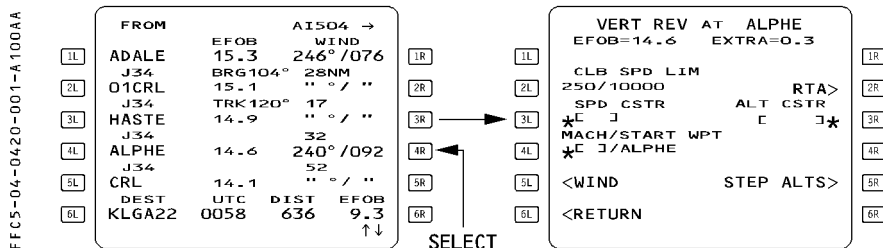


GENERAL

The vertical revision function allows the pilot to modify the following parts of the flight plan :

- Speed limit
- Speed and altitude constraints
- Time constraints
- Wind
- Step climb or step descent
- Constant Mach segment

The pilot selects these functions by pressing the right key on flight plan A or B.



Note : Section (4.04.20) only describes the following three functions : Wind and time constraints, and constant Mach segment.

For other vertical revision functions, refer to the next chapter (4.05).

TIME CONSTRAINT/RTA

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints. Once the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a start (*) :

- If the RTA is predicted as matched, the start (*) is in magenta.
- If the RTA is predicted as missed, the star (*) is in amber.

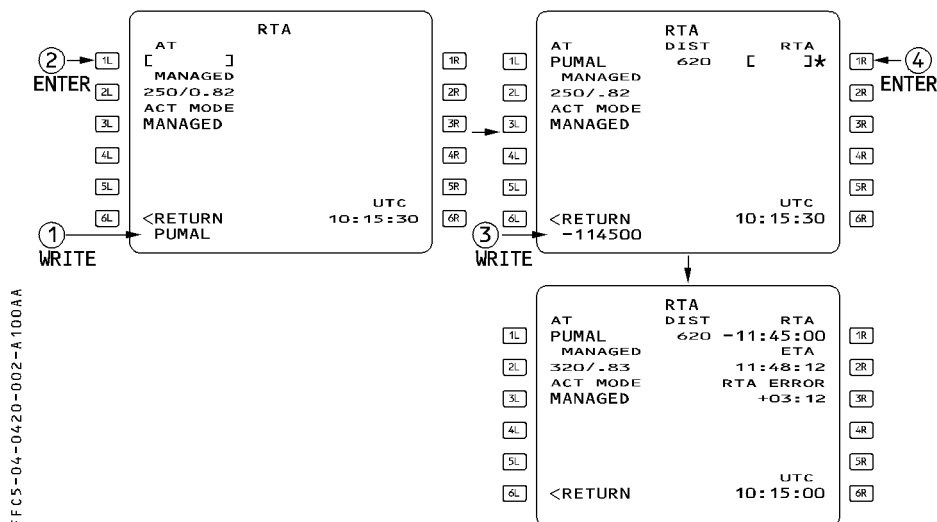
No specific symbol is provided on the ND.

A time constraint is cleared as any other constraints. If a time constraint is automatically deleted, an "RTA DELETED" message is displayed on the MCDU.

ENTERING A REQUIRED TIME OF ARRIVAL

- SELECT the F-PLN key on MCDU
 - SELECT a VERT REV at revised waypoint
 - SELECT the RTA prompt (2R key)
- The MCDU displays the RTA page.*
- WRITE the identifier of the waypoint where the time constraint has to be defined
 - ENTER it in 1L field

The prompt RTA and the distance indication appear.



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- WRITE the required time of arrival
The format is HHMMSS (entry of seconds is not mandatory)
- ENTER it in 1R field
- CHECK on fields 2R and 3R if the entered constraint can be met.

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WIND – TEMPERATURE – QNH

GENERAL

In order to receive the best predictions, the pilot must enter wind and temperature values for the different phases and for various waypoints of the cruise phase.

The system uses the temperature value at a given altitude, associated with the tropopause as entered on the INIT A page to optimize the temperature profile.

ENTERING THE TRIP WIND AND TEMPERATURE DURING THE F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The pilot can enter it before engine start on the INIT B page. It is usually defined by the airlines flight operations on the computerized flight plan.

