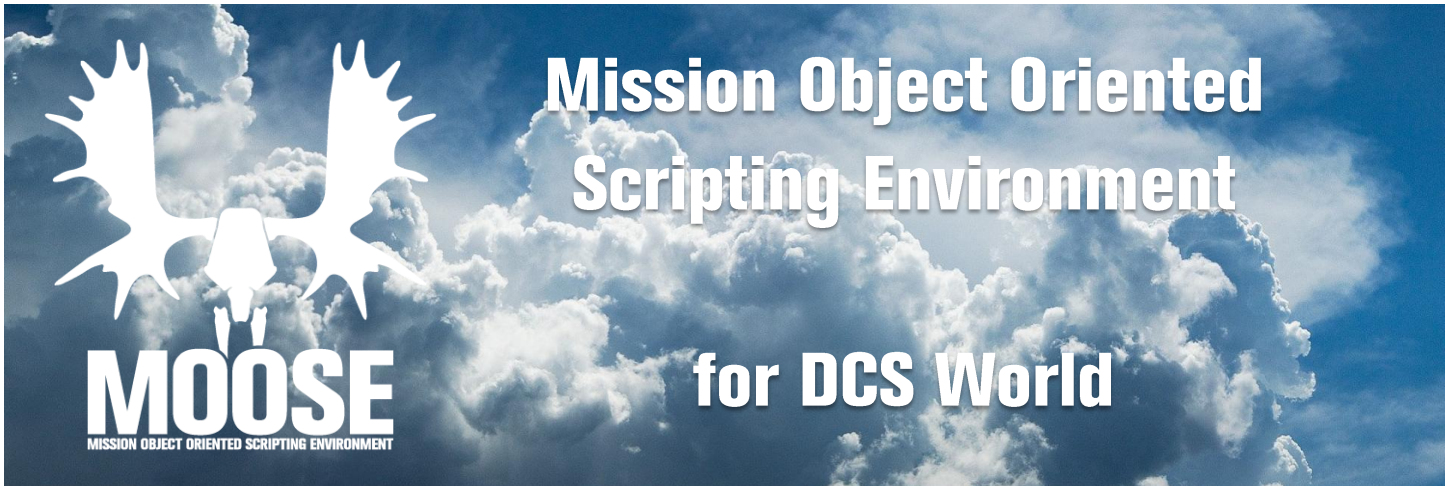



# MOOSE Release 2.2.0

**Download the latest release here.**

**The new Release 2.2.0 of the MOOSE framework had a focus on bringing or extending the A2A capabilities!, and it brings a lot of fixes and optimizations.**

**Find here a short summary of each added function block, with a link to the documentation.**

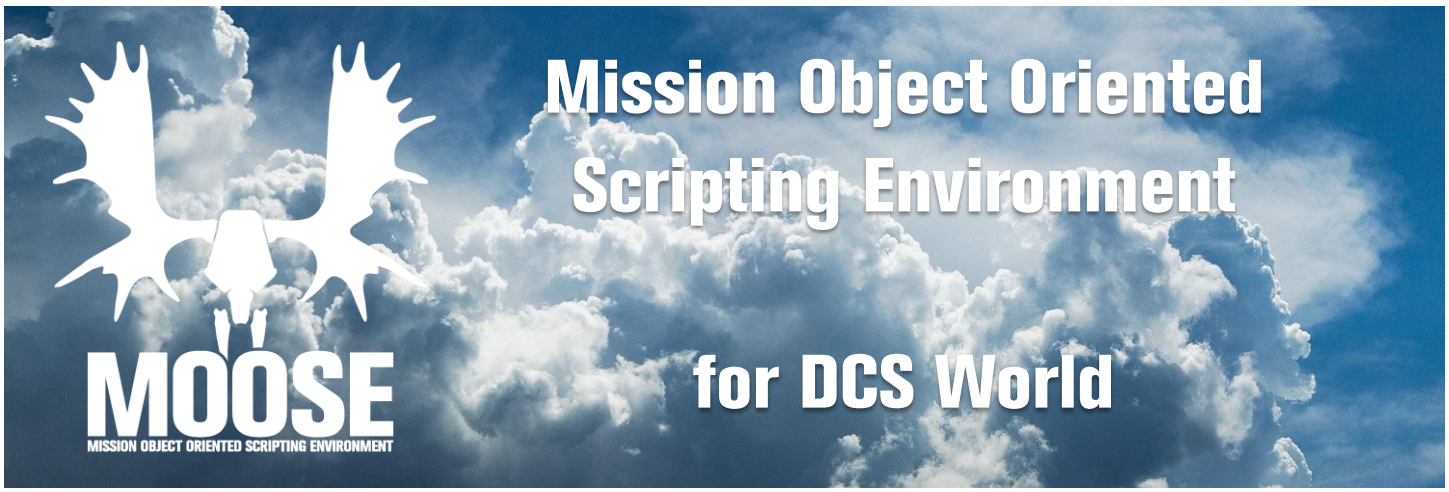
## 1. Setup an advanced AI Air Defense System

**The AI_A2A_DISPATCHER is a new class, that brings a GCICAP capability to be used by mission designers. It is very versatile, introduces squadrons located at specific airbases. The GCICAP is not a one to one conceptual copy of the existing GCICAP script, a lot of new stuff has been added, lots of improvements have been made, and more flexibility has now become possible to tweak the behaviour.**

**Per squadron defined, specific options can be set:**

- **Execute Control Air Patrol (CAP) at defined zones.**
- **Execute Ground Control Intercept (GCI) towards intruders.**
- **Define the defense overhead, meaning, the amount of defending planes to be spawned based on the attackers counted.**
- **Define the grouping of the defenders, group per 1, 2, 3, 4 planes.**
- **Define the border zones**
- **Define the take-off methods.**
- **Define the landing methods.**
- **Resource management**
- **Airborne Refuel management of CAP planes.**

