EFFECTIVITY:ON EMBRAER 505 ACFT WITH RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM

Introduction

The ROAAS (Runway Overrun Awareness and Alerting System) is an alerting system, hosted by each of the display units, with the function of reducing risk of overrun during landing phase of flight. The function generates audio and visual annunciations to help the flight crew maintain situational awareness and avoid potential runway excursions during landing.

The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - OVERVIEW provides further data on the preceding text.

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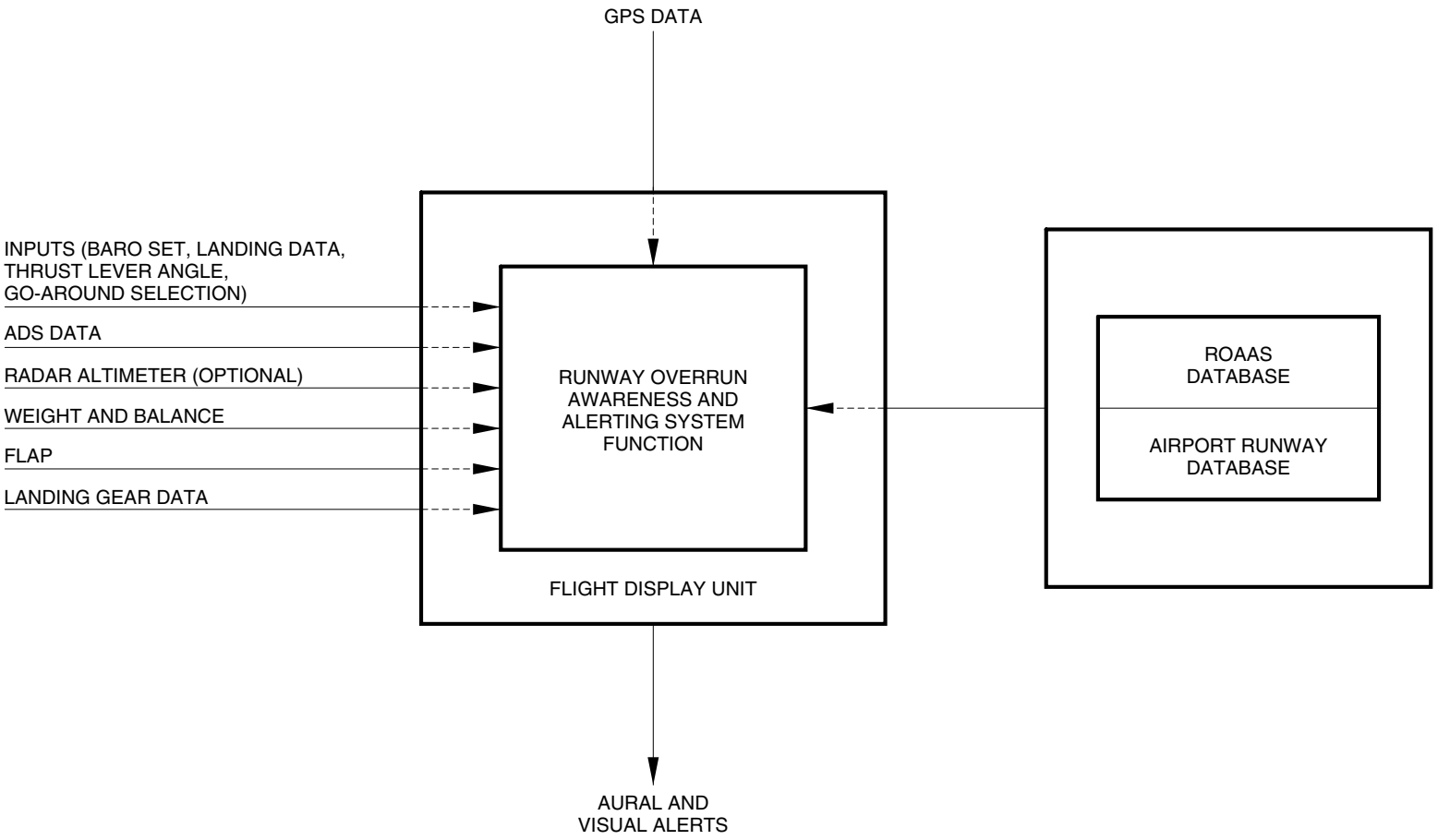

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - OVERVIEW

General Description

When the aircraft is in air, the ROAAS calculates the total landing distance, and, when it is on ground, it calculates the distance remaining until the aircraft stop. At this phase, the go-around is not available.

