Performance Measurement
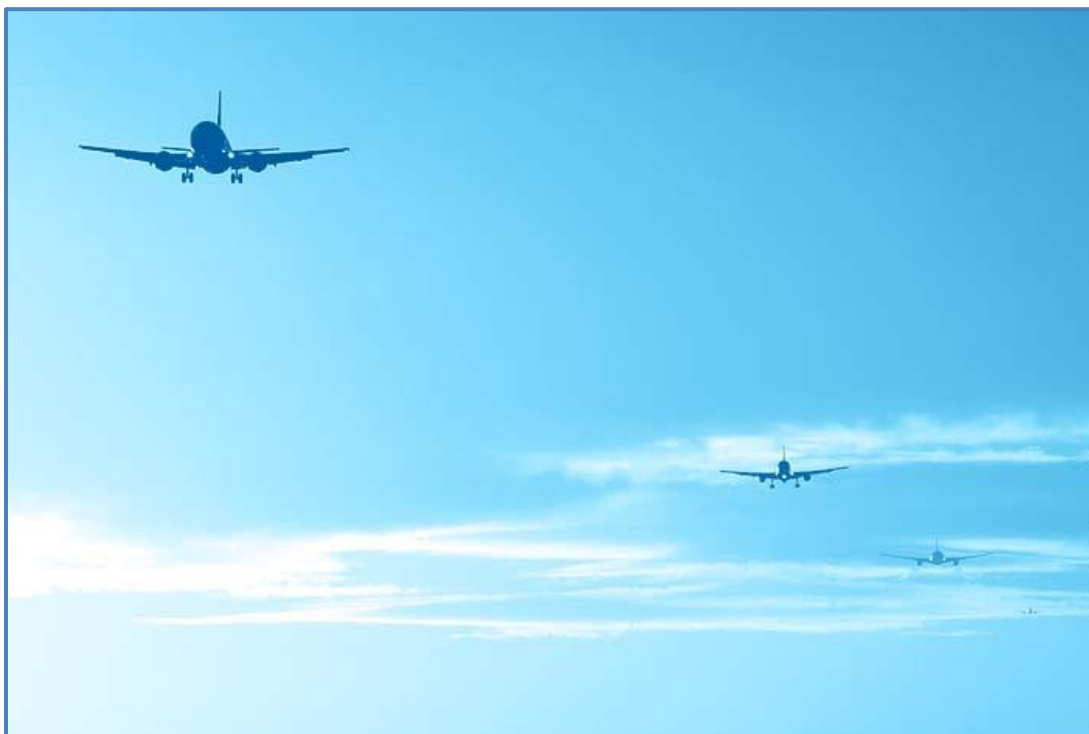
Simulator Version: 8.12

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Performance Measurement

Competencies

After the simulator exercise has been completed the Termination Panel will display some feedback on performance, provided the exercise has been run for at least one minute.

For Target and Circuit Exercises, some specific detail will be displayed here. For other exercises, a score will be reported in up to five competencies. These are:

- ATC;
- Interface;
- Separation;
- Sequencing; and
- Vectoring.

Algorithms for calculating the score in each of these competencies are outlined below.

Where used, the score for each competency is weighted and combined to produce an overall score.

For exercises that have been run for a minimum period of time (normally one minute), a Detailed Feedback panel is available by clicking the top button in the Feedback Panel. This panel will provide a detailed summary of metrics captured during the exercise.