The FMGS does not consider the trip wind for alternate predictions.

The trip wind is used as long as no winds are entered in the CLB, CRZ and DES WIND pages.

When the pilot enters a CLB, CRZ or DES WIND, the FMGS disregards the trip wind.

- PRESS the INIT key
- INSERT the temperature at cruise FL
- On the INIT B page INSERT the TRIP WIND
The trip wind is defined as a headwind component (HDXX, XXHD or – XX), or as a tailwind (TLXX, XXTL or + XX).
The FMGS uses the trip wind to compute preliminary performance, time and fuel predictions.
- CHECK the predictions on the F-PLN B page

ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page and once the wind and cruise FL temperature forecasts are available, the pilot may enter them, if significantly different, by pressing the wind prompt.

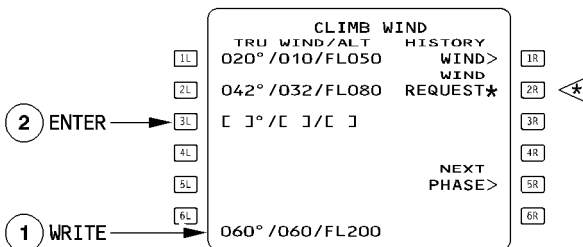
He will access the different wind pages using NEXT PHASE key and PREV PHASE key. He will slew the CRZ WIND page to access the various waypoints of the cruise winds.

The pilot will enter wind data as follows :

- For climb phase ; by inserting either the HISTORY WIND data (as recorded during the last descent) or by inserting winds (at up to 5 altitudes) on the CLIMB WIND page.
- for cruise phase ; by inserting winds (at up to 4 FL) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The pilot may enter the temperature of each waypoint and at destination on this page.
- For descent phase ; by inserting winds (at up to 5 FL/altitudes) on the DES WIND page.

- V16 ALL

– WRITE new winds into the scratchpad and ENTER.



Winds entered on CLIMB, CRZ and DESCENT WIND pages are always true north referenced.

Tower wind entered on PERF is magnetic referenced.

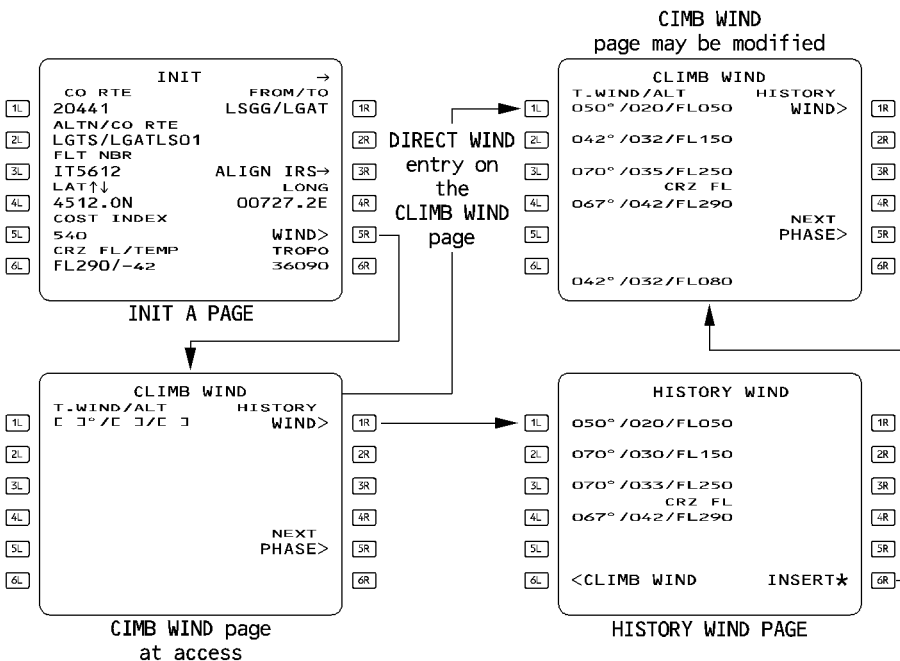
The pilot can enter "GRND" in the altitude field for wind at destination.

CLIMB WIND cannot be modified when the climb phase is active.

