters) between objects that causes the trigger to fire

Proximity Type

The detection method used by the trigger

Closer: The trigger fires if the specified objects are inside a specified distance from one another.

Further: The trigger fires if the specified objects are outside a specified distance from one another.

Plane Coalitions

Detect planes from coalitions that are set to "True". Double click a row to change the setting.

Note: Use this setting only if you object link the trigger to a single object.

Vehicle Coalitions

Detect vehicles from coalitions that are set to "True". Double click a row to change the setting.

Note: Use this setting only if you object link the trigger to a single object.

See an example of the proximity trigger in Detect the Proximity of Objects to One Another (pg. 87).

Usage Notes

Here are the ways that you can specify objects that the trigger detects:

- Object link the trigger to a single object and (in the advanced properties) specify a coalition that includes the other plane or vehicle objects that you want to detect.

  In this case, the trigger detects the distance of the single object to any of the objects in the specified coalition.
- Object link the trigger to specific planes or vehicles.

  In this case, the trigger detects the distances between all the linked objects. You cannot specify specific player planes in a multiplayer mission because those planes are created using an airfield object.

Spawner Trigger

The Spawner Trigger can create certain objects while a mission is running. For example, you can use the spawner trigger to spawn an AI fighter when the player enters a zone and use the delete trigger (pg. 280) to delete it when the player exits the zone (assuming that the player does not shoot down the fighter). Spawning and deleting objects in this way can help your missions run better by using resources only when they are needed.

Note: You can only spawn objects that have the "Enabled" option available in the object

advanced properties. That is, you can spawn artillery, planes, ships, trains, and vehicles.

Icon

Input

A target link from another MCU or a message link from an object

Output

Object links to the objects that you want to spawn

(Optional) The first part of an OnSpawned report message link, which is set up in the object to be spawned. The second part of the report message link goes from the object to another MCU that you want to trigger. For details, see On Report Properties Dialog (pg. 224).

Advanced Properties

Spawn at me

Spawn the object at the spawner trigger location, including the altitude set in the Position Y field of the spawner trigger MCU Basic Properties Dialog (pg. 204).

If you select this check box, you can only spawn one object.

If you clear this check box, you can spawn one object or multiple objects with one spawner trigger. Each object spawns at its location.

Usage Notes

- Do not spawn objects that are in formation because the wingmen do not follow commands given to the leader.
- You cannot spawn groups or player planes.

  Player planes are spawned from airfield objects in a multiplayer mission.

For an example of using the spawner trigger, see Create or Delete an Object While a Mission is Running (pg. 107).

Timer Trigger

The timer trigger allows you to do the following:

- Introduce a time delay into your mission.
- Include random events in your mission.
- Connect MCUs together in a simpler way.
- Block and unblock MCUs from triggering other MCUs

See more details later in this topic.

Icon

Input

A target link from another MCU or a message link from an object

Output

A target link to an MCU

Advanced Properties

Random

The probability that the trigger will fire.

Here are some uses for the timer trigger:

- Introduce a time delay before a mission event occurs.

  Here are some delay examples:

  - If you specify what occurs at the start of a mission (pg. 93), you must create a short delay (a second or so) after the mission begin translator. This delay allows IL-2 Sturmovik to complete mission-start processing and then your own mission start events can occur.
  - Delay the take-off of an AI bomber until a certain time in the mission.
  - Establish the mission duration, using a long-running timer that triggers a mission end translator (pg. 270).
  - Introduce a short time delay so that certain MCUs are not triggered simultaneously with other MCUs. The example in Make a Vehicle Follow a Route (pg. 67) shows a delay between triggering waypoint "WP 1" and triggering the "On Road" formation command.
- Introduce a probability of the timer trigger actually firing after the time delay.

  For example, the random switch (pg. 294) uses timers with different firing probabilities to trigger a mission event chosen at random. See an example of using a random switch in Manage Object Formations (pg. 74).
- Create a connector to link a distant icon in the View Port to several local icons.

  Rather than linking a distant icon to each local icon, you can link the distant icon to a local timer and then link that timer to the local icons. Using a timer as a connector in this way reduces the clutter from multiple links crossing the map.

  You normally set the timer to zero seconds when you use it as a connector, but you can set it to another time if you also want a delay.

  For an example of timers used as connectors, see the "Input Enable Switch" and "Input Disable Switch" timers in the target defence switch (pg. 298).

- Create standard input and output connectors for custom mission functions (pg. 287), such as the random switch or even one of your own custom designs.

  Input and output connectors have these advantages:

  - They make it simpler to connect external MCUs and objects to the internal logic of a custom mission function.
  - They allow you to enable and disable the input to and output from a custom mission function.

  You normally set the timer to zero seconds when you use it as an input or output connector, but you can set it to another time if you also want a delay.
- Block and unblock MCUs from triggering other MCUs

  For example, the random switch custom mission function uses deactivate triggers and activate triggers to deactivate and activate the input and output timer triggers. If you deactivate a timer trigger, it cannot be triggered until you activate it again.

Usage Notes

If you deactivate a timer trigger that was triggered but has not yet fired, it pauses at the current time and resumes the countdown when it is activated again. For more information, see Activate Trigger (pg. 274) and Deactivate Trigger (pg. 280). For an example of pausing and resuming a timer, see the example in Create a "Capture-the-Flag" Scenario (pg. 137).

Waypoint Trigger

The waypoint trigger causes a specified AI object such as a plane or vehicle to move towards it in the View Port. Once the object reaches the waypoint, the waypoint can trigger an action from another MCU (such as another waypoint trigger or a land command).

You can target link multiple waypoint triggers together to form a route that an AI object can follow. See the examples listed in this topic.

Icon

Input

A target link from another MCU or a message link from an object

Output

An object link to the object that must move towards the waypoint

(Optional) A target link to another MCU

Advanced Properties

Priority

The priority of reaching the waypoint compared to other goals for the object.

Low –Objects can alter course to attack nearby enemies.

Medium–The object can alter course to defend itself from attacks.

High–The object does not alter course.

Note: The "Low" priority applies only to fighters without bombs.

Area

The radius of the area (in meters) in which an object causes the waypoint trigger to fire. An object at any altitude within the area causes the waypoint trigger to fire.

Important! For use with planes, a good area value is around 200 meters. If the area is much smaller than 200 meters, a plane can miss the waypoint area and circle around until it finds it.

Speed

The object speed (kph) as it moves toward the trigger.

Usage Notes

- To automatically link multiple waypoint triggers as you place them, do the following:
  1. Place the first waypoint trigger.
  2. Press and hold left Shift.
  3. Click where you want more waypoints triggers.
- To insert a waypoint along an existing route, do the following:
  1. Remove the target link between two waypoints where you want to add a new waypoint.
  2. Target link the original two waypoints and the new waypoint together to establish the revised route.
- Make sure that each waypoint on a route has an object link to the object that must follow the route.
- Do not create sharp turns in a route where waypoints are close together.
- Do not trigger a waypoint for an object while that object is executing a command. Instead, trigger the waypoint and use a short timer trigger (one or two seconds) to delay triggering the command. See Make a Vehicle Follow a Route (pg. 67) for an example that shows a delay between triggering waypoint "WP 1" and triggering the "On Road" formation command.
- For each waypoint on a route for planes, set an appropriate altitude in the Position Y box of the MCU Basic Properties Dialog (pg. 204).

- You can make an object on a route change to another route (pg. 74).
- Avoid linking multiple objects to a waypoint because only the first object to reach the waypoint causes it to fire. All other objects just move to the waypoint and stay there; they do not cause the waypoint to fire again.

For examples of using the waypoint trigger, see the following topics:

- Help Pilots Fly a Route (pg. 60)

  This topic also shows how to display the waypoint on the GUI map and in the air.
- Make a Plane Take Off, Fly a Route, and Land (pg. 61)
- Make a Vehicle Follow a Route (pg. 67)
- Make a Train Follow a Route (pg. 70)
- Make a Ship Follow a Route (pg. 73)
- Manage Object Formations (pg. 74)

  This topic shows how to set up waypoints so that a formation files a circuit around the map continuously.

Custom Mission Functions

This section describes various combinations of MCUs that provide custom functions to a mission. Each custom mission function is available as a group in the file for the sample missions and groups (pg. 11).

The designs in this section are not official, they just show one possible way to implement each function. You can design your own custom functions (even based on those functions described in this section) and store those functions as groups for others to reuse.

Important! You do not need to understand how the internal parts of each function work. You only need to set up links to the input and output MCUs specified and sometimes specify a few MCU properties. However, understanding the functions in detail helps you understand complex mission logic in general.

Damage Display Switch

The damage display switch detects OnKilled events from each object that makes up a target (such as all the buildings in a factory complex) and activates an icon translator (pg. 255) that shows the total damage to the target. This ability allows pilots to see the current damage to each target on the GUI map and prioritize their missions accordingly.

The default switch handles up to eight objects and four damage levels, but you can edit the switch to handle different requirements.

Note: This function is available as a group in the file for the sample missions and groups (pg. 11).

Input

An OnKilled event message link from each object at the target to one of the counter

triggers (pg. 278) IN1 to IN8. Link each object to a different counter trigger.

Output

For each damage level, a target link from the associated "OUT1" activate trigger to the icon translator for that damage level. For example, link "OUT1 50% Damage" to the icon translator for 50% damage. In this case, 50% damage now appears on the map.

For each damage level, a target link from the associated "OUT2" deactivate trigger to the icon translator for the previous damage level. For example, link "OUT2 50% Damage" to the icon translator for 25% damage. In this case, 25% damage no longer appears on the map. Note that the "OUT2 25% Damage" deactivate trigger is target linked to the icon translator for no damage.

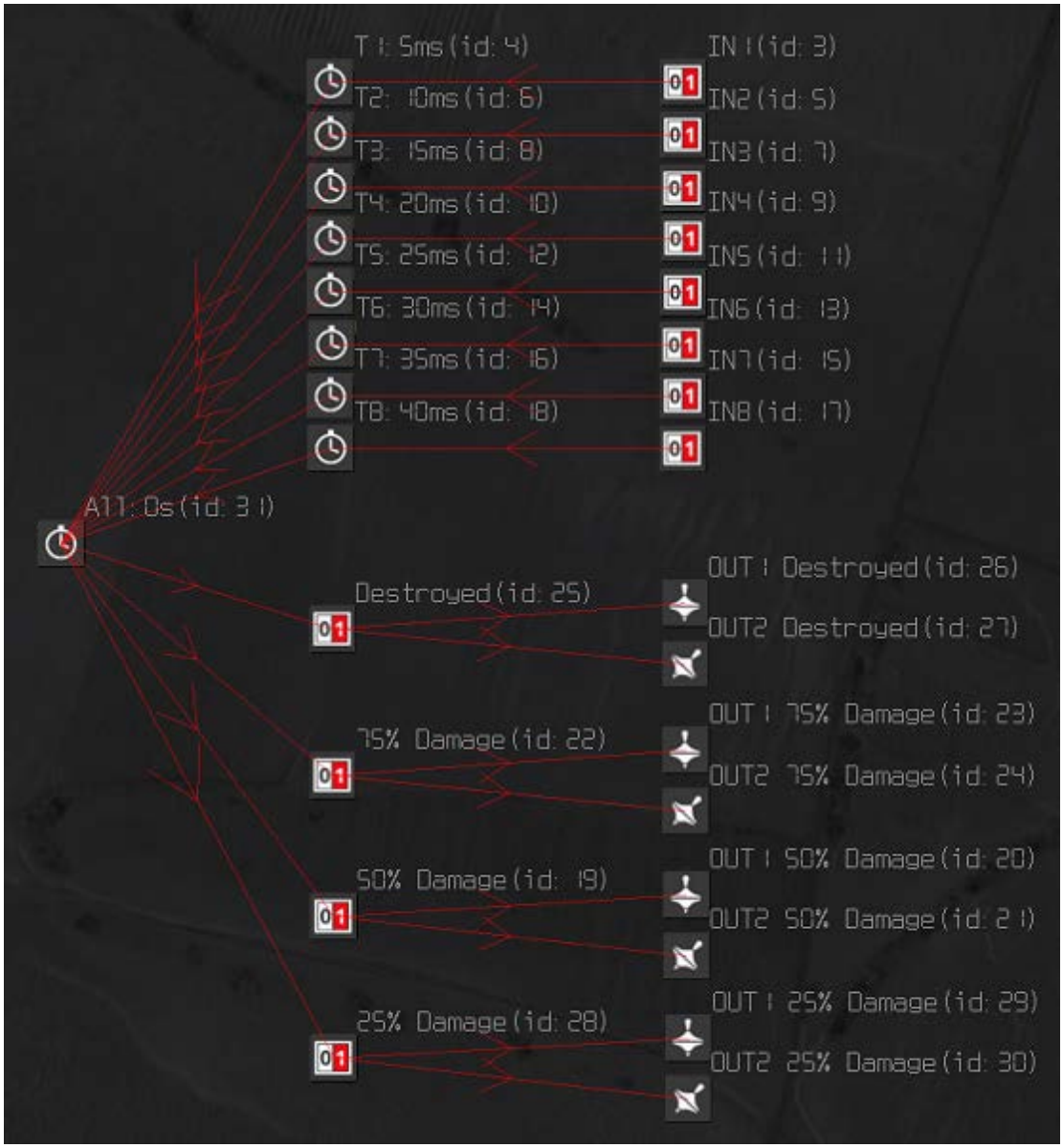
Usage Notes

For an example of using the damage display switch, see Mark a Target as Damaged or Destroyed (pg. 128).

Place icon translators for each damage level (including undamaged) near the target. In the advanced properties, select the "Enabled" check box in the icon translator for the undamaged target and clear that check box for all the other damage levels.

Description

Here is the damage display switch:



Because an object can generate multiple OnKilled event messages, the advanced property "Reset After Operation" is cleared in each of the input counter triggers (IN1 to IN8). In this case, each counter only accepts the first OnKilled message from the object linked to it.

The timers T1 to T8 are set with an increasing delay time (5ms to 40ms) for each timer. The increasing delays ensure that simultaneous OnKilled messages are spread out over time so

that the switch can react to each one. Simultaneous OnKilled messages can occur, for example, if a large bomb destroys two adjoining objects or bombs from multiple planes destroy two non-adjoining objects at the same time.

Each time an OnKilled event occurs, timer trigger ALL is triggered and it then triggers all of the damage-level counter triggers (for example "50% Damage").

The "Counter" setting in the advanced properties for each damage-level counter trigger defines the total number of destroyed objects that represent that damage level. The default damage display switch handles eight objects so the "25% damage" counter is set to 2, "50% damage" is set to 4, and "Destroyed" is set to 8.

