B737 NG CBT - FMS - PREFLIGHT

COURSE OUTLINES

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COURSE START

1-The material contained in this training program is based on the information obtained from current national, international and company regulations and it is to be used for training purposes only. At the time of designing this program contained then current information. In the event of conflict between data provided herein and that in publications issued by the authority, the authority shall take precedence.

FLIGHT MANAGEMENT SYSTEM- PREFLIGHT

2-This section describes the FMS operation and pilot's tasks during preflight. Here is the outline: * Overview * Identification page * Position initialization page * Route page * Performance initialization page * N1 limit page * Takeoff reference page * Departure/Arrival index page * Change of performance data after V speed entry * Menu page

OVERVIEW

3-During preflight, the flight crew must initialize the FMC with the entry of required and optional preflight data to ensure the most accurate performance possible. If available, the data link can also be used to load the FMC preflight data from the airline ground station.

4-The preflight data is entered or confirmed via CDU pages in the following sequence: identification page, position initialization page, route page, performance initialization page, N1 limit page and takeoff reference page.

5-A prompt in the lower right of the display helps you move through the appropriate CDU pages to satisfy the minimum requirements for the preflight completion.

6-You can also use the initialization/reference index page to access the preflight pages as well as other FMC pages. You push the key beside the IDENT, POSITION INITIALIZATION, PERFORMANCE INITIALIZATION, TAKEOFF REFERENCE, APPROACH or OFFSET prompt to select the related page.

7-The Navigation Data prompt normally lets you show the REFERENCE NAVIGATION DATA page which can be used to review information about waypoints, navaids, airports and runways.

8-On the ground, you can also use the NAVIGATION DATA prompt to display the SUPPLEMENTAL NAVIGATION DATA page. To do this, type SUPP in the scratchpad and then push the key next to the NAVIGATION DATA prompt. Now, the SUPPLEMENTAL NAVIGATION DATA page appears on the display.

9-The MAINTENANCE prompt shows only when the airplane is on the ground. The key beside the prompt is used to access to maintenance pages for maintenance use.

10-When the airplane is in the air, the MAINTENANCE prompt is replaced by the NAVIGATION STATUS prompt. This allows you to select the NAVIGATION STATUS page to see the status of navigation aids being tuned by the FMC when needed.

11-In some versions, the INITIALIZATON /REFERENCE INDEX page has an ALTERNATE DESTINATION prompt. The key next

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to prompt directs you to the page used for alternate airport planning and diversions.

12-Now let's take a look at the FMS normal preflight sequence in detail.

INDENTIFCATION (IDENT) PAGE

13-Preflight begins with the IDENT page. You use the IDENT page to verify the FMC operational flight program and data base number and validity.

14-After a normal power–up, the FMC shows the IDENT page. You can also access the IDENT page from the FMC prompt on the MENU page or from the IDENT prompt on the INITIALIZATION/REFERENCE INDEX page.

15-The data Line 1 left shows the airplane model. The W after the airplane model indicates that the airplane has winglets.

16-The Line 2 left indicates the navigation data base identification number loaded in the FMC. The FMC operational program software part number and the update version is displayed in Line 4 left.

17-The first data line to the right shows the engine thrust rating. Make sure airplane the MODEL and ENGINE RATING are correct.

18-If a valid performance database is not loaded into the FMC, MODEL and ENGINE RATING data lines are blank. MODEL/ENGINE DATA INVALID alerting message shows in the scratchpad. Contact maintenance personnel to take corrective action.

19-The second and third data lines on the right show the effective dates of the active and inactive navigation databases.

20-In this example the active database can be used from October 30 to November 27. The inactive database is valid between November 28 and December 26.

21-You must check to see if the date range of the active database is valid.

22-If the active database is out of date, the CDU alerting message NAVIGATION DATA OUT OF DATE shows in the scratchpad. You should exchange the dates on the active and inactive database lines.

23-To exchange the dates, clear the scratchpad.

24-Make a copy of the inactive database date into scratchpad.

25-Then transfer this date to the active database line. The previous active date moves down to the inactive date line.

26-You can change the navigation database only on the ground. Changing the navigation database removes all previously entered route data.

27-You may wonder what happens if an active navigation database expires in flight. In this case, the expired database

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continues to be used until the active date is changed after landing.

