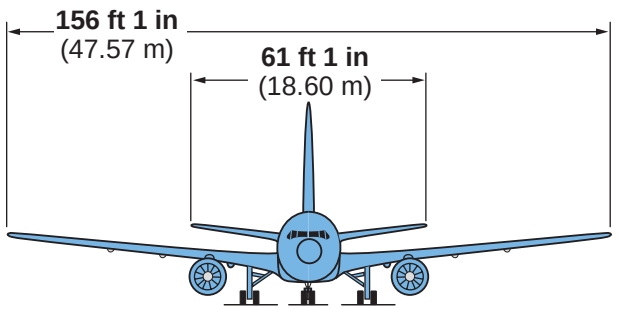
767 Flight Deck and Avionics

January 2002

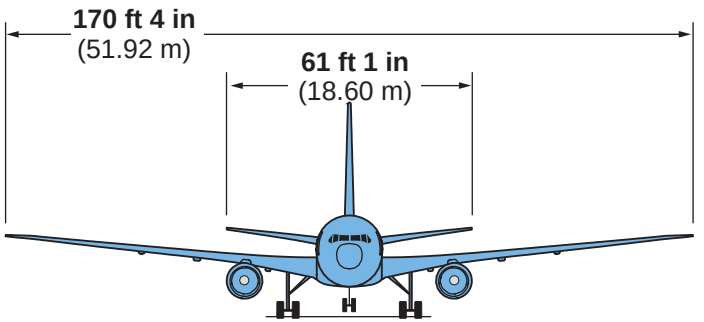
767 Size Comparison

767-200ER/-300ER/-400ER

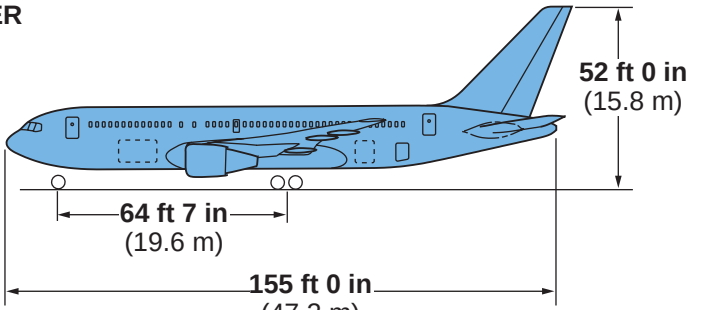
767-200ER
767-300ER



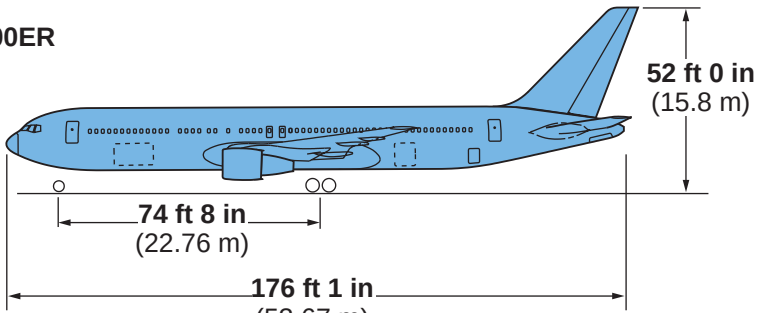
767-400ER



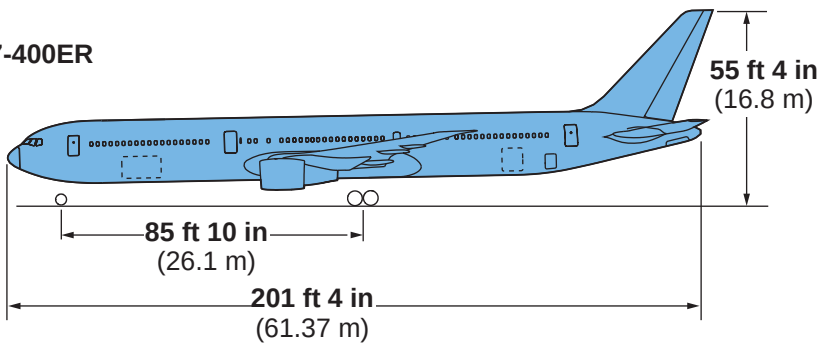
767-200ER



767-300ER

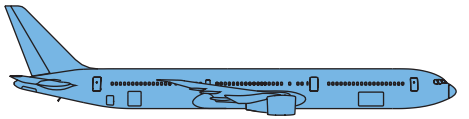


767-400ER



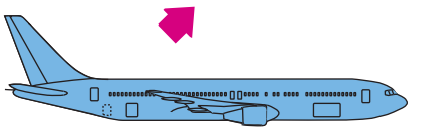
797-FD-0052C
1-18-2-MT/CF

767 Evolution

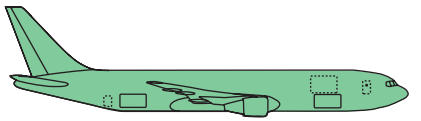


767-400ER
450,000 lb (204,120 kg)

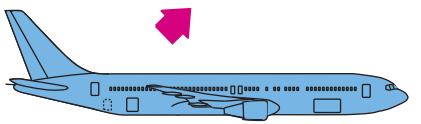
(767-400ER covered in separate book)



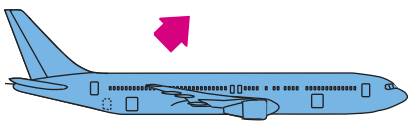
767-300ER
412,000 lb (186,880 kg)



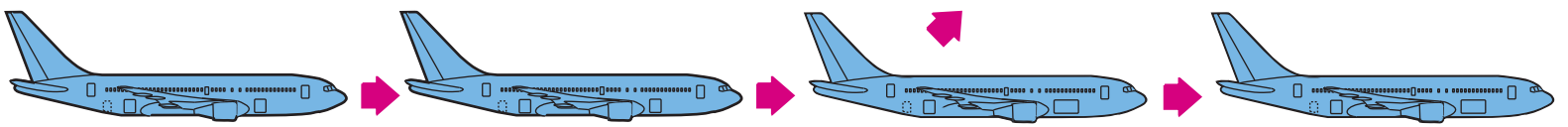
767-300 Freighter
412,000 lb (186,880 kg)



767-300ER
387,000 lb (175,540 kg)



767-300*
351,000 lb (159,210 kg)



767-200*
300,000 lb (136,080 kg)

767-200*
315,000 lb (142,880 kg)

767-200ER
351,000 lb (159,210 kg)

767-200ER
395,000 lb (179,170 kg)

*No longer offered.

797-FD-0054C
11/27-0-MT

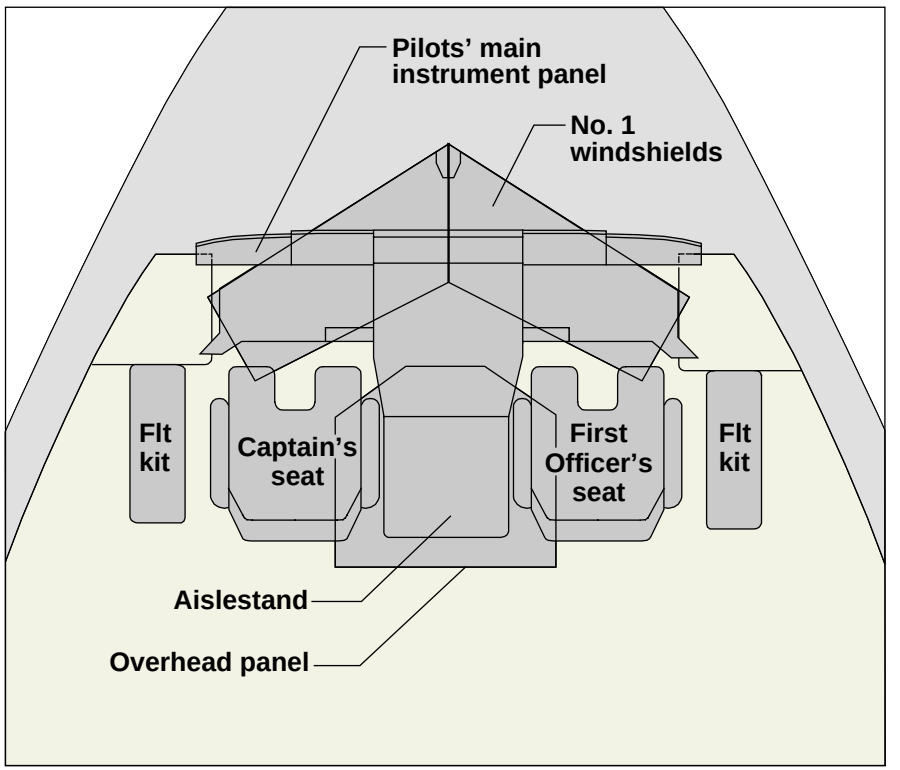
Boeing Flight Deck Design Philosophy

- The pilot is the final authority for safe airplane operation; the hierarchy of tasks is
  - Safety
  - Passenger comfort
  - Efficiency
- Automation is applied as a tool to aid but not replace the pilot
- New technology is used only when there is a clear advantage with no adverse impact on human-machine interface
- System designs are error tolerant; the hierarchy of design alternatives is
  - Simplicity
  - Redundancy
  - Automation
- Designs address fundamental human strengths, limitations, individual differences, and pilots' past operational experience

757/767 Commonality

Design Features

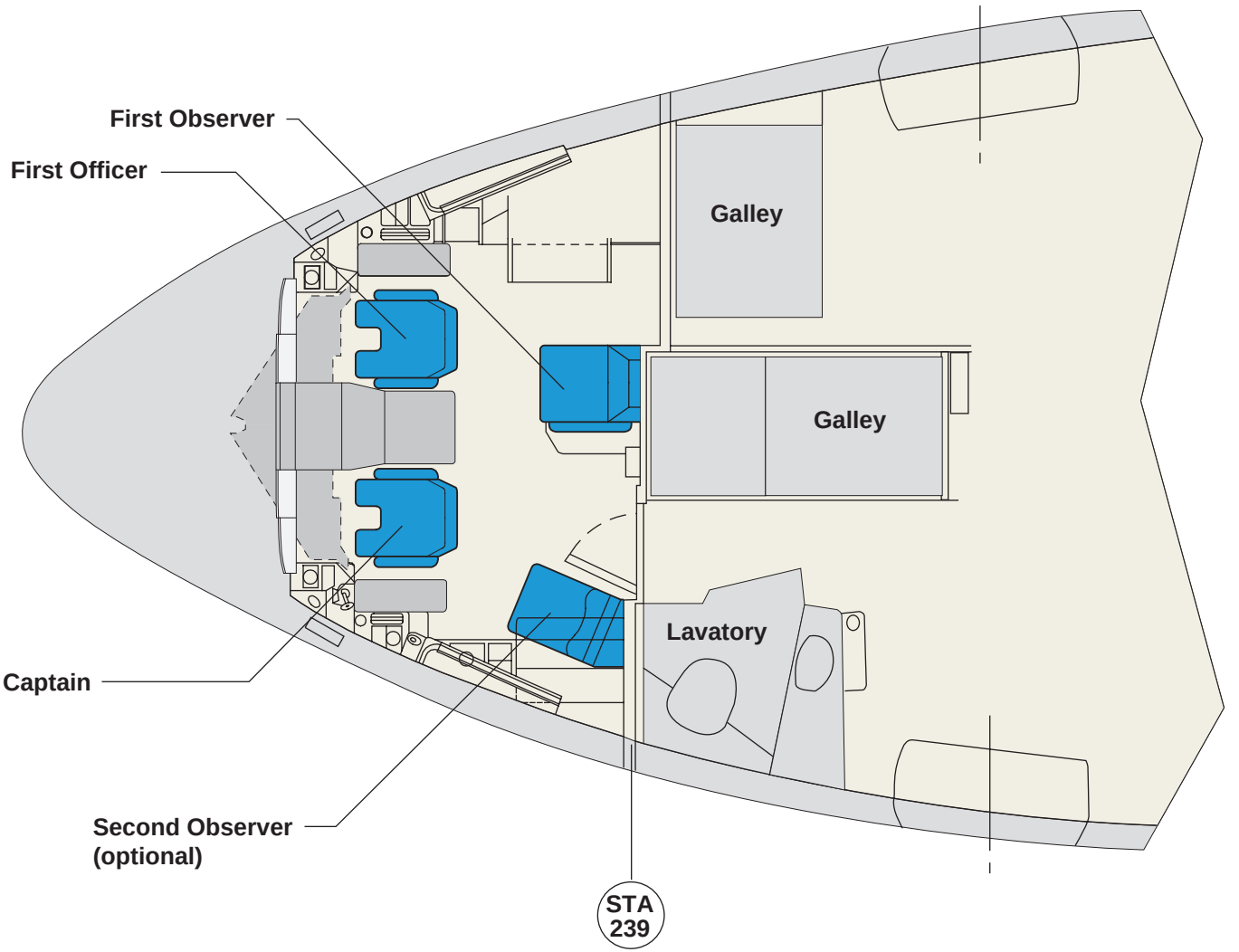
- Similar handling characteristics
- Same crew procedures
  - Identical recall items
  - Identical aural warnings
  - Similar checklists
  - Similar visual alerts
- Same flight deck arrangement
  - Windshield
  - Main instrument panel
  - Overhead panel
  - Aislestand
  - Glareshield panels
  - Panels/controls
    - Location
    - Arrangement
    - Nomenclature
- Initial and recurring training will qualify crew for both airplanes
- Same flight training simulator can be used for both airplanes



767 Flight Deck - General

Flight Deck and Forward Cabin

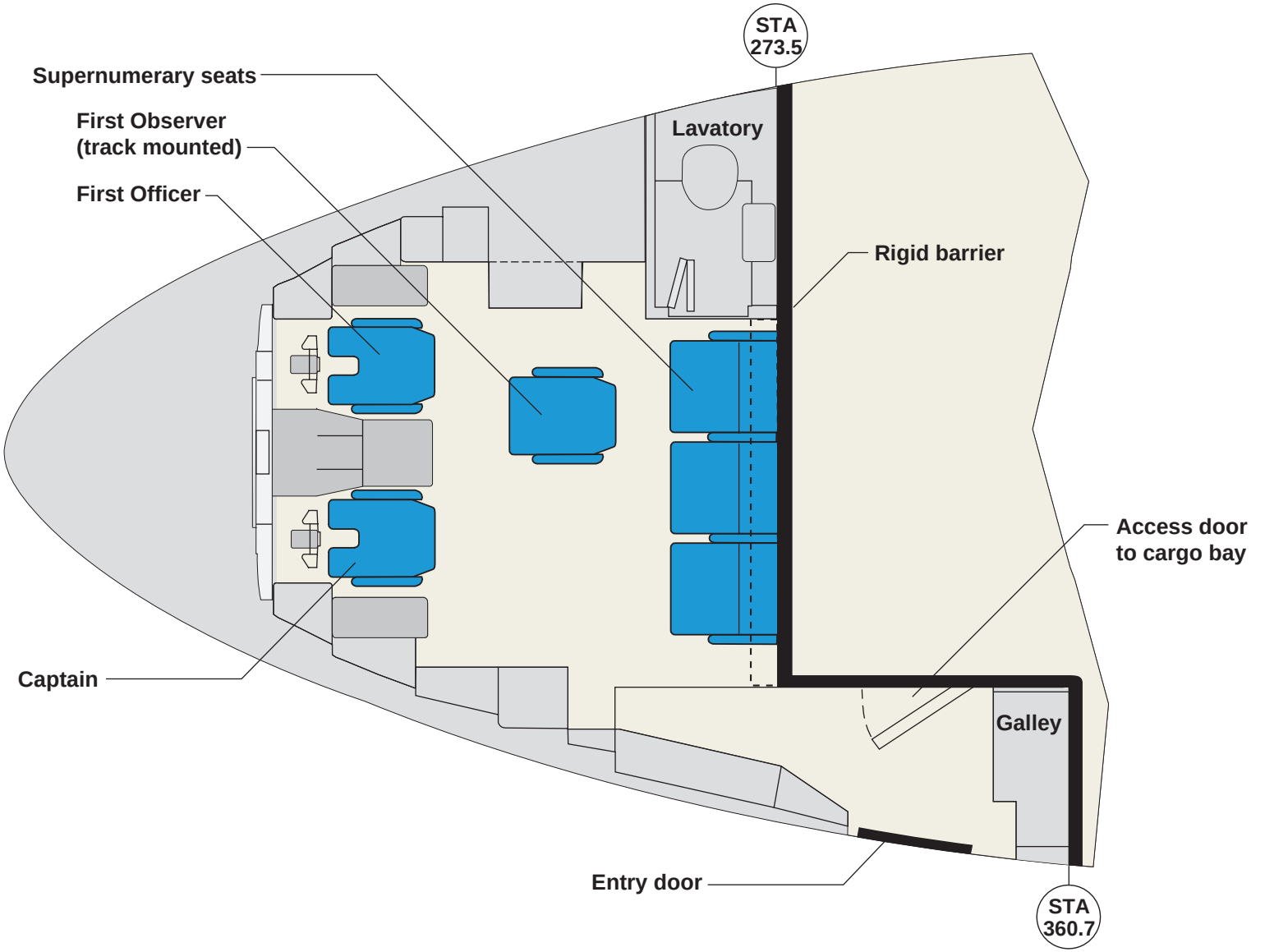
767-200ER/-300ER Passenger



797-FD-0058C
1-18-2-MT/CF

Flight Deck and Forward Cabin

767-300 Freighter

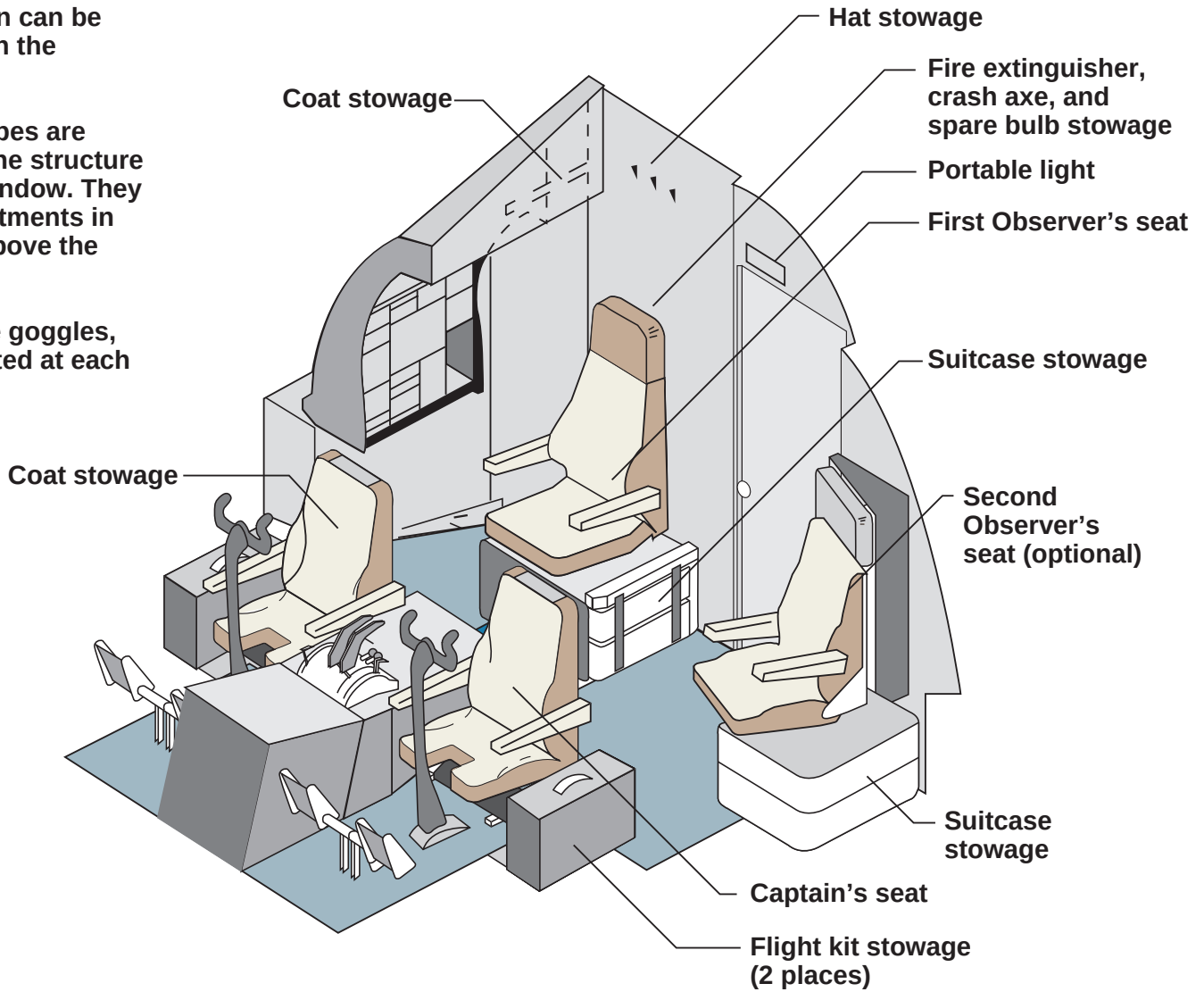


797-FD-0059C
1-18-2-MT/CF

Flight Deck Accommodations

767-200ER/-300ER Passenger

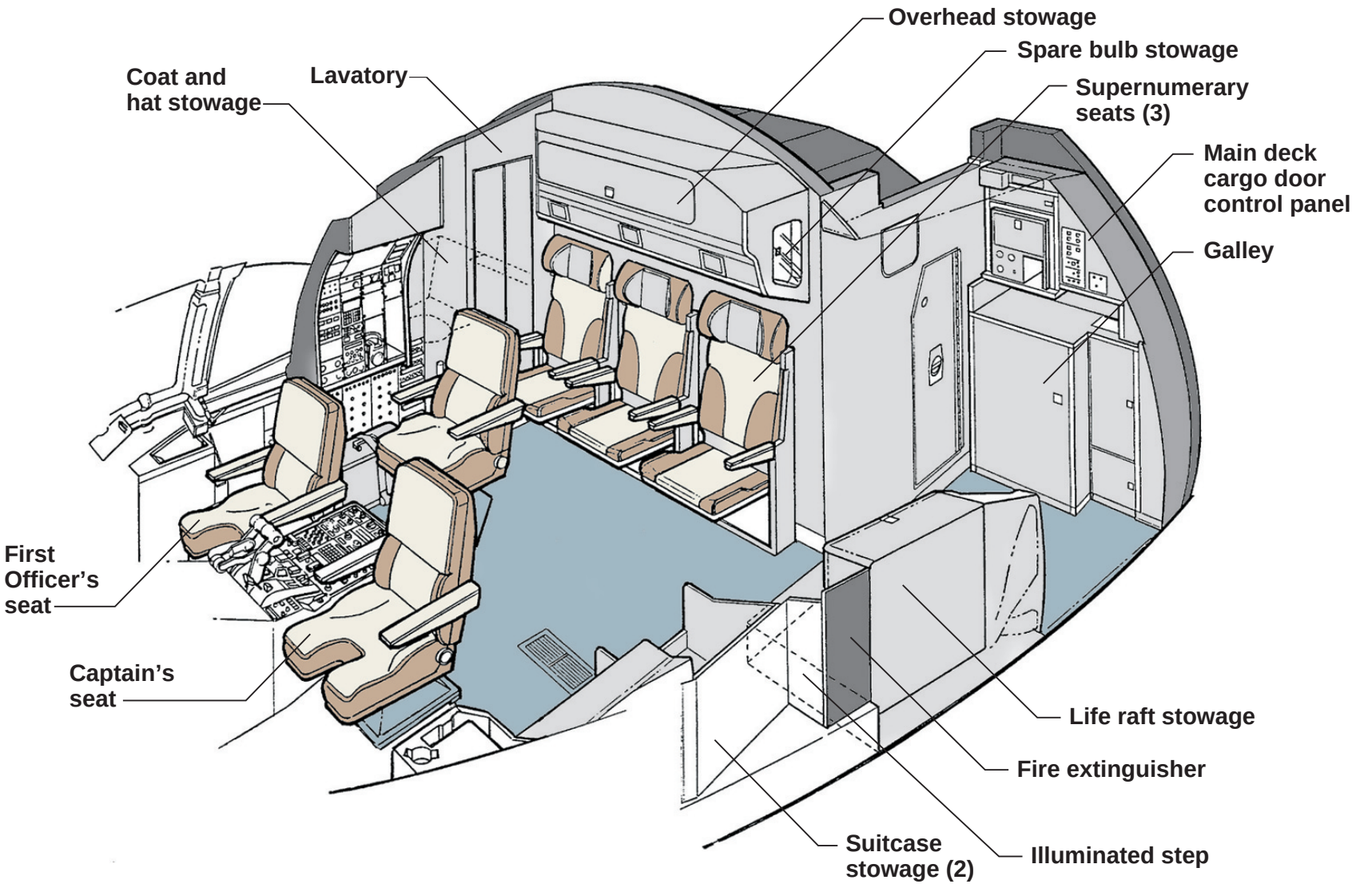
- **Emergency evacuation can be accomplished through the no. 2 side windows.**
- **Flight deck escape ropes are attached to the airplane structure above each sliding window. They are stowed in compartments in the overhead lining above the pilots' seats.**
- **Oxygen mask, smoke goggles, and life vest are located at each crewmember station.**



797-FD-0067C
1-18-2-whp/PW

Flight Deck Accommodations

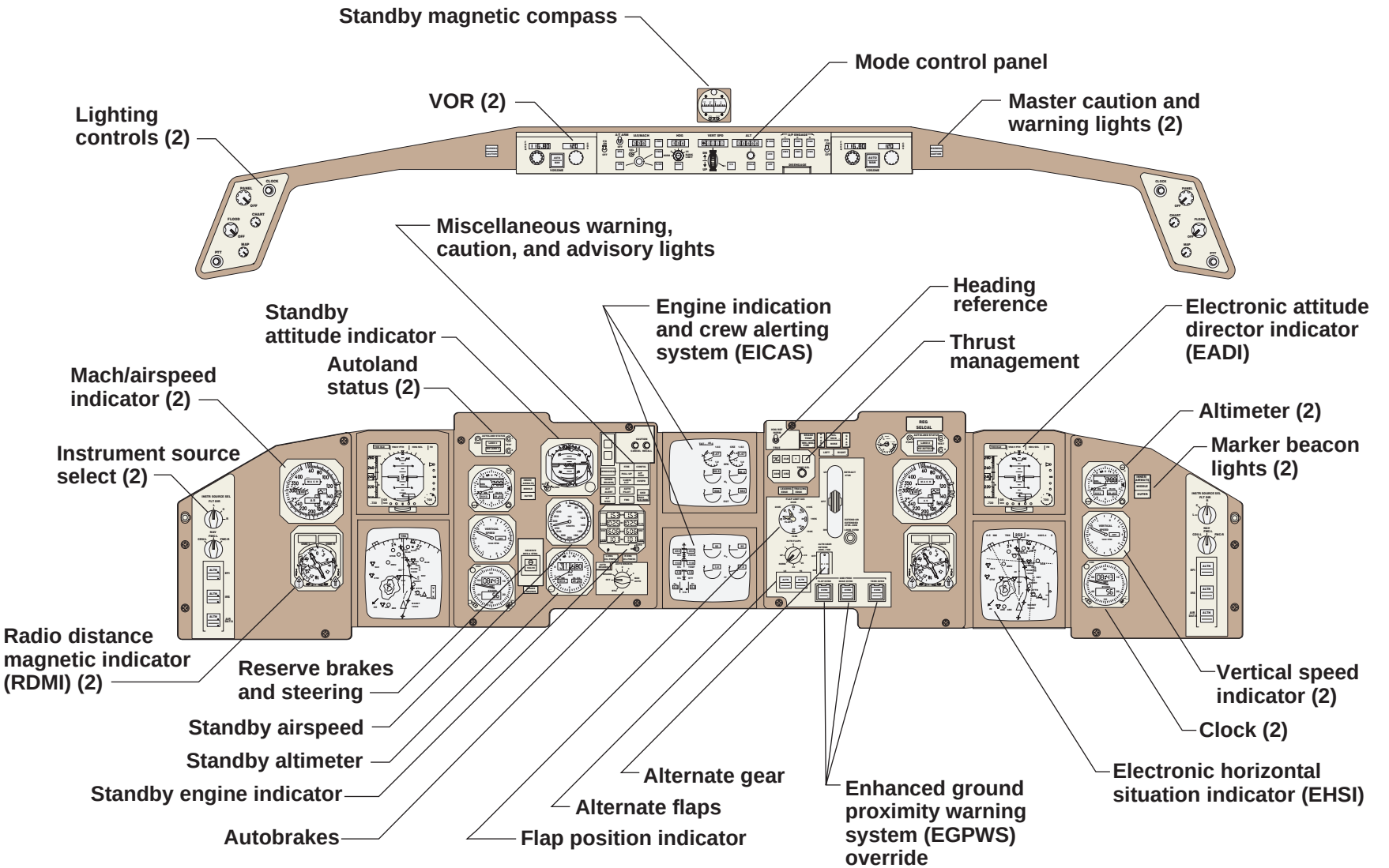
767-300 Freighter



797-FD-0068
1-18-2-whp/CF

Pilots' Main Panel

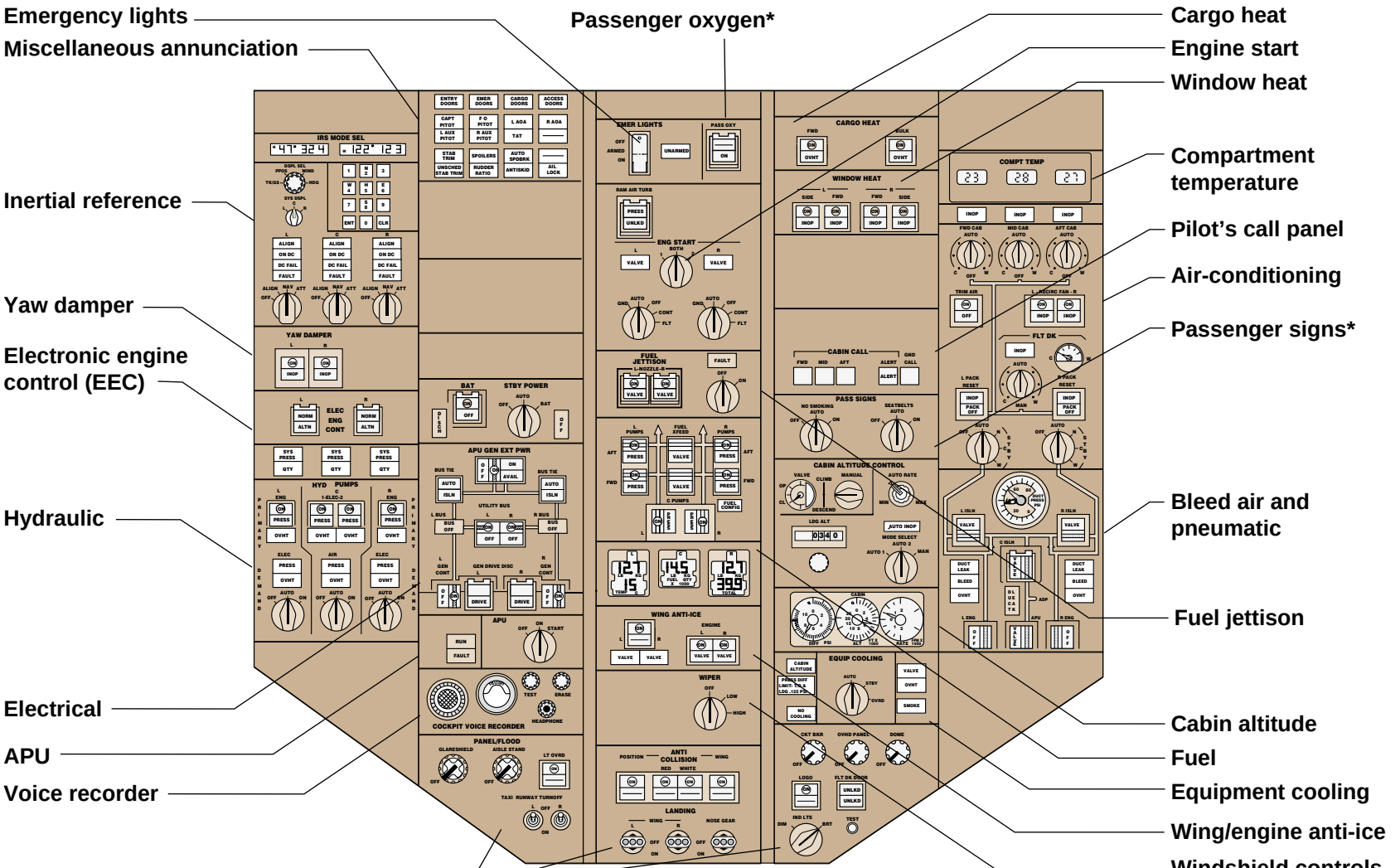
767-200ER/-300ER



797-FD-0060C
1-18-2-whp/CF

Overhead Panel

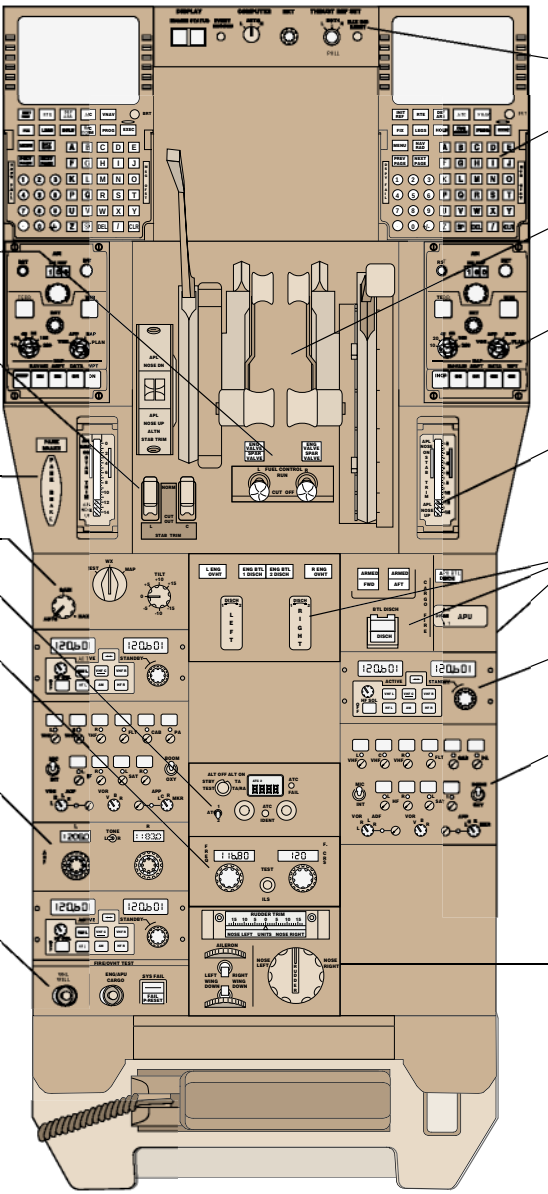
767-200ER/-300ER



*Passenger airplanes only.