**A derived class from AI_A2A_DISPATCHER is AI_A2A_GCICAP, which brings a more end-user friendly implementation, where noob users can configure easily a defense system and visually place the squadrons on the defending airbases and define the zones.**




## 2. Dispatch INTERCEPT, ENGAGE, SWEEP tasks to players

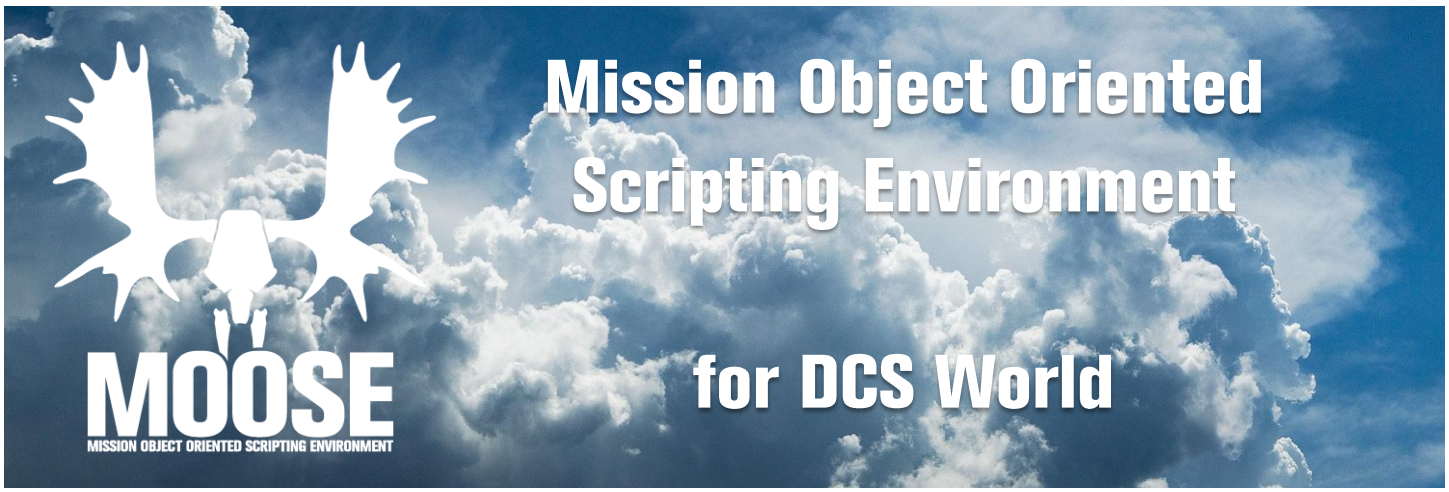
The TASK_A2A_DISPATCHER defines tasks for human players to engage upon in order to accomplish a larger mission, and is the human counterpart of the AI_A2A_DISPATCHER.
The system provides a true dynamic environment for mission designers and players to define exciting missions.
The system uses the DETECTION_ class suite to detect targets, which are reported to a COMMANDCENTER. The COMMANDCENTER is then collecting and grouping the detections and planning or assigning tasks to individual players who are logged onto the server. A complete menu system is defined that allows players to interact with the tasking system: enquire the briefing, enquire reports on the different tasks, enquire status and engage/abort tasks...
The TASK_A2A_DISPATCHER works together with the SCORING class to setup exciting scoring schemes to allow mission designers to accomplish individual scores on a score board.

## 3. Dispatch CAS, BAI and SEAD tasks to players

The TASK_A2A_DISPATCHER is built on the overall TASKING system, which also the TASK_A2G_DISPATCHER is using. As a result, the TASK_A2G_DISPATCHER has also been improved, especially the menu system and the overall coordination of the different tasks.

## 4. Settings Management for players

The SETTINGS class is a new capability within MOOSE that allows to define various settings for different moose classes, and are kept persistent per server for players. The current settings that are modeled are for A2G and A2A formats used during communications, like BR, LL, MGRS, BULLS, BRAA ... Additionally, an imperial and metric measure system has been setup.
So players can use this menu to configure their own preferred settings, and automatically the system will use the right communication format during routing, briefings etc.
On top, COMMANDCENTERS will have menus to setup the default settings for a server. The system is automatically included within the MOOSE system and these menus will be automatically available when you design missions using MOOSE.




## 5. Keep airbases clean

The CLEANUP_AIRBASE class has been a while in MOOSE, but has now been completely revised and improved. Use the the class to keep your airbases clean and to guarantee airbase operations (airbases stop operations if a plane crashes on the runway, or if any missile or bomb is dropped on the runway).