You can edit the switch as follows to handle your requirements:

- Add or delete "IN" counters and the also the adjoining timers to match the number of objects in your target.

  If you add timers, increase the time by 5 milliseconds for each one that you add.

  For example, if you have 10 objects, add IN9, T9 (45ms), IN10, and T10 (50ms). Then target link IN9 to T9 and IN10 to T10.

  If you have less than 8 objects, you can delete the unused counters and timers, but it is not mandatory.
- Add or delete the damage-level counters at the bottom left and the adjoining "OUT" triggers to provide different damage levels.

  For example, if you only want "50% Damaged" and "Destroyed", delete the 25% and 75% damage counters and the associated activate/deactivate triggers. Then adjust the damage counter values accordingly.
- Adjust the count in the advanced properties of the damage-level counters at the bottom left to define the number of objects that represent each damage level.

Effect Sustainer

The effect sustainer allows certain effect objects that have a limited lifespan to run continuously.

The following effects have approximately a 16 second lifespan so they require the effect sustainer to run continuously:

- city_fire (the smoke disappears after 16 seconds but the fire is permanent)
- city_firesmall (this effect is smoke only)
- villagesmoke

Note: This function is available as a group in the file for the sample missions and groups (pg. 11).

Input

A target link or a message link to "In Start", which starts the effects

A target link or a message link to "In Stop", which stops the effects

Output

An object link from "Out Start Effect 1" to the first effect object (see usage notes)

An object link from "Out Start Effect 2" to the second effect object (see usage notes)

Object links from "Out Stop Effects" to each effect

Object links from "Out A1" to city_fire effect objects (if you use them)

Object links from "Out D1" to city_fire effect objects (if you use them)

Usage Notes

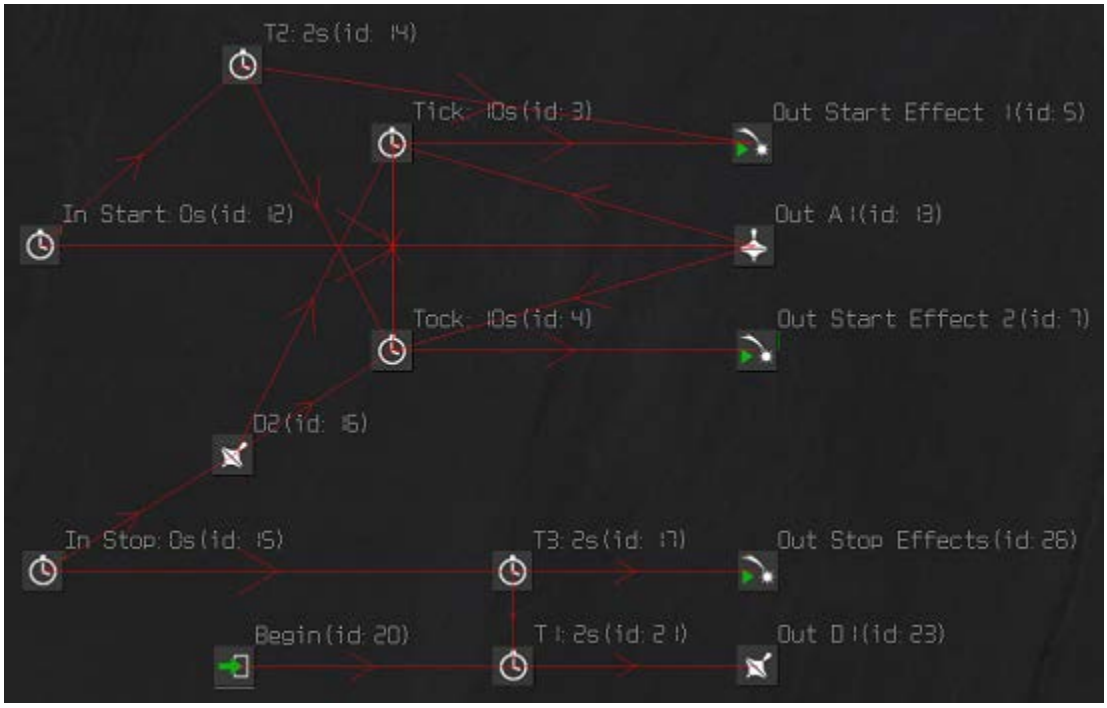
The effect sustainer requires two copies of an effect placed right next to each other. This custom function starts effect 1, waits 10 seconds, and then starts effect 2 before the lifespan runs out on effect 1. The effect sustainer continues to start each effect at 10 second intervals until it detects a stop request.

If you are not using the city_fire effect, you can delete Begin, T1, and "Out D1"

If you do not need to stop the effects, you can delete "In Stop: 0s", D2, T3, and "Out Stop Effects".

Description

Here is the effect sustainer:



When the mission starts, timer T1 triggers "Out D1", which deactivates the city_fire effects (if you use them). This deactivation is required for the city_fire effect because the fire part of

this "smoke-and-fire" effect starts automatically when the mission starts.

The zero-second input timers "In Start: 0s" and "In Stop: 0s" serve only as input connectors to the effect sustainer.

The effects are started by a signal from an external MCU to the "In Start" timer, which then triggers T2 and "Out A1".

"Out A1" activates the following:

- The Tick and Tock timers

  This activation is redundant on the first start but it is required when the effects are stopped and then restarted.
- The city_fire effects (if you use them)

Timer T2 waits 2 seconds for Tick and Tock to be activated and then it triggers the Tock timer and "Out Start Effect 1".

After 10 seconds, Tock triggers Tick and "Out Start Effect 2". Tick and Tock trigger each other at 10 second intervals to keep effect 1 and effect 2 running.

The effects are stopped by a signal to the "In Stop" timer, which triggers the following:

- Deactivate trigger D2, which deactivates the Tick and Tock timers
- Timer trigger T3, which waits 2 seconds for the deactivation of Tick and Tock and then triggers timer T1 and "Out Stop Effects".

As occurs at the beginning of the mission, T1 triggers "Out D1", which deactivates the city_fire effects (if you use them).

Multi-Input Counter

A multi-input counter triggers an event when multiple mission events occur one time each and they may occur simultaneously. For example, assume that you want to trigger a subtitle translator when five buildings in a complex are destroyed. If two buildings are right next to each other, they can be destroyed by a single large bomb and the destruction may be counted once only. The multi-input counter counts the destruction of each building separately.

The default multi-input counter handles up to eight inputs, but you can edit it to handle your requirements.

Note: This function is available as a group in the file for the sample missions and groups (pg. 11).

Input

A target link or message link from the MCU or object for each input mission event to the input counter triggers "IN1", IN2, and so on.

Output

A target link from counter trigger "OUT" to the MCU that you want to trigger.

Usage Notes

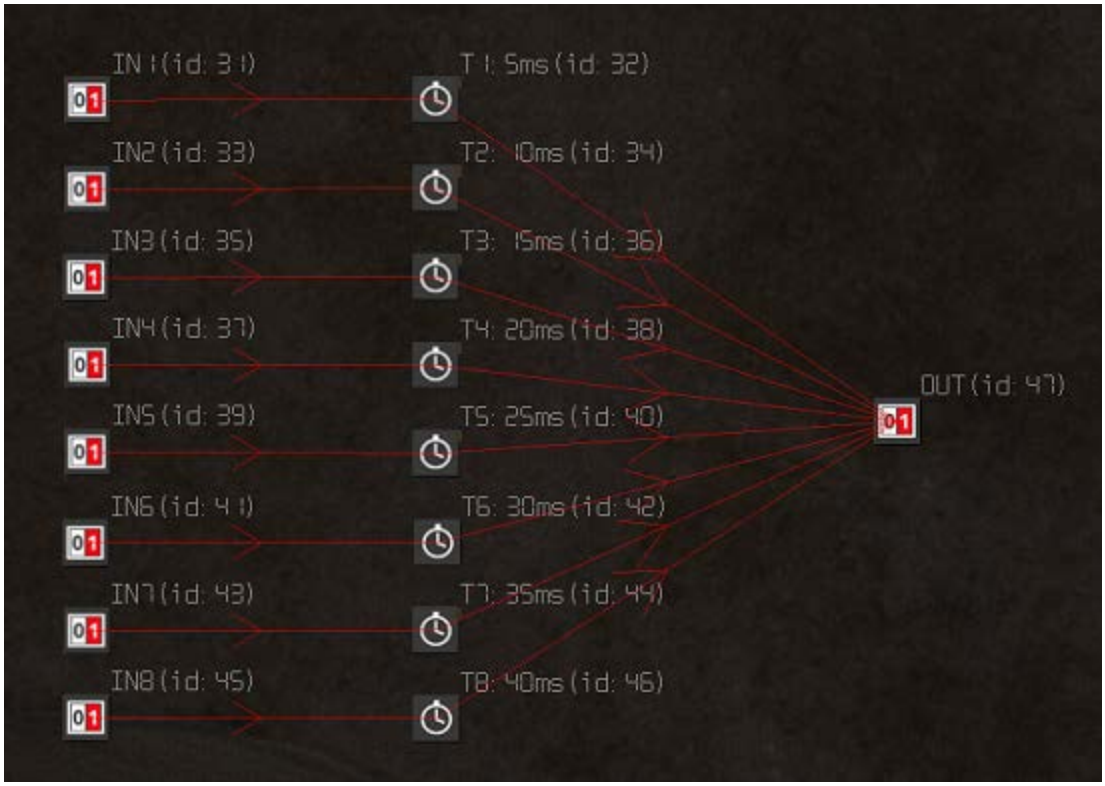
For an example of using the multi-input counter, see example "Destroy a Factory Complex" in Trigger an Event Based on How Many Times Other Events Occur (pg. 94).

To edit the multi-input counter, delete or add input counter triggers and timer triggers according to the number of inputs that you want to handle. Make sure that each timer trigger that you add is 5ms longer than the previous one (which ensures that simultaneous inputs are counted separately). In the advanced properties for OUT, set "Counter" to the number of inputs that you want to handle. For example, to handle 10 inputs, do the following:

1. Below IN8, add IN9 and IN10.
2. Below T8, add T9 and T10.
3. Set T9 to 45ms and T10 to 50ms.
4. Target link IN9 to T9 and IN10 to T10.
5. Target link T9 and T10 to OUT.
6. In the advanced properties for OUT, set "Counter" to 10.

Description

Here is the multi-input counter:



In the advanced properties of all of the input counter triggers (IN1 to IN8), "Counter" is set to 1 and "Reset After Operation" is cleared.

The timers T1 to T8 are set with an increasing delay time (5ms to 40ms) for each timer. The increasing delays ensure that simultaneous input signals (such as OnKilled messages) are spread out over time so that the switch can react to each one. Simultaneous input signals can occur, for example, if a large bomb destroys two adjoining objects or bombs from multiple planes destroy two non-adjoining objects at the same time.

Random Switch

A random switch allows you to trigger a randomly chosen mission event that is linked to the switch. This ability can help make your missions less predictable and more interesting. For example, you could link a random switch to various waypoints to automatically select a route for a bomber to fly. In this case, you would never know from one mission to the next what route the bomber is on unless you searched for it. For details, see the example in Randomly Choose an Event to Trigger (pg. 103).

Note: This function is available as a group in the file for the sample missions and groups (pg. 11).

Input

A target link or a message link to the "In:0ms" timer trigger

Output

Target links from the output timer triggers (for example, "Out 1") to the MCUs that you want to trigger

Usage Notes

You can trigger the random switch multiple times, but it requires a short time to process each input before the next input is allowed. That time is specified in timer "Wait for Output", shown in the screenshots later in this topic.

A random switch is categorized based on how many outputs it has. For example, a two-way random switch has two outputs and a three-way random switch has three outputs.

You can change the probabilities of each output being triggered by editing the "Random" field in the advanced properties of each "Random" timer trigger (for example "Random 2"). For details about how the random timers work, see the switch description later in this topic.

Here is a formula that you can use to calculate the probability to set in each random timer:

$$TPx = \frac{OPx}{(OPx + ... + OPn)} \times 100$$

where

TPx is the probability to specify in the current "Random" timer trigger to obtain the desired probability (OPx) of triggering the related output.

OPx is the probability that you want for the current output to be triggered.

OPx,...,OPn are the probabilities that you want for all of the outputs associated with the "Random" timers that have yet to fire.

For example, say you want a three-way random switch where the probability of output 1, 2, and 3 are 75%, 20%, and 5%, respectively. Here are the calculations for each random timer setting:

$$TP\,1 = \frac{75}{(75+20+5)} \times 100 = 75$$

$$TP\,2 = \frac{20}{(20+5)} \times 100 = 80$$

$$TP\,3 = \frac{5}{5} \times 100 = 100$$

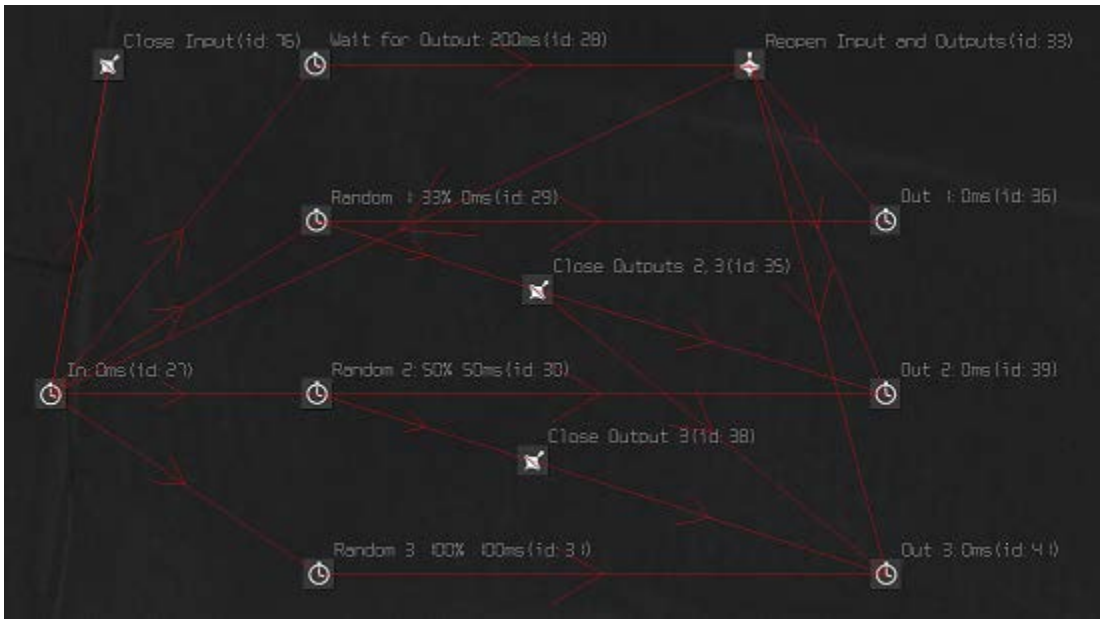
So, you would set the "Random" field in "Random 1" to 75, "Random 2" to 80, and "Random 3" to 100.