Center Aislestand

767-200ER/-300ER



EICAS control

MCDU (2)

Throttle levers
Stab trim switches
Flap lever
Speed brake lever

EFIS control (2)

Fuel control

Stab trim cutout

Stab trim indicator (2)

Parking brake

Weather radar

ATC/TCAS

Engine, cargo, and APU fire control

ILS

Radio communications panel (3)

ADF

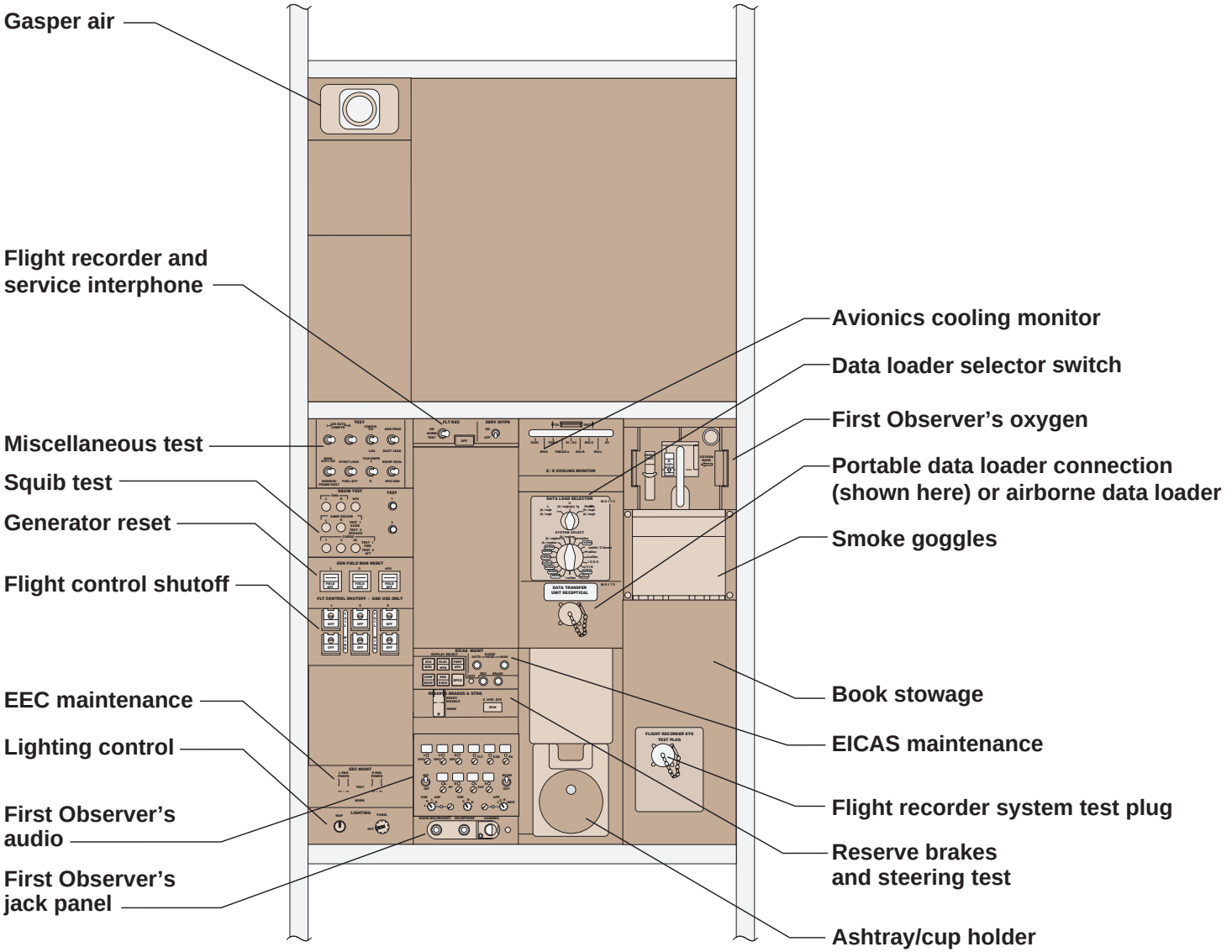
Audio selector (2)

Fire/overheat test

Aileron/rudder trim

Right Side Panel

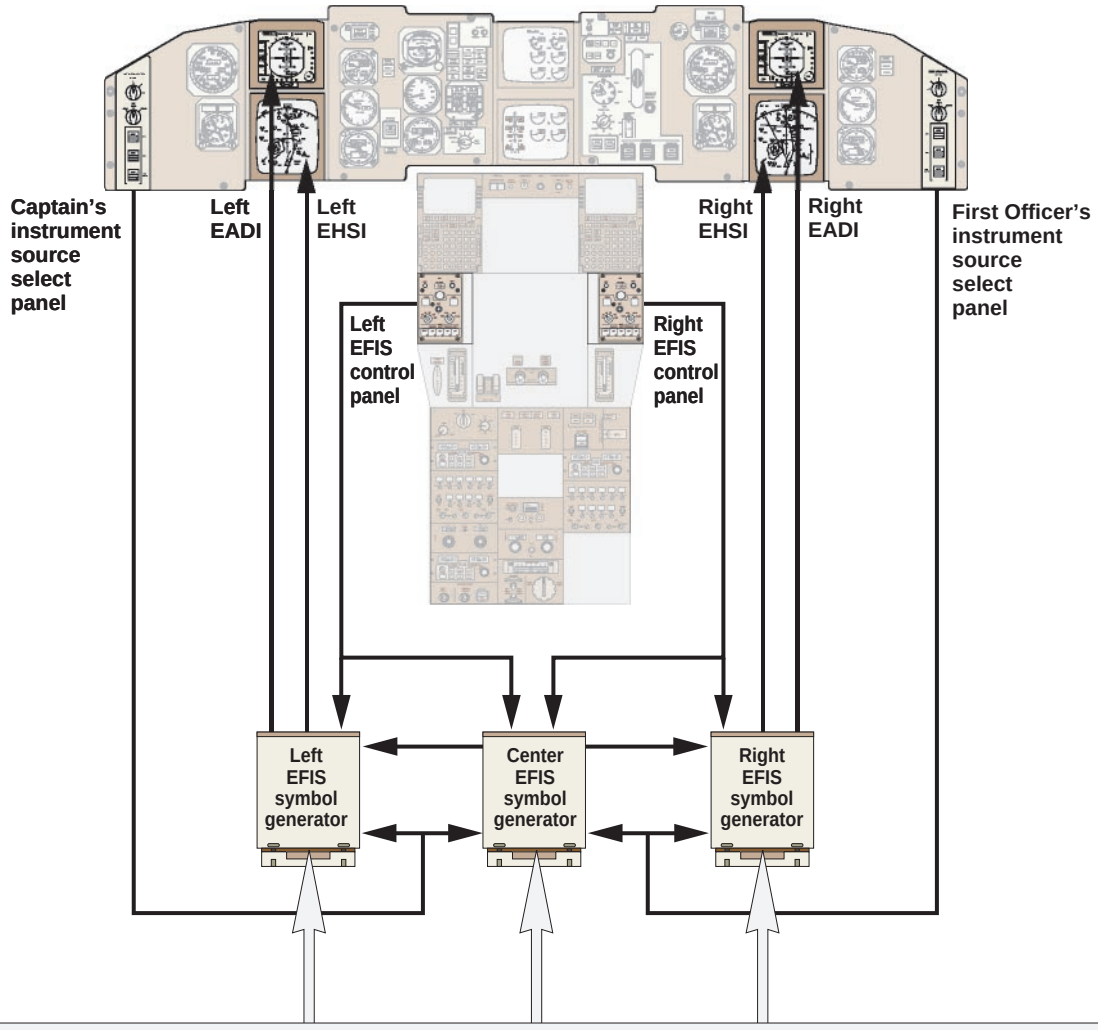
767-200ER/-300ER



767 Flight Deck - EFIS

Electronic Flight Instrument System (EFIS)

767-200ER/-300ER



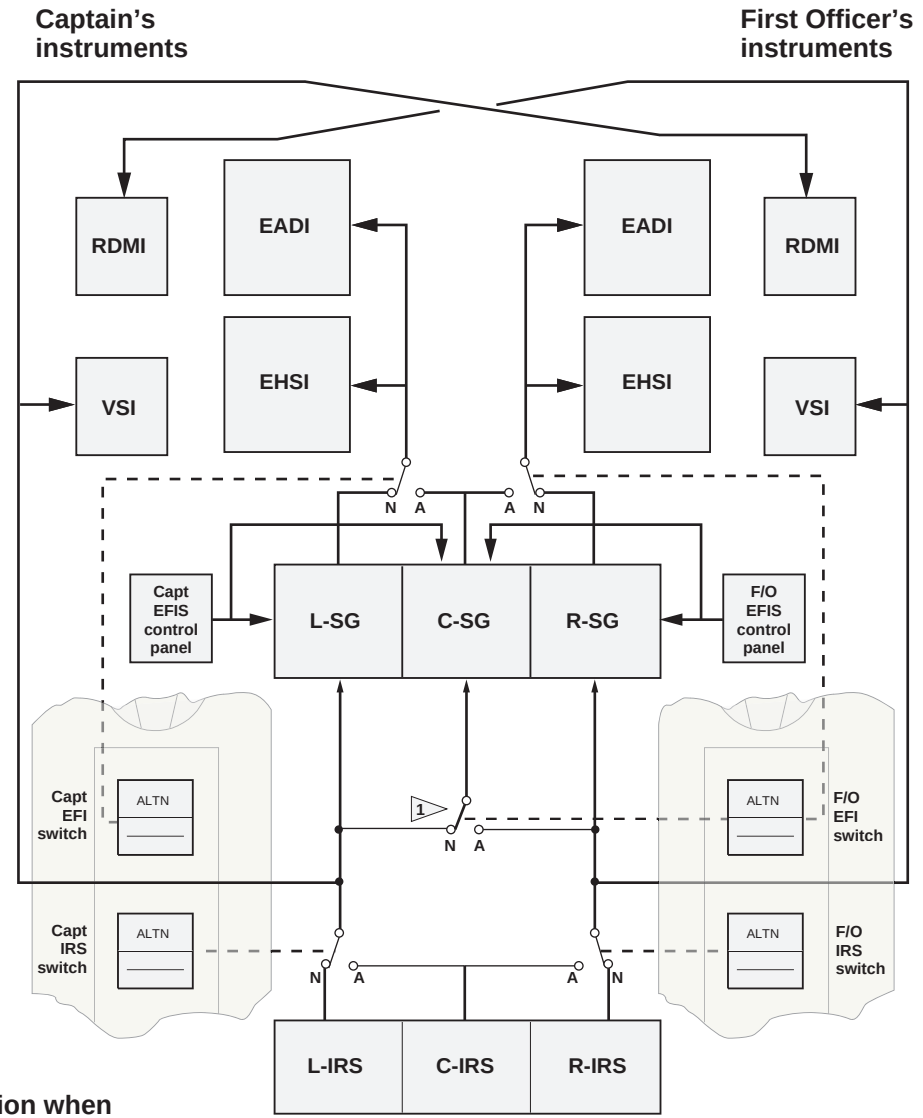
- Thrust management system
- ILS navigation system
- Radio altimeter system
- PWS system
- VOR system
- DME system
- Autopilot flight director system
- Weather radar system
- ADC system
- ADF system
- EGPWS
- FMCS
- TCAS
- IRS

797-FD-0071
1-18-2-PW/CF

EFIS/IRS Switching

767-200ER/-300ER

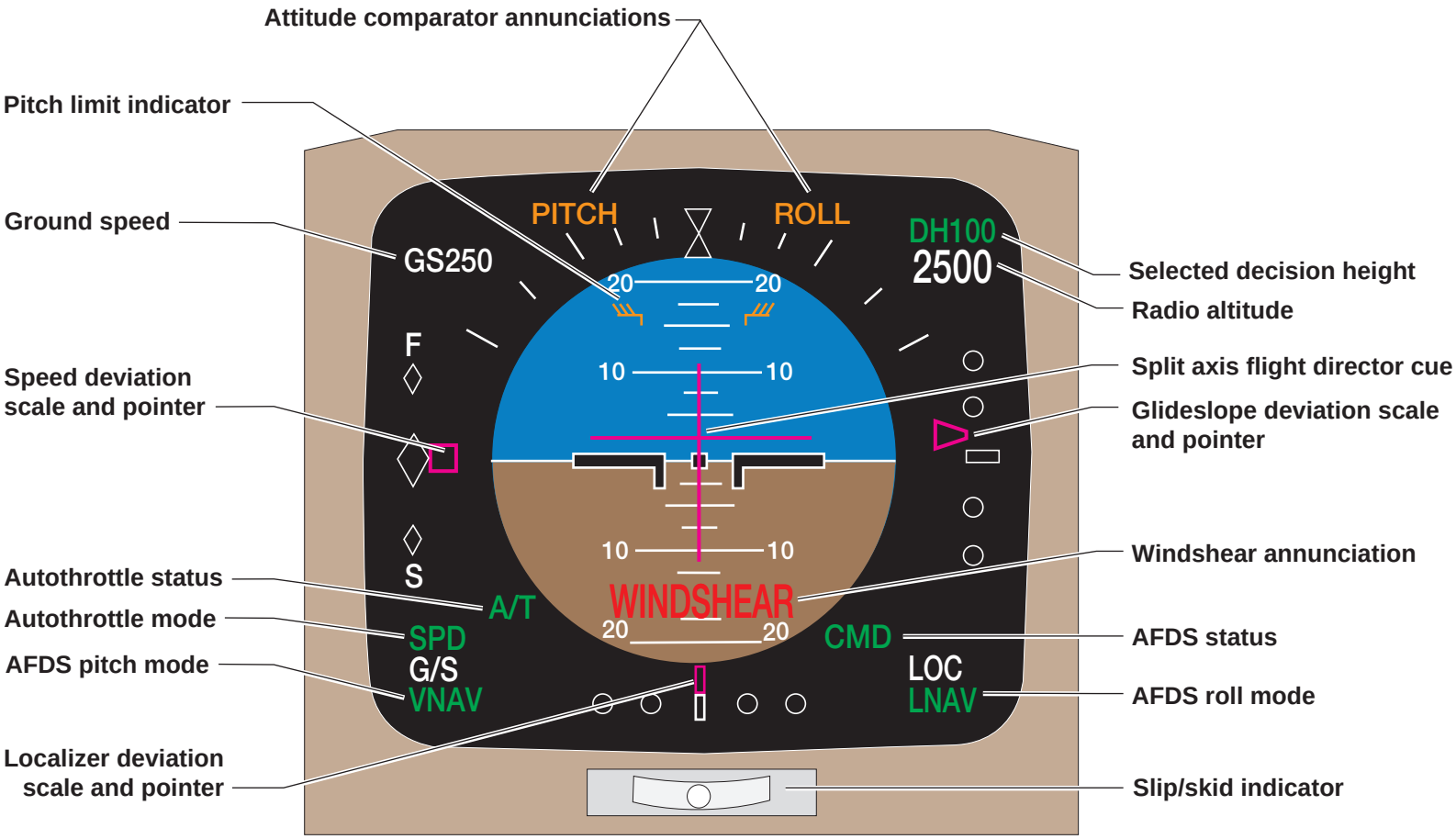
EADI - Electronic attitude director indicator
EHSI - Electronic horizontal situation indicator
EFI - Electronic flight instrument
IRS - Inertial reference system
RDMI - Radio distance magnetic indicator
SG - EFIS symbol generator
VSI - Vertical speed indicator



1 This switch remains in the N position when the Capt EFI switch is selected to ALTN.

Electronic Attitude Director Indicator

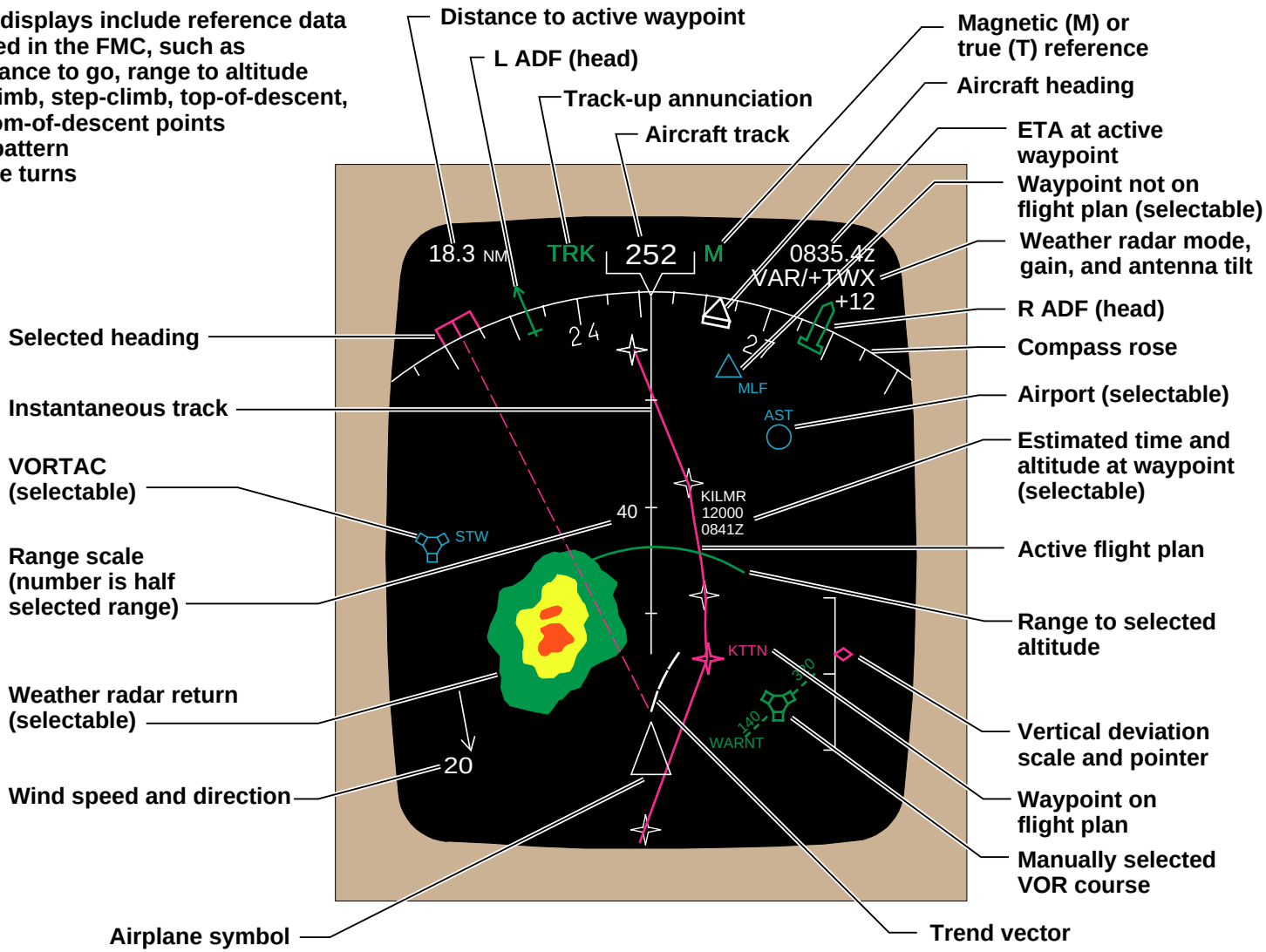
767-200ER/-300ER



Electronic Horizontal Situation Indicator

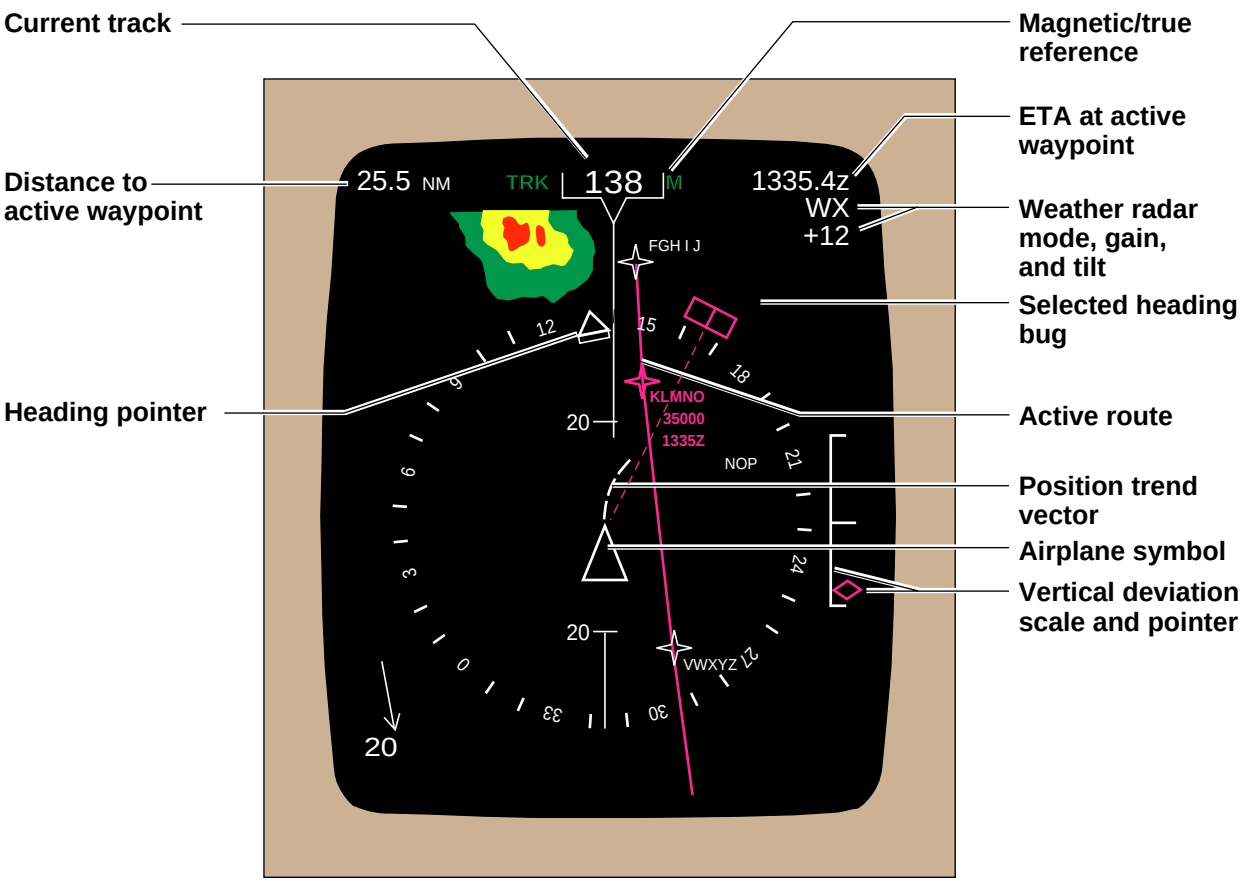
767-200ER/-300ER—Expanded Map Mode

- Map mode displays include reference data programmed in the FMC, such as
  - ETA, distance to go, range to altitude
  - Top-of-climb, step-climb, top-of-descent, and bottom-of-descent points
  - Holding pattern
  - Procedure turns



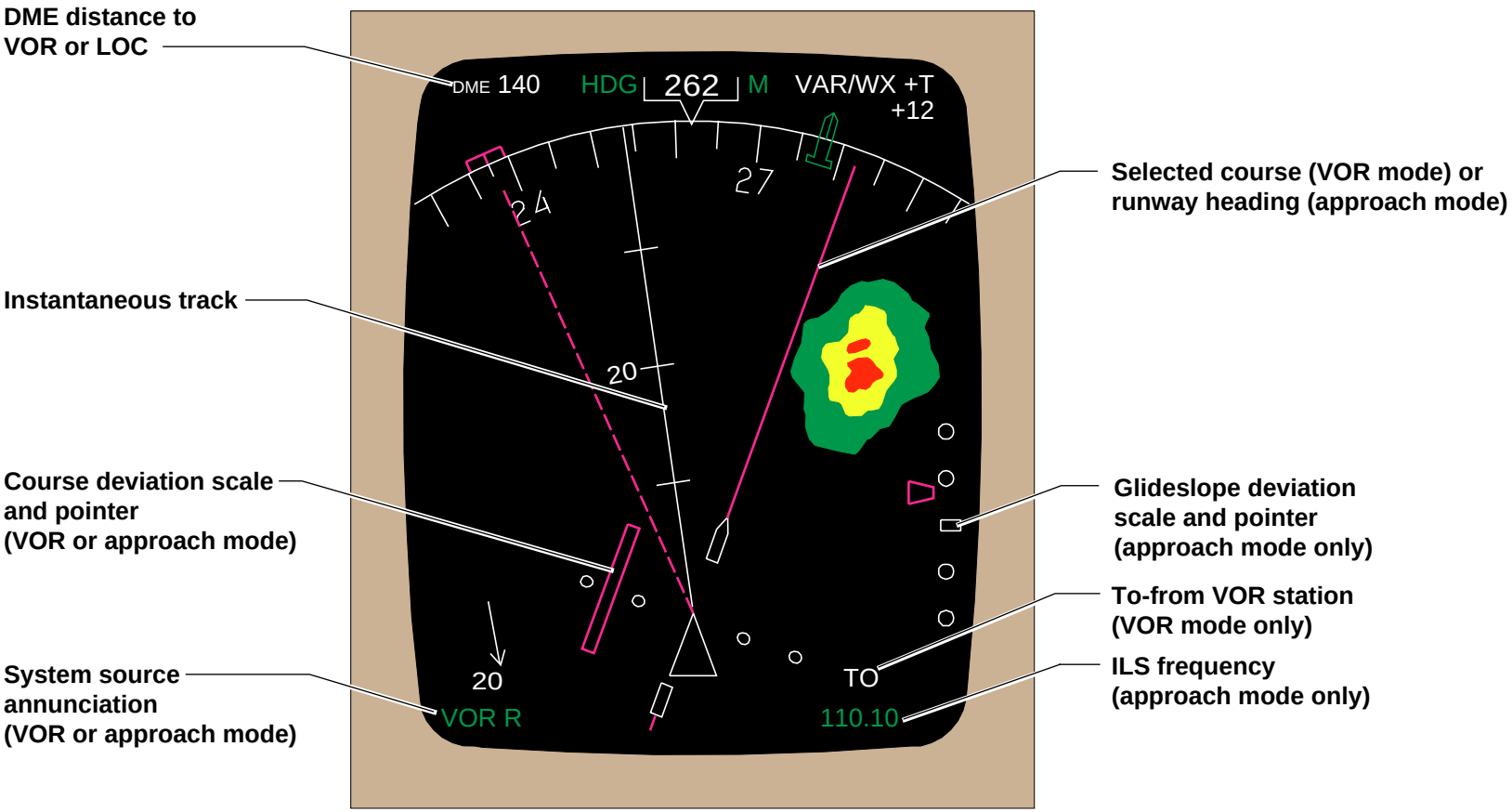
Electrical Horizontal Situation Indicator