## 6. Let players transport infantry to random locations

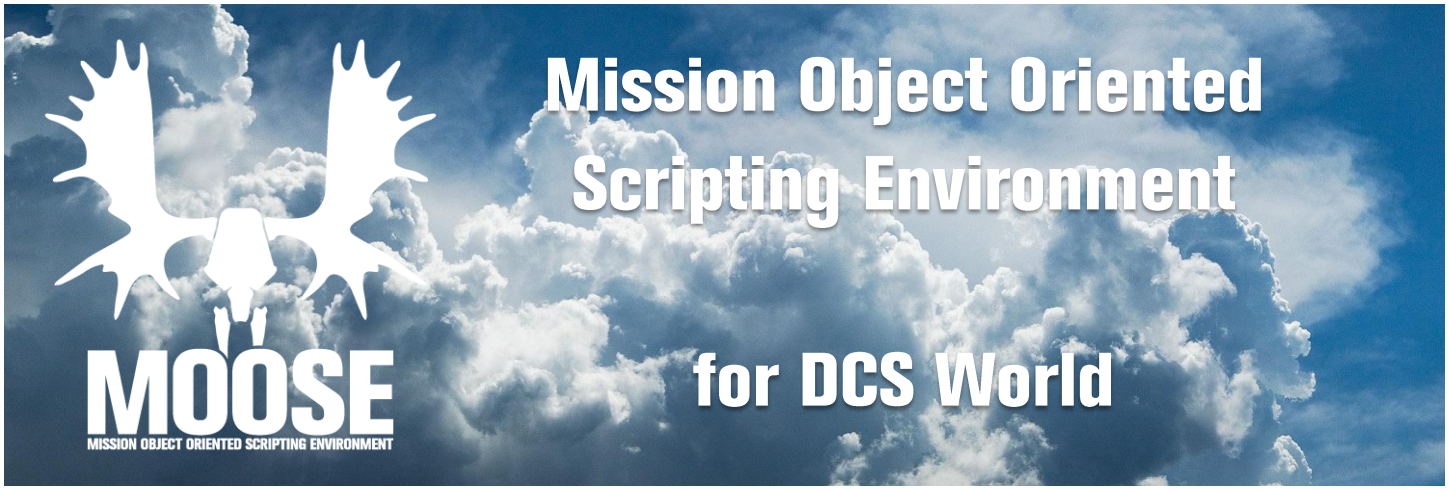
The release 2.1 of MOOSE introduced the TASK_CARGO_TRANSPORT capability. The system has been heavily debugged and more functionality has been added, like automatic respawing of cargo when it is destroyed in the field, or when a carrier crashed when the cargo was loaded in the carrier etc. The menu system to transport cargo has been optimized, and the overall workings have been improved and bugs have been resolved.

## 7. Setup Random Air Traffic, make use of the empty airspace!

The new RAT class, which implements Random Air Traffic, has been added, and is a development of FunkyFranky... (Frank)... He has done a magnificent job and I really encourage you all to try this out. I will let Frank introduce further the RAT class in a separate post!

## 8. Reduction of moose.lua file size!

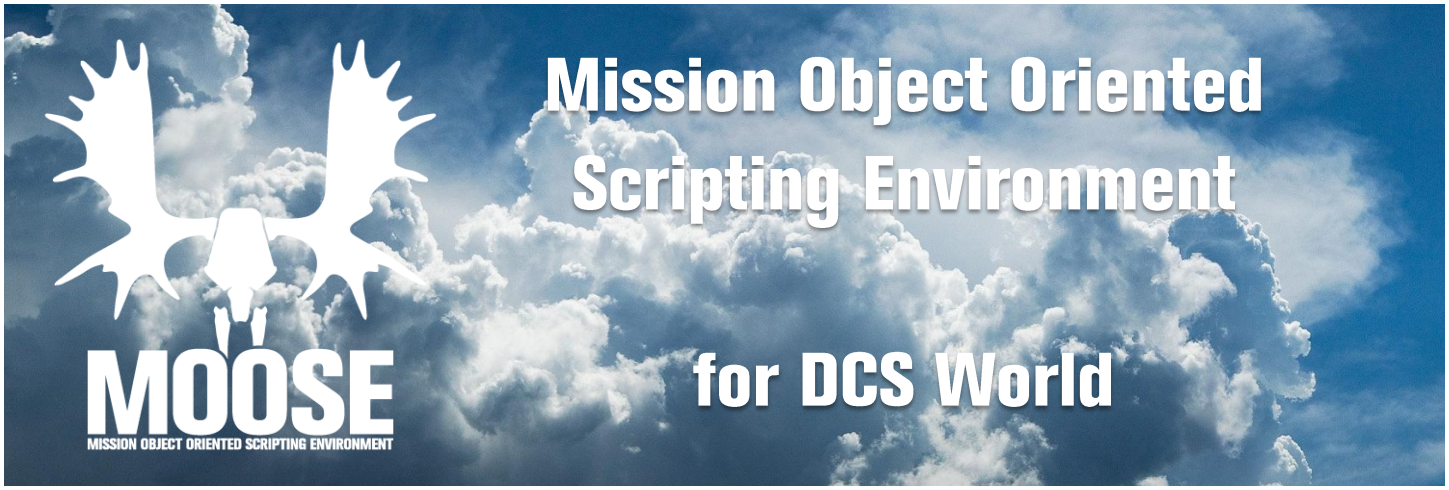
Based on a great idea of Shadowze, an optimization has been done to reduce the moose.lua file size from 2.1 GB to 0.8 GB. This results in faster mission loading, faster performance.



