The Scarlet Pigs Mission Making and QA Handbook
Version 1.0.1

This is written to create transparency and understanding for the mission makers process along with the quality assurance that we do to make sure the mission is up to a set standard in several parameters. It is quite long and includes a lot of insight in how we create our missions and some of the reasoning behind it. There are tips for sound mission design as well as standard practices that mission makers are expected to follow.

Overview

Expectations

When designing a mission for Scarlet Pigs to play as a main operation (called Op), it is important that the mission will follow the set criterias and that the mission maker tries to use the various frameworks that have been established to ensure quality missions are played. By reading and understanding this handbook, as well as assisting QA with their work in the ways mentioned we can continue to have many different mission makers and fresh concepts. With a growing number of mission makers and a fairly long time from when an Op concept is accepted to when it is played, the mission maker has time to really refine and polish their mission. If there is interest in setting up backup missions that are played if the pre-planned mission fails to work well in time, despite the many precautions taken, this will assist in our ability to take time to work on our missions and polish them, instead of having to rush to complete a mission for a date sooner than the one originally planned.

QA Process

To ensure that all of the different mission makers are keeping a set standard, a QA team will look at the mission and assist the mission maker in finding things that could take away from the experience. This is gone through again in detail in the QA chapter which you are expected to have read. You are also expected to use the checklist there. Here is a quick overview of what is done during QA:

Mission idea is submitted via the concept form - Looked at and, if deemed to be realizable, approved by QA, after which the mission can be scheduled by Unit Organizers and created in the Editor by the mission maker. Keep in mind that the preliminary scheduling may be subject to change.

Mission maker checklist - The mission maker checks the created mission himself in LAN.

Working mission is submitted - Mission is looked through by QA and issues are addressed in comments in the mission file itself. Any QA remarks are addressed by the mission maker.

Server tests - Once QA has no further remarks, the mission is server tested.

OP announcement and assignments - The mission maker helps MadLetter with this (info on factions, player force composition, available roles, noting DLC-locked equipment etc.).

Play day - QA assists in booting up the server and mission file.

A mission maker is also expected to follow the formalities and naming conventions to help with organisation and QA.

Planning

Before being able to claim an operation day, the Op needs to be conceptualised. The mission maker fills out all of the required fields in the form linked below and pings **@Mission QA** so the QA team knows to take a look at the concept to see if it is viable.

[Concept form](#)

Our intention with this is to pick up on anything that is not doable within the game, doesn't fit our playstyle, or is deemed too complicated or difficult to get into a playable state. It also serves as a structured application process which helps in scheduling the Op as well as supplying the mission maker with the correct resources. Once the concept is accepted, the Op can then be scheduled. Once QA has looked at the mission file they will contact you in regards to scheduling, assessing whether any present issues can reasonably be fixed in time. Keep in mind that parts of the concept might need to be discussed or explained before it is fully accepted and therefore thought needs to be given regarding all of the various mission parameters. Additionally, a PBO with marked objectives and the broad strokes of the mission explained in a comment will help to give the QA team a better understanding of the thought process.

Core concepts

Different core concepts to consider that are present in every mission are the following:

Predetermined order of objectives - which is easier to balance but takes away some of the creative freedom of planning by Command.

Free choice in which objectives are done and which order they are done in (having main objectives and optional objectives) - more interesting for Command elements as well as replayable.

Split or concentrated friendly forces - helps to determine which assets are given and which organisatory adaptations need to be taken, if any are needed.

Intel based objectives - not all the information is revealed from the start, therefore Command elements need to think quickly.

Objectives/Tasks

The objectives or tasks define what the players are supposed to do. There are many different tasks you could give the players, as well as many different ways to go about making sure the tasks and objectives work.

Defining the task can for example be done by a task module, map markers or verbal briefings. Being clear in your communication with the players so they know how a task is accomplished is important. If the completion of a task module is linked to a specific condition it is important to communicate this, just the same as communicating that a map marked task is done when *x, y* and *z* have been done.

Special Factors

One way of keeping missions fresh is by introducing special factors such as night time, scripted features, special insertions, changing objectives mid-mission and so on. These need to be thought out and they need to be properly weighed out. They can provide ambiance, difficulty or just fresh ways of doing things, however they can also deduct from the experience in several ways. Things can become too difficult, the game can break, confusion can arise around features and so on. It is also advised to avoid Ops requiring usage of NVGs during the entire mission because this is known to cause headaches among our unit members.

Extra mods/setting changes

Extra mods

If you as a mission maker want to utilize a mod or a map that is not in the modpack, that can be arranged. Mods up to the size of 1 GB can quite easily be approved by QA if the addition is justifiable and doesn't interfere with mods present in the standard modpack. We ask that any larger mods and maps provide enough content for at least 3 missions. In addition, if you think the mod will benefit the Scarlet Pigs in the long run, post it in ***#mod-submissions***. Our modpack is updated at least once a year.

ACE Settings

If you wish to change some ACE setting from our baseline, speak with QA. There are several settings that the server overwrites no matter what, and you won't be able to change these. Other settings that you do wish to tweak are changed on top of a preset that is provided.

Making the mission

Once the concept has been accepted by QA, the actual mission is made, where units, scripts, triggers, modules and other parts making the mission playable are placed down. This following section provides tips and general mission making SOPs. Additional help can be found in **#mission-making-resources** and **#mission-makers-chat**.

Modpack for creating the mission

For creating missions you need to import the baseline mission making mod preset found in **#mission-making-resources**. After that, any approved content/map mods are added. No client-side mods such as JSRS Soundmod are to be loaded to avoid dependencies. If you choose to use a mod for mission making that isn't included in the modpack, you need to make sure that it doesn't create any dependencies and doesn't have to be installed on the server.