767-200ER/-300ER—Center Map Mode



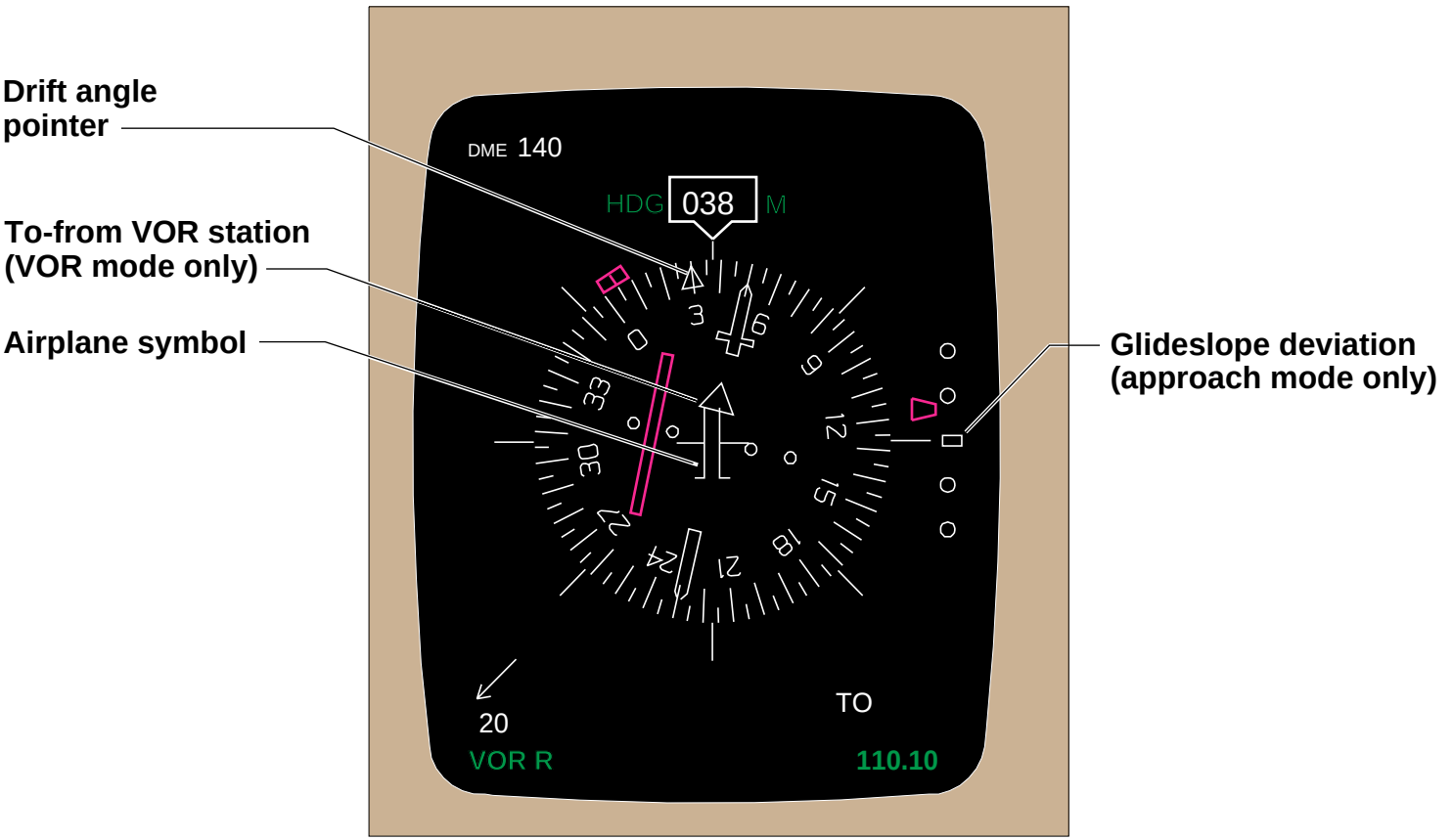
Electronic Horizontal Situation Indicator

767-200ER/-300ER—Expanded VOR/Approach Mode



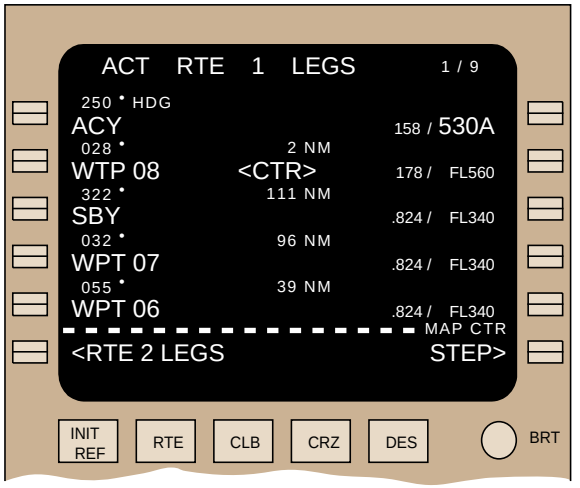
Electronic Horizontal Situation Indicator

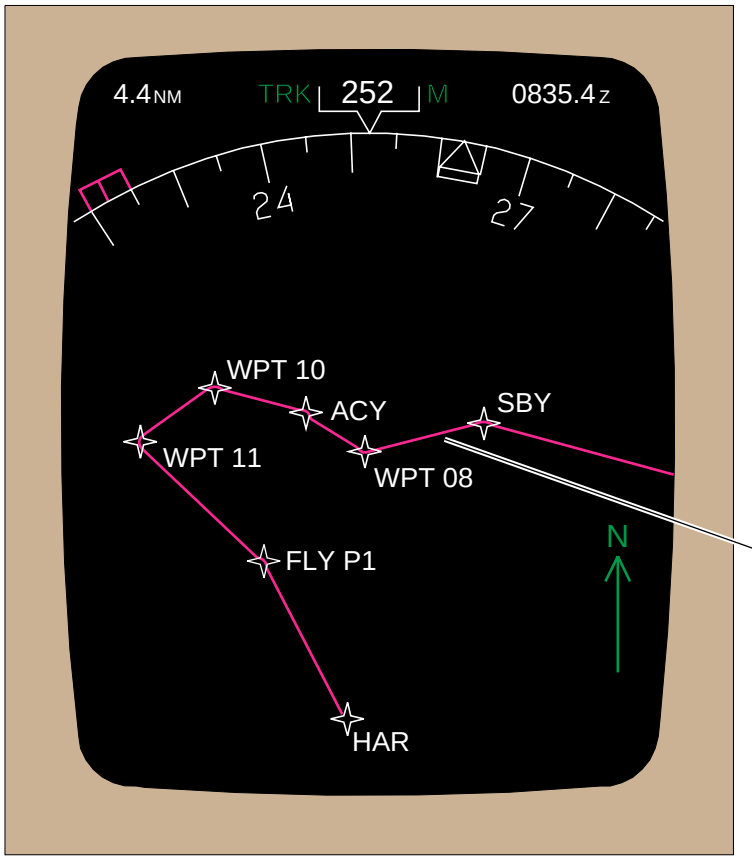
767-200ER/-300ER—Center VOR/Approach Mode



Electronic Horizontal Situation Indicator

767-200ER/-300ER—Plan Mode





Plan mode displays active flight plan referenced to true north. Pilots can step through flight plan on MCDU and EHSI by pushing “STEP” line select key.

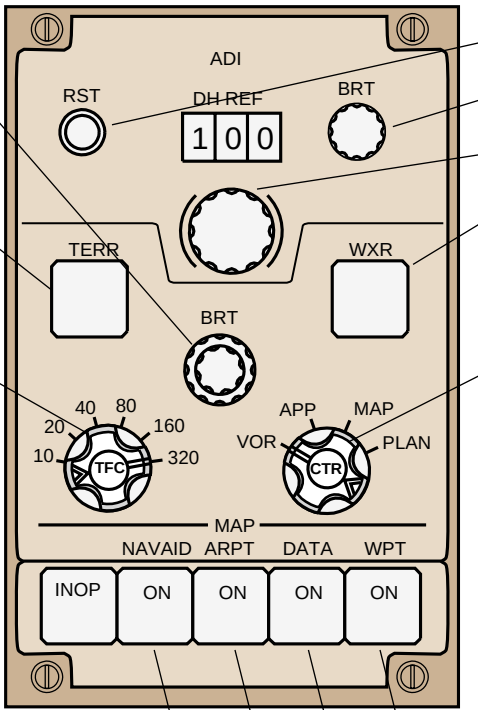
EFIS Control Panel

767-200ER/-300ER

EHSI brightness control
- **Outer knob - EHSI display**
- **Inner knob - weather radar return**

Terrain data displayed when in MAP, CENTER MAP, EXPANDED APPROACH, and EXPANDED VOR modes

EHSI range selection
- **Outer knob - selects desired nautical mile display range for MAP, CENTER MAP, EXPANDED APPROACH, and EXPANDED VOR modes**
- **Center switch (TFC) - displays TCAS data when in MAP, CENTER MAP, EXPANDED APPROACH, and EXPANDED VOR modes**



Decision height alert reset

EADI brightness control

Decision height selector

Weather radar return displayed when in MAP, CENTER MAP, EXPANDED APPROACH, and EXPANDED VOR modes

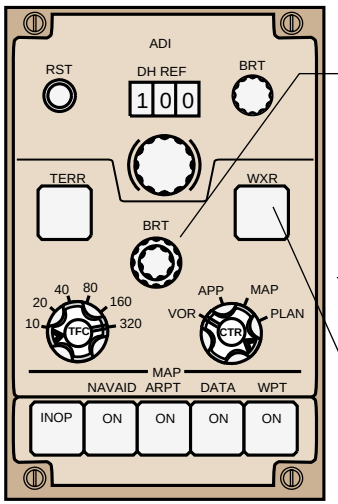
EHSI mode selector
- **Outer knob - selects VOR, APPROACH, MAP, and PLAN display modes**
- **Center switch (CTR) - alternates display modes between center and expanded formats for VOR, APPROACH, and MAP modes**

Map switches - select information to be displayed in MAP or CENTER MAP mode:
- **NAVAID - displays high altitude navigation aids in FMC database if selected range is 80 nmi or greater**
- **ARPT - displays airports in FMC database**
- **DATA - displays altitude and ETA for each waypoint on the active route**
- **WPT - displays waypoints in the FMC database but not on the active route if selected range is 40 nmi or less**

NOTE: Terrain data and weather radar cannot be shown on the same EFIS display at the same time. Selection of the TERR switch turns off weather radar display if showing. Selection of the WXR switch turns off terrain display if showing. It is possible, and a common practice, to show weather radar on one pilot's EFIS display and show terrain data on the other pilot's EFIS display.

Weather Radar

767-200ER/-300ER



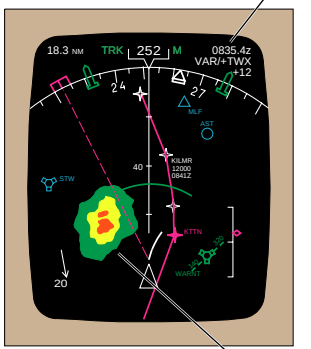
Brightness control (inner knob)

- **Adjusts brightness of WXR return on EHSI**

Aislestand

Weather radar switch

- **Pushing the WXR switch displays returns on the MAP, EXPANDED MAP, EXPANDED APPROACH, and EXPANDED VOR modes of the EHSI.**



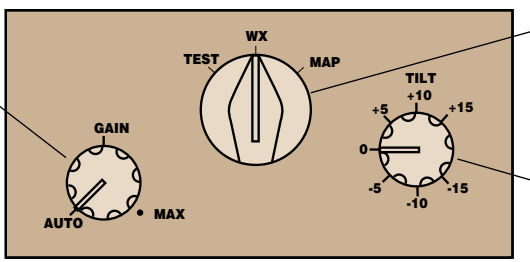
Weather radar mode, gain, and antenna tilt data displayed on EHSI.

Weather radar returns

- **When the WXR switch is pushed on the EFIS control panel, the weather radar returns are displayed on the respective on-side EHSI.**
- **The most intense areas of precipitation are displayed in red, less intense in amber, and least intense in green.**
- **Detected turbulence is displayed in magenta.**

Gain control

- **AUTO presents an optimum receiver sensitivity for best weather radar display.**
- **Preset gain occurs automatically only in WX mode.**
- **Rotate manually to set receiver gain.**



Weather radar panel (representative)

Radar mode selector

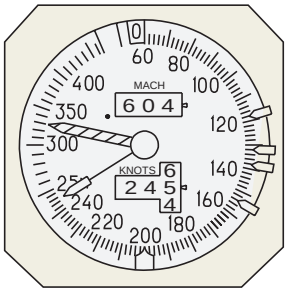
- **TEST – displays maintenance test pattern**
- **WX – displays weather radar returns**
- **MAP – displays ground returns**

Antenna tilt control

- **Controls antenna tilt angle with reference to horizon**

Flight Instruments

767

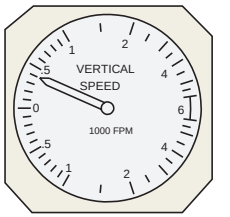


Mach/airspeed indicator

- **Each Mach/airspeed indicator displays airspeed, Mach, and V_{MO} data from its on-side air data computer (ADC).**
- **Each indicator displays data from the off-side ADC when the respective air data switch is selected to the ALTN position.**
- **The command speed bug can be moved automatically from the FMC CDU or manually from the IAS/Mach selector on the MCP.**

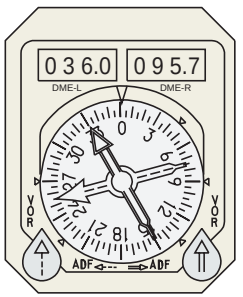
Altimeter

- **Each primary altimeter displays altitude data from its on-side ADC.**
- **Each indicator displays data from the off-side ADC when the respective air data switch is selected to the ALTN position.**
- **An ALT light on each indicator provides visual indication of altitude alerting.**



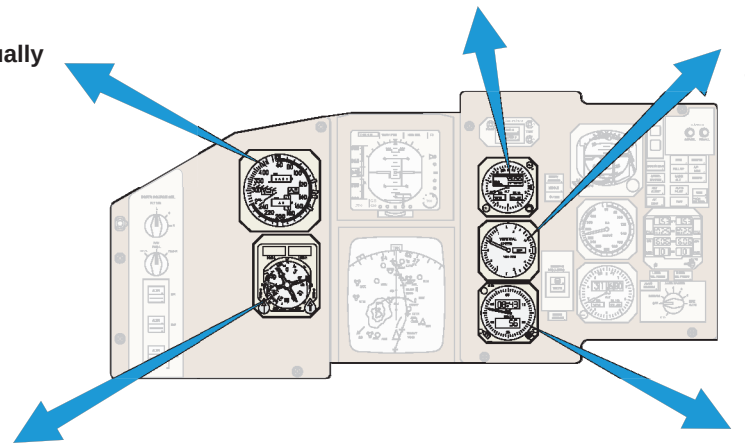
Vertical speed indicator (VSI)

- **Each vertical speed indicator displays vertical speed data from its on-side inertial reference unit (IRU) and on-side ADC.**
- **Each indicator displays data from the center IRU when the respective IRS switch is selected to the ALTN position and from the off-side ADC when the respective ADC switch is selected to the ALTN position.**

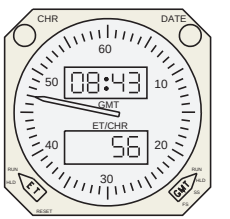


Radio distance magnetic indicator (RDMI)

- **Each indicator displays magnetic heading; VOR and/or ADF bearings; and VOR, ILS, DME, or VORTAC distance.**
- **Each indicator displays magnetic heading data from its on-side IRU.**
- **Each indicator displays magnetic heading data from the center IRU when the respective IRS switch is selected to the ALTN position.**



- **Both indicators display magnetic heading when the HSI heading reference switch is in the NORM position and the airplane is between 73 N and 60 S latitude (with standard MAGVAR table) or 82 N and 82 S latitude (with extended MAGVAR table). The heading flag is displayed when the switch is in the TRUE position or the airplane is outside of these latitudes.**

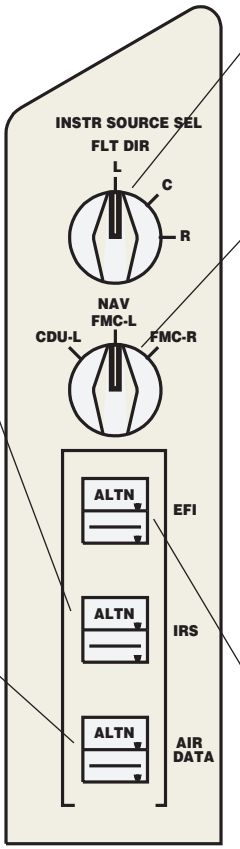


Clock

- **Provides Greenwich mean time (GMT) in day, month, and year or hours and minutes on the GMT indicator. Provides elapsed time or chronograph on the ET/CHR indicator.**
- **The chronograph is controlled by the pushbutton on the clock or the remote switch on the glareshield.**

Instrument Source Select Panel

767-200ER/-300ER



Flight director selector
- **Selects the flight control computer (L, C, or R) for flight director command bar operation**

IRS switch
(alternate action)

BLANK - selects normal configuration:
- **L IRS supplies L and C EFIS SG, CAPT VSI, and F/O RDMI**
- **R IRS supplies R and C EFIS SG, F/O VSI, and CAPT RDMI**
- **C IRS is available as the alternate IRS source**

ALTN - selects center IRS for attitude, heading, and track data for the appropriate systems above

NAV instrument source selector
- **Selects source supplying FMS information to symbol generators and flight control computers**

Captain's side:
- **FMC-L – supplies L and C EFIS SG, and L and C FCC**
- **FMC-R – supplies L and C EFIS SG, and L and C FCC**
- **CDU-L– supplies L and C EFIS SG**

First Officer's side:
- **FMC-R – supplies R EFIS SG and R FCC**
- **FMC-L – supplies R EFIS SG and R FCC**
- **CDU-R – supplies R EFIS SG**

Air data switch
(alternate action)

BLANK - selects normal configuration:
- **L ADC supplies CAPT MACH/AIRSPEED and primary altimeter**
- **R ADC supplies F/O MACH/AIRSPEED and primary altimeter**

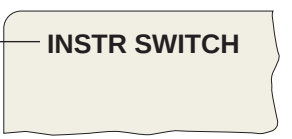
ALTN - selects opposite air data computer to supply above instruments

EFI switch
(alternate action)

BLANK - selects normal configuration:
- **L EFIS SG supplies CAPT ADI and HSI**
- **R EFIS SG supplies F/O ADI and HSI**
- **C EFIS SG is available as the alternate SG**

ALTN - selects center EFIS SG for ADI and HSI display
- **CAPT has display control if each pilot has selected ALTN (C-SG)**
- **Causes EICAS message of INSTR SWITCH if each pilot has selected ALTN**

INSTR SWITCH
EICAS advisory message
- **Indicates each pilot has selected ALTN with EFI switch**



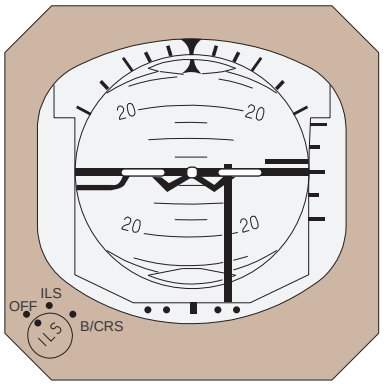
EICAS display

Standby Flight Instruments

767-200ER/-300ER

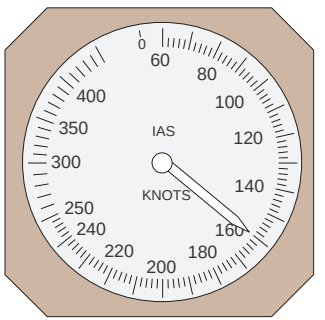
Standby attitude indicator

- **The self-contained standby attitude indicator incorporates an ILS display with backcourse capability.**



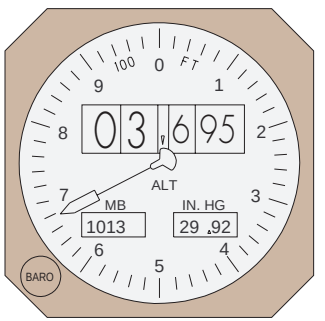
Standby airspeed indicator

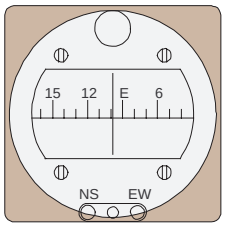
- **The standby airspeed indicator (pneumatic) receives input from the L AUX pitot and the alternate static system.**



Standby altimeter

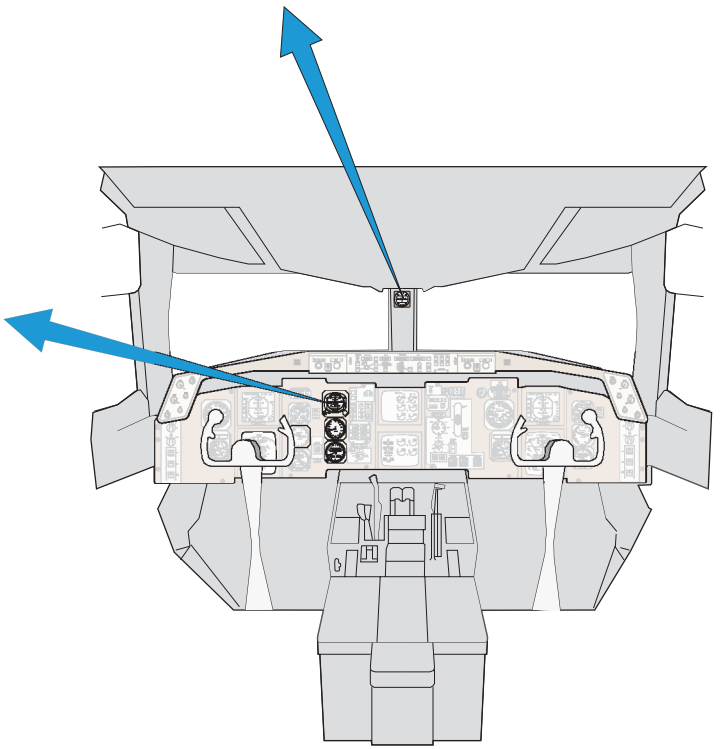
- **The standby altimeter (pneumatic) receives input from the alternate static system.**





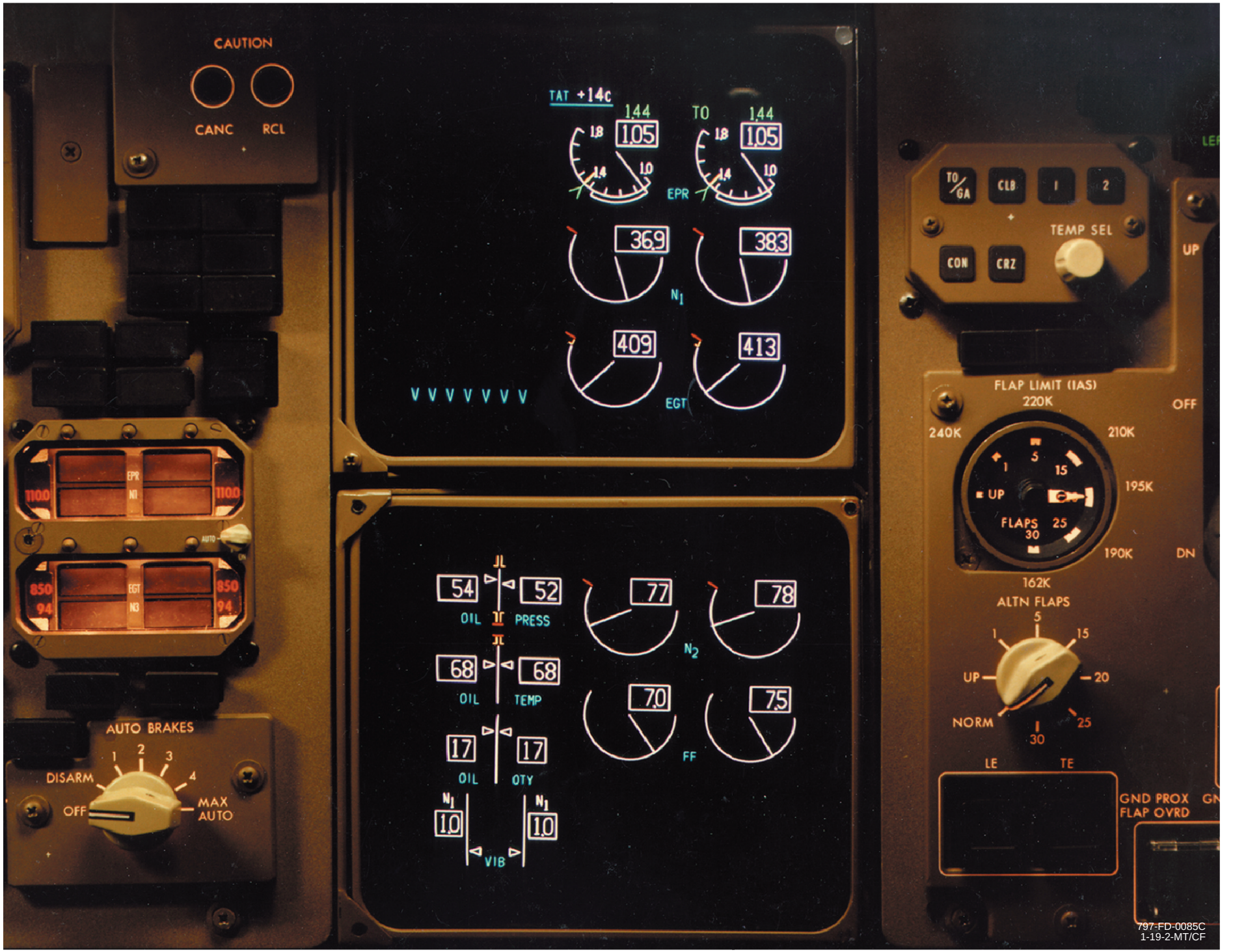
Standby magnetic compass

- **A direct reading compass is installed on the center window post.**



Pilots' main panel

767 Flight Deck - EICAS and Other Alerting Systems

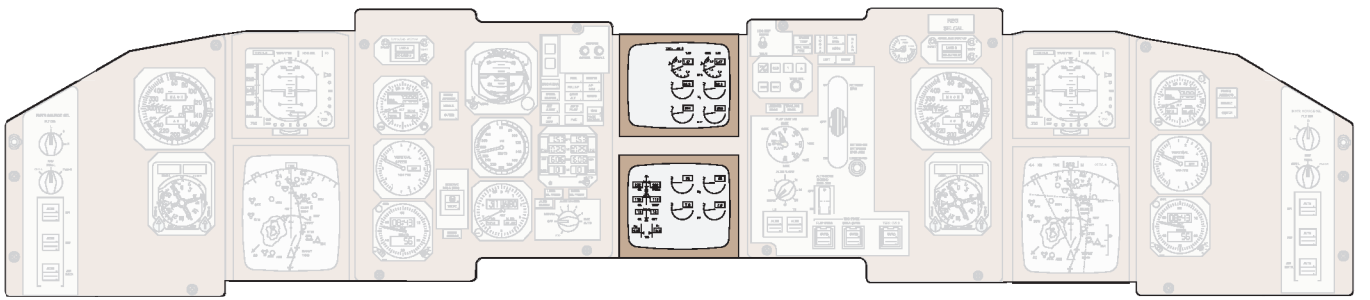

CAUTION
CANC
RCL
TAT +14C
1.44
1.05
1.8
1.4
1.0
EPR
TO
36.9
38.3
N1
409
413
EGT
V V V V V V V
TO/GA
CLB
1
2
TEMP SEL
CON
CRZ
UP
FLAP LIMIT (IAS)
220K
OFF
240K
210K
195K
190K
DN
162K
1
5
15
UP
FLAPS
25
30
ALTN FLAPS
20
NORM
LE
TE
GND PROX
FLAP OVRD
EPR
N1
1100
AUTO
EGT
N2
850
94
54
52
OIL
PRESS
68
TEMP
77
78
N2
70
75
FF
17
QTY
VIB
AUTO BRAKES
DISARM
MAX
AUTO
OFF
797-FD-0085C
1-19-2-MT/CF

Engine Indication and Crew Alerting System

767-200ER/-300ER (EICAS)

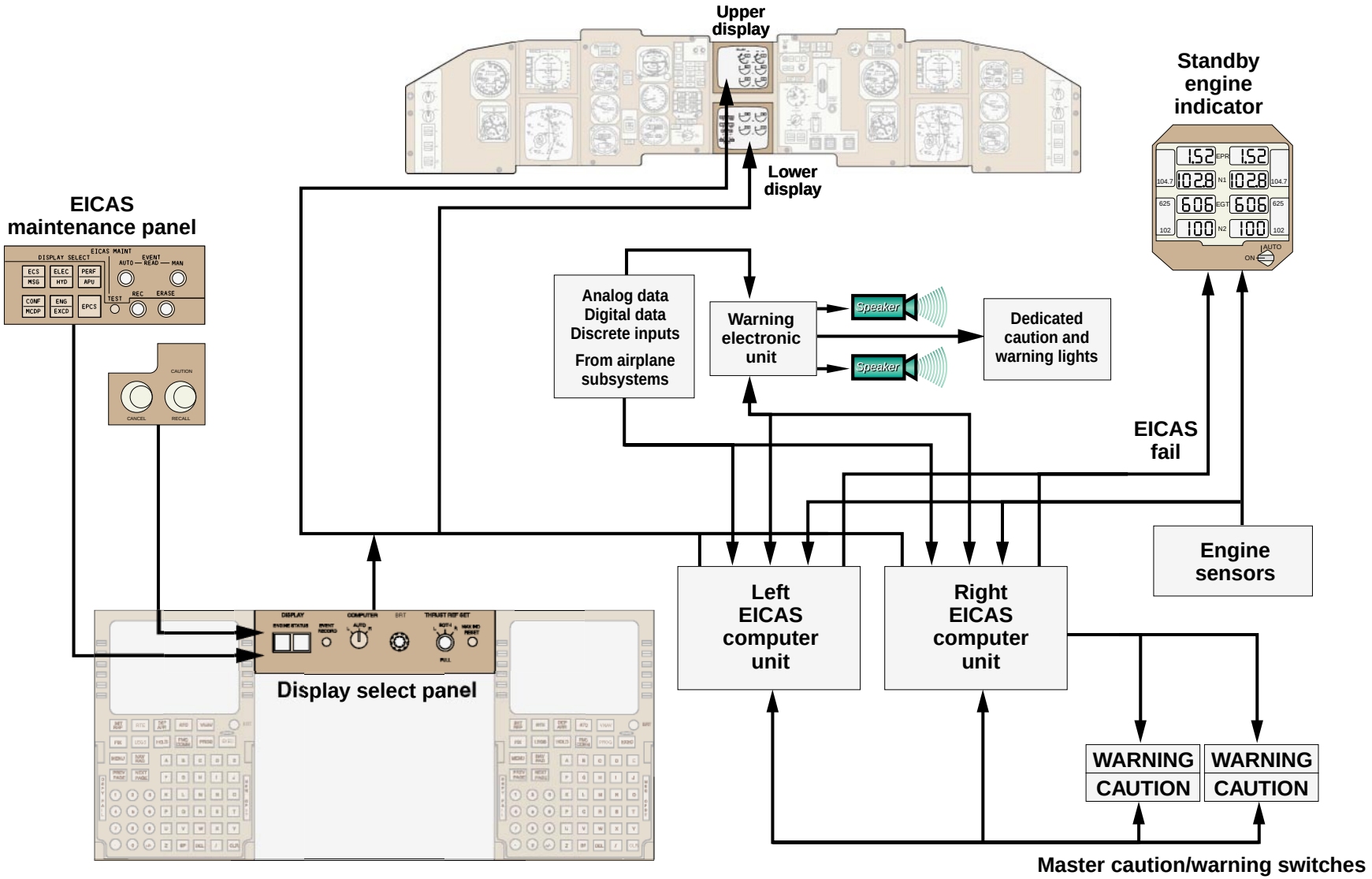
Engine indication and crew alerting system (EICAS) features:

- **Operational displays:**
  - **Primary and secondary engine parameters**
  - **Crew alerting messages**
- **Status page provides additional systems data for determining the readiness of the airplane for dispatch**
- **Maintenance pages**
- **Automatic and manual recording of maintenance data**
- **Automatic display of in-flight start envelope**



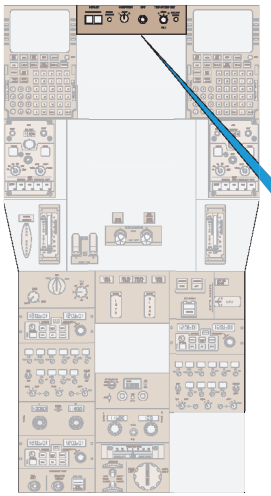
Pilots' main panel

EICAS Display



EICAS Display Select Panel

767-200ER/-300ER



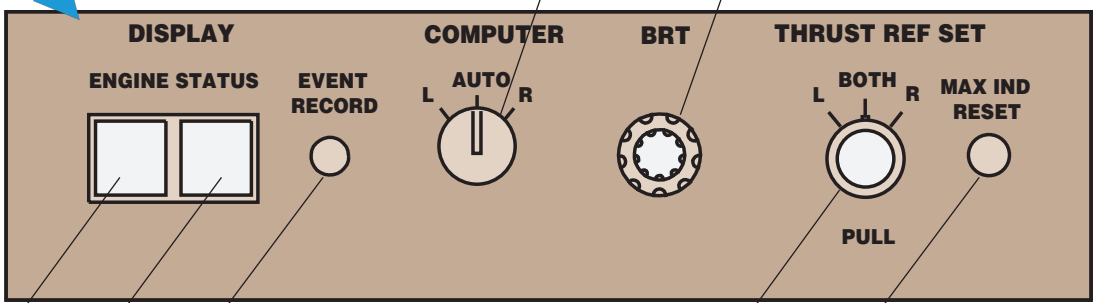
Aislestand

EICAS computer select knob

- **AUTO** — Selects the left computer and automatically switches to the right computer upon detected failure
- **L, R** — Manually selects the left or right computer