At climb phase transition, wind data switch from blue to green colour and any attempted modification will trigger the "NOT ALLOWED" message.

The system extrapolates the highest wind entry to all higher levels.

The system interpolates winds between 2 entered levels.

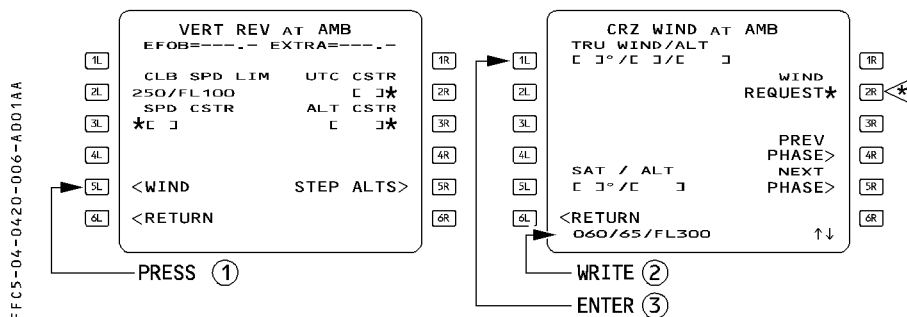


ENTERING THE CRUISE WINDS AND TEMPERATURES

At flight plan initialization the CRZ WIND page displays all cruise waypoints with empty brackets. In flight, only down path waypoints are displayed.

- SELECT VERT REV at WPT.
- PRESS the WIND prompt.
- SELECT NEXT PHASE.
- SLEW until relevant waypoint is displayed.
- WRITE and ENTER the new temperature into the scratchpad.
- WRITE and ENTER the new wind data into the scratchpad.

WIND and temperature may be entered through ACARS pages. Refer to 4.04.40 if ACARS is installed.



The crew will modify the entered winds and temperatures in flight if a significant difference is expected (greater than 30 kt or 30° for the wind data and greater than 5° for the temperature).

The system propagates the pilot (or ACARS) wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered for the same flight level, or until the last cruise waypoint.

The forecast winds at a waypoint is determined as follows :

- If the predicted altitude at the waypoint matches an altitude defined in the CRZ WIND page, the forecast wind is the corresponding entered or propagated wind displayed at that waypoint on the CRZ WIND page.
- If the predicted altitude lies between two altitudes entered on the CRZ WIND page, the wind direction and velocity are linearly interpolated.

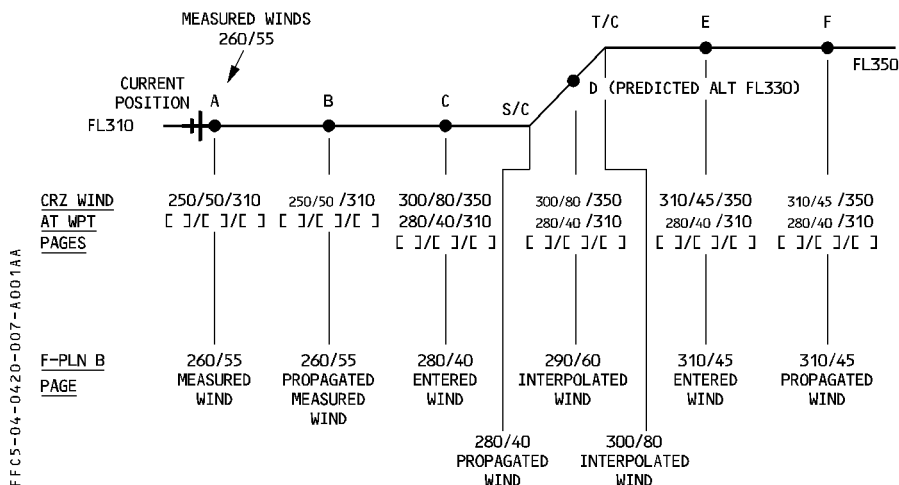
- If the predicted altitude is above or below the set of cruise altitudes, the forecast wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRZ WIND page for that point.

Once in flight, the FMGS considers the actual measured wind up to 200 NM ahead of the aircraft to permanently update the wind profile. This updated wind profile is used to compute the predictions and the performance data, but is not displayed to the crew.