For examples of using the random switch, see the following topics:

- Randomly Choose an Event to Trigger (pg. 103)
- Manage Object Formations (pg. 74)
- Create or Delete an Object While a Mission is Running (pg. 107)

Description

The following screenshot shows a three-way random switch. The switch has one input (timer "In") and three outputs (timers "Out 1", "Out 2", and "Out 3"). In this case, you can randomly trigger one of three mission events, each with an equal probability of being triggered.



The zero millisecond input timer ("In") and output timers ("Out 1", "Out 2", and "Out 3") are just connectors into and out of the switch.

When the "In" timer is triggered, it triggers the following:

- Timers "Random 1", "Random 2", and "Random 3", which determine the output timer to fire based on the value in the "Random" field in the advanced properties
- The "Close Input" deactivate trigger, which disables the input timer while the switch is making the random selection
- The "Wait for Output" 200ms timer trigger, which waits for random processing to complete and then triggers the "Reopen Input and Outputs" activate trigger.

"Random 1", "Random 2", and "Random 3" are triggered at the same time but they are set to fire at different times (0ms, 50ms, and 100 ms respectively). Also, each timer has been assigned a different probability of firing (33%, 50%, and 100% respectively).

Even though each random timer has a different firing probability, they each have an equal chance (33%) of outputting a signal because the firing times are different. The firing probability of each timer is based on how many timers have not yet fired. Here is how the logic proceeds after an input signal is received:

1. At 0ms, "Random 1" has a 33% chance of firing.

   If "Random 1" doesn't fire, two timers remain that can fire.

   If "Random 1" does fire, it triggers the "Out 1" timer and the "Close Outputs 2,3" deactivate trigger. Closing "Out 2" and "Out 3" prevents possible signals from the remaining random timers ("Random 2" and "Random 3") from getting through.
2. After 50 ms, "Random 2" has a 50% chance of firing.

   If "Random 2" doesn't fire, one timer remains that can fire.

   If "Random 2" does fire, it triggers the "Out 2" timer and the "Close Output 3" deactivate trigger. Closing "Out 3" prevents a possible signal from the remaining random timer ("Random 3") from getting through.
3. After 100 ms, "Random 3" has a 100% chance of firing.

   "Random 3" triggers the "Out 3" timer.

Once the switch has had enough time to output a signal, the input and the outputs must be enabled again to handle another switch request. The "Wait for Output" timer waits for 200 milliseconds and triggers "Reopen Input and Outputs", which enables the input timer and the output timers.

The screenshot following shows the details of a two-way random switch.

The two-way random switch is similar to the three-way random switch except there are only two random timers. These timers are set to 50%/0ms and 100%/50ms. So, each output has a 50% chance of passing a signal.

Target Defence Switch

A target defence switch activates target defences (AA, searchlights, and so on) when enemy planes or vehicles are nearby and deactivates the defences when the planes or vehicles leave. Deactivating target defences saves mission resources, which makes your mission run efficiently.

Note: This function is available as a group in the file for the sample missions and groups (pg. 11).

Input

A target link or a message link to the "Input Enable Switch" timer trigger. That timer trigger causes the switch to start checking for enemy objects entering or leaving the defence zone.

(Optional) A target link or a message link to the "Input Disable Switch" timer trigger. That timer trigger causes the switch to stop checking for enemy objects entering or leaving the defence zone.

Output

An object link from the "Output Defences On" and "Output Defences Off" timer triggers to all guns and searchlights that defend the target.

An object link from the "Output Defence Area" attack area command to all guns and searchlights that defend the target.

An object link from the "Output Stop Defence" force complete command to all guns and searchlights that defend the target.

(Optional) A target link from the "Detect In Zone" or the "Detect Out of Zone" check zone trigger to any MCU that you want to trigger when specified objects are detected.

Settings

Set the desired values in the advanced properties of "Detect In Zone", "Detect Out of Zone", and "Output Defence Area", which are discussed later in this topic. Make sure that the radius of "Detect Out of Zone" is slightly greater than "Detect In Zone" and the radius of "Output Defence Area" is less that "Detect In Zone".

In the advanced properties for all guns and searchlights that defend the target, clear the "Enabled" check box.

Description and Usage Notes

The following screenshot shows the target defence switch.

At the heart of the switch are two check zone triggers ("Detect In Zone" and "Detect Out of Zone") and an attack area command ("Output Defence Area"). Do not move these MCUs in relation to one another because they define concentric zones.

"Detect In Zone" detects when any of the objects specified in the trigger are inside the zone. Here are the advanced properties for the trigger:

- Zone: 3000 (default; set this value to whatever you require, but make sure that the value is slightly less than that of the "Detect Out of Zone" timer trigger)
- Zone Type: Selected (Cylinder)
- Distance Type: Selected (Closer)
- Plane Coalitions: False (default; set the coalition to "True" for planes that you wish to detect)
- Vehicle Coalitions: False (default; set the coalition to "True" for vehicles that you wish to detect)

"Detect Out of Zone" detects when all of the objects specified in the trigger are outside the zone. Here are the advanced properties for the trigger:

- Zone: 3100 (default; set this value to whatever you require, but make sure that the value is slightly greater than that of the "Detect In Zone" timer trigger)
- Zone Type: Selected (Cylinder)
- Distance Type: Cleared (Further)
- Plane Coalitions: False (default; set the coalition to "True" for planes that you wish to detect)
- Vehicle Coalitions: False (default; set the coalition to "True" for vehicles that you wish to detect)

The "Detect Out of Zone" trigger is made slightly larger than the "Detect In Zone" to avoid constant "in zone" and "out of zone" detections for an object traveling along the edge of the detection zone.

The "Output Defence Area" attack area command defines the area covered by the defensive guns and searchlights. Here are the advanced properties for the command:

- Priority: Medium

  Important! Do not set this field to High if you have a searchlight at the location because the light will not turn on at dusk. If the light does not turn on and find a target, the AA guns do not fire.
- Attack Targets: All check boxes are cleared (default; select the targets that you want the guns to defend against)
- Attack Area: 1500 (default; set his value to whatever you require, but make sure that it is less than the Zone value of the "Detect In Zone" timer trigger)
- Time: 999 minutes, 0 seconds (default; set his value to whatever you require)

The two input timer triggers, "Input Enable Switch" and "Input Disable Switch", allow you to turn the switch on or off. When the switch is on, it automatically turns the target defences on or off, depending on whether objects are inside of or outside of the defined detection zones. When the switch is off, the defences are always off.

When "Input Enable Switch" is triggered, it triggers "Detect In Zone" and (through a 0ms timer) "Detect Out of Zone". Both check zone triggers are then ready to detect objects. After a 100ms delay (from timer trigger id:55), the deactivate trigger "Detect Out of Zone – Off" deactivates "Detect Out of Zone". This deactivation is done when the switch is first turned on because the defences are off and the switch just needs to detect incoming objects.

When "Detect In Zone" detects the first specified object in the zone, it triggers the following:

- "Output Defences On" activate trigger, which activates all the guns and searchlights for the target
- "Wait for Defences On" two second timer trigger, which waits for the defences to be activated and then triggers the "Output Defence Area" attack area command
- "Detect Out of Zone - On" activate trigger, which activates "Detect Out of Zone"
- "Detect In Zone - Off" deactivate trigger, which deactivates "Detect In Zone"

When "Detect Out of Zone" detects that all specified objects are outside of the zone, it triggers the following:

- "Output Stop Defence", which cancels the "Output Defence Area" command sent to all guns and searchlights earlier
- "Wait for Defence to Stop" two second timer trigger, which waits for the "Output Defence Area" command to be canceled and then triggers the "Output Defences Off" deactivate trigger. "Output Defences Off" deactivates all the guns and searchlights for the target.
- "Detect In Zone - On" activate trigger, which activates "Detect In Zone"
- "Detect Out of Zone - Off" deactivate trigger, which deactivates "Detect Out of Zone"

Triggering "Input Disable Switch" triggers the following:

- "Detect in Zone - Off" deactivate trigger, which deactivates "Detect In Zone"
- "Detect Out of Zone – Off" deactivate trigger, which deactivates "Detect Out of Zone"
- "Output Stop Defence", which cancels the "Output Defence Area" command (if it was sent to all guns and searchlights earlier)
- "Wait for Defence to Stop" two second timer trigger, which waits for the "Output Defence Area" command to be canceled and then triggers the "Output Defences Off" deactivate trigger. "Output Defences Off" deactivates all the guns and searchlights for the target.

Related Information

Create Target Defences (pg. 125)

Modifications and Payloads for Planes

This topic lists the modifications and payloads that are available for each plane in IL-2 Sturmovik. Payloads are combinations of basic weapons, armor, and modifications.

This topic helps you do the following:

- Choose values for the WeaponMods and Payload fields of the Object Advanced Properties Dialog (pg. 209).
- Choose values for the Payload ID, WeaponMods, Available Payloads, and Available Mods fields of the Plane Settings Dialog (pg. 226), used in multiplayer missions.

For each plane, this topic lists the following:

- **Mods**–A numbered list of the modifications available
- **Payload ID / Payload Name**–A payload number followed by a concise description of the payload

  For details regarding the concise description, see Payload Name Key (pg. 302).
- **Mod #**–Numbers from the "Mods" list that indicate the required modifications (positive numbers) and prohibited modifications (negative numbers) for each Payload ID / Payload Name

  If a modification number is not listed for a particular payload, that modification is optional.

  For example, say that you want Bf 109 E-7 payload "1/0,1-MG17-AP-2000 + 2,3-MGFF-APHE-120 + SC50-4". According to the payload list, you need to choose mod #1 (SC 50 bombs) and you must not choose mod #2 (SC 250 bomb).

Payload Name Key

AP–Armour Piercing
APHE–Armour Piercing + High Explosive
BK–Russian Machine Gun Pod
BK37–German 37mm Cannon
BREDA7–Italian 7.7mm Machine Gun
BREDA12–Italian 12.7mm Machine Gun
BS–Russian UBS 12.7mm Machine Gun
FAB–Russian Bomb
HE–High Explosive
M250–American M2 .50 caliber Machine Gun
MG15115–German 15mm Cannon
MG15120–German 20mm Cannon
MG17–German 7.92mm Machine Gun
MGFF–German 20mm Cannon
RBS82–Russian Armor-Piercing Rocket
ROFS132–Russian Fragmentation Rocket

ROS82–Russian High-Explosive Rocket
ROS132–Russian High-Explosive Rocket
SC–German Bomb
SH37–Russian 37mm Cannon
SHVAK–Russian 20mm Cannon
T–Italian Bomb
UB–Russian UBS 12.7mm Machine Gun
VYA23–Russian 23mm Cannon
WB81B–German 7.92mm Machine Gun Pod

Bf 109 E-7

Mods

1: SC 50 bombs
2: SC 250 bomb
3: Armoured Wind Screen
4: Removed Armoured Head Rest
5: Additional Armour Plates

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-2000 + 2,3-MGFF-APHE-120	-1,-2
1/0,1-MG17-AP-2000 + 2,3-MGFF-APHE-120 + SC50-4	1,-2
2/0,1-MG17-AP-2000 + 2,3-MGFF-APHE-120 + SC250-1	2,-1
3/Empty	-1,-2
4/SmokeGenWhiteOne-1	-1,-2
5/SmokeGenWhiteTwo-2	-1,-2
6/SmokeGenBlueOne-1	-1,-2
7/SmokeGenBlueTwo-2	-1,-2
8/SmokeGenRedOne-1	-1,-2
9/SmokeGenRedTwo-2	-1,-2
10/SmokeGenGreenOne-1	-1,-2
11/SmokeGenGreenTwo-2	-1,-2
12/SmokeGenYellowOne-1	-1,-2
13/SmokeGenYellowTwo-2	-1,-2
14/SmokeGenBlackOne-1	-1,-2
15/SmokeGenBlackTwo-2	-1,-2

Bf 109 F-2

Mods

1: MG-151/20 nose gun
2: SC 50 bombs
3: SC 250 bomb
4: Armoured Wind Screen
5: Removed Armoured Head Rest

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-1000 + 2-MG15115-APHE-200	-1,-2,-3
1/0,1-MG17-AP-1000 + 2-MG15115-APHE-200 + SC50-4	2,-1,-3
2/0,1-MG17-AP-1000 + 2-MG15115-APHE-200 + SC250-1	3,-1,-2
3/0,1-MG17-AP-1000 + 2-MG15120-APHE-200	1,-2,-3
4/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC50-4	1,2,-3
5/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC250-1	1,3,-2
6/Empty	-2,-3
7/SmokeGenWhiteOne-1	-2,-3
8/SmokeGenWhiteTwo-2	-2,-3
9/SmokeGenBlueOne-1	-2,-3
10/SmokeGenBlueTwo-2	-2,-3
11/SmokeGenRedOne-1	-2,-3
12/SmokeGenRedTwo-2	-2,-3
13/SmokeGenGreenOne-1	-2,-3
14/SmokeGenGreenTwo-2	-2,-3
15/SmokeGenYellowOne-1	-2,-3
16/SmokeGenYellowTwo-2	-2,-3
17/SmokeGenBlackOne-1	-2,-3
18/SmokeGenBlackTwo-2	-2,-3

Bf 109 F-4

Mods

1: MG-151/15 gun pods
2: SC 50 bombs
3: SC 250 bomb
4: Armoured Wind Screen
5: Removed Armoured Head Rest
6: MG-151/20 gun pods

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-1000 + 2-MG15120-APHE-200	-1,-2,-3,-6
1/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC50-4	2,-1,-3,-6
2/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC250-1	3,-1,-2,-6

3/0,1-MG17-AP-1000+2-MG15120-APHE-200+3,4-MG15115pod-APHE-270-add	1,-2,-3,-6
4/0,1-MG17-AP-1000+2-MG15120-APHE-200+3,4-MG15120pod-APHE-270-add	6,-1,-2,-3
5/Empty	-1,-2,-3,-6
6/SmokeGenWhiteOne-1	-1,-2,-3,-6
7/SmokeGenWhiteTwo-2	-1,-2,-3,-6
8/SmokeGenBlueOne-1	-1,-2,-3,-6
9/SmokeGenBlueTwo-2	-1,-2,-3,-6
10/SmokeGenRedOne-1	-1,-2,-3,-6
11/SmokeGenRedTwo-2	-1,-2,-3,-6
12/SmokeGenGreenOne-1	-1,-2,-3,-6
13/SmokeGenGreenTwo-2	-1,-2,-3,-6
14/SmokeGenYellowOne-1	-1,-2,-3,-6
15/SmokeGenYellowTwo-2	-1,-2,-3,-6
16/SmokeGenBlackOne-1	-1,-2,-3,-6
17/SmokeGenBlackTwo-2	-1,-2,-3,-6