EICAS display brightness control

- Inner knob controls brightness of upper display unit
- Outer knob controls brightness of lower display unit



Engine display switch

- Pushing selects or deselects SECONDARY ENGINE display on lower CRT

Status display switch

- Pushing selects or deselects the STATUS display on lower CRT

Event record switch

- Records maintenance data into nonvolatile memory

Manual thrust set knob

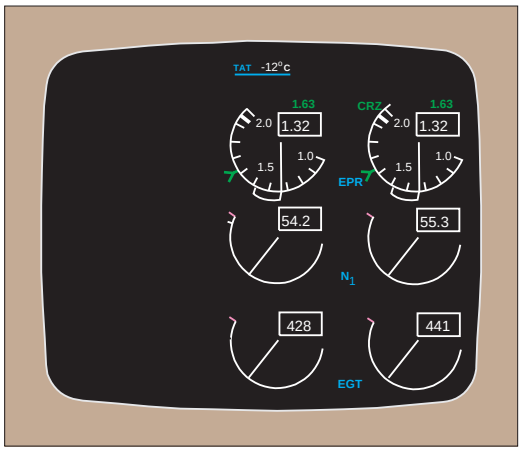
- Inner knob
  - Push - reference thrust automatically set by TMC
  - Pull and rotate - manually sets reference thrust bug on PRIMARY ENGINE display
- Outer knob
  - Rotate - selects engine(s) for manual thrust reference control

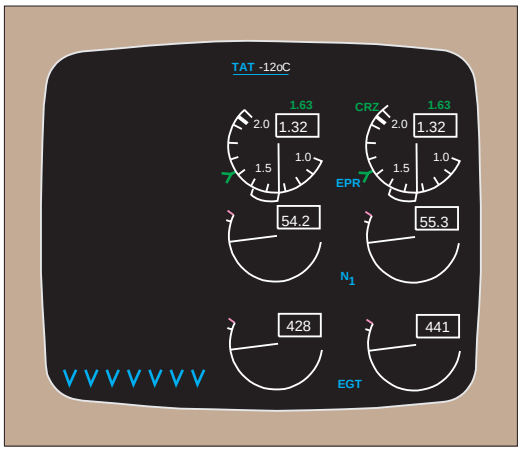
Maximum indication reset switch

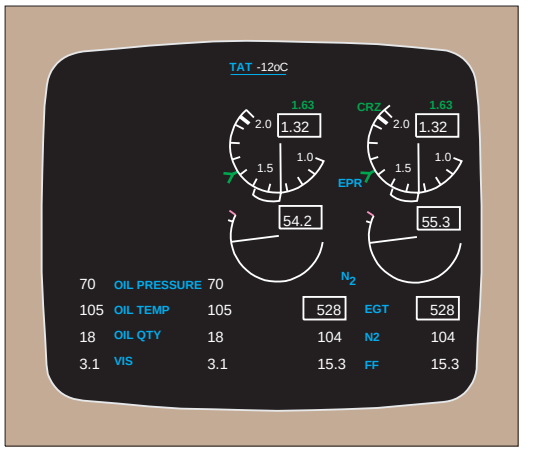
- Resets displayed overlimit readouts

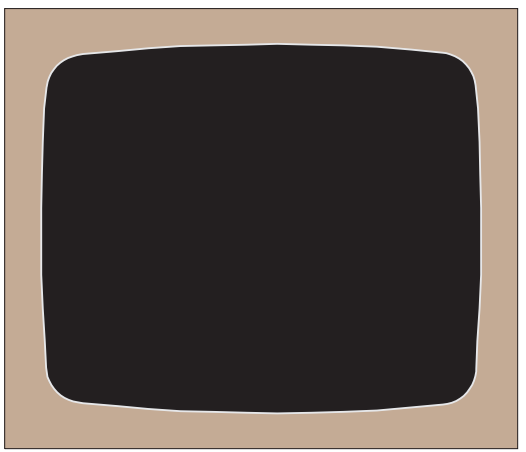
Typical Normal EICAS Formats

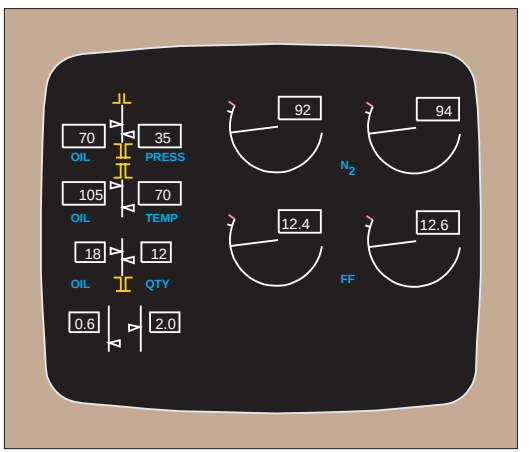
767-200ER/-300ER

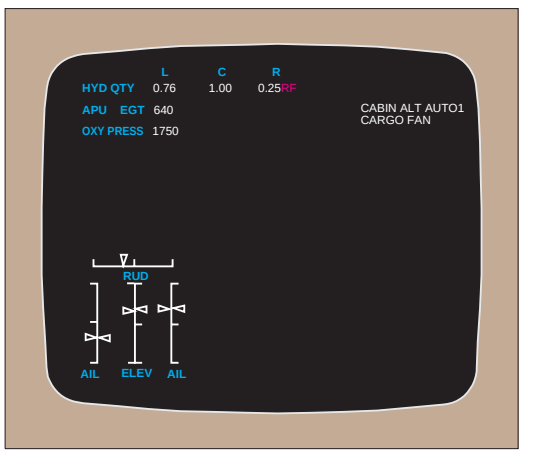


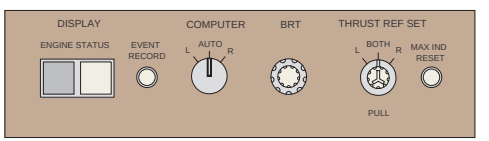


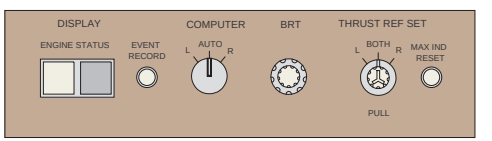




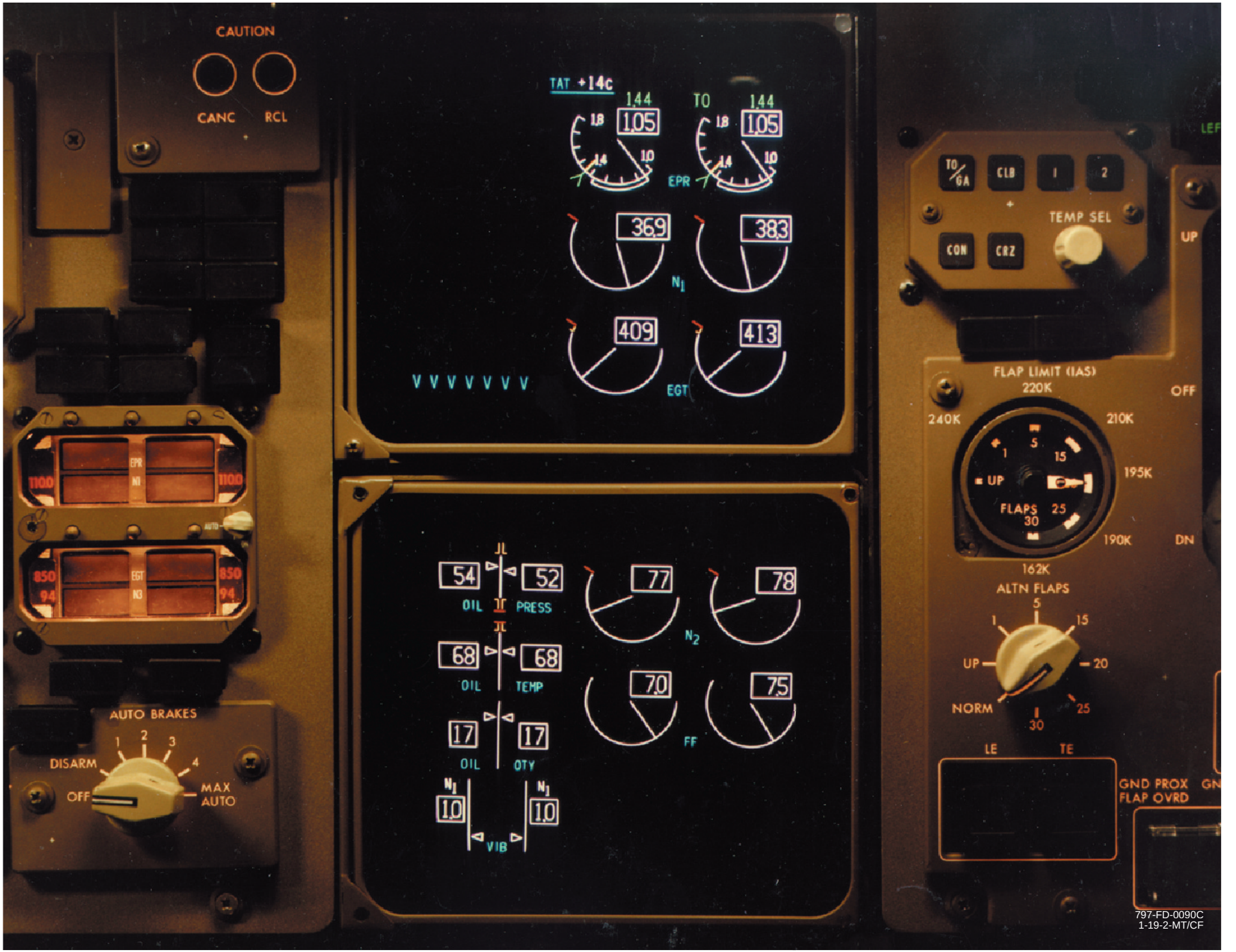




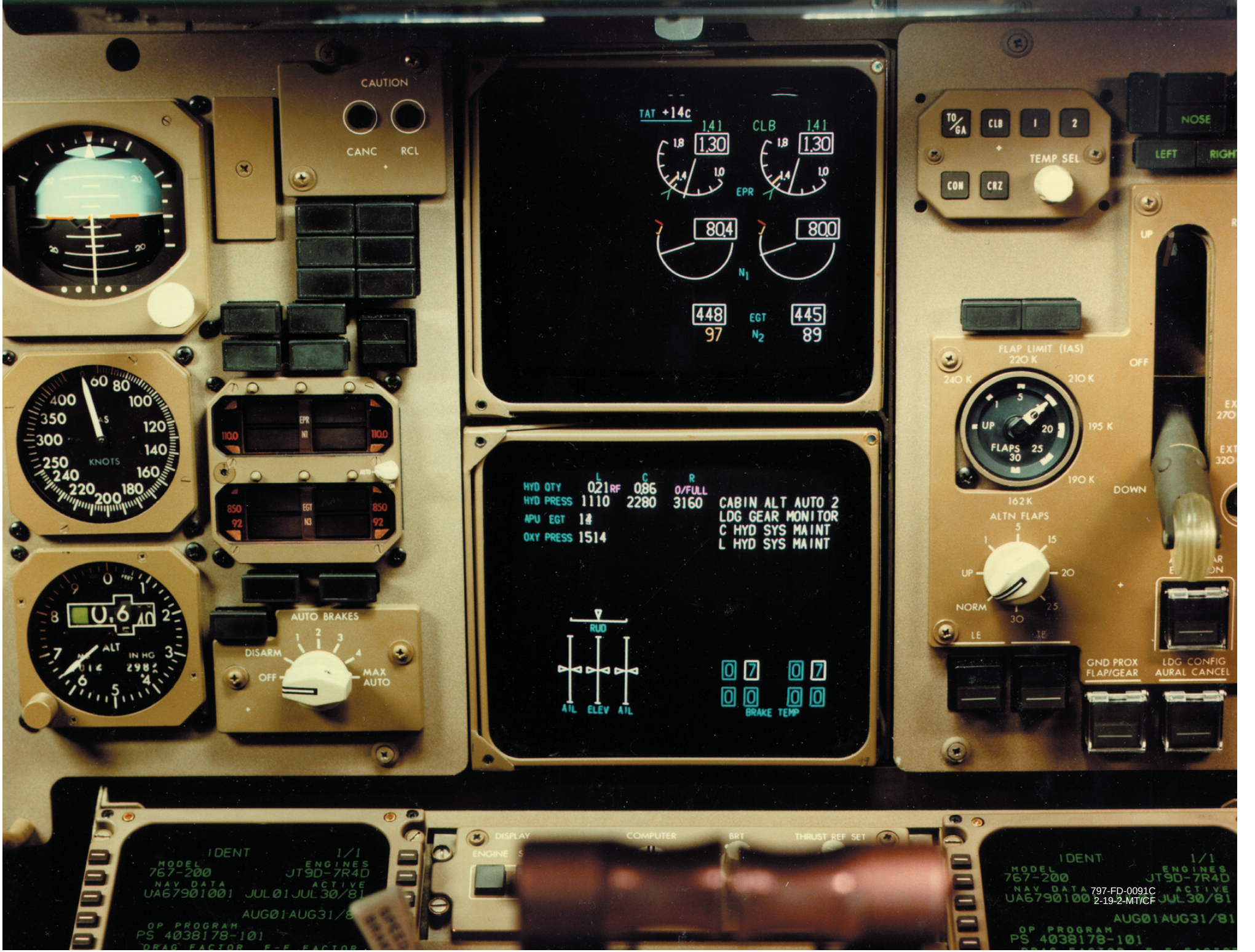




797-FD-0089C
1-19-2-MT/CF



797-FD-0090C
1-19-2-MT/CF



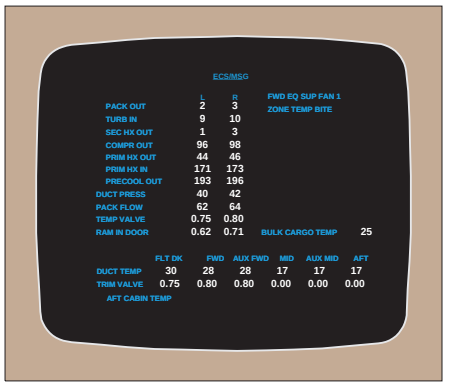
797-FD-0091C
2-19-2-MT/CF

EICAS Maintenance Displays

767-200ER/-300ER

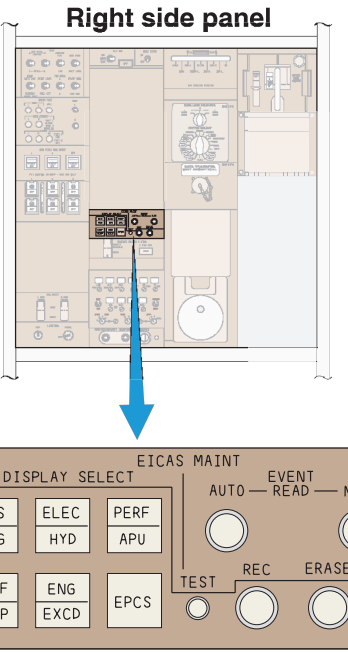
Postflight

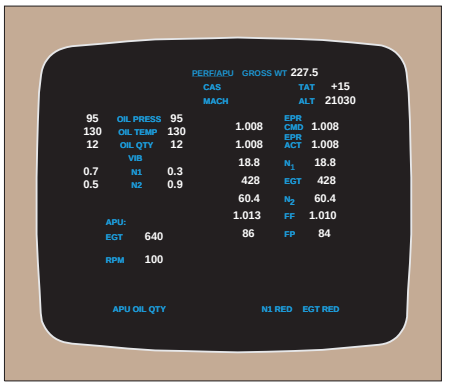
- Logbook entry of status and maintenance messages and data
- MCDP checkout



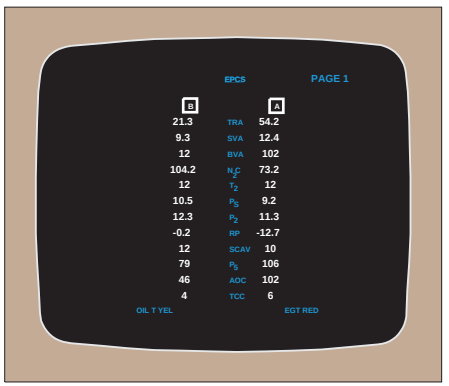
ECS/status messages

Right side panel

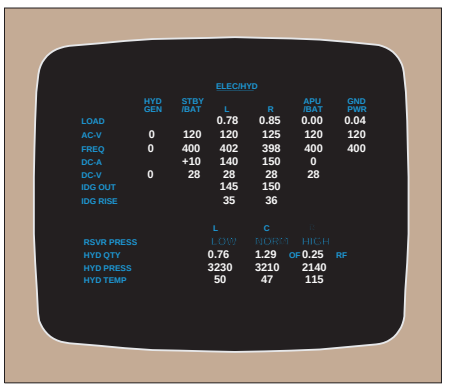




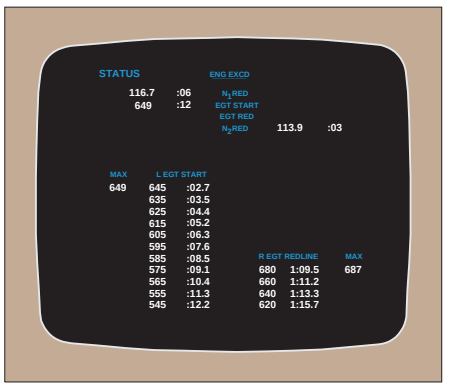
Performance APU



Electronic propulsion control system



Electrical/hydraulics

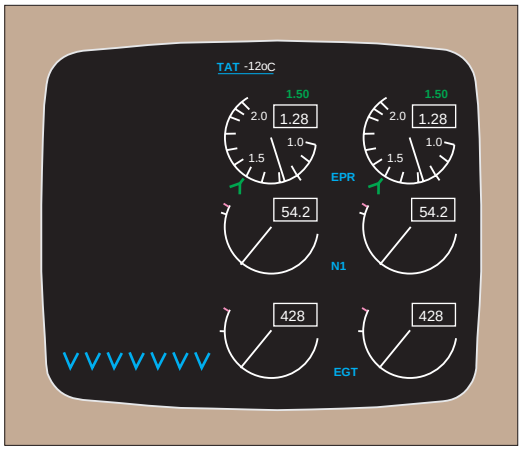


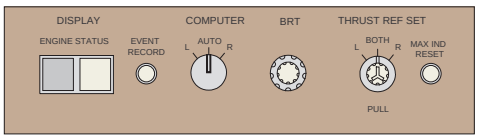
Engine exceedance

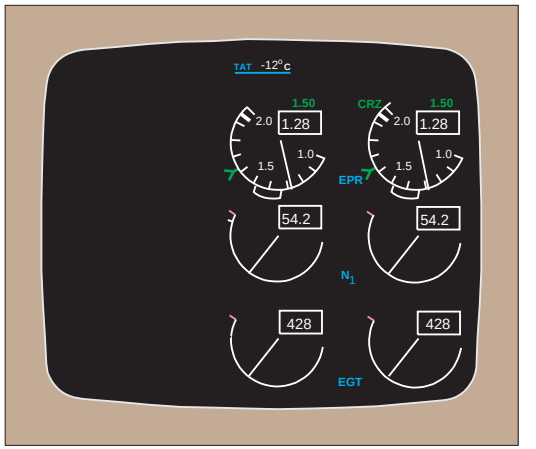
Configuration MCDP

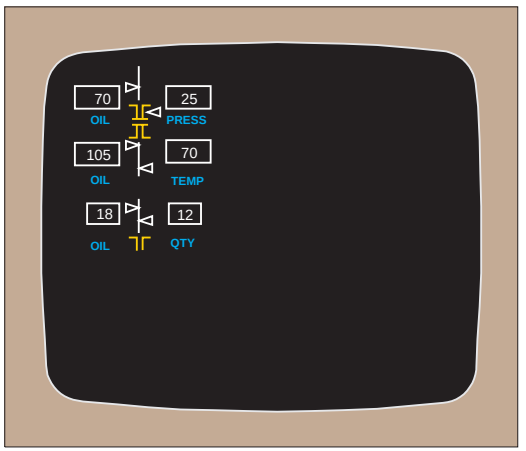
Non-Normal EICAS Operation

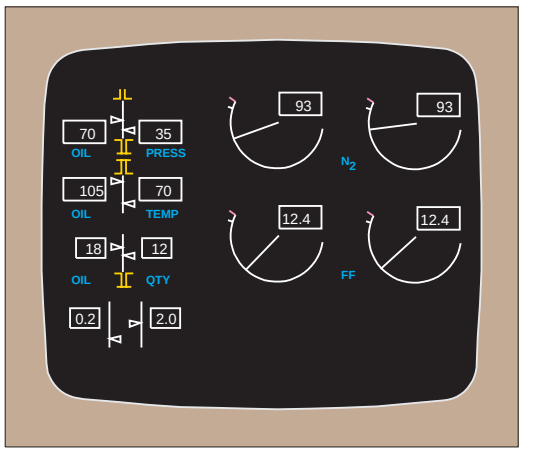
767-200ER/-300ER









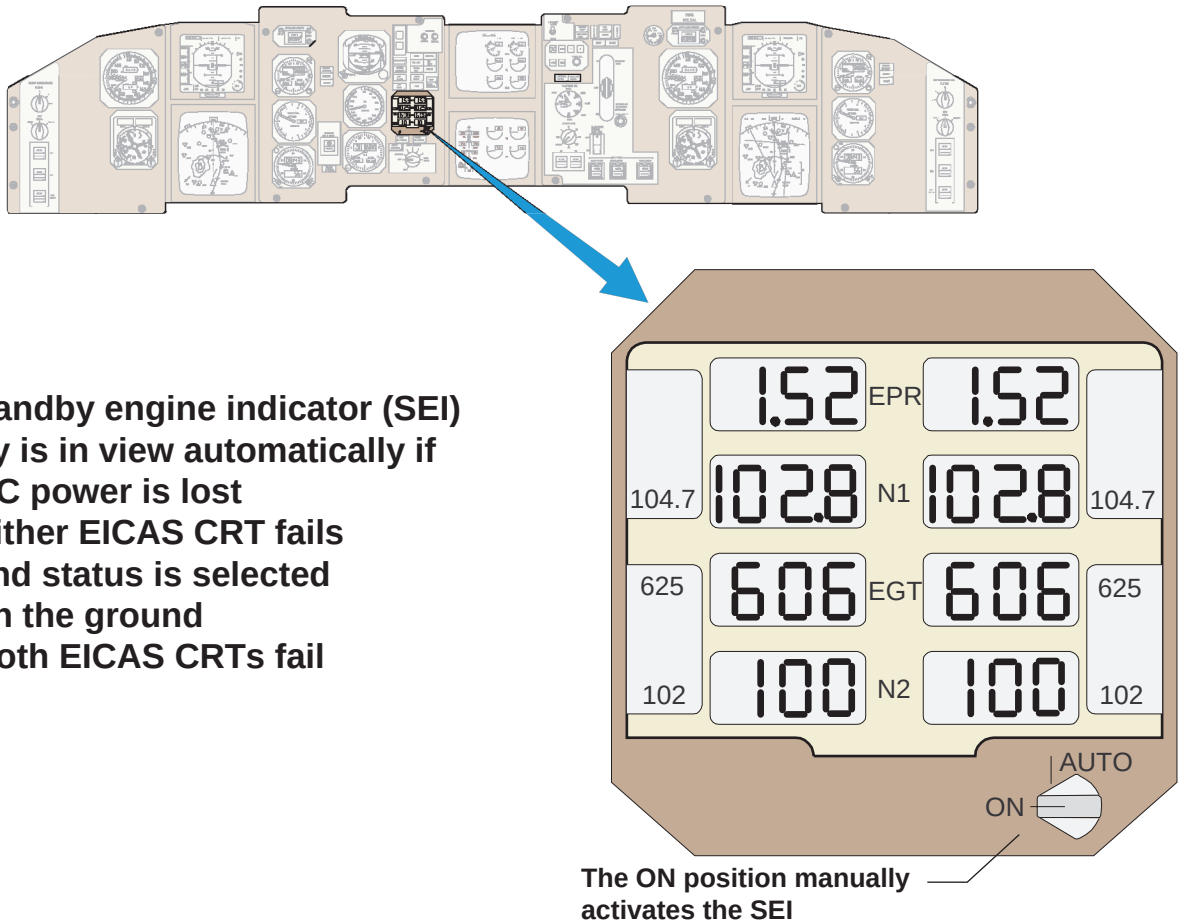


Low oil pressure, temperature, and quantity are displayed automatically

Secondary engine parameters selected

Standby Engine Indicator

767-200ER/-300ER



The standby engine indicator (SEI) display is in view automatically if

- **AC power is lost**
- **Either EICAS CRT fails and status is selected on the ground**
- **Both EICAS CRTs fail**

The ON position manually activates the SEI

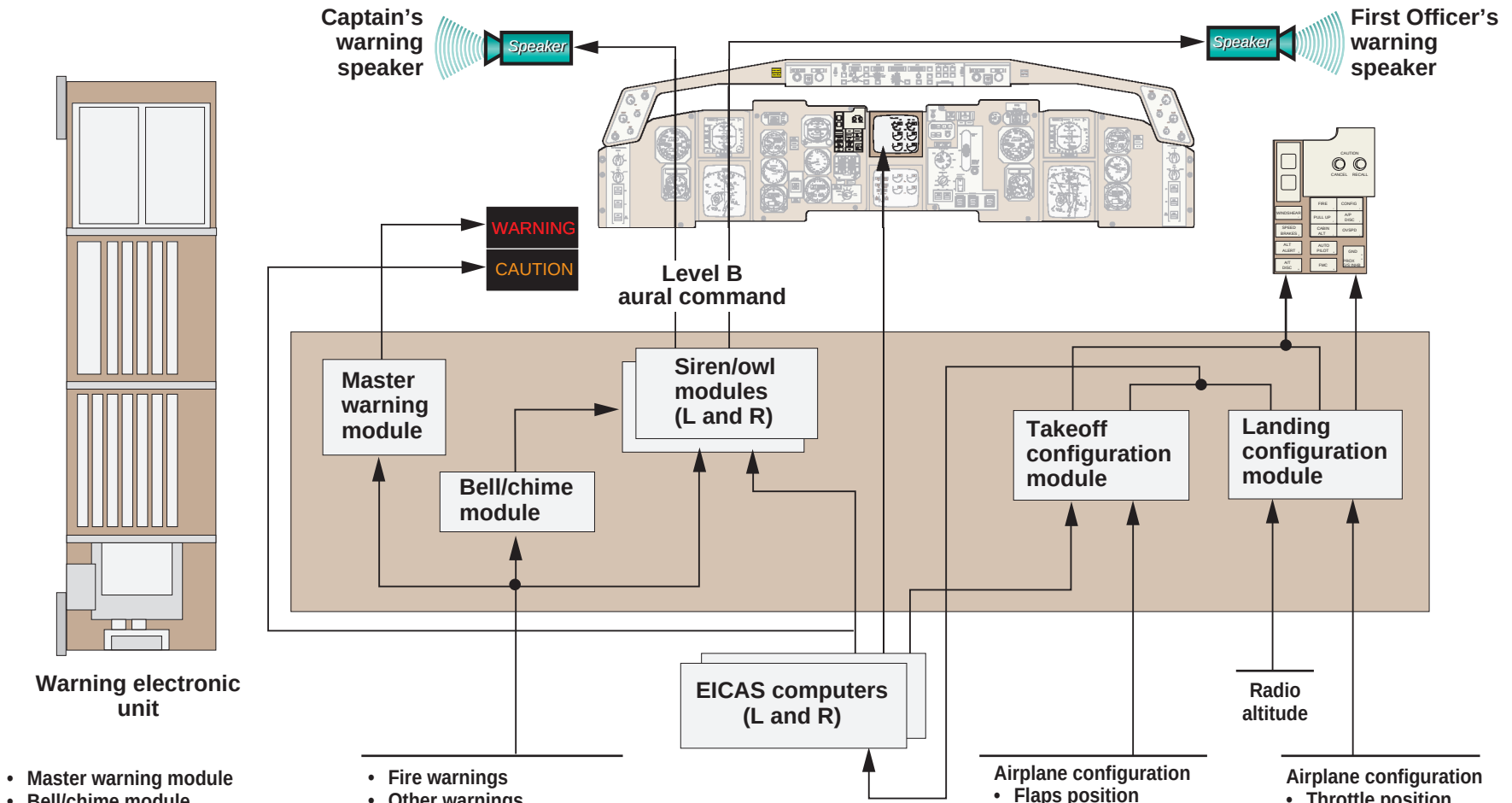
Crew Alerting Features

767-200ER/-300ER

- Master warning and caution lights in Pilots' primary field of view
- Discrete alert lights repeated by EICAS messages
- Consistent use of colors
  - Red for warnings
  - Amber for cautions and advisories
  - White for communications
- Reduced number of aurals: bell, siren, beeper, voice, and chime
- Sound intensity automatically adjusted to compensate for flight deck background noise
- Predictive windshear and reactive windshear detection systems installed
- Enhanced ground proximity warning system (EGPWS) installed
- Traffic alert and collision avoidance system (TCAS) installed