28-The fifth data line on the right shows the effective date of supplemental navigation data. The line is blank if there is no supplemental data.

29-The key beside the INDEX prompt lets you access to INITIALIZATION/REFERENCE INDEX page.

30-When you are done with the IDENT page, you select the position initialization page. Now, it is time to see the position initialization page in detail.

POSITION INITIALIZATION PAGE

31-The position initialization page lets you set the airplane initial position for the IRS alignment and FMC initialization.

32-The page is the first of three position pages. Thus, it is also used to access to the POSITION REFERENCE and POSITION SHIFT pages which are discussed in different section.

33-The position initialization page also displays GPS time and date. If the GPS time is not valid, the display shows 0000.0 Zulu when the FMC is first powered. The MONTH/DAY is blank.

34-On the position initialization page, the LAST POSITION line shows the last computed position of the FMC when it was shut down at the end of the previous flight.

35-When the ICAO identifier of the current airport is entered in the reference airport line, the FMC displays the latitude and longitude of the airport reference point if it is in the navigation database.

36-You can enter the gate identifier to show the gate coordinates. It helps you to further refine the initial position.

37-You must select the most accurate position for the IRS alignment. In this scenario, the gate position is the most accurate.

38-Make a copy of the gate position into scratchpad. Then put it in the SET IRS POSITION data line. The IRS can now complete the alignment.

39-The initial position can also be entered manually. In this example the gate identifier is not available, but you know the latitude and longitude position of the airplane.

40-Write the latitude and longitude letters, numbers and decimals on the scratchpad. Do not use the space key. Now enter the coordinates in the SET IRS POSITION data line. This completes the position initialization page.

ROUTE PAGE

41-The route page lets the flight crew enter the route into the FMC.

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42-The route is entered manually. However, it may also be uplinked on an ACARS message, if the airplane has the datalink capability. In these airplanes, the route page also shows FLIGHT PLAN REQUEST prompt. The key next to the prompt is used to transmit a request for a flight plan route uplink.

43-With the position initialization page completed, push the line select key next to the ROUTE prompt. The first route page shows and the message light illuminates because LTBJ is in the scratchpad.

44-The FMC automatically copies the reference airport identifier from the position initialization page to the route page. This may save time when you enter the route.

45-The route is entered and displayed in air traffic control format. Let’s put in a sample flight route from IZMIR to ISTANBUL ATATURK airport.

46-Start with the departure airport. Enter ICAO identifier LTBJ in the ORIGIN line. The message light extinguishes. The RUNWAY line title shows on the display.

47-Enter the ICAO identifier for ISTANBUL as the DESTINATION. Note that if the FMC does not contain the data for the entered identifier, the NOT IN DATA BASE message appears on the scratchpad.

48-The Line 2 Left is used to enter a route defined by the company. The company route will be discussed later

49-Now enter the flight number. The flight number shows on the PROGRESS page title line.

50-Type runway number in the scratchpad and put it in the runway line. The runway entry is removed upon takeoff.

51-In some models, with the origin airport identifier entered, an alternate destination prompt shows on the page. The line select key next to the prompt lets you access to the first ALTERNATE DESTINATIONS page.

52-With the first route page completed, push the NEXT PAGE key to show the next route page which is used to enter the route segments.

53-Each route segment is entered in the VIA column as AIRWAY and DIRECT great circle path. The end waypoint of the related route segment is put in the TO column. If you enter the end waypoint first, the corresponding VIA data line automatically shows DIRECT.

54-Other valid route segment entries are the procedures which are discussed later.

55-In our example, the first end waypoint is a direct to waypoint. Write the waypoint identifier in the scratchpad and enter it in the TO column. DIRECT is automatically put in the VIA column.

56-Now, enter the second route segment, which is the upper airway UG80, in the next VIA data line. The box prompts are displayed in the TO column.

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57-To complete the segment, enter the segment's end waypoint in the box prompt under the TO column.

58-With the last route segment and waypoint put in, the route entry is completed. The route is in, but it is not active yet and is still shown in cyan on navigation display.

59-You must activate the route in two steps. First select the line select key next to the ACTIVATE prompt. The EXECUTE light illuminates.

60-Then push the Execute key to make the route active. The route title line shows ACTIVE and the route changes to magenta on the navigation display.

61-The company route data line can also be used to enter the flight plan

62-The company route can include origin and destination airports, departure runway, route data, SID, and STAR. The route is defined by an identifier.