Bf 109 G-2

Mods

1: MG-151/20 gun pods
2: SC 50 bombs
3: SC 250 bomb
4: Armoured Glass Head Rest
5: Removed Armoured Head Rest

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-1000 + 2-MG15120-APHE-200	-1,-2,-3
1/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC50-4	2,-1,-3
2/0,1-MG17-AP-1000 + 2-MG15120-APHE-200 + SC250-1	3,-1,-2
3/0,1-MG17-AP-1000+2-MG15120-APHE-200+3,4-MG15120pod-APHE-270-add	1,-2,-3
4/Empty	-1,-2,-3
5/SmokeGenWhiteOne-1	-1,-2,-3
6/SmokeGenWhiteTwo-2	-1,-2,-3
7/SmokeGenBlueOne-1	-1,-2,-3
8/SmokeGenBlueTwo-2	-1,-2,-3
9/SmokeGenRedOne-1	-1,-2,-3
10/SmokeGenRedTwo-2	-1,-2,-3
11/SmokeGenGreenOne-1	-1,-2,-3
12/SmokeGenGreenTwo-2	-1,-2,-3
13/SmokeGenYellowOne-1	-1,-2,-3
14/SmokeGenYellowTwo-2	-1,-2,-3
15/SmokeGenBlackOne-1	-1,-2,-3
16/SmokeGenBlackTwo-2	-1,-2,-3

Bf 110 E-2

Mods

1: Armoured Wind Screen and Head Rest
2: Additional Armour Plates
3: SC 50 (x12) bombs
4: SC 500 bombs
5: SC 1000 bombs

Payload ID / Payload Name	Mod #
0/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360	-3,-4,-5
1/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC250-2	-3,-4,-5
2/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC250-2 + SC50-4	-3,-4,-5
3/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC50-12	3,-4,-5
4/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC500-2	4,-3,-5
5/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC500-2 + SC50-4	4,-3,-5
6/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC1000-1	5,-3,-4
7/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC1000-1 + SC250-1	5,-3,-4
8/0,1,2,3-MG17-AP-4000 + 4,5-MGFF-APHE-360 + SC1000-1 + SC50-4	5,-3,-4
9/Empty	-3,-4,-5
10/SmokeGenWhiteOne-1	-3,-4,-5
11/SmokeGenWhiteTwo-2	-3,-4,-5
12/SmokeGenBlueOne-1	-3,-4,-5
13/SmokeGenBlueTwo-2	-3,-4,-5
14/SmokeGenRedOne-1	-3,-4,-5
15/SmokeGenRedTwo-2	-3,-4,-5
16/SmokeGenGreenOne-1	-3,-4,-5
17/SmokeGenGreenTwo-2	-3,-4,-5
18/SmokeGenYellowOne-1	-3,-4,-5
19/SmokeGenYellowTwo-2	-3,-4,-5
20/SmokeGenBlackOne-1	-3,-4,-5
21/SmokeGenBlackTwo-2	-3,-4,-5

Fw 190 A-3

Mods

1: SC 50 bombs
2: SC 250 bomb
3: SC 500 bomb
4: MG FF gun pods (x60 ammo)
5: MG FF gun pods (x90 ammo)

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-1800 + 2,3-MG15120-APHE-500	-1,-2,-3,-4,-5
1/0,1-MG17-AP-1800 + 2,3-MG15120-APHE-500 + SC50-4	1,-2,-3,-4,-5
2/0,1-MG17-AP-1800 + 2,3-MG15120-APHE-500 + SC250-1	2,-1,-3,-4,-5
3/0,1-MG17-AP-1800 + 2,3-MG15120-APHE-500 + SC500-1	3,-1,-2,-4,-5
4/0,1-MG17-AP-1800+2,3-MG15120-APHE-500+4,5-MGFF-APHE-120-add	4,-1,-2,-3,-5
5/0,1-MG17-AP-1800+2,3-MG15120-APHE-500+4,5-MGFF-APHE-180-add	5,-1,-2,-3,-4
6/Empty	-1,-2,-3,-4,-5
7/SmokeGenWhiteOne-1	-1,-2,-3,-4,-5
8/SmokeGenWhiteTwo-2	-1,-2,-3,-4,-5
9/SmokeGenBlueOne-1	-1,-2,-3,-4,-5
10/SmokeGenBlueTwo-2	-1,-2,-3,-4,-5
11/SmokeGenRedOne-1	-1,-2,-3,-4,-5
12/SmokeGenRedTwo-2	-1,-2,-3,-4,-5
13/SmokeGenGreenOne-1	-1,-2,-3,-4,-5
14/SmokeGenGreenTwo-2	-1,-2,-3,-4,-5
15/SmokeGenYellowOne-1	-1,-2,-3,-4,-5
16/SmokeGenYellowTwo-2	-1,-2,-3,-4,-5
17/SmokeGenBlackOne-1	-1,-2,-3,-4,-5
18/SmokeGenBlackTwo-2	-1,-2,-3,-4,-5

He 111 H-6

Mods

1: MG FF belly gun turret
2: MG FF nose gun turret
3: SC 1000 bombs
4: SC 1800 bomb
5: SC 2500 bomb

Payload ID / Payload Name	Mod #
0/SC50-16	-3,-4,-5
1/SC250-4	-3,-4,-5
2/SC500-1 + SC50-16	-3,-4,-5
3/SC500-1 + SC250-4	-3,-4,-5
4/SC1000-2	3,-4,-5
5/SC1000-1 + SC50-16	3,-4,-5
6/SC1000-1 + SC250-4	3,-4,-5
7/SC1800-2	4,-3,-5
8/SC1800-1 + SC50-16	4,-3,-5
9/SC1800-1 + SC250-4	4,-3,-5
10/SC1800-1 + SC1000-1	3,4,-5
11/SC2500-1	5,-3,-4

12/SC2500-1 + SC1000-1	3,5,-4
13/Empty	-3,-4,-5
14/SmokeGenWhiteOne-1	-3,-4,-5
15/SmokeGenWhiteTwo-2	-3,-4,-5
16/SmokeGenBlueOne-1	-3,-4,-5
17/SmokeGenBlueTwo-2	-3,-4,-5
18/SmokeGenRedOne-1	-3,-4,-5
19/SmokeGenRedTwo-2	-3,-4,-5
20/SmokeGenGreenOne-1	-3,-4,-5
21/SmokeGenGreenTwo-2	-3,-4,-5
22/SmokeGenYellowOne-1	-3,-4,-5
23/SmokeGenYellowTwo-2	-3,-4,-5
24/SmokeGenBlackOne-1	-3,-4,-5
25/SmokeGenBlackTwo-2	-3,-4,-5

I-16 type 24

Mods

1: ROS-82 (x4) rockets
2: ROS-82 (x6) rockets
3: FAB-50 / FAB-100 bombs
4: One-piece windscreen
5: ShVAK wing mounted guns

Payload ID / Payload Name	Mod #
0/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800	-1,-2,-3,-5
1/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + FAB50SV-2	3,-1,-2,-5
2/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + FAB100M-2	3,-1,-2,-5
3/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-4	1,-2,-3,-5
4/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-4-dist600	1,-2,-3,-5
5/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-4-dist800	1,-2,-3,-5
6/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-4-dist1000	1,-2,-3,-5
7/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-6	2,-1,-3,-5
8/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-6-dist600	2,-1,-3,-5
9/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-6-dist800	2,-1,-3,-5
10/0,1-SHKAS-AP-1000 + 2,3-SHKAS-AP-1800 + ROS82-6-dist1000	2,-1,-3,-5
11/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add	5,-1,-2,-3
12/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + FAB50SV-2	3,5,-1,-2
13/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + FAB100M-2	3,5,-1,-2
14/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-4	1,5,-2,-3
15/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-4-dist600	1,5,-2,-3
16/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-4-dist800	1,5,-2,-3
17/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-4-dist1000	1,5,-2,-3
18/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-6	2,5,-1,-3

19/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-6-dist600	2,5,-1,-3
20/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-6-dist800	2,5,-1,-3
21/0,1-SHKAS-AP-1000 + 2,3-SHVAK-APHE-180-add + ROS82-6-dist1000	2,5,-1,-3
22/Empty	-1,-2,-3,-5
23/SmokeGenWhiteOne-1	-1,-2,-3,-5
24/SmokeGenWhiteTwo-2	-1,-2,-3,-5
25/SmokeGenBlueOne-1	-1,-2,-3,-5
26/SmokeGenBlueTwo-2	-1,-2,-3,-5
27/SmokeGenRedOne-1	-1,-2,-3,-5
28/SmokeGenRedTwo-2	-1,-2,-3,-5
29/SmokeGenGreenOne-1	-1,-2,-3,-5
30/SmokeGenGreenTwo-2	-1,-2,-3,-5
31/SmokeGenYellowOne-1	-1,-2,-3,-5
32/SmokeGenYellowTwo-2	-1,-2,-3,-5
33/SmokeGenBlackOne-1	-1,-2,-3,-5
34/SmokeGenBlackTwo-2	-1,-2,-3,-5

Il-2 mod.1941

Mods

1: VYa-23 guns
2: FAB-50 / FAB-100 (x6) bombs
3: FAB-250 bombs
4: RBS-82 rockets
5: ROFS-132 rockets

Payload ID / Payload Name	Mod #
0/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420	-1,-2,-3,-4,-5
1/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add	1,-2,-3,-4,-5
2/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add	1,-2,-3,-4,-5
3/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add	1,-2,-3,-4,-5
4/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-4	-1,-2,-3,-4,-5
5/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4	1,-2,-3,-4,-5
6/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4	1,-2,-3,-4,-5
7/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4	1,-2,-3,-4,-5
8/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-6	2,-1,-3,-4,-5
9/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6	12,-3,-4,-5
10/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6	12,-3,-4,-5
11/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6	12,-3,-4,-5
12/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB100M-4	-1,-2,-3,-4,-5
13/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4	1,2,-3,-4,-5
14/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4	1,2,-3,-4,-5
15/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4	1,2,-3,-4,-5
16/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB100M-6	2,-1,-3,-4,-5

17/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-6	1,2,-3,-4,-5
18/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-6	1,2,-3,-4,-5
19/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-6	1,2,-3,-4,-5
20/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + ROS82-8	-1,-2,-3,-4,-5
21/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + ROS82-8	1,-2,-3,-4,-5
22/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + ROS82-8	1,-2,-3,-4,-5
23/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + ROS82-8	1,-2,-3,-4,-5
24/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-4 + ROS82-8	-1,-2,-3,-4,-5
25/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4,-5
26/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4,-5
27/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4,-5
28/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-6 + ROS82-8	2,-1,-3,-4,-5
29/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6 + ROS82-8	1,2,-3,-4,-5
30/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + ROS82-8	1,2,-3,-4,-5
31/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + ROS82-8	1,2,-3,-4,-5
32/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB100M-4 + ROS82-8	-1,-2,-3,-4,-5
33/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4,-5
34/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4,-5
35/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4,-5
36/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB250SV-2	3,-1,-2,-4,-5
37/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB250SV-2	1,3,-2,-4,-5
38/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB250SV-2	1,3,-2,-4,-5
39/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB250SV-2	1,3,-2,-4,-5
40/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + RBS82-8	4,-1,-2,-3,-5
41/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + RBS82-8	1,4,-2,-3,-5
42/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + RBS82-8	1,4,-2,-3,-5
43/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + RBS82-8	1,4,-2,-3,-5
44/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-4 + RBS82-8	4,-1,-2,-3,-5
45/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3,-5
46/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3,-5
47/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3,-5
48/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-6 + RBS82-8	2,4,-1,-3,-5
49/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6 + RBS82-8	1,2,4,-3,-5
50/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + RBS82-8	1,2,4,-3,-5
51/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + RBS82-8	1,2,4,-3,-5
52/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB100M-4 + RBS82-8	-1,4,-2,-3,-5
53/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3,-5
54/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3,-5
55/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3,-5
56/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + ROFS132-8	5,-1,-2,-3,-4
57/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + ROFS132-8	1,5,-2,-3,-4
58/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + ROFS132-8	1,5,-2,-3,-4
59/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + ROFS132-8	1,5,-2,-3,-4

60/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-4 + ROFS132-8	5,-1,-2,-3,-4
61/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB50SV-4+ROFS132-8	1,5,-2,-3,-4
62/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + ROFS132-8	1,5,-2,-3,-4
63/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + ROFS132-8	1,5,-2,-3,-4
64/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB50SV-6 + ROFS132-8	2,5,-1,-3,-4
65/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB50SV-6+ROFS132-8	1,2,5,-3,-4
66/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + ROFS132-8	1,2,5,-3,-4
67/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + ROFS132-8	1,2,5,-3,-4
68/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-420 + FAB100M-2 + ROFS132-8	5,-1,-2,-3,-4
69/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB100M-2+ROFS132-8	1,5,-2,-3,-4
70/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-2 + ROFS132-8	1,5,-2,-3,-4
71/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-2 + ROFS132-8	1,5,-2,-3,-4
72/Empty	-1,-2,-3,-4,-5
73/SmokeGenWhiteOne-1	-1,-2,-3,-4,-5
74/SmokeGenWhiteTwo-2	-1,-2,-3,-4,-5
75/SmokeGenBlueOne-1	-1,-2,-3,-4,-5
76/SmokeGenBlueTwo-2	-1,-2,-3,-4,-5
77/SmokeGenRedOne-1	-1,-2,-3,-4,-5
78/SmokeGenRedTwo-2	-1,-2,-3,-4,-5
79/SmokeGenGreenOne-1	-1,-2,-3,-4,-5
80/SmokeGenGreenTwo-2	-1,-2,-3,-4,-5
81/SmokeGenYellowOne-1	-1,-2,-3,-4,-5
82/SmokeGenYellowTwo-2	-1,-2,-3,-4,-5
83/SmokeGenBlackOne-1	-1,-2,-3,-4,-5
84/SmokeGenBlackTwo-2	-1,-2,-3,-4,-5

Il-2 mod.1942

Mods

1: VYa-23 guns
2: VYa-37 guns
3: FAB-250 bombs
4: RBS-82 / ROFS-132 rockets
5: Rear ShKAS turret