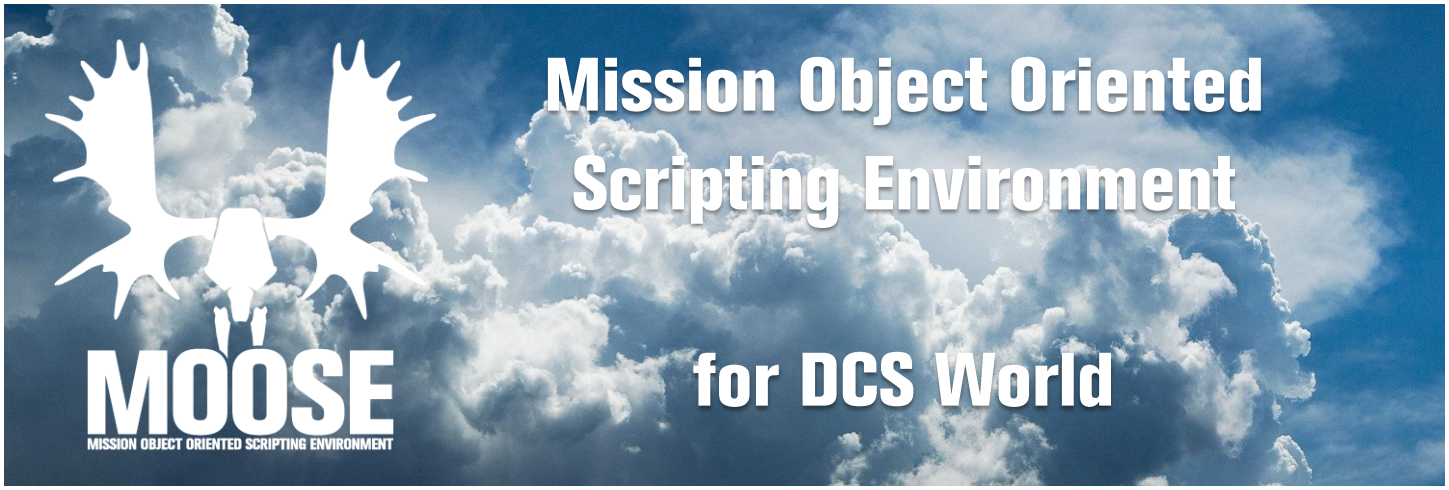

# 9. List of changes

**There are many more optimizations done, but all this is too much to mention and hardly anybody will read it.**
**Here is the list.**

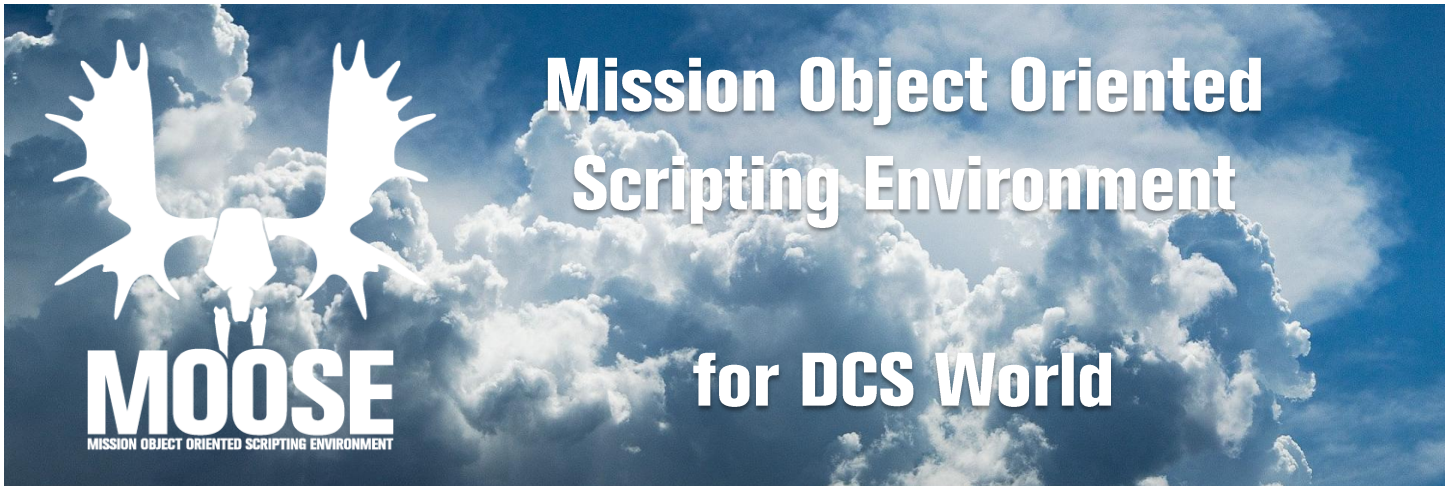
- **Added A2A LL and MGRS on top of BRAA and BULLS. Now A2G has BR, MGRS and LL and A2A has BRAA, BULLS, LL and MGRS.**
- **Fixed Zones problem with {} in AI_A2A_DISPATCHER:SetBorderZone and DETECTION_BASE:SetAcceptZones and DETECTION_BASE:SetRejectZones. Now a single zone object or multiple zone objects in a list can be given.**
- **Fixed issue where A2G cannot be selected for A2G tasks with an airplane.**
- **Fixed problem with nil value in Detection.lua**
- **Adapted task menus to know the task type for the reporting mode selected.**
- **Optimized range of template placement for AI_A2A_GCICAP to 1.5km from center of airbase.**
- **Optimized takeoff height when airplanes spawn in the air.**
- **Optimized helicopters to be included in detections.**
- **Fixed some glitches in Detection (when Detection Set is empty).**
- **Tasks now have MISSION menus under a command center on coalition level.**
- **The DESIGNATE:New() method has now an optional 4th parameter setting the MISSION object where the designate menu should be placed.**
- **Fixed double menu items in planned tasks for one task when a player joined.**
- **AG2 tasking is now optimized. When a task is assigned to a group, new targets detected will be added to the targets. When new targets detected results in a task type change (f.e. BAI -> SEAD), the assigned task BAI will be cancelled. And the new task SEAD is planned. Players can then engage on the new SEAD task.**
- **Designate message (cannot mark) is removed. No more message spamming.**
- **Designate menus are refreshed instead of removed and rebuilt. This results in a much more smooth menu creation.**
- **Fixed an issue in MENU_GROUP_COMMAND where changing menu parameters weren't populated into the menu when the menu had to be refreshed. It was just skipped and that was wrong.**
- **Fixed reports to be shown in ESCORT class. SETTINGS now also are working in ESCORT reports. MGRS, LL, BR, metric, imperial are now supported.**
- **Added default behaviour functions for AI_A2A_DISPATCHER:**
  - **function AI_A2A_DISPATCHER:SetDefaultTakeoff( Takeoff )**
  - **function AI_A2A_DISPATCHER:SetDefaultTakeoffFromParkingCold()**
  - **function AI_A2A_DISPATCHER:SetDefaultTakeoffFromParkingHot()**
  - **function AI_A2A_DISPATCHER:SetDefaultTakeoffFromRunway()**
  - **function AI_A2A_DISPATCHER:SetDefaultTakeoffInAir()**
  - **function AI_A2A_DISPATCHER:SetDefaultLanding( Landing )**