Eden vs Zeus

We allow both missions fully created in Eden and those created on the fly as Zeus (with some preparation beforehand), and every mission created in Eden needs to have a backup Zeus who can fix problems should they arise. Then why would you create a mission in Eden? Eden allows for more things to be done, such as scripted events, and allows the mission maker to take part as a player in a supporting role rather than as a Zeus exclusively. It also provides a fairly good overview of how the mission will play out, and therefore issues can be avoided while making the mission. If you intend to create the mission as Zeus, you are expected to provide an overview of objectives and your vision of the mission in comments.

Flashpoints vs objectives

A *flashpoint* is an area where AI are clustered together, usually in the form of fortifications, bases and garrisons, with patrols nearby.

It is recommended to space out your flashpoints. AI placement areas should be at least 2 km apart (with recommended dynamic simulation settings), preferably much more. This is to prevent flashpoints from merging unintentionally, which can turn engagements into slogs and possibly activate too many AI at once, and to allow Command room to maneuver without activating 2 flashpoints at once.

AI density

The following numbers are rather conservative and will work on unoptimized, unfinished maps (e.g. Chernarus 2035). On well-optimized maps the total number of AI can reach 150 without impacting server performance negatively, but it is advised to stick to the lower numbers provided below. When in doubt, ask in **#mission-makers-chat** or **#creator_qa**.

For simple Ops where player units are expected to stick together, keep the total number of AI at 100 or less per flashpoint, minus AI that is always active and not hidden (e.g. an air patrol, artillery). With QRFs and reinforcements that number should not exceed 120. For larger, complex Ops where player units are expected to split up and tackle 2 or more flashpoints simultaneously, keep the total number of AI at 100 or less for all flashpoints that can be active simultaneously. Again, with QRFs and reinforcements that number should not exceed 120.

Objectives are the goals that the players can or need to accomplish. They can be set up using Task modules and triggers or by placing markers on the map. A Zeus can create tasks and make them succeed or fail on the fly.

Mission balance

Balancing an ARMA mission is not always straightforward as there are many factors that play into the difficulty of a mission. Some factors the mission maker can directly influence, some are more out of your hands (e.g. how well communication between player elements works).

Force Multipliers and Counters

Force Multipliers are units that greatly increase the firepower of a given side. E.g. MBTs, attack helicopters, artillery. *Counters* are units designed to take out specific targets effectively and efficiently. E.g. attack helicopters vs. vehicles in general (depending on loadout, vs. MBTs, infantry, and/or helicopters). When used correctly, CAS in players' hands can soften enemy resistance and make the infantry's job easier or even manageable at all. However, CAS can also turn flashpoints into cakewalks if there are no counters to them to begin with. Ideally, CAS needs infantry to disable enemy AA so it can engage targets that infantry are vulnerable to (like IFVs and artillery). Finding the right balance is the key.

Recon and Intel

There are several options for the mission maker on how to provide intel to the players, and how reliable it is. He can also have the players be responsible for their intel to a large degree by providing them with recon units.
Intel can be provided in the form of a briefing document published before the mission is played (e.g. as a Google Doc or a PDF), as a briefing document accessible inside the game, or verbally during the command briefing by the mission maker.
Recon data can also be provided by the mission maker using pre-placed markers, including timestamps or info about reliability/accuracy of the data (e.g. satellite data using thermal imagery that is 12 hours old, recon drone data using visual identification only that is up to date).
Player recon can likewise be done before the regular mission starts (usually 1-2 hours early), and/or during the mission with appropriate equipment. Pre-Op recon runs the risk of unintentionally triggering QRFs, this can be mitigated or avoided with special trigger conditions. However, the mission maker can also set up QRFs specifically to hunt player recon units.

AI Information Sharing

An important factor in having AI units work together effectively is in providing them with radios for sharing information on player targets, a feature that is provided by LAMBS but isn't active for infantry by default. Artillery spotters on foot and mortar crews need this to work together effectively. To enable it, either double-click on a group or on a unit to open their attributes, scroll down to Object: LAMBS Danger.fsm, and enable "Has Radio".

Placing units in the Editor

Place enemy units and give them waypoints or sync their group leaders to LAMBS Danger Waypoints modules (found under Assets -> Systems -> Modules -> LAMBS Danger Waypoints).
Keep the limits mentioned above under **AI density** in mind.

Assign variable names where needed (e.g. for officers that need to be captured) and to keep an overview. Keep variable names as short as possible, e.g. "o_1", "o_2" for the officers.
Use markers. Placing temporary markers for enemy groups/flashpoints is optional but recommended, that way you can keep track of how many AI you've placed and how many AI slots are left (e.g. for QRF/reinforcements).

Dynamic simulation should be enabled for all AI units. Exceptions are:
- Units synced to Show / Hide modules. (Only the unit leader may be synced to the module.)
- Artillery that is always active.
- Long-range SAM + Radar that are always active.
- Units exempt from dynamic simulation on purpose, e.g. a far-ranging air patrol over the AO.

Disable simulation and damage for, or check simple object for:
Helipads, campfires, 2D garbage textures, roads, and props that serve as window dressing.

Enable dynamic simulation and disable damage for:
Camo nets. (Recommended because they're very fragile.)

Enable dynamic simulation for:
Buildings, vehicles, statics, high sandbags, barriers, barbed wire, razorwire, h-barriers, walls, fences, mines, bar gates. This is to prevent AI units from simply moving through these props.
Optionally: boxes, crates, low sandbags, barrels.
Exceptions are buildings that players need to destroy with vehicle weapons or artillery, at a greater range than the dynamic simulation setting for Props.