Payload ID / Payload Name	Mod #
0/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500	-1,-2,-3,-4
1/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add	1,-2,-3,-4
2/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add	1,-2,-3,-4
3/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add	1,-2,-3,-4
4/0,1-SHKAS-AP-1500 + 2,3-SH37-APHE-80-add	2,-1,-3,-4
5/0,1-SHKAS-AP-1500 + 2,3-SH37-AP-80-add	2,-1,-3,-4
6/0,1-SHKAS-AP-1500 + 2,3-SH37-HE-80-add	2,-1,-3,-4
7/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-4	-1,-2,-3,-4

8/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4	1,-2,-3,-4
9/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4	1,-2,-3,-4
10/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4	1,-2,-3,-4
11/0,1-SHKAS-AP-1500 + 2,3-SH37-APHE-80-add + FAB50SV-4	2,-1,-3,-4
12/0,1-SHKAS-AP-1500 + 2,3-SH37-AP-80-add + FAB50SV-4	2,-1,-3,-4
13/0,1-SHKAS-AP-1500 + 2,3-SH37-HE-80-add + FAB50SV-4	2,-1,-3,-4
14/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-6	-1,-2,-3,-4
15/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6	1,-2,-3,-4
16/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6	1,-2,-3,-4
17/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6	1,-2,-3,-4
18/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB100M-4	-1,-2,-3,-4
19/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4	1,-2,-3,-4
20/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4	1,-2,-3,-4
21/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4	1,-2,-3,-4
22/0,1-SHKAS-AP-1500 + 2,3-SH37-APHE-80-add + FAB100M-2	2,-1,-3,-4
23/0,1-SHKAS-AP-1500 + 2,3-SH37-AP-80-add + FAB100M-2	2,-1,-3,-4
24/0,1-SHKAS-AP-1500 + 2,3-SH37-HE-80-add + FAB100M-2	2,-1,-3,-4
25/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB100M-6	-1,-2,-3,-4
26/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-6	1,-2,-3,-4
27/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-6	1,-2,-3,-4
28/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-6	1,-2,-3,-4
29/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + ROS82-8	-1,-2,-3,-4
30/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + ROS82-8	1,-2,-3,-4
31/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + ROS82-8	1,-2,-3,-4
32/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + ROS82-8	1,-2,-3,-4
33/0,1-SHKAS-AP-1500 + 2,3-SH37-APHE-80-add + ROS82-8	2,-1,-3,-4
34/0,1-SHKAS-AP-1500 + 2,3-SH37-AP-80-add + ROS82-8	2,-1,-3,-4
35/0,1-SHKAS-AP-1500 + 2,3-SH37-HE-80-add + ROS82-8	2,-1,-3,-4
36/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-4 + ROS82-8	-1,-2,-3,-4
37/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4
38/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4
39/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + ROS82-8	1,-2,-3,-4
40/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-6 + ROS82-8	-1,-2,-3,-4
41/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6 + ROS82-8	1,-2,-3,-4
42/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + ROS82-8	1,-2,-3,-4
43/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + ROS82-8	1,-2,-3,-4
44/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB100M-4 + ROS82-8	-1,-2,-3,-4
45/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4
46/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4
47/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4 + ROS82-8	1,-2,-3,-4
48/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB250SV-2	3,-1,-2,-4
49/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB250SV-2	1,3,-2,-4
50/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB250SV-2	1,3,-2,-4

51/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB250SV-2	1,3,-2,-4
52/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + RBS82-8	4,-1,-2,-3
53/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + RBS82-8	1,4,-2,-3
54/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + RBS82-8	1,4,-2,-3
55/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + RBS82-8	1,4,-2,-3
56/0,1-SHKAS-AP-1500 + 2,3-SH37-APHE-80-add + RBS82-8	2,4,-1,-3
57/0,1-SHKAS-AP-1500 + 2,3-SH37-AP-80-add + RBS82-8	2,4,-1,-3
58/0,1-SHKAS-AP-1500 + 2,3-SH37-HE-80-add + RBS82-8	2,4,-1,-3
59/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-4 + RBS82-8	4,-1,-2,-3
60/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3
61/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3
62/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + RBS82-8	1,4,-2,-3
63/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-6 + RBS82-8	4,-1,-2,-3
64/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB50SV-6 + RBS82-8	1,4,-2,-3
65/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + RBS82-8	1,4,-2,-3
66/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + RBS82-8	1,4,-2,-3
67/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB100M-4 + RBS82-8	-1,4,-2,-3
68/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3
69/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3
70/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-4 + RBS82-8	1,4,-2,-3
71/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + ROFS132-8	4,-1,-2,-3
72/0,1-SHKAS-AP-1500 + 2,3-VYA23-APHE-300-add + ROFS132-8	1,4,-2,-3
73/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + ROFS132-8	1,4,-2,-3
74/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + ROFS132-8	1,4,-2,-3
75/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-4 + ROFS132-8	4,-1,-2,-3
76/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB50SV-4+ROFS132-8	1,4,-2,-3
77/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-4 + ROFS132-8	1,4,-2,-3
78/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-4 + ROFS132-8	1,4,-2,-3
79/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB50SV-6 + ROFS132-8	4,-1,-2,-3
80/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB50SV-6+ROFS132-8	1,4,-2,-3
81/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB50SV-6 + ROFS132-8	1,4,-2,-3
82/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB50SV-6 + ROFS132-8	1,4,-2,-3
83/0,1-SHKAS-AP-1500 + 2,3-SHVAK-APHE-500 + FAB100M-2 + ROFS132-8	-1,4,-2,-3
84/0,1-SHKAS-AP-1500+2,3-VYA23-APHE-300-add+FAB100M-2+ROFS132-8	1,4,-2,-3
85/0,1-SHKAS-AP-1500 + 2,3-VYA23-AP-300-add + FAB100M-2 + ROFS132-8	1,4,-2,-3
86/0,1-SHKAS-AP-1500 + 2,3-VYA23-HE-300-add + FAB100M-2 + ROFS132-8	1,4,-2,-3
87/Empty	-1,-2,-3,-4
88/SmokeGenWhiteOne-1	-1,-2,-3,-4
89/SmokeGenWhiteTwo-2	-1,-2,-3,-4
90/SmokeGenBlueOne-1	-1,-2,-3,-4
91/SmokeGenBlueTwo-2	-1,-2,-3,-4
92/SmokeGenRedOne-1	-1,-2,-3,-4
93/SmokeGenRedTwo-2	-1,-2,-3,-4

94/SmokeGenGreenOne-1	-1,-2,-3,-4
95/SmokeGenGreenTwo-2	-1,-2,-3,-4
96/SmokeGenYellowOne-1	-1,-2,-3,-4
97/SmokeGenYellowTwo-2	-1,-2,-3,-4
98/SmokeGenBlackOne-1	-1,-2,-3,-4
99/SmokeGenBlackTwo-2	-1,-2,-3,-4

Ju 87 D-3

Mods

1: Siren
2: SC 1800 bomb
3: Additional Armour Plates
4: WB-81B machinegun pods
5: BK 37 gun pods

Payload ID / Payload Name	Mod #
0/0,1-MG17-AP-2000	-2,-4,-5
1/0,1-MG17-AP-2000 + SC250-1 + SD70-4	-2,-4,-5
2/0,1-MG17-AP-2000 + SC500-1	-2,-4,-5
3/0,1-MG17-AP-2000 + SC500-1 + SD70-4	-2,-4,-5
4/0,1-MG17-AP-2000 + SC500-1 + SC250-2	-2,-4,-5
5/0,1-MG17-AP-2000 + SC250-3	-2,-4,-5
6/0,1-MG17-AP-2000 + SC1000-1	-2,-4,-5
7/0,1-MG17-AP-2000 + SC1800-1	2,-4,-5
8/0,1-MG17-AP-2000 + 2,3-WB81B-AP-3000-add	-2,4,-5
9/0,1-BK37-AP-24-add	5,-2,-4
10/0,1-BK37-HE-24-add	5,-2,-4
11/Empty	-2,-4,-5
12/SmokeGenWhiteOne-1	-2,-4,-5
13/SmokeGenWhiteTwo-2	-2,-4,-5
14/SmokeGenBlueOne-1	-2,-4,-5
15/SmokeGenBlueTwo-2	-2,-4,-5
16/SmokeGenRedOne-1	-2,-4,-5
17/SmokeGenRedTwo-2	-2,-4,-5
18/SmokeGenGreenOne-1	-2,-4,-5
19/SmokeGenGreenTwo-2	-2,-4,-5
20/SmokeGenYellowOne-1	-2,-4,-5
21/SmokeGenYellowTwo-2	-2,-4,-5
22/SmokeGenBlackOne-1	-2,-4,-5
23/SmokeGenBlackTwo-2	-2,-4,-5

Ju 88 A-4

Mods

1: SC 250 wing-mounted bombs
2: SC 500 bombs
3: SC 1000 bombs
4: SC 1800 bomb
5: SC 2500 bomb

Payload ID / Payload Name	Mod #
0/SC250-4	-1,-2,-3,-4,-5
1/SC250-6	1,-2,-3,-4,-5
2/SC50-28	-1,-2,-3,-4,-5
3/SC50-44	5,-1,-2,-3,-4
4/SC250-4 + SC50-28	-1,-2,-3,-4,-5
5/SC250-6 + SC50-28	1,-2,-3,-4,-5
6/SC500-4	2,-1,-3,-4,-5
7/SC500-4 + SC250-2	1,2,-3,-4,-5
8/SC500-4 + SC50-18	2,-1,-3,-4,-5
9/SC1000-2	3,-1,-2,-4,-5
10/SC1800-1	4,-1,-2,-3,-5
11/SC1800-1 + SC1000-1	3,4,-1,-2,-5
12/Empty	-1,-2,-3,-4,-5
13/SmokeGenWhiteOne-1	-1,-2,-3,-4,-5
14/SmokeGenWhiteTwo-2	-1,-2,-3,-4,-5
15/SmokeGenBlueOne-1	-1,-2,-3,-4,-5
16/SmokeGenBlueTwo-2	-1,-2,-3,-4,-5
17/SmokeGenRedOne-1	-1,-2,-3,-4,-5
18/SmokeGenRedTwo-2	-1,-2,-3,-4,-5
19/SmokeGenGreenOne-1	-1,-2,-3,-4,-5
20/SmokeGenGreenTwo-2	-1,-2,-3,-4,-5
21/SmokeGenYellowOne-1	-1,-2,-3,-4,-5
22/SmokeGenYellowTwo-2	-1,-2,-3,-4,-5
23/SmokeGenBlackOne-1	-1,-2,-3,-4,-5
24/SmokeGenBlackTwo-2	-1,-2,-3,-4,-5

La-5 ser.8

Mods

1: FAB-50 bombs
2: FAB-100 bombs
3: RPK-10 radio compass
4: Flat windscreen
5: Gun special payload

Payload ID / Payload Name	Mod #
0/0,1-SHVAK-APHE-340	-1,-2
1/0,1-SHVAK-APHE-340 + FAB50SV-2	1,-2
2/0,1-SHVAK-APHE-340 + FAB100M-2	-1,2
3/0,1-SHVAK-AP-340	-1,-2,5
4/0,1-SHVAK-AP-340 + FAB50SV-2	1,5,-2
5/0,1-SHVAK-AP-340 + FAB100M-2	2,5,-1
6/0,1-SHVAK-HE-340	-1,-2,5
7/0,1-SHVAK-HE-340 + FAB50SV-2	1,5,-2
8/0,1-SHVAK-HE-340 + FAB100M-2	2,5,-1
9/Empty	-1,-2,-5
10/SmokeGenWhiteOne-1	-1,-2,-5
11/SmokeGenWhiteTwo-2	-1,-2,-5
12/SmokeGenBlueOne-1	-1,-2,-5
13/SmokeGenBlueTwo-2	-1,-2,-5
14/SmokeGenRedOne-1	-1,-2,-5
15/SmokeGenRedTwo-2	-1,-2,-5
16/SmokeGenGreenOne-1	-1,-2,-5
17/SmokeGenGreenTwo-2	-1,-2,-5
18/SmokeGenYellowOne-1	-1,-2,-5
19/SmokeGenYellowTwo-2	-1,-2,-5
20/SmokeGenBlackOne-1	-1,-2,-5
21/SmokeGenBlackTwo-2	-1,-2,-5