This functionality is hosted by each of the display units and does not require the installation of any additional equipment in the aircraft. All the information used as input is originated from baseline equipment.

The main inputs information for this function are:

- GPS (Global Positioning System) DATA
- ADS (Air Data System) DATA
- WEIGHT AND BALANCE DATA
- FLAP SELECTION
- LANDING GEAR DATA
- AIRPORT DATABASE
- RAD ALT (Radar Altimeter) SYSTEM DATA (OPTIONAL)

The data related to the landing information and performance are entered by the flight crew using the touch screen controllers, and this information is available to the display units via HSDB (High Speed Data Bus).

The GPS data and all the flight data necessary for the functionality computations are received by the display units from the GIA (Garmin Integrated Avionics unit)s, through HSDB.

Whenever the conditions are met to trigger ROAAS related aural warning or caution, each GIA receives the corresponding instruction from the display units through the HSDB. The GIA plays the corresponding audio clips, which are sent to the audio processors and then routed to the pilots headsets and cockpit speakers, when enabled.

ROAAS function must be unlocked every time the software/ configuration of the Avionics Integrated system or the software/ configuration of the Flight Display Units is updated (AMM TASK 34-46-00-470-801-A/200). Also, ROAAS function requires an installation of an specific database.

The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - BLOCK DIAGRAM provides further data on the preceding text.

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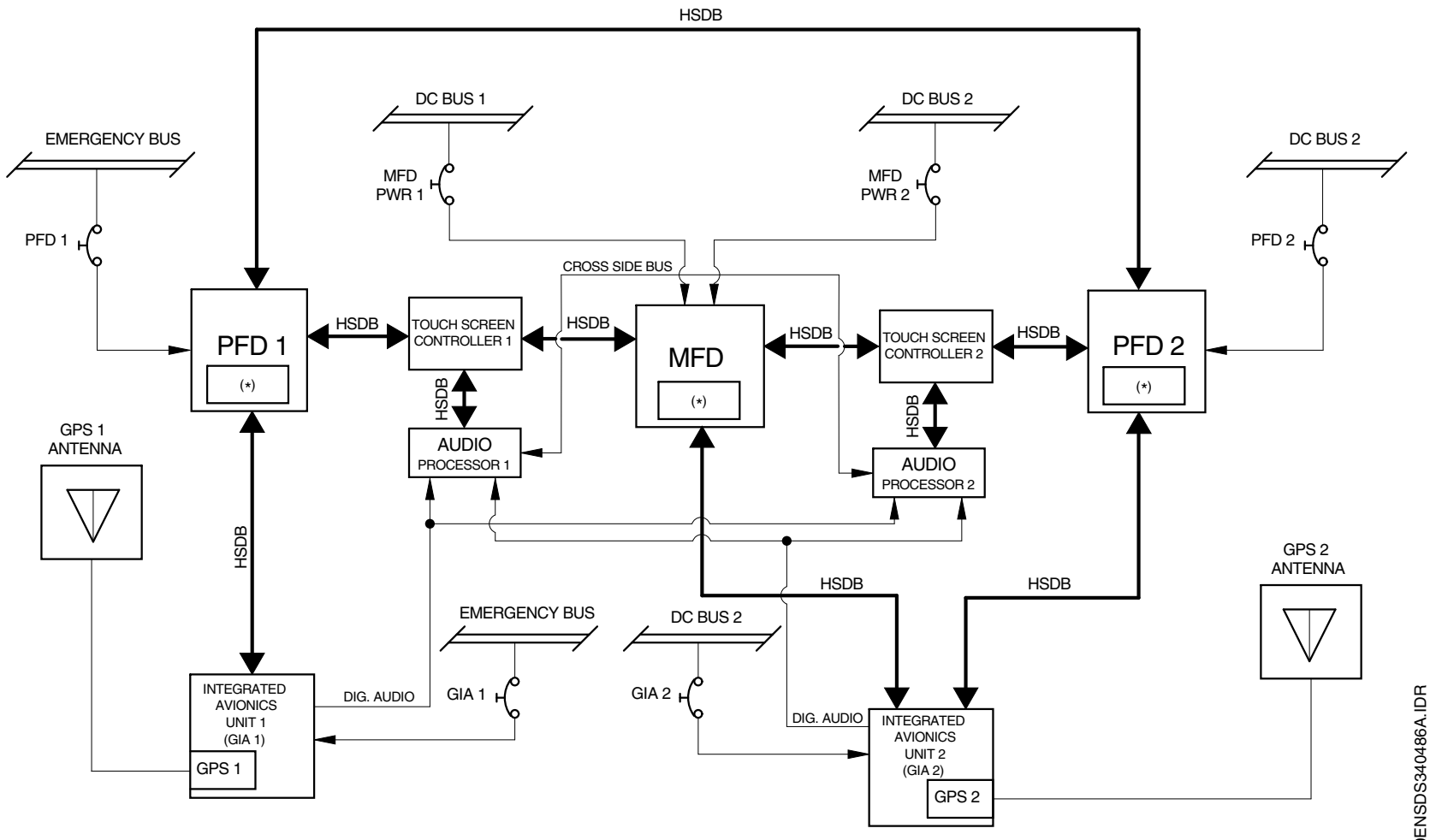