Disable damage for:
Player supply containers - ammo boxes, supply crates and the like. (Recommended because seeing your ammo go up in flames due to a collision with a tree is slightly frustrating.)

It is recommended to place as few props as possible for server performance. If you do place loads of props (including civilians spawned by the Civilian Presence module), you need to lower the number of AI accordingly.

Player recon attributes

The effectiveness of player recon units on foot can be increased by making them harder to spot and be heard by AI. This is done by lowering their Camouflage and Audible coefficients, found in their unit attributes.

AI skills and sub-skills

It is recommended to adjust the AI skill for AI groups using the Editor no higher than 0.7 for regular units and 0.9 for elite units.
For changing AI sub-skills, the Aiming shake, Aiming accuracy and Aiming speed values may not be changed in any way. All AI aiming/accuracy values are handled by server settings.
The other sub-skills are fair game, but it is recommended to raise them no higher than 85%, except for Courage which can be maxed and the Fleeing coefficient which can be set to minimum (both very useful for achieving aggressive AI behavior).
As a guideline, it makes sense to have the Spotting sub-skills represent a unit's sensors/optics, thus an OH-6 recon helicopter with an experienced crew could well have them both at 100%.

Modules and Triggers

Triggers are a powerful tool to make things happen when certain conditions are fulfilled. They can be confined to an area, checking for a certain condition, or check if a condition has been fulfilled anywhere during the mission. Conditions can range from the predefined options in the trigger UI to scripted conditions using Arma's scripting language. Common trigger usages are to designate a given task as succeeded, to activate hidden units using the Show / Hide module, and to have AI units react to player action by skipping their current waypoint - these examples are further explained below.

Generally, a trigger needs to be synced to a unit (usually the group leader), waypoint, or logic entity to have the desired effect. This is done by right-clicking on the trigger, left-clicking Sync to, and connecting the blue line that is now drawn between the trigger and the mouse cursor to the target by left-clicking on it. Additionally, triggers need to be set to Server Only where possible to reduce network load (all triggers in a mission are checked every 0.5 seconds). Triggers that are intended to directly affect players such as an audible alarm going off are an exception to this. Triggers that are no longer needed can also be deleted via script by successive triggers to lighten network load.

Skip Waypoint triggers are normally used for units that have a HOLD waypoint followed by another waypoint, e.g. a TASK HUNT or a GET IN placed on a vehicle. Unlike other triggers they're used with Set Waypoint Activation (instead of Sync to) directly on the waypoint that is to be skipped, and will not work on modules such as Show / Hide.

Tasks need at least two modules for each task: Create Task and Set Task State, and these need to be synced. Set Task State needs to be set to Succeeded and synced to a trigger that fires when the conditions for the task are fulfilled. Zeused missions don't require the Set Task State module as the Zeus can set the task state on the fly.

Show / Hide modules are a tool that can be used instead of, or in support of, dynamically simulated AI, usually for a QRF. The module has two selectable actions: *Hide units* and *Show units*.
When set to Hide units and either synced to certain units or a layer containing units (explained below), affected units are both invisible and their simulation is paused, saving server performance. Should a hidden unit receive damage in any way, that damage will be applied once the unit is shown. It is thus recommended to place hidden units so that they won't be run over by vehicles or killed by stray shots. Also, a hidden vehicle's headlights will still be active unless disabled in the vehicle's attributes, or if it's manned by setting the group's behavior to Combat or Stealth.
When set to Show units and synced to a trigger, on activation of the trigger the synced units will be shown and their simulation started.

LAMBS modules are an alternative to regular LAMBS waypoints, providing greater customization in their attributes. Unlike giving waypoints to a unit, a LAMBS module must be synced to a unit's group leader to be functional, and units cannot be given waypoints and be assigned to these modules simultaneously. More information on LAMBS.

It is recommended to use variable names for modules and triggers to keep an overview. Keep variable names as short as possible (e.g. use "t" as a prefix for tasks, "tr_" as a prefix for triggers, so you'd have "t1" for Task 1 and "tr_t1" for the trigger that sets Task 1 as succeeded).

Layers

It is strongly recommended to use layers in the Editor to sort and organize the units and props placed in the Editor. Layers are basically folders that can be named and also be set so their contents can't be edited (thus preventing accidental deletions) and/or hidden from view. The Show / Hide module can be set to apply to a layer so you don't need to sync it manually to each unit.
To create a layer, open the Entities tab in the left-hand side of the Editor (or hit the "e" key). Select the units you want to create a layer for and click New Layer (the symbol is a folder with a plus sign). Arma will name the layer automatically (Layer #), rename it by simply double-clicking the layer.

Units are placed in a layer either by selecting them and then clicking New Layer, or by selecting them and dragging-and-dropping them into an existing layer in the Entities tab.

The following layer structure is recommended:
- Mission modules - for Game Master, Headless Client, Cover Map.
- Tasks/Objectives - for props and units (with their associated modules) related to a given task/objective. If using Create Task and Set Task State modules, these and their associated triggers go here as well. Using a sub-layer for props such as sandbags, walls, bunkers etc. is recommended for each task, objective or area.
- QRFs - for Show / Hide modules with their associated triggers. Units with their associated modules should go into a sub-layer.
! Don't place Show / Hide activation triggers into layers hidden by Show / Hide modules !
- Players - for playable units, player vehicles, resupplies. Using sub-layers for vehicles, resupplies, props (e.g. player base buildings) is recommended.
- QA Passes - Comments from QA will be placed here and organized into sub-layers.
- Changelog - Recommended to document changes done by the mission maker between revisions. This can also be placed directly in QA Passes or in a sub-layer there.