LaGG-3 ser.29

Mods

1: Vya-23 gun
2: Sh-37 gun
3: FAB-50 bombs
4: FAB-100 bombs
5: ROS-82 rockets

Payload ID/Payload Name	Mod #
0/0-UB-APHE-200 + 1-SHVAK-APHE-160	-1,-2,-3,-4,-5
1/0-UB-APHE-200 + 1-VYA23-APHE-90-add	1,-2,-3,-4,-5
2/0-UB-APHE-200 + 1-VYA23-AP-90-add	1,-2,-3,-4,-5
3/0-UB-APHE-200 + 1-VYA23-HE-90-add	1,-2,-3,-4,-5
4/0-UB-APHE-140 + 1-SH37-APHE-20-add	2,-1,-3,-4,-5
5/0-UB-APHE-140 + 1-SH37-AP-20-add	2,-1,-3,-4,-5
6/0-UB-APHE-140 + 1-SH37-HE-20-add	2,-1,-3,-4,-5
7/0-UB-APHE-200 + 1-SHVAK-APHE-160 + FAB50SV-2	3,-1,-2,-4,-5
8/0-UB-APHE-200 + 1-VYA23-APHE-90-add + FAB50SV-2	1,3,-2,-4,-5
9/0-UB-APHE-200 + 1-VYA23-AP-90-add + FAB50SV-2	1,3,-2,-4,-5
10/0-UB-APHE-200 + 1-VYA23-HE-90-add + FAB50SV-2	1,3,-2,-4,-5
11/0-UB-APHE-140 + 1-SH37-APHE-20-add + FAB50SV-2	2,3,-1,-4,-5
12/0-UB-APHE-140 + 1-SH37-AP-20-add + FAB50SV-2	2,3,-1,-4,-5
13/0-UB-APHE-140 + 1-SH37-HE-20-add + FAB50SV-2	2,3,-1,-4,-5
14/0-UB-APHE-200 + 1-SHVAK-APHE-160 + FAB100M-2	4,-1,-2,-3,-5
15/0-UB-APHE-200 + 1-VYA23-APHE-90-add + FAB100M-2	1,4,-2,-3,-5
16/0-UB-APHE-200 + 1-VYA23-AP-90-add + FAB100M-2	1,4,-2,-3,-5
17/0-UB-APHE-200 + 1-VYA23-HE-90-add + FAB100M-2	1,4,-2,-3,-5
18/0-UB-APHE-140 + 1-SH37-APHE-20-add + FAB100M-2	2,4,-1,-3,-5
19/0-UB-APHE-140 + 1-SH37-AP-20-add + FAB100M-2	2,4,-1,-3,-5
20/0-UB-APHE-140 + 1-SH37-HE-20-add + FAB100M-2	2,4,-1,-3,-5
21/0-UB-APHE-200 + 1-SHVAK-APHE-160 + ROS82-6	5,-1,-2,-3,-4
22/0-UB-APHE-200 + 1-VYA23-APHE-90-add + ROS82-6	1,5,-2,-3,-4
23/0-UB-APHE-200 + 1-VYA23-AP-90-add + ROS82-6	1,5,-2,-3,-4
24/0-UB-APHE-200 + 1-VYA23-HE-90-add + ROS82-6	1,5,-2,-3,-4
25/0-UB-APHE-140 + 1-SH37-APHE-20-add + ROS82-6	2,5,-1,-3,-4
26/0-UB-APHE-140 + 1-SH37-AP-20-add + ROS82-6	2,5,-1,-3,-4
27/0-UB-APHE-140 + 1-SH37-HE-20-add + ROS82-6	2,5,-1,-3,-4
28/0-UB-APHE-200 + 1-SHVAK-APHE-160 + ROS82-6-dist600	5,-1,-2,-3,-4
29/0-UB-APHE-200 + 1-VYA23-APHE-90-add + ROS82-6-dist600	1,5,-2,-3,-4
30/0-UB-APHE-200 + 1-VYA23-AP-90-add + ROS82-6-dist600	1,5,-2,-3,-4
31/0-UB-APHE-200 + 1-VYA23-HE-90-add + ROS82-6-dist600	1,5,-2,-3,-4
32/0-UB-APHE-140 + 1-SH37-APHE-20-add + ROS82-6-dist600	2,5,-1,-3,-4
33/0-UB-APHE-140 + 1-SH37-AP-20-add + ROS82-6-dist600	2,5,-1,-3,-4
34/0-UB-APHE-140 + 1-SH37-HE-20-add + ROS82-6-dist600	2,5,-1,-3,-4
35/0-UB-APHE-200 + 1-SHVAK-APHE-160 + ROS82-6-dist800	5,-1,-2,-3,-4
36/0-UB-APHE-200 + 1-VYA23-APHE-90-add + ROS82-6-dist800	1,5,-2,-3,-4
37/0-UB-APHE-200 + 1-VYA23-AP-90-add + ROS82-6-dist800	1,5,-2,-3,-4
38/0-UB-APHE-200 + 1-VYA23-HE-90-add + ROS82-6-dist800	1,5,-2,-3,-4
39/0-UB-APHE-140 + 1-SH37-APHE-20-add + ROS82-6-dist800	2,5,-1,-3,-4
40/0-UB-APHE-140 + 1-SH37-AP-20-add + ROS82-6-dist800	2,5,-1,-3,-4
41/0-UB-APHE-140 + 1-SH37-HE-20-add + ROS82-6-dist800	2,5,-1,-3,-4

42/0-UB-APHE-200 + 1-SHVAK-APHE-160 + ROS82-6-dist1000	5,-1,-2,-3,-4
43/0-UB-APHE-200 + 1-VYA23-APHE-90-add + ROS82-6-dist1000	1,5,-2,-3,-4
44/0-UB-APHE-200 + 1-VYA23-AP-90-add + ROS82-6-dist1000	1,5,-2,-3,-4
45/0-UB-APHE-200 + 1-VYA23-HE-90-add + ROS82-6-dist1000	1,5,-2,-3,-4
46/0-UB-APHE-140 + 1-SH37-APHE-20-add + ROS82-6-dist1000	2,5,-1,-3,-4
47/0-UB-APHE-140 + 1-SH37-AP-20-add + ROS82-6-dist1000	2,5,-1,-3,-4
48/0-UB-APHE-140 + 1-SH37-HE-20-add + ROS82-6-dist1000	2,5,-1,-3,-4
49/Empty	-1,-2,-3,-4,-5
50/SmokeGenWhiteOne-1	-1,-2,-3,-4,-5
51/SmokeGenWhiteTwo-2	-1,-2,-3,-4,-5
52/SmokeGenBlueOne-1	-1,-2,-3,-4,-5
53/SmokeGenBlueTwo-2	-1,-2,-3,-4,-5
54/SmokeGenRedOne-1	-1,-2,-3,-4,-5
55/SmokeGenRedTwo-2	-1,-2,-3,-4,-5
56/SmokeGenGreenOne-1	-1,-2,-3,-4,-5
57/SmokeGenGreenTwo-2	-1,-2,-3,-4,-5
58/SmokeGenYellowOne-1	-1,-2,-3,-4,-5
59/SmokeGenYellowTwo-2	-1,-2,-3,-4,-5
60/SmokeGenBlackOne-1	-1,-2,-3,-4,-5
61/SmokeGenBlackTwo-2	-1,-2,-3,-4,-5

MC.202 ser.VIII

Mods

1: Armoured Wind Screen
2: 50T bombs
3: 100T bombs
4: Breda 7mm wing-mounted machineguns
5: MG-151/20 gun pods

Payload ID / Payload Name	Mod #
0/0,1-BREDA12-APHE-800	-2,-3,-4,-5
1/0,1-BREDA12-APHE-800 + T50-2	2,-3,-4,-5
2/0,1-BREDA12-APHE-800 + T100-2	3,-2,-4,-5
3/0,1-BREDA12-APHE-800 + 2,3-BREDA7-AP-1000-add	4,-2,-3,-5
4/0,1-BREDA12-APHE-800 + 2,3-MG15120-APHE-270-add	5,-2,-3,-4
5/Empty	-2,-3,-4,-5
6/SmokeGenWhiteOne-1	-2,-3,-4,-5
7/SmokeGenWhiteTwo-2	-2,-3,-4,-5
8/SmokeGenBlueOne-1	-2,-3,-4,-5
9/SmokeGenBlueTwo-2	-2,-3,-4,-5
10/SmokeGenRedOne-1	-2,-3,-4,-5
11/SmokeGenRedTwo-2	-2,-3,-4,-5
12/SmokeGenGreenOne-1	-2,-3,-4,-5

13/SmokeGenGreenTwo-2	-2,-3,-4,-5
14/SmokeGenYellowOne-1	-2,-3,-4,-5
15/SmokeGenYellowTwo-2	-2,-3,-4,-5
16/SmokeGenBlackOne-1	-2,-3,-4,-5
17/SmokeGenBlackTwo-2	-2,-3,-4,-5

MiG-3 ser.24

Mods

1: ROS-82 (x6) rockets
2: FAB-50 / FAB-100 bombs
3: BK machinegun pods
4: UBS (x2) nose mounted machineguns
5: ShVAK nose mounted guns

Payload ID / Payload Name	Mod #
0/0,1-SHKAS-AP-1500 + 2-BS-APHE-300	-1,-2,-3,-4,-5
1/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + ROS82-6	1,-2,-3,-4,-5
2/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + ROS82-6-dist600	1,-2,-3,-4,-5
3/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + ROS82-6-dist800	1,-2,-3,-4,-5
4/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + ROS82-6-dist1000	1,-2,- 3,-4,-5
5/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + FAB50SV-2	2,-1,-3,-4,-5
6/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + FAB100M-2	2,-1,-3,-4,-5
7/0,1-SHKAS-AP-1500 + 2-BS-APHE-300 + 3,4-BK-APHE-290-add	3,-1,-2,-4,-5
8/0,1-BS-APHE-700	4,-1,-2,-3,-5
9/0,1-BS-APHE-700 + ROS82-6	1,4,-2,-3,-5
10/0,1-BS-APHE-700 + ROS82-6-dist600	1,4,-2,-3,-5
11/0,1-BS-APHE-700 + ROS82-6-dist800	1,4,-2,-3,-5
12/0,1-BS-APHE-700 + ROS82-6-dist1000	1,4,-2,-3,-5
13/0,1-BS-APHE-700 + FAB50SV-2	2,4,-1,-3,-5
14/0,1-BS-APHE-700 + FAB100M-2	2,4,-1,-3,-5
15/0,1-BS-APHE-700 + 3,4-BK-APHE-290-add	3,4,-1,-2,-5
16/0,1-SHVAK-APHE-300	5,-1,-2,-3,-4
17/0,1-SHVAK-APHE-300 + ROS82-6	1,5,-2,-3,-4
18/0,1-SHVAK-APHE-300 + ROS82-6-dist600	1,5,-2,-3,-4
19/0,1-SHVAK-APHE-300 + ROS82-6-dist800	1,5,-2,-3,-4
20/0,1-SHVAK-APHE-300 + ROS82-6-dist1000	1,5,-2,-3,-4
21/0,1-SHVAK-APHE-300 + FAB50SV-2	2,5,-1,-3,-4
22/0,1-SHVAK-APHE-300 + FAB100M-2	2,5,-1,-3,-4
23/0,1-SHVAK-APHE-300 + 3,4-BK-APHE-290-add	3,5,-1,-2,-4
24/Empty	-1,-2,-3,-4,-5
25/SmokeGenWhiteOne-1	-1,-2,-3,-4,-5
26/SmokeGenWhiteTwo-2	-1,-2,-3,-4,-5
27/SmokeGenBlueOne-1	-1,-2,-3,-4,-5

28/SmokeGenBlueTwo-2	-1,-2,-3,-4,-5
29/SmokeGenRedOne-1	-1,-2,-3,-4,-5
30/SmokeGenRedTwo-2	-1,-2,-3,-4,-5
31/SmokeGenGreenOne-1	-1,-2,-3,-4,-5
32/SmokeGenGreenTwo-2	-1,-2,-3,-4,-5
33/SmokeGenYellowOne-1	-1,-2,-3,-4,-5
34/SmokeGenYellowTwo-2	-1,-2,-3,-4,-5
35/SmokeGenBlackOne-1	-1,-2,-3,-4,-5
36/SmokeGenBlackTwo-2	-1,-2,-3,-4,-5

P-40E-1

Mods

1: M250 (x4) machineguns
2: Additional ammo for machineguns
3: ROS-82 (x4) rockets
4: FAB-250 bomb
5: FAB-500 bomb

Payload ID / Payload Name	Mod #
0/0,1,2,3,4,5-M250-AP-1410	-1,-2,-3,-4,-5
1/0,1,2,3,4,5-M250-AP-1686	2,-1,-3,-4,-5
2/0,1,2,3-M250-AP-940	1,-2,-3,-4,-5
3/0,1,2,3-M250-AP-2460	1,2,-3,-4,-5
4/0,1,2,3,4,5-M250-AP-1410 + FAB250SV-1	4,-1,-2,-3,-5
5/0,1,2,3,4,5-M250-AP-1686 + FAB250SV-1	2,4,-1,-3,-5
6/0,1,2,3-M250-AP-940 + FAB250SV-1	1,4,-2,-3,-5
7/0,1,2,3-M250-AP-2460 + FAB250SV-1	1,2,4,-3,-5
8/0,1,2,3,4,5-M250-AP-1410 + FAB500M-1	5,-1,-2,-3,-4
9/0,1,2,3,4,5-M250-AP-1686 + FAB500M-1	2,5,-1,-3,-4
10/0,1,2,3-M250-AP-940 + FAB500M-1	1,5,-2,-3,-4
11/0,1,2,3-M250-AP-2460 + FAB500M-1	1,2,5,-3,-4
12/0,1,2,3,4,5-M250-AP-1410 + ROS82-4	3,-1,-2,-4,-5
13/0,1,2,3,4,5-M250-AP-1686 + ROS82-4	2,3,-1,-4,-5
14/0,1,2,3-M250-AP-940 + ROS82-4	1,3,-2,-4,-5
15/0,1,2,3-M250-AP-2460 + ROS82-4	1,2,3,-4,-5
16/0,1,2,3,4,5-M250-AP-1410 + ROS82-4-dist600	3,-1,-2,-4,-5
17/0,1,2,3,4,5-M250-AP-1686 + ROS82-4-dist600	2,3,-1,-4,-5
18/0,1,2,3-M250-AP-940 + ROS82-4-dist600	1,3,-2,-4,-5
19/0,1,2,3-M250-AP-2460 + ROS82-4-dist600	1,2,3,-4,-5
20/0,1,2,3,4,5-M250-AP-1410 + ROS82-4-dist800	3,-1,-2,-4,-5
21/0,1,2,3,4,5-M250-AP-1686 + ROS82-4-dist800	2,3,-1,-4,-5
22/0,1,2,3-M250-AP-940 + ROS82-4-dist800	1,3,-2,-4,-5
23/0,1,2,3-M250-AP-2460 + ROS82-4-dist800	1,2,3,-4,-5

24/0,1,2,3,4,5-M250-AP-1410 + ROS82-4-dist1000	3,-1,-2,-4,-5
25/0,1,2,3,4,5-M250-AP-1686 + ROS82-4-dist1000	2,3,-1,-4,-5
26/0,1,2,3-M250-AP-940 + ROS82-4-dist1000	1,3,-2,-4,-5
27/0,1,2,3-M250-AP-2460 + ROS82-4-dist1000	1,2,3,-4,-5
28/0,1,2,3,4,5-M250-AP-1410 + FAB250SV-1 + ROS82-4	3,4,-1,-2,-5
29/0,1,2,3,4,5-M250-AP-1686 + FAB250SV-1 + ROS82-4	2,3,4,-1,-5
30/0,1,2,3-M250-AP-940 + FAB250SV-1 + ROS82-4	1,3,4,-2,-5
31/0,1,2,3-M250-AP-2460 + FAB250SV-1 + ROS82-4	1,2,3,4,-5
32/0,1,2,3,4,5-M250-AP-1410 + FAB500M-1 + ROS82-4	3,5,-1,-2,-4
33/0,1,2,3,4,5-M250-AP-1686 + FAB500M-1 + ROS82-4	2,3,5,-1,-4
34/0,1,2,3-M250-AP-940 + FAB500M-1 + ROS82-4	1,3,5,-2,-4
35/0,1,2,3-M250-AP-2460 + FAB500M-1 + ROS82-4	1,2,3,5,-4
36/Empty	-2,-3,-4,-5
37/SmokeGenWhiteOne-1	-2,-3,-4,-5
38/SmokeGenWhiteTwo-2	-2,-3,-4,-5
39/SmokeGenBlueOne-1	-2,-3,-4,-5
40/SmokeGenBlueTwo-2	-2,-3,-4,-5
41/SmokeGenRedOne-1	-2,-3,-4,-5
42/SmokeGenRedTwo-2	-2,-3,-4,-5
43/SmokeGenGreenOne-1	-2,-3,-4,-5
44/SmokeGenGreenTwo-2	-2,-3,-4,-5
45/SmokeGenYellowOne-1	-2,-3,-4,-5
46/SmokeGenYellowTwo-2	-2,-3,-4,-5
47/SmokeGenBlackOne-1	-2,-3,-4,-5
48/SmokeGenBlackTwo-2	-2,-3,-4,-5