63-When you enter the company route identifier, all route data is automatically entered. However, runway and SID may be left out because of probable runway change.

64-With the route page completed and activated, you can move to the PERFORMANCE INITIALIZATION page.

PERFORMANCE INITIALIZATION PAGE

65-The performance initialization page lets you enter data to initialize the FMS for performance calculations which are used to manage the vertical navigation

66-The performance data may be entered manually or uplinked with an ACARS message if the airplane has the data link capability. In this case the page also shows PERFORMANCE INITIALIZATION REQUEST prompt which points the key to transmit a request for a PERFORMANCE INITIALIZATION uplink.

67-The performance initialization page appears with some data already been displayed

68-The page initially shows the default cruise center of gravity. Entry of actual cruise center of gravity may revise the maximum altitude capability.

69-The page also automatically shows the fuel on board as received from the airplane fuel quantity indicating system. Ensure that fuel quantity displayed agrees with the fuel quantity indicators.

70-The PLAN fuel entry lets you put in planned trip fuel quantity before actual fuel quantity is known. This allows performance calculations during airplane refueling. The entry is blanked when the flaps are extended or when the airplane is in the air.

71-The transition altitude data line shows the altitude where the FMC changes to standard barometric reference.

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72-The default value is 18000 feet. You may enter another value. It will change automatically if the departure procedure has a different transition altitude

73-Let's enter this dispatch data in the performance initialization page.

74-You may enter the airplane gross weight or zero fuel weight. Normally the zero fuel weight is entered first from the dispatch paperwork and the FMC computes the airplane gross weight. This allows the FMC to make performance calculations more accurately.

75-Alternately, you may enter the gross weight first; then the FMC calculated zero fuel weight will show automatically.

76-Let's enter the zero fuel weight. First divide the number by 1000 and type it on the scratchpad. Next, load the data into the zero fuel weight data line. The FMC calculated gross weight is automatically displayed.

77-After dividing it 1000, enter the reserve fuel in the RESERVES line.

78-The cost index is another entry to be made on this page. The cost index is a number which shows the effect of fuel cost on the overall trip cost as compared to other time-related operating costs.

79-The cost index is intended to help the company reduce operating costs. When the fuel costs are high compared to other operating costs, the company normally prefers to use lower cost index.

80-The FMC uses the cost index to calculate the economy climb and cruise speeds.

81-The range of the cost index for B737-800 is from 0 to 500. Entering zero for the cost index will result in maximum range airspeed and minimum trip fuel. Conversely, if the maximum value for cost index is put in, the FMC ignores the cost of fuel and uses maximum flight envelope speeds to provide minimum trip time. In practice, neither of the extreme CI values is used

82-Let's go back to our example. The company defined cost index value is supplied by the dispatch. Enter the cost index in the corresponding data line.

83-FMC now calculates and displays the recommended trip altitude.

84-The trip altitude is the most economical altitude for the minimum cruise time. It is intended to provide you with a reference to select the planned cruise altitude. Note that trip altitude is computed and shows only after the origin and destination airports, gross weight and cost index have been set.

85-Now, enter the cruise altitude in the scratchpad and move it to corresponding data line. The cruise altitude automatically shows on the CLIMB, CRUISE, and ROUTE Legs pages.

86-When all data lines with boxes are complete, the execute light comes on. The data is not active until you push the

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Execute key. Let’s continue to put in other data to improve the FMC performance computations before activating the page.

87-Enter the forecast cruise wind direction and speed from the dispatch data. If no entry is made, the FMC assumes zero wind for preflight predictions.

88-Now, enter ISA deviation for top of climb altitude. The FMC automatically computes and show the top of climb outside air temperature.

89-With the data entry completed, push the Execute key. The title line shows ACTIVE. This completes the performance initialization page preflight. Before moving to the N1 page, let’s take a look at second performance initialization page.

90-You push the next page key to show the second performance page, which is the performance limits page. This page lets you set performance limits affecting REQUIRED TIME OF ARRIVAL, or RTA, and ECONOMY functions.

91-The TIME ERROR TOLERANCE data field is related to required time of arrival function. It lets you enter the time error tolerance for arriving at a flight plan waypoint. This tolerance is used by the FMC to calculate a speed target to achieve the time constraint.

