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Copy:	CORA 2 TEAM		
Subject:	CORA 2 HMI DOCUMENT: FIRST DRAFT.		
From:	CORA 2 TEAM	31 October 2003	
Ref.:			

Purpose of the document

This memo is the first draft version of the CORA 2 HMI ideas document.

An HMI specification reflects a choice for displaying information and for interactions between the controller and the CORA 2 system.

This memo will be used by the Human Factor Lab to perform reduced-scale simulations to test design applicable to the CORA 2 system for specific functions to be tested: Trajectory edition, Clearance Assistance and Conflict Delegation.

Scope of the document

This document is the first level of the CORA 2 HMI specifications for specific functions.

It describes the HMI displays and the HMI interactions in relation to each of the three main functions to be tested in the HF Lab:

- ∅ Following a function organisation. The HMI specifications are organised according to each function of the CORA2 system to be tested.
- ∅ Following a display organisation. According to the function to be tested, the displayed objects and proposed interactions are shown. For easy reading, pictures are provided.

Organisation of the document

The document is organised as follows:

- ∅ The introduction describes briefly the purpose of CORA 2 and the three functions to be investigated.
- ∅ The third section presents all the HMI design for the Trajectory edition.
- ∅ The fourth section presents all the HMI design for the Clearance Assistance.
- ∅ The fifth section presents all the HMI design for the Conflict Delegation.
- ∅ The last section describes the manipulated data via the described HMIs.

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1. Introduction

CORA will provide en-route Air Traffic Controllers with ranked conflict free resolution advice. CORA is primarily a planning tool, and aims to introduce a new ATC support environment.

CORA will assist the Controller in the identification, prioritisation and resolution of medium-term conflicts. It will address both conflicts between aircraft and conflicts between aircraft and restricted airspace. CORA will enable the Planning Controller to de-conflict early. This optimisation will reduce the workload of the Tactical Controller, enabling improvement of quality of service to aircraft, and smoother ATM. CORA will also provide Controllers with better information regarding the development of the future situation and the possibility to evaluate several potential resolutions to conflicts and problems.

CORA will support planning and monitoring activities, facilitate co-ordination within and across sectors, maintain or increase safety, and smooth and reduce Controller workload.

1.1 Trajectory Edition

The main operational objective(s) of this trajectory edition function is to assist ATCO to review and modify accurately in the four dimensions the aircraft trajectory.

The operational objective(s) of the Trajectory Edition function is to assist the controller tasks of problem solving and/or trajectory optimisation.

The Trajectory Edition function will assist the controller:

- To be more accurate.
- To anticipate the trajectory modification.
- To test options via the sub-function of What-If/simulation coupled to the function of conflict predictor.

1.2 Clearance Assistance

Clearance Assistance is a function that serves to remind the controllers of previously planned flight-related actions. They are issued a parameter time before or after the predicted occurrence of the associated event. The objective is to enhance safety by reminding the controller about manoeuvres allowing their timely execution.

The Clearance Assistant receives the position of the aircraft from the Surveillance System and the aircraft system trajectory data from the FDPS/TP. When the flight is passing a specified “reminder point” on the trajectory, the Clearance Assistant triggers the display of the appropriate reminder. The “reminder point” can be created automatically or as a result of manual inputs, e.g. top of descent “reminder point” is created automatically but route “reminder point” is created as a result of the controller's manual trajectory editing (heading input). The reminders are displayed to the controller currently in control of the associated flight.

If the controller has already taken an action for which a reminder is provided, that reminder is not displayed (e.g. the change of control frequency reminder will not be displayed if the control frequency has already changed).

The Clearance Assistant sends the reminders to the System (CWP HMI) for presentation to the controllers. Which reminders will then be effectively displayed to the controllers depends on local implementation. The reminder presentation is maintained until the controller initiates the appropriate action or acknowledges the reminder.

1.3 Conflict Delegation

The process of delegation, which leads the controller to take ownership of a conflict situation and the associated working method, will need to be validated. The functions such as the delegation process modify inter-sector co-operation. The intra-sector co-operation will also evolve with the PC ability to participate in managing TC workload with functions such as preparation of clearances. CORA 2 supports this evolution by facilitating conflict resolution.

Inter-sector conflict delegation means a transfer of responsibility from one sector to another for the resolution of a particular conflict or problem. Forward and backward delegations can be distinguished.

When a controller is working on a traffic situation that could lead to a conflict within his/her Area of Interest, but outside his/her Area of Responsibility, this controller having still control of the aircraft shall be provided with the capacity to ask the sector receiving the conflicting aircraft whether or not they agree to delegate the resolution of this conflict to him/her. In case of a positive answer, the controller requesting the delegation and currently responsible for the aircraft will take the responsibility of solving the conflicting situation, even if it was not originally occurring within his/her Area of Responsibility.

On the other hand, a controller detecting a conflict that is to occur within his/her Area of Responsibility but still in the Area of Interest of the upstream controllers currently controlling at least one of the conflicting aircraft should be able to request from the concerned sector to solve this conflict before transferring the aircraft.

It is important to make sure that controllers from both communicating sectors are considering the same situation on a common information basis. Thus, it should be possible for both upstream and downstream sectors to designate a conflict to the other sector via HMI, e.g. editing concerned graphical routes with or without associated context traffic. If a conflict is detected by one of the sectors but not by the other, it should be possible to transmit via HMI the conflict information from a sector to another to enable co-ordination negotiation.

Intra-sector conflict delegation means a transfer of responsibility from one Controller (Planning controller) to another Controller of the same sector (Tactical Controller) for the resolution of a particular conflict or problem.

Within a sector, conflict delegation aims to balance controller's workload: CORA should enable the delegation of a conflict or problem from one controller working position to another within a sector. The evolution of the controllers task sharing

within a sector heads towards the Planning Controller pre-resolving a maximum of conflicts for the Tactical Controller(s) of the sector. Working with a longer time horizon for conflict notification, The Planning Controller can solve a lot of conflicts through co-ordination with the other sectors. However, there are conflicts the Planning Controller cannot avoid. In this case, the system should enable the Planning Controller to “delegate” the conflict by adding a conflict detected by the system to the Tactical Controller notified conflicts, and the Tactical Controller should know that for this conflict, there is nothing that the Planning Controller can do.

2. HMI specifications for Trajectory Edition

2.1 Principle

The principal components of the TED HMI are:

- A Lateral view of the trajectory in the RPVD
- A Vertical view of the trajectory or profile in a separate window, the Profile Window

The TED shall allow performing the following trajectory modifications via

- Lateral Edition procedures such as
 - Headings (+/ resume trajectory)
 - New route (new sequence of route constraints), New entry point, New exit point
 - Direct
 - Offset
- Vertical Edition procedures
 - New PEL
 - Intermediate CFL
 - New XFL
- Speed instructions

With the Trajectory Edition function, ATCO will manage different trajectories for the same a/c:

- The active trajectory or System Trajectory which is shared by all the Control Units concerned and by all the modules of the system (CP, MONA,). There is one active trajectory per a/c at a time. It is the reference and is common to all CWPs. The first active trajectory in the system is the original trajectory based on the flight plan composed by the a/c.
- The working trajectory which is a temporary copy of the active trajectory, copy that has been edited by the controller in order to test solution or any modification. This copy shall be sent to:
 - the Conflict predictor .
 - the Co-ordination manager (i.e. SYSCO)

The working trajectory is not local to a CWP (a working trajectory can be consulted by adjacent controllers).

- The proposal /alternate trajectory (PAC) is a working trajectory that can become external to the sector CWP(s) in order to be co-ordinated, exchanged with adjacent sector (and/or negotiated with air).
- The planned trajectory is the part of the system trajectory (which has been modified from the original) which is not yet known by the a/c, in other words the part which has not been yet cleared. Similarly, the cleared trajectory is the part of the system trajectory, which is contracted with the aircraft.

Every order shall be defined by the following parameters:

- A target value
- A start expressed as follows:
 - At X NM from/to (radial X of) beacon
 - From beacon
- An end or a duration expressed as follows:

- At X NM from/to beacon
- to beacon
- for X-min / for X NM
- when target value reached.

2.2 Rules for edition

2.2.1 Rules for horizontal edition

- Direct to resume navigation after a deviation is calculated on the base of 30 degrees angles.
 - When angle with next not yet “passed” beacon is less than 30 degrees, that next beacon is the resume beacon.
 - Check of the next one (one by one along the trajectory) until to find a valid resume beacon.

2.2.2 Rules for vertical edition

Input of a new level constraint will follow the following rules:

- For the next level constraint:
 - Next level constraint > new level: According to the rule, climb as soon as possible, calculation of the earliest climb phase to be at the same level as the level of the next level constraint.
 - Next level constraint < new level: According to the rule, descend as late as possible, calculation of the latest descend phase to be at the same level as the level of the next level constraint.
 - Next level constraint = new level: calculation of a stable vertical profile until the next level constraint.
 - Unable to build the profile: The next level constraint is moved until reaching the point where a valid profile exists (in this case, a change in the XFL may occur).
- For the previous level constraint:
 - Previous level constraint > new level: According to the rule, descend as late as possible, calculation of the latest descend phase to be at the same level as the level of the new level constraint.
 - Previous level constraint < new level: According to the rule, climb as late as possible, calculation of the earliest climb phase to be at the same level as the level of the new level constraint.
 - Next level constraint = new level: calculation of a stable vertical profile until the new level constraint.
 - Unable to build the profile: The previous level constraint is moved until reaching the point where a valid profile exists (in this case, a change in the EFL may occur).

2.2.3 Rules for co-ordination

When a Co-ordination involving 3 sectors, the following rule is applied. If N edits a trajectory, which modifies boundary with N-1 and N+1, the proposed trajectory will be co-ordinated first with N-1.

- If N-1 accepts, the proposed trajectory is sent to N+1. N is alerted.
 - If N+1 refuses, N is alerted. N needs to re-edit the proposal trajectory to change exit conditions.
 - If N+1 accepts, the co-ordinated trajectory becomes the system trajectory for the related aircraft. Entry and exit conditions are updated accordingly.
- If N-1 refuses, N is alerted. N needs to re-edit the proposal trajectory to change entry conditions.

2.3 Trajectory Edition activation

Action

On Radar Display (RPVD):

- Left Click on the XPT Field for an aircraft (TED for an aircraft).
- Left Click on the Red Dot in the label of an involved aircraft (TED for a conflict).
- Left Click on the Conflict Number in the DFL on an involved aircraft (TED for a conflict).

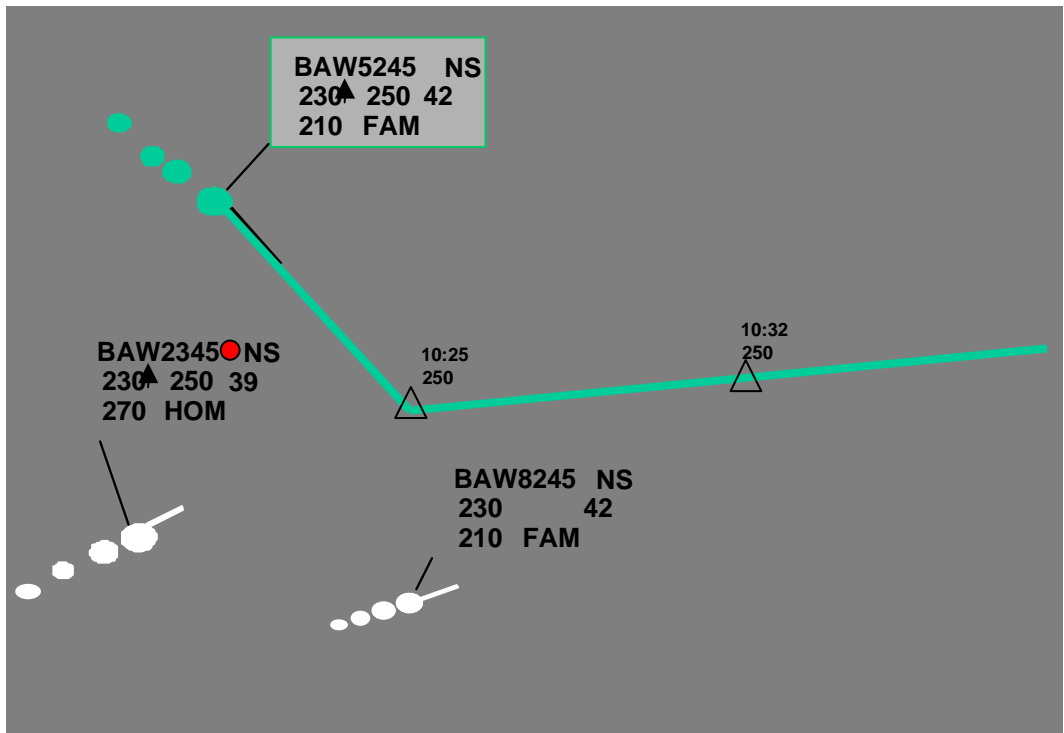
On Conflict Display (CRD):

- Left Click on the square related to a conflict (TED for a conflict) and selection of the EDIT item in the Conflict menu (See **Manual transfer of a conflict**).

Remark: Same action to close the edition (all edition actions already made are stored).

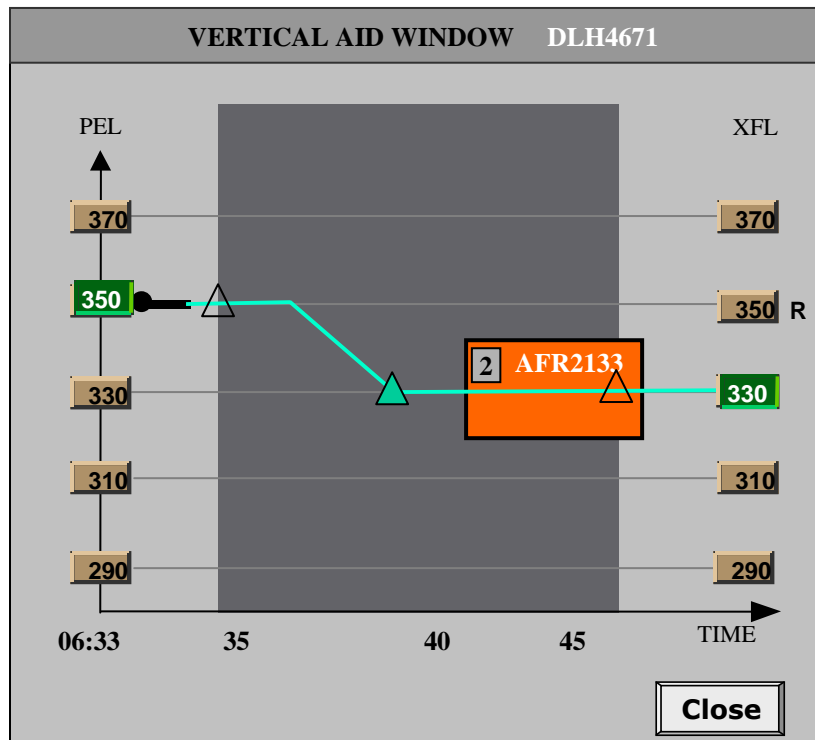
Remark: Only one edition at a time for the same aircraft (whatever the controller is).

Result



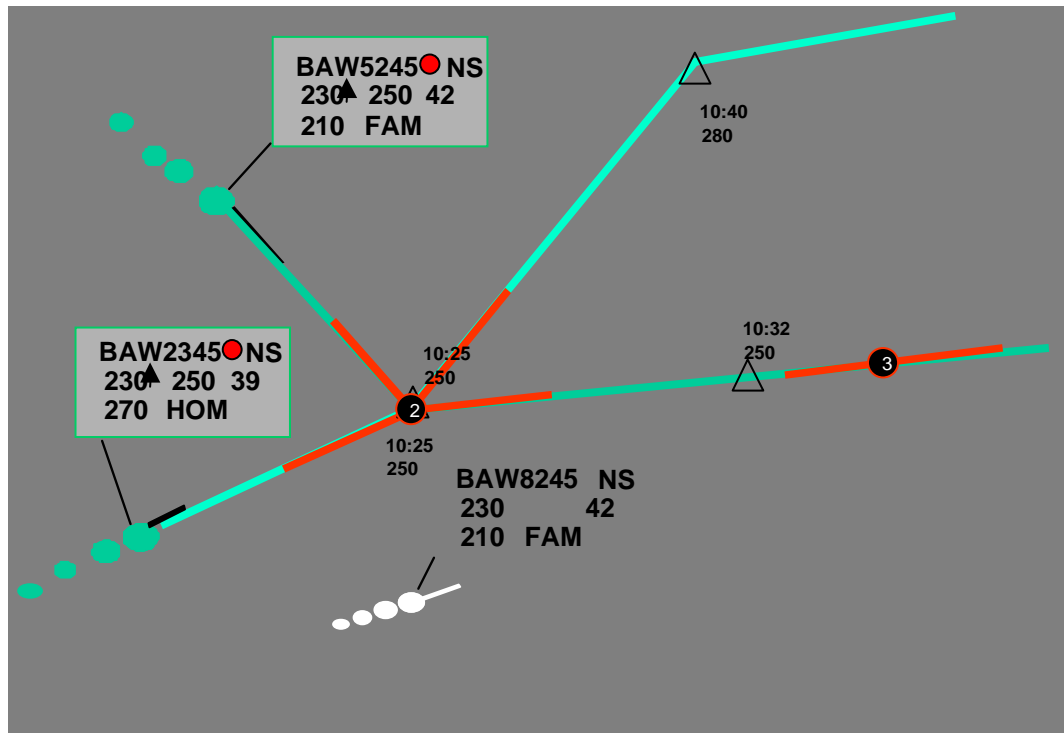
TED for an aircraft in the RPVD

Remark: If the VAW is not yet open, it is open for the related aircraft.



TED in the VAW

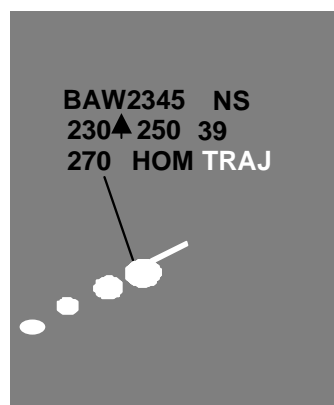
Remark: In the VAW, the current EFL and XFL are highlighted. A "R" indicates the RFL. The limits of the sector are in dark grey.



TED for a conflict in the RPVD

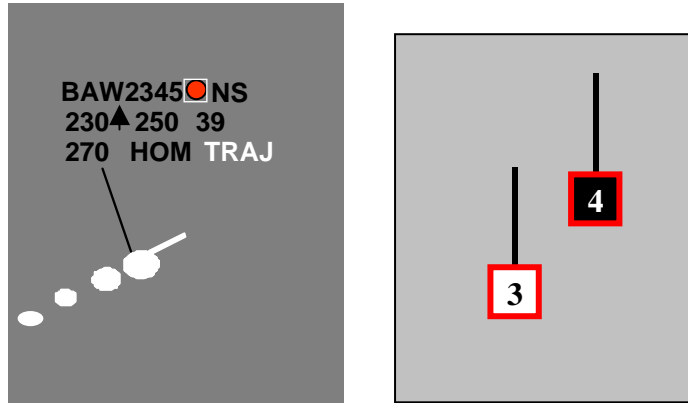
Remark: If the VAW is not yet open, it is open for the related aircraft. The trajectory at the foreground is in a lighter green colour.

- To change the trajectory at the foreground level (in the RPVD): Right Click on the position marker of the other aircraft (If two trajectories are overlapping during conflict edition, this function enables to bring to front the trajectory to be edited).
- To change the displayed trajectory (in the VAW): Right Click on the aircraft callsign displayed in the conflict indicator.
- When a trajectory editor is open on an aircraft, TRAJ is displayed in white (colour of working trajectory) in the label of the involved aircraft (wherever the label is displayed) as soon as edition begins in order to indicate to all others controllers that this aircraft is in pending edition.



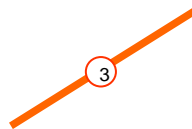
Indication of pending edition for an aircraft

Remark: If the trajectory edition is performed for a conflict, the red dot (in the label of all aircraft involved in it) is displayed squared also in white to indicate that the conflict is in pending edition. The white square appears as soon as at least one trajectory (not necessary for both aircraft) is in pending edition.

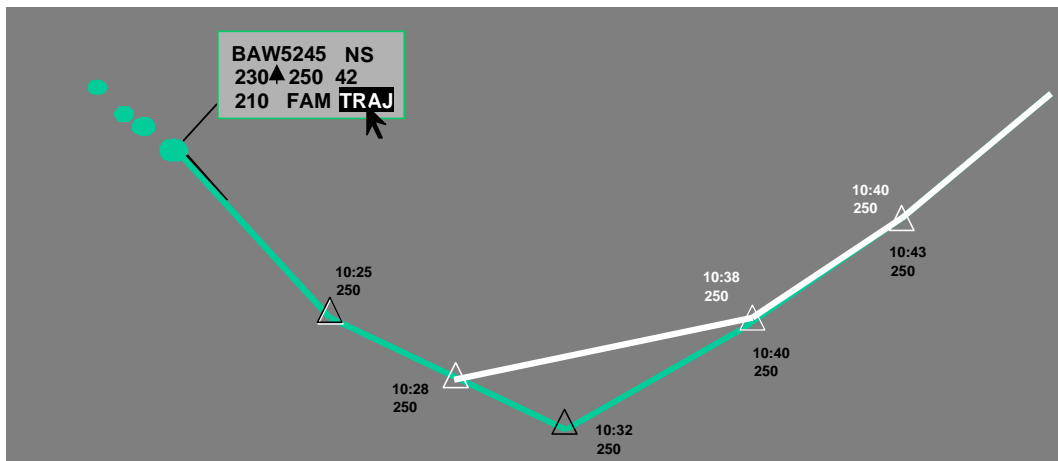


Indication of pending edition for a conflict in the RPVD and in the CRD

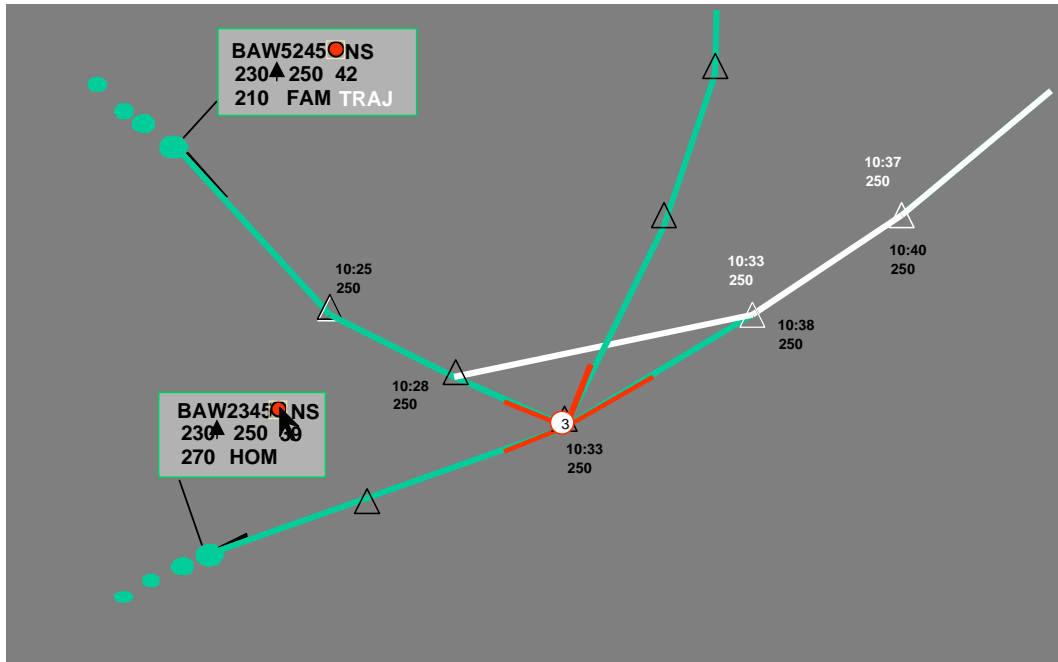
Remark: The same indication of pending edition for a conflict is displayed when a conflict is displayed on a DFL:



Remark: By a right hold click anywhere a working edition is indicated (whatever the status of the edition: pending edition, pending co-ordination, rejected edition), if the trajectory edition is not active for that pointed edition, the working trajectory(ies) are displayed (as DFLs).