Pe-2 ser.35

Mods

1: FAB-100 (x10) bombs
2: FAB-250 (x4) bombs
3: FAB-500 (x2) bombs
4: ROS-132 (x10) rockets
5: RPK-2 radio compass

Payload ID / Payload Name	Mod #
0/0-SHKAS-AP-450 + 1-UB-APHE-150	-1,-2,-3,-4
1/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-4	-1,-2,-3,-4
2/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-6	-1,-2,-3,-4
3/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-2	-1,-2,-3,-4
4/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-10	1,-2,-3,-4
5/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-4	2,-1,-3,-4
6/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB500M-2	3,-1,-2,-4
7/0-SHKAS-AP-450 + 1-UB-APHE-150 + ROS132-10	4,-1,-2,-3

8/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-4 + ROS132-10	4,-1,-2,-3
9/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-6 + ROS132-10	4,-1,-2,-3
10/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-2 + ROS132-10	4,-1,-2,-3
11/Empty	-1,-2,-3,-4
12/SmokeGenWhiteOne-1	-1,-2,-3,-4
13/SmokeGenWhiteTwo-2	-1,-2,-3,-4
14/SmokeGenBlueOne-1	-1,-2,-3,-4
15/SmokeGenBlueTwo-2	-1,-2,-3,-4
16/SmokeGenRedOne-1	-1,-2,-3,-4
17/SmokeGenRedTwo-2	-1,-2,-3,-4
18/SmokeGenGreenOne-1	-1,-2,-3,-4
19/SmokeGenGreenTwo-2	-1,-2,-3,-4
20/SmokeGenYellowOne-1	-1,-2,-3,-4
21/SmokeGenYellowTwo-2	-1,-2,-3,-4
22/SmokeGenBlackOne-1	-1,-2,-3,-4
23/SmokeGenBlackTwo-2	-1,-2,-3,-4

Pe-2 ser.87

Mods

1: FAB-100 (x10) bombs
2: FAB-250 (x4) bombs
3: FAB-500 (x2) bombs
4: ROS-132 (x10) rockets
5: VUB-1 blister UBT turret

Payload ID / Payload Name	Mod #
0/0-SHKAS-AP-450 + 1-UB-APHE-150	-1,-2,-3,-4
1/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-4	-1,-2,-3,-4
2/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-6	-1,-2,-3,-4
3/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-2	-1,-2,-3,-4
4/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-10	1,-2,-3,-4
5/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-4	2,-1,-3,-4
6/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB500M-2	3,-1,-2,-4
7/0-SHKAS-AP-450 + 1-UB-APHE-150 + ROS132-10	4,-1,-2,-3
8/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-4 + ROS132-10	4,-1,-2,-3
9/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB100M-6 + ROS132-10	4,-1,-2,-3
10/0-SHKAS-AP-450 + 1-UB-APHE-150 + FAB250SV-2 + ROS132-10	4,-1,-2,-3
11/Empty	-1,-2,-3,-4
12/SmokeGenWhiteOne-1	-1,-2,-3,-4
13/SmokeGenWhiteTwo-2	-1,-2,-3,-4
14/SmokeGenBlueOne-1	-1,-2,-3,-4
15/SmokeGenBlueTwo-2	-1,-2,-3,-4
16/SmokeGenRedOne-1	-1,-2,-3,-4

17/SmokeGenRedTwo-2	-1,-2,-3,-4
18/SmokeGenGreenOne-1	-1,-2,-3,-4
19/SmokeGenGreenTwo-2	-1,-2,-3,-4
20/SmokeGenYellowOne-1	-1,-2,-3,-4
21/SmokeGenYellowTwo-2	-1,-2,-3,-4
22/SmokeGenBlackOne-1	-1,-2,-3,-4
23/SmokeGenBlackTwo-2	-1,-2,-3,-4

Yak-1 ser.69

Mods

1: ROS-82 (x2) rockets
2: ROS-82 (x6) rockets
3: FAB-50 bombs
4: FAB-100 bombs
5: RPK-10 radio compass

Payload ID / Payload Name	Mod #
0/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120	-1,-2,-3,-4
1/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-2	1,-2,-3,-4
2/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-2-dist600	1,-2,-3,-4
3/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-2-dist800	1,-2,-3,-4
4/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-2-dist1000	1,-2,-3,-4
5/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-6	2,-1,-3,-4
6/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-6-dist600	2,-1,-3,-4
7/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-6-dist800	2,-1,-3,-4
8/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + ROS82-6-dist1000	2,-1,-3,-4
9/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + FAB50SV-2	3,-1,-2,-4
10/0,1-SHKAS-AP-1500 + 2-SHVAK-APHE-120 + FAB100M-2	4,-1,-2,-3
11/Empty	-1,-2,-3,-4
12/SmokeGenWhiteOne-1	-1,-2,-3,-4
13/SmokeGenWhiteTwo-2	-1,-2,-3,-4
14/SmokeGenBlueOne-1	-1,-2,-3,-4
15/SmokeGenBlueTwo-2	-1,-2,-3,-4
16/SmokeGenRedOne-1	-1,-2,-3,-4
17/SmokeGenRedTwo-2	-1,-2,-3,-4
18/SmokeGenGreenOne-1	-1,-2,-3,-4
19/SmokeGenGreenTwo-2	-1,-2,-3,-4
20/SmokeGenYellowOne-1	-1,-2,-3,-4
21/SmokeGenYellowTwo-2	-1,-2,-3,-4
22/SmokeGenBlackOne-1	-1,-2,-3,-4
23/SmokeGenBlackTwo-2	-1,-2,-3,-4

Yak-1 ser.127

Mods

1: FAB-50 bombs
2: FAB-100 bombs
3: Landing light
4: RPK-10 radio compass

Payload ID / Payload Name	Mod #
0/0-UB-APHE-220 + 1-SHVAK-APHE-140	-1,-2
1/0-UB-APHE-220 + 1-SHVAK-APHE-140 + FAB50SV-2	1,-2
2/0-UB-APHE-220 + 1-SHVAK-APHE-140 + FAB100M-2	2,-1
3/Empty	-1,-2
4/SmokeGenWhiteOne-1	-1,-2
5/SmokeGenWhiteTwo-2	-1,-2
6/SmokeGenBlueOne-1	-1,-2
7/SmokeGenBlueTwo-2	-1,-2
8/SmokeGenRedOne-1	-1,-2
9/SmokeGenRedTwo-2	-1,-2
10/SmokeGenGreenOne-1	-1,-2
11/SmokeGenGreenTwo-2	-1,-2
12/SmokeGenYellowOne-1	-1,-2
13/SmokeGenYellowTwo-2	-1,-2
14/SmokeGenBlackOne-1	-1,-2
15/SmokeGenBlackTwo-2	-1,-2

Mission Files

Saving your mission generates the following files:

- .mission—The mission source file

  Important! You can view this file in NotePad if you like, but do not edit it unless you know what you are doing. If you edit this file, use an advanced text editing program such as NotePad++ (free download) rather than NotePad. Using a text editor like NotePad++ helps avoid potential text formatting issues that could affect the file.
- .msnbin—The mission binary file, which IL-2 Sturmovik runs.
- .list—The list of localization files (see the next bullet). Every mission requires at least one .list file, but if it is missing you can recreate it by saving the mission.
- .eng, .fra, .ger, and so on—Localization files that store certain mission text in a specific language. Every mission requires at least one localization file for the native language of the mission. For more detail on localizing your mission, see Provide a Mission in Various Languages (pg. 49).

Important! If you move a mission, be sure that you move at least the .msnbin file and the

localization files (if you provide your mission in various languages (pg. 49)). Moving the .mission file is optional because you can still edit a mission without the mission source file (pg. 48).

DServer Interface

Main Window

File Menu

Open

Allows you to select a DServer configuration file (.sds file) and then starts the remote console service (if it is enabled), and starts the mission that you specified in the .sds file.

Close

Stops the currently running mission and shuts down the remote console service (if it was started).

Manage SDS

Opens the Configuration Dialog (pg. 326), where you can configure the DServer.

Note: You can also configure the DServer by editing the .sds file that stores the DServer configuration settings..the DServer. Instructions for each .sds file setting are included in the default .sds file, called "DServer_dogfight_default_config.sds". The default .sds file is in your DServer installation directory under \data\Multiplayer.

Mission

The path and file name of the IL-2 Sturmovik mission file (.msnbin) currently running.

The mission file shown can change periodically if there are multiple missions specified in the DServer configuration file (.sds file).

Mode

The value set for "Mission Type" in the Mission Properties Dialog (pg. 208) of the Mission Editor. This value must be "Deathmatch" for multiplayer missions.

Player List

A list of the players that have joined the current mission on the DServer. Player #0 is the DServer itself.

CID

Client ID. An ID assigned to each player on the DServer.

Ping

The current ping (in milliseconds) for client communications with the DServer

State

The current state of each client

Server Performance Graph (Bottom of Window)

A trace over time of the percent DServer processing load relative to the maximum acceptable processing load. Once the load exceeds 100%, the DServer response slows down.

The horizontal axis is marked in one minute intervals. The most recent data appears at the right and moves to the left.

The vertical axis is marked in 50% intervals, with 0% at the bottom and 200% at the top.

The trace that indicates usage over time is colour-coded as follows:

- A yellow trace indicates acceptable usage levels (0% to 100%).
- A red trace indicates unacceptable usage levels, during which server overload warning messages are shown in the mission chat box.

The trace can also include temporary spikes in the usage level, such as when an object is spawned.

Server SDS

The path and file name of the DServer configuration file (.sds file) currently in use

SPS

Simulations per second (the number of simulation processing cycles per second). The minimum value is 50. If the value drops below 50, the simulation slow-down becomes noticeable.

Note: If the value exceeds 50, the SPS display still shows 50.

State

The state of the DServer, which changes as a mission is loaded and starts.

Status History Box (Under the Skip mission Button)

A history of the DServer status since the DServer was started.

Tick Delay

The time required for one processing cycle of the simulation. The maximum processing value must be less than or equal to 20 milliseconds (20ms). If the value is greater than 20ms, the simulation slow-down becomes noticeable.

Configuration Dialog

How to Open: In the File menu, choose "Manage SDS".

Here are the fields that require a description:

Downloader Port

The port used for downloading a multiplayer mission to a player's IL-2 Sturmovik client. The default is 28100.

Note: You may have to open port 28100 or forward it on your router.

Load

Allows you to select a DServer configuration file (.sds file) to load

Login/Password

The credentials for your DServer account, which you create in Install and Update a Multiplayer Mission Server (pg. 167). The credentials are used to log your DServer onto the IL-2 Sturmovik master server.

Max Clients

The maximum number of players (including the DServer) that can join the server at one time. Set this field based on the capability of your DServer PC.

Note: The maximum number shown in the IL-2 Sturmovik multiplayer list does not include the DServer.

Specify 4 or above in this field because the minimum number shown in the IL-2 Sturmovik multiplayer list is 3. Specifying 4 accommodates the DServer plus three players.

The maximum value that you can specify in this field is 85 (giving you 84 players).

Max Client Ping

The maximum ping (in milliseconds) allowed between a player and the server before that player is automatically disconnected from the server. Select the "Unlimited" check box to have the server accept any ping.

Missions

A list of the current missions that you added to the mission rotation. Missions are run in the order that they are listed, unless you select the "random rotation" check box.

The "Add" button allows you to select a mission from the DServer installation folder under \data\Multiplayer or a sub-folder of that folder.

The "Stock Missions" button opens the "Manage stock missions" dialog, where you can select built-in IL-2 Sturmovik missions to add to your rotation list or remove those missions from the list.

Protection

A password that players must specify to join the server. If you specify a password, a lock symbol appears beside the server name on the IL-2 Sturmovik multiplayer server list.

Reload server config now

Prepares the DServer to restart using whatever configuration changes you make while it is running. To proceed with the restart, click the "Save and Close" button. The currently running mission is terminated and the server restarts using the new settings.

Remote Console

Opens the Remote Console Settings Dialog (pg. 335), where you can configure DServer communications with the Remote Console. The Remote Console allows you to control a multiplayer mission server from any PC (pg. 173).

Server DL Limit

The maximum download speed (in kilobits per second or Kb/s) from the DServer to each player's IL-2 Sturmovik client. The download occurs at the speed that the player selects in IL-2 Sturmovik, unless the speed exceeds the Server DL Limit.

To determine the best value for this setting, first determine the typical download speed that you experience from your ISP (Internet Service Provider). Then, calculate the setting (up to a maximum of 10000) using the following formula:

$$\text{Server DL Limit} = \frac{\text{ISP Download Speed}\,(\text{Mb/s})}{4} \times 1000$$

The maximum value is 10000 (10,000 Kb/s or 10 Mb/s) because the player's "Receiving" slider on the IL-2 Sturmovik Network screen only goes up to 10 Mb.

Server IP

The IP address for the PC running the DServer software. To find the value for "Server IP", do the following on the DServer PC:

1. Type "Cmd" in the Windows search box and press Enter.
   A command window opens.
2. In the command window, type "ipconfig" and press Enter.
   The "IPv4 Address" line gives the DServer IP address.

Note: The IP for the DServer is allocated by your router so it can change when you reboot your router or PC. To ensure that the IP address stays constant, you must either reserve the address in DHCP (Dynamic Host Configuration Protocol) on your router or set up a static IP address on your server PC LAN adapter properties.

Server Info

The server name and description. The server name is displayed in the server list when a player clicks "Multiplayer" in the IL-2 Sturmovik main menu. The server description is not displayed in the current version of IL-2 Sturmovik.

Server Type

The Server Type specifies pre-set or custom DServer configurations that accommodate different pilot experience levels. The configurations are described in Advanced Settings Dialog (pg. 331).

The "ranked server" check box functionality is not implemented yet. When ranked servers are enabled, various mission statistics (for example, kills) will be kept for each

player that joins the mission. These statistics will be available on a web page.

The server type values are as follows:

custom

Enables the "Advanced Settings" button. This button opens the Advanced Settings Dialog, where you can specify custom DServer settings.

expert

Configures the server to use server and mission settings suitable for expert pilots.

The server settings selected/specified are:

- Coalition balancer
- Coalition change timeout: 30
- Finish mission if landed
- Finish mission timeout: 15
- Friendly fire return
- Idle kick timeout: 300
- Kill notification
- Max time for round: 1800
- Mission end timeout: 60
- Penalty timeout: 30
- Respawn timeout: 10
- Team points per round: 500

The mission settings selected are:

- Navigation icons
- Warmed up engine

For a comparison of the mission-related setting names in the DServer versus the IL-2 Sturmovik Realism screen, see DServer Mission Settings Versus IL-2 Sturmovik Realism Settings (pg. 334).

normal

Configures the server to use server and mission settings suitable for non-expert pilots.