Settings and modules

1. Editor settings

1.1 ATTRIBUTES - GENERAL
In the Editor go to **ATTRIBUTES** in the menu bar at the top. Under **Presentation** give your mission the proper title and mark your authorship. You can set how the GREENFOR (Independents) stand towards BLUFOR and REDFOR at the start of the mission with the icons at the bottom.

Under **Misc** check "Editable Objects (Zeus)".
Please do not binarize the scenario file!

1.2 ATTRIBUTES - ENVIRONMENT
Under **Date**, set Time. For a daylight mission, leave at least 4 hours of daylight, preferably more. Expect the mission to be up for ~1 hour before OP start, therefore you need to plan the time you set, or pause time progression in Zeus on startup if dawn/dusk is a key component.
Use **Fog** sparingly and with great care. Recommend not setting it at more than 10%.

1.3 ATTRIBUTES - MULTIPLAYER
Under **ATTRIBUTES** in the menu bar, hit **Multiplayer**. Apply the following options:

Type
Game Type: Zeus
Min Players: 0
Max Players: Set equal to player slots.

Lobby

Summary. Optional, recommend filling it out with Side/Faction, type of Op (e.g. Mechanized Infantry), main objective.
Uncheck "Enable AI".

Respawn

Respawn Settings: "Respawn on Custom Position"
Checkmark on "Select Respawn Position".
Set "Respawn Delay" between 3 and 10 seconds.
Checkmark on "Subtract tickets upon death".
Make sure "Allow Manual Respawn" is checked.
Checkmark on "Save Loadout".
Respawn Tickets: For players' side, recommend 1 ticket per player for an easy mission, 1 ticket per 2 players for a moderately difficult mission, or 1 ticket per 3 players for a difficult mission.

Revive

Revive Mode: Disabled.

1.4 ATTRIBUTES - PERFORMANCE

Under ATTRIBUTES in the menu bar, hit **Performance**. Apply the following options:

Garbage Collection

As a guideline, 2 different settings are provided below.

- Aggressive settings, prioritize performance over immersion. E.g. wrecks may vanish in vicinity of players so they can't be used for cover.
Minimum distance: Recommend leaving at 0.
Character Corpses
      Mode: All scenario objects or Only objects that cannot respawn.
      Limit: Recommend 15.
      Min Delay: Recommend 5 seconds (00:00:05).
      Max Delay: Recommend 5 minutes (00:05:00).
Vehicle Wrecks
      Mode: All scenario objects or Only objects that cannot respawn.
      Limit: Recommend 5.
      Min Delay: Recommend 5 seconds (00:00:05).
      Max Delay: Recommend 5 minutes (00:05:00).

- Relaxed settings, prioritize immersion over performance. E.g. wrecks may be used for cover and will only vanish when players are further away.
Minimum distance: 500 or more.
Character Corpses
      Mode: All scenario objects or Only objects that cannot respawn.
      Limit: Recommend 50.

Min Delay: Recommend 15 minutes (00:15:00).
Max Delay: Recommend 60 minutes (01:00:00).
Vehicle Wrecks
Mode: All scenario objects or Only objects that cannot respawn.
Limit: Recommend 25.
Min Delay: Recommend 15 minutes (00:15:00).
Max Delay: Recommend 60 minutes (01:00:00).

Dynamic Simulation
Enable Dynamic Simulation: Checked.
Activation Distance Settings
Characters: Recommend 1000-1200m, but depends on map, terrain in mission area, visibility (lines of sight, fog).
Manned Vehicles: As above, or 1500-3000m, depends on player assets (ATGMs, attack helicopters), map, terrain in mission area, visibility (lines of sight, fog).
Props: Recommend 100-250m.
Empty Vehicles: Recommend half of Manned Vehicles setting.
Activation Distance Modifiers
Is Moving: Recommend 1x.
Limit by View Distance: Checked.

1.5 PREFERENCES
Under **SETTINGS** in the menu bar, hit **Preferences**
Binarize New Scenario Files needs to be unchecked.

1.6 ADDON OPTIONS
Mod setup should be done after importing the settings files. Click **Settings** in the menu bar, then **Addon Options**.
Make sure **MISSION** is selected at the top, then hit the **IMPORT** button on the bottom left, copy-paste the latest ACE Settings from ***#mission-makers-resources***. Some settings you as a mission maker can change, however have a dialogue with the QA team about what you are altering.
Do the same under the **SERVER** tab.

2. Mission Modules

2.1 Place Zeus Entity
On the right side under **Assets**, make sure you are in the F5 mode (**Systems**) and then select the **MODULES** submenu (gear wheel symbol)
Open the Zeus Subsection at the bottom and place a **Game Master** module into the world (any place will do).

Double-click on placed module to open its details, under Owner (NOT NAME!) add "#adminLogged" to enable the admin to enter Zeus mode. That way an admin can assist or replace you if something goes wrong (e.g. an Internet outage, TFAR Zeus bug).
Select "All addons (including unofficial ones)" to enable access to everything included in the modpack.

Add a separate Game Master module for your Steam profile. To do this, copy your Steam UID (found in the URL of your Steam profile) and paste it into the Owner field. Name it "Zeus_<your name>".
If you do not want a physical presence in the game at all, activate Forced Interface.

2.2 Place Headless Client Modules
On the right side under **Assets**, select **LOGIC ENTITIES** submenu (flag symbol).
Open the Virtual Entities Subsection at the bottom and place a **Headless Client** module into the world (any place will do).
Double-click on placed module to open its details, under Variable Name enter "hc" and check Playable.
Copy-paste the placed module and change its Variable Name to "hc1".