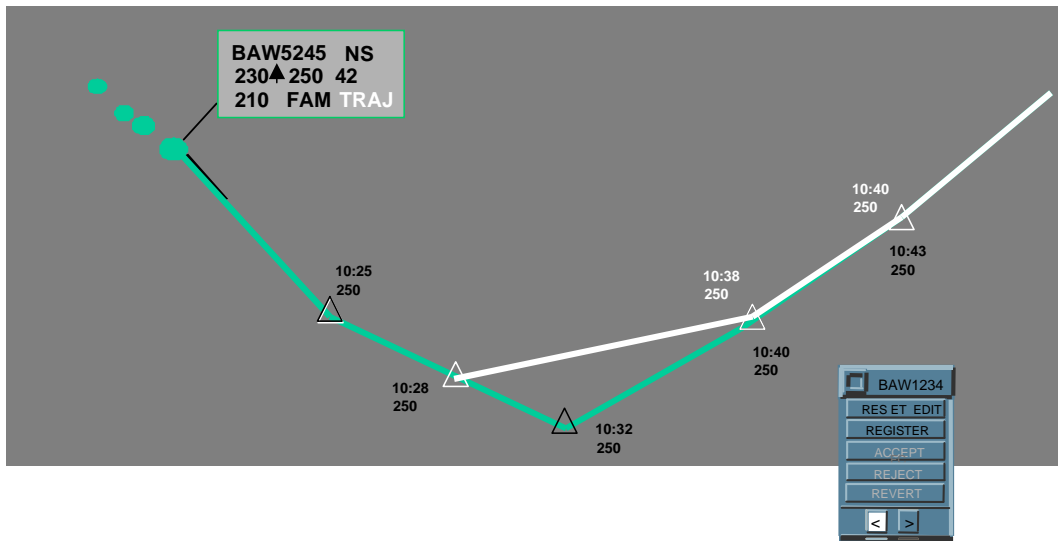


Right hold click on TRAJ text in a label



Right hold click on red dot squared in white in a label

Remark: If the TED is activated and a working trajectory already exists for the related aircraft, the existing working trajectory (in the probed state) is displayed and the Trajectory Support Tool too.



Activation of the TED for an aircraft which has already a pending working trajectory

2.4 Edition of an instruction

All the editions are valid both in edition for an aircraft or edition for a conflict. These editions could begin on any existing trajectory:

- Working trajectory.
- Proposed trajectory.
- System trajectory.

- Old trajectory.

2.4.1 Common interaction

Action

On Radar Display:

- Point on any point of a trajectory

On VAW:

- Point on any point of a trajectory

Result

Point too close from the current position (2 minutes: must be a parameter):

- Display of caution cursor.

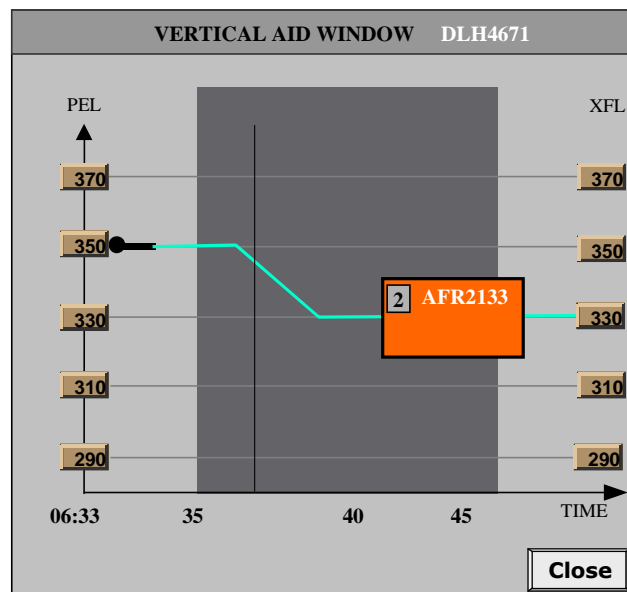


Point on an existing constraint:

- Display of path location cursor in RPVD if edition in the VAW:

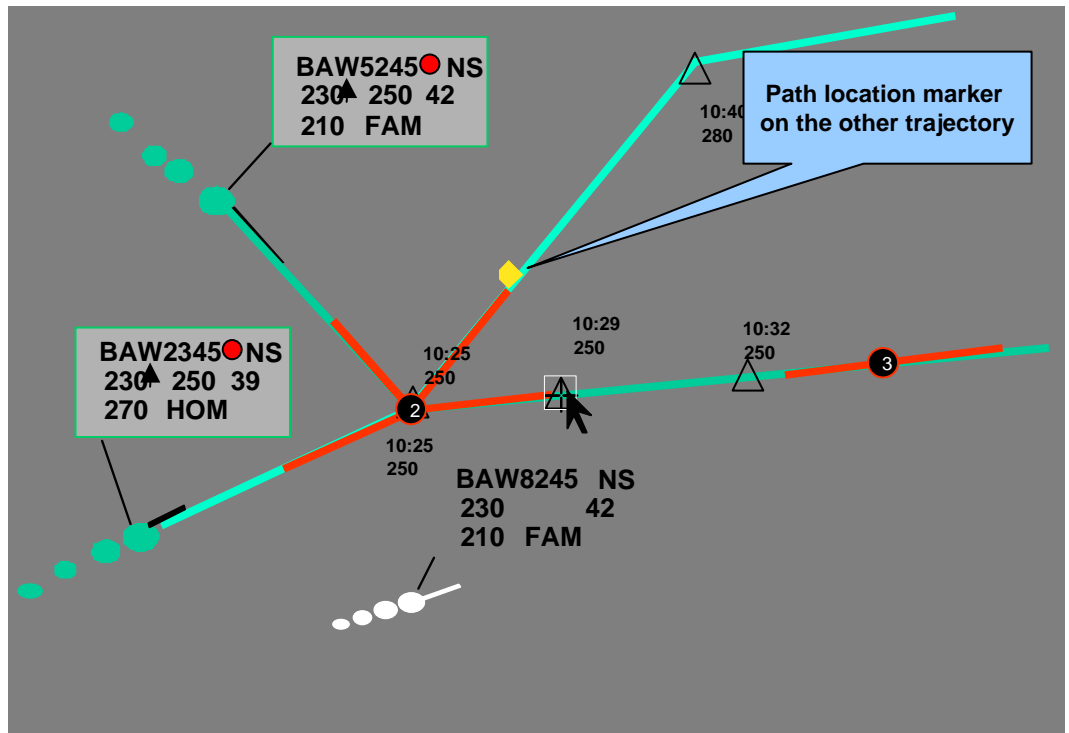


Display of the path location line in the VAW if edition in the RPVD:



Remark: The path location cursor or the path location line moves accordingly to the cursor along the trajectory (it is to have a marker in the other “window” during edition).

Remark: For edition for a conflict and two trajectories are displayed, the path location cursor is displayed when moving on one trajectory on the other trajectory.



Point on existing constraint

- Display of the edition cursor (a cross).

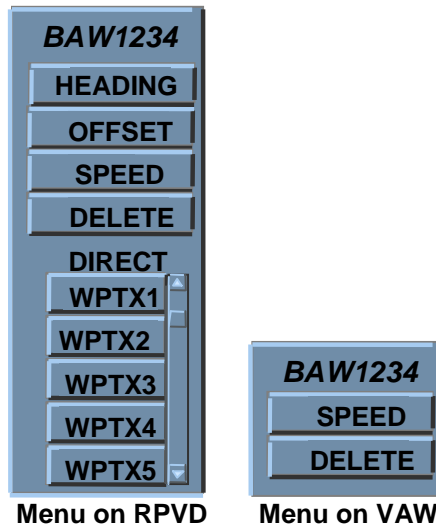


- Highlight of the constraint.

Constraint Highlight Marker
 Example of
 Constraint Highlight Marker on :

△
 Route constraint on a beacon

- Display of the contextual Edition Menu (after a while: e.g. 400 ms parameter).



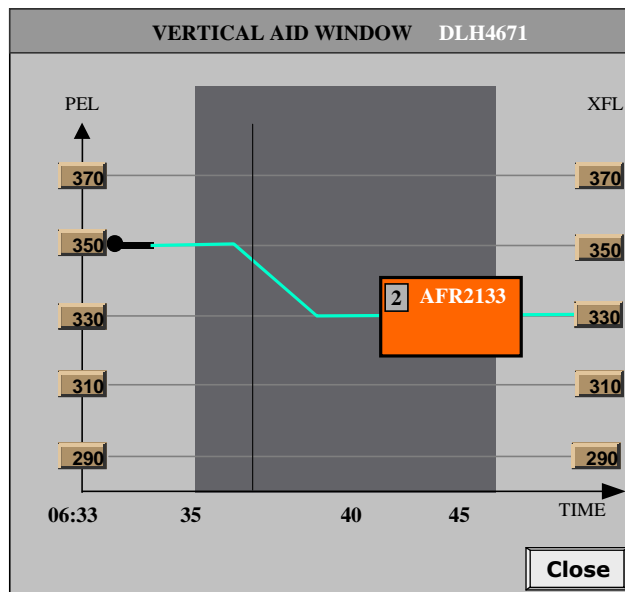
Remark: The edition menu disappears when an item is selected or when the cursor is moved outside the trajectory or outside the menu itself.

Point on a trajectory outside an existing constraint:

- Display of path location cursor in RPVD if edition in the VAW:

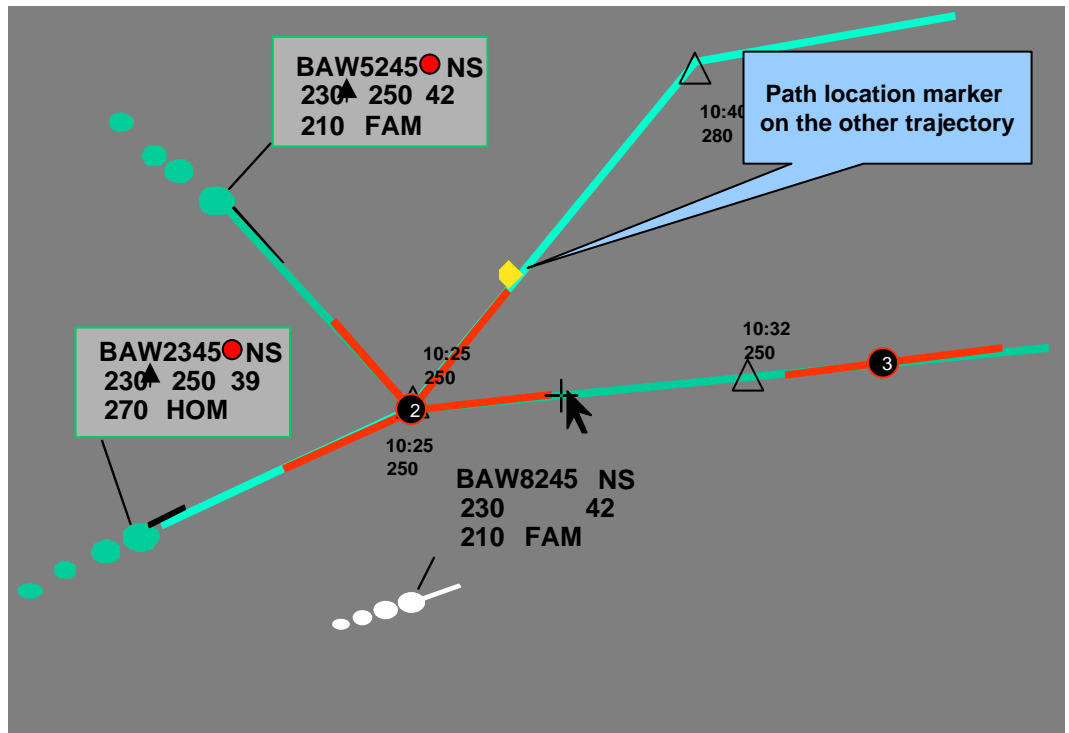


Display of the path location line in the VAW if edition in the RPVD:



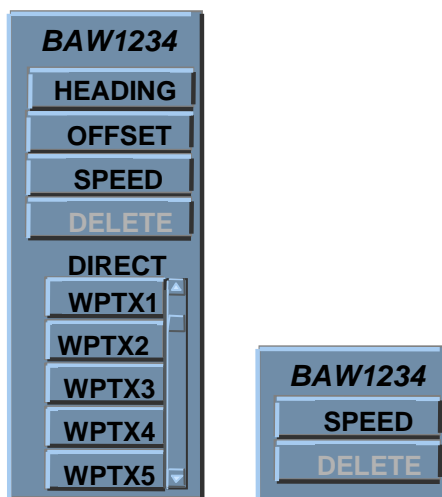
Remark: The path location cursor or the path location line moves accordingly to the cursor along the trajectory (it is to have a marker in the other “window” during edition).

Remark: For edition for a conflict where two trajectories are displayed, the path location cursor is displayed, when moving on one trajectory, on the other trajectory.



Point outside an existing constraint

- Display of the edition cursor (a cross).
- Display of the contextual Edition Menu (after a while: e.g. 400 ms parameter).



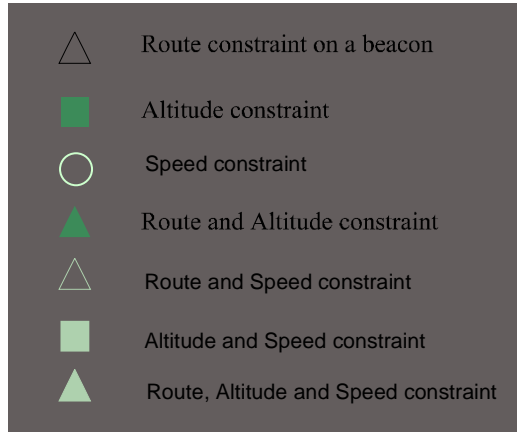
Menu on RPVD

Menu on VAW

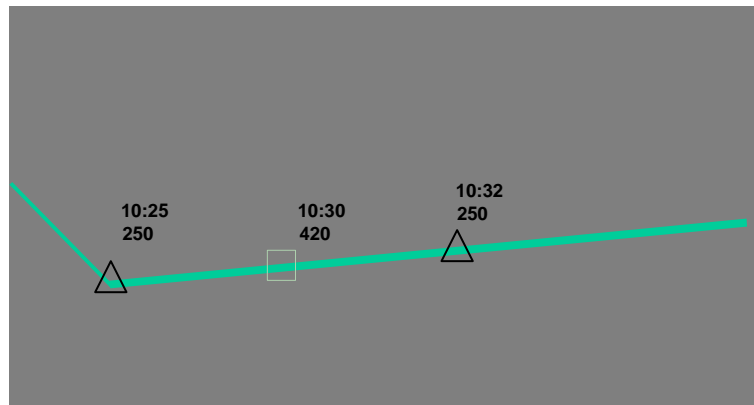
Remark: The edition menu disappears when an item is selected or when the cursor is moved outside the trajectory or outside the menu itself or during a mouse drag (move an existing constraint).

Types of constraints

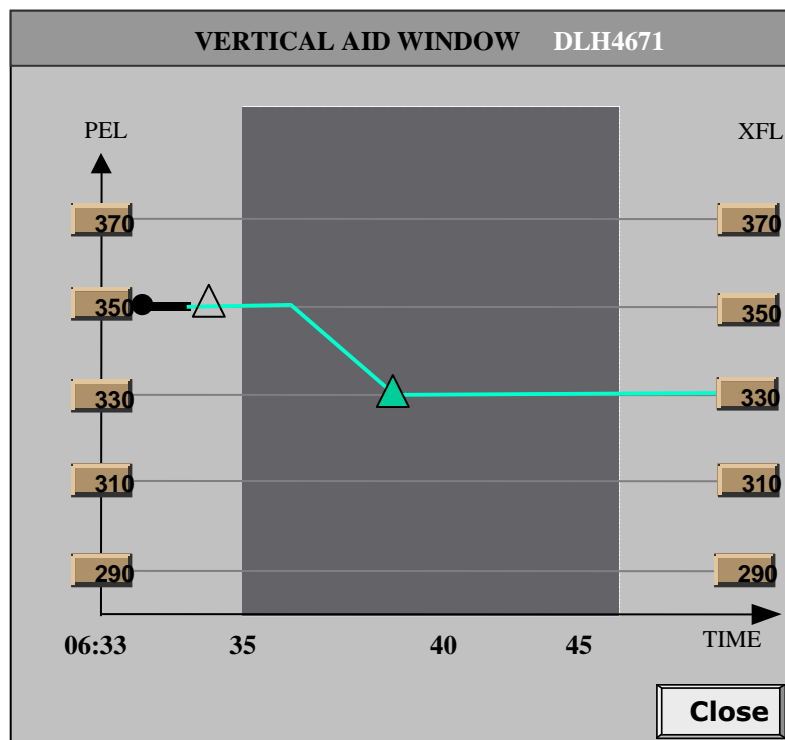
When a constraint exists, it is displayed as follows along the trajectory (in the VAW or the RPVD):



Each constraint, when DFL is displayed is displayed with the symbol above plus a label indicating the value of the constraint (level, speed, time in mm:ss):



Constraints in the RPVD



Constraints in the VAW

Remark: The constraints are displayed in the VAW and in the RPVD trajectories.

Remark: When the cursor leaves the trajectory, it becomes the normal cursor.

2.4.2 Edition of a new heading

Action

On Edition Menu:

- Left click on the Heading item.

Result

On Radar Display:

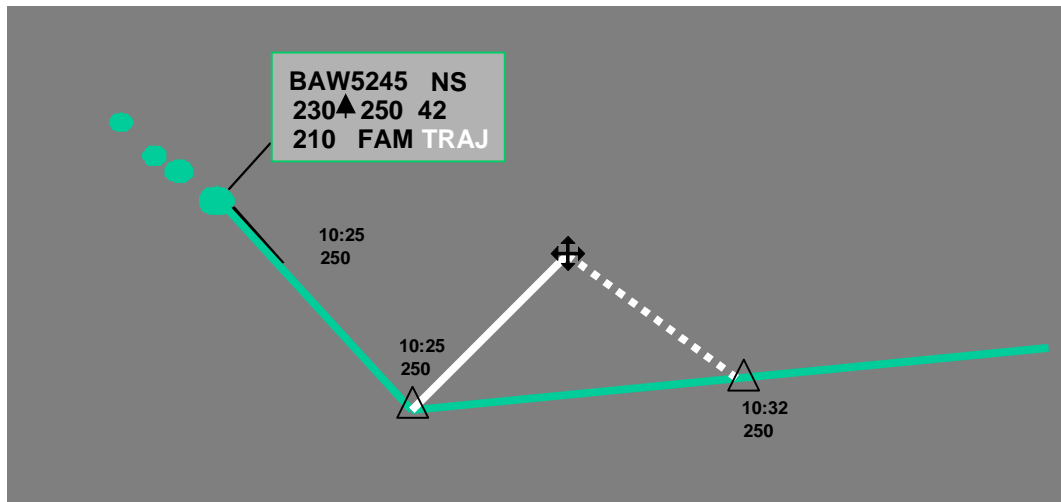
- The edition menu disappears.
- The cursor becomes a cross:



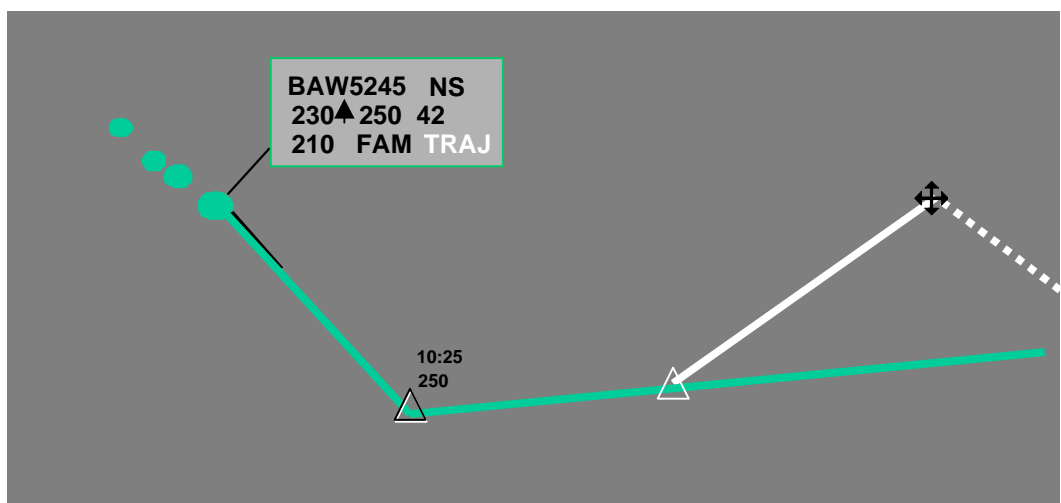
- A working trajectory (white colour) is created.
- If no route constraint at the starting point, a new one is created in working colour (white).
- Move the cursor to move the elastic vector. User will draw the outbound leg (i.e. heading and range) and the system will draw the rejoin track on any published point along the route as long as the (rejoin) track is not exceeding an angle of 30 degrees.

Remark: The cursor can be moved to an existing waypoint outside the original route (the waypoint is highlighted when pointed) in order to designate a beacon outside the route as a new waypoint of the route.

Remark: The cursor can be moved to an existing waypoint within the original route (the waypoint is highlighted when pointed) in order to designate a direct to a beacon in the route (See ***Edition of a direct by the elastic vector***). In this case, there is no rejoin track and a click ends the lateral edition (instead of the usual double click).



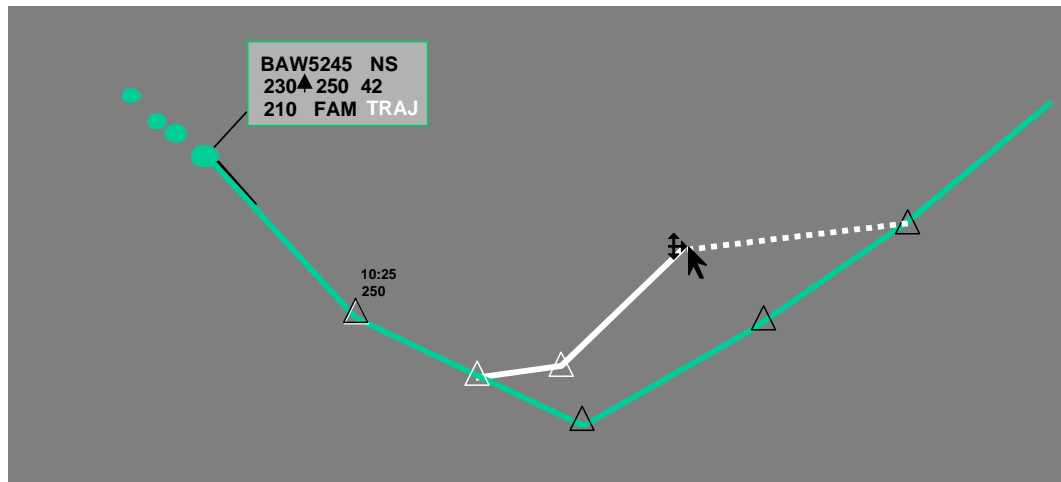
Elastic vector from an existing route constraint



Elastic vector from no existing route constraint

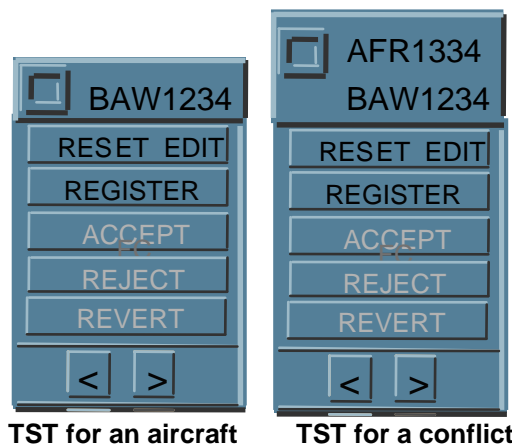
- Double left click to stop the elastic vector.

Remark: Left click to fix the point and go on with an elastic vector from this new point (multiple headings).



Multiple headings

- The cursor becomes the edition cursor (if on the trajectory).
- A new route constraint is created where it is clicked (If you click on an existing waypoint, this waypoint becomes the new route constraint).
- The entire working trajectory is displayed in white and plain line.
- The Trajectory Support Tool is displayed (if first edition):

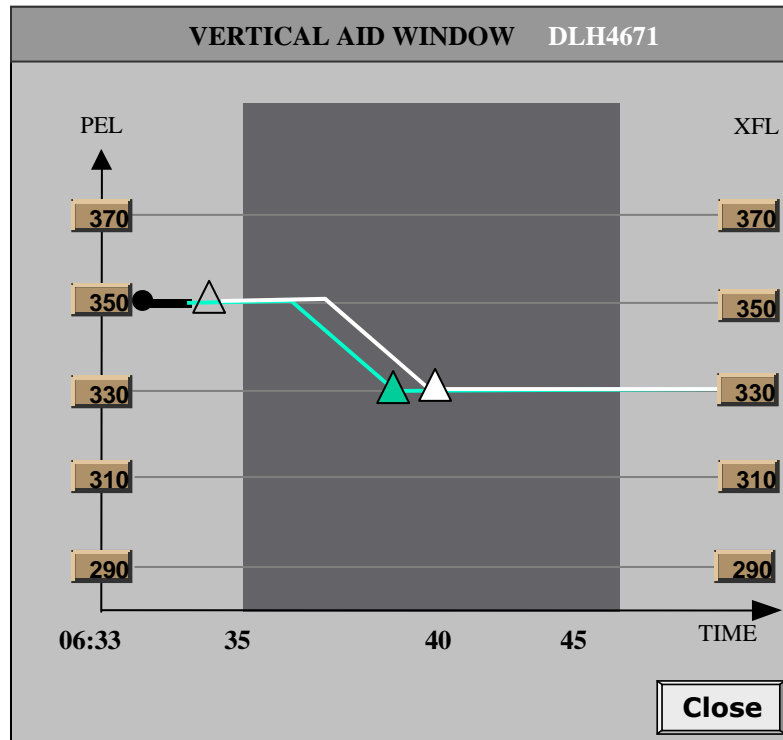


TST for an aircraft

TST for a conflict

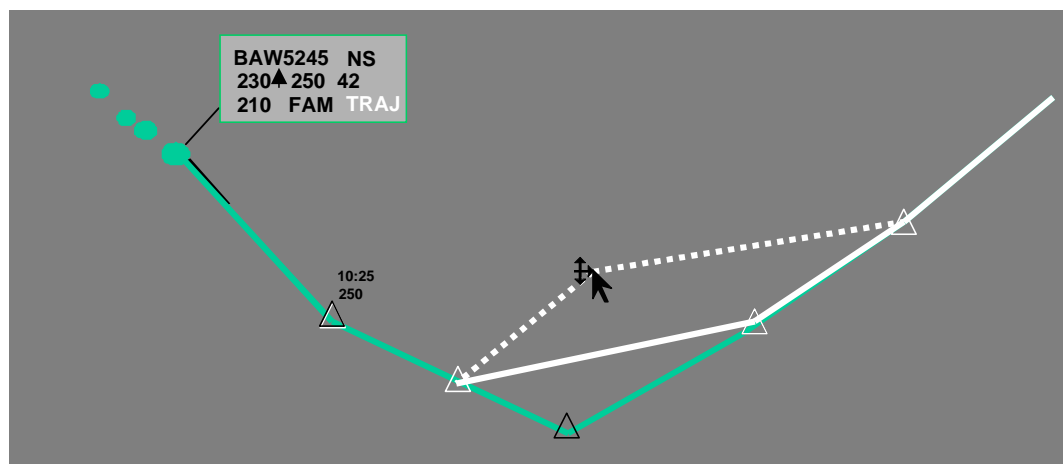
Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the VAW: The working trajectory is also displayed with the new constraint points if any.



- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

Remark: You can start a new working trajectory from the original trajectory.



New working trajectory with an existing one

2.4.3 Modification of an existing route constraint

Action

On Radar Display:

- Left hold (on an existing route constraint)

Result

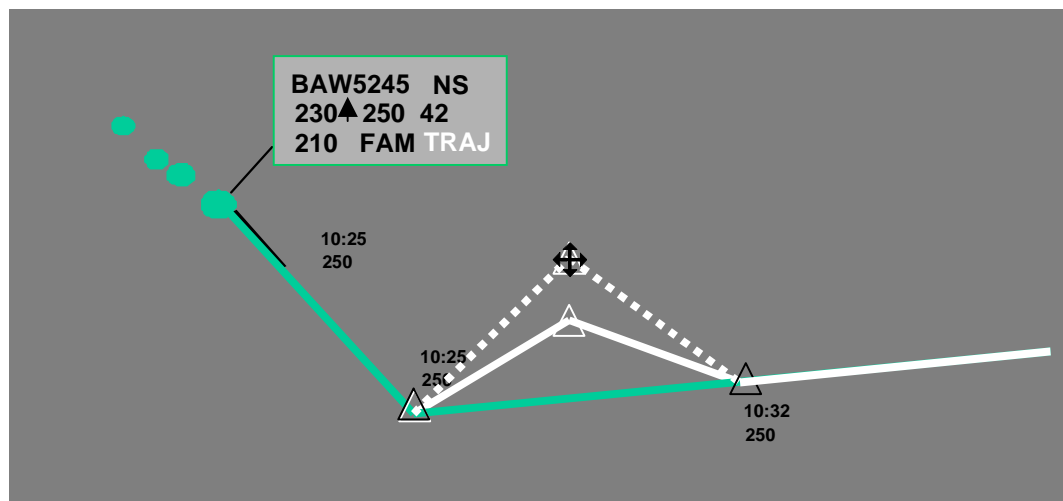
On Radar Display:

- The edition menu disappears.
- The cursor becomes a cross:

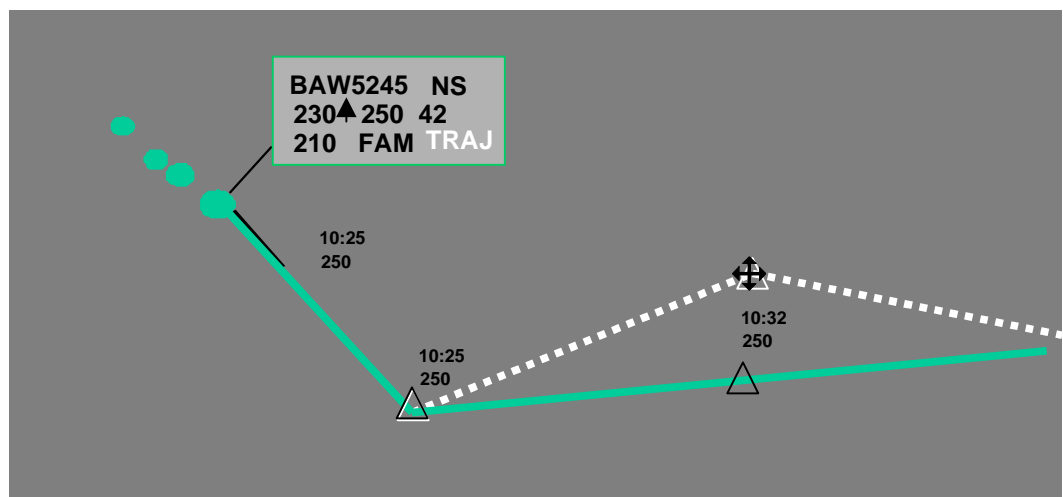


- Drag the cursor: the constraint is moved with the cursor. From a working trajectory, the new trajectory is displayed in dotted white line. From an active trajectory, a working trajectory is created: the new trajectory is displayed in dotted white line.

Remark: the principle of the 30 degrees angle is maintained during moving of a route constraint (the point to be rejoined could so change during dragging).

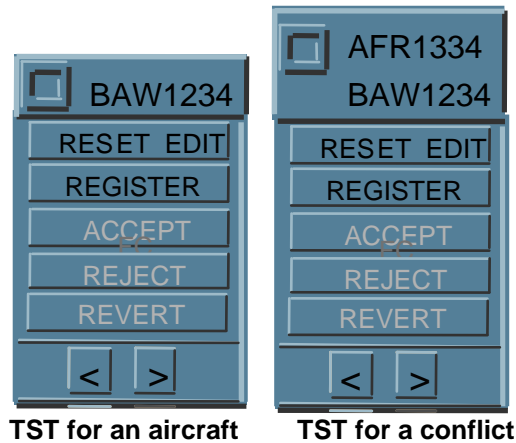


Moving a route constraint from a working trajectory



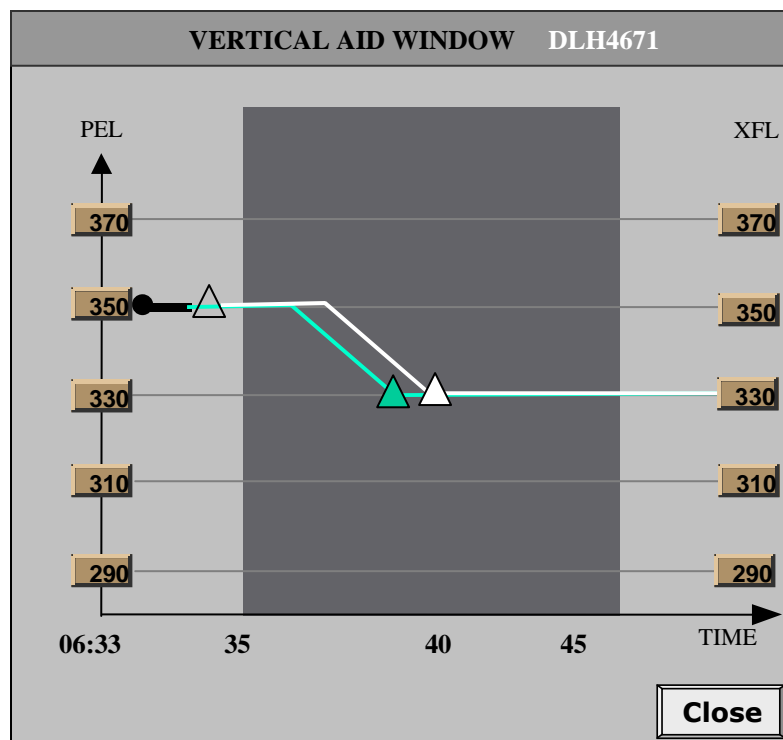
Moving a route constraint from an active trajectory

- Release left button to stop the drag of the existing constraint.
- The new trajectory becomes a plain white working trajectory and replaces the previous working trajectory (if any).
- The Trajectory Support Tool is displayed (if first edition action).



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the VAW: The working trajectory is also displayed with the updated constraints points.



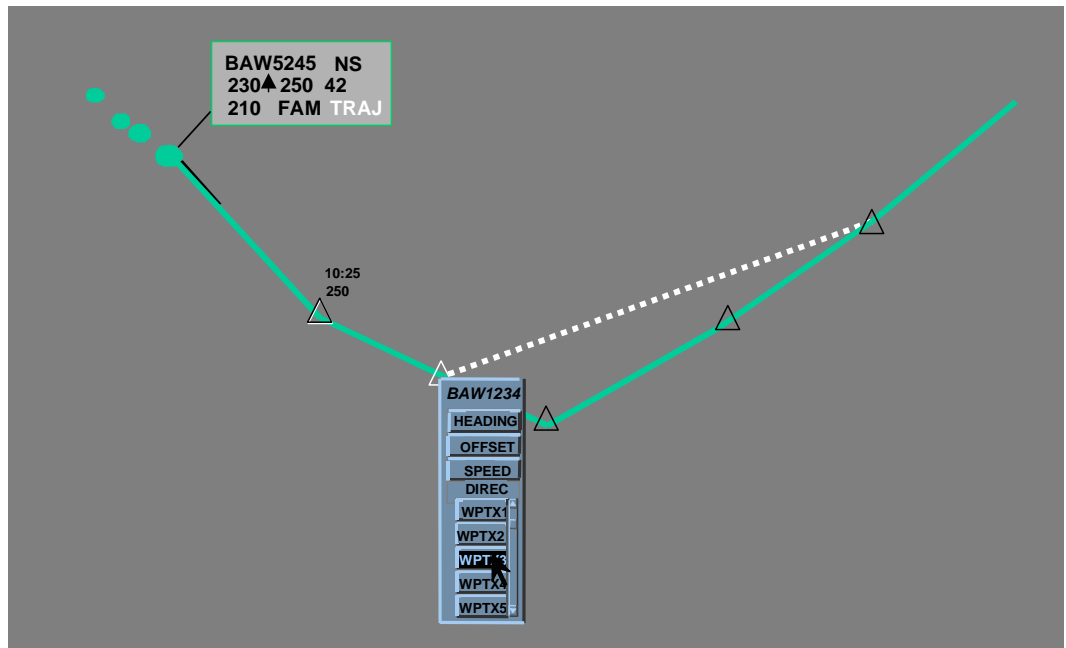
- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.4 Edition of a direct through the menu

Action

On Edition Menu:

- Move cursor on the beacons list: The direct is shown in white dotted line when moving on each item of the list.



- Left click on the beacon to valid the direct in the list.

Result

On Radar Display:

- The edition menu disappears.
- The working trajectory is build accordingly: a direct from the point where the menu was called (new route constraint if not exists) until the direct selected in the menu.
- The Trajectory Support Tool is displayed (if first edition action).
- In the VAW: The working trajectory is also displayed with the new constraints points (if any).
- The Test of the working trajectory is launched (See ***Test of the working trajectory***).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.5 Edition of a direct by deleting points

Action

On RPVD:

- Point on the route constraint to be deleted (highlight of the constraint)
- Right click on the highlighted constraint
or
Left click on the DELETE option when the Edition menu is displayed (after a while: e.g. 400 ms parameter).



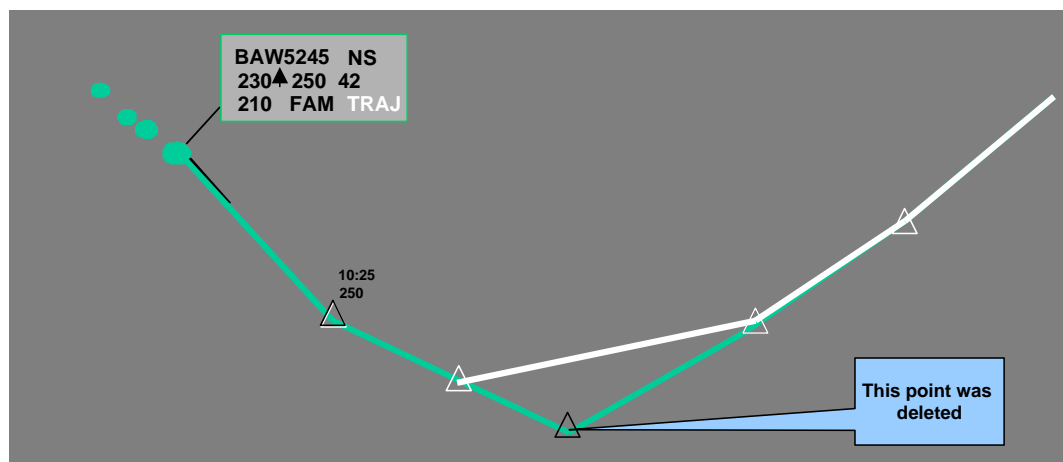
Edition Menu for deletion

Remark: The edition menu disappears when an item is selected or when the cursor is moved outside the trajectory or outside the menu itself.

Result

On Radar Display:

- The working trajectory is build accordingly to the constraint point deleted: displayed in white plain line.



- In the VAW: The working trajectory is also displayed.
- The Test of the working trajectory is launched (See ***Test of the working trajectory***).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.6 Edition of a direct by the elastic vector

Action

On Edition Menu:

- Left click on the Heading item.

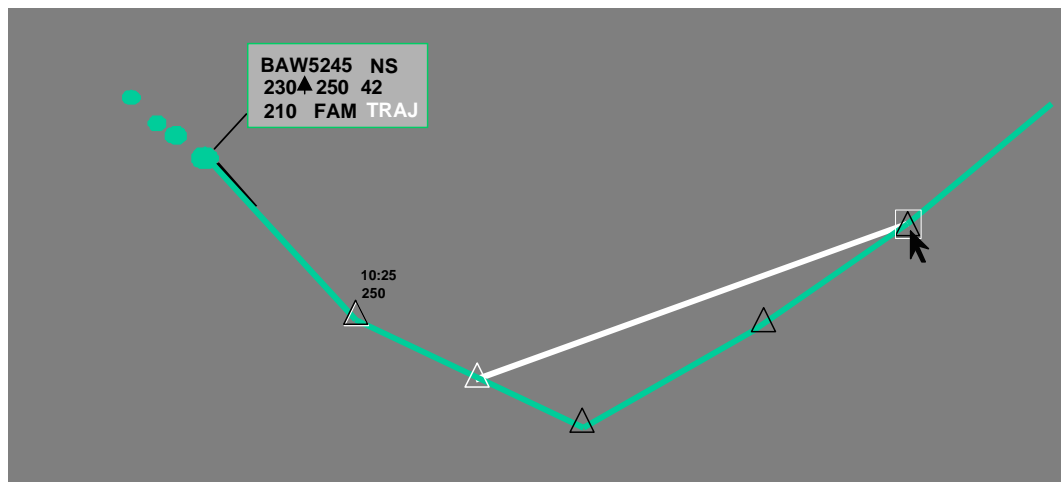
Result

On Radar Display:

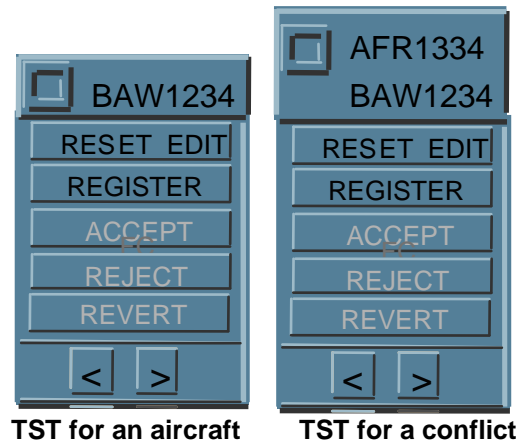
- The edition menu disappears.
- The cursor becomes a cross:



- A working trajectory (white colour) is created (if any).
- If no route constraint at the starting point, a new one is created in working colour (white).
- Move the cursor to move the elastic vector until a beacon on the route (in plain line if it is a new working trajectory, in dotted line if it is a modified one).
- The pointed beacon is highlighted.



- Click to end the direct edition.
- The new working trajectory becomes a plain white working trajectory and replaces the previous working trajectory (if any).
- The Trajectory Support Tool is displayed (if first edition action).



- In the VAW: The working trajectory is also displayed with the updated constraint points.
- The Test of the working trajectory is launched (See ***Test of the working trajectory***).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.7 Edition of an offset ending on star gate

Action

On Edition Menu:

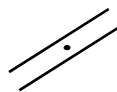
- Left click on the OFFSET item.

Remark: The offset can begin from an existing route constraint or from any point along the trajectory.

Result

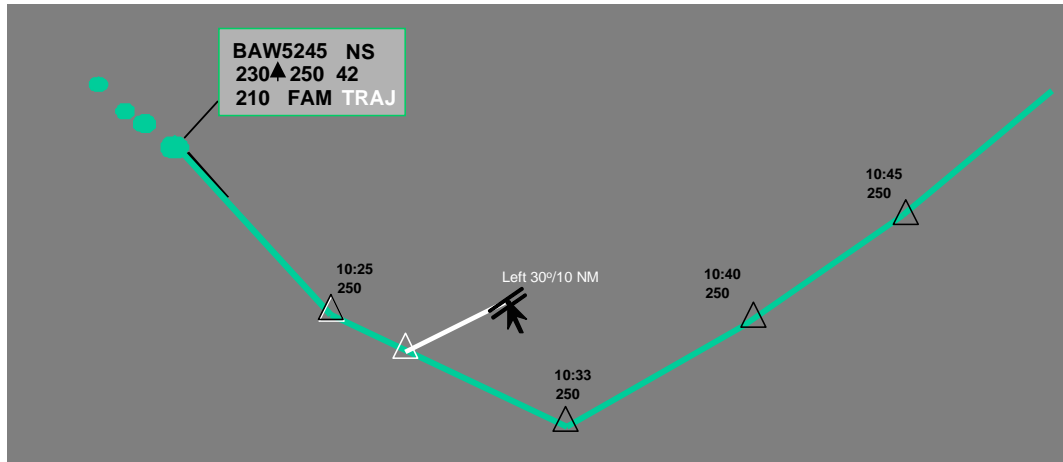
On Radar Display:

- The edition menu disappears.
- The cursor becomes an offset cursor:



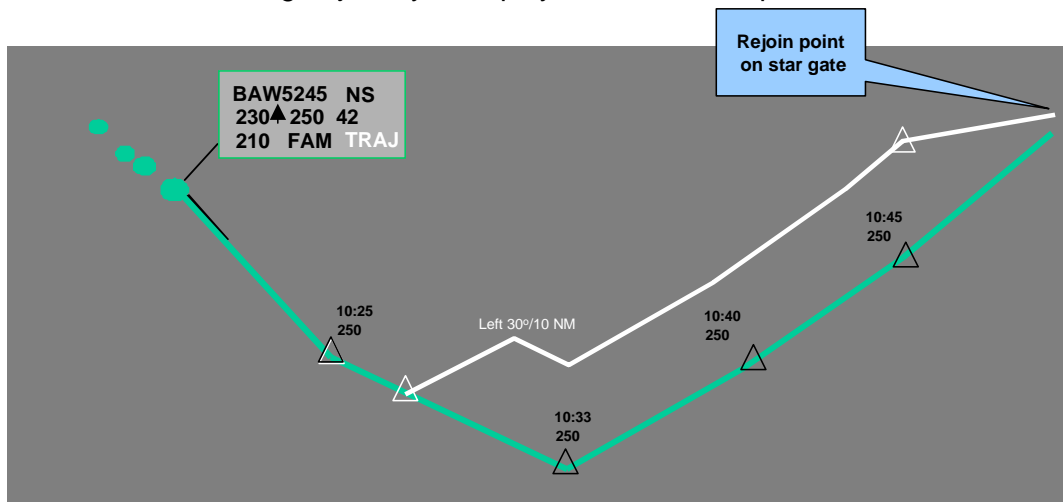
- A working trajectory (in white dotted colour) is created.
- If no route constraint at the starting point, a new one is created in working colour (white).
- Move the cursor to move the elastic vector. The distance of the offset and the direction (left or right) are displayed beside the cursor.

Remark: The distance and angle for the OFFSET shall be maintained in specific values: e.g. 1 by 1 Nm and 5 by 5 degrees of heading. The mouse cursor shall be caught by a grid corresponding to intervals defined just before.

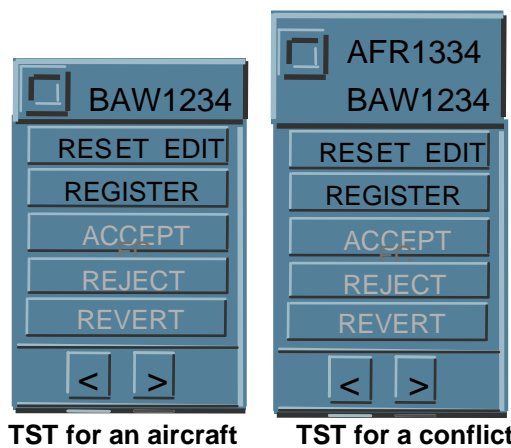


Left offset of 10 NM

- Double left click to end the offset (the end point of the offset is the star gate).
- The cursor becomes the edition cursor (if on the trajectory).
- A new route constraint is created where the aircraft will turn to rejoin the star gate.
- The entire working trajectory is displayed in white and plain line.



- The Trajectory Support Tool is displayed (if first edition):



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the VAW: The working trajectory is also displayed with the new constraint points.
- The Test of the working trajectory is launched (See ***Test of the working trajectory***).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.8 Edition of an offset ending on any waypoint

Action

On Edition Menu:

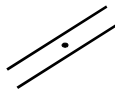
- Left click on the OFFSET item.

Remark: The offset can begin from an existing route constraint or from any point along the trajectory.

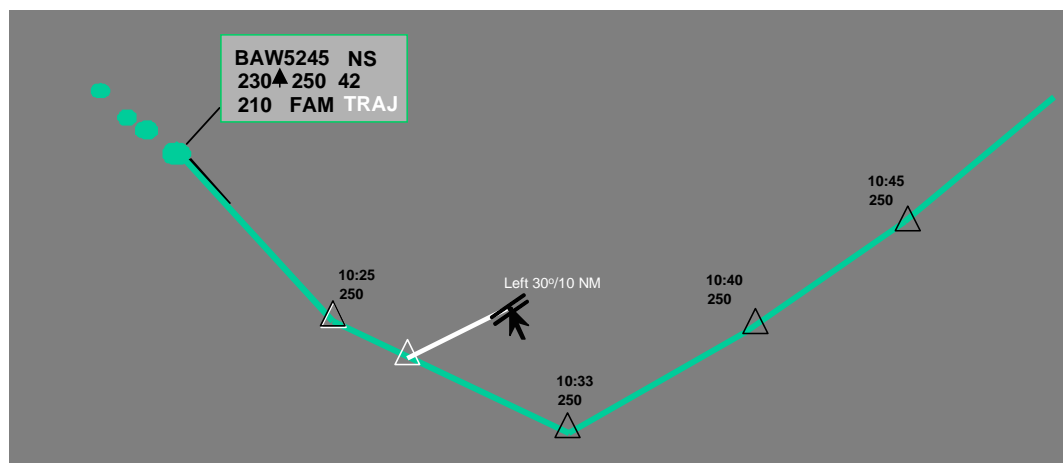
Result

On Radar Display:

- The edition menu disappears.
- The cursor becomes an offset cursor:

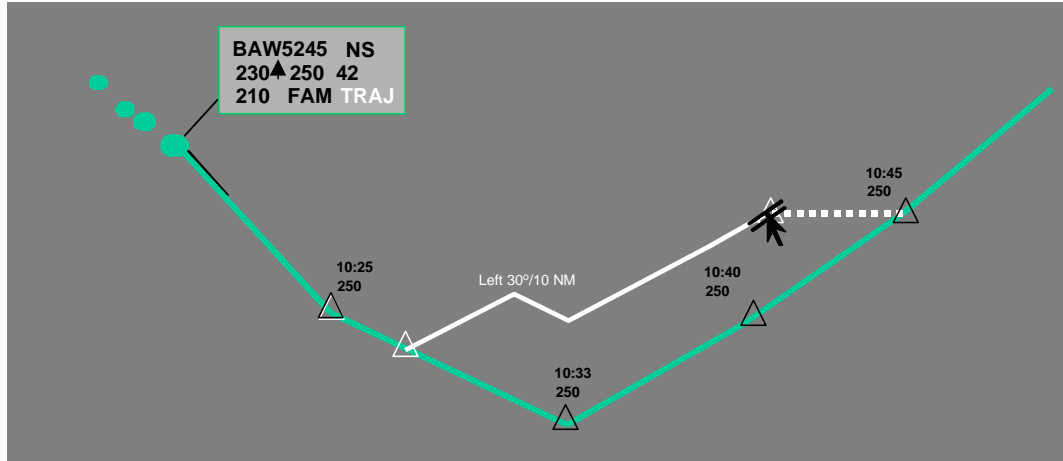


- A working trajectory (in white dotted colour) is created.
- If no route constraint at the starting point, a new one is created in working colour (white).
- Move the cursor to move the elastic vector. The distance of the offset and the direction (left or right) are displayed beside the cursor.