The CRZ WIND pages display the propagated values in blue small font, and the pilot (or ACARS) entries in blue large font.

Note : The CRZ WIND page displays only ACARS ◀ or crew entered data. It never displays computed or propagated data (F-PLN B page only).

Example :



EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The computation of the OPT FL considers the wind entries made at the different altitudes (normally at the different CRZ FL).

When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL ; these winds are propagated automatically and may be significantly different from the actual winds.

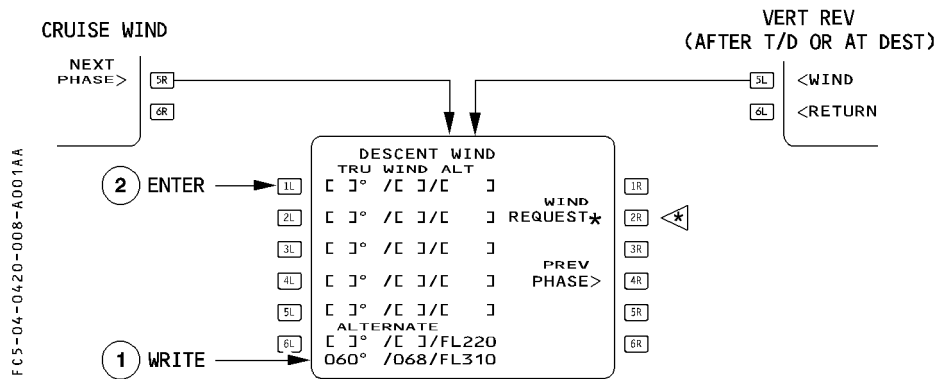
We recommend the following procedure : if the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes or if not available, the wind measured at the current CRZ FL.

ENTERING THE DESCENT WINDS

The pilot will enter as many as one wind at 5 different FL or altitudes, and the temperature at one FL or altitude. These wind and temperature data will be used for descent profile and prediction computation.

From the vertical revision page or from the CRZ WIND page :

- PRESS the WIND prompt
- SELECT the DESCENT WIND page
- ENTER up to 5 different “wind/altitude”

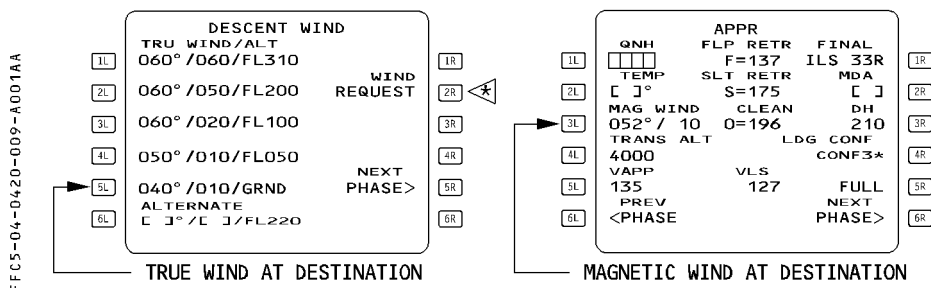


A wind is written as true direction/velocity/flight level or altitude in feet.

If the crew enters “GRND” in the altitude field, the system uses the associated wind as wind at destination.

The descent profile is corrected as well as the tower wind entered in the PERF APPR page.

(The wind direction is then modified of the magnetic variation, if the airfield is magnetic North referenced).



When the winds have been entered, the F-PLN B page displays the forecast wind profile at all descent waypoints using values it has interpolated from manual entries. Descent winds are not modifiable when descent, approach or go around phase is active. At descent phase transition, wind data switch from blue to green colour and any attempted modification triggers the “NOT ALLOWED” message.

ENTERING THE ALTERNATE WIND

Alternate wind is entered in the DESCENT WIND page. The altitude is defaulted to FL 220 or 310 but can be corrected. If an alternate wind is not defined, the predictions are computed with a wind defaulted to zero.

Alternate wind can be modified at any time.