Completion

For an exercise to be completed, the following criteria must apply:

- For Target exercises, at least 80% of the Targets in the exercise must be completed. So, for exercise 3a and 3b at least 8 individual targets must be completed for the exercise to be marked as completed.
- For Maze exercises (3c), the student must run the exercise for 20 minutes with all aircraft added to the Maze. The exercise length the Maze exercise is 30 minutes, so this effectively means all the aircraft must be added within the first ten minutes, or the exercise cannot be completed;
- For Circuit exercises (5a, 5b, 6a, 6b, 10a, 10b), 9 or more aircraft must be departed and 7 or more of these processed for a landing for the exercise to be completed;
- For Task Trainer exercises, at least 80% of the tasks must be completed;
- For Sequencing exercises (exercises 13, 14, 15, 16, 17, 18, 19, 20 and 21), the simulator must be run for 80% of the design length of the exercise. Most of these exercises are one hour in length, so at least 48 minutes must be run. This does not include repeated time from backstepping the simulator. From version 8.11 of the course, the simulator also allows completion when at most one aircraft is still airborne, and not more than one aircraft has been killed (removed).

Success

For an exercise to be marked as successful, the following criteria must apply:

- Score in each individual competency (ATC, Interface, Sequencing, Separation and Vectoring) must not be less than 70%; and
- Overall score must not be less than 80%.

Passing

For a student to be deemed as having passed the exercise, the following criteria must apply:

- The exercise must be Completed; and
- The exercise must be Successful.

Weights

Sim Task Trainers:

For Sim Task Trainers, there are no individual competencies scored only an overall score. The overall score is the percentage of tasks that have been completed. This score is used to determine Completion, Success and Passing.

Target Exercises

For Target exercises, only the Vectoring competency is scored. It thus as a weight of 1.0 and is used to determine the Success parameter. The Completion parameter is based on the number of Targets that have been completed.

Maze Exercise

For Maze exercises, the ATC, Vectoring and Interface competencies are scored. Separation is not scored in the VVA Maze because all aircraft are vertically separated. The weighting is:

Competency	Scoring Weight
ATC	0.5
Interface	0.5
Vectoring	1.0

Circuit Exercises

For Circuit exercises, the ATC, Interface and Separation competencies are scored. The weighting is:

Competency	Scoring Weight
ATC	0.8
Interface	0.8
Separation	1.0

Sequencing Exercises

For other exercises in the VVA course, the ATC, Interface, Separation and Sequencing competencies are scored. The weighting is:

Competency	Scoring Weight
ATC	0.8
Interface	0.8
Separation	1.0
Sequencing	1.0

ATC Competency:

Description

The ATC Competency is designed to capture the student's performance in performing general ATC tasks, other than separation and sequencing. This is generally related to the service provided to the aircraft, such as ensuring that the aircraft is assigned appropriate descent, kept in controlled airspace and

Applicability

The ATC Competency not scored in Task Trainer or Target exercises. It is scored in all other exercises.

Metrics

The following Metrics are used in scoring the ATC competency:

Metric	Details
Pauses	The number of times the exercise was paused.
Aircraft 'Killed'	The number of aircraft removed from the exercise.
Requests	The number of aircraft requests made. This is normally when descent is needed because the aircraft is too high when close to the airport.
Bad Phrases	The number of bad phrases that were issued in the exercise. Examples: • An aircraft is given descent to a level above; • An aircraft is given climb to a level below; • An aircraft is issued a right turn to a heading that is to the left; • An aircraft is issued a left turn to a heading that is to the right; • An aircraft is issued a visual approach when not visual; • An aircraft is issued an ILS approach when not established and not issued an intercept heading.
Frequency Changes Incorrect	The number of frequency changes (transfers) incorrectly issued in the exercise.
Updates ALT	The number of individual radar/surveillance updates for which the aircraft was outside controlled airspace.
Updates Slow	The number of individual radar/surveillance updates for which the simulator clock speed has been slowed.
Go-Arounds	The number of aircraft which execute a go-around (missed approach) in the exercise.
QNH Issuance (only scored in sequencing exercises (13-21))	The number of times: • An aircraft is issued an incorrect QNH; • An aircraft is not issued a QNH prior to landing; • An aircraft lands without having an incorrect QNH corrected.