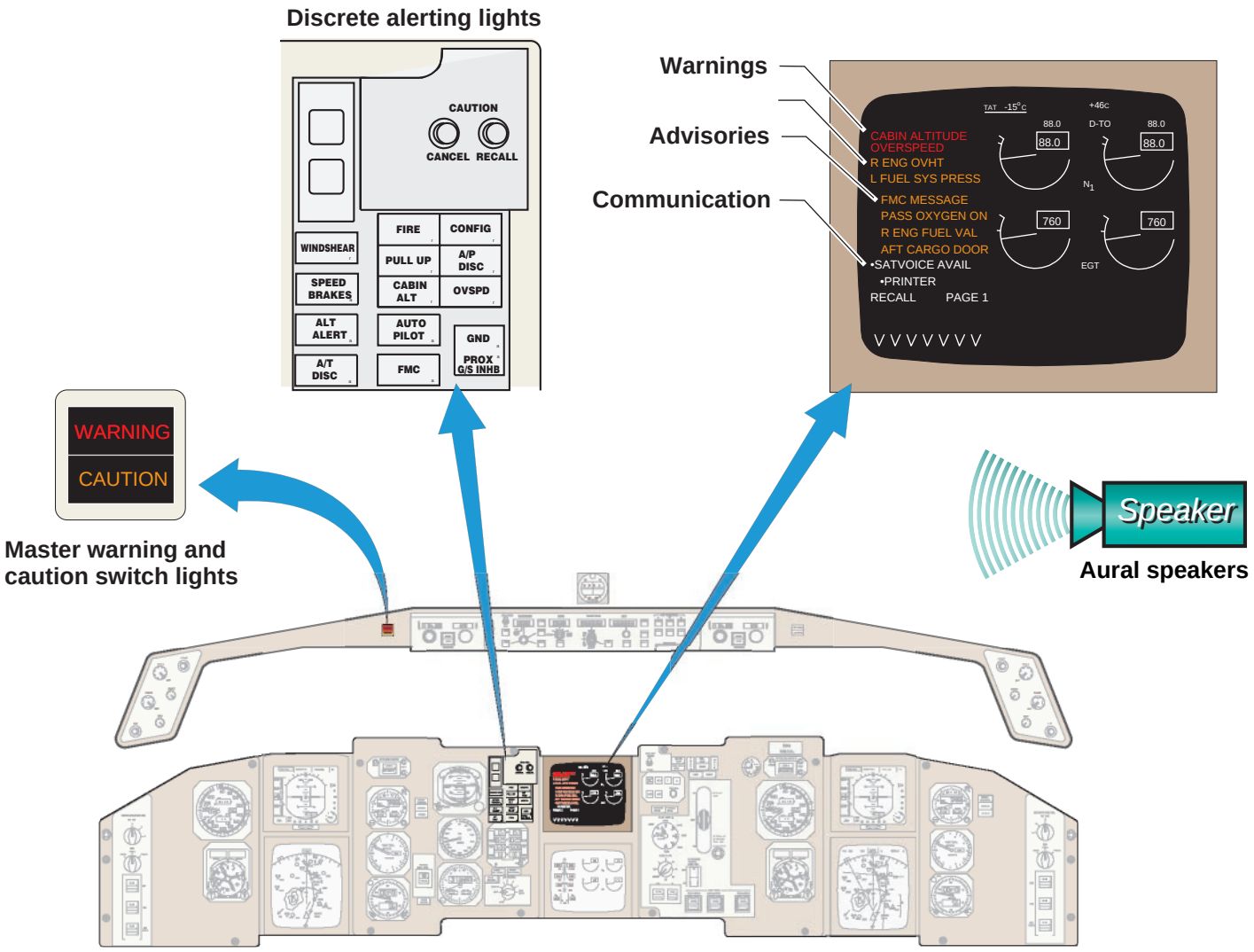
Crew Warning and Alerting System

767-200ER/-300ER



Crew Alerting System

767



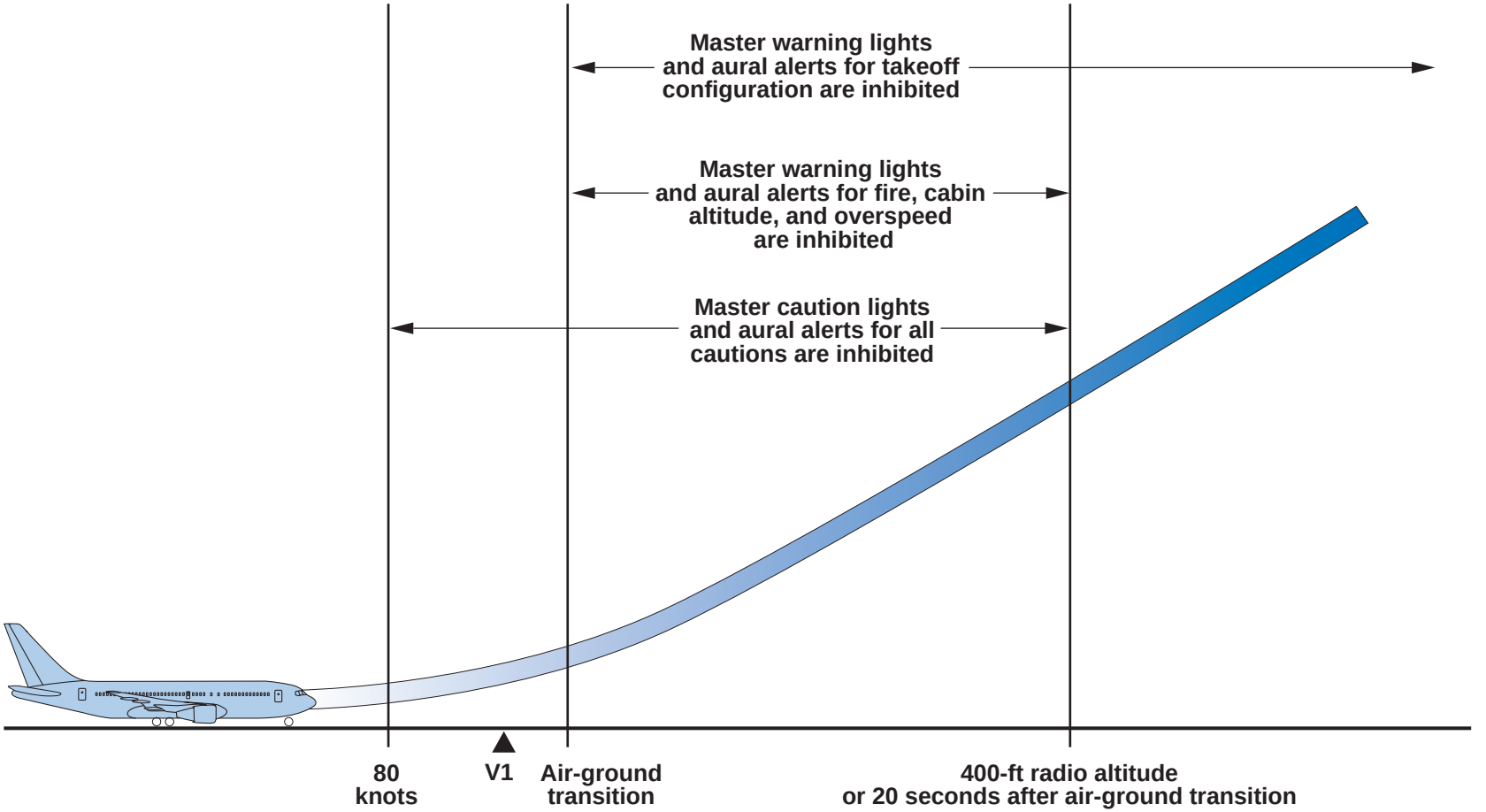
EICAS Message Definitions

767-200ER/-300ER

Warning (red)	**An operational or aircraft system condition that requires immediate corrective or compensatory action by the crew** **• Associated with warning aural or fire bell and red master warning lights and dedicated system warning annunciators**
Caution (amber)	**An operational or aircraft system condition that requires immediate crew awareness and future compensatory action** **• Associated with master caution aural and amber master caution lights and dedicated system caution annunciators**
Advisory (amber)	**An operational or aircraft system condition that requires crew awareness** **• Associated with system alert annunciators**
Communication (white)	**A normal communications condition that may require crew attention** **• Associated with chime aural**
Status (white)	**An MEL-related aircraft system fault requiring crew awareness prior to dispatch** **• Displayed on status page**

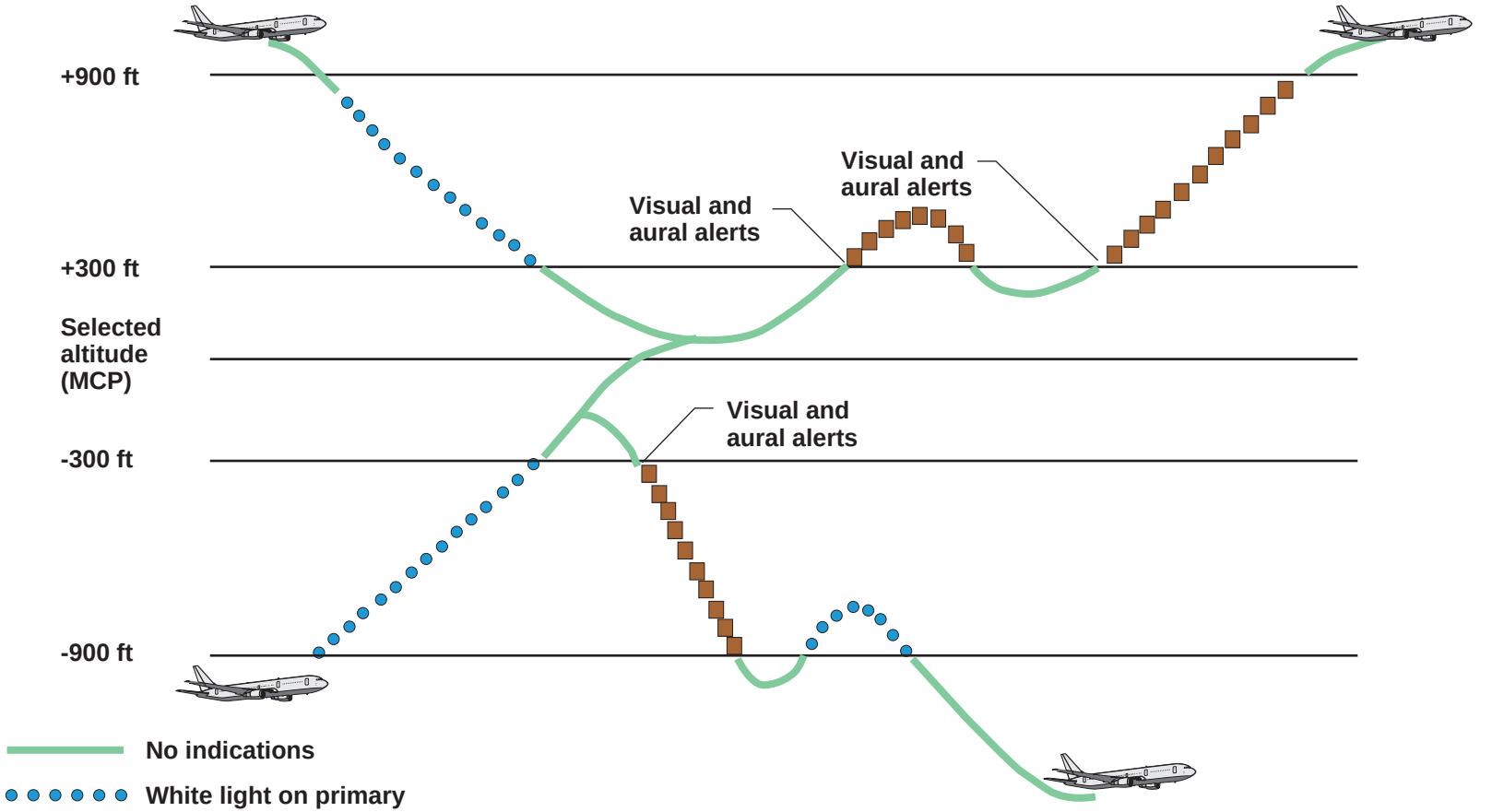
Alerting Inhibits During Takeoff

767-200ER/-300ER



Altitude Alert System

767-200ER/-300ER



TCAS EADI Display

767-200ER/-300ER

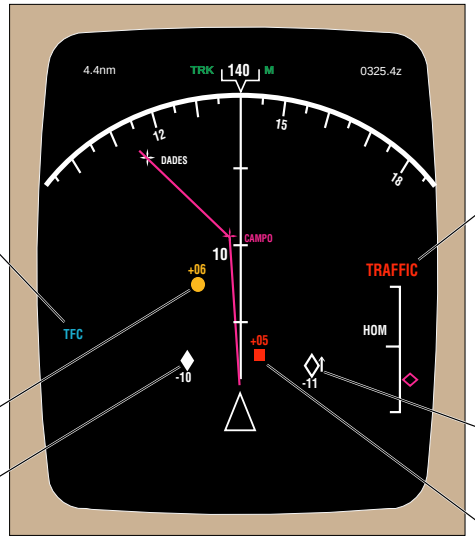
Resolution advisory (RA)

- **Displayed automatically when the traffic alert and collision avoidance system (TCAS) calculates a collision threat with another aircraft**

- **Provides vertical guidance for a pitch maneuver to ensure adequate vertical separation with the traffic airplane**

TCAS EHSI Display

767-200ER/-300ER



TCAS mode annunciation
- TFC
- TA only
- TCAS fail
- TCAS test
- TCAS off

TA display annunciation

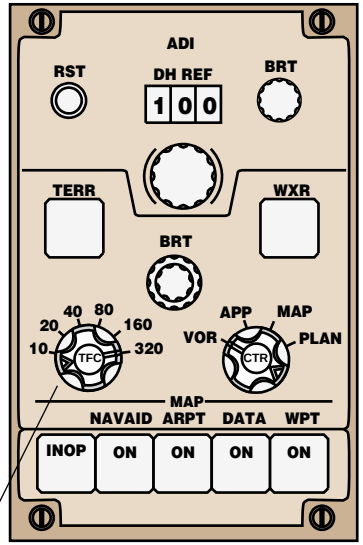
Proximate traffic

TA or RA annunciation (red or amber)

Other traffic symbol

RA

Aislestand



TCAS mode selector (TFC)
- Push for TCAS display

Traffic symbols are available in the EHSI modes:
- Center map
- Expanded map
- Expanded VOR
- Expanded approach

Definition of

RA - Resolution advisory
Other aircraft is 15 to 35 seconds from closest point of approach

TA - Traffic advisory
Other aircraft is 20 to 48 seconds from closest point of approach

Proximate traffic - Other aircraft is less than 6 nmi away and within ± 1,200 vertical feet from own aircraft and not currently a potential conflict

Other traffic - Other aircraft is more than 6 nmi away or greater than ± 1,200 vertical feet from own aircraft and not currently a potential conflict

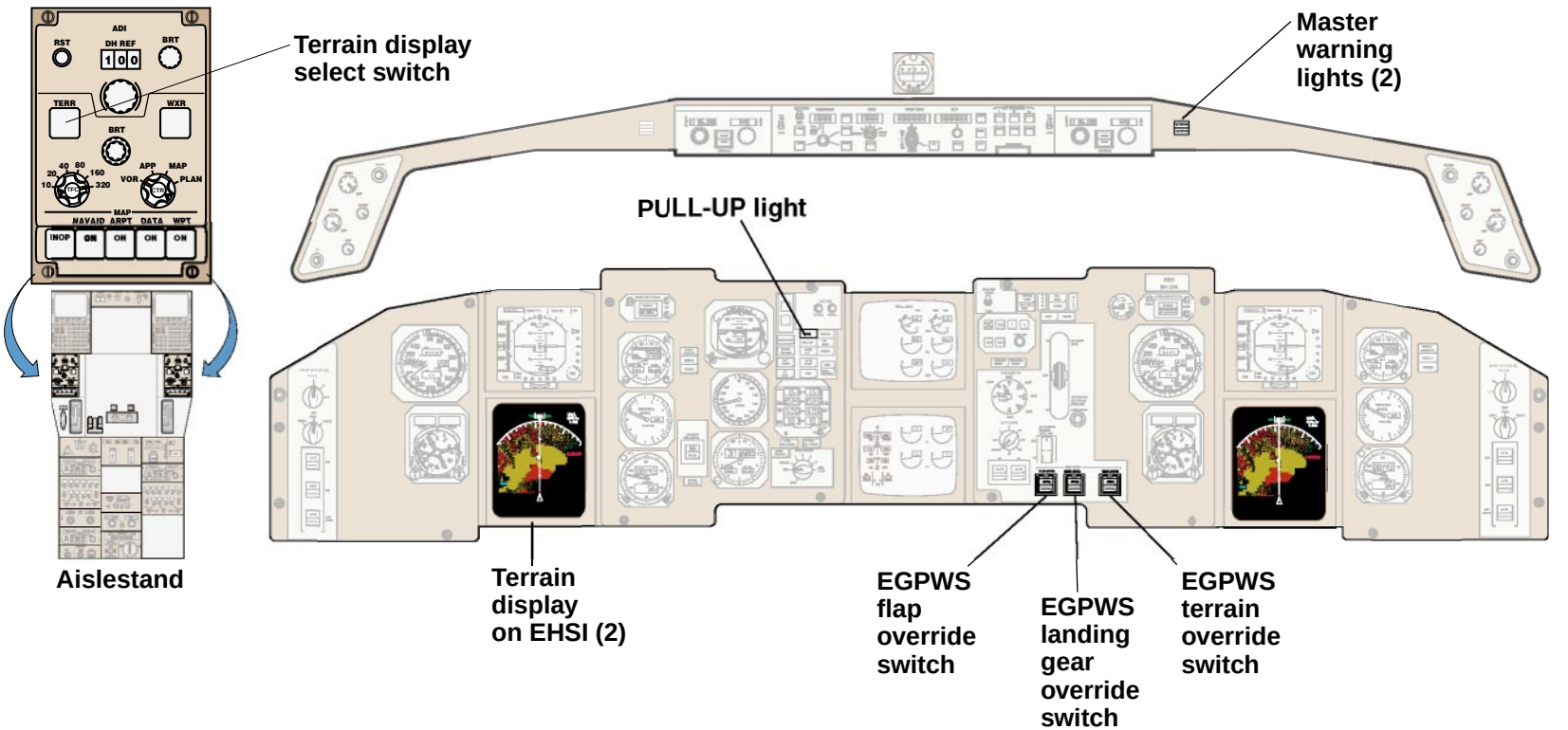
Arrow - Indicates traffic climbing or descending at a rate greater than or equal to 500 fpm

Altitude - Number and associated sign (+ or -) indicates altitude of traffic in hundreds of feet relative to the airplane. The number is below the traffic symbol when the traffic is below and above the traffic symbol when the traffic is above

Enhanced Ground Proximity Warning System (EGPWS)

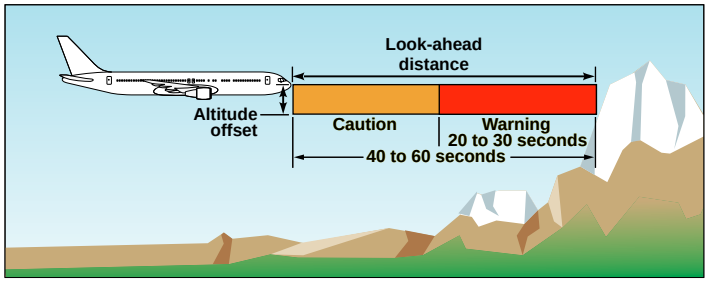
767-200ER/-300ER

The enhanced ground proximity warning system (EGPWS) is a basic installation on Boeing airplanes. EGPWS provides caution and warning level alerts to the flight crew about potential terrain conflicts. The alerts are based primarily on airplane position, flight path, and barometric altitude information in conjunction with the EGPWS self-contained worldwide airport and terrain databases.

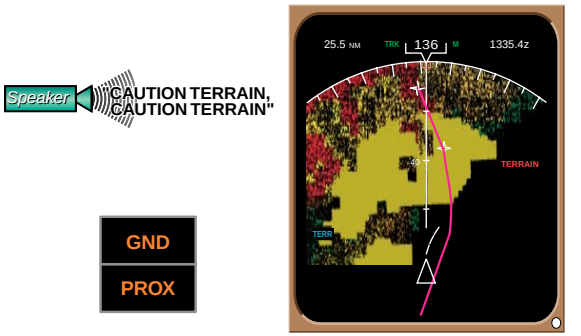


Enhanced Ground Proximity Warning System

767-200ER/-300ER

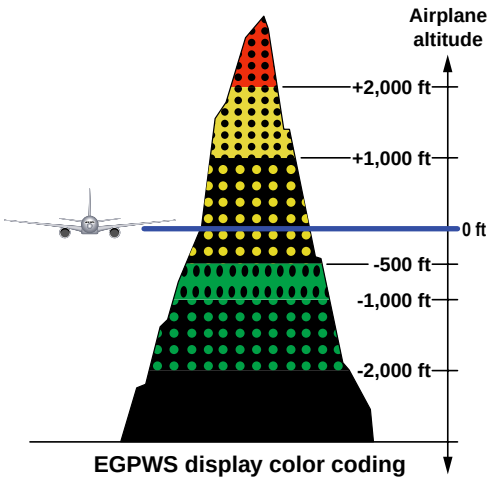


The enhanced ground proximity warning system computes two levels of terrain alerting envelopes: caution and warning.

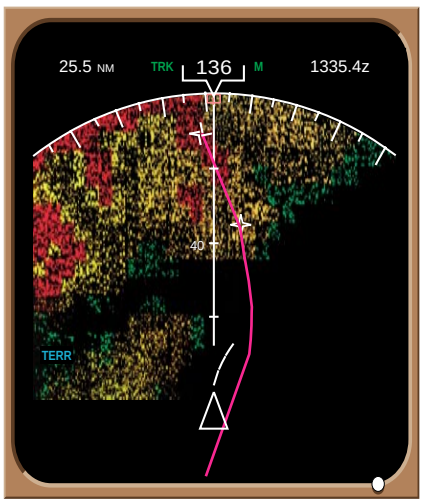


EHSI

The enhanced ground proximity warning system look-ahead caution alert includes unique voice aural, terrain display, and map annunciations.

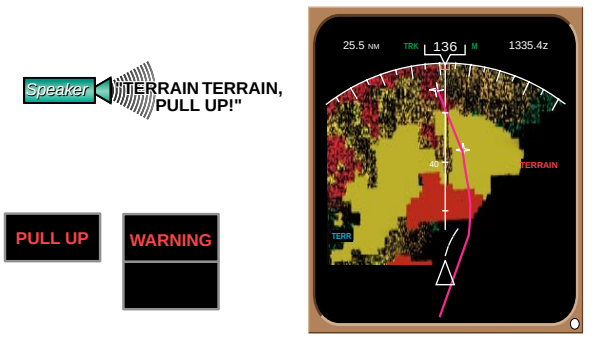


EGPWS display color coding



EHSI

Terrain display colors indicate the height of the terrain relative to the current airplane altitude.



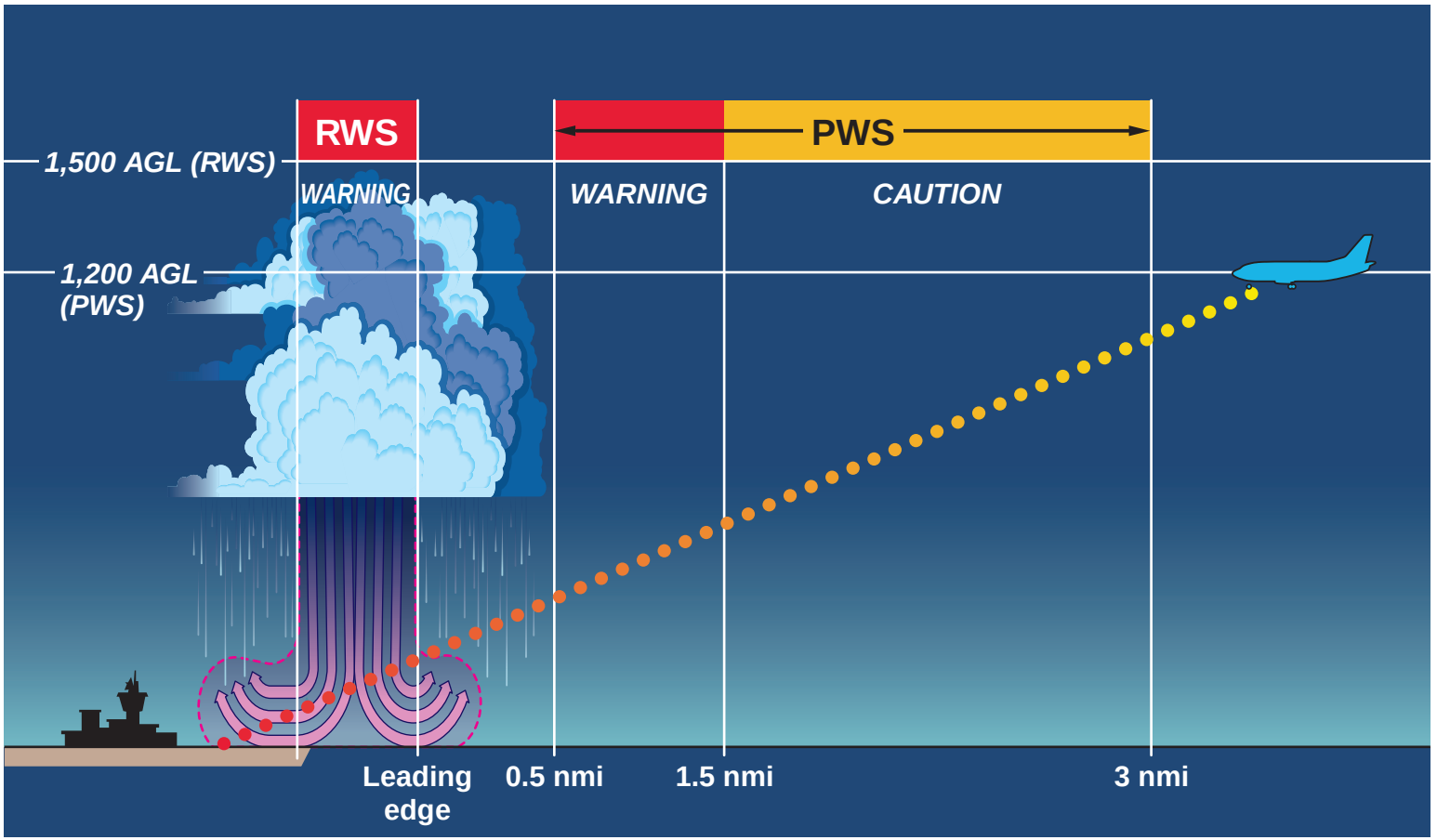
EHSI

The enhanced ground proximity warning system look-ahead warning alert aurals are nearly identical to those for the basic GPWS warnings in order to elicit the same pilot response. In addition, threatening terrain is presented on the map display.

Reactive and Predictive Windshear Systems

767-200ER/-300ER

Both a reactive windshear system (RWS) and a predictive windshear system (PWS) are basic equipment on Boeing airplanes. The systems provide windshear detection capability during all operations below 1,500 feet (460 m) **above ground level.**



Reactive and Predictive Windshear Systems

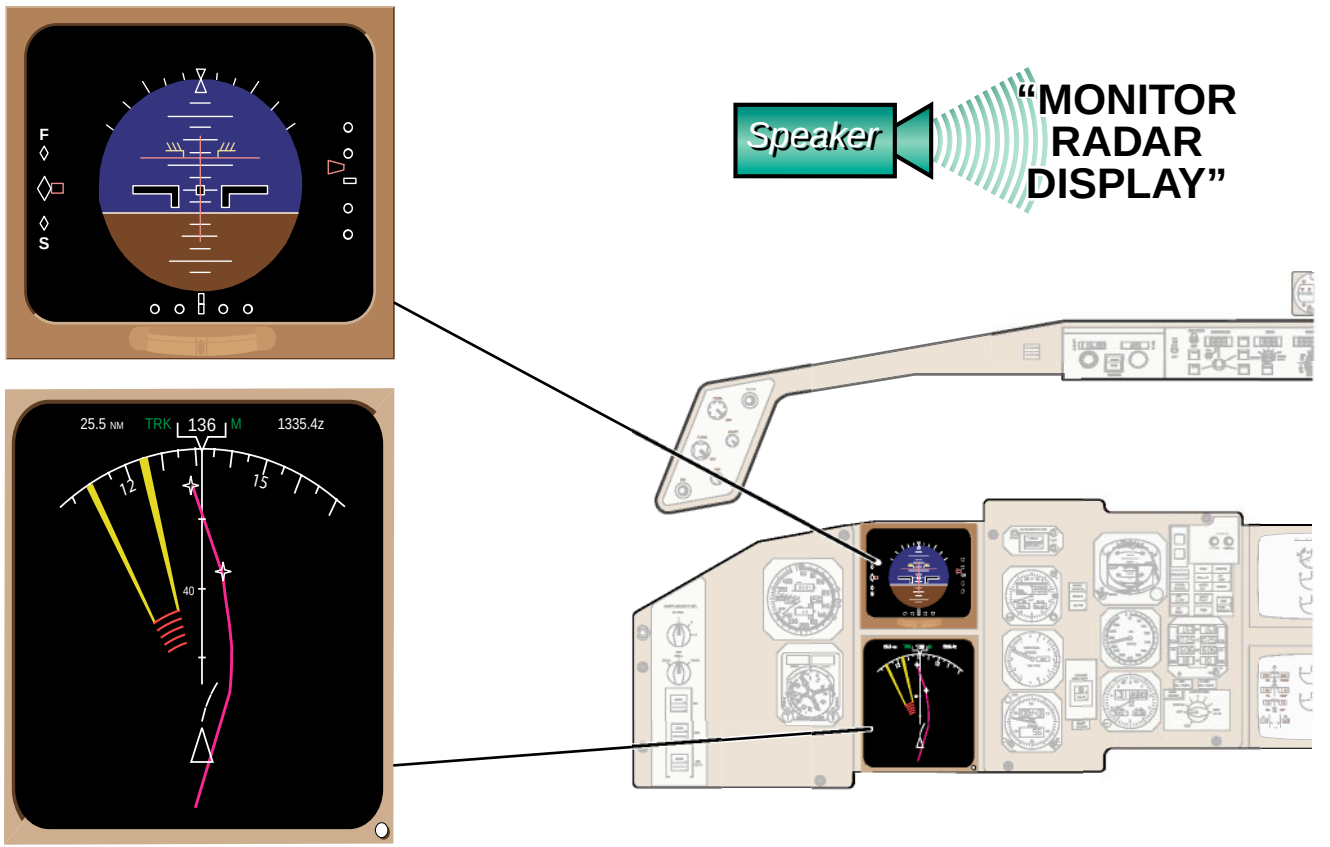
767-200ER/-300ER

- **Predictive windshear system**
  - **Provides aural and visual alerts of an impending windshear condition based on weather radar returns**
- **Reactive windshear system**
  - **Provides recovery guidance and aural and visual alerts when the EGPWS detects the aircraft has entered a windshear condition**
  - **The AFDS provides windshear recovery guidance by means of the normal go-around pitch and roll modes when windshear is detected:**
    - **If an autopilot is engaged and the go-around mode is armed, the autopilot commands a pitch-up of 15 degrees or slightly below the pitch limit (whichever is lower) when a GA switch is actuated**
    - **If an autopilot is not engaged when the go-around is initiated, the pilot must fly the windshear recovery following the flight director commands. If the autothrottle is not armed or engaged, the pilot must advance the throttle levers manually**

Predictive Windshear System (PWS)

767-200ER/-300ER

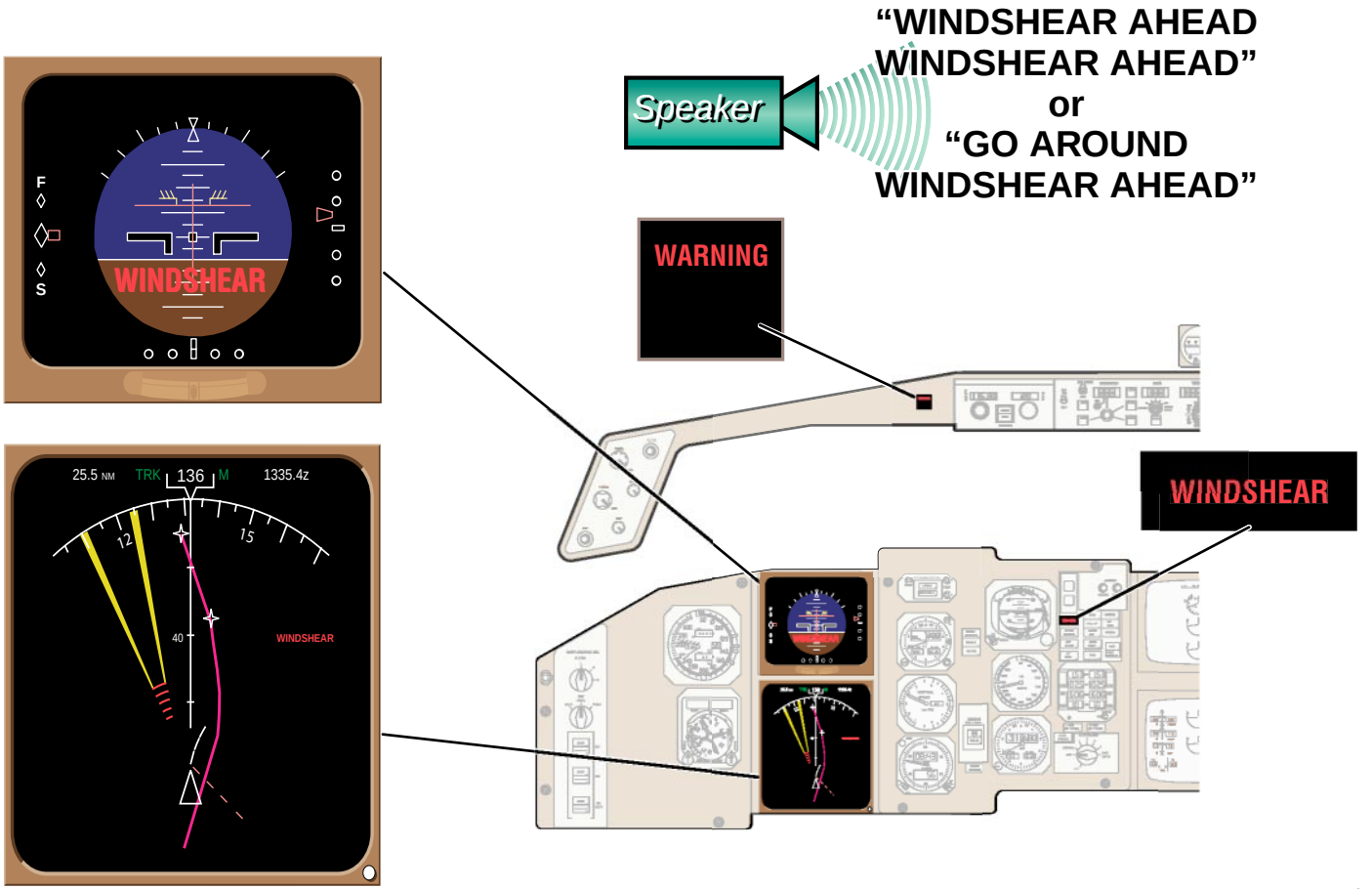
The predictive windshear system begins the windshear alerting sequence with a caution to the flight crew, including a voice aural alert and an amber WINDSHEAR message on the EHSI. The predictive windshear alerts are generated by the weather radar system.