92-The default value of time error tolerance is 30 seconds. Valid entry range is from 5 to 30 seconds.

93-The minimum and maximum speed limits for each phase of flight in both RTA and ECONOMY modes are also displayed or can be entered in this page. In this example, the page shows the default values for lower and upper limits

94-Let’s go back to performance initialization page and continue with the FMC preflight. Push the key next to N1 limit prompt to show the N1 limit page

N1 LIMIT PAGE

95-During preflight, the N1 LIMIT page is used to set the takeoff and climb thrust limits.

96-The outside air temperature is normally put in by the FMC; but it can also be entered manually. Manual entry is displayed with large characters.

97-The entry of the outside air temperature lets the FMC calculate takeoff N1 limits for normal or reduced thrust takeoff, which is displayed in the upper right data field.

98-The page allows you to select either full rated or reduced thrust limits for takeoff and climb. The ACTIVE prompt in large font shows the selected takeoff thrust. Similarly, the SELECTED prompt shows the selected climb thrust.

99-The key next is the TO prompt is used to select the maximum takeoff thrust. Data line title displays full rated thrust. When a takeoff thrust is selected, the FMC always selects the highest possible climb thrust. This prevents a throttle push

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at transition from takeoff thrust to climb thrust. Thus selection of TO automatically selects the maximum rated climb thrust

100-You can perform takeoff with reduced thrust in situations where takeoff can be executed without the need for full engine power.

101-You can use two methods to perform a takeoff with reduced thrust: The derated thrust method and assumed temperature method.

102-The derated method is a certified takeoff thrust rating that is lower than the maximum rated takeoff thrust.

103-The N1 limit page offers two levels of derated thrust. You can select either derated 1 or derated 2 to perform the takeoff at a preset reduced thrust limit. The data line title shows the corresponding reduced thrust rating.

104-Normally, selecting TO–1 automatically arms CLIMB–1 and selecting TO–2 automatically arms CLIMB–2 derated thrust.

105-Alternately you can use assumed temperature thrust reduction for takeoff. Let’s see how you can achieve this.

106-An approved takeoff performance data is necessary to use the assumed temperature method. In this example, the outside air temperature is 20°C, no wind is present and the takeoff weight is 72 500 kilograms. You should select an assumed temperature that is higher than the outside air temperature for reduced thrust takeoff. The takeoff performance datasheet indicates that you may select an assumed temperature up to 40°C which is the temperature corresponding to your takeoff weight.

107-Let’s put an assumed temperature of 34°C in the SELECTED TEMPERATURE line. With an assumed temperature higher than outside air temperature entered, the FMC computes and shows a lower takeoff N1 value for each engine. The takeoff N1 data line title shows RED. Note that the thrust reduction provided by the assumed temperature is limited to 25% from the full rated thrust, or from a derated thrust.

108-When reduced takeoff thrust is selected either by derated or assumed temperature, the FMC commands a reduced takeoff thrust to the autothrottles. The thrust mode display shows R-TO to indicate that the reduced takeoff thrust is selected.

109-When you delete the assumed temperature, the full rated takeoff thrust is automatically selected. The thrust mode display shows TO to indicate that full rated takeoff thrust is selected. With the full rated takeoff and climb mode set, let’s move to takeoff reference page.

TAKEOFF REFERENCE PAGE

110-The takeoff reference page is the last page that you must make entries for the completion of the normal FMC preflight.

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111-The page shows the active takeoff thrust computed by the FMC. As you remember, in our example, full rated takeoff thrust has been selected in the N1 limit page; thus, the same takeoff thrust data shows on this page.

112-The takeoff reference page also automatically shows the current airplane gross weight.

113-The departure runway from the route page is automatically shown on the page.

114-With the runway remaining distance not entered and the GPS UPDATE OFF, the FMC updates to the runway threshold when the TO/GA switch is pushed.

115-If the runway remaining distance is entered and GPS UPDATE is OFF, the FMC updates to the runway length remaining when the TO/GA switch is pushed

116-Now let’s enter the dispatch data in the takeoff reference page. Enter the takeoff flap setting. Allowable manual entries are flaps 1, 5, 10, 15, or 25.

117-Entry of the flap setting allows the FMC to compute the V speeds based on the current gross weight and, if selected, based on assumed temperature.

118-The FMC calculated V speeds show in small font under the QRH prompt. The line select key next to SELECT QRH OFF prompt can be used to remove the FMC computed V speeds from the display.