2.3 Respawn Position(s)
On the right side under **Assets**, make sure you are in the F5 mode (**Systems**) and then select the **MODULES** submenu (Gearwheel Symbol).
Open the **Multiplayer** Subsection and place a **Respawn Position** where you want respawns to happen.
Double-click on the placed module to open its details.
Leave the Variable Name at the top blank.
Name is whatever you like, e.g. HQ, Base.
Type: Infantry
Side is whatever side the players are, e.g. BLUFOR, OPFOR.
Show to: Everyone or The side and its allies (for TvT scenarios)
Notification: Enabled

You can set up multiple respawn positions, either in the Editor or via the Zeus interface.
Every respawn needs its own UNIQUE (!) Name or Variable Name.

If you add a respawn position via scripting, e.g. in a unit's Init field, the Variable Name is respawn_<side>_<name>, e.g. respawn_west_FOB.
! Respawn scripts (using the function) don't work together with respawn modules !

2.4 Optional: Cover Map

The Cover Map module places an overlay on the map that darkens everything outside of the module's area. This is useful to define the mission's AO. It is recommended to set the boundaries generously, e.g. don't have the boundary begin just 1 km away from an objective.

3. Object and unit attributes

3.1 Props
Check if simulation and damage are disabled for, or simple object is checked for:
Helipads, campfires, 2D garbage textures, roads, and props that serve as window dressing.

Check if dynamic simulation is enabled and damage is disabled for:
Camo nets. (Recommended because they're very fragile.)

Check if dynamic simulation is enabled for:
Buildings, vehicles, statics, high sandbags, barriers, barbed wire, razorwire, h-barriers, walls, fences, mines, bar gates.
Optionally: boxes, crates, sandbags, barrels.

Check if damage is disabled for:
Player supply containers (boxes, crates and the like. Recommended because seeing your ammo go up in flames due to a collision with a tree is slightly frustrating.)

It is recommended to place as few props as possible for MP performance.

3.2 Units
Dynamic simulation should be enabled for all AI units.
Exceptions are:
Units synced to Show / Hide modules. Only the group leader may be synced to the module.
Artillery that is always active.
Long-range SAM + Radar that are always active.
Units exempt from dyn sim on purpose, e.g. far-ranging air patrol.

3.3 Player units:
Must be Playable.
Check traits (medic, engineer) both under Unit Traits and ACE Options.
Check group leader's Role Description for "@NAME" or "@ Name" (Scarlet Pigs standardized naming scheme).
For non-vetted loadouts (including supply boxes), either check them here or later in LAN - checking in LAN is faster but notes need to be taken in a separate text file.
Loadout checks and approvals are done by Nuttcase.
Important: To check if a piece of equipment is DLC-locked, look at:
https://community.bistudio.com/wiki/Arma_3:_DLC_Restrictions
Not all Scarlet Pigs players own the APEX DLC and only a minority owns CONTACT, thus it is recommended to include equipment from these DLCs for player use sparingly or not at all.
The same goes for the Creator DLCs (e.g. Global Mobilization).

3.4 Player vehicles and supplies:

Logi vehicles should have plenty of cargo space for supplies (at least 10, preferably 20+), and spare wheels and spare tracks as well (these also take up 1 cargo space each). Some cargo vehicles have a very small cargo space by default, thus it's important to check this in the vehicle's attributes.

If armed vehicles are present, check for resupply options via ammo trucks, fuel trucks, vehicle ammo crates, fuel tanks/containers/canisters, and scripted resupply areas/buildings. Note that fuel containers might require init scripts to be movable via Ace interaction.

Estimate amount of supplies - e.g. an overabundance of supplies would be 1 full resupply for all players per flashpoint. Ideally, the mission maker should state his intent for the mission, QA should ask him if he hasn't.

4. Systems

Check Task modules' attributes and syncing, and associated triggers.

Check Show / Hide modules' attributes and syncing, and associated triggers.

Check all other triggers. (Server Only? Functionality?)

Recommend placing no more than 50 triggers in total (network performance). Note: This is from a mission making guide from another Arma unit, I'm not sure how that relates to Server Only triggers, but better safe than OP NAZAIRE.

5. AI

5.1 AI density

Check spacing of flashpoints. Recommend 2 km between them (or roughly double the dynamic sim activation distance), preferably more.

Check AI density and numbers at flashpoints and near objectives. Within activation distance of dynamic sim, plus number of always active AI, no more than 100-120 AI should be active simultaneously. For a well optimized map like Altis or Tanoa, that number can go up to 150. If players are expected to split forces and engage multiple flashpoints at once, take the total number of AI at these flashpoints. Take note of spawn triggers for these checks.

5.2 AI tasks

Check that AI units have waypoints or are synced to LAMBS modules. Syncing must be to the group leader.

Check patrol areas for ground units, they should not go over water. Vice versa for naval units. Vehicles using LAMBS patrol waypoints/modules are not recommended (according to LAMBS documentation).

Check placement of statics. (Plausible tactical positioning? Clipping into objects?)

Check garrison areas and exit triggers. (Usage as strongpoints or reinforcements?)

6. Script files

To have players spawn into the map right where they're placed, create the following file with a text editor. Note that players who reconnect can't choose a respawn location, thus requiring a Zeus teleport or Logi reinsert to get back to their unit.
File name and extension: description.ext
Enter this text into the file:
respawnOnStart = 0;

To have players use their weapon safety switch automatically when they spawn into the map and on respawn, create the following file with a text editor.
File name and extension: onPlayerRespawn.sqf
Enter this text into the file:
[ACE_player, currentWeapon ACE_player, currentMuzzle ACE_player] call ace_safemode_fnc_lockSafety;

Add script files and folders before exporting the mission, otherwise they will not be included in the mission PBO.
Whenever you save a mission under a different name, these files are not included in the new folder, and you have to copy them over. Renaming the mission folder is easier.