(*) RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM FUNCTION.

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - BLOCK DIAGRAM

CONTROLS

Both data entry and inhibition control are done through the touch screen controllers.

Entry of data, which is required for the functionality proper operation, is done through the "LANDING DATA" page.

Landing information (airport/runway), as well as performance data (weather for runway condition and BARO pressure source), are entered on the touch screen controllers. These data are available to the display units through the HSDB.

The interfaces used for the entry of airport and runway information are the same already used by the FMS (Flight Management System).

The inhibition control is located through the touch screen controller "AVIONICS SETTINGS" page.

The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - CONTROL INHIBITION provides further data on the preceding text.

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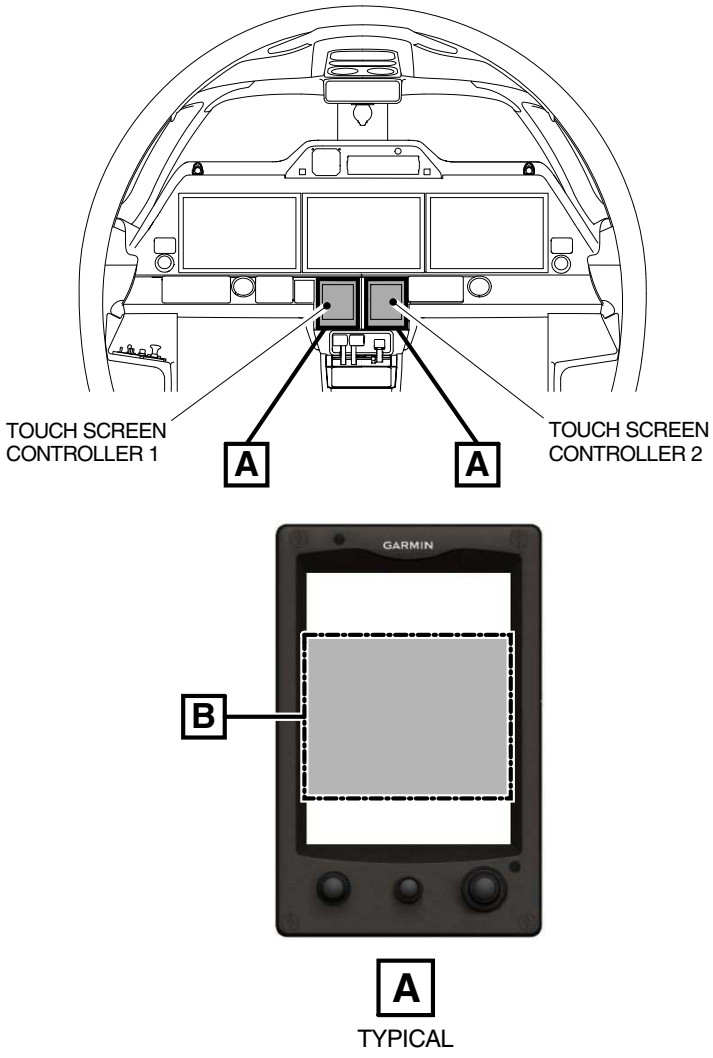