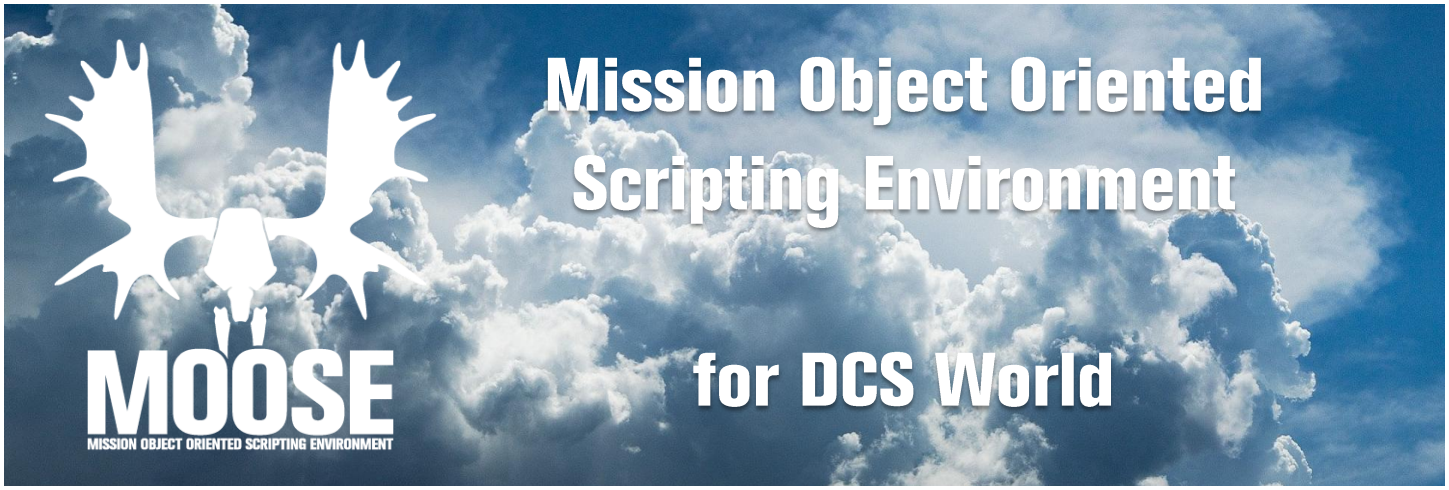

    - function AI_A2A_DISPATCHER:SetDefaultLandingAtEngineShutdown()
    - function AI_A2A_DISPATCHER:SetDefaultLandingAtRunway()
    - function AI_A2A_DISPATCHER:SetDefaultLandingNearAirbase()
    - function AI_A2A_DISPATCHER:SetDefaultGrouping( Grouping )
    - function AI_A2A_DISPATCHER:SetDefaultOverhead( Overhead )
- Fixed returning planes when landing not to despawn when using AI_A2A_GCICAP.
- Fixed problem with route path in dcs 2.1.1 when planes takeoff from runway or parking spot.
- Added method :SetDefaultFuelTreshold( FuelTreshold ) in AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- Added method :SetDefaultDamageTreshold( DamageTreshold ) in AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- Added method :SetDefaultCapTimeInterval( CapMinSeconds, CapMaxSeconds) for AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- Added method :SetDefaultCapLimit( CapLimit ) for AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- Corrected spelling mistake in :SetDefaultDamageTreshold( DamageTreshold ). Renamed to :SetDefaultDamageThreshold( DamageThreshold ). Actually renamed every wrong spelled Treshold word into Threshold, also in the documentation.
- Added method :SetIntercept( InterceptDelay ) for AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- DETECTION_ classes can now also calculate the intercept point.
- Added method :SetDisengageRadius( DisengageRadius ) method for AI_A2A_DISPATCHER and AI_A2A_GCICAP.
- Fixed a problem with grouping. Now the required amount of groups are spawned on AI_A2A_DISPATCHER.
- When a Disengage range is reached, the planes go on hold for a while and orbit on AI_A2A_DISPATCHER.
- Improved the tactical display panel showing now also fuel and damage status of each defender on AI_A2A_DISPATCHER.
- Apply randomization at start for schedules. This is a core change.
- Fixed endless loop when out of resources upon receiving a GCI request on AI_A2A_DISPATCHER.
- Implemented a working Stop time on SCHEDULER.
- Implemented the CAP and Refuelling capability in the AI_A2A_DISPATCHER and AI_A2A_GCICAP. Methods :SetDefaultFuelThreshold(), :SetSquadronFuelThreshold(), :SetDefaultTanker(), :SetSquadronTanker() have been added in AI_A2A_DISPATCHER.
- Changed methods :New() and :NewWithBorder() for the AI_A2A_GCICAP module. A resources parameter has been added.
- By default, when Squadrons are defined using AI_A2A_DISPATCHER and AI_A2A_GCICAP the Squadron will have unlimited resources, unless the now optional Resources parameter of the :SetSquadron() method is specified.
- Added methods :SetSquadronTakeoffInAirAltitude() and :SetSquadronTakeoffInAirAltitude() in AI_A2A_DISPATCHER and AI_A2A_GCICAP.