Assets and loadouts

Since a wide range of factions are played, loadouts vary from Op to Op, however there is a baseline of which the mission maker is expected to use. Smaller tweaks that make sense in accordance with the mission theme or setting is okay, though we ask that you provide some reasoning behind any changes to the baseline kit. This has been worked out to fit our medical settings and playstyle.

Baseline loadout

Standard personal medical kit:
10-12 Bandages (Basic)
4-6 Bandages (Packing)
1 Epinephrine
1 Morphine
2 Splints
2-4 Tourniquets

Other personal kit:
Everyone gets the AN/PRC 152 radio (BLUFOR) / FADAK (REDFOR) / AN/PRC 148 (GREFOR)
Entrenching Tool
1-2 Grenades
2-3 Smokes (recommend purple for mass cas, red to mark enemy positions, white for general usage)
7+ Magazines / 1000 Rounds for automatic riflemen (depending on caliber, 7.62 and higher weigh too much to fit that much ammo)
Spray Paint (Red) used to mark cleared buildings

Leadership kit:
Long range radio (same variant for all leaders) for default radio setup
Map Tools
Vector 21 (Vector 21 Nite if parts of the mission take place at night)
MicroDAGR GPS

Combat Medic kit: (in addition to personal medical kit)
50+ Bandages (Elastic)
10+ Bandages (Basic)
10+ Bandages (Packing)
8+ Blood IV (1000ml)
8+ Epinephrine
8+ Morphine
8+ Splints
8 Tourniquets
2+ Blood IV (500ml) (optional)
1 Surgical Kit (this goes into the vest)
Recommended: 1 Personal Aid Kit

CLS kit: (in addition to personal medical kit)
Medic Bag (it's an RHS REDFOR item under backpacks, easily distinguished, a slung-over carry bag)
20 Bandages (Elastic)
20 Bandages (Basic)
12 Bandages (Packing)
2 Blood IV (1000ml)
2 Blood IV (500ml)
2+ Epi
2+ Morphine
2 Splints
* If a squad is to run a second medic role or MEDEVAC is used in a mission, the CLS role is used.

Engineer/Repair Specialist kit:
Toolkit

Combat Engineer/Demo Specialist kit:
Defusal kit
M152 or M57 Firing Device
Mine Detector
Wirecutter
2+ M112 demolition blocks (single or 4x)

Providing assets

A Logistics element is almost always part of our missions. This is most often helicopter borne, although it can also use trucks or similar assets. The Logi vehicle's Cargo Space value needs to be checked in the Editor because the values for some vehicles are way too low. Recommended: at least 10, preferably 20+.

MedEvac can be a good asset, though the mission needs to be designed with this in mind and the Ace settings adjusted accordingly.

Additional assets including but not limited to: specialized weapons teams, support vehicles, CAS, and UAVs can assist the player force. These additions need to be thought out and if the attendance indicates less than 25 players it is suggested that only one asset is provided. Above 25 players another asset can be provided. Assets can also be given to the squads, such as transport vehicles (jeeps, trucks, MRAPs, APCs) or special roles.

Composition

We usually run a platoon with attached assets. Logistics is attached by default. With a low attendance we cannot really afford to take players away from the regular squads, therefore attached assets and specialized units are really only viable when two regular squads are guaranteed to be full. The normal infantry squad is to be designed with 8-12 slots (more in some cases). Locking squads into a single role, for example a weapons team that cannot sustain itself, might make for a mission where that squad only really does one thing. Sometimes this is necessary, but you need to consider how you can make gameplay interesting for all squads with interesting and different challenges and ways of solving them.

With varying numbers of people turning up it is important that the team composition can work from around 20 players to as many as 40. Closer to the Op date a better estimate can be provided, however in a few weeks there can be large swings, so keep that in mind.

When placing down the player units, make sure the CLS or medic is an actual ACE medic, and engineers/vehicle drivers (alternatively vehicle gunners) and pilots are ACE engineers, giving them the ability to use the specialized tools they need to fulfill their roles. Logi should be an Advanced Engineer able to fully repair all player vehicles.

Place them near other player units to create a cohesive starting unit with all players in the same group. Double click on the unit identifier (blue box) and mark them PLAYABLE. These slots will now show up on the server as the designated roles. Make sure one playable unit is set to PLAYER, this might save you some trouble once you start placing enemy units. (If no

unit is set as PLAYER, the next unit you place will be set as PLAYER automatically regardless of its side or faction.)

Set the group leader's Role Description followed by "@NAME" or "@ Name" to apply the Scarlet Pigs Standardized Naming scheme (e.g. Commander@ODIN or Commander @ Odin). Squads will now show up on the server with their callsigns, however if the group leader has been changed in the Editor this may cause issues and not show up properly in the role selection screen.

Resources

Nuttcase is in charge of going through loadouts and assets. Keep in contact with him, other mission makers and QA if you have any questions.

Several compositions and loadouts that have been used in the past are available in **#the-supply-crate**, though not all of them are up to date or will fit without some adjustments.

Reserve area

Establish a Zeus reserve area away from the AO. Copy all player vehicles (minus any scripted respawn points) and supply boxes, and paste them into the reserve area. Why should you do that? To quote MadLetter's wisdom on player assets:

"ARMA Rule #1: Even if you have something that can respawn, you still place extra copies because at some point the respawn script may fuck up and end in an explosive loop and then you are fucked. Unless you were smart and pre-un-fucked yourself by placing extra copies."