The alternate wind profile is as follows :

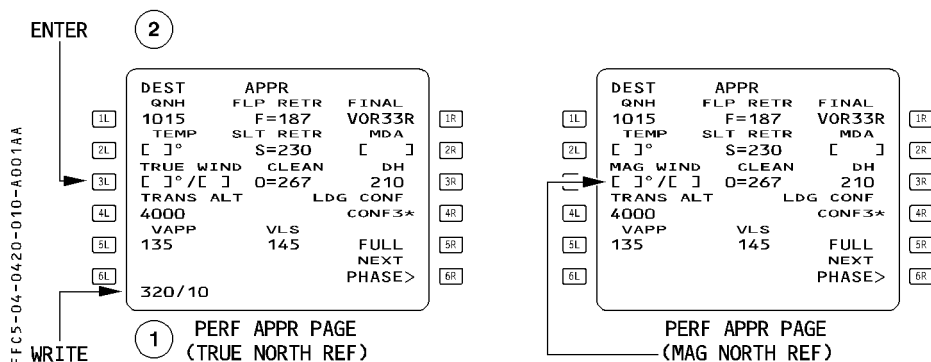
- ALTN CLB wind : mean wind between ALTN CRZ wind as entered on the DESCENT WIND page and the wind at primary DEST as entered on the PERF APPR page.
- ALTN CRZ wind : If no ALTN WIND has been entered on the DESCENT WIND page, the WIND at primary DEST (as entered on the PERF APPR page) is considered.
In case of no crew's entry, Zero wind is assumed.
- ALTN DES wind : mean wind between ALTN CRZ WIND and wind at FL 100.
Wind at FL 100 = interpolation between wind at ALTN CRZ FL and zero at ALTN DEST.

ENTERING THE APPROACH WIND TEMPERATURE AND QNH

The wind at destination is entered on the PERF APPR page 3L field. If the airport is magnetic North referenced, the PERF APPR page displays MAG WIND. It displays TRUE WIND if the airport is true North referenced.

It is copied in true reference into DESCENT WIND page at ground level (GRND) and F-PLN B page at destination. A ground entry into DESCENT WIND page is in the same way, copied to F-PLN B page and PERF APPR page (magnetic or true, depending on the airfield reference) automatically.

This wind is modifiable in descent and approach and go around phase.



- SELECT the PERF key on the MCDU
- PRESS the NEXT key (6R)
- WRITE QNH and temperature and enter them.
- WRITE the surface wind (magnetic or true, depending on the airport reference) into the scratchpad and enter it.

Note : – At each wind entry, the descent profile is recomputed, therefore it is recommended to enter all winds, temperature and QNH at the same time to minimize recomputation time.

CONSTANT MACH SEGMENT

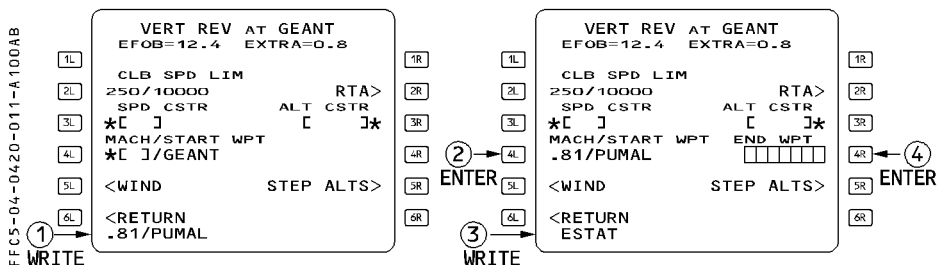
GENERAL

The pilot can enter the start and end points of a constant Mach segment, and its associated Mach number from the VERT REV page.

Only one constant Mach segment may be defined in the active flight plan, and only one in the secondary flight plan. No constant Mach segment can be defined in the alternate flight plan.

ENTERING A CONSTANT MACH SEGMENT

- SELECT the F-PLN key on the MCDU.
- SELECT VERT REV at a waypoint.
(except destination and alternate flight plan waypoint).
- WRITE the Mach/start waypoint pair.
It is possible to enter only the Mach or the waypoint. But, for the first entry, a Mach entry is mandatory.
The waypoint must be located in front of the aircraft and must be part of the cruise.
- ENTER it in the 4L field
The END WPT prompt appears in the 4R field.



- WRITE the end waypoint
The end waypoint must be part of the cruise.
- ENTER it in the 4R field