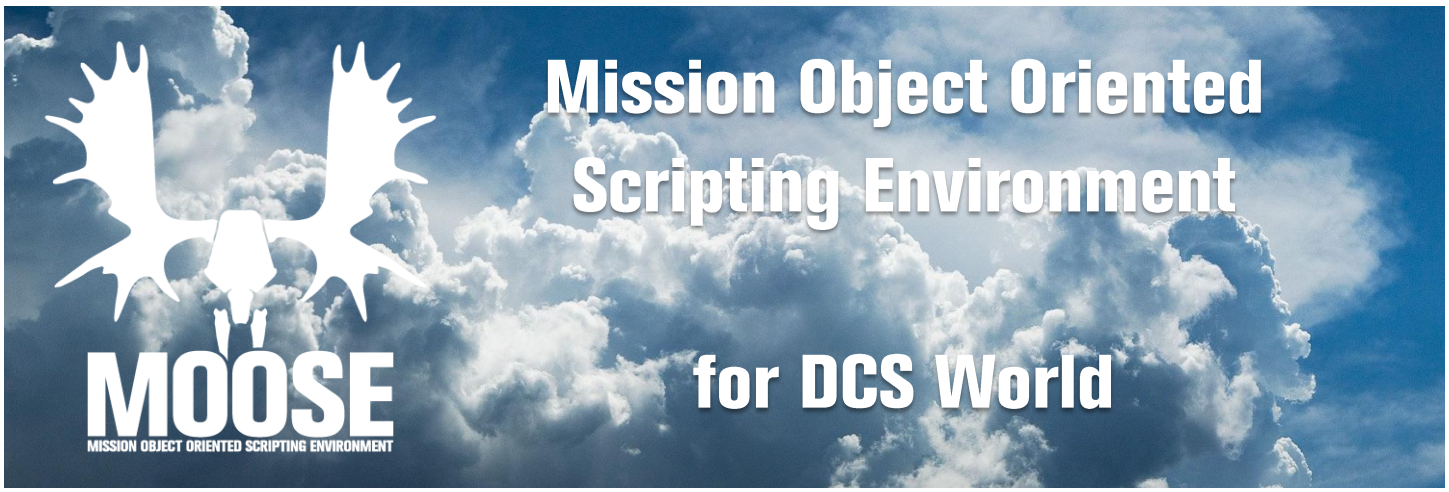

- Modified method :SetSquadronTakeoffInAir() in AI_A2A_DISPATCHER and AI_A2A_GCICAP, adding an optional TakeoffAltitude parameter.
- Modified method :SpawnFromAirbase() in SPAWN, adding an optional TakeoffAltitude parameter.
- Fixed the Status Report format in TASK_A2G and TASK (acessible through the Mission Menu).
- WARNING! Fixed the way functions can be called from waypoints. Modified the :TaskFunction() method in CONTROLLABLE! Cleaned up a lot of noisy code. Now it is very nice and clean. :TaskFunction gets now 2 parameters, the function in a string, and variable arguments, which are set to the CONTROLLABLE and given as variable parameters when the function gets called. I don't think anybody used this method yet in their code, so I don't think this is a (big) compatibility issue.
- WARNING! Renamed method :RoutePointGround() of COORDINATE to :WaypointGround(). I don't think anybody used this method yet in their code, so I don't think this is a (big) compatibility issue.
- WARNING! Renamed method :RoutePointAir() of COORDINATE to :WaypointAir(). I don't think anybody used this method yet in their code, so I don't think this is a (big) compatibility issue.
- Added method :RouteGroundTo() in CONTROLLABLE to route ground groups towards various COORDINATEs.
- Added method :RouteAirTo() in CONTROLLABLE to route air groups towards various COORDINATEs.
- Modified the way :RouteTo() works. Much nicer code now.
- Added REPORT in new Report.lua in Core.
- Reworked DESIGNATE class... Improved performance, added a limit of maximum detections in scope, better distribution of targets and recces, menu system is much improved.
- Optimized DETECTION_BASE and derived DETECTION_ classes in various ways.
- Optimized MENU_COMMAND_GROUP to handle changing function and parameters without having to change the menu text!!!
- Implemented nearest DESIGNATE distance, which is set by default to 12000 meters (both ground and air).
- Added a maximum markings per designated target group in DESIGNATE. So not all FACs are occupied.
- Optimized the designation report in DESIGNATE. Move the horizontal line.
- Ensured in DESIGNATE that when targets are ordered to be smoke or designated, that this also will happen. Was issue with the scheduler, which got garbage collected before actually being executed, resulting in an obsolete schedule.
- Fixed the TASKING, coordinates are now updated when enquiring a task report.
- Fixed problem with waypoint actions for DCS world 2.1.1.8244. This version behaves differently than DCS world 1.5.7. in terms of waypoint actions for airborne units. Fixes had to be done in AI_A2A, AI_A2A_GCI, AI_A2A_CAP, AI_A2A_PATROL.
- Fixed problem in SCHEDULERDISPATCHER with the GetClassNameAndID not existing for some objects.