Quality Assurance

Concept and scheduling

When a mission concept has been submitted via the [concept form](#) and QA informed about the submission, QA will contact you and if no issues are found with the mission concept, the Op can be scheduled. Keep in mind that it may be moved back if it is deemed to not be ready or another mission is to be replayed.

Checklist

Before submission to QA, the mission maker needs to test the mission himself. The checklist below is to be used. In the [Settings and modules](#) chapter all the recommended settings and module options are available, along with how to set them. If you deviate from the settings comment this and give your reasons for doing so.

0. File name

The file name is standardised and provides several bits of information separated by underscores. Construct the file name according to the examples below, it is important that it is in the same order to avoid confusion.

Information	Example
3-letter name tag of the mission maker	MAD; YWN; OVE; DIV
ONLY CAMPAIGNS: Campaign number, mission number	c01_m01
Side, faction (use BLUFOR, REDFOR, GREFOR)	REDFOR_Spetsnaz
Era (35 =2035; 2k =2000s; 90 =1990s; 80 =1980s etc.)	2k
OP name	OP_Last_Light
Revision number, starting with Rev0 for the initial version	Rev0; Rev1

This would result in:
MAD_c01_m01_REDFOR_Spetsnaz_2k_OP_Last_Light_Rev0

Anyone who does QA on it will submit the file looked at with the suffix of QA followed by their 3-letter name tag: QAOVE; QAYWN; QANUB
MAD_c01_m01_REDFOR_Spetsnaz_2k_OP_Last_Light_Rev0_QAOVE

When the comments are addressed by the mission maker a new revision is sent, with the QA suffix removed and the revision number updated.
MAD_c01_m01_REDFOR_Spetsnaz_2k_OP_Last_Light_Rev1

Current name tags are:
ABE - Dr Sherlock Sharpe
ALN - Alanith
DIV - Divinicer
FRO - Frostbearer
GWM - George
JNG - Jangoon
JTF - Jorah the Fedora, AKA Gun Go Brrrrrr
LIT - Lithobraker
MAD - MadLetter
MOS - Mossy
NIK - Nikke Knatterton
NTO - Nato
NBL - Nublet
NUT - Nuttcase
ONS - Onskandeeri

OVE - MORD OVE
RID - Ridderrasmus
SHZ - Nodadso (Shonz)
TOM - The flying pig games
TPT - Tempestal
YWN - Dust (YaWn)

1. Editor settings

1.1 ATTRIBUTES - GENERAL
GREFOR Alignment towards BLUFOR AND REDFOR

1.2 ATTRIBUTES - ENVIRONMENT
Time is right for the setting, expect the mission to be up for ~40 minutes before start and therefore make sure that a night op does not get too light and a daytime op not too dark (unless planned)
Fog is not too thick.

1.3 ATTRIBUTES - MULTIPLAYER
Under **ATTRIBUTES** in the menu bar, hit **Multiplayer**. Apply the following options:

Type
Game Type: Zeus
Min Players: 0
Max Players: Set equal to player slots.

Lobby
Summary.
Uncheck "Enable AI".

Respawn
Works

Revive
Revive Mode: Disabled.

1.4 ATTRIBUTES - PERFORMANCE
Garbage Collection
Enabled and changed to working settings.

Dynamic Simulation
Enabled and set to appropriate settings.
"Is moving" set to 1x.

1.5 PREFERENCES
Binarize New Scenario Files unchecked.

1.6 ADDON OPTIONS
Latest addon options imported into the mission and server tab from
#mission-makers-resources.
Any changes made to the settings are communicated to the QA team.

2. Mission Modules

2.1 Zeus Entity
Game Master module with #adminLogged, and Zeus slot with Game Master module or
Game Master module with mission maker's Steam UID.

2.2 Headless Client Modules
Two playable headless client modules are present, with the correct names "hc" and "hc1".

2.3 Respawn Position(s)
Respawn positions for players and vehicle assets are present and work.

2.4 Optional: Cover Map
Cover map module defines the AO.

3. Object and unit attributes

3.1 Props
Correct damage and simulation settings are used for props. Targets to be neutralized from afar, flags and other objects that move and need to be seen moving from outside the dynamic simulation area are the only props that are to have normal simulation modes. The rest should be either dynamic simulation or disabled simulation depending on the prop.

3.2 Units
Dynamic simulation should be enabled for all AI units.
Exceptions are:
Units synced to Show/Hide modules. Only the group leader may be synced to the module.
Artillery that is always active.
Long-range SAM + Radar that are always active.
Air assets

3.3 Player units:
Playable enabled.
Check traits (medic, engineer) both under Unit Traits and ACE Options.
Role descriptions are accurate.
Squad leaders have @Callsign after his role description
Loadouts are checked through.

DLC dependencies are checked:
https://community.bistudio.com/wiki/Arma_3:_DLC_Restrictions
Not all Scarlet Pigs players own the APEX DLC and only a minority owns CONTACT, thus it is recommended to include equipment from these DLCs for player use sparingly or not at all.

3.4 Player vehicles and supplies:
Logi has enough space for full resupplies. Might require tweaking the attributes.
Attached assets have logistics to refuel, rearm and repair them.
Enough supplies are provided.
The mission maker's vision for how reinserts and rearms are available and to be used is presented.

4. Systems

Modules are synced.

Show/hide modules work and are synced correctly.

All triggers are tested in a LAN server (to be tested on the actual server too).

Not too many triggers are present (50 is our soft cap) due to network and server performance.

5. AI

Flashpoints are spaced so that a player between them does not activate both.

No more than 100-120 (150 for well optimized maps) AI are active at a time. Account for planned splits of the player force.