Predictive Windshear System (PWS)

767-200ER/-300ER

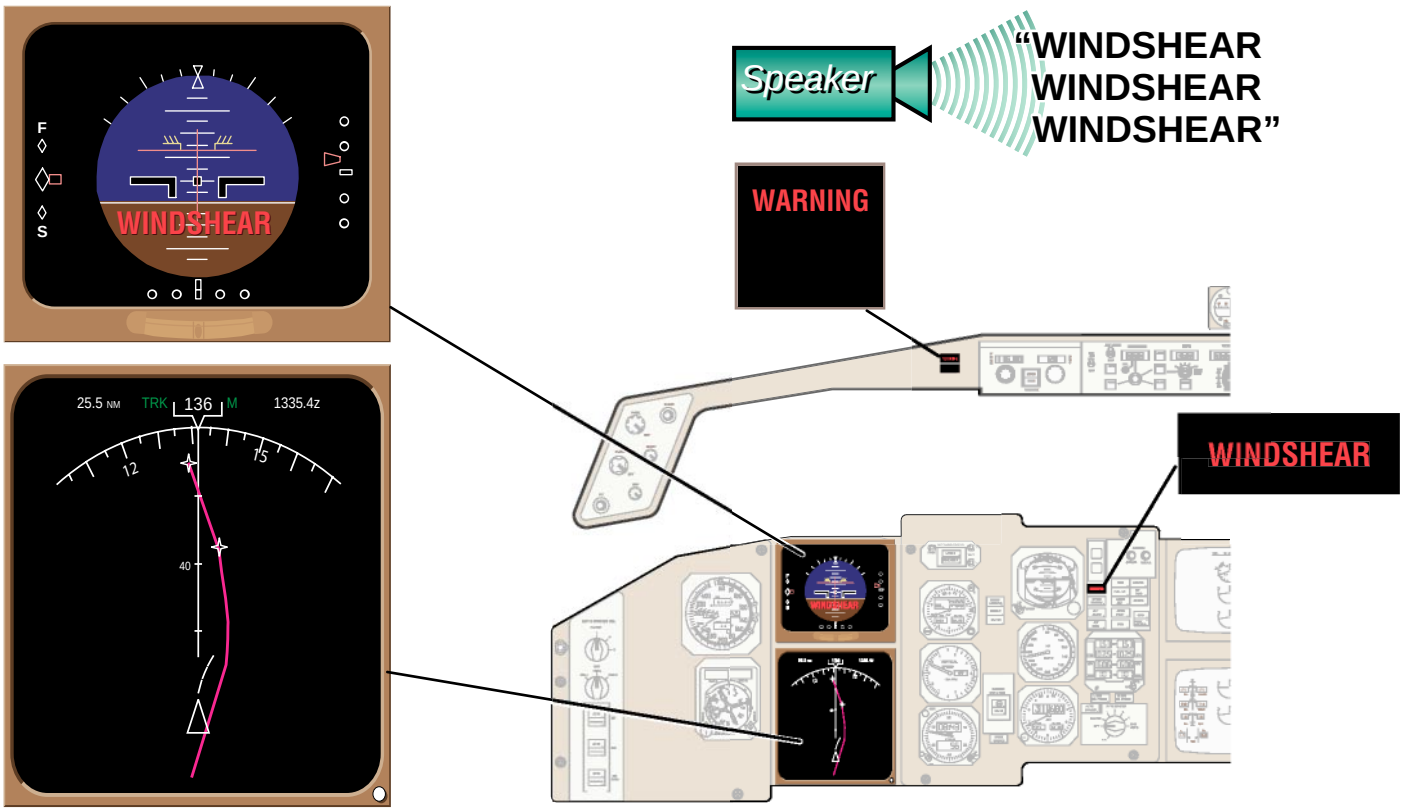
The predictive windshear system next generates one of two warning voice aural alerts, as well as a red WINDSHEAR message on the EHSI and EADI, and illumination of the master warning lights. “WINDSHEAR AHEAD” voice aural alert is annunciated during takeoff phase of flight. “GO AROUND, WINDSHEAR AHEAD” voice aural alert is annunciated during the approach phase of flight.



Reactive Windshear System (RWS)

767-200ER/-300ER

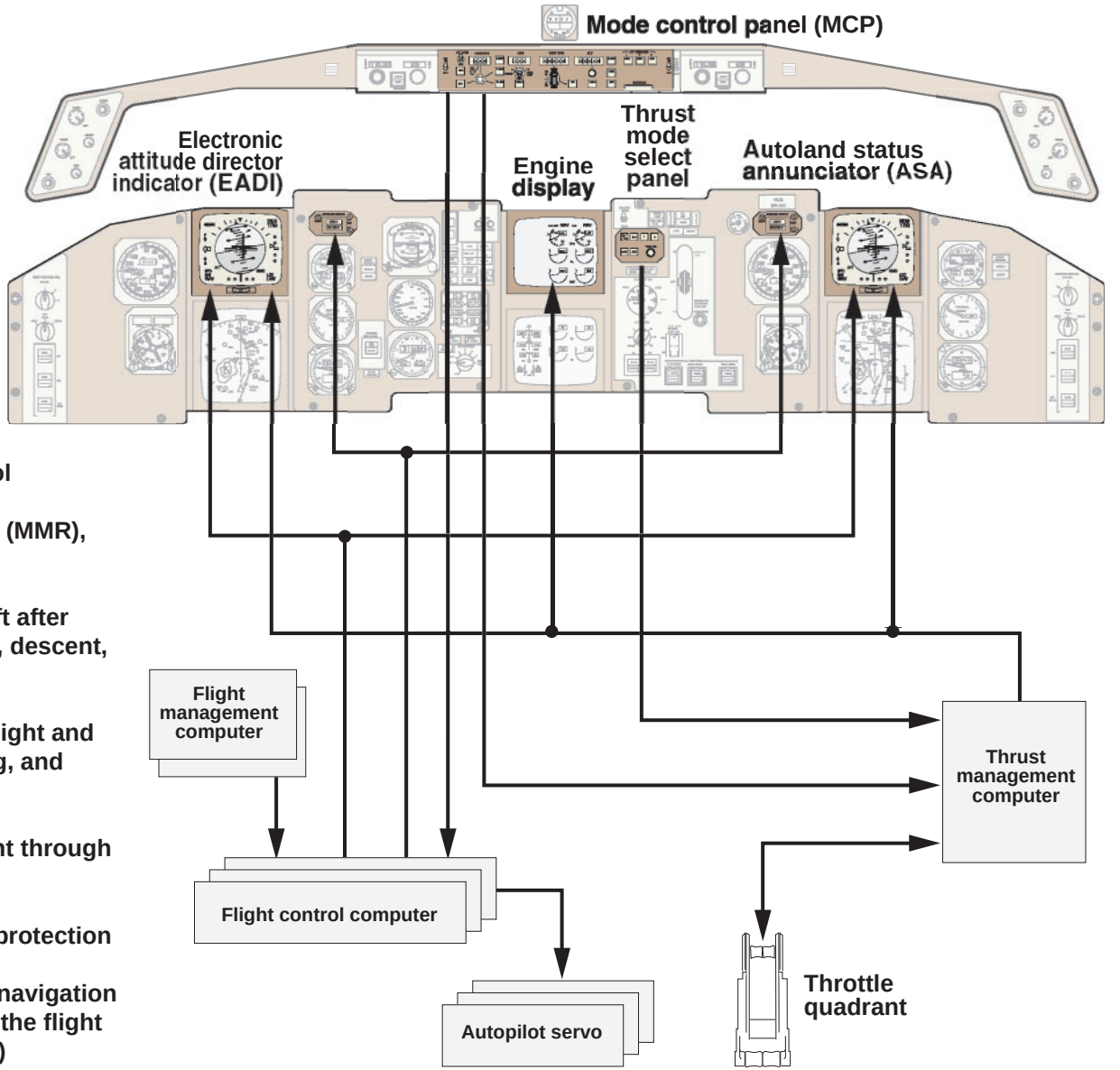
The reactive windshear system warning provides a voice aural alert and a red WINDSHEAR message when the airplane enters a performance-decreasing windshear. The reactive windshear alert is generated by the EGPWS.



767 Flight Deck - Autoflight

Autopilot Flight Director System

767-200ER/-300ER



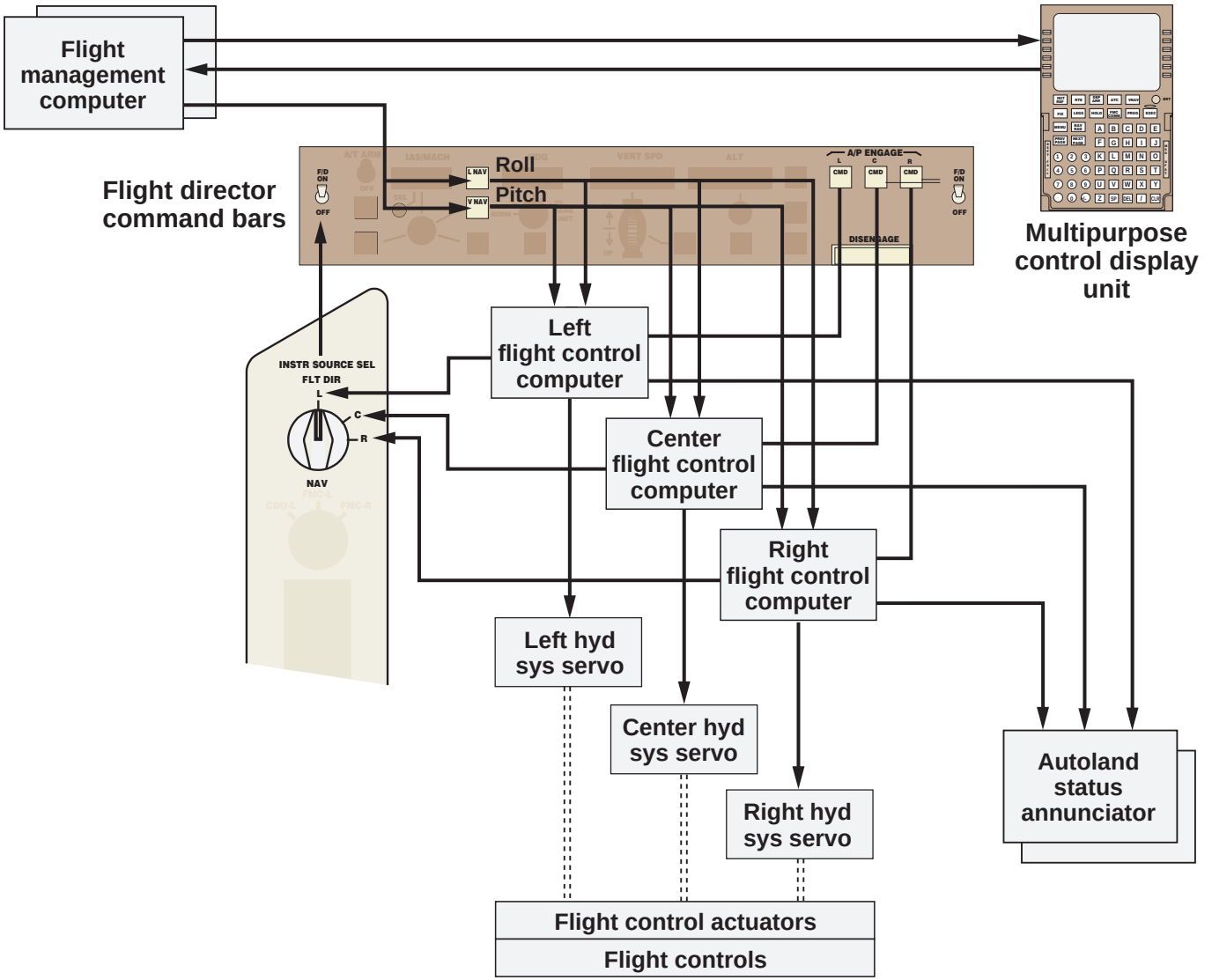
The autopilot flight director system (AFDS) provides

- **Triple-redundant flight control computers (FCC), autopilot servos, multi-mode receivers (MMR), and radio altimeters**
- **Autopilot available from 200 ft after takeoff through climb, cruise, descent, landing, and go-around**
- **Category IIIb, 0 ft decision height and 300 ft RVR, approach, landing, and rollout capability**
- **Automatic thrust management through full-flight regime**
- **Flap placard and alpha floor protection**
- **Optimum vertical and lateral navigation capabilities when coupled to the flight management computer (FMC)**

797-FD-0108C
1-19-02-whp/DD

Autopilot Flight Director

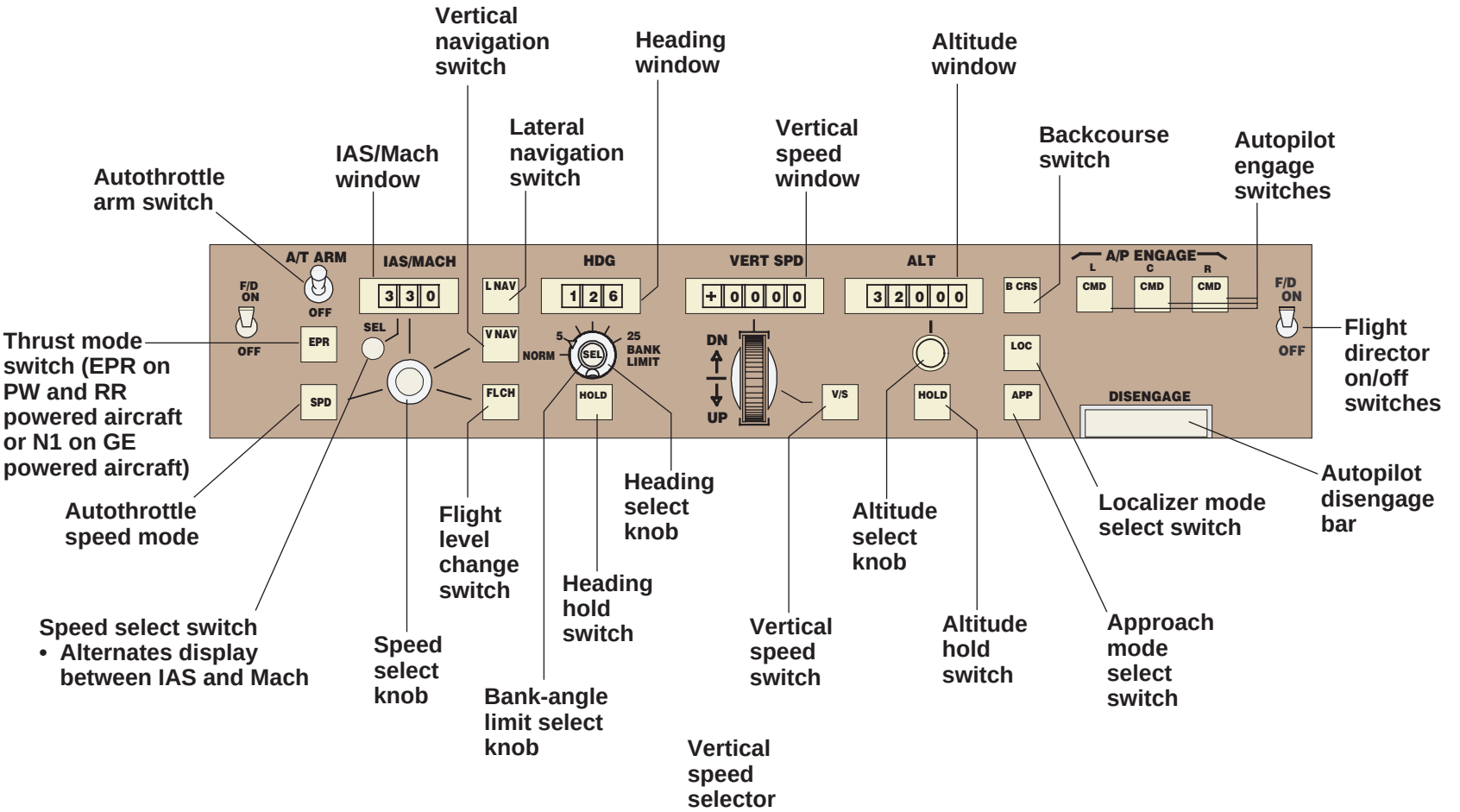
System Diagram



797-FD-0044C
1-19-02-whp/DD

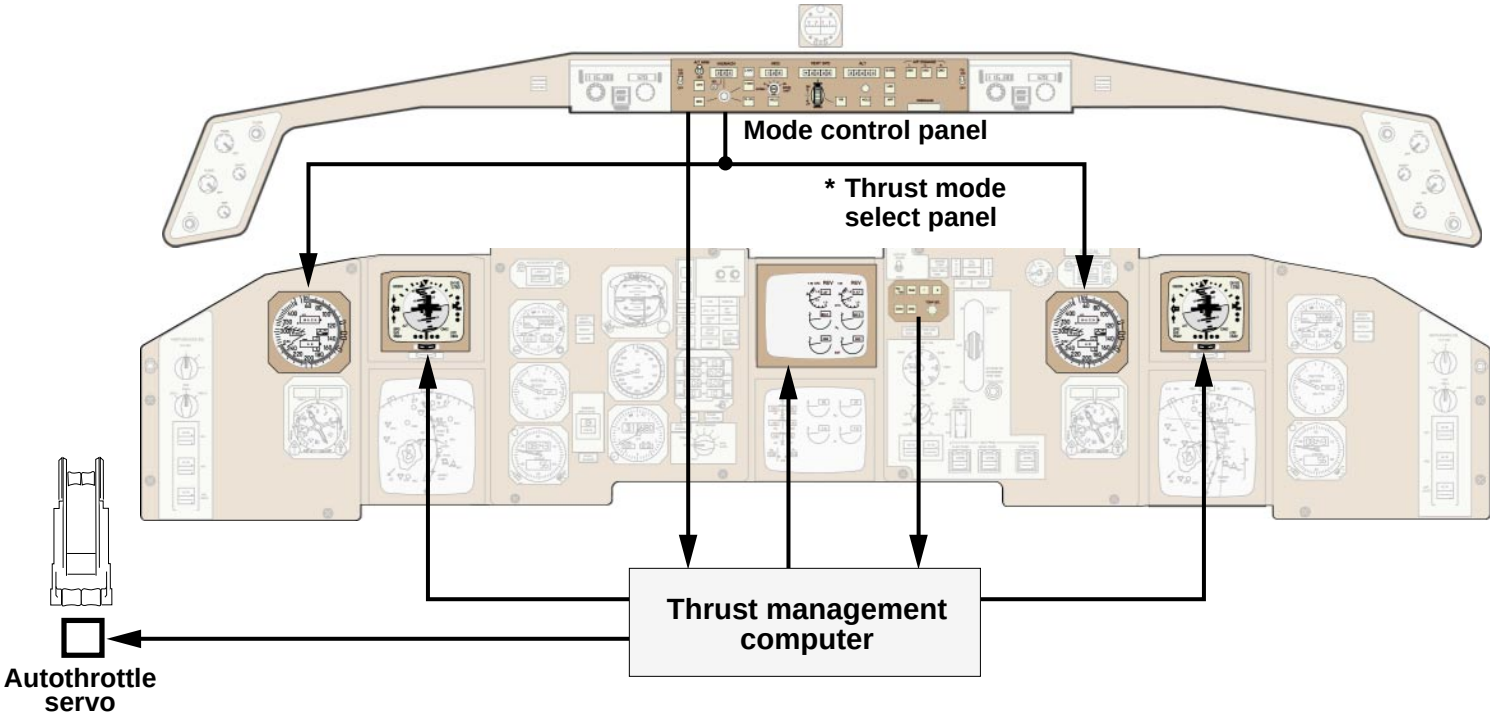
Mode Control Panel

767-200ER/-300ER



Thrust Management System

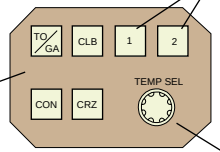
767-200ER/-300ER



Thrust rating
- Thrust limit computation
- Thrust reduction
  - Fixed climb derates
  - Variable reduction by assumed temperature

Autothrottle control
- Controls to thrust limit
- Controls to IAS/Mach or selected thrust setting
- Speed protection

*** Thrust mode select panel**



Selector switches
- TO/GA - Selects takeoff limit while on the ground and go-around limit while in flight
- CLB - Selects maximum climb thrust
- CON - Selects maximum continuous thrust
- CRZ - Selects maximum cruise thrust

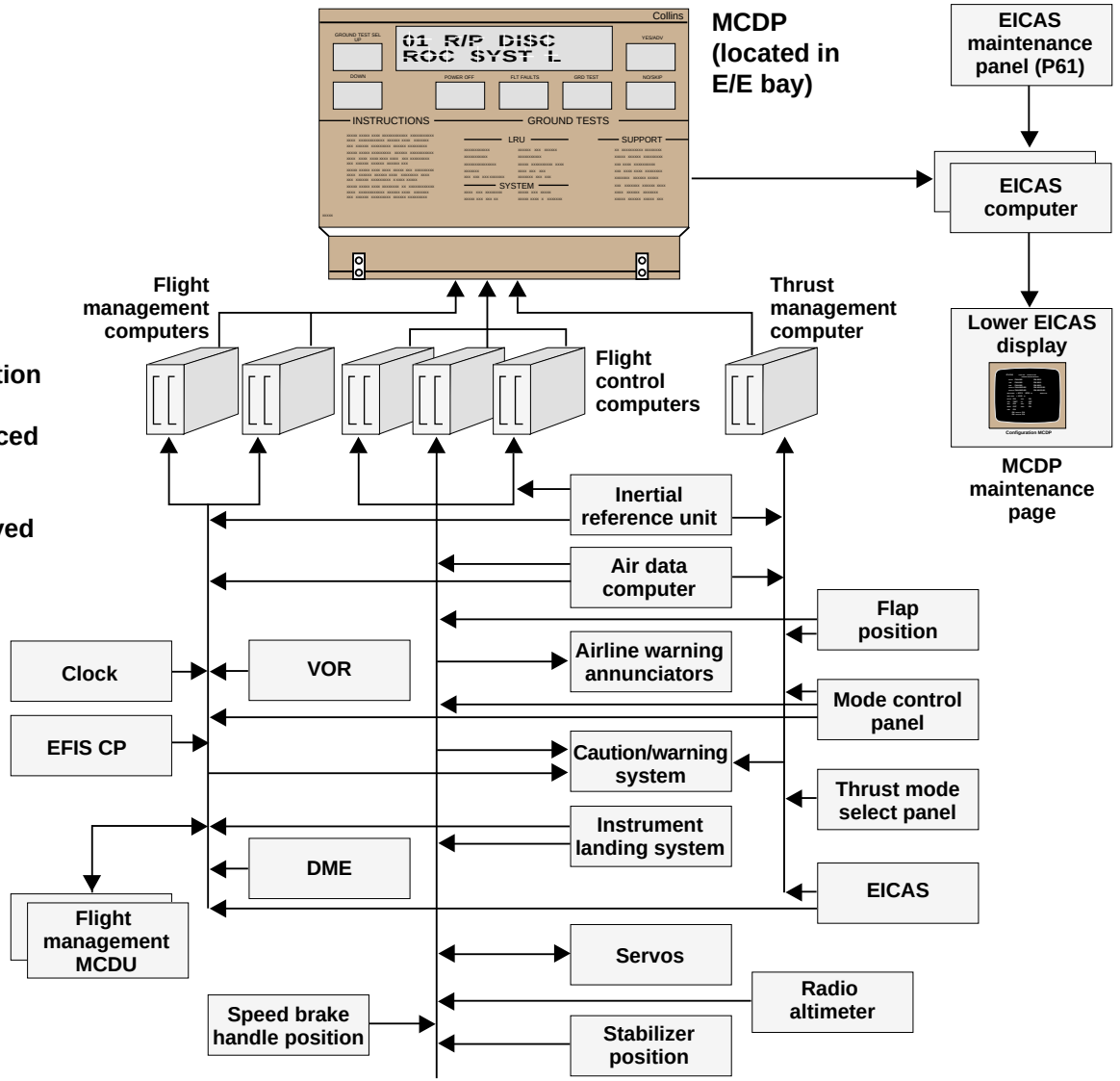
Derate switches
- Select fixed derate for climb

Temperature selector
- Selects assumed temperature reduced thrust for takeoff
- Reduced thrust assumed temperature shown in degrees Celsius on EICAS primary display
- Maximum 25% assumed temperature reduced thrust

Maintenance Control and Display Panel

767-200ER/-300ER

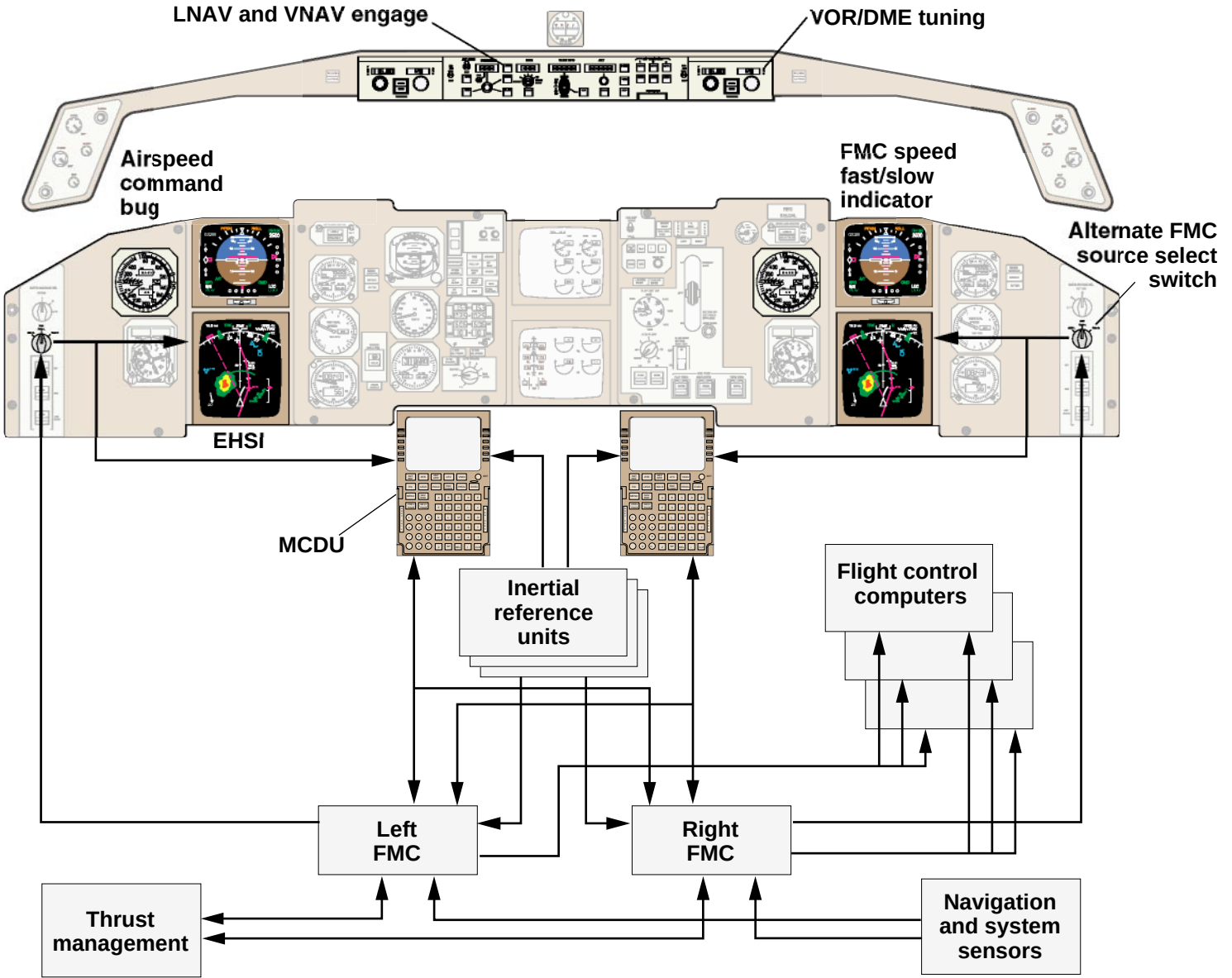
- **The maintenance control and display panel (MCDP) provides flight fault recording for the FCC, TMC, and FMC systems and ground test BITE for the flight control and thrust management systems.**
- **The MCDP can store up to 350 faults for up to 99 flights.**
- **Central fault recording and fault isolation**
  - **Allow faster airplane turnaround**
  - **Ensure that the proper LRU is replaced**
  - **Help lower the cost of ownership**
- **Faults and diagnostic data are displayed on the MCDP or on the EICAS maintenance page.**



767 Flight Deck - FMS and MCDU

Flight Management Computer System

767-200ER/-300ER



Flight Management Computer System

767-200ER/-300ER

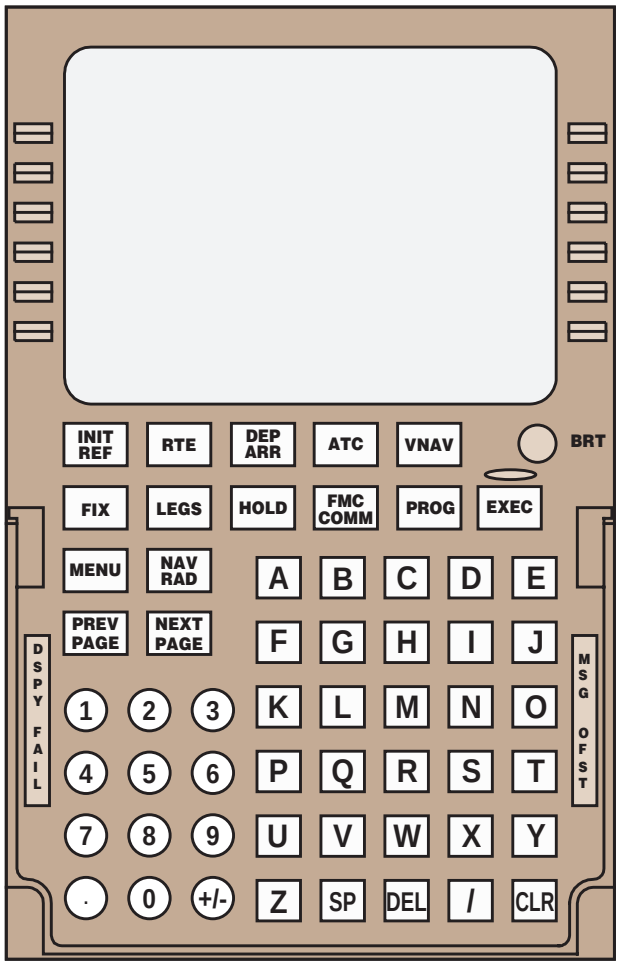
Pegasus FMC is basic

Pegasus FMC features:

- FANS-1 capable
- Performance management
  - Economically efficient flight profiles
    - Climb
    - Cruise
    - Descent
    - Holding
    - Nonprecision approach
  - Cost index selection
  - Speed schedules
  - Engine out performance
  - Clean or speedbrake descent distances displayed
  - En route winds
  - Step-climb planning improvements
- Flight planning
  - Range/fuel data
  - Takeoff and landing
  - Top of descent
  - Optimum altitude and step-climb point
  - Alternate airports
  - Required navigation performance (RNP)
  - Route offsets available
  - Active waypoint distance and predicted fuel displayed
- Navigation/guidance calculations
  - FMC calculates airplane position using navigation sensor data in the following priority:
    - GPS/LOC/INERTIAL
    - DME/DME/LOC/INERTIAL
    - DME/VOR/LOC/INERTIAL
    - LOC/INERTIAL
    - GPS/INERTIAL
    - DME/DME/INERTIAL
    - DME/VOR/INERTIAL
    - INERTIAL ONLY
    - GPS ONLY
    - All navigation sensors failed - none
  - Point-to-point great circle paths
- Guidance commands (LNAV, VNAV, and autothrottle)
- Auto tuning of DME and VOR for position updating
- Database storage
  - Airplane and engine performance
  - Navigation data (VHF NAVAIDS, airports, SIDs, STARs, runways, airway approaches, and missed approaches)
- Display data processing
- Crew alertness monitor

Multipurpose Control Display Unit (MCDU)

767-200ER/-300ER

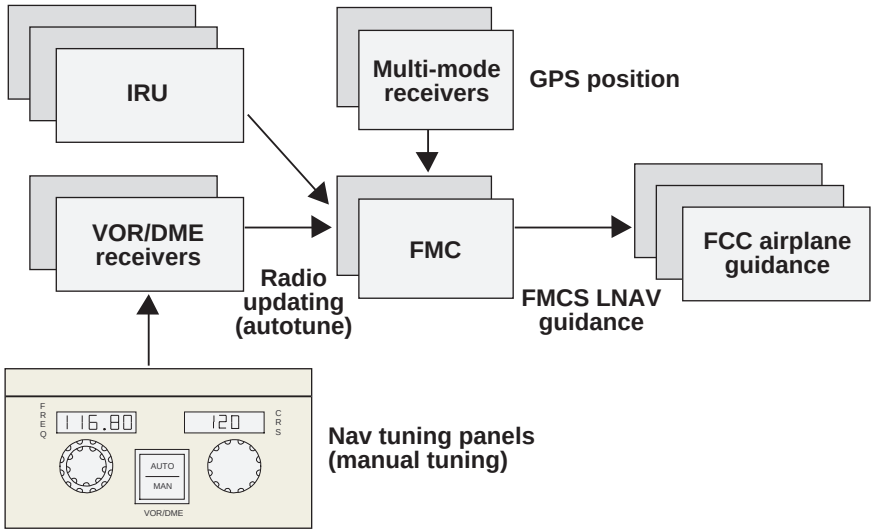


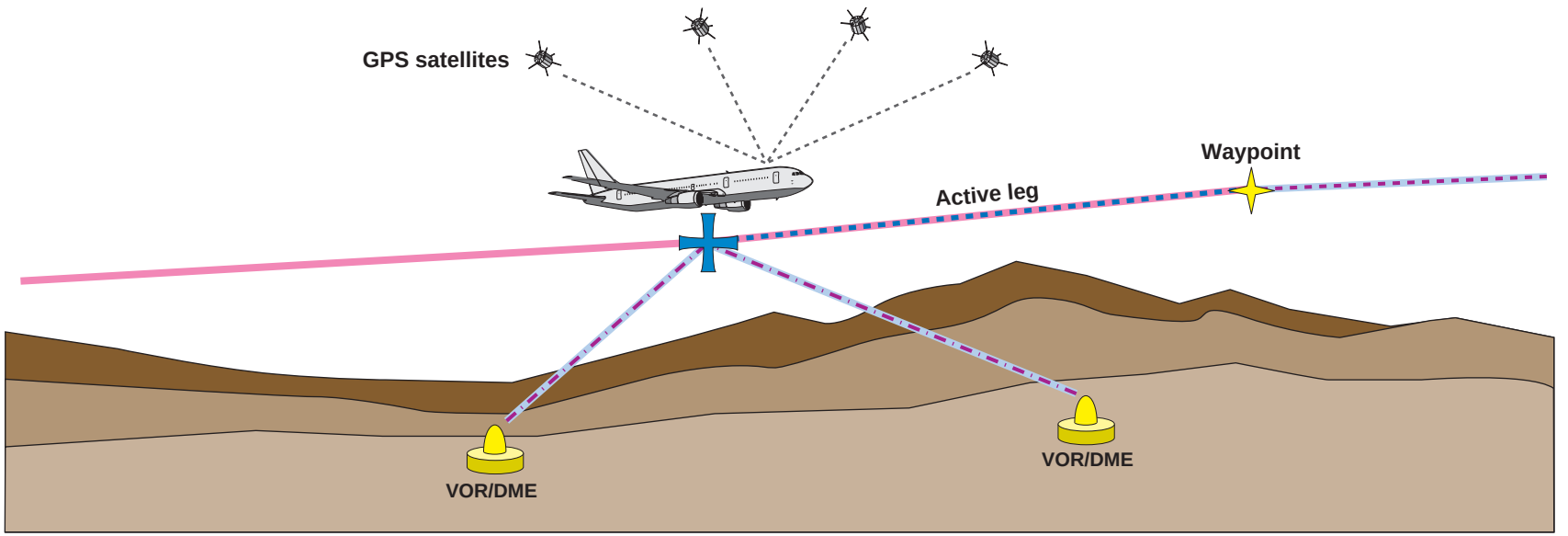
- **Keyboard layout similar to 747-400 FANS CDU**
  - **NAV RAD key - access to NAV RADIO page – VOR radio tuning**
  - **ATC COMM key - access to ATC data link**
  - **FMC COMM key - access to ACARS FMC data link**
  - **VNAV key - access to active CLB, CRZ, DES page**
- **Alternate navigation function - The MCDUs can be used as an alternate navigation system if both FMCs fail. The MCDUs perform lateral navigation computations. LNAV and VNAV are not available. Each MCDU can display route information on its on-side EHSI.**

FMCS Position Updating

767-200ER/-300ER

- The FMCS determines aircraft position using the available sources in this priority:
  1. GPS/LOC/INERTIAL
  2. DME/DME/LOC/INERTIAL
  3. DME/VOR/LOC/INERTIAL
  4. LOC/INERTIAL
  5. GPS/INERTIAL
  6. DME/DME/INERTIAL
  7. DME/VOR/INERTIAL
  8. INERTIAL ONLY
  9. GPS ONLY
- The FMCS automatically tunes VOR/DME radios.
- If both VOR/DMEs are manually tuned, the FMC will use the range/bearing information as long as signal criteria are satisfied.
- The frequency of a navigational aid on an active leg will be tuned if it is part of a published terminal area procedure.

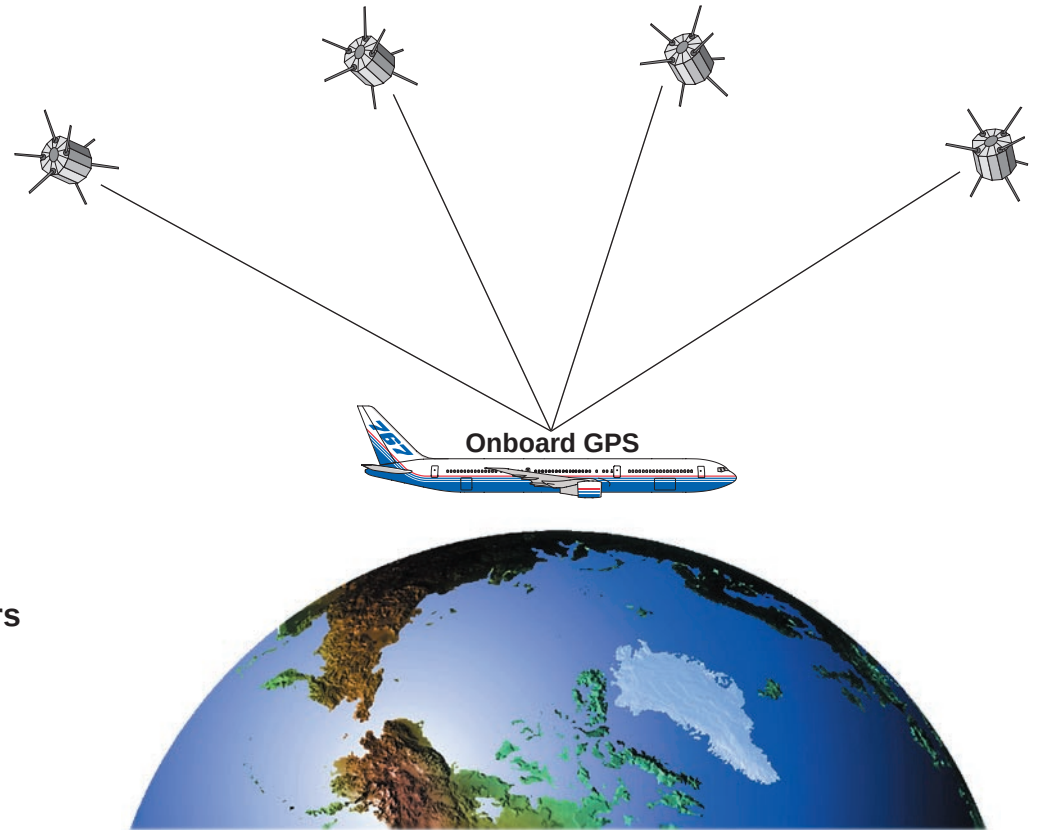




Global Positioning System

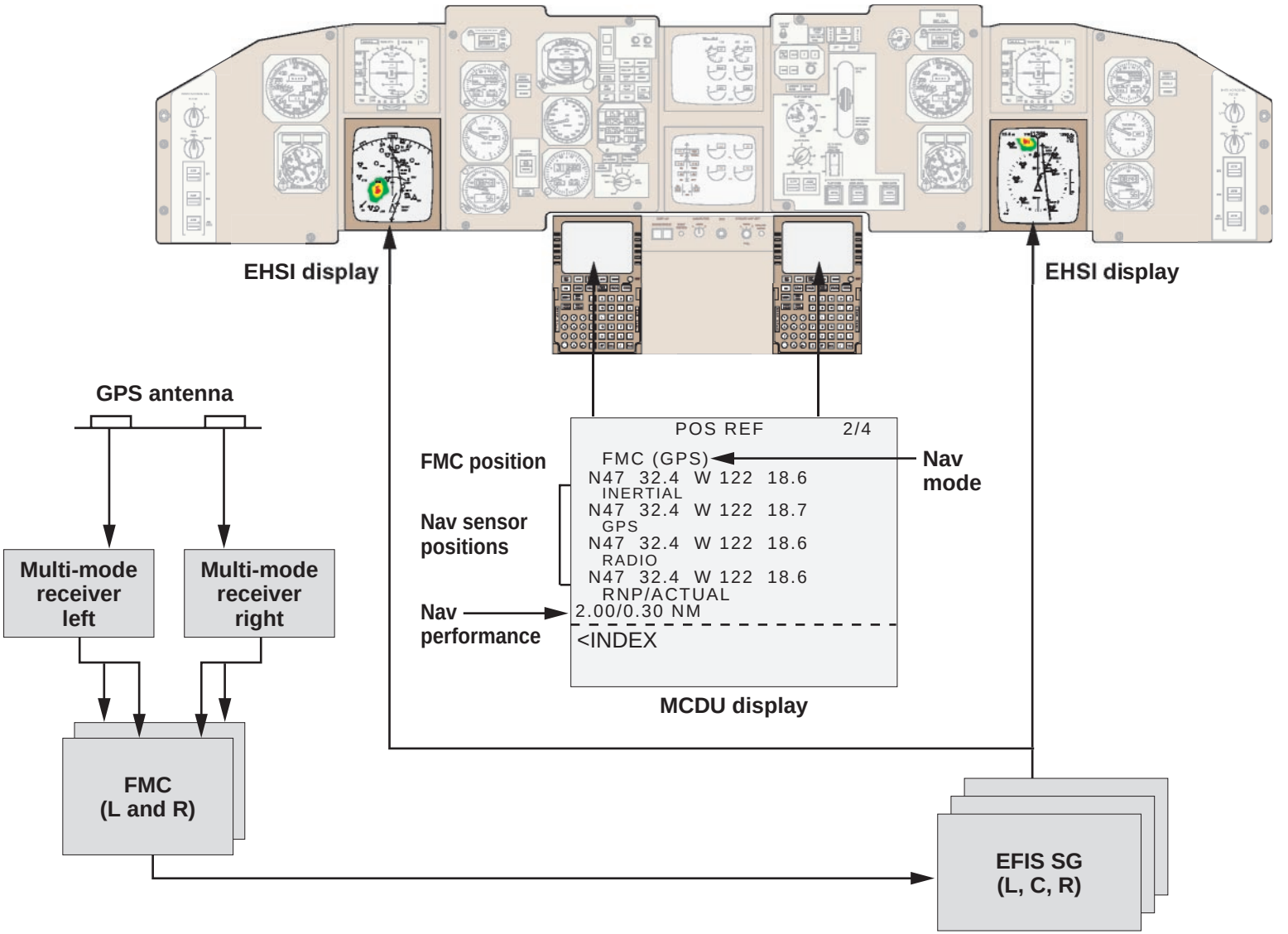
767-200ER/-300ER

- **Global positioning system (GPS) provides precision navigation for**
  - **FMC position**
  - **RNP operations**
  - **EGPWS**
  - **FANS operation**
- **GPS supports required navigation performance (RNP) operations down to 0.2 nmi**
- **FMC automatically selects best sensors (GPS, DME, VOR, LOC)**



Global Positioning System With Pegasus FMC

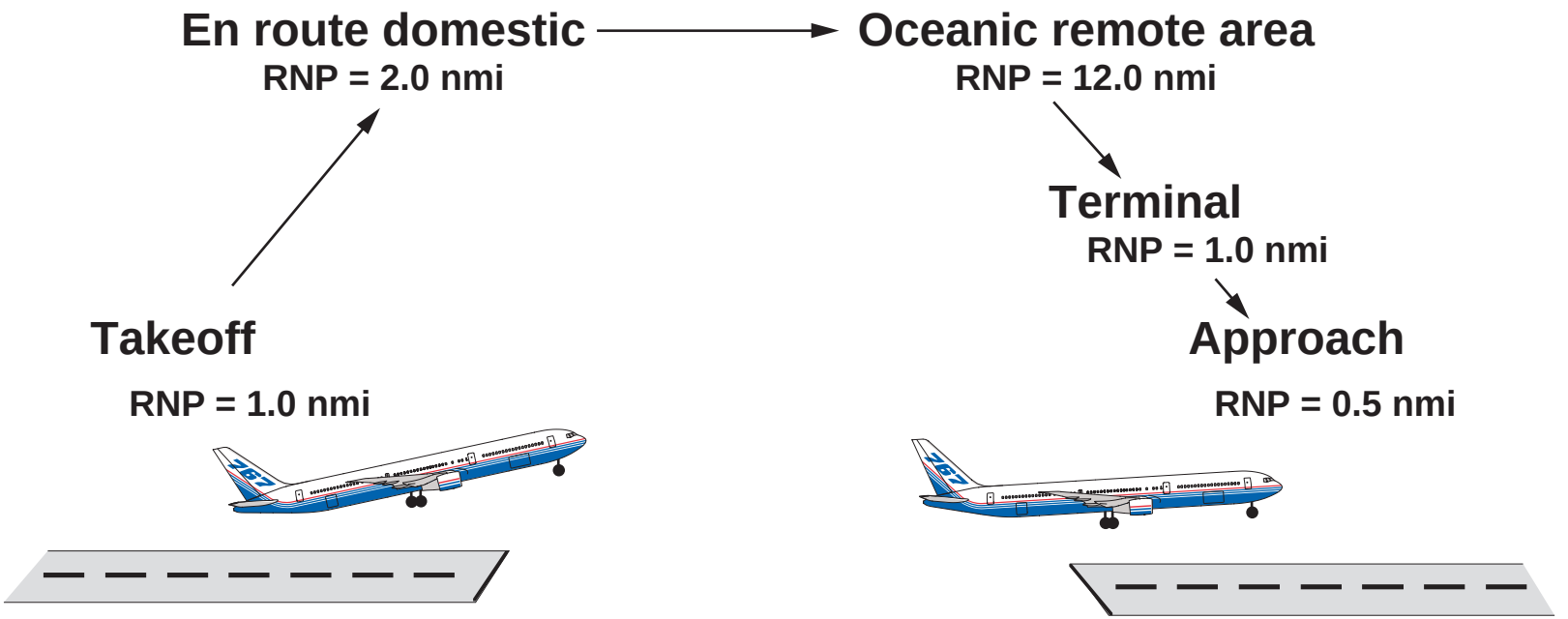
767-200ER/-300ER



Required Navigation Performance (RNP)

767-200ER/-300ER

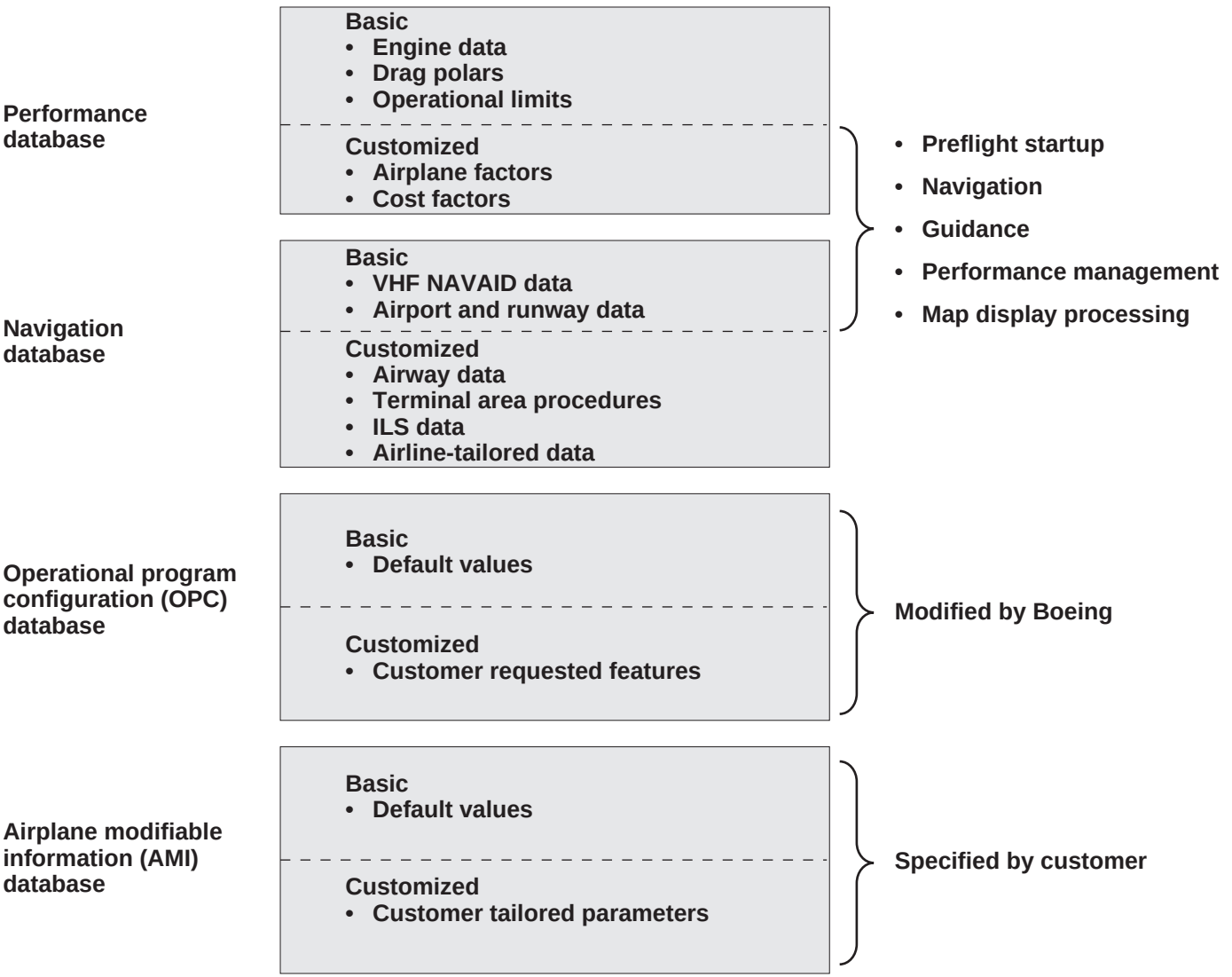
Default RNP Values



Note: RNP values shown here are default values and do not reflect the maximum capability of the airplane.

FMCS Databases

767-200ER/-300ER



FMCS Databases - OPC and AMI

767-200ER/-300ER

Operational program configuration (OPC)

- **The OPC is a loadable database used to selectively enable those features requested by the customer within the operational program software (OPS). The OPC can be changed only by Boeing. This is done during aircraft configuration or with a service bulletin.**

- **The OPC enables these following optional FMC features:**
  - **Runway distance and offset position shift in units of feet or meters (must enable either feet or meters)**
  - **Crew alertness monitor**
  - **Non-directional beacon approaches**
  - **Non-precision GPS approaches**
  - **Display of vertical bearing, flight path angle (FPA) and vertical speed**
  - **Scanning DME operations**
  - **Altitude intervention**
  - **Airline operational communications data link (AOC DL)**
  - **Air traffic services data link (ATS DL)**
  - **Takeoff data link**
  - **Required time of arrival (RTA)**
  - **FMC printer interface**

Airline modifiable information (AMI) file

- **The AMI is a loadable database that provides for software designation of various FMC parameters. Each airline has the ability to tailor their AMI to suit their specific operations by selecting the AMI parameters. In the event the AMI parameters are not modified by the customer or are not available, the FMC provides hard-coded default parameters in the basic software.**

- **Some AMI parameters may be viewed by the crew on the CDU airline policy page.**
- **A summary of types of parameters that can be specified by the AMI are:**
  - **Performance, guidance, and takeoff data**
  - **Crew alertness monitor configuration data**
  - **Alternate function parameters**
  - **Data link request/report prompt inhibits**
  - **Data link Imbedded element identifier (IEI)/ response/trigger enables**
  - **Down link trigger for position report enable**
  - **Down link trigger for progress report enable**
  - **Request uplink Imbedded message identifiers (IMI) table**
  - **Down link address table**

Inertial Reference System

767-200ER/-300ER

IRS features

- Triple-redundant laser gyros
- Certified for extended navigation over water
- Maximum alignment time of 10 min
- 30-sec quick alignment for through-stops
- Initial position input through either the inertial reference mode panel or FMS MCDU
- Flight crew selectable alternate data sources

IRS outputs

- Magnetic/true heading
- Magnetic/true track
- Primary attitude
- Ground speed
- Wind velocity and direction
- Vertical speed
- Navigation position/drift angle
- Inertial velocity vectors
- Acceleration and angular rates

RDMI
EADI
EHSI
VSI
MCDU (2)
RDMI
EADI
EHSI
VSI

Navigation systems
- WXR
- EGPWS
- FMC
- MMR (GPS)

Autopilot systems
- FCC
- TMC
- Yaw damper

Antiskid/autobrake system
- EICAS

EFIS symbol generator

Left IRU

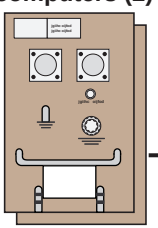
Instrument source select switch

Center IRU

Instrument source select switch

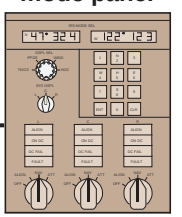
Right IRU

Air data computers (2)



True airspeed
Altitude
Altitude rate

Inertial reference mode panel



Initialization control display

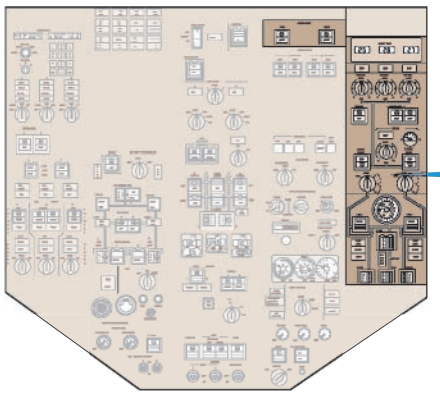
767 Flight Deck - Systems

Air-Conditioning and Pneumatics

767-200ER/-300ER Passenger

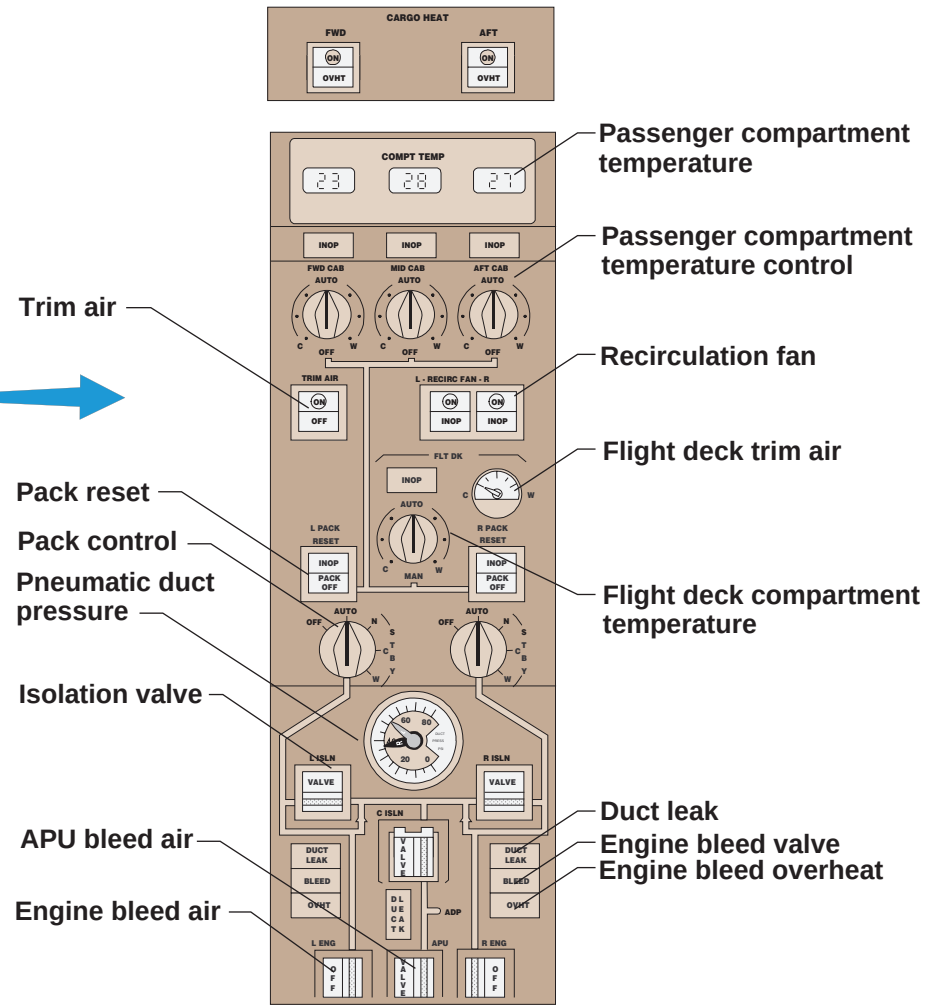
Air-conditioning system

- **Two independent packs with one-pack dispatch capability**
- **Automatic temperature control for the flight deck, forward, mid, and aft passenger cabin zones**



Pneumatic system

- **Provides air for**
  - **Engine starting**
  - **Cabin air-conditioning**
  - **Pressurization**
  - **Wing and engine anti-icing**
  - **Potable water tank and hydraulic reservoir pressurization**
  - **TAT probe aspiration**
  - **Bleed air normally isolated to its associated pack**



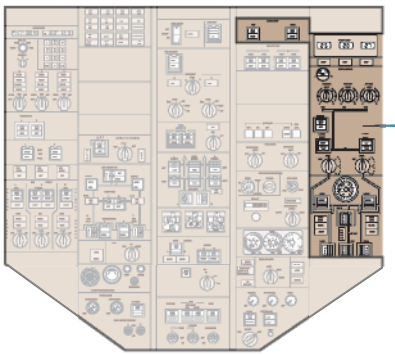
Normal in-flight procedures: none

Air-Conditioning and Pneumatics

767-300 Freighter

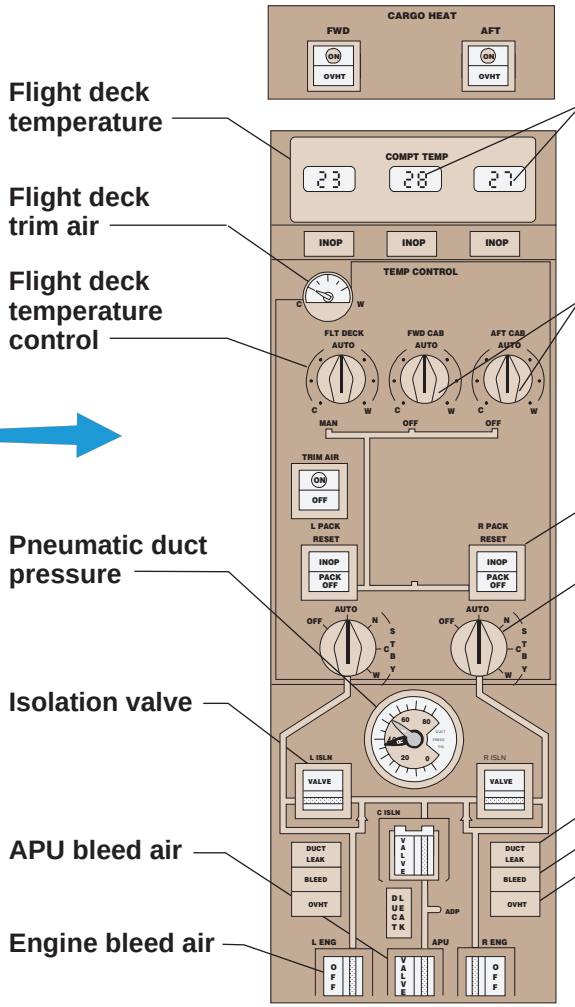
Air-conditioning system

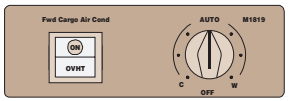
- **Two independent packs with one-pack dispatch capability**
- **Automatic temperature control for the flight deck, forward, and aft main deck cargo zones**
- **Automatic temperature control for forward lower lobe cargo compartment (General Market Freighter)**



Pneumatic system

- **Provides air for**
  - **Engine starting**
  - **Cabin air-conditioning**
  - **Pressurization**
  - **Wing and engine anti-icing**
  - **Potable water tank and hydraulic reservoir pressurization**
  - **TAT probe aspiration**
  - **Bleed air normally isolated to its associated pack**



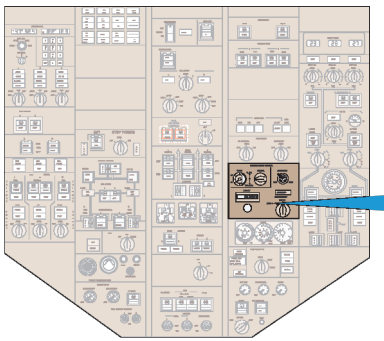


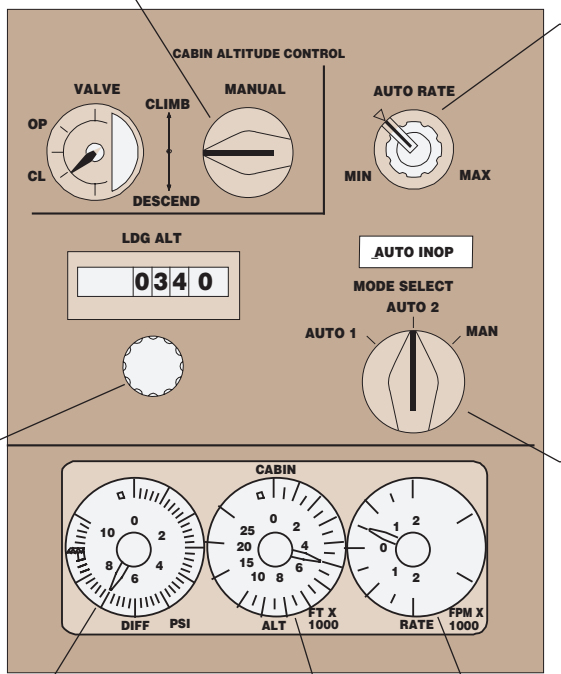
Forward cargo air-conditioning panel (767 General Market Freighter Only)