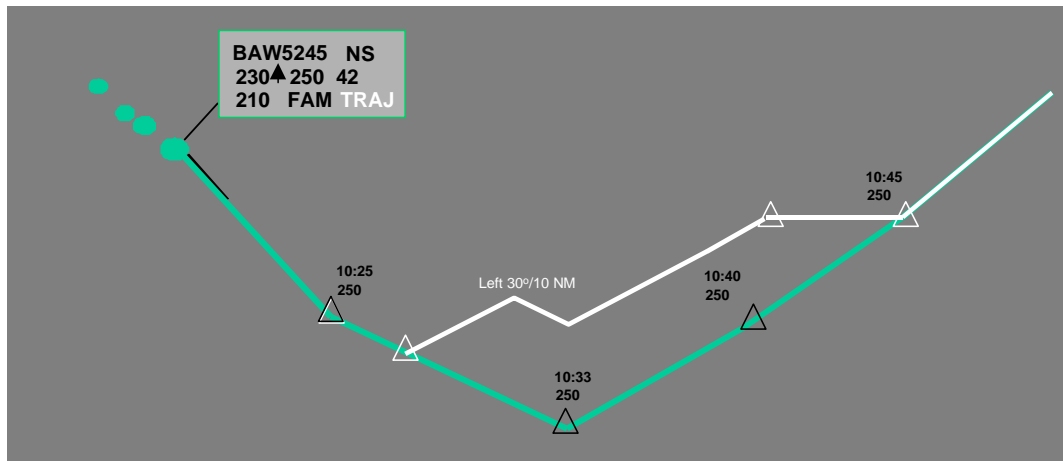


Left offset of 10 NM

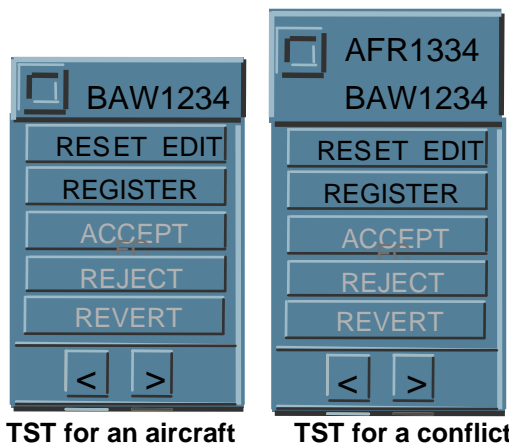
- Left click to begin the offset. The working trajectory becomes a white plain line.
- Move the cursor to go to the desired end point. During moving, the offset is built and a rejoin point is proposed according to the position of the cursor (rule of the 30 degrees) in white dotted line.



- A new route constraint is created where the aircraft will turn to rejoin the rejoin point on the route.
- The entire working trajectory is displayed in white and plain line.



- The Trajectory Support Tool is displayed (if first edition):



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the VAW: The working trajectory is also displayed with the new constraint points.
- The Test of the working trajectory is launched (See ***Test of the working trajectory***).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.9 Edition of an EFL/XFL

Remark: During any edition of a vertical constraint, the rate of climb or descend used for building the pending working trajectory will be an average rate. When the working trajectory is checked and probed, the rate might be slightly different and in this case the probed working trajectory slightly different from the one edited by the Controller.

Action

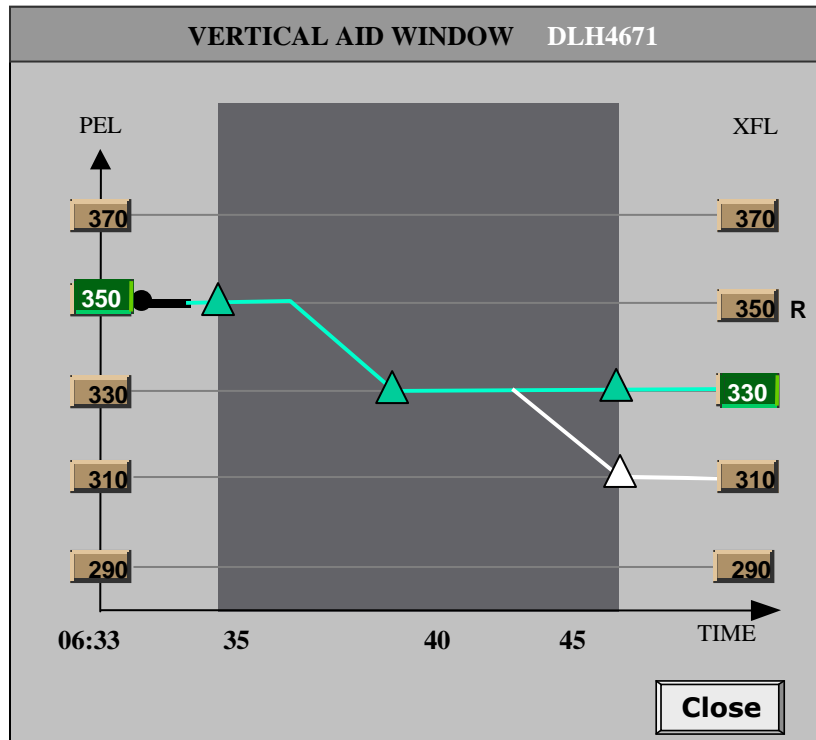
In the VAW:

- Left click on the level to be the new EFL/XFL in the EFL/XFL buttons column.

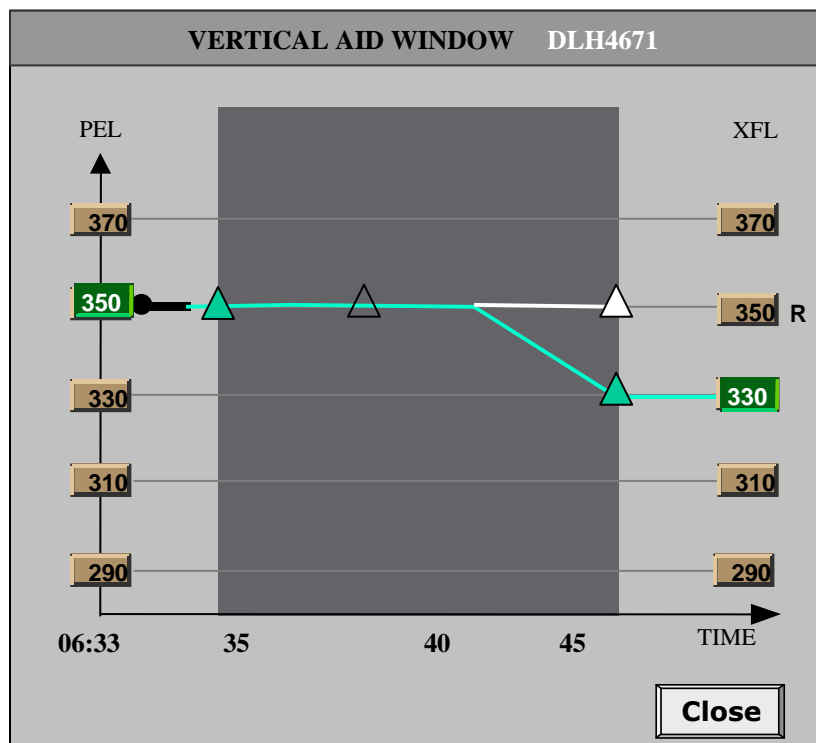
Result

In the VAW:

- A working trajectory is built in white plain line with the new EFL/XFL.



Change of XFL from 330 to 310 (Descend as late as possible)

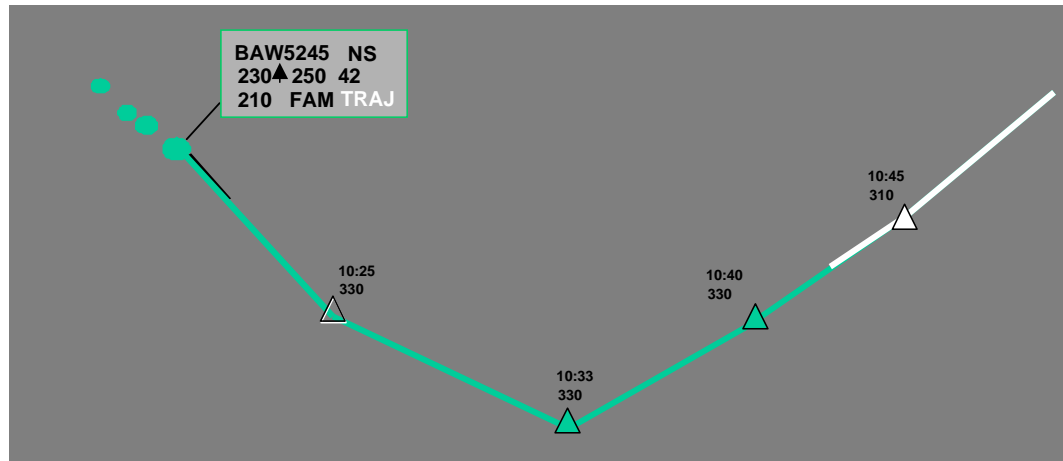


Change of XFL from 330 to 350

Remark: The new trajectory is built on the principle of “Descend as late as possible and climb as soon as possible”. The rate of climb used is the normal one for the involved aircraft.

In the RPVD:

- A working trajectory is built in white plain line with the new EFL/XFL (updated constraints are displayed).



Change of XFL from 330 to 310 (Descend as late as possible)

- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.10 Edition of a new CFL

Remark: During any edition of a vertical constraint, the rate of climb or descend used for building the pending working trajectory will be an average rate. When the working trajectory is checked and probed, the rate might be slightly different and in this case the probed working trajectory slightly different from the one edited by the Controller.

Action

On VAW:

- Left click on any point on the trajectory.

Result

In the VAW:

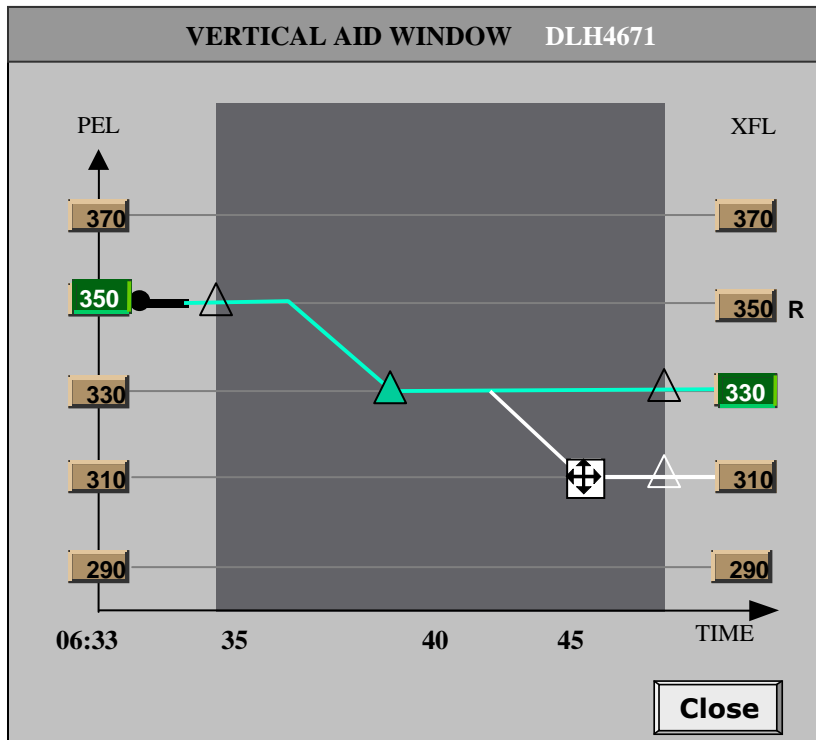
- The edition menu in the VAW disappears.
- The cursor becomes a vertical cursor:



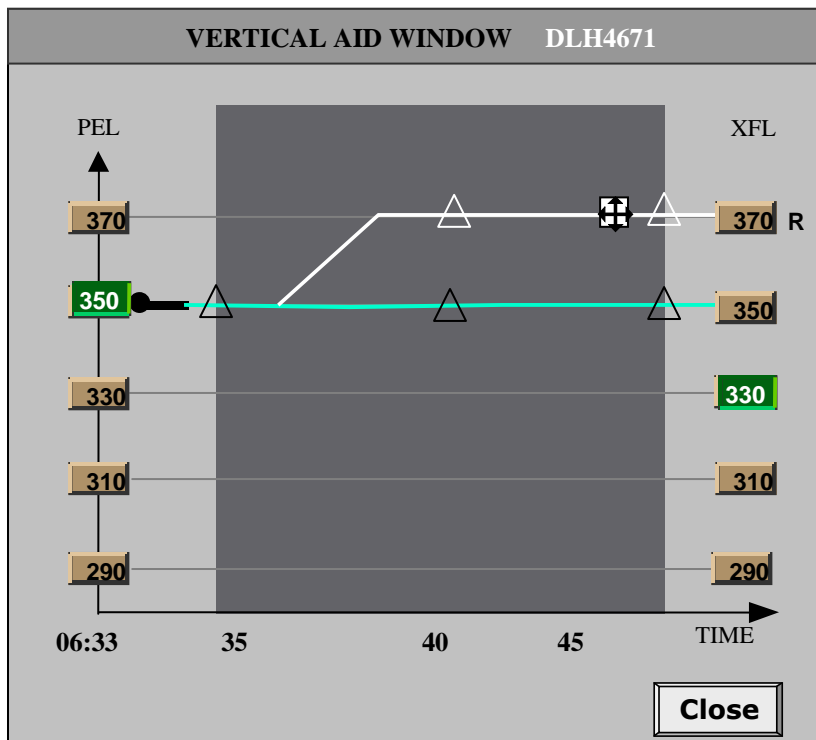
- A working is created: trajectory in white plain colour when it is a new one, in white dotted line when it is a modification of an existing working trajectory.
- Move the cursor to move the trajectory. The working trajectory is drawn (or redrawn).

Remark: The drawn or redraw of the vertical trajectory is done according to the principles related to a vertical profile e.g. (descend as

soon as possible, descent as late as possible, a rate of climb or descend, ...



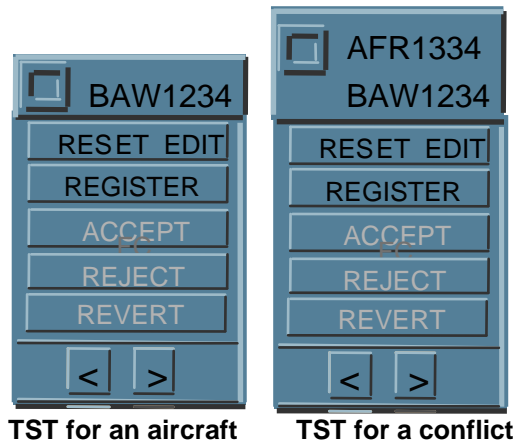
New CFL (Descend as late as possible)



New CFL (Climb as soon as possible)

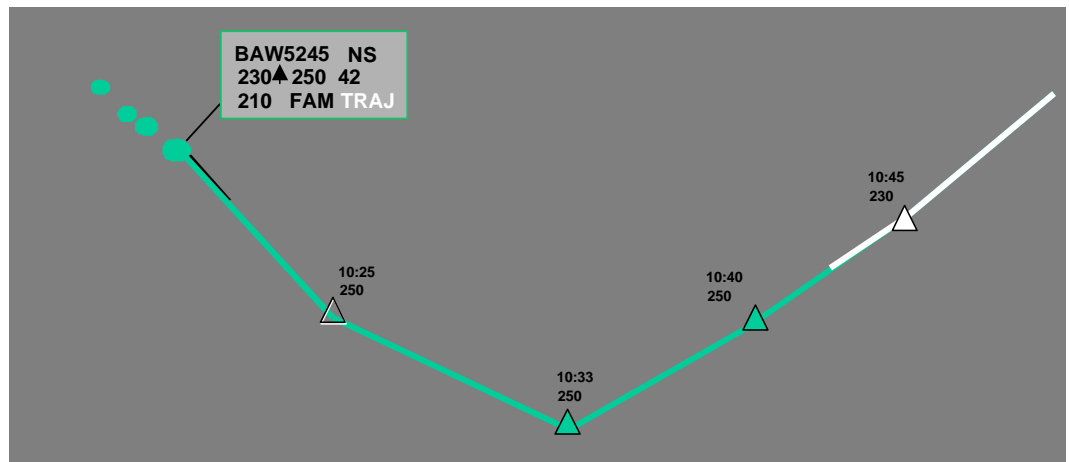
- Left click to stop the drag of the trajectory.

- The new trajectory becomes a plain white working trajectory and replaces the previous working trajectory (if any).
- The Trajectory Support Tool is displayed (if first edition action).



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the RPVD: The working trajectory is also displayed with the new constraint points (if any).



- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.11 Edition of an existing Level constraint

Remark: During any edition of a vertical constraint, the rate of climb or descend used for building the pending working trajectory will be an average rate. When the working trajectory is checked and probed, the rate might be slightly different and in this case the probed working trajectory slightly different from the one edited by the Controller.

Action

On VAW:

- Left hold (on an existing level constraint)

Result

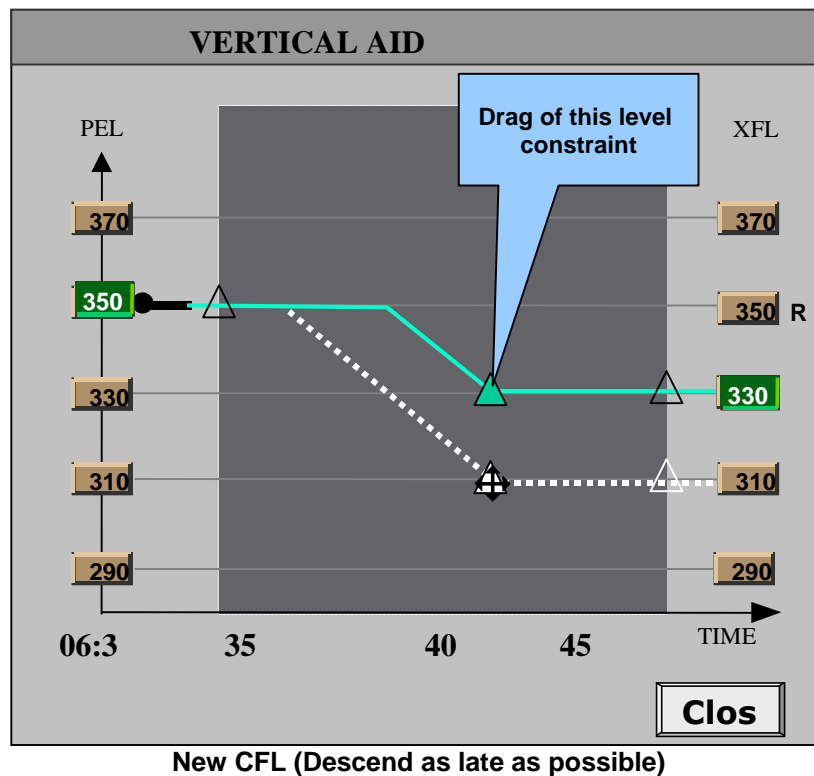
In the VAW:

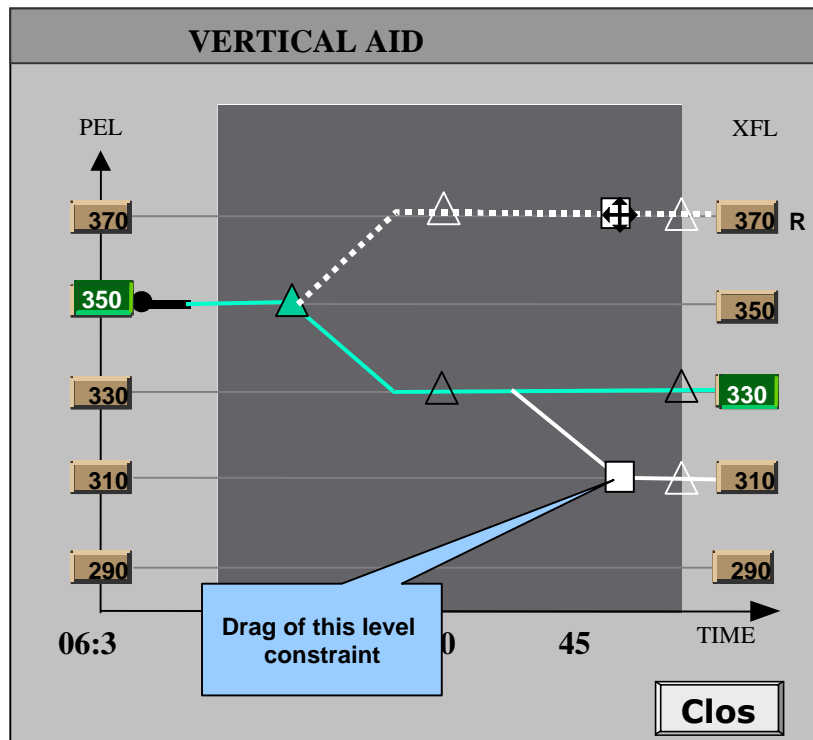
- The edition menu in the VAW disappears.
- The cursor becomes a vertical cursor:



- A working is created in white dotted line.
- Move the cursor to move the level constraint. The working trajectory is drawn (or redrawn).

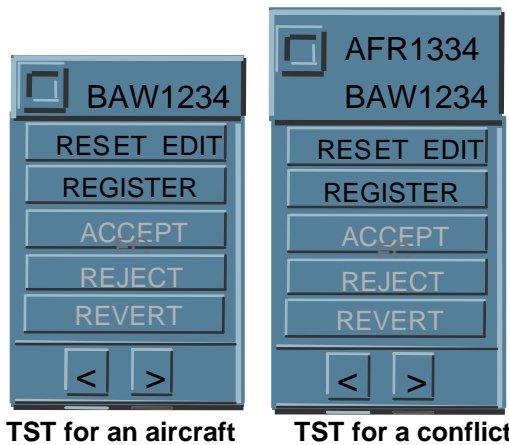
Remark: The drawn or redraw of the vertical trajectory is done according to the principles related to a vertical profile e.g. (descend as soon as possible, descend as late as possible, a rate of climb or descend, respect of the XFL and EFL ...).





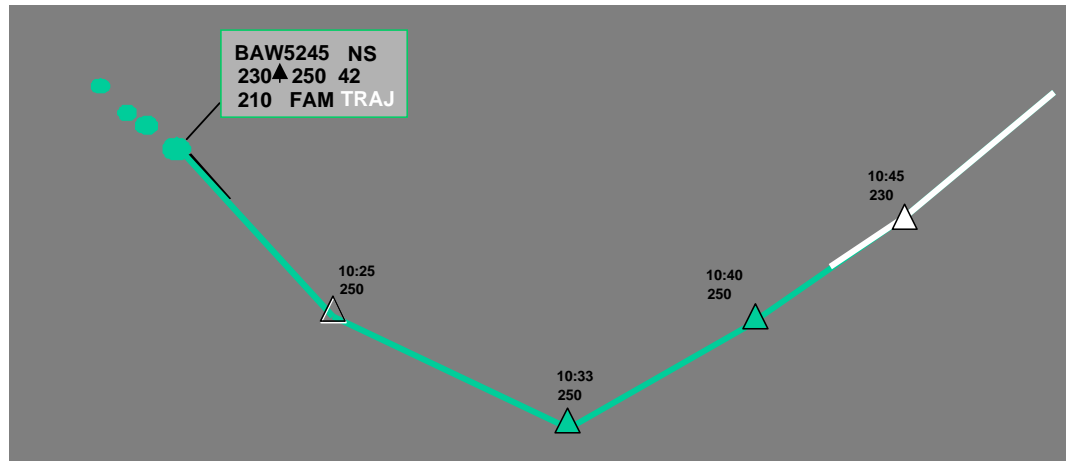
New CFL (Climb as soon as possible)

- Release left to stop the move of the level constraint.
- The new trajectory becomes a plain white working trajectory and replaces the previous working trajectory (if any).
- The Trajectory Support Tool is displayed (if first edition action).



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- In the RPVD: The working trajectory is also displayed with the new constraint points (if any).



- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.12 Edition of a SPEED constraint

Action

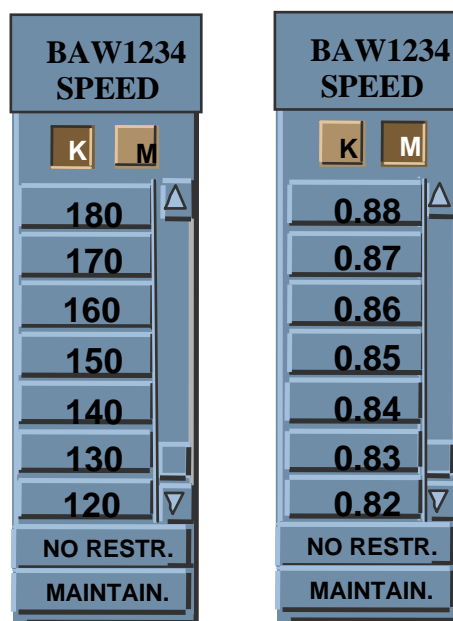
In the Edition Menu:

- Left click on the speed item.

Result

In the RPVD or VAW (from where the menu is displayed):

- The Edition Menu disappears.
- The SPEED menu is displayed.

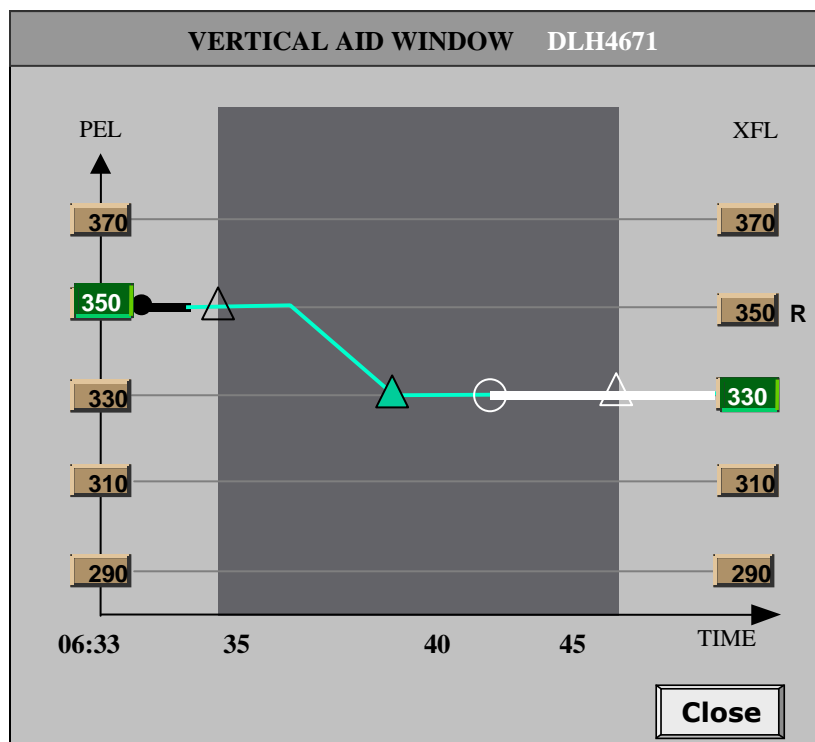
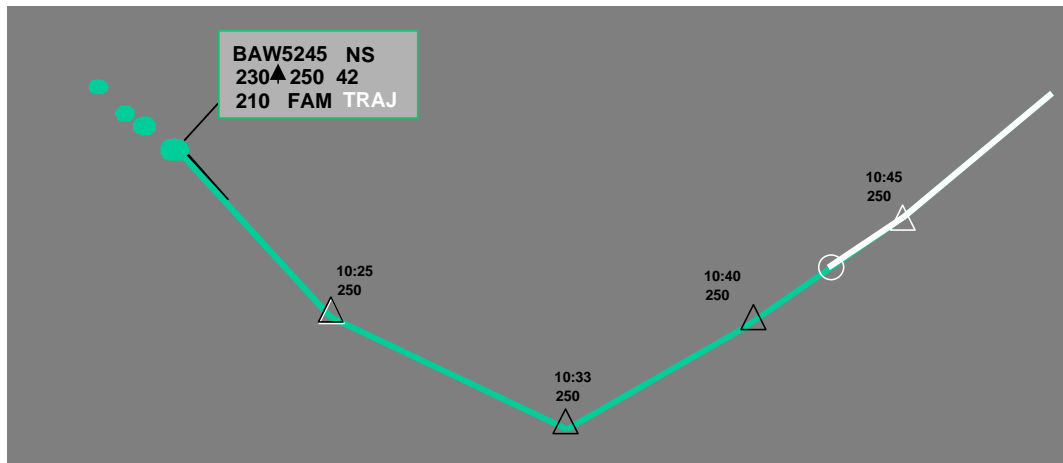


SPD Menu in Knots and Mach

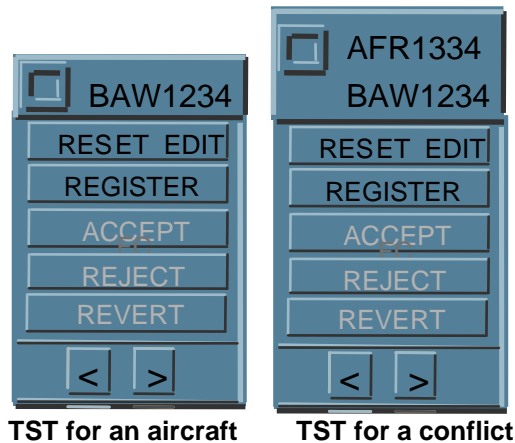
Remark: The SPEED menu disappears when an item is selected or when there is a click outside the menu.

Remark: The “NO RESTR” item in the menu is sensitive only when a previously speed restrictions was specified.

- Click on a value to select the value for the Speed constraint:
 - Selected value is affected to the speed constraint (the new one is any or the existing one if the menu was called on an existing speed constraint).
 - “NO RESTR.” Is to stop any speed restriction.
 - “MAINTAIN” is to maintain the aircraft speed at the current value.
- The Speed menu disappears.
- The New speed constraint point is created and the related working trajectory is built in white plain line in the RPVD and in the VAW.



- The Trajectory Support Tool is displayed (if first edition action).



Remark: The TST disappears when the Trajectory Edition is closed (Call of trajectory edition for another aircraft or conflict or close of the current edition) or when the trajectory edition is completed (REGISTER of a new trajectory).

- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- If a previous working trajectory exists, the new one replaces the old one.

2.4.13 Deletion of a constraint

Action

In the Edition Menu:

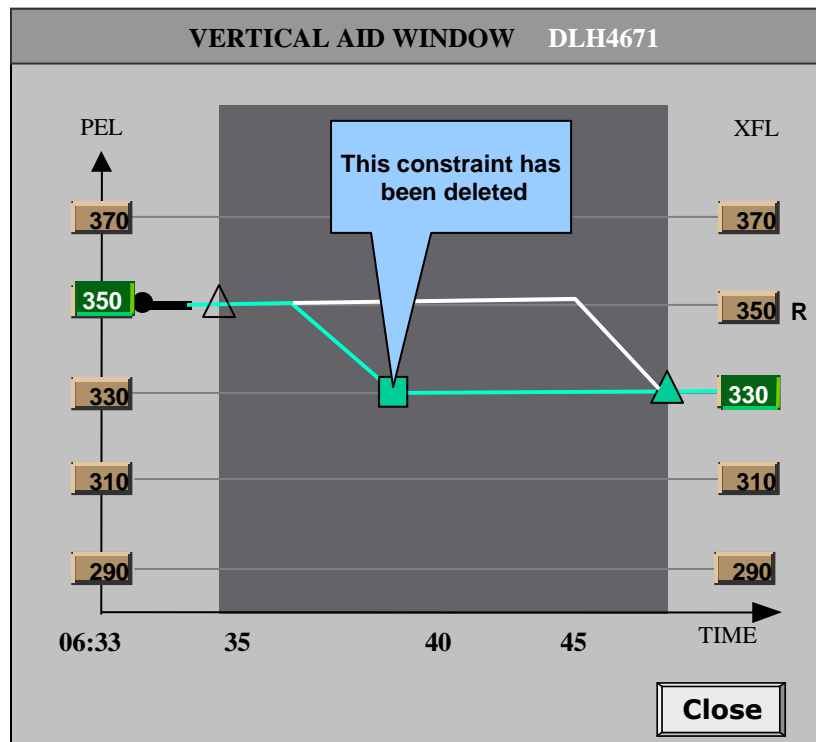
- Left click on the DELETE item.

Remark: The DELETE item is sensitive only if the menu appears when the cursor is on an existing constraint.

Result

In the RPVD or VAW (from where the menu is displayed):

- The Edition Menu disappears.
- The working trajectory is updated according to the deleted constraint.



Deletion of a level constraint

Remark: The deletion of a route constraint is equivalent to a direct edition by deletion of a route constraint.

- The Test of the working trajectory is launched (See *Test of the working trajectory*).

2.4.14 Cancel edition action

Assumption

An edition action is pending (an action without a hold click).

Action

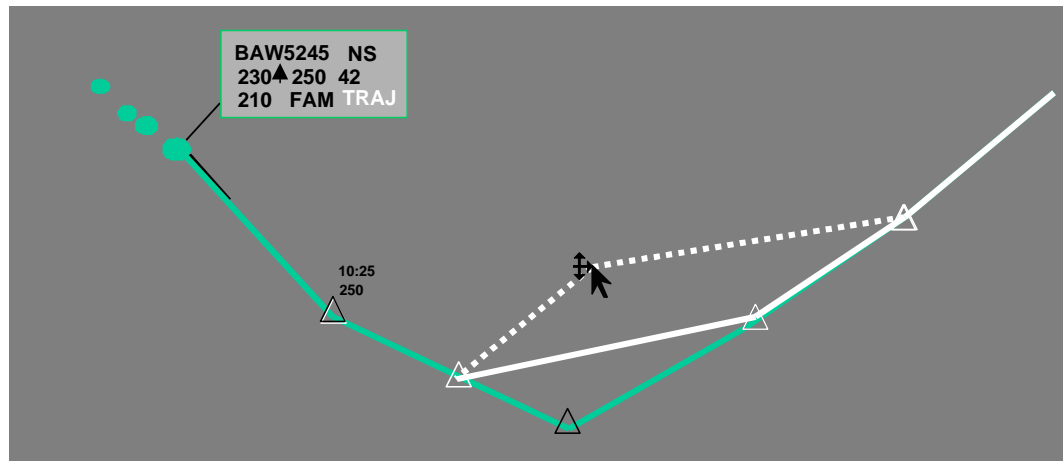
On RPVD or VAW (where edition has begun):

- Right click.

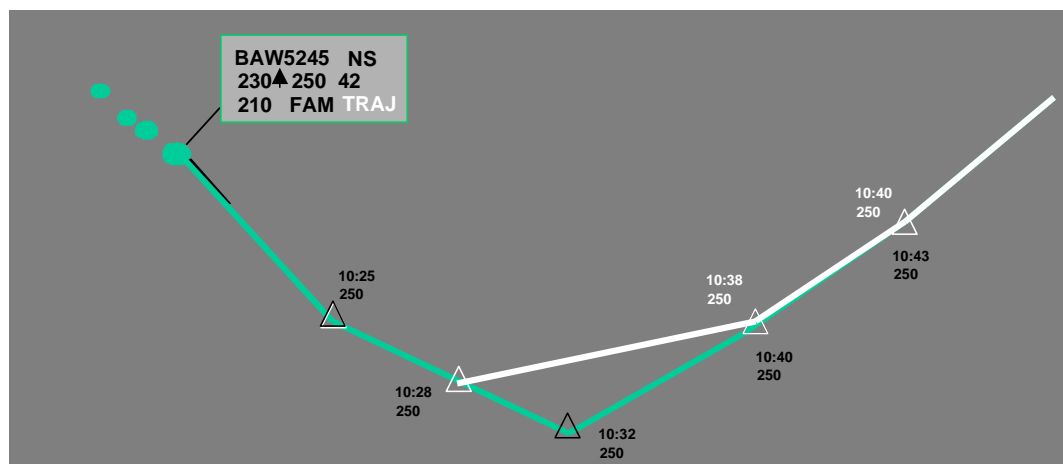
Result

On RPVD or VAW (where edition has begun):

- The new pending working trajectory (in white dotted line generally) is removed from display.
- Back to the last working trajectory probed (if any).



Pending edition action (with a previous working trajectory)



Cancel of pending edition action (with a previous working trajectory)

2.4.15 Test of the working trajectory

Action

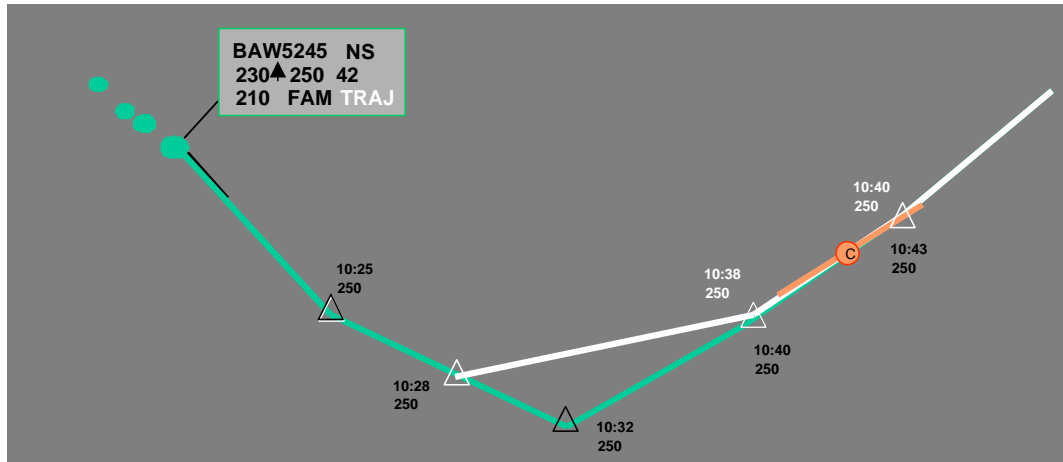
- At the end of any edition and when any update related to the involved aircraft in a working trajectory occurs.

Result

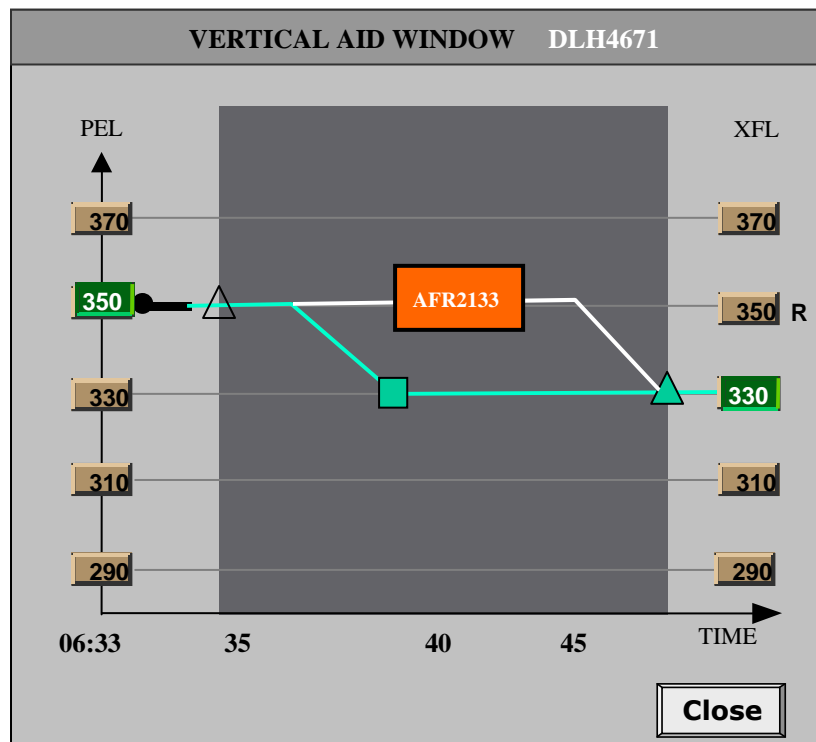
In the RPVD and the VAW:

- The working trajectory is updated with information from the MTCD (potential conflicts on the working trajectory in a light red colour) and the TP (potential conflict information and trajectory information e.g. estimated time on constraint points) and for co-ordination needs.

Remark: The conflict checks of the working trajectory are done only with the systems trajectories of others aircraft.



Remark: By pointing on the detected conflict on the working trajectory, the trajectory of the conflicting aircraft is displayed in the RPVD (DFL of the conflicting aircraft).



Remark: By pointing on the detected conflict on the working trajectory, the trajectory of the conflicting aircraft is displayed in the RPVD (DFL of the conflicting aircraft).

- The co-ordination needs are highlighted through the co-ordination buttons in the TST (in white: colour for working trajectory):



Upstream co-ordination is needed on the tested trajectory

2.5 TST tool

All the options are valid both in edition for an aircraft or edition for a conflict.

2.5.1 Deletion of the working trajectory

Action

In the TST:

- Left click on the RESET EDIT item.

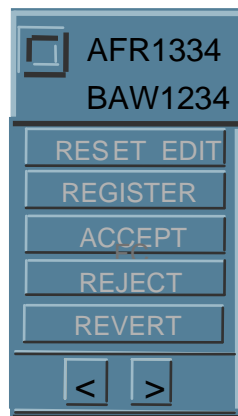
Result

In the RPVD and the VAW:

- The working trajectory is deleted (whatever the status of the working trajectory: pending edition, pending co-ordination or rejected trajectory).

Remark: In the case of deletion of a trajectory in a pending co-ordination, the co-ordination is cancelled (all the related messages are deleted). In the case of a rejected trajectory, the related messages are also deleted.

- The TST tool is updated accordingly (no option are any longer valid). All co-ordination need indications (if any) are deleted.



- The TRAJ text in the label is deleted for all involved aircraft and the conflict dot (in the RPVD) and the conflict square (in the CRD) are updated accordingly if necessary.

2.5.2 Register a trajectory without co-ordination

Action

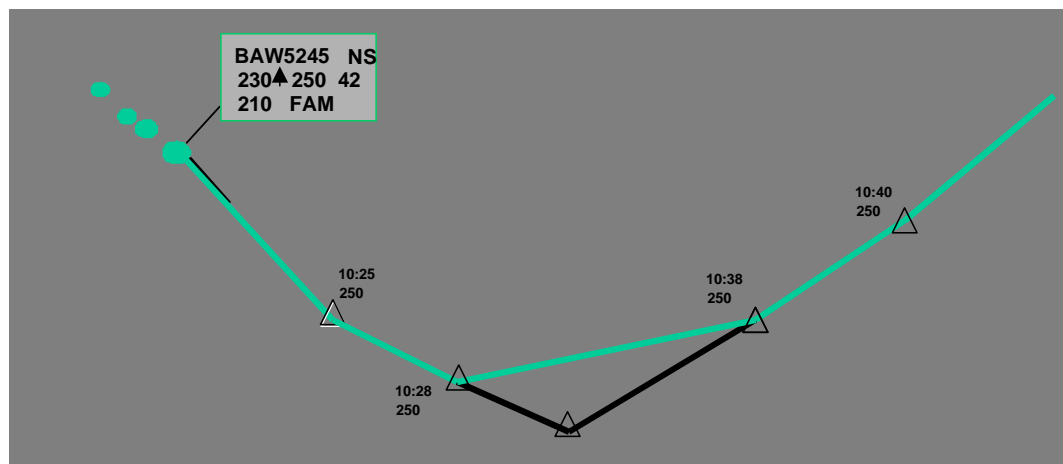
In the TST:

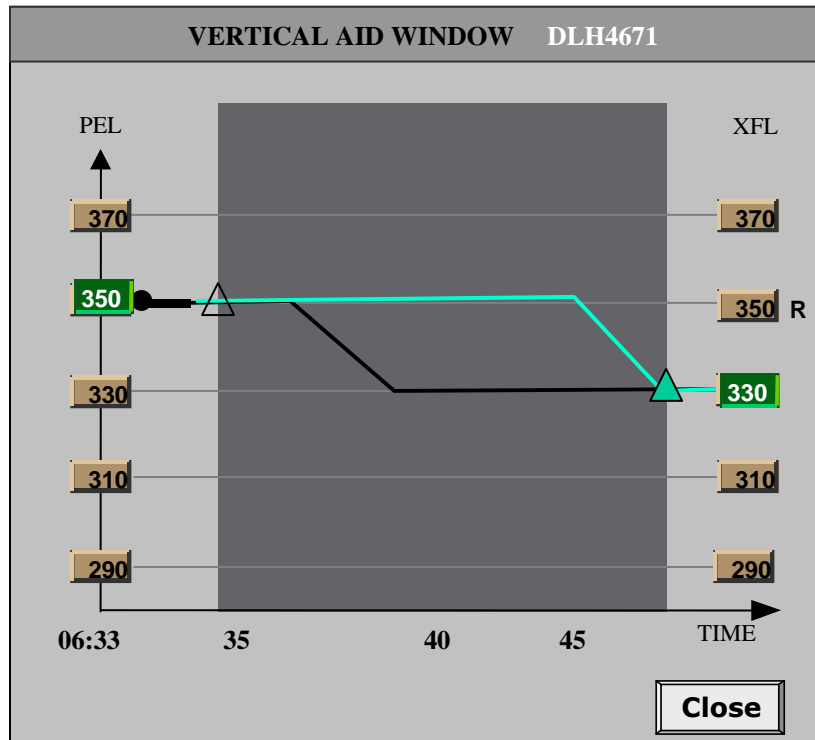
- Left click on the REGISTER item.

Result

In the RPVD and the VAW:

- If no co-ordination is needed, it becomes the new system trajectory (green colour). The TED is closed. The old system trajectory is kept (black colour) to enable the revert actions and to be displayed through the DFL.

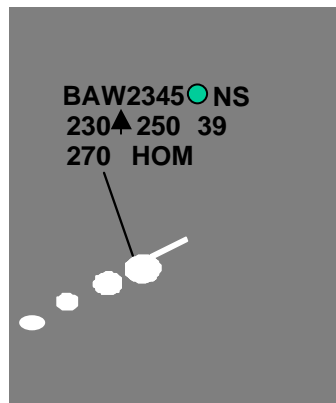




Display of the old system trajectories

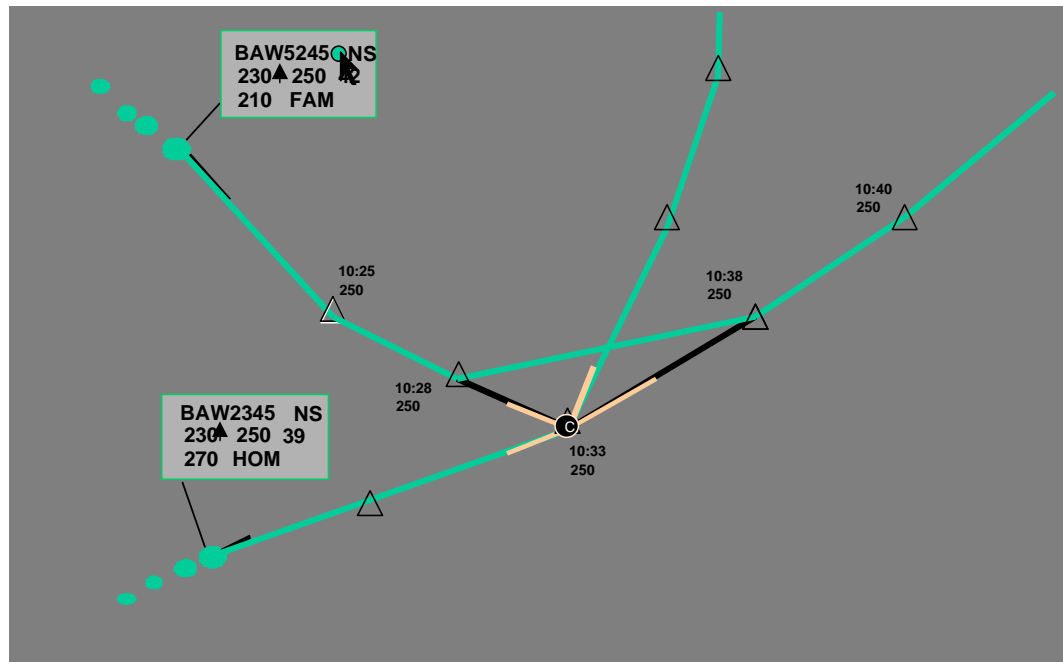
Remark: If it was a conflict edition and both trajectories were edited, this happens when both trajectories are co-ordination free.

- The TRAJ text in the label(s) disappears.
- The Trajectory edition is closed and the TST tool disappears.
- If it was a conflict edition: the red dot in the label of the involved aircraft becomes a green dot.



Remark: With a right hold click on the green dot, the trajectories of the both aircraft, which were involved in the conflict, are displayed together plus a ghost of the old conflict and the old system trajectories.

Remark: If a conflict is detected on the new system trajectory for an aircraft involved in a resolution trajectory, the red dot indicating the detected conflict replaces the green dot.



Remark: The green dot disappears when the last manoeuvre of the new system trajectory has been issued. If the green dot is displayed for more than one aircraft, it disappears for each aircraft separately according to the issuance of each last manoeuvre.