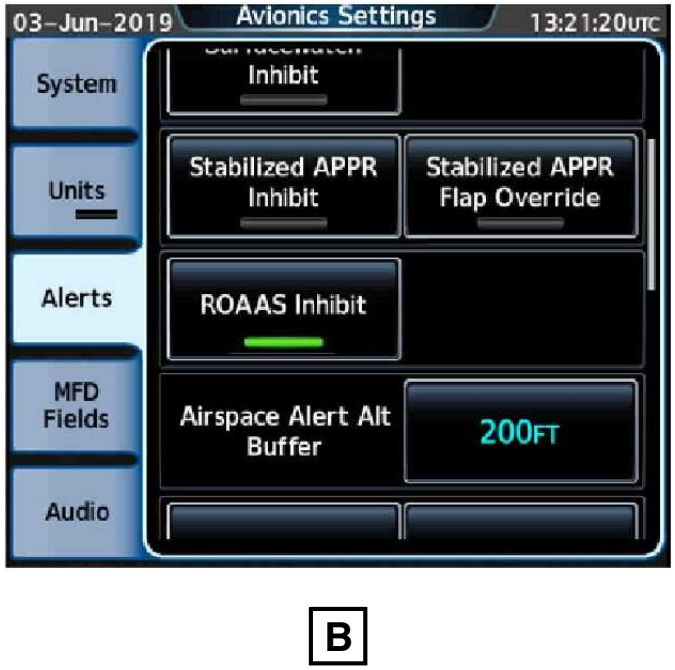

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RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - CONTROL INHIBITION

INDICATIONS - ALERTS ANNUNCIATIONS

The ROAAS provides alerts that are generated to notify the flight crew of potentially unsafe situations.

The alerts are displayed on the PFD (Primary Flight Display) on the bottom left side of the ADI (Attitude Director Indicator).

Each of the 4 alerts has a corresponding aural alert and a particular meaning.

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - ROAAS VISUAL AND AURAL ALERTS

VISUAL ANNUNCIATION	TYPE	AURAL ALERT	DESCRIPTION
OVERRUN (RED COLOR)	WARNING	“Overrun, go around. Overrun, go around”	When the aircraft is between 100 ft and 30 ft above the runway threshold and the predicted stop position is beyond the runway end available for landing. The minimum altitude value limit is 5 ft when the overrun is preceded by long flare.
OVERRUN (RED COLOR)	WARNING	“Overrun, brakes. Overrun, brakes”	When the aircraft is on the ground and the predicted stop position is beyond the runway end available for landing.
OVERRUN (YELLOW COLOR)	CAUTION	“Caution, overrun. Caution, overrun”	When the aircraft is between 500 ft and 100 ft above runway threshold and the predicted stop position is beyond the runway end available for landing.
LONG FLARE [1] (YELLOW COLOR)	CAUTION	“Long flare. Long flare”	When the flight crew performs a flare longer than expected for a normal approach and the remainder runway distance available is still sufficient for a safe landing.

[1] For aircraft with RAD ALT system.

The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - INDICATION provides further data on the preceding text.