Normal in-flight procedures: none

Cabin Pressure Control

767-200ER/-300ER





Cabin altitude manual control

- Controls outflow valve with mode selector in manual

Cabin altitude auto rate control

- Sets limit for cabin altitude rate of climb or descent during auto control
- Establishes approximately 500 ft/min climb and 300 ft/min descent when set on index

Landing altitude selector

- Selects landing altitude from 1,000 ft below sea level up to 14,000 ft

Cabin pressurization mode control

- Dual automatic system with auto switching in event of failure
- Maintains sea level up to 22,500 ft and 8,000 ft up to maximum cruise
- Maximum pressure differential 8.6 psi

Cabin rate of climb indicator

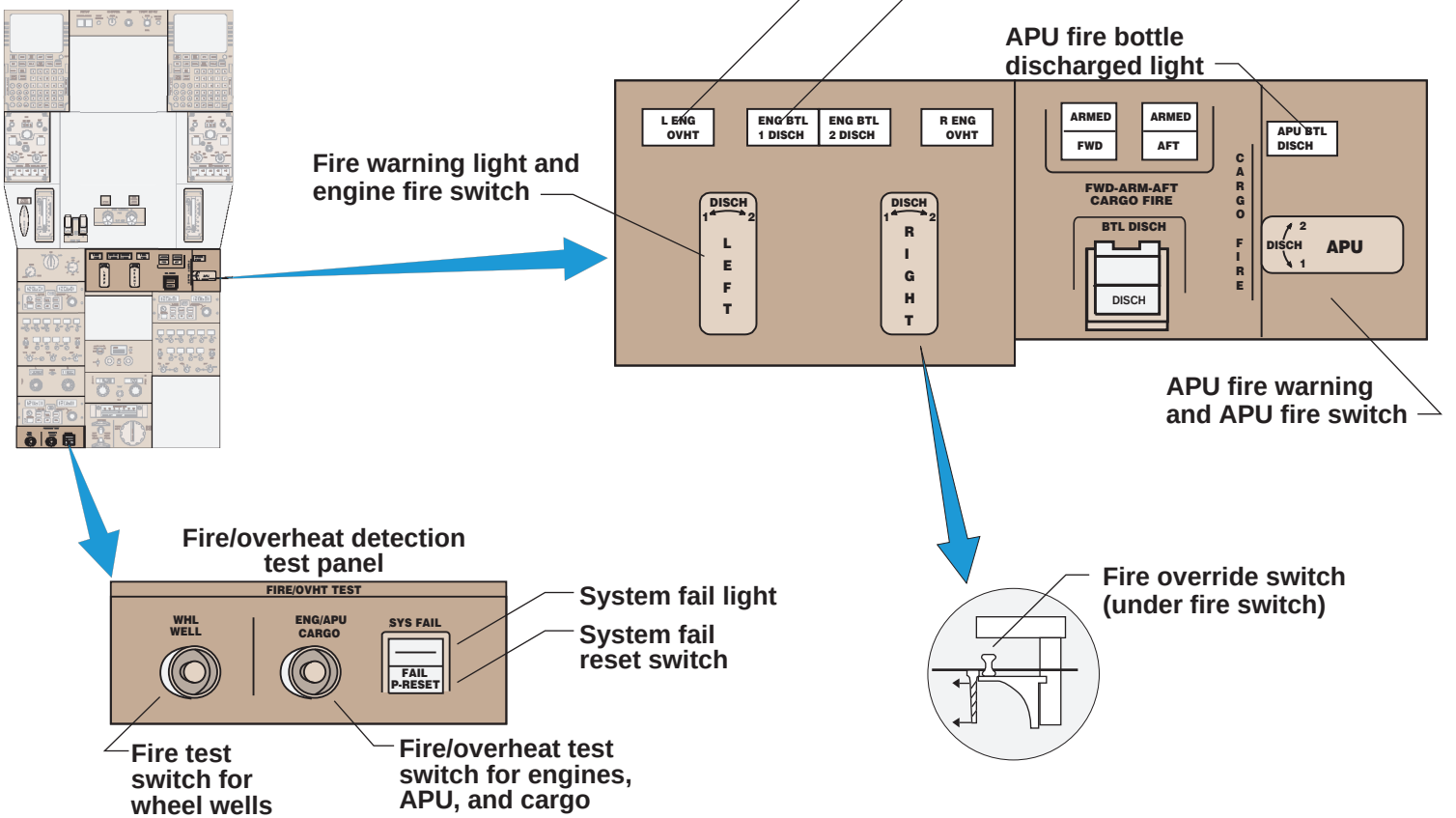
Differential pressure indicator

Cabin altitude indicator

Cargo and APU Fire Protection

767-200ER/-300ER Passenger

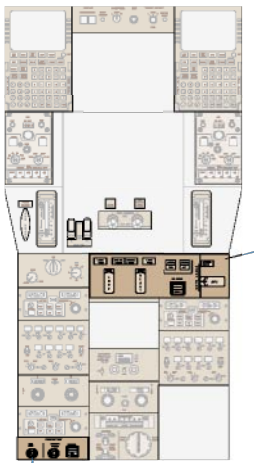
- **Fire detection and extinguishing systems are installed for both engines, the APU, and cargo compartments. The main wheel wells have detection only.**
- **Two fire extinguisher bottles are installed for engine fire control for General Electric and Pratt & Whitney engines. Four fire extinguishing bottles are installed for engine fire control for Rolls-Royce engines.**
- **One fire extinguisher bottle is installed for APU fire control.**
- **Three fire extinguishing bottles are installed for cargo fire control.**



Cargo and APU Fire Protection

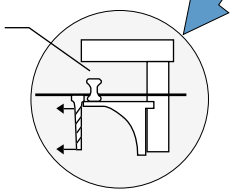
767-300 Freighter

- Fire detection and extinguishing systems are installed for both engines, the APU, and cargo compartments. The main wheel wells have detection only.
- Two fire extinguisher bottles are installed for engine fire control for General Electric and Pratt & Whitney engines. Four fire extinguishing bottles are installed for engine fire control for Rolls-Royce engines.
- One fire extinguisher bottle is installed for APU fire control.
- Three fire extinguishing bottles are installed for cargo fire control.



Fire warning light and engine fire switch

Fire override switch (under fire switch)

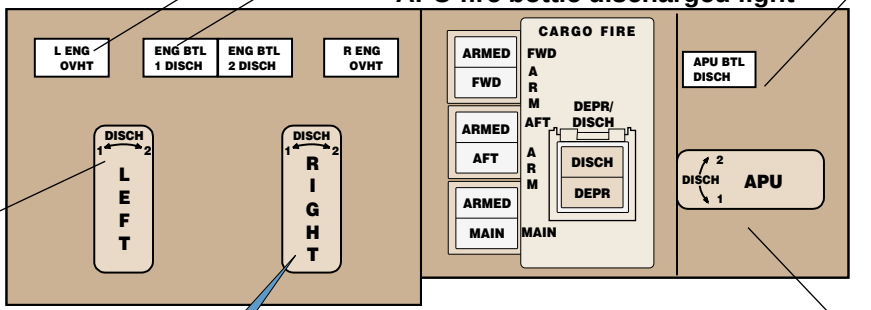


General Market Freighter Configuration

Engine overheat light

Engine fire bottle discharge light

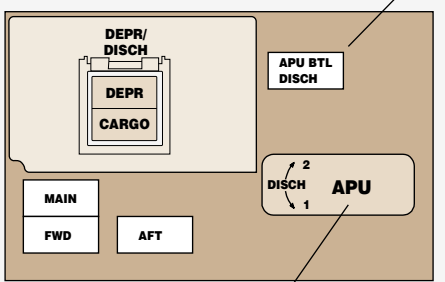
APU fire bottle discharged light



APU fire warning and APU fire switch

Package Freighter Configuration

APU fire bottle discharged light



APU fire warning and APU fire switch

Fire/overheat detection test panel

System fail light

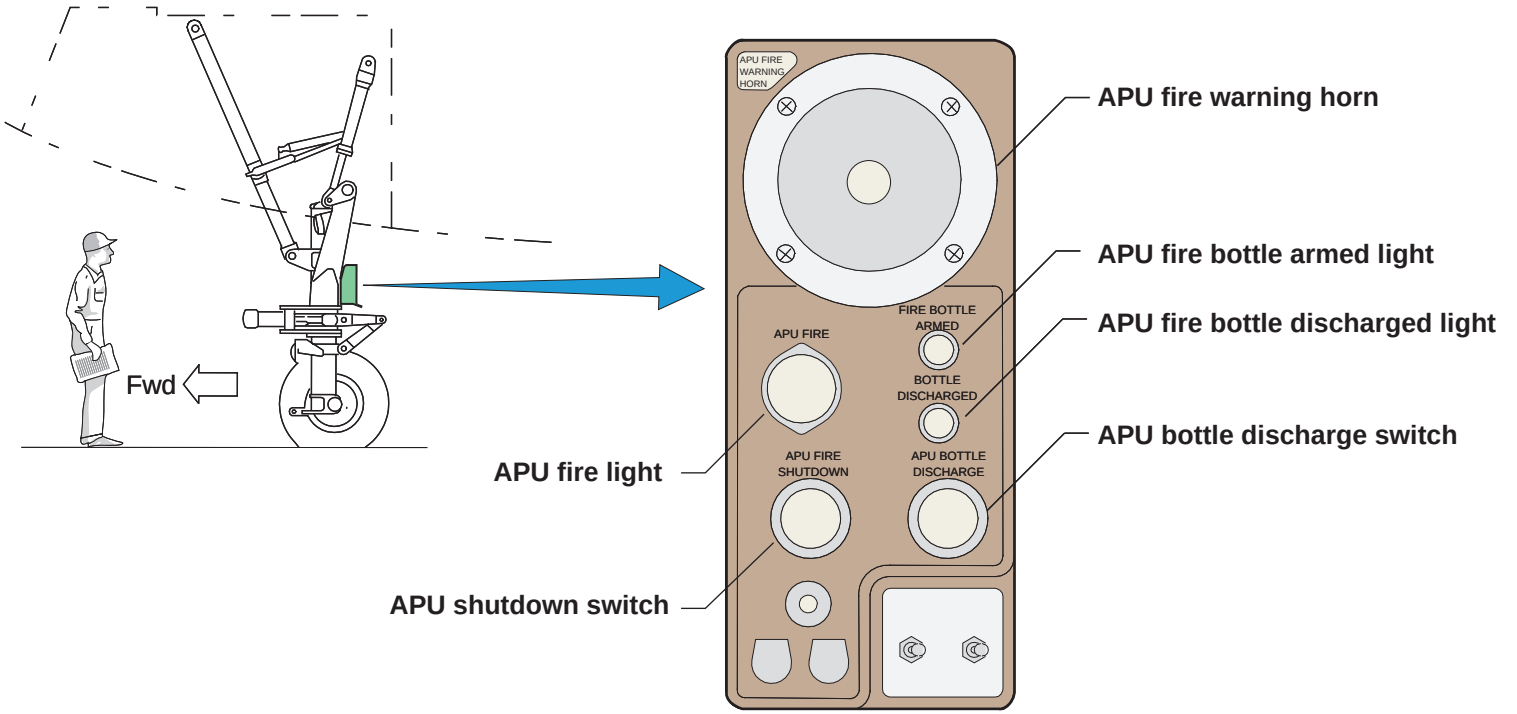
System fail reset switch

Fire test switch for wheel wells

Fire/overheat test switch for engines, APU, and cargo

Fire Protection

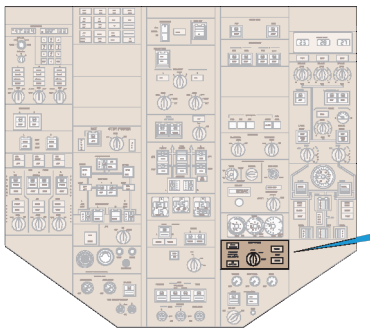
767-200ER/-300ER APU Ground Service Control Panel

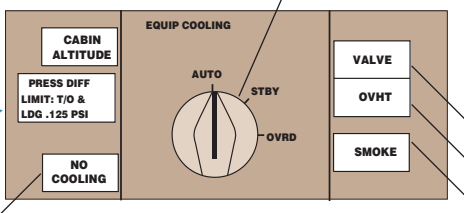


APU ground control panel on nose landing gear strut

Equipment Cooling

767-200ER/-300ER





Equipment cooling selector

Valve light

Overheat light

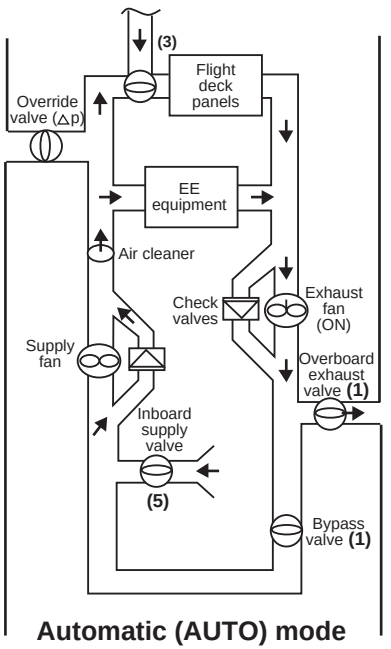
Smoke light

No cooling light

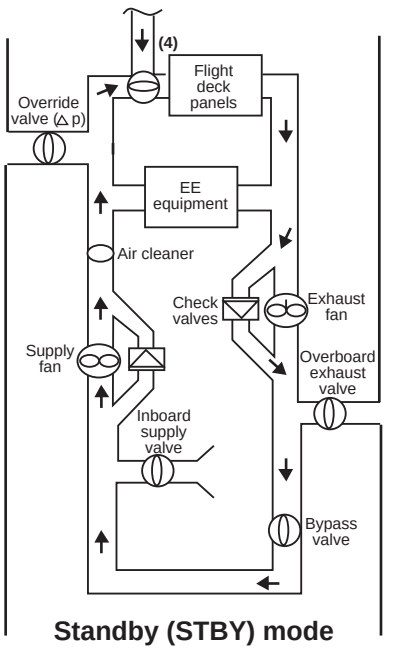
AUTO – Automatically controls equipment cooling system

STBY – Positions equipment cooling system for inboard airflow

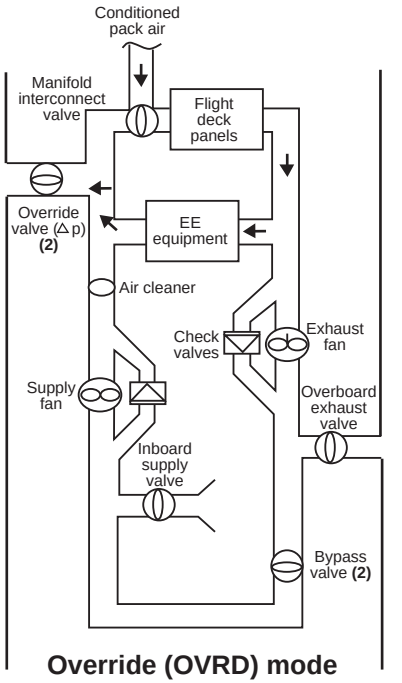
OVRD – Positions equipment cooling system for reverse airflow



Automatic (AUTO) mode



Standby (STBY) mode



Override (OVRD) mode

(1) These valves reverse if OAT below 45°F/7°C or in flight or on ground with both engines running.

(2) These valves reverse if cargo fire switch is in DEPR (Freighter only).

(3) This valve is open on the 767 Freighter only in flight or on the ground with both engines running.

(4) This valve is open on the 767 Freighter.

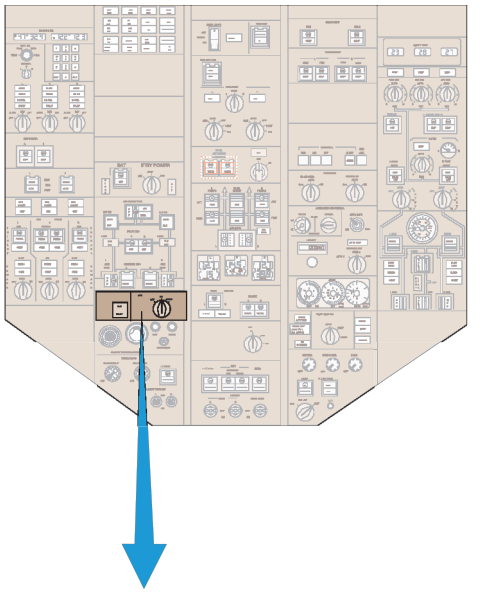
(5) This valve is closed during flight.

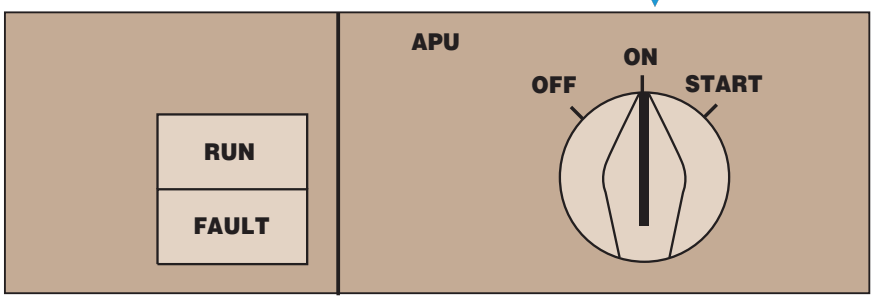
Auxiliary Power Unit

767-200ER/-300ER

Auxiliary power unit (APU)

- **Installed in unpressurized tail cone**
- **Ground or in-flight use**
- **90-kVA electrical generator**
  - **Generator power available to airplane's maximum certified altitude**
- **Bleed air for packs and engine start**
- **Automatic start**
  - **Crew monitoring not required**
  - **Start up to 35,000 ft**
- **Automatic cooldown on shutdown**
- **Automatic shutdown for fault/fire**
- **EGT readout on EICAS status page**

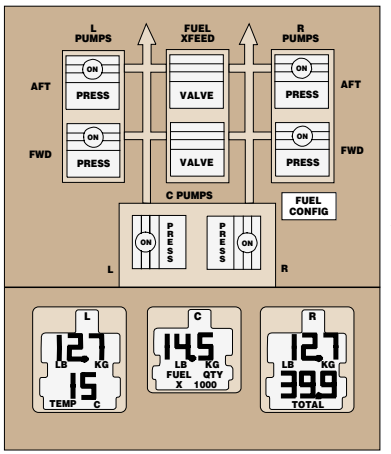


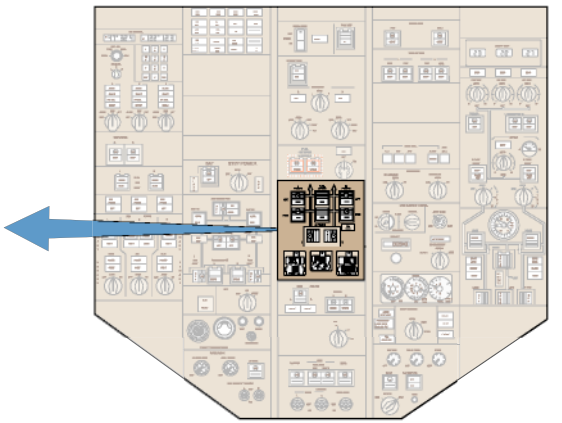


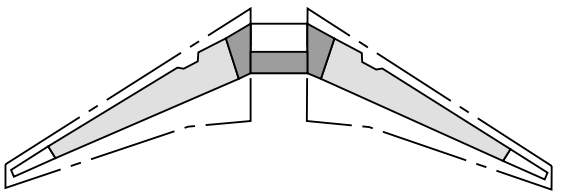
Fuel System

767-200ER/-300ER

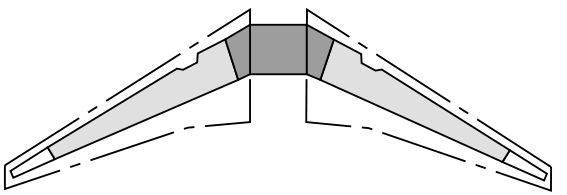
- **Three-tank system**
- **Independent fuel system for each engine with crossfeed capability**
  - **Two boost pumps in each wing tank**
  - **Two override pumps in center tank**
  - **Automatic scavenge system for center tank**
  - **APU supplied from the left fuel manifold**
- **Normal fuel configuration is tank to engine**
- **Solid-state fuel quantity and temperature indication**
- **Fuel configuration alerts for**
  - **Fuel imbalance**
  - **Low fuel**
  - **Center tank pumps off with fuel in tank**
- **Minimum crew workload**
  - **All pumps turned on before flight**
  - **Center tank pumps turned off when center tank is empty**







767-200ER
138,037 lb (20,450 U.S. gal)
62,600 kg (77,410 liters)



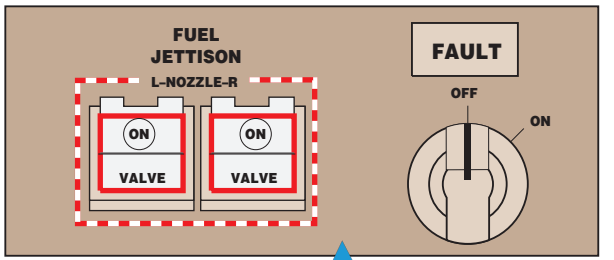
767-200ER*, -300ER
161,700 lb (24,140 U.S. gal)
73,350 kg (91,380 liters)

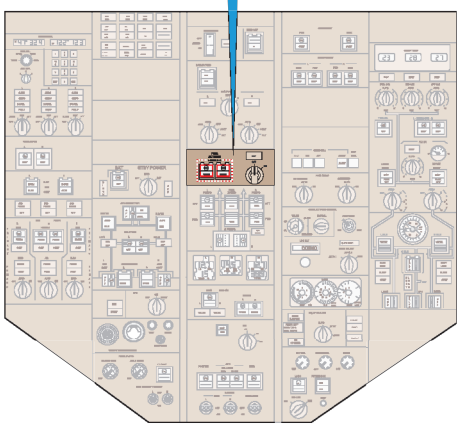
* Option

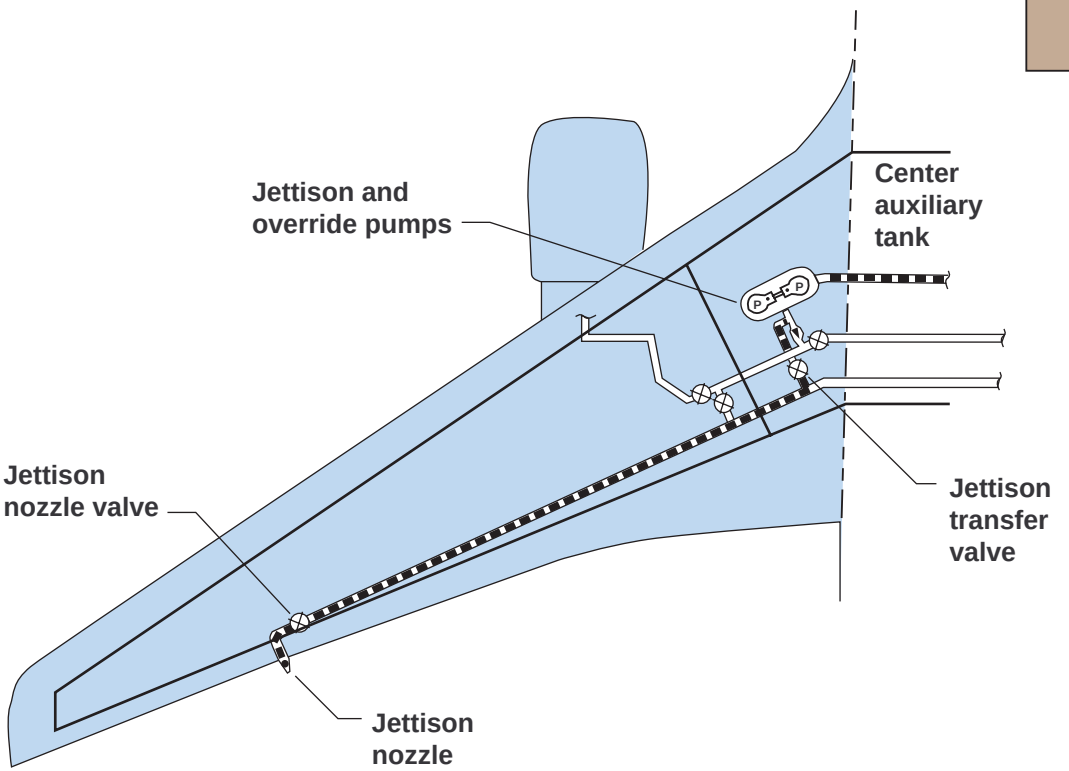
Fuel Jettison

767-200ER/-300ER

- **A fuel jettison system is installed on 767 airplanes with gross takeoff weights in excess of 360,000 lb.**
- **Fuel is pumped from the center auxiliary tank by dedicated jettison pumps through jettison transfer valves to the jettison nozzles located on the outboard trailing edges of the wings.**







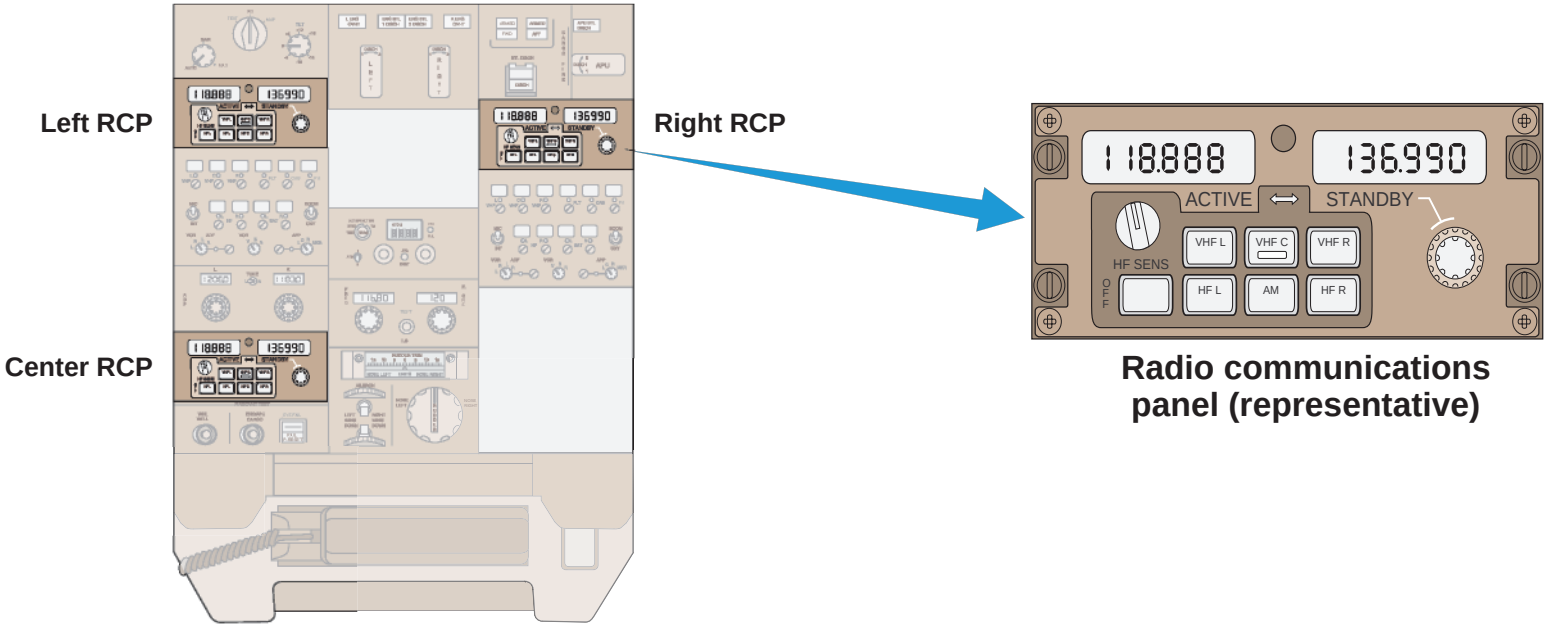
Left wing shown, right wing identical

Existing fuel system

Fuel jettison system

Communication Radios and Equipment

767-200ER/-300ER

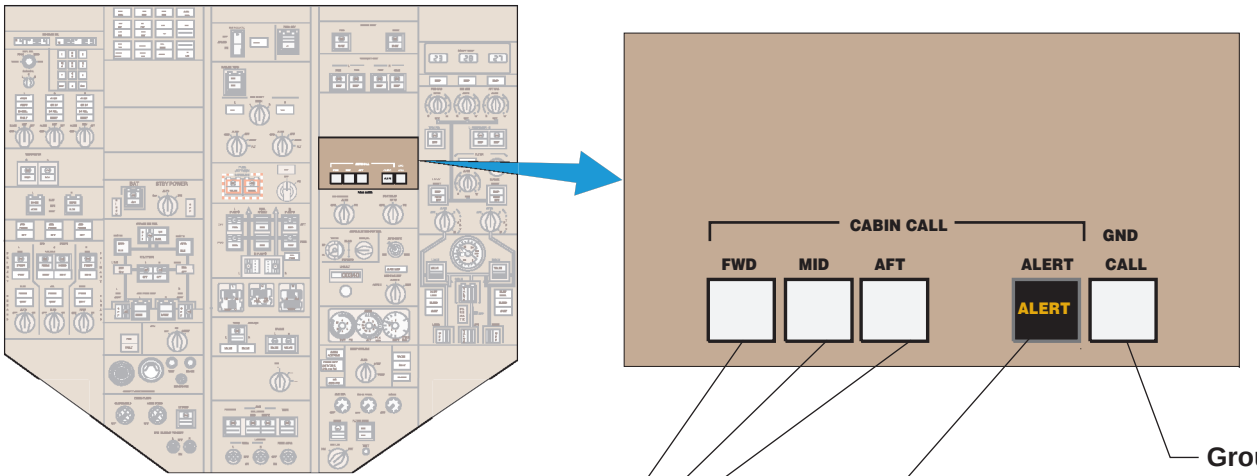


Radio communications panel (representative)

- **Three radio communications panels are each capable of tuning the VHF and HF radios.**
- **Radio communications panels support VHF data link, HF data link, 8.33-kHz frequency spacing, VDL mode 2, and voice mode protection. Separate options are available to enable each of these functions.**
- **Separate option is available, contingent on selection of compatible HF and VHF transceivers, to display transceiver fault status on the radio communications panel by monitoring the CMC output bus.**

Pilots' Call Panel

767-200ER/-300ER



SELCAL call lights/switches (blue)
- Illuminate when attendant at respective station calls flight crew
- Accompanied by flight deck high chime
- Reset when call is answered or switch is pressed
- Sound high-low chime and illuminate pink light at attendant station
- Inhibited if handset at selected station is off hook

Alert call light/switch (amber)
- Illuminates when cabin attendant activates alert call
- Accompanied by flight deck high chime
- Resets when call is answered, the calling handset is reset, or when switch is pressed
- Sounds high-low chime three times and flashes pink lights at all attendant stations when pressed

Ground call light/switch (blue)
- Illuminates when ground personnel at APU ground control panel call the flight crew
- Accompanied by flight deck high chime
- Press to reset
- As long as the switch is held down, a horn sounds in the wheel well to call ground personnel

Audio Selector Panel

