Attachment 7

Operational Factors Group Chairman's Factual Report

DCA00MA030

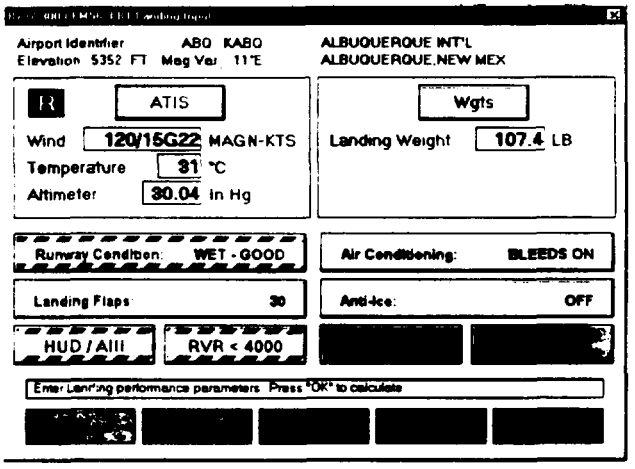
Onboard Performance Computer (OPC), Landing Performance

Landing Performance Module

The Landing Performance module allows input of configuration and condition data for computation of landing distance, speeds, and power settings for the actual landing weight.

After selecting "Landing Performance" from the Module Menu, the Airport Directory will appear.

- Scroll to and select the arrival airport.
- Click "OK" to continue to the Runway Directory.
- Click on the runways to be considered for landing.
- Enter NOTAM data, if necessary
- Click "OK" to continue to the ATIS Input screen.
- Enter ATIS information.
- Verify all entries and click "OK" to accept and return to Landing Input screen.



- Click on the "Wgts" button to display the Landing Weights Input screen and enter the anticipated landing weight. Click "OK" to return to the Landing Input screen.

To input the anticipated runway condition and aircraft configuration, simply click on the appropriate buttons to toggle through the available selections. Anytime a toggle button is displaying anything other than the default configuration, the button will be highlighted with hash-marks.

Runway Condition: Toggle to the reported runway condition. If other than DRY is selected, all other WET selections are for braking action only.

Landing Flaps: Toggle to the flap setting that will be used or the NON-NORMAL landing configuration.

Landing Performance

The Landing module provides advisory landing distance information for both normal and abnormal flap configurations. In addition, it provides go-around climb performance, maximum quick turn limitations and determines if there is a landing restriction due to a low RVR.

The Landing module should be used anytime landing performance capabilities (approach climb and/or maximum quick turnaround limitations) are in question and include (but are not limited to) the following landing conditions:

- Abnormal Landing Configurations
- Tailwind
- High gross weight
- High density altitude airport
- High temperature
- Wet or cluttered runway
- RVR < 4000 feet on runways shorter than 6500 feet
- Short runway
- Takeoff or landing at an airfield other than planned landing field.

Approximate Landing Distance

The landing distances are based on the stopping distances provided in the AFM for minimum, medium, and maximum autobrake settings. An increment of 1500 feet is added to account for the distance required to cross the threshold at 50 feet, flare, and touchdown. Since the AFM autobrake data are provided as guidance material and since the air distance is based on operational experience, the total distances calculated and displayed by the Onboard Performance Computer are approximate. It is important to note that there are no conservative pads provided in these distances; therefore, any touchdown beyond 1500 feet from the runway threshold will cause a corresponding increase in the total landing distance. The distance for MAX braking is based on maximum manual braking at touchdown without the use of thrust reversers.

Dispatch Landing Performance

Compliance with dispatch landing performance requirements must be demonstrated prior to takeoff. An airplane is not permitted to depart if its anticipated weight upon arrival at the landing airport is greater than that weight which satisfies the field length and climb requirements described below. The predicted enroute fuel burn is added to the computed maximum allowable landing weight in order to establish a landing performance-limited takeoff weight. This calculation is normally performed by the aircraft dispatcher and the result is presented on the Flight Release as the ATOG. The ATOG must be entered into the Onboard Performance Computer in order for the dispatch landing requirements to be properly considered when computing the maximum allowable takeoff weight.

Field Length Requirements

Field length requirements are established to ensure that the airplane can safely land with the most critical engine inoperative.

The landing field length-limited weight for dry runway conditions is the maximum weight for which the total distance required to cross the runway threshold at a height of 50 feet and a speed of 1.3 times V_{STALL}, flare, touchdown and come to a complete stop (without the aid of thrust reversers) is not more than 60% of the available landing distance.

The landing field length-limited weight for wet runway conditions is the maximum weight for which 115% of the total distance required to cross the runway threshold at a height of 50 feet and a speed of 1.3 times V_{STALL}, flare, touchdown and come to a complete stop (without the aid of thrust reversers) is not more than 60% of the available landing distance.

When establishing the landing field length-limited weight, the distance requirements described above must be satisfied for the following two landing distances:

1. Most favorable runway

   The most favorable runway is the runway at the destination airport with the longest available landing distance. The weight limit for this runway is computed with no wind.

2. Most suitable runway

   The most suitable runway is the most probable landing runway based on the forecast conditions at the landing airport. The weight limit for this runway is computed using the forecast wind component.

The dispatch landing module of the Onboard Performance Computer automatically considers both landing field length requirements for each selected runway. If the maximum allowable landing weight is based on the most favorable runway, then the computer will display a limitation code of "MFAVR". If the maximum allowable landing weight is based on the most suitable runway, then the computer will display a limitation code of "RUNWY". These codes are displayed on the Dispatch Landing Output screen.