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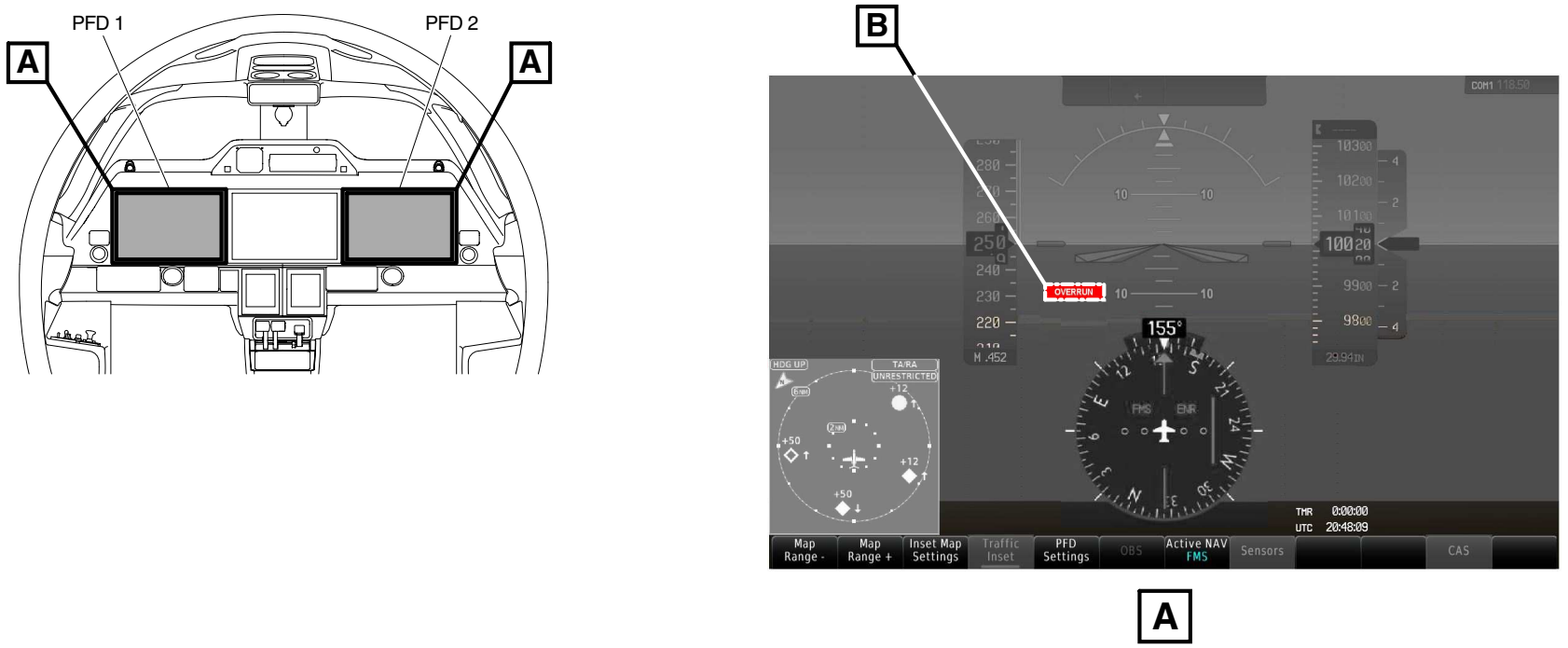

01 ON AIRCRAFT WITH RADAR ALTIMETER SYSTEM

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - INDICATION

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Components

ROAAS runs on integrated avionics system platform and is processed inside the flight display units, without the need of any dedicated hardware.

The ROAAS database information is installed on the flight display units.

This function is optional and it is necessary to unlock it on the Avionics Integrated system.

The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - Components provides further data on the preceding text.