2.5.3 Register a trajectory with co-ordination

Action

In the TST:

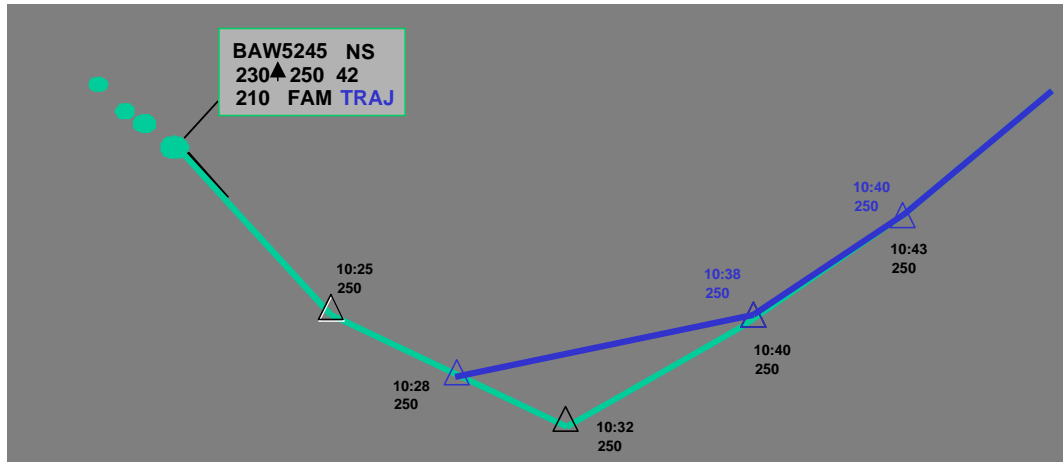
- Left click on the REGISTER item.

Remark: This happens when at least one of the modified trajectories needs co-ordination. In this case, no trajectory becomes system trajectory until the completion of the needed co-ordination.

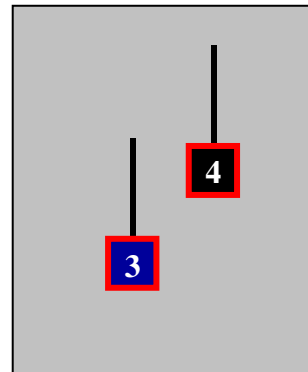
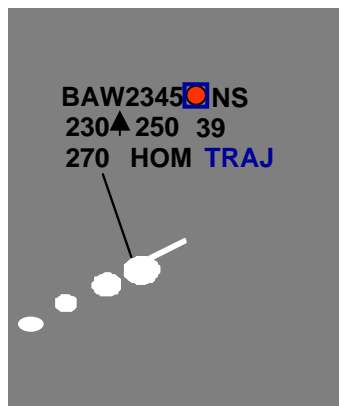
Result

In the RPVD and the VAW:

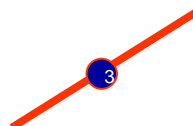
- The working trajectory is now a proposal trajectory to be co-ordinated (blue colour).
-



- The label is updated accordingly with the blue colour for the aircraft involved in the co-ordination and for the related conflict dot in the RPVD and conflict square in the CRD (if conflict edition):



Remark: The same indication of pending co-ordination for a conflict is displayed when a conflict is displayed on a DFL:



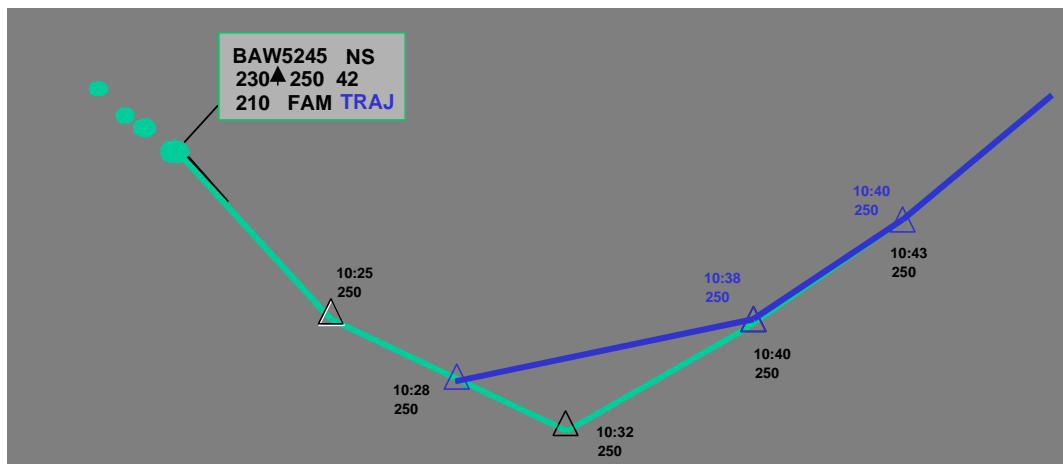
- The TST tool is also updated with the blue colour in the co-ordination button (REGISTER option is no longer valid).



- A message in the MOW is displayed to indicate that the co-ordination has been sent.



Remark: With a right hold click on it, it is possible to display the trajectory in pending co-ordination:



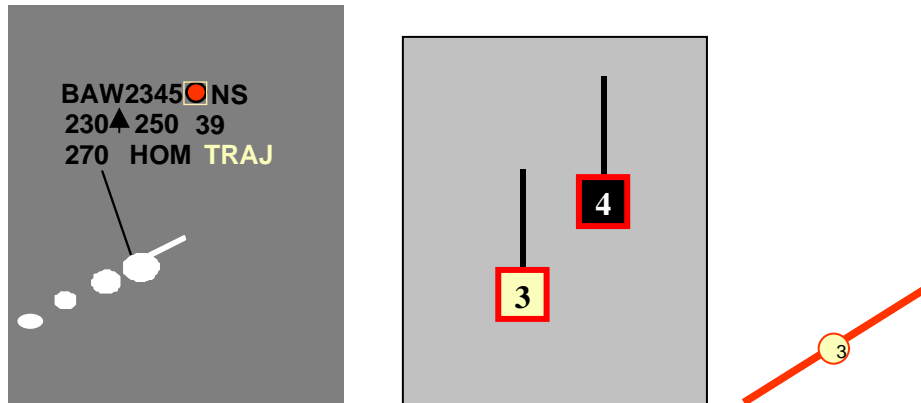
- Wait until an answer from the adjacent sector. When the co-ordination is accepted, the message in the MOW is deleted and the following steps are the same as in the case of no-ordination needed when registration of the edited trajectory.

Remark: In the case of multiple co-ordinations, only the accepted one is highlighted in the TST tool. The registration of the proposal trajectory is not done until acceptance of the remaining co-ordination.



TST for acceptance of only entry co-ordination

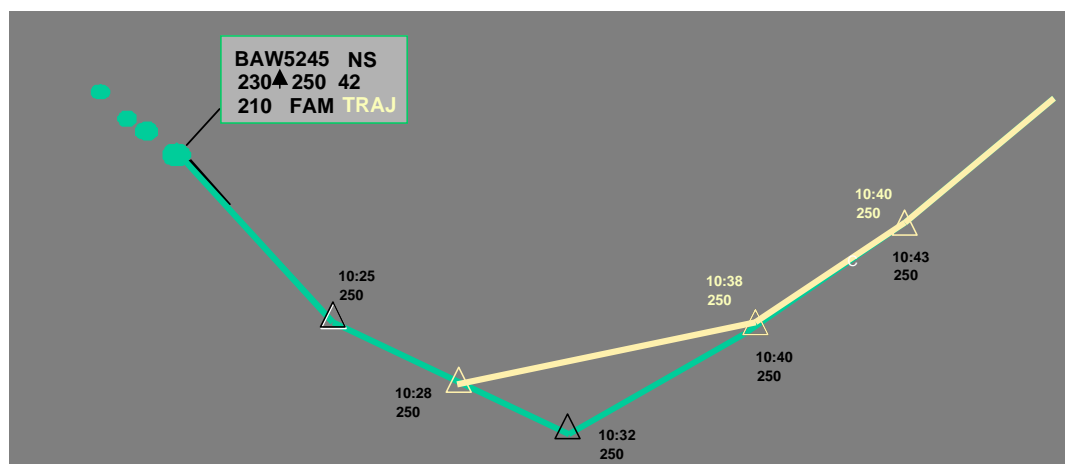
- When the co-ordination is rejected, all the display related to the rejected trajectory becomes yellow: the TRAJ text, the squared dot in the label(s) and the conflict square in the CRD.



- A message in the MIW replaces the corresponding message in the MOW.



Remark: With a right hold click on it, it is possible to display the trajectory in rejected co-ordination:



- When trajectory is rejected, redo edition by activating the trajectory edition:
 By left click on the rejection message
 or
 By any action described in **Trajectory Edition activation**



TST for a rejected trajectory

2.5.4 Revert totally to the previous system trajectory

Action

In the TST:

- Left click on the REVERT item.

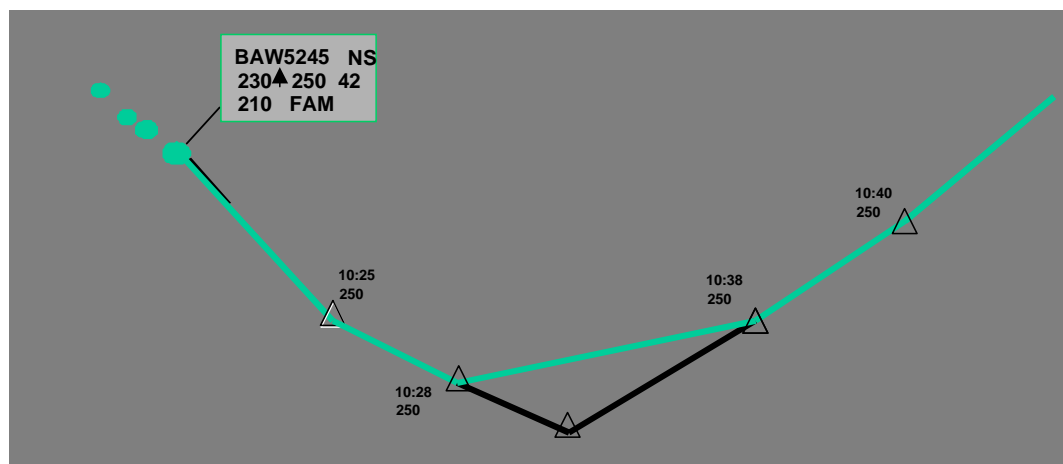
Remark: The REVERT item is sensitive only when a previous system trajectory exists.

Remark: As soon as the first manoeuvre of a new system trajectory has been issued, the old trajectory is deleted (no longer valid) because the aircraft begins to follow the new system trajectory. From this point, there is no means to go back to the old system trajectory.

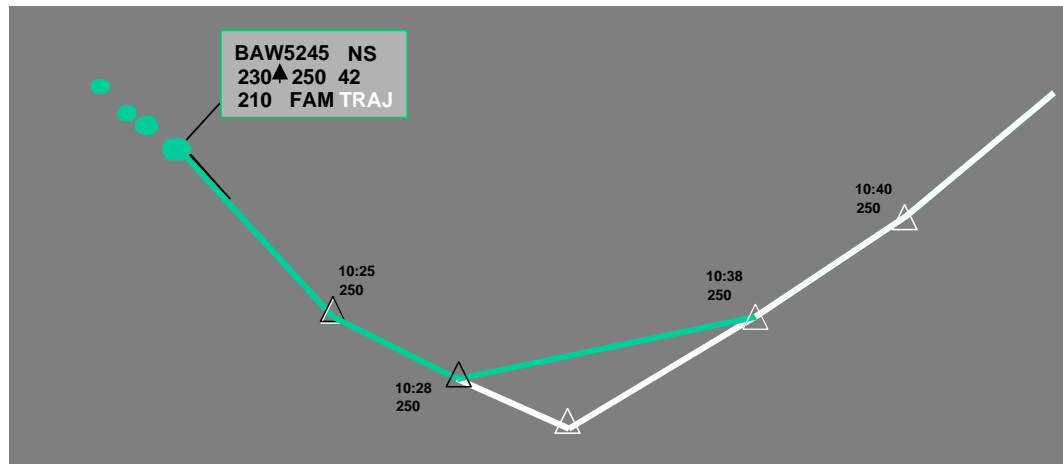
Result

In the RPVD and the VAW:

- A working trajectory is built on the base of the previous old system trajectory.



Before revert



After revert

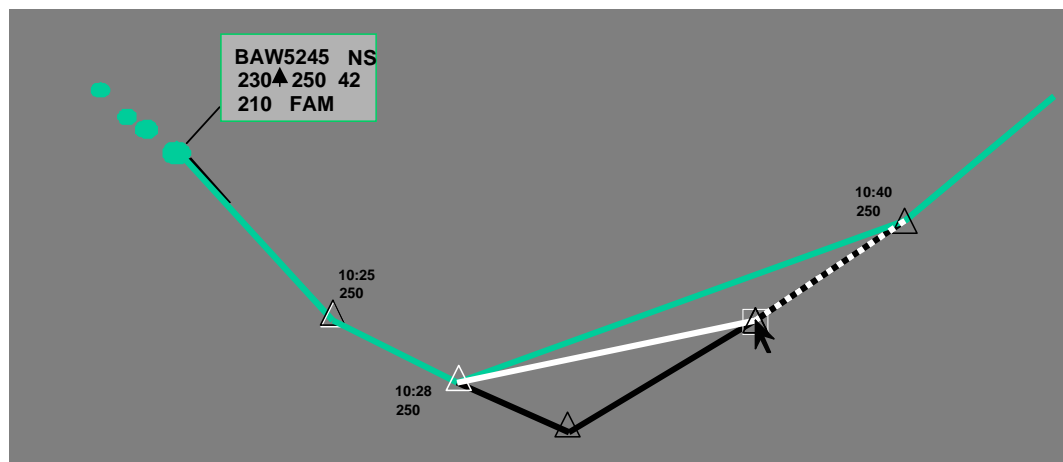
- The Test of the working trajectory is launched (See *Test of the working trajectory*).

2.5.5 Revert partially to the previous system trajectory

Action

In the RPVD or VAW:

- Edition action (as described above in 2.2 and 2.3) to point on existing constraints of the old system trajectory (used as a guideline).

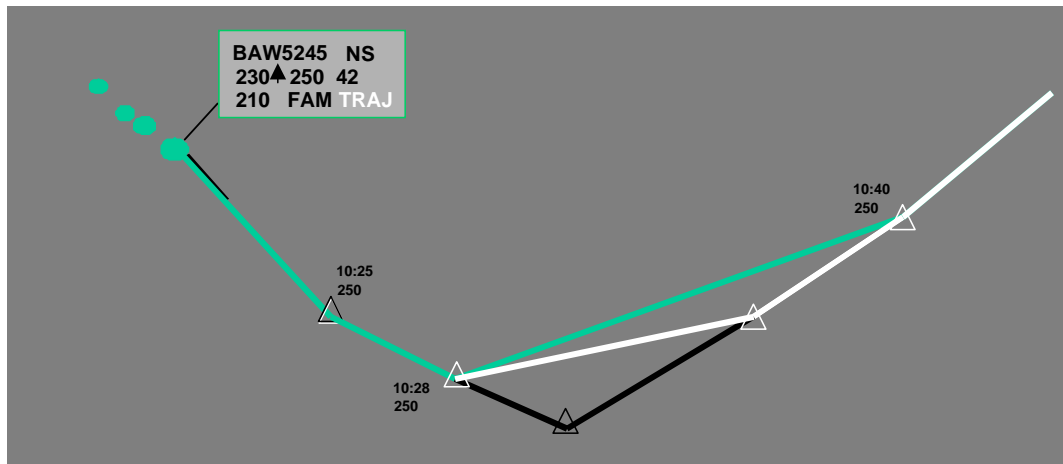


Partial revert to the old system trajectory by a heading edition

Result

In the RPVD and the VAW:

- A working trajectory is built on the base of the trajectory edition guided by the old system trajectory.

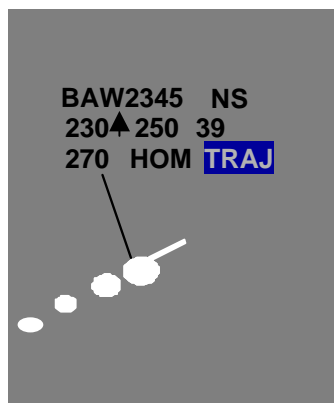


- The Test of the working trajectory is launched (See *Test of the working trajectory*).

2.5.6 Accept a trajectory co-ordination

Indication of a trajectory co-ordination request

We are in the adjacent sector. The adjacent controller is alerted of a pending co-ordination on a trajectory by a message in the MIW and by a TRAJ text displayed in the involved aircraft.

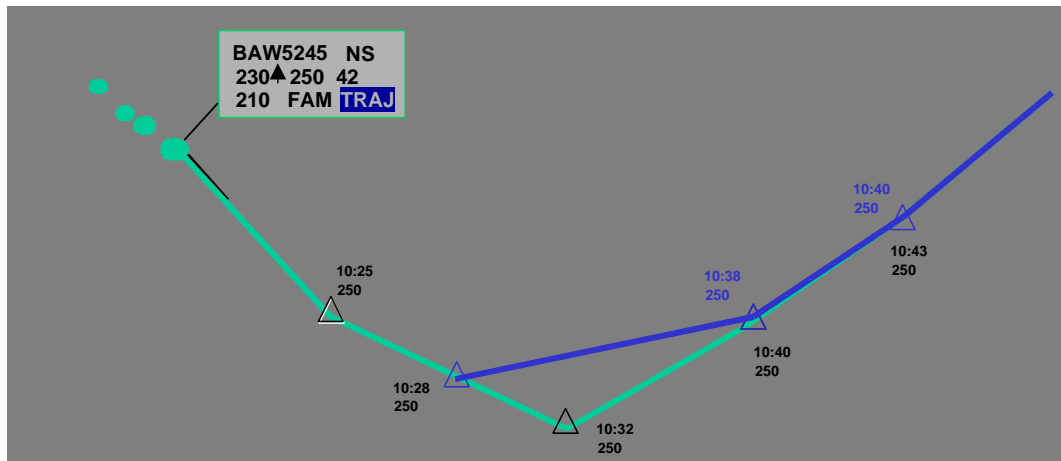


Trajectory co-ordination request displayed in the label

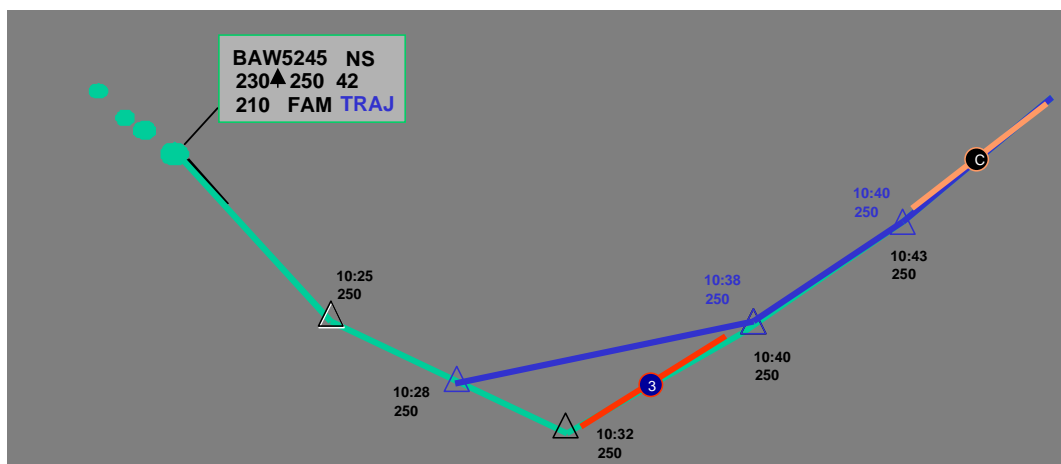


Trajectory co-ordination request displayed in the MIW

Remark: With a right hold click on the item in the label or in the MIW, it is possible to display the trajectory in pending co-ordination (all conflicts, on the working trajectory or on the system trajectory are displayed if any):



Trajectory co-ordination request displayed in the DFL (without any conflict)



Trajectory co-ordination request displayed in the DFL (without conflicts)

Action

In the MIW:

- Left click on the ACCEPT button.

In the RPVD:

- Left click on the TRAJ text in the involved aircraft.
- The Trajectory Edition is open in co-ordination mode (no edition action is possible).
- The TST tool is displayed (with indication if it is a co-ordination from the upstream or downstream sector):



TST for co-ordination request from upstream sector

- Left click on ACCEPT button in the TST tool.

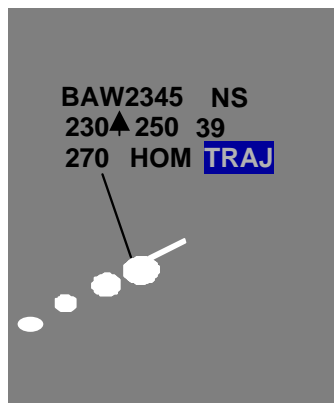
Result

- The message in the MIW is deleted.
- The Trajectory edition in co-ordination mode is closed if open.
- The TRAJ text is deleted from the labels.
- Same steps as in no co-ordination registration of a trajectory (See **Register a trajectory without co-ordination**).

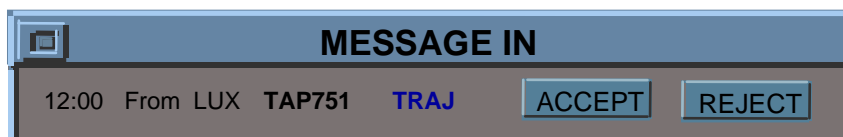
2.5.7 Reject a trajectory co-ordination

Indication of a trajectory co-ordination request

We are in the adjacent sector. The adjacent controller is alerted of a pending co-ordination on a trajectory by a message in the MIW and by a TRAJ text displayed in the involved aircraft.

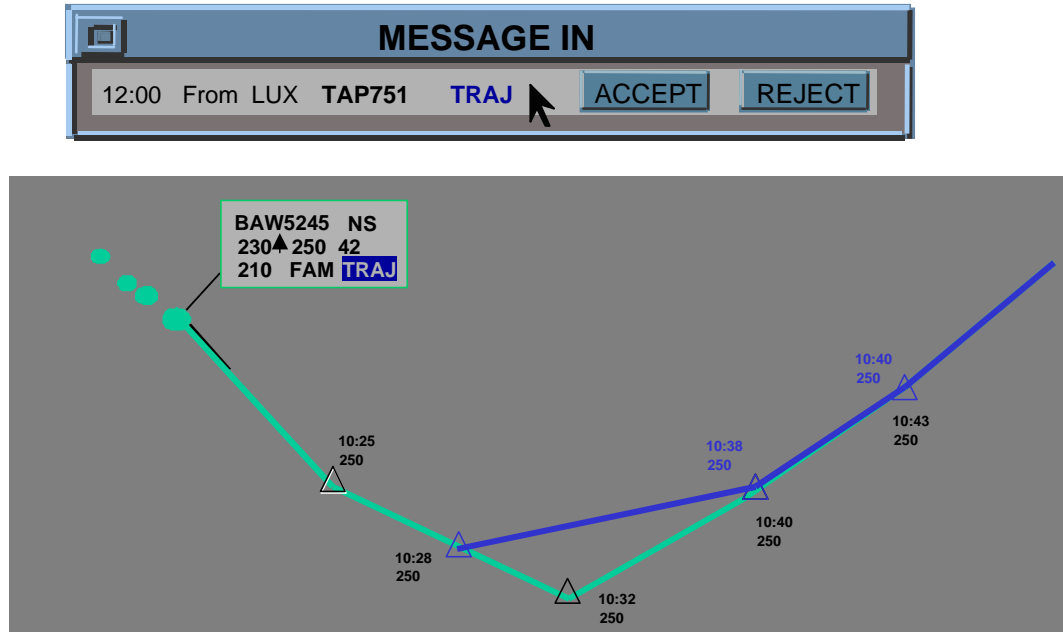


Trajectory co-ordination request displayed in the label



Trajectory co-ordination request displayed in the MIW

Remark: With a right hold click on the item in the label or in the MOIW, it is possible to display the trajectory in pending co-ordination (all conflicts, on the working trajectory or on the system trajectory are displayed if any):



Action

In the MIW:

- Left click on the REJECT button.

In the RPVD:

- Left click on the TRAJ text in the involved aircraft.
- The Trajectory Edition is open in co-ordination mode (no edition action is possible).
- The TST tool is displayed (with indication if it is a co-ordination from the upstream or downstream sector):



TST for co-ordination request from upstream sector

- Left click on REJECT button in the TST tool.

Result

- The message in the MIW is deleted.
- The Trajectory edition in co-ordination mode is closed if open.
- The TRAJ text is deleted from the labels.

- Go back to course in registration of trajectory with co-ordination needs (See **Register a trajectory with co-ordination**).

3. HMI specifications for Clearance Assistance

3.1 Principle

When a controller (through the Trajectory Editor or, in the future, has prepared a new trajectory by implementation of a CORA 2 resolution provided for a detected conflict), this trajectory when validated has been registered as a new system trajectory for the involved aircraft. The associated clearances corresponding to the modifications of the trajectory have been prepared and associated to that new system trajectory.

These prepared clearances need to be issued on time to ensure the aircraft to follow the new system trajectory (which is different from the original flight plan). To ensure correct issuance, they will be reminded with different states for the reminders in order to indicate time remaining for issuance.

A clearance may be issued at required time (real-time instruction given to the aircraft) or in advanced (differed instruction given to the aircraft).