The following table describes how the ATC score is calculated:

Metric	Deduction	Note
Pauses	0.25% for each Pause during the exercise.	One Pause is allowed without penalty.
Aircraft 'Killed'	7.5% is deducted for each aircraft 'Killed' (removed from the exercise).	Maximum deduction: 40%. Note that version 8.8 corrected bug where this was not deducted.
Requests	1.5% is deducted for each request (such as a descent or intercept request).	
Bad Phrases	1.5% is deducted for each Bad Phrase detected.	
Frequency Changes Incorrect	Incorrect frequency changes (to Tower) are recorded but not scored in VVA.	
Updates ALT	0.1% is deducted for each individual aircraft surveillance update detected outside controlled airspace.	Not in Maze exercise, Maximum deduction: 15%;
Updates Slow	15% is deducted if more that 25% of the exercise time was conducted at a reduced clock speed.	
Go-Arounds	2.5% deducted for each Go-Around.	Not in Circuit Exercises; Also scored in Sequencing
Incorrect QNH	1.5% deducted for each incorrect QNH issued.	Maximum deduction: 15%
No QNH Issued	1% deducted for time an aircraft lands without having a QNH issued.	Maximum deduction: 10%
Incorrect QNH uncorrected	1% deducted for time an aircraft lands having an incorrect QNH issued.	Maximum deduction: 15%

Interface Competency:

The Interface Competency is designed to capture the correct interaction with the label interface, such as keeping label contents up to date, and handing off and accepting aircraft ion t timely fashion.

Applicability

The Interface Competency not scored in Task Trainer or Target exercises. It is scored in all other exercises.

Metrics

The following Metrics are used in scoring the Interface Competency:

Metric	Description
Updates CL Incorrect	The number of individual radar/surveillance updates for which Cleared level in the label did not match the assigned level.
Updates CL Highlight	The number of individual radar/surveillance updates for which Cleared level highlight in the label was on. This is an indication that level readbacks and initial calls are not being monitored.
Acceptances Late	The number of inbound aircraft tracks that were accepted too late (after crossing the airspace boundary).
Updates off Frequency Inside Sector	The number of individual radar/surveillance updates for which the aircraft was inside the sector but not on the user's frequency. This is an indication of a late acceptance.
Assumptions	The number of aircraft tracks that were assumed (forced acceptances without a handover).
Updates on Frequency Outside Sector	Individual radar/surveillance updates for which the aircraft was outside the sector but on the user's frequency. This is an indication of a late handoff/transfer.

Algorithm

The following table describes how the Interface score is calculated:

Metric	Deduction	Note
Updates CL Incorrect	0.1% is deducted for each individual aircraft surveillance update detected when the assigned level does not match the level in the label.	Two updates are allowed for each level change; Maximum deduction: 15%;
Updates CL Highlight	0.05% is deducted for each individual aircraft surveillance update detected when the CL is highlighted.	Allowance is applied of 2 updates per level change, 5 updates per acceptance and 15 updates for each departure; Maximum deduction: 15%;
Acceptances Late	1% is deducted for each late acceptance.	Maximum deduction: 15%
Updates off Frequency Inside Sector	0.1% is deducted for each individual aircraft surveillance update detected inside sector and off frequency.	Maximum deduction: 20%
Assumptions	1% is deducted for each Assumption.	Maximum deduction: 10%
Updates on Frequency Outside Sector	0.1% is deducted for each individual aircraft surveillance update detected outside sector and on frequency.	Maximum deduction: 15%

Separation Competency:

The Separation Competency is designed to measure the ability to detect conflicts and apply (or regain) separation.

Applicability

The Separation Competency not scored in Task Trainer or Target exercises. It is scored in all other exercises.

Metrics

The following Metrics are used in scoring the Separation Competency:

Metric	Description
Updates Loss of Separation	The number of individual radar/surveillance updates for tracks subject to a CA (loss of separation).
Losses of Separation	The number of conflicts (losses of separation) during the exercise.

Algorithm

The following table describes how the Separation score is calculated:

Metric	Deduction	Note
Updates Loss of Separation	0.5% is deducted for each individual aircraft surveillance update subject to a CA (loss of separation).	
Losses of Separation	10% is deducted for each individual CA (loss of separation).	

Sequencing Competency:

The Sequencing Competency is designed to measure the ability to correctly space arrivals onto a runway.

Applicability

The Sequencing Competency is not scored in Task Trainer, Circuit, Maze or Target exercises. It is scored in all other exercises.

Metrics

The following metrics are used in scoring the Sequencing Competency: In the table below, the reference distances make use of the default target sequencing trail distances. If the trail distance is changed from default, then the reference distances will change proportionally. These reference distances are saved in the performance record.

Metric	Description	Reference Distance (Km)	Reference Distance (NM)
Go-Arounds	The number of aircraft which execute a go-around (missed approach) in the exercise.	-	-
Trails Very Low	The number of sequencing trails to the runway that were measured as 'Very Low'.	<9.0	<4.5
Trails Low	The number of sequencing trails to the runway that were measured as 'Low'.	9.0-10.0	4.5-5.0
Trails Ideal	The number of sequencing trails to the runway that were measured as 'Ideal'.	10.0-11.0	5.0-5.4
Trails High	The number of sequencing trails to the runway that were measured as 'High'.	11.0-13.0	5.4-6.0
Trails Very High	The number of sequencing trails to the runway that were measured as 'Very High'.	13.0-18.5	6.0-10.0
Trails Low and Vector	The number of sequencing trails to the runway that were below 'Ideal' and the following aircraft was under a vector.	<10.0	<5.0
Trails Ideal and Vector	The number of sequencing trails to the runway that were 'Ideal' and the following aircraft was under a vector.	10.0-11.0	5.0-5.4
Trails High and Vector	The number of sequencing trails to the runway that were above 'Ideal' and the following aircraft was under a vector.	>11.0	>5,4
Missed Gate	The number of times an aircraft tracking by via a sequencing gate is directed to miss this gate,	Not used in VVA	

Algorithm

The following table describes how the Sequencing score is calculated:

Metric	Deduction	Note
Go-Arounds	2.5% deducted for each Go-Around.	Also scored in ATC.
Trails Very Low	4% is deducted for each 'Very Low' trail	
Trails Low	2% is deducted for each 'Low' trail	
Trails Ideal	1% bonus is applied for each 'Ideal' trail	Maximum score limited to 100%
Trails High	1.5% is deducted for each 'High' trail	
Trails Very High	3% is deducted for each 'Very High' trail	
Trails Low and Vector	1% is deducted when the following aircraft is below 'Ideal' distance in trail and still under a vector.	
Trails Ideal and Vector	0.5% is deducted when the following aircraft is at an 'Ideal' distance and still under a vector.	
Trails High and Vector	4% is deducted when the following aircraft is above 'Ideal' trail distance and still under a vector.	

Vectoring Competency:

The Vectoring Competency is designed to measure the ability to select and issue vector instructions.

Applicability

The Vectoring Competency scored in Maze and Target exercises only.

Metrics: Target

The following Metrics are used in scoring the Vectoring Competency for Target exercises:

Metric	Description
Target Good	The number of Target scenarios for which a 'Good' outcome was achieved.
Target Keep Trying	The number of Target scenarios for which a 'Keep Trying' outcome was achieved.

Algorithm: Target

The following table describes how the Sequencing score is calculated:

Metric	Deduction
Target Good	2.5% is deducted for result of 'Good'.
Target Keep Trying	5% is deducted for result of 'Keep Trying'.

Metrics: Maze

The following Metrics are used in scoring the Vectoring Competency for Maze exercises:

Metric	Description
Updates Outside Maze Laterally	The number of individual radar/surveillance updates outside the lateral confines of the Maze.

Algorithm: Maze

The following table describes how the Sequencing score is calculated:

Metric	Deduction
Updates Outside Maze Laterally	0.25% is deducted for each individual aircraft surveillance update laterally outside the Maze.