119-When the SELECT QRH OFF key is pushed, the FMC computed V speeds disappear from the display. You push the key again to show the V speeds.

120-You can enter a V speed in two ways. To enter an FMC computed V speed, you just push the line select key next to the related V speed. If you need to enter a V speed other than FMC computed V speed, you must first type it on the scratchpad and then move it to the corresponding V speed data line.

121-In our example, the V speeds on the dispatch sheet are the same as the FMC computed V speeds. Let’s enter the V1 speed. Push the line select key adjacent to V1 speed data line. The V1 speed is displayed in large font under the V1 line title. The airspeed indication now shows the V1 speed. You may also enter V speed other than calculated by the FMC.

122-Other V speeds are entered in the same way. The takeoff weight data field shows the gross weight that corresponds to the entered V speeds.

123-Now put in the center of gravity. With the center of gravity entered, the FMC calculates and displays the stabilizer takeoff trim setting.

124-The INDEX prompt stays in view to indicate that all required preflight entries are made and the FMC preflight is complete.

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125-If the required preflight entries are not complete, the related page title replaces the INDEX prompt. In this example the performance initialization page is not complete.

126-Push the line select key to show the performance initialization page. The Execute light is on and the data has not been activated. Push the Execute key.

127-Now, go back to the takeoff reference page to see if the FMC preflight is complete. The page shows the INDEX prompt, thus the FMC preflight is complete.

128-The second takeoff reference page incorporates several optional entries that you can use to refine the FMC performance computations.

129-You can enter surface wind direction and speed here.

130-The data line below RUNWAY SLOPE/HEADING prompt lets you put in the runway slope. The slope is entered as a percentage either U or + for up or D or – for down slopes from the runway threshold. The HEADING displays runway heading for the origin airport.

131-You can select the runway conditions for dry, wet and skid resistant runways from the upper right data line. The active condition is highlighted.

132-The SEL/OAT prompt that shows on N1 LIMIT page is also displayed in this page; so you may enter the outside air temperature or an assumed temperature for a reduced thrust takeoff from this page. The adjacent data line on the right shows the active takeoff thrust.

133-The THRUST REDUCTION prompt lets you select an altitude at which the autothrottle reduces from takeoff thrust to climb thrust. The climb thrust setting as selected on N1 LIMIT page is displayed here.

134-The default thrust reduction altitude is 1500 feet and is indicated in small characters.

135-The allowable manual entries are from 800 feet to 9999 feet above ground level and displayed in large characters.

DEPARTURE/ARRIVAL INDEX PAGE

136-The Departure Arrival index page is a supplementary preflight page with no automatic prompt. However, you may need to use the page during preflight when the route includes SIDs and STARs.

137-You use the departure arrival function key to access to the departure arrival index page. The page lets you view the departure and arrival data for the origin and destination airports of each route.

138-The upper left departure prompt is used to show the departures page for the origin airport. The upper right arrival prompt lets you access to arrivals page for the origin airport. You use this prompt if a turn-back is required.

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139-This arrival prompt is used to display the arrivals page for destination airport.

140-The page also provides access to departure and arrival data for other selected airports from the navigation data base.

141-With the ICAO identifier of an airport other than origin and destination entered in the scratchpad, push either departure or arrival line select key. The departure or arrival data for the related airport shows. You can view the displayed data, but not select it.

142-Here, we discuss the departure page from the origin airport. The arrival page for the destination airport is discussed in a different lesson. Push the departure line select key to show the departure page for the origin airport.

143-The departures page lets you select the departure runway, standard instrument departure, or SID, and the transition for the route origin airport.

144-The SIDS column shows an alphabetical list of the SIDs for the origin airport. The RUNWAYS column displays a numerical list of the runways for the origin airport.

145-In this example, your flight plan contains a departure procedure with no transition.

146-You enter the origin and destination airport, flight number and departure runway as you did before.

147-Now push the departure/arrival key to show departure arrival index page. From this page, go to the LTBJ departure page.

148-The page shows select prompt next to the runway selected on the route page. Now select the departure procedure for your flight. The SID is selected but not active yet.

149-Use the ROUTE prompt to return to route page and then select next page. The selected SID is displayed as the first route segment in the VIA column. The TO column shows the end waypoint of the SID.