The server settings selected/specified are:

- Coalition balancer
- Coalition change timeout: 10
- Finish mission timeout: 15
- Friendly fire return
- Idle kick timeout: 300
- Kill notification
- Max time for round: Unlimited

- Mission end timeout: 60
- Penalty timeout: 10
- Respawn timeout: 10
- Team points per round: 500

The mission settings selected are:

- Aiming help
- Allow spectator
- Auto pilot
- Auto RPM limit
- Auto mixture control
- Auto radiator
- Navigation icons
- Object icons
- Padlock
- Simple gauges
- Warmed up engine

For a comparison of the mission-related setting names in the DServer versus the IL-2 Sturmovik Realism screen, see DServer Mission Settings Versus IL-2 Sturmovik Realism Settings (pg. 334).

Server UL Limit

The maximum upload speed (in kilobits per second or Kb/s) from each player's IL-2 Sturmovik client to the DServer. The upload occurs at the speed that the player selects in IL-2 Sturmovik, unless the speed exceeds this DServer setting.

To determine the best value for this setting, first determine the typical upload speed that you experience from your ISP (Internet Service Provider). Then, calculate the setting (up to a maximum of 10000) using the following formula:

$$\text{Server UL Limit} = \frac{\text{ISP Upload Speed}\,(\text{Mb/s})}{4} \times 1000$$

The maximum value is 10000 (10,000 Kb/s or 10 Mb/s) because the player's "Sending" slider on the IL-2 Sturmovik Network screen only goes up to 10 Mb.

Shutdown Loads

The number of missions that the DServer will run from the mission rotation before it disconnects from the IL-2 Sturmovik master server. To have the DServer run unlimited missions, select the "Unlimited" check box.

TCP Port

The TCP port used for communication between the DServer and a player's IL-2 Sturmovik client. The default is 28000.

Note: You may have to open port 28000 or forward it on your router.

UDP Port

The UDP port used for communication between the DServer and a player's IL-2 Sturmovik client. The default is 28000.

Note: You may have to open port 28000 or forward it on your router.

Advanced Settings Dialog

The Advanced Settings dialog allows you to specify detailed server and mission settings. The mission settings correspond to the singleplayer mission settings that a player can set in the IL-2 Sturmovik "Realism" screen. The corresponding settings are listed in DServer Mission Settings Versus IL-2 Sturmovik Realism Settings (pg. 334).

Here are the Advanced Settings dialog fields that require a description:

Aiming help

Displays a yellow circle to the pilot that indicates where bombs or rockets will impact. To hit the target, the pilot must fly the plane to put the yellow circle over the target before dropping bombs or firing rockets.

Allow MouseJoy

Allows the player to use a mouse to control a plane.

Coalition balancer

Prevents players from spawning at an airfield if their side has more players than the enemy.

Coalition change timeout

The delay (in seconds) after a player changes sides before they can spawn in.

Course Weapons Aiming help

Displays a small red crosshair and a small red circle to the pilot once the plane is within ½ km from the nearest enemy target. The crosshair indicates where machine gun and cannon fire will impact. The circle locks on to the nearest enemy target. To hit the target, the pilot must fly the plane to put the red crosshair over the red circle before firing machine guns or cannons.

Finish mission if landed

Prevents players from finishing their current flight unless they land, they are killed, or they leave the server.

Finish mission timeout

The delay (in seconds) after a player clicks "Finish the flight" before they are transferred

to the map, where they can respawn. The remaining time is displayed in the chat box. This delay prevents players from quitting as soon as they are attacked to avoid being marked as killed. This time delay starts at the same time as the "Respawn timeout" delay, described later in this topic.

Friendly fire return

Does the following if a player hits a friendly object:

- Applies damage to the player's plane
- Shows the message "fired on a friendly" in the chat window
- Reduces the player's points to zero for the current flight

Idle kick timeout

The delay (in seconds) after a player plane is stationary before they are kicked from the mission.

Invulnerability

Prevents damage to the plane and crew resulting from enemy fire

Kill notification

Displays a message in the chat window whenever someone kills a plane or a ground object.

Lock fuel load

Restricts players to the fuel load that you specify for each plane.

Lock payloads

Restricts players to the payloads specified in the Payload and Available Payloads fields of the Plane Settings Dialog (pg. 226). Players can make changes that you allow in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Lock skins

Restricts players to the skins specified in Skins and Available Skins, in the Plane Settings Dialog (pg. 226).

Lock weapon mods

Restricts players to the weapon modifications specified in the WeaponMods and Available Mods fields of the Plane Settings Dialog (pg. 226). Players can make any changes that you allow in the IL-2 Sturmovik Plane Settings screen, Setup tab.

Max time for round

The delay (in seconds) before a mission ends. The mission can end sooner if a team loses all their points set in the "Team points per round" field.

Mission end timeout

The delay (in seconds) at mission end before the mission statistics are shown. Players can keep flying until the mission end timeout expires. A countdown is displayed on

screen in the chat box.

Navigation icons

Shows icons on the GUI map for the player plane and for waypoint triggers (pg. 285) that are object linked to the player plane.

No engine overflow

Prevents engines from cutting out due to negative G forces.

No misfires

Prevents guns and cannons from jamming.

Object icons

Shows icons on the GUI map for all objects that are linked entities in the game.

Padlock

Enables the player to use the IL-2 Sturmovik padlock controls in the cockpit view.

Penalty timeout

The delay (in seconds) after a player is killed before they can respawn.

Respawn timeout

The delay (in seconds) after a player clicks "Finish the flight" until they can click the "Start" button to respawn. The remaining time is displayed in the Start button. This delay starts at the same time as the "Finish mission timeout" delay, described earlier in this topic.

Safe collisions

Prevents damage resulting from collisions with other planes or objects.

Team points per round

The maximum points that each team starts with. Once a team loses all their points, the mission ends automatically. The current points for each team is shown at the top right of the map screen before players spawn in.

Note: If you set the value to 0, the mission ends after a minute or so.

DServer Mission Settings Versus IL-2 Sturmovik Realism Settings

This section shows the DServer mission settings that correspond to the settings in the IL-2 Sturmovik "Realism" screen (used before starting a singleplayer mission).

DServer Advanced Settings Dialog	DServer .sds File	IL-2 Sturmovik Realism Screen
Aiming help	aimingHelp	Bombing assist
Allow MouseJoy	allowMouseJoy	Mouse (in Control Devices screen)
Allow spectator	allowSpectator	Allow spectators
Auto mixture control	autoMix	Engine auto control
Auto pilot	autoPilot	Autopilot
Auto radiator	autoRadiator	Radiator assist
Auto RPM limit	autoThrottleLimit	Throttle auto limit
Auto rudder	autoCoordination	Rudder assist
Auto throttle	autoThrottle	Cruise control
Course Weapons Aiming Help	courseWeaponsAimingHelp	Aiming assist
Easy flight	easyFlight	Simplified controls
Invulnerability	invulnerability	Invulnerability
Navigation icons	navigationIcons	Navigation markers
No engine overflow	engineNoStop	No engine stall
No misfire	noMisfire	No misfires
No Wind	noWind	No wind
Object icons	objectIcons	Object markers
Padlock	padlock	Padlock
Safe collisions	noBreak	Unbreakable
Simple gauges	SimpleDevices	Instrument panel
Simplified physics	noMoment	Simplified physics
Unlimited ammo	unlimitAmmo	Unlimited ammo
Unlimited fuel	unlimitFuel	Unlimited fuel
Warmed up engine	hotEngine	Warmed up engine

Remote Console Settings Dialog

How to Open: Click the "Remote console" button in the DServer Configuration Dialog (pg. 326). For details, see Configure a Multiplayer Mission Server to Run Missions (pg. 169).

The Remote Console Settings dialog specifies the DServer configuration for communication with the Remote Console.

Important! Communication between the Remote Console and the DServer PC is not encrypted. For example, the login ID and password are transmitted to the DServer in plain text. To protect Remote Console to DServer communications, you must use a secure communications channel, such as a VPN.

Login/Password

The credentials for your DServer account, which you create in Install and Update a Multiplayer Mission Server (pg. 167).

IP Address

The IP address for the PC running the DServer. To find the value for "IP Address", do the following on the DServer PC:

1. Type "Cmd" in the Windows search box and press Enter.
   A command window opens.
2. In the command window, type "ipconfig" and press Enter.
   The "IPv4 Address" line gives the DServer IP address.

Port

The DServer PC port used for communications with the Remote Console. The default is 8991.

Enable Remote Console

Enables the Remote Console service when the DServer is started. You can then start the Remote Console itself on any PC and connect to the DServer. If the start up is successful, you get this message in the DServer Status History box:

Remote Console service started on *ipaddress* port *portnum*

For details, see Control a Multiplayer Mission Server From Any PC (pg. 173).

Remote Console Interface

Main Window

Important! Communication between the Remote Console and the DServer PC is not encrypted. For example, the login ID and password are transmitted to the DServer in plain text. To protect Remote Console to DServer communications, you must use a secure communications channel, such as a VPN.

File Menu

Connect

Opens the Connect dialog, where you specify the IP address and port number of the PC running the DServer. For details, see the Remote Console Settings Dialog (pg. 335). Press the "Connect" button to connect to the DServer.

Note: If you use this menu item to connect to the DServer, you must send the "Auth" command (see "Command Menu") before every other command that you send from the Remote Console. If you want to avoid this requirement, connect using the "Open cfg" menu item instead.

Open cfg

Opens the "Open Client Config" dialog, which allows you to select a file containing information for connecting Remote Console to the DServer.

Note: Choosing this option rather than the "Connect" option makes it easier to send commands to the DServer later.

There is a sample configuration file called _rconClient.cfg, which is in \bin\console under the IL-2 Sturmovik game directory or the directory for your DServer (depending on where you are running the Remote Console).

The configuration settings are as follows:

server/port

The IP address and port number of the PC running the DServer

user/password

The credentials for your DServer account

For details, see the Remote Console Settings Dialog (pg. 335).

Once you have chosen a configuration file, click the "Open" button in the "Open Client Config" dialog to connect to the DServer. A successful connection is indicated as follows:

- Status 1 in the Server Output box of the Remote Console
- The following message in the DServer status box:
  RCON: New incoming connection [*connectionnum*]: *ipaddress*: *portnumber*

Command Menu

Auth

Opens the Auth Command dialog, where you specify the credentials that allow the Remote Console to connect to the DServer. You must specify the login ID and password that was set up in the Remote Console Settings Dialog (pg. 335) of the DServer interface.

Ban Player

Bans the selected player from the DServer for 24 hours

Close Session

Stops the DServer and leaves the DServer interface open

Cut Chat Log

Saves the contents of the chat window to a chat log and starts a new chat log for the currently running mission. After you save the chat log, subsequent chat window entries are saved to the new log when you stop the current mission.

Note: Before you can save chat logs, you must set chatlog = 1 in the [KEY = system] section of file startup.cfg on the DServer PC. The startup.cfg is in the \data directory under the IL-2 Sturmovik game directory.

When you issue this command, you get the following message in the DServer Status History box:

"...chat log reopened"

Chat logs are stored on the DServer PC in \data under the IL-2 Sturmovik game directory. The file name format is as follows:

(*yyyy-mm-dd_hh-mm-ss*)*missionname*.*lognum*.chatlog

yyyy-mm-dd_hh-mm-ss—Date and time

missionname–The file name of the currently running mission

lognum–The number of the log for the currently running mission (e.g., 0, 1, 2...)

For example, (2016-09-22_21-11-25)MyMission.0.chatlog

Get SPS

Displays statistics for the DServer SPS value (see the DServer interface Main Window (pg. 325))

Kick Player

Disconnects the selected player from the DServer

My Status

Displays the authorization status for your Remote Console. The Remote Console Server Output box shows one of the following responses to the command:

- "authed=0", which means that your Remote Console is not logged on to the DServer.
- "authed=1", which means that your Remote Console is logged on to the DServer.

Open SDS

This command will be documented in a later edition of this manual.

Players List

Lists information about the players in the currently running mission.

The first part of the response in the DServer Status History box gives the format for the player information. For example:

"playerList=cId,ingameStatus,nServerPing,name,playerId,profileId|
0,0,10,JohnDoeDServer,..."

For more details, see "Player List" in the DServer Interface Main Window (pg. 325).

Reset SPS

This command will be documented in a later edition of this manual.

Send Stat Now

This command will be documented in a later edition of this manual.

When you issue this command, you get the following message in the DServer Status History box:

"...request for log send issued"

Server Console

Displays the contents of the DServer Status History Box (see the DServer Interface Main Window (pg. 325))

Server Input

Triggers a specified server input translator (pg. 273) in the current mission running on the DServer.

Format: serverinput *translatorname*

Specify the server input translator name when the Server Input Command dialog opens.

For an example, see Allow a Multiplayer Server Administrator to Trigger an Event (pg. 105).

Server Status

Not working in the current version

Shutdown

Stops the DServer and closes the DServer interface

Send Chat Msg

Opens the Send Chat Message Dialog (pg. 340), which allows an administrator to send a message to the chat window in a running mission.

Unban All Users

Allows all players that have been banned from the DServer to connect to it again.

Command Box (Top Box in the Window)

The box where you enter commands to send to the DServer. You can type in a command or select a command from the Command menu.

Select the "auto send" check box to send the command as soon as you select it from the Command Menu.

Select the "Decode Last Result to Tree" check box to display the result of a command in a user-friendly format in the Server Output box.

Decode Last Result to Tree

Presents the content of the Server Output Box in a tree structure. You can click on the plus signs in the tree to expand a branch and click on the minus signs in the tree to contract a branch.

Server Output Box

Displays the reply from the DServer to commands that you sent. Here are some of the possible replies:

STATUS

1 = OK

2 = Unknown error

3 = Unknown command

4 = Parameter count error

5 = Receiver buffer error

6 = Authorization incorrect

7 = DServer is not running

8 = DServer user error

9 = Unknown user error

Send Chat Message Dialog

Client ID (to the Right of Room Type)

For Room Type "ClientId", the client ID to send the message to. The client IDs are listed under CID in the Player List of the DServer interface Main Window (pg. 325).

Note: Specify 0 (zero) for room types other than ClientId.

Message Box

The area where you type the message that you want to send

Room Type (Drop-Down List at Bottom Left)

The destination for the message that you send. For example, ClientId sends the message to the chat for the specified client. See the Client ID drop down for more details.