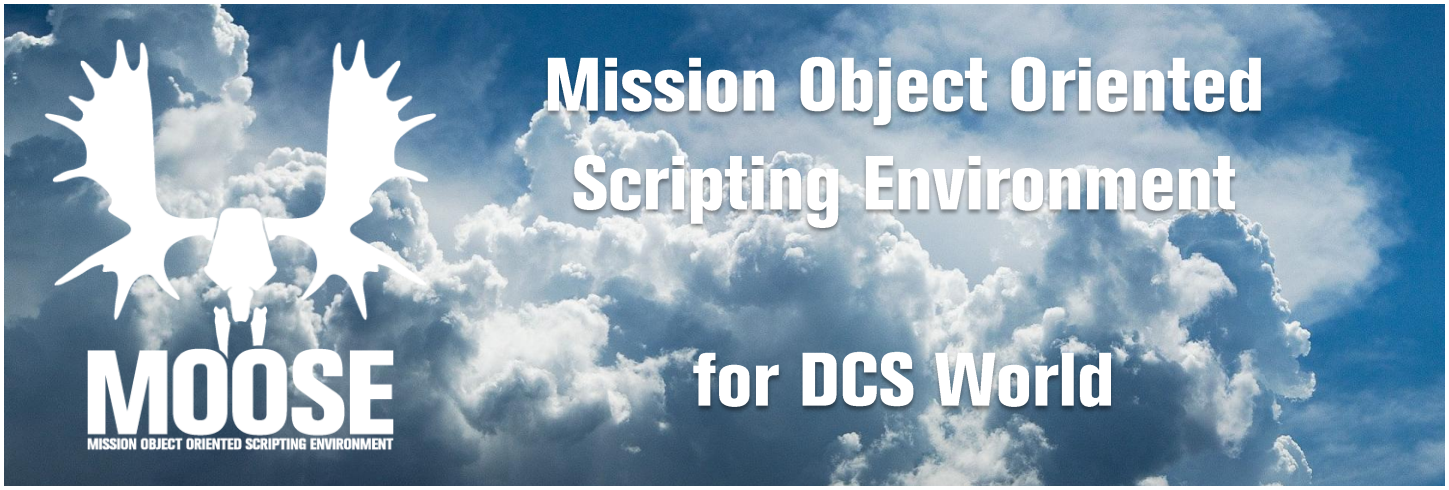

- Now the LL menu is replaced by 2 menus,
  - Lon/Lat Degree Min Sec (LL DMS)
  - Lon/Lat Degree Dec Min (LL DDM)
- LL Accuracy menu options are only available when LL DDM. As agreed, for LL DMS there won't be any accuracy. Optimized the menu settings logic. Default menu setting is BR for A2G and BRAA for A2A.
- DETECTION has now a detection "cache" that contains the last detected targets and coordinates.
- AI_A2A_DISPATCHER now uses the DETECTION cache. So until a new DETECTION is done, the coordinates aren't updated!
- TASK_A2G_DISPATCHER now uses the DETECTION cache. So until a new DETECTION is done, the coordinates aren't updated!
- AI_A2A_DISPATCHER: CAP now counts correctly per squadron. The specified amount of CAP will work now.
- AI_A2A_DISPATCHER: CAP now schedules at different start times, and have different repeat times. More random.
- AI_A2A_DISPATCHER: GCI is now correctly spawning.
- AI_A2A_DISPATCHER: Fixed issue with waypoints working differently in 2.1.1 as in 1.5.7!!! It cause big issues.
- AI_A2A_DISPATCHER: Solved issue with CAP not engaging target.
- DETECTION problem with ESCORT fixed!
- DESIGNATE can now lase targets with specific laser codes upon request by players. Methods :AddMenuLaserCode() and :RemoveMenuLaserCode() added, which allow to set or delete specific additional menu options in the lase menu for players to lase with specific codes. This comes in handy for the SU-25T and the A-10A and other planes.
- Detection reports of DETECTION classes now are returned as a REPORT object. So they can be streamed with various delimiters \n or , or other...
- If a coordinate needs to be represented by BR or BRAA, then a "source" controllable is required, which is usually the player aircraft. If not given, the coordinate will be returned in MGRS format !!!
- TASK_A2G_DISPATCHER task updating is now improved. New tasks when defined for the first time aren't dissapearing from the menu and appearing again. They are consistent. The whole task dispatching has been reworked and is now much more consistent. The conversion of assigned tasks are now improved. The conversion of planned tasks are also improved.
- TASK_A2A_DISPATCHER: Need to do the same as above.
- Added DETECTION_BASE:FilterFriendliesCategory() method, which allows to filter friendlies based on the category of the units found. This method was required to be added to avoid counting airborne units as friendlies in A2G missions. It would result in tasks being converted from BAI to CAS when a player was nearby the target seated in an airplane, which is wrong. Now tasks won't be converted if a player seated in an airplane is near a BAI task area!




- AI_A2A_DISPATCHER: Planes remaining on the airfield is now fixed. The issue was with planes out of fuel doing CAP, which would return to a different airbase because they were out of control. At the landing, these weren't despawned.
- Fixed CAP not engaging problem. CAP become part of the EWR network. They are patrolling and reporting to the EWR their findings. Once they detect targets, the dispatcher will order certain patrols to engage.
- Fixed bug with a nil value when searching for friendlies in the vicinity.
- Closest CAP is selected to engage closest intruder.
- Ensure that CAP is also engaging when there isn't any EWR network initially setup.
- Renamed method DETECTION_BASE:SetDetectionInterval() to DETECTION_BASE:SetRefreshTimeInterval(). This allows to modify the detection interval to a specified amount of seconds.
- Renamed method DETECTION_MANAGER:SetReportInterval() to DETECTION_MANAGER:SetRefreshTimeInterval(). This allows to modify the detection interval to a specified amount of seconds.
- AI_A2A_DISPATCHER: Corrected the calculation to the distance to the airbase, when the intercept calculation is used. Now the intercept point is not anymore interfering with the gci radius validation and gci radius is now correctly respected and validated.
- AI_A2A_CAP and AI_A2A_GCI: Player disconnecting will not result in coordinate calculation problems while engaged with the player machine. The engagement will stop.
- DESIGNATE: Unless autolase is activated, lase will stop after 60 seconds by the JTAC.
- Fixed CAP not engaging issue when there was more than one CAP squadron defined. A stupid typo in the logic overwrote the friendlies prefixes of the first squadron when a second squadron was defined.
- Stability fixes for AI_A2A_DISPATCHER in multi player. Players can exit units due to unexpected disconnects...
- Squadron and Default overhead is now correctly interpreted in GCI engagements. 1 is the neutral number for the Overhead parameter. Any fractional number larger than 1 will calculate additional overhead of defenses. Any fractional number smaller than 1 will calculate less overhead of defenses. Note that overhead is calculated in terms of GCI, not in terms of calculating the engagement of CAP and returning GCI aircraft!
- MARKINGS: Added markings to the A2G tasking. Now a mark can be placed on the map where detected targets are located and includes target details. There is a new option added in "Join Task" menu that allows to automatically place a marker on the map. Note that the marker is done for the player group only, not for the whole coalition.
- SETTINGS: The settings menu has been added with display times... Added new functions that allow to configure the display timings of messages. Not all messages that are generated by moose have been converted into this system, but i plan to gradually do this. There are basically 5 different message display types:
    - Update Messages: these provide a short info (like route info, status update info etc.). Important is that these kind of messages can be switched off!