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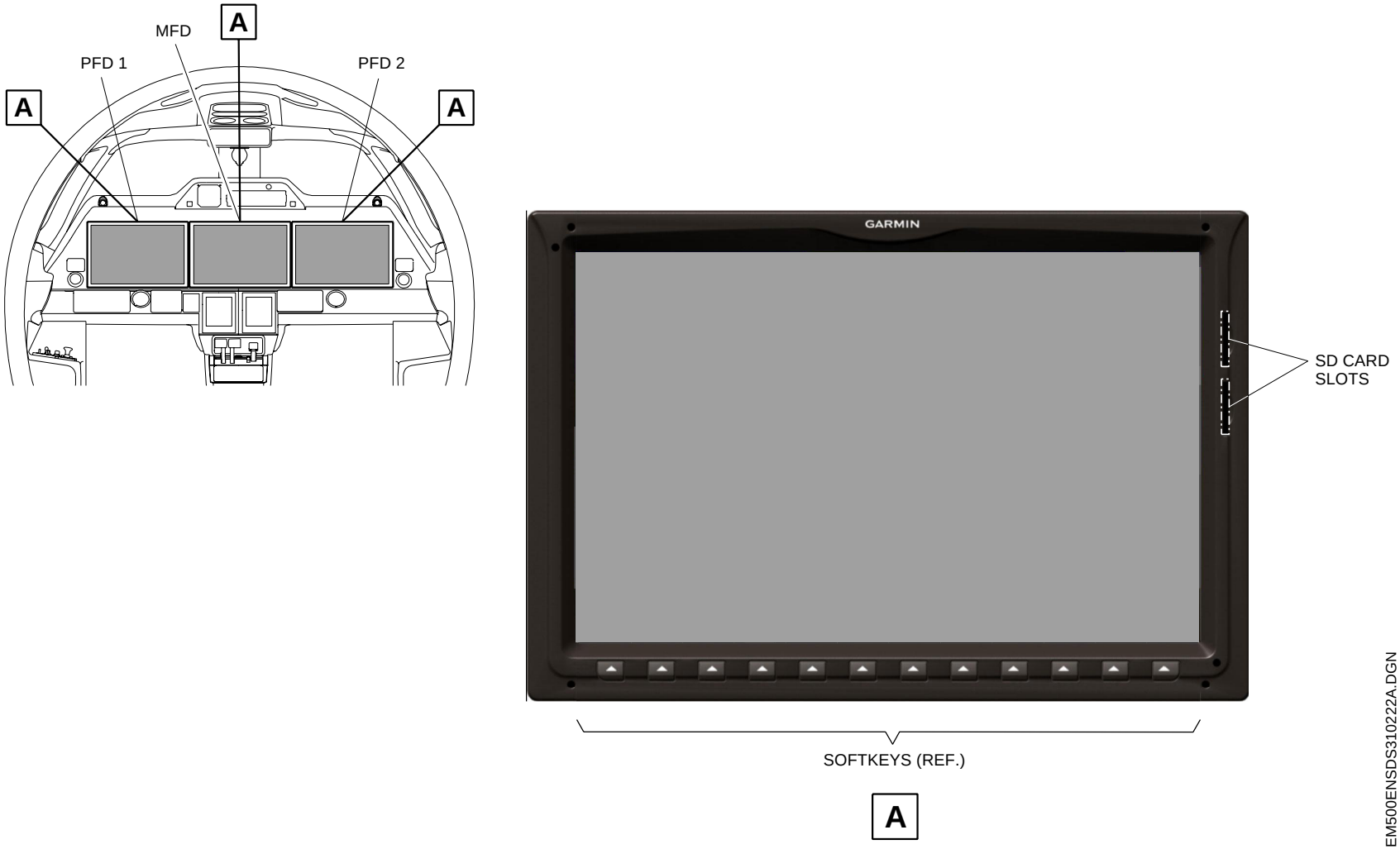

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - Components

Operation

ROAAS functionality becomes automatically enabled upon the avionics system power up.

The audio and visual alerts may be inhibited by the crew at any time, through an appropriate control on the touch screen controller "AVIONICS SETTINGS" page.

To access the inhibition control, on the home page of touch screen controller, select "UTILITIES" / "SETUP" / "AVIONICS SETTINGS" / "ALERTS" tab and then scroll the page until the ROAAS inhibit control option is displayed. A green bar indicates that the alerts are inhibited.

ROAAS functionality requires the following landing data:

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - ROAAS LANDING DATA

LANDING DATA TAB	ROAAS ENTRY DATA	MEANING	REQUIRED OR OPTIONAL?
DEST	Destination airport	Airport selected for landing	Required
DEST	Destination Runway	Runway threshold selected for landing	Required
Weather	Runway condition	DRY or WET conditions	Required
Weather	BARO pressure source	“DEST airport” refers to a value specifically measured at the destination airport. “Area” refers to a value that is not specifically measured for the destination airport.	Required
Runway	Shorten DEP End	Runway reduction at the opposite threshold the aircraft is approaching to (Departure End).	Optional
Runway	Landing Distance Available	Available landing distance based in “Shorten DEP End” and “Shorten APPR End” inputs	Optional

RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - ROAAS LANDING DATA

LANDING DATA TAB	ROAAS ENTRY DATA	MEANING	REQUIRED OR OPTIONAL?
Runway	Shorten APPR End	Runway reduction at landing threshold, for which the aircraft is approaching to (Approach End)	Optional
Landing Config	Steep Approach	Operational procedure when approach is performed at a glideslope steeper than the standard	Optional

The destination airport and runway information are automatically filled when:

- Flight plan is created and destination information (airport and runway) is entered
- Flight plan is edited and the speeds are not set on speed tape

Therefore, after creating or editing a flight, ROAAS landing data is updated. However, entering the ROAAS landing data will not change the flight plan information.

ABNORMAL OPERATION

The ROAAS continually monitors its internal functions as well as data inputs from other systems such as GPS and ground speed.