150-With the entry of the other segments complete, execute the route.

151-Now, suppose that you need to enter a SID to the first end waypoint after the route has already been executed.

152-Push the departure/arrival key to show departure arrival index page and select the LTBJ departure page as you did before

153-The page now shows the active prompt next to the departure runway selected on the route page. Select the departure procedure. The Execute light illuminates when you are about to modify the route.

154-The navigation display shows modifications as white dashes.

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155-The word MOD appears in the page title on the route pages.

156-An ERASE prompt comes into view. This prompt lets you remove all modifications and restore the original route.

157-Push the line select key adjacent to the erase prompt. The route modifications are erased. The Execute light extinguishes. Now, select the departure procedure again.

158-Select the route prompt and then show the number 2 route page. Direct to BERGO is replaced by the selected SID. Execute the modification.

ENTRY OF RTA AT A WAYPOINT

159-The Required Time of Arrival, RTA, function provides a speed target to satisfy a time constraint entered at a flight plan waypoint or destination airport.

160-To activate RTA function at a waypoint, you use the RTA PROGRESS page. The RTA PROGRESS page can be accessed either from the PERFORMANCE LIMITS page or by selection of the PROGRESS function key on the CDU.

161-Let’s enter RTA function at waypoint TRON. With the waypoint identifier put in the scratchpad, push the line select key next to RTA WAYPOINT line. You can initiate RTA function only at waypoints in the flight plan. Otherwise, the CDU message NOT IN FLIGHT PLAN is displayed.

162-Now, enter BIG in the RTA waypoint line. With a valid RTA waypoint entered, the page title shows MODIFIED and the EXECUTE light illuminates.

163-Execute the modification. The required time of arrival line initially displays current ETA based on the active flight plan and performance parameters at time of waypoint entry.

164-Let’s enter desired RTA at the selected waypoint. If you want to specify an arrival time of at or after, put letter A after RTA. Entry of B after RTA specifies arrival time of at or before.

165-Put the arrival time in the RTA line. Then, execute the modification. The RTA function is now set for the related waypoint.

166-The page shows the recommended takeoff time or brake release time to meet the planned RTA.

167-The GMT data line shows the current GMT.

168-This line displays distance to, predicted altitude and estimated time of arrival at the RTA waypoint. The FMC computes the estimated time of arrival based on immediate takeoff, MINIMUM/MAXIMUM speeds on PERFORMANCE LIMITS page and entered forecast winds.

169-The TAKEOFF WINDOW shows the latest takeoff time to satisfy the RTA.

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170-If you have entered an arrival time of “At or After”, the window would display only the FIRST field.

171-On the other hand, if the entered RTA time is “At or Before”, like in this example, only the LAST field is displayed.

172-The TIME ERROR line shows the current time error at the RTA waypoint in minutes and seconds.

173-The line displays ON TIME when GMT is within present TAKEOFF WINDOW.

174-EARLY or LATE is displayed as appropriate when GMT is not within current TAKEOFF WINDOW.

CHANGE OF PERFORMANCE DATA AFTER V SPEED ENTRY

175-After the V speeds have been put in, if you change the takeoff thrust on the N1 LIMIT page, the FMC automatically removes the previously entered V speeds. NO V SPEED flag shows on the airspeed indication. In this case enter the V speeds again as needed.

176-With the V speeds already entered, if you change gross weight, zero fuel weight or plan fuel, the previously selected V speeds must be verified.

177-In this example, the zero fuel weight is changed after the V speeds have been selected. A scratchpad message VERIFY TAKEOFF SPEEDS is displayed.

178-In addition, the previously entered V speeds are displayed in small characters and REJECT and ACCEPT prompts appear on the TAKEOFF REFERENCE page.

179-To accept the previous V speeds, push the line select key next to the ACCEPT prompt. The V speeds now show in large characters.

180-To reject the previous V speeds, push the line select key next to the REJECT prompt. The previous V speeds are removed. Now you can enter new V speeds.

MENU PAGE

181-The MENU page lists the different systems which can be accessed through the CDU. You push the key beside the name of a subsystem to select that subsystem.

182-The active system is indicated by the ACTIVE label next to the system title. When a subsystem requires use of the CDU, a request label appears next to the subsystem title. You can place a subsystem on hold temporarily by selecting HOLD line select key.

COURSE END

183-End of course. ?

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