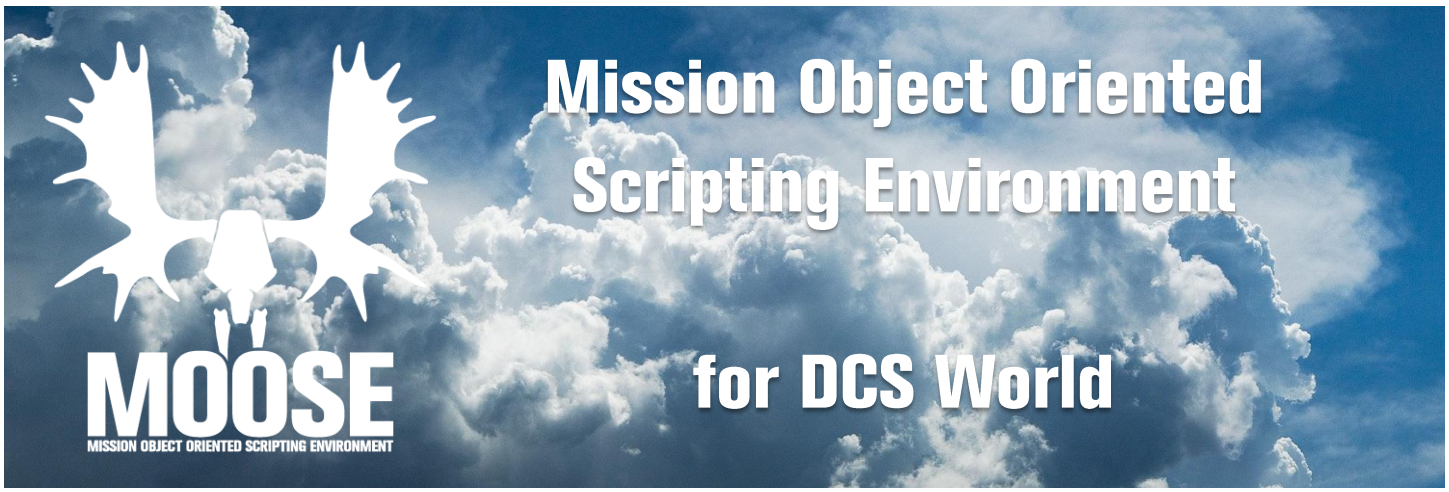



    - Information Messages: these provide information to the pilot. Can't be switched off.
    - Briefing Reports: The briefing reports are typically to be displayed a bit longer.
    - Overview Reports: Reports that provide an overview. Can be displayed a bit longer than normal messages, but not too long. These reports may become large. So, they are not to be used for long-time displays. They are used to generate an "impression".
    - Detailed Reports: Reports that provide details of a subject. These also may need to be viewed longer, as they may contain important information.
      The SETTINGS menu has been added now with options to configure the display timings of these reports, both on a system level, as on a player level.
- SPAWN: Updated SpawnAtAirbase() method to fix a couple of very hidden defects in the logic, and to ensure that spawning is now correctly done on airdromes, ships and farps...
- TASKING: Detailed reports of tasks are now modified to also follow the coordinate settings of the player or use the system setting.
- MARKINGS: Fixed bearing problem of a SET_UNIT. The bearing of the set can only be calculated if all the moving units are moving +/- 5 degrees in the same direction. Otherwise bearing is unknown...
- DESIGNATE: Messages not appearing correctly and crashing the logic is fixed. (due to a stupid typo).
- TASK_A2G: Tasking is fixed. Status menus are now displayed properly, also when the task is planned.
- MENU_COMMAND: I found now why DCS is displayer "error in error handler" sometimes when a menu was selected. The error handler is DCS is bugged, so made my own one. This one is to help FubarBundy.
- AI_CAP_ZONE: Fixed issues with CAP engaging (independent CAP so not related to GCICAP).
- AI_CAS_ZONE: Fixed issues with CAS engaging.
- SCORING: Messages now also implement the SETTINGS formatting and display time selection. Especially for "Hit" messages are now of type "Update" message, now it is possible to "disable" those because Update messages can be switched off.
- AI_A2A_DISPATCHER and AI_A2A_GCICAP: Fixed problem with TakeoffFromRunway... When spawned GCI groups were queued for takeoff at the airbase, they weren't spawned at the airbase. And the dispatcher wasn't aware and thinking that there weren't enough GCI spawned so it spawned again and again. Resulting in a queue of spawnings. Now it is nicely solved by awaiting takeoff... So only after each takeoff of a spawned group the dispatcher will activate the finite state machine GCI logic. This results in a consistent TakeoffFromRunway defense system! It also solves the delays of helicopters taking off from FARPs (when there isn't enough place, sometimes takeoff is queued, even at hot or cold starts.
- AI_A2A_DISPATCHER and AI_A2A_GCICAP: Under certain circumstances, the DISPATCHER would
  spawn more planes than there were at the airport. And that is when
  there is a GCI needed, and only a small amount of planes left, for example one, but like 4




attackers coming and to be defended. In the previous case like 4 planes would be spawned, but fixed it now so that only one plane will be spawned for GCI for defenses from the airbase.

- AI_A2A_DISPATCHER and AI_A2A_GCICAP: As a result of all these issues, planes taking off for GCI sometimes immediately returned home... This should be much better now too!
- Worked on a great idea from Shadowze, reducing the size of the moose.lua file from 2GB to 0.8MB, removing all comments and all unnecessary spaces etc.
- AI_A2A_DISPATCHER: Fixed error with resources not correctly checked at GCI, resulting in GCI to fail.




**We hope that Release 2.2.0 of MOOSE will increase the fun level for DCS fans and mission designers using the MOOSE framework.**

**Thanks to all those people who have helped and are using the MOOSE framework!**

**Thanks,**
**FC and FunkyFranky**