When a failure occurs, the CAS (Crew Alerting System) message "ROOAS FAIL" is displayed.

If the functionality is inhibited or disabled, CAS message "ROAAS INHIB” is displayed.

When no valid ROAAS data was entered by the flight crew, CAS message "ROAAS NODATA” is displayed.

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The figure RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM - LANDING DATA ENTRY provides further data on the preceding text.

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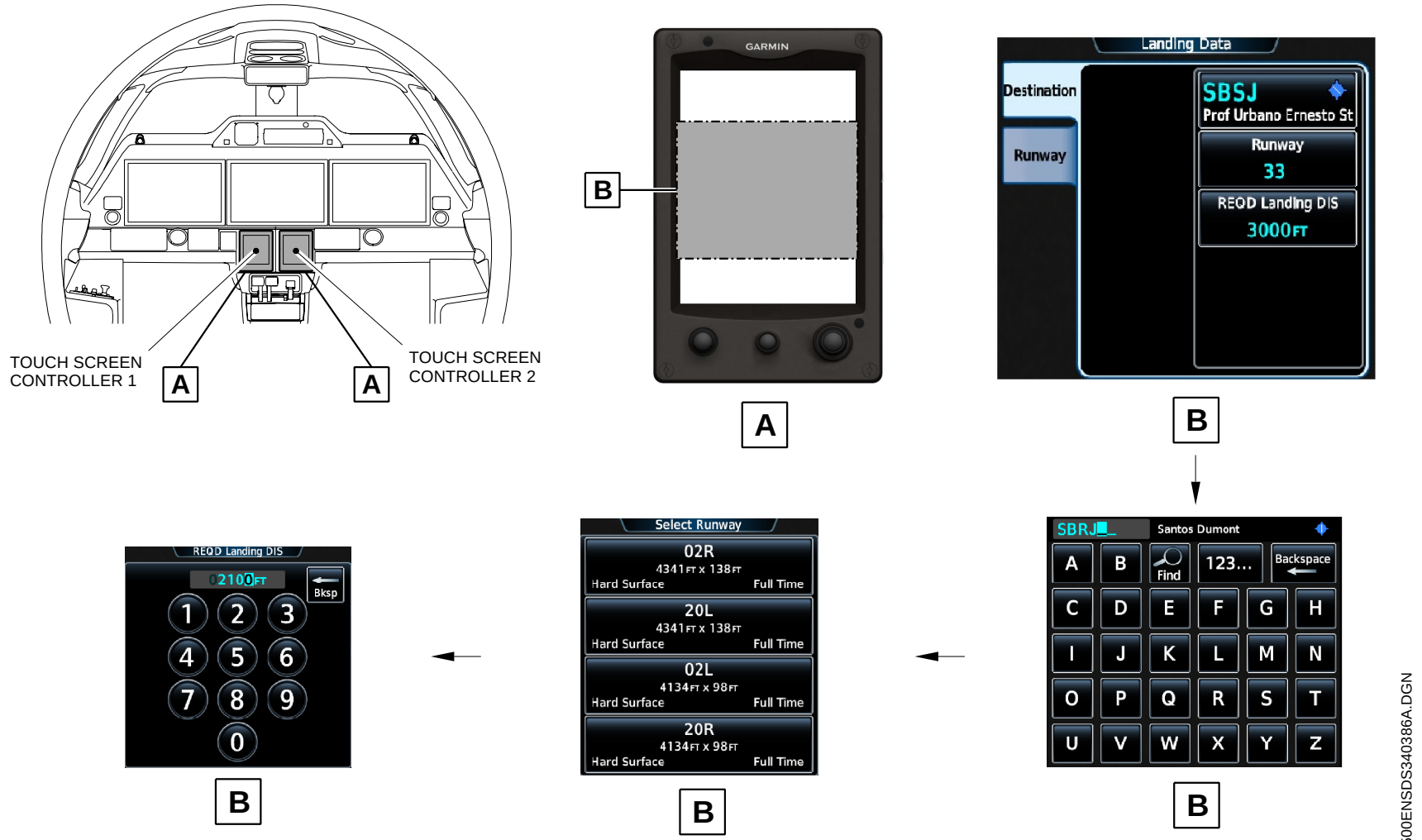

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