AI have waypoints or are synced to LAMBS modules.

Patrol routes work.

Statics are in positions which are not too mean or unrealistic. Neither are they to fall over.

6. Script files

Start on map screen without respawn timer and choosing respawn position:
in *description.ext*
respawnOnStart = 0;

Weapon safety on spawn and respawn:
in *onPlayerRespawn.sqf*

[ACE_player, currentWeapon ACE_player, currentMuzzle ACE_player] call
ace_safemode_fnc_lockSafety;

Script files and textures added to the latest mission file.

7. LAN Test

Check respawning of players and vehicles.
Check player loadouts.
Check if supply boxes can be carried or dragged.
Check if supply boxes carry all grenade and ammo types used by player loadouts, and if
required non-ammo resupplies like UAV batteries are provided.

As Zeus, set yourself invincible.
Teleport to activate AI and check their placement (LAMBS Garrison module's Teleport
option), including statics. (AI in an inaccessible location? Dead AI anywhere? Statics tipped
over or destroyed? Vehicles blown up?)

8. Mission overview

For anything the QA people need to know to understand the mission, such as what you are
going for, what intel is provided from mission start, if you are Zeusing vital parts, or if
anything important needs to happen, place a comment in the *QA layer* called *Mission
overview.* If the mission is mainly created in Zeus, you need to describe the objectives and
your mission overview with comments. In addition an overview of the enemies used as well
as their assets are expected to be provided in the mission file. Explained in [Reserve area](#).
Place these far away from where friendlies would go and disable their simulation.

Uploading

Once the mission has been checked against the checklist and everything is satisfactory,
export the mission file as a .pbo and upload it in **#qa-files**. The QA team will then take a look
at it. Keep in mind to do this well before the scheduled date or your Op may be moved back
and another Op that is confirmed to be working will be played. A minimum of one week is
required by QA for Zeus missions, with at least two weeks for fully created missions. The QA
team does this in their free time after all.

Editor QA

To make your life easier when dealing with .pbo files, it is strongly recommended to use the
PBO Manager program found in **#mission-making-resources**.

QA Layers
Create a layer called "QA Passes", then inside create a sublayer for each new revision (e.g. called Rev0). In this layer QA people create their own layers for comments (e.g. Rev0 QAOVE).

Changelog
In the revision layer a changelog is provided. It does not need to be very detailed. A changelog is expected for every revision.

QA Comments
To place a comment, right-click on terrain or map → Comment
When you have received feedback from QA, the easiest way of going forward is to copy the comments made by QA and paste them into your mission file. You can then address any issues and simply rename your mission folder, increasing the revision number by 1, without needing to copy over any script files or subfolders. This also prevents applying accidental changes by QA that can happen due to Arma load times, hang-ups, alt-tabbing and the like.

Remember, a comment does not necessarily mean that something needs to be changed, however any comments that do not lead to a change could use an explanation from the mission maker. This is done by opening the comment, on a new row make a line to separate the comment from the response (--------), then below that type the response. The title is then to be changed to have the prefix *"Re:"*

If you have simply fixed or changed what was commented, put the prefix *"Changed:"*

For longer responses or discussion, tag the QA guy in ***#creator_qa***.

New revision
Once a new revision is done, make sure you have addressed all the comments in some way, update the revision number by renaming the mission folder name, export the mission (or pack the renamed folder into a .pbo file using PBO Manager), and upload it to ***#qa-files***.

Server testing

Once the mission is agreed to be ready by both the mission maker and QA, server testing is to be done.

Communicate with the QA team to get the mission on the server, and if requested help them in making sure that the mission does not break on the server. Use the checklist below:

Respawns
Scripts
Triggers
Task progression
ACE Settings
Dynamic simulation distance

Last week

MadLetter announces the Op, however you are expected to make his life easier.

Send him a message that includes the following information by Wednesday the week of the Op:
Vital roles, excluding leadership roles and medics:
Logistics (air or ground), vehicle crew, UAV operator, special weapon operators, EOD/demo, recon, CAS.
As well as a link to the map on steam, if this isn't in the modpack preset.
Optionally you can also post a briefing document, a template for which is found in **#mission-making-resources** called "SP OPORD" (simply copy it and fill it out).

Nuttcase will check the loadouts for the mission and inform QA when he's satisfied with the loadouts.

The QA member who approved the server tested mission file will post a mission status report in **#qa-internal** regarding the mission file to be used as soon as server testing is done.

Assignment sheet

On Friday the week of the Op, or latest on Saturday supply MadLetter with a draft for the assignment sheet. If you want you can help with the assignments, however MadLetter will look it over and make the graphic to be posted. We aim to have this posted on Saturday, latest on Sunday morning. The earlier the better as any problems can be resolved without stress and jerryrigging.

This is to be provided in the message to MadLetter:

Op Name
Player faction
Enemy faction
Map
Callsigns from the [sheet of whitelisted callsigns](#), their function, the vital roles in the squad (this time including leadership and medics), the number of total slots in the squad, along with a note for any roles, assets or squads that are vital for the mission to work.

Playday

Contact a QA member one hour before Op time and the server will be turned on and the ACE settings will be checked one more time.

Command briefing is to begin 30 minutes before the Op, help in giving any leaders a heads up that they are expected to show up early.

Changelog and Credits

Changelog

Version 1.0
Handbook written.

Version 1.0.1
Settings and Modules: Specified hc is Variable Name.
Baseline Loadout: 7-8 Mags → 7+ Mags

Credits

Written by MORD OVE, Dust (YaWn) and Nuttcase

Special thanks goes out to MadLetter and Nublet

Created for Scarlet Pigs mission makers and quality assurance.