When time to issue is passed, monitoring alerts will be activated.

The prepared clearances will be:

- Lateral clearances
 - ☐ Heading clearance (Left or right headings or absolute heading)
 - ☐ Direct clearance
 - ☐ Offset clearance
- Vertical clearances
 - ☐ Climb clearance
 - ☐ Descend clearance
- Speed instructions
 - ☐ Climb clearance
 - ☐ Descend clearance
 - ☐ Maintain speed
 - ☐ End of speed restriction

Remark: Each time a new system trajectory is registered, the already prepared clearance(s) are updated accordingly. Some will be deleted and reminders removed from display (if any) and some will be added (and reminders displayed if needed).

3.2 Indication of prepared clearance(s)

Assumption

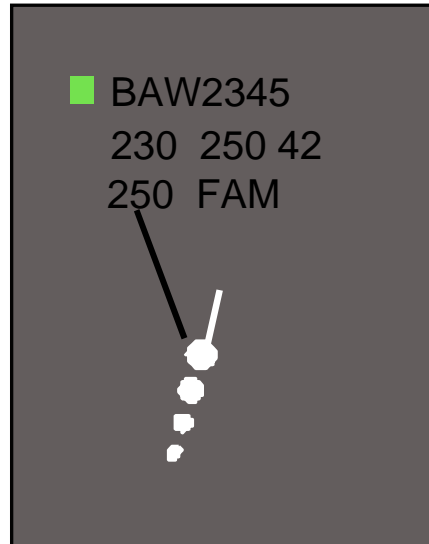
A new trajectory has been prepared by a controller and has been registered as a new system trajectory for the involved aircraft. The associated clearances have been prepared and associated to the new system trajectory.

Display

In the RPVD:

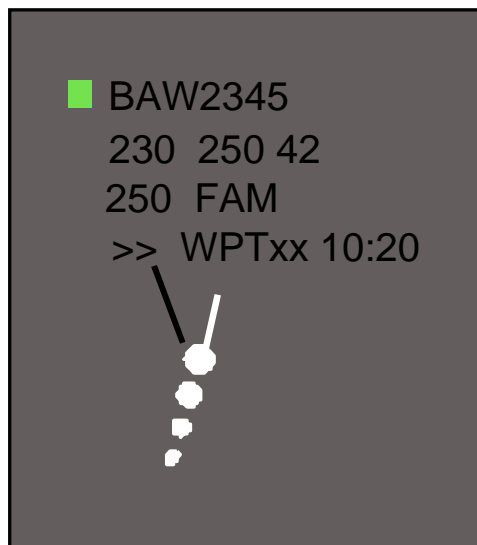
- A green square is displayed in the label of the involved aircraft at the left side of the callsign to indicate that a clearance remains to be issued for that aircraft.

Remark: This green square is also displayed wherever the callsign of the related aircraft is displayed (SIL, SEL, MIW, MOW).



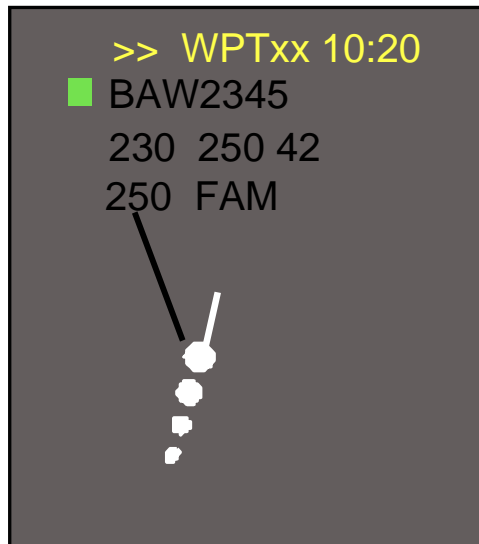
Indication of a prepared clearance

- The next clearance to be issued is displayed in normal colour in the last line of the label of the involved aircraft when time to issue is one minute before the reminder time (so 2 minutes before issuance: parameter).



Indication of a prepared clearance 2 minutes (parameter) before issuance

- The next clearance to be issued is displayed in yellow in the first line of the label of the involved aircraft when time to issue it is less than 1 minute (reminder to issue the clearance).



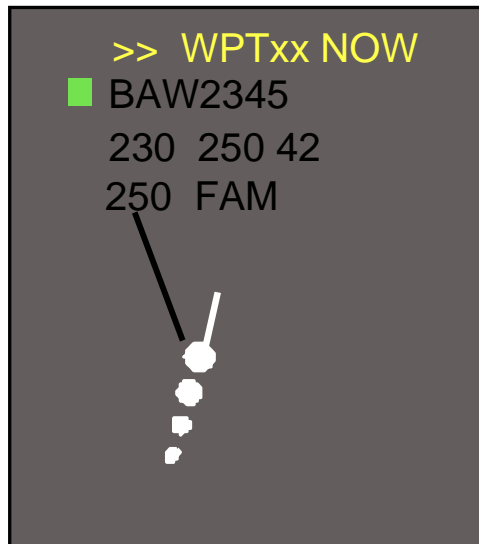
Reminder of a prepared clearance when time to issue is within the next minute (non selected label format)

Remark: The different formats are the following ones:

- α Direct instruction: ">> WPTxx HH:MM"
- α Heading instruction: "h+30 HH:MM" (relative right one), "h-20 HH:MM" (relative left one), "h120 HH:MM" (absolute one).
- α Level instruction: "↓ 350 HH:MM" or "↑ 350 HH:MM".
- α Speed instruction: "s.78 HH:MM" or "sMTN HH:MM" (Maintain speed) or "sEND HH:MM" (end of speed restriction).
- α OFF SET instruction: "// 10R5 WPTxx HH:MM" (right off set of 5 degrees and 10 NM and resume on WPTxx) or "// 5L10 WPTxx HH:MM" (left off set of 10 degrees and 5 NM and resume on WPTxx).

Remark: When time to issue the clearance is passed, the first line in the label will be replaced by the MONA alert. The green square disappears (if no more clearance needs to be issued).

Remark: When time to issue the clearance is reached (parameter), the time in the clearance reminder is replaced by NOW.



Reminder of a prepared clearance when time to issue is now (non selected label format)

3.3 Consultation of the next prepared clearance(s) for an aircraft.

Action

In the RPVD:

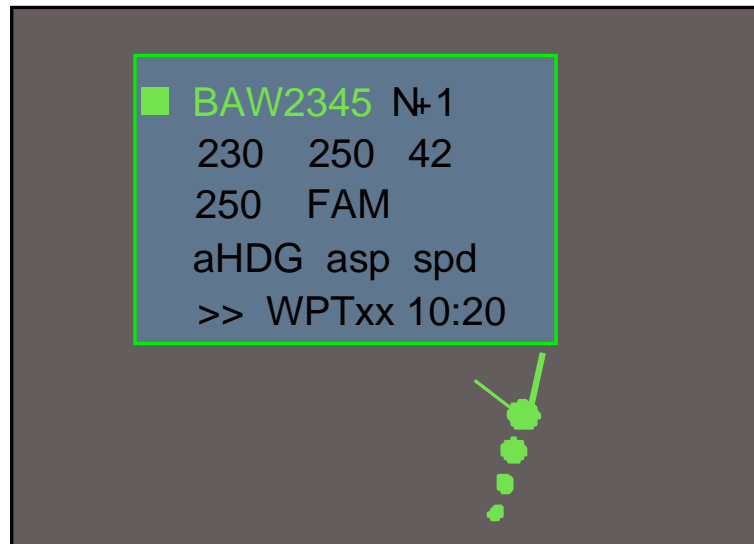
- Point on the label.

Remark: wherever the green square is displayed, this action is possible and the result is the same as described below.

Result

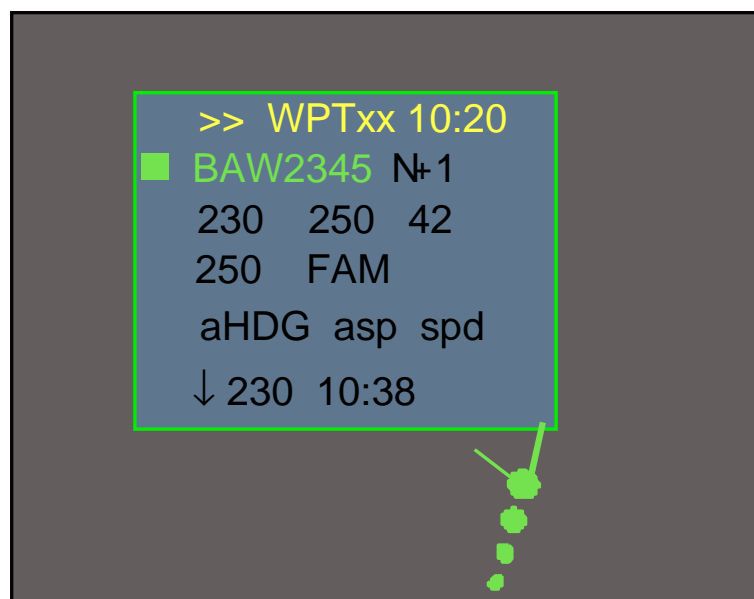
In the RPVD:

- In the selected label of the aircraft, the clearance to be issued is displayed in the last line of the label.



Display of a prepared clearance when time to issue is more than two minute (selected format of the label) before issuance.

Remark: When time to issue the clearance is less than one minute (the clearance is displayed in the first line of the label), it is the next clearance which is displayed in the last line.



Display of the second prepared clearance when time to issue the first one is less than one minute (selected format of the label) before issuance.

3.4 Consultation of the all the prepared clearance(s) for an aircraft.

Action

In the RPVD:

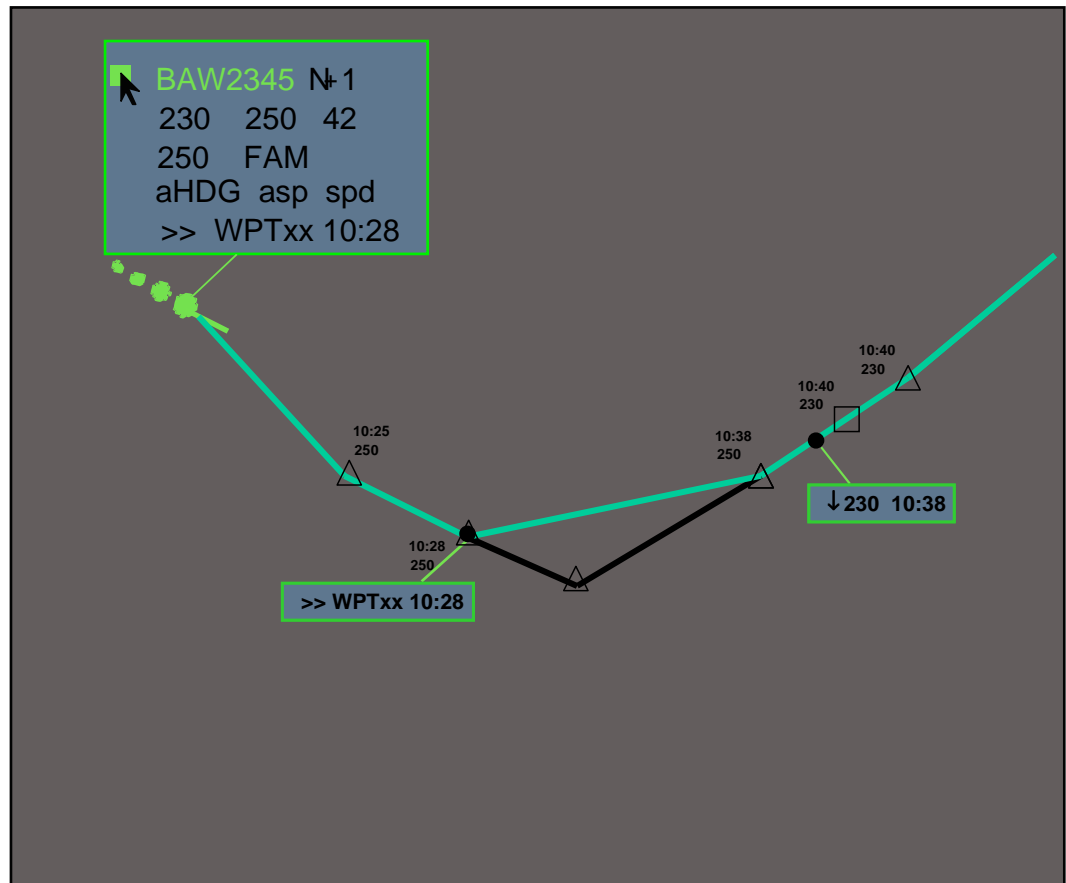
- Right hold click on the green square.

Remark: wherever the green square is displayed, this action is possible and the result is the same as described below.

Result

In the RPVD:

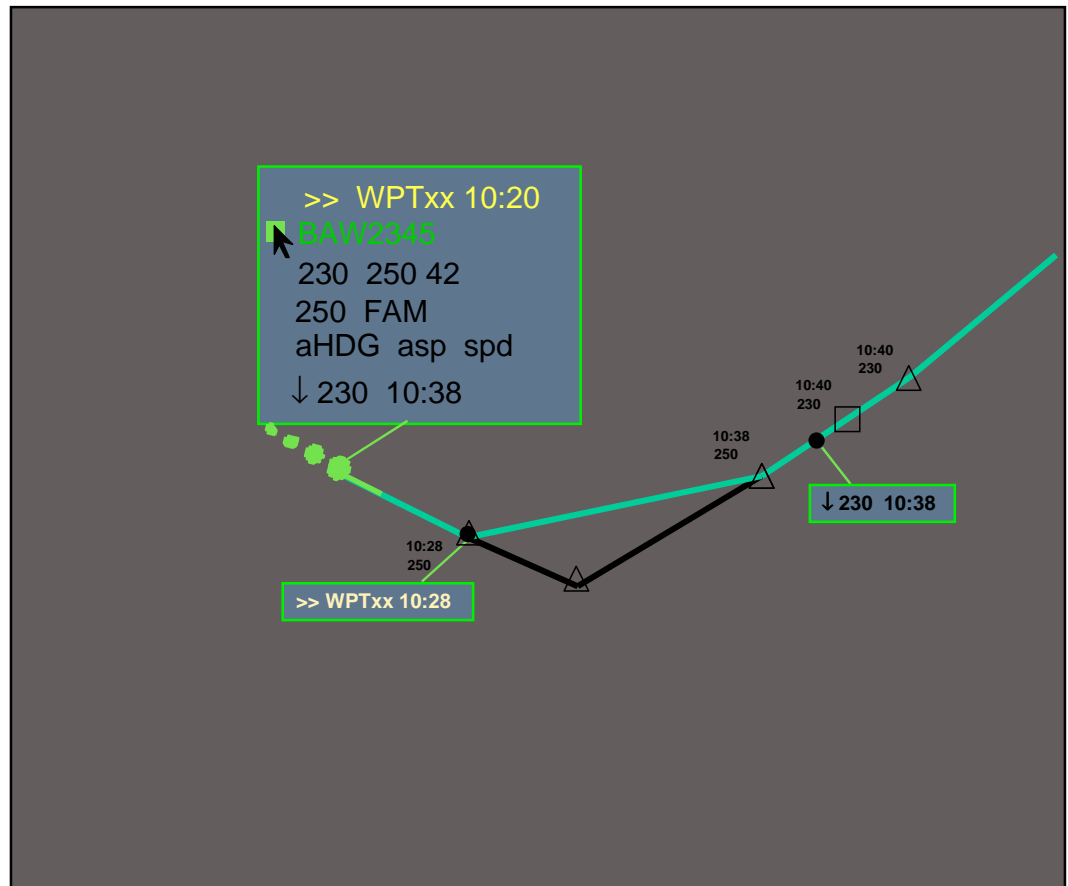
- The trajectory of the related aircraft is displayed with all the associated clearances displayed along it.



Display of all prepared clearance(s) along the trajectory

Remark: As soon as a clearance has been issued, it is no longer displayed along the trajectory.

Remark: As soon as a clearance needs to be issued (within the minute), it is displayed along the trajectory in yellow (reminder colour).



Display of all prepared clearance(s) along the trajectory with the first one reminded.

Remark: When the right mouse is released, all disappears.

3.5 Issuance of a clearance before time (differed order).

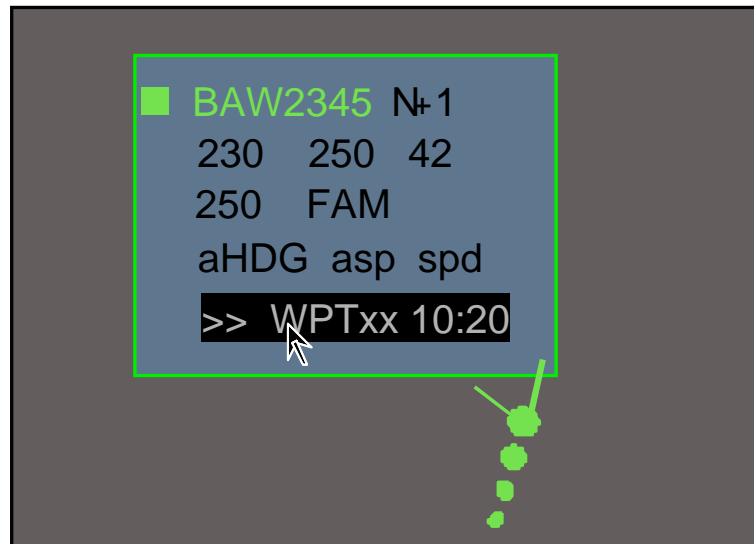
Assumption

The Controller has issued the clearance in advance (a differed order) by the frequency.

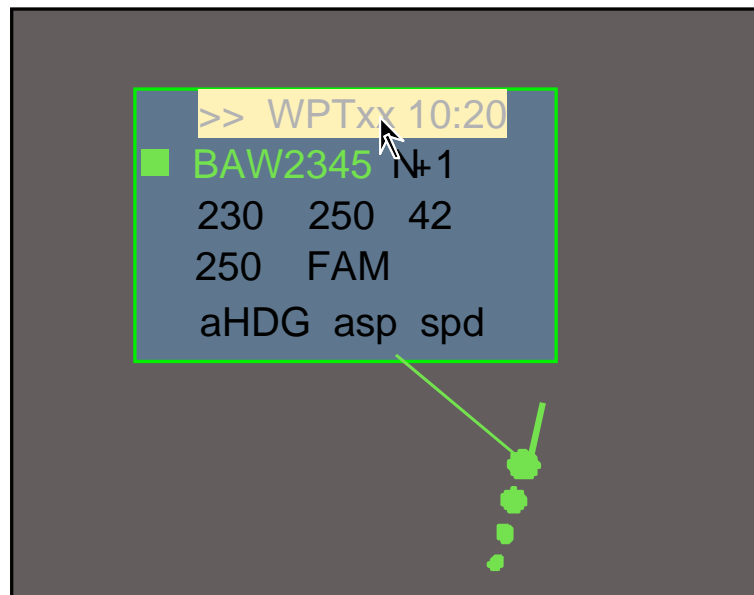
Action (Option 1)

In the RPVD:

- Double left click on the clearance text in the selected label of the related aircraft.



Issuance before reminder: pointing on the last line

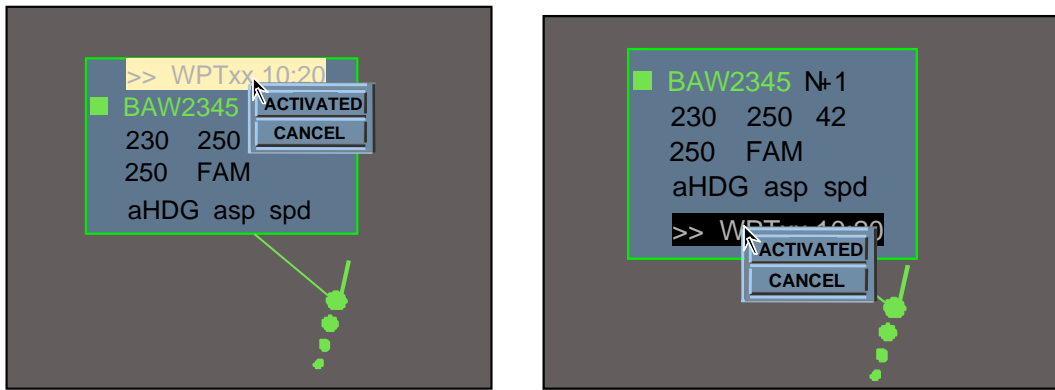


Issuance during reminder: pointing on the reminder line

Action (Option 2)

In the RPVD:

- Left click on the clearance text in the selected label of the related aircraft.
- The Clearance menu appears.



Clearance menu

- Left click on the “ACTIVATED” item.

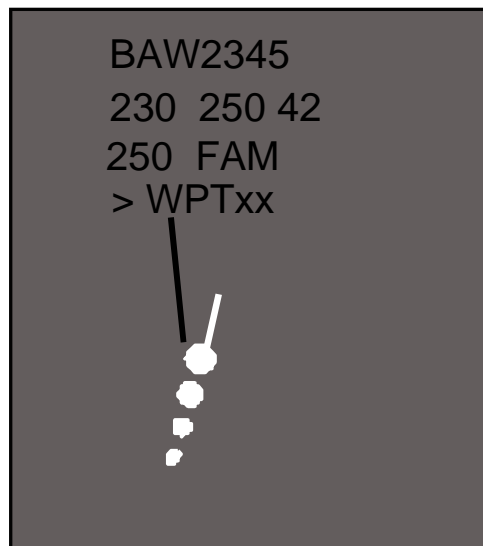
Result

In the RPVD:

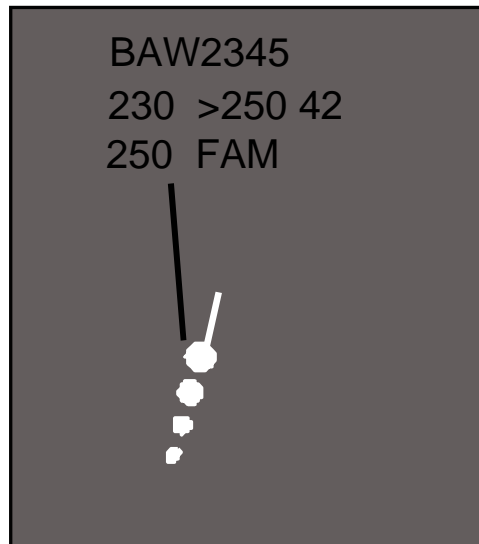
- The clearance text is removed from display in the label and wherever this clearance is displayed.

Remark: If it was the last prepared clearance, the green square is removed from display.

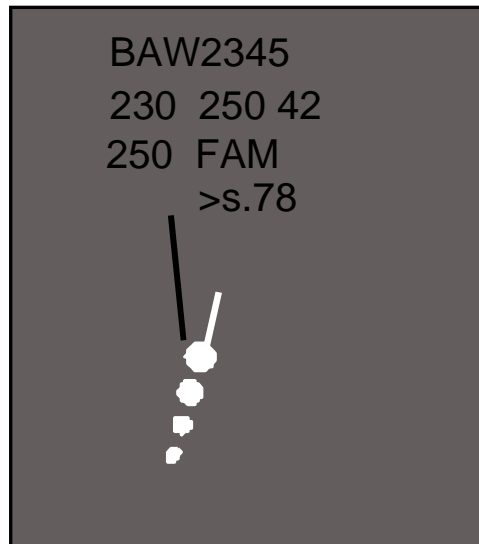
- In the label of the related aircraft, the instruction issued is displayed with a “>” before the value (to indicate the differed status) in the concerned instruction field.



Differed Direct on WPTxx



Differed CFL: 250



Differed Speed: .79

Remark: As soon as the related differed order is performed by the aircraft, the ">" symbol disappears but the instruction remains displayed in the label.

3.6 Issuance of a clearance at time.

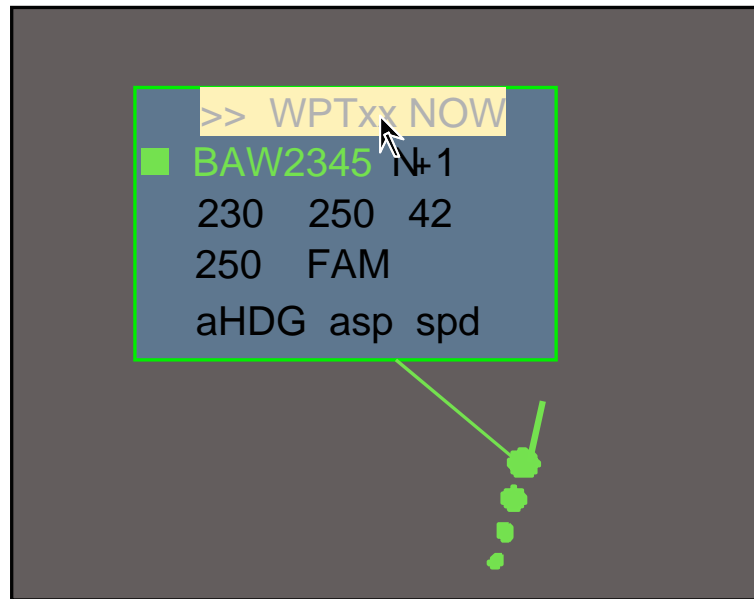
Assumption

The Controller has just issued the related clearance by the frequency.

Action

In the RPVD:

- Double left click on the clearance reminder text in the label of the related aircraft.



Remark: The other way to issue the clearance is to input the instruction by the procedures for real-time instructions. This will be detected and the clearance reminder will be removed from display.

Result

In the RPVD:

- The clearance reminder text is removed from display in the label and wherever this reminder is displayed.

Remark: If it was the last prepared clearance, the green square is removed from display.

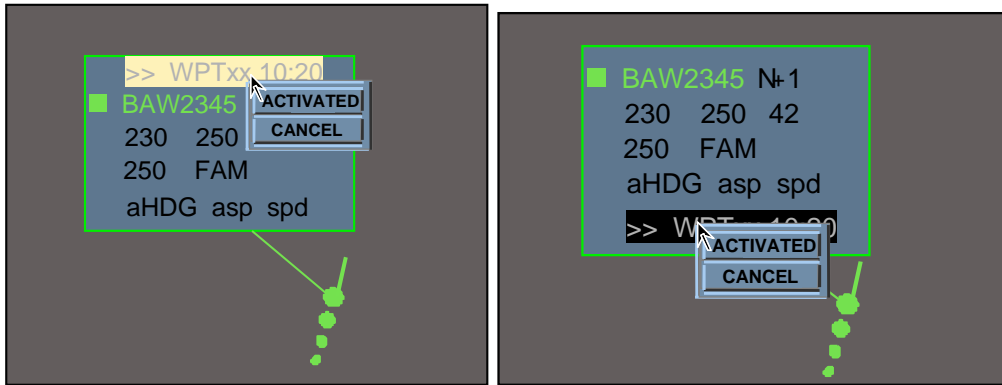
- In the label of the related aircraft, the instruction issued is displayed in the concerned instruction field (as for any “real-time” instruction).

3.7 Cancellation of a prepared clearance

Action

In the RPVD:

- Left click on the clearance text in the selected label of the related aircraft.
- The Clearance menu appears.



Clearance menu

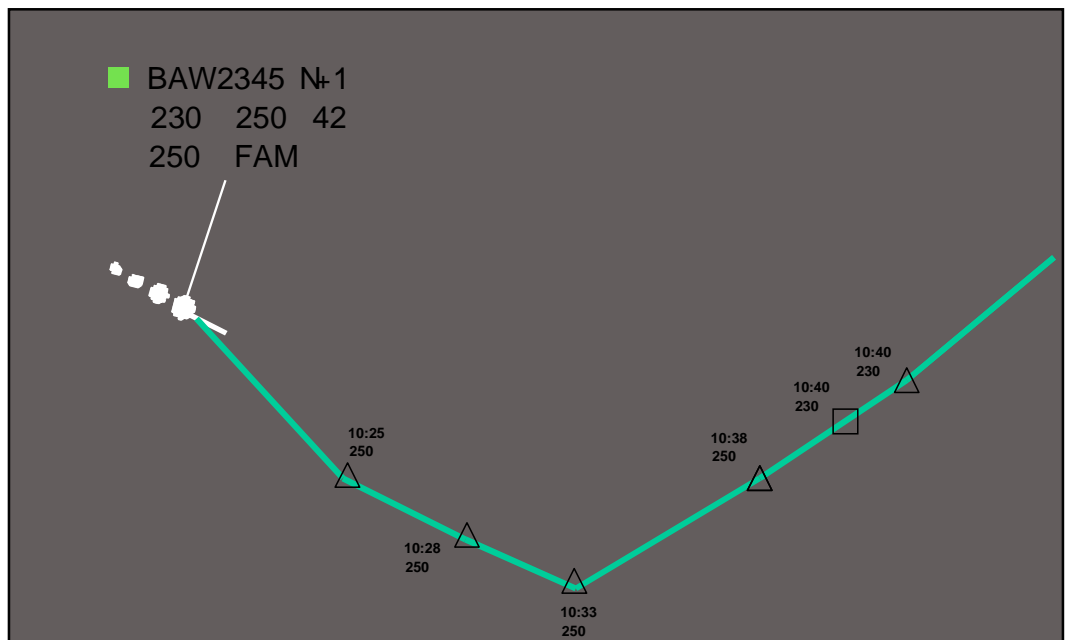
- Left click on the “CANCEL” item.

Remark: When time to cancel the clearance is too late (too close from time to issue), the Cancel option is greyed and so not available.

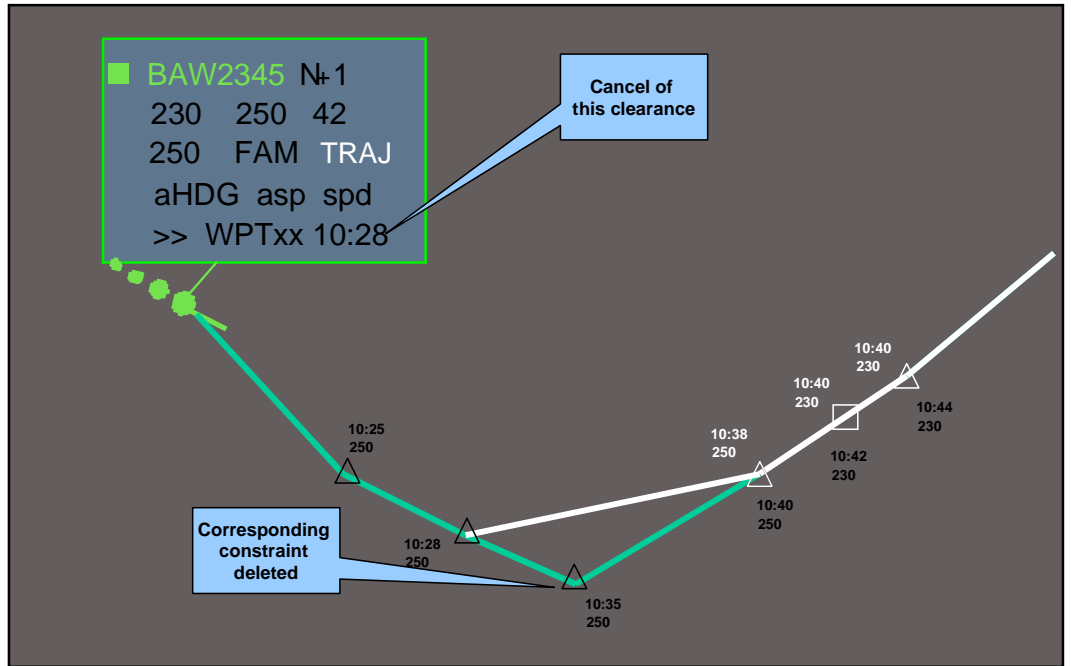
Result

In the RPVD:

- The Clearance menu disappears.
- The Trajectory Editor for the related aircraft is open (See **Trajectory Edition activation**).
- The constraint on the trajectory related to the clearances to be deleted is destroyed and the working trajectory is automatically calculated according to the deleted constraint. The working trajectory is displayed in a plain white line in the RPVD and in VAW.

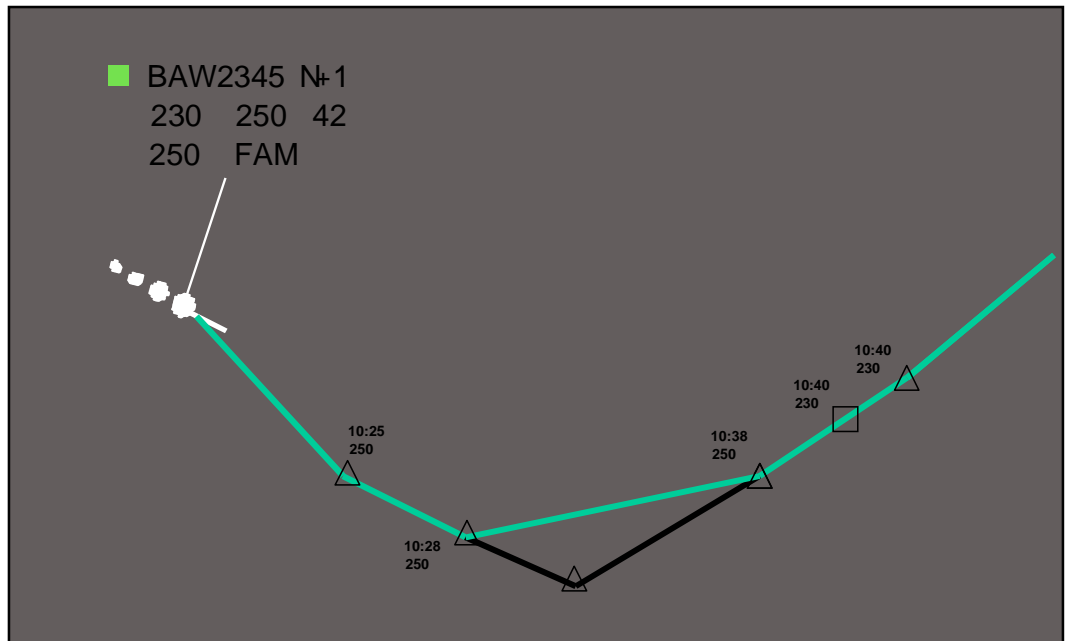


Previous trajectory (No old one)

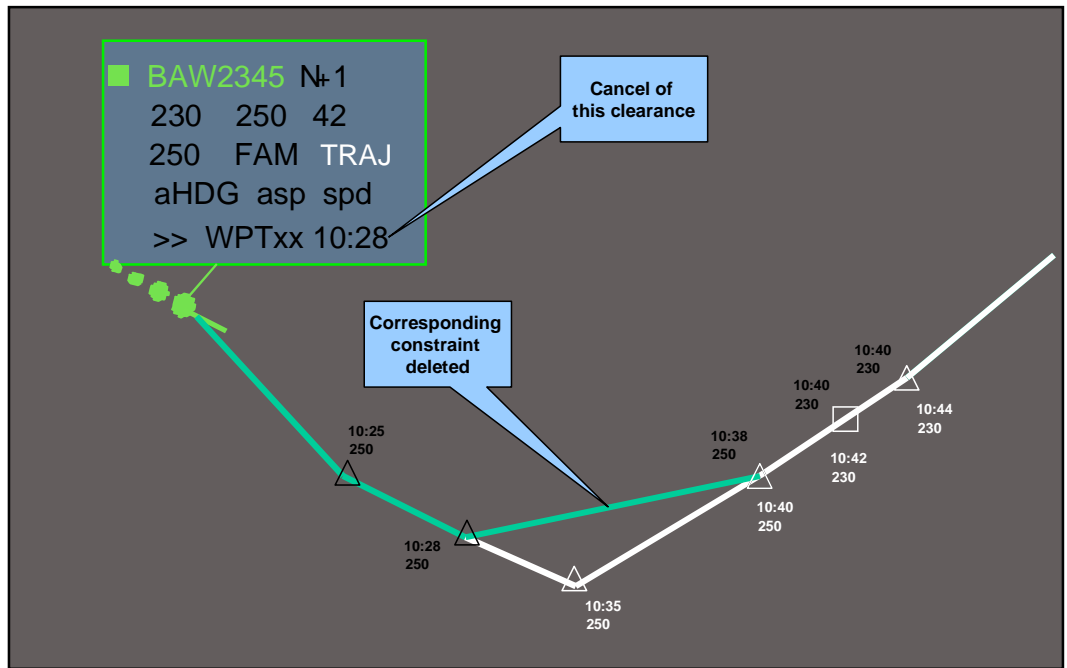


Cancel of a clearance with no old trajectory

Remark: If an old system trajectory exists, the deletion of the clearance and so of the related constraint will build a working trajectory on the base of the old one.



Previous trajectories (New and Old)



Cancel of a clearance with go back to an old trajectory

- The Trajectory Support Tool is displayed.



TST for an aircraft

- The Test of the working trajectory is launched (See *Test of the working trajectory*).
- Following steps are the same as in the Trajectory Editor.

4. HMI specifications for Conflict Delegation

4.1 Intra-sector delegation

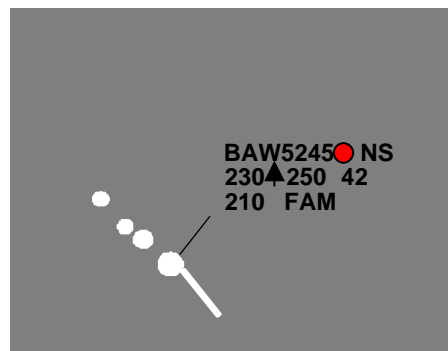
Intra-sector conflict delegation means a transfer of responsibility from one Controller (Planning controller) to another Controller of the same sector (Tactical Controller) for the resolution of a conflict. Working with a longer time horizon for conflict notification, The Planning Controller can solve a lot of conflicts through co-ordination with the other sectors before assume of the involved aircraft. However, there are conflicts the Planning Controller may decide not to solve: In this case, the system should enable the Planning Controller to “delegate” the conflict by adding a conflict detected by the system to the Tactical Controller notified conflicts. The Tactical Controller should know that this conflict was delegated by his(her) planning Controller.

By default, there is an automatic transfer of a conflict from PC to TC as soon as the Tactical Controller has assumed at least one of the involved aircraft in the related conflict.

4.2 Conflict notification

In the RPVD:

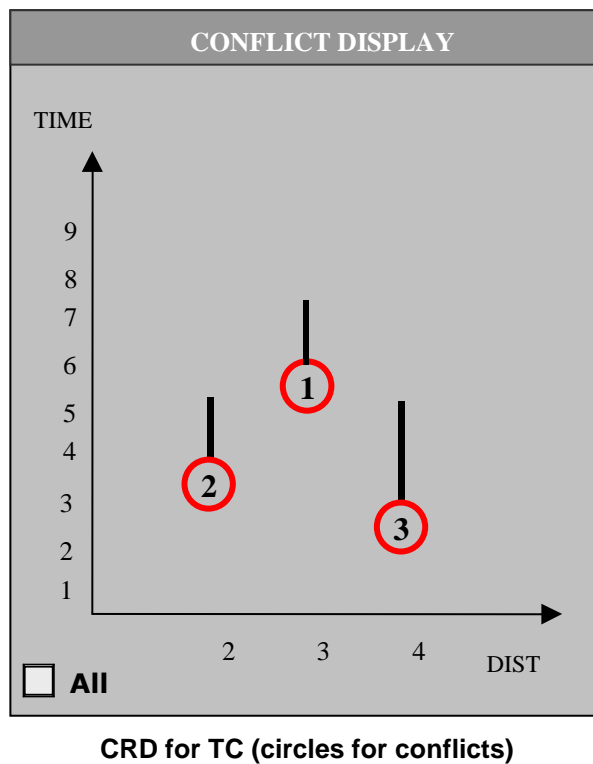
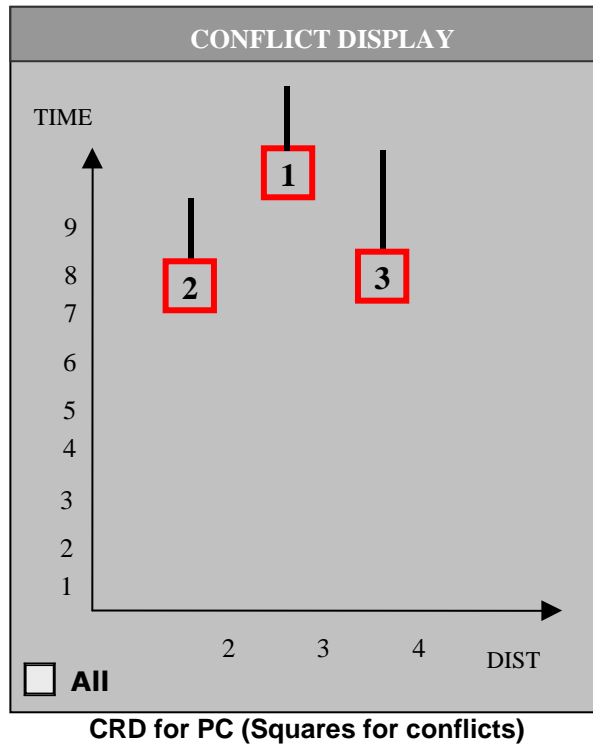
- The notification of conflict in the RPVD is displayed in the same way for PC and TC.



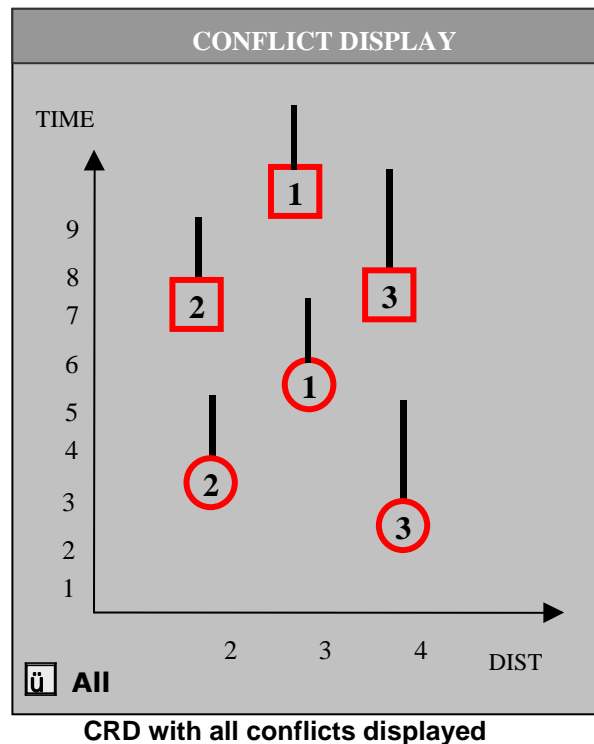
Remark: The same notification is displayed wherever the callsign of the involved aircraft is displayed (MIW, MOW, SIL, SEL, ...).

In the CRD:

- The notification of conflict in the RPVD is displayed differently for PC and TC.



Remark: By default, the Controller can see the conflicts he is responsible for. The check box enables the Controller (Left click on the check box) to ask for display of all the conflicts in his sector (same action to go back)



4.3 Automatic transfer of a conflict

In the CRD:

- As soon as the TC assumes an aircraft involved in a detected conflict within the sector, there is an automatic transfer of the related conflict responsibility from PC to TC. The square for the related conflict becomes a circle in all the CRDs where it is displayed.

Remark: If conflict was displayed in the CRD of the PC in restricted display (not all conflicts displayed), the conflict notification is removed from the related CRD.

Remark: The transfer is enable when the PC does not perform any trajectory edition for that conflict. In this case, the transfer is differed at the end of the process of edition (close of the TED).

4.4 Manual transfer of a conflict

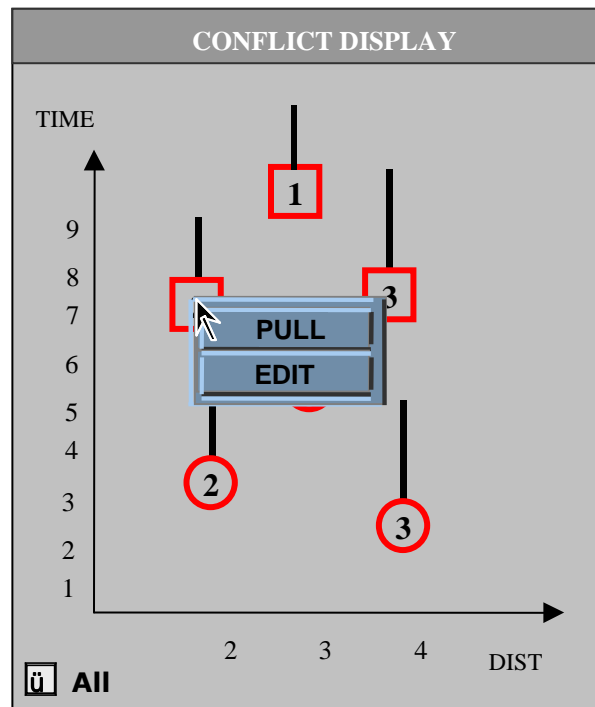
Assumption

We are before assuming of any of the aircraft involved in the conflict by the TC. This manual transfer may be done either by the PC (Push of the conflict responsibility to the TC) or by the TC (Pull of the conflict responsibility from PC).

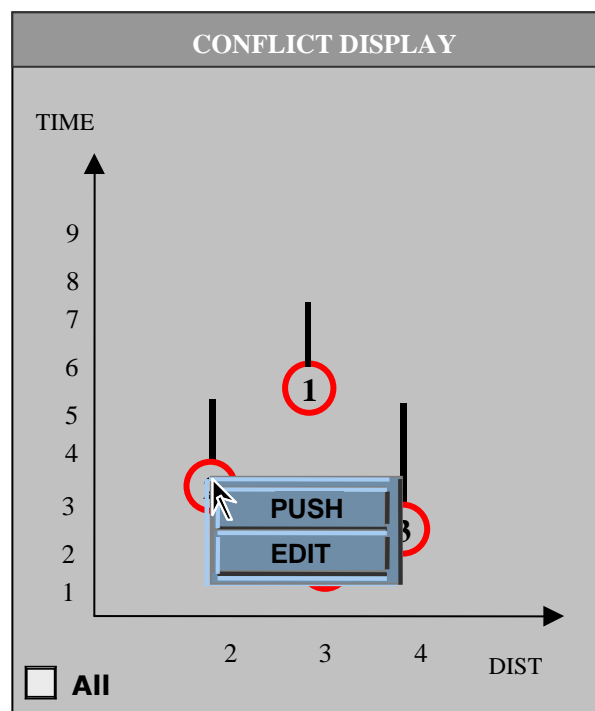
Action

In the CRD:

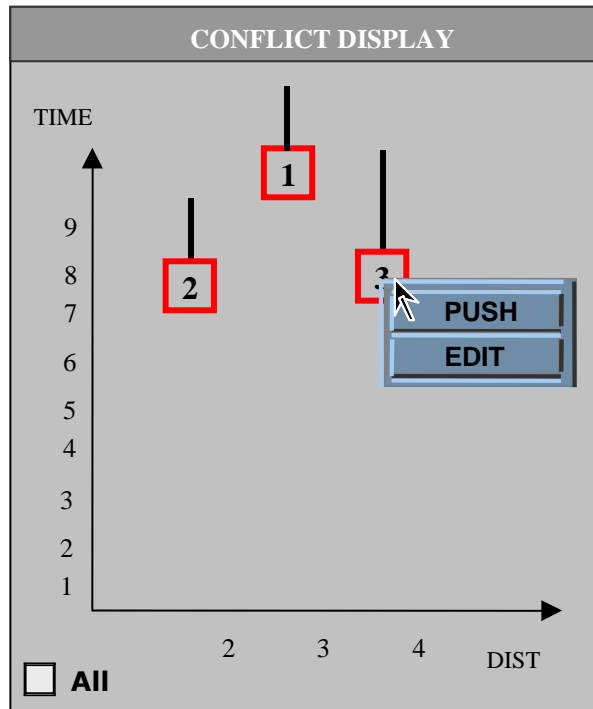
- Left click on the conflict notification.
- The Conflict menu appears.



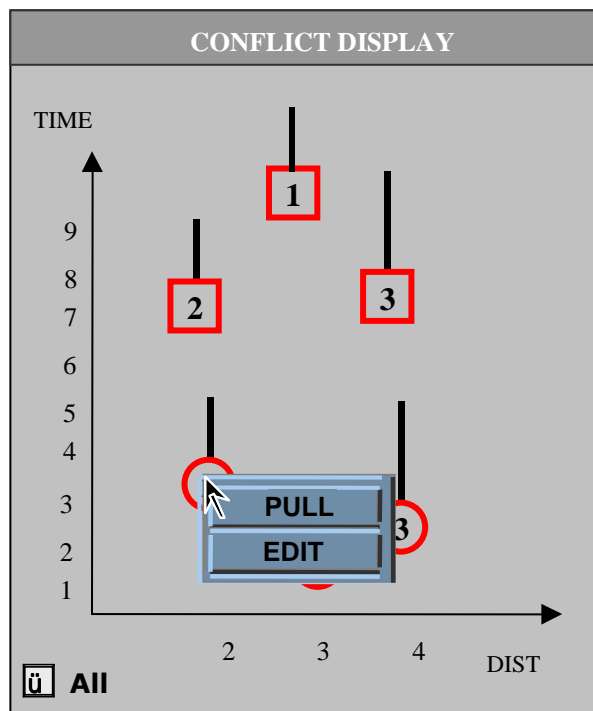
Conflict Menu in the TC's CRD for taking conflict responsibility from PC (TC Pull action).



Conflict Menu in the TC's CRD for delegating conflict responsibility to PC (TC Push action).



Conflict Menu in the PC's CRD for delegating conflict responsibility to TC (PC Push action).



Conflict Menu in the PC's CRD for taking conflict responsibility from TC (PC Pull action).

Remark: As soon as the TC has assumed an aircraft involved in a conflict, the PUSH transfer from TC to PC is not possible.

Result

In the CRD:

- According to the delegating action, the conflict notification becomes a square or a circle and is displayed if required in the related CRDs (See ***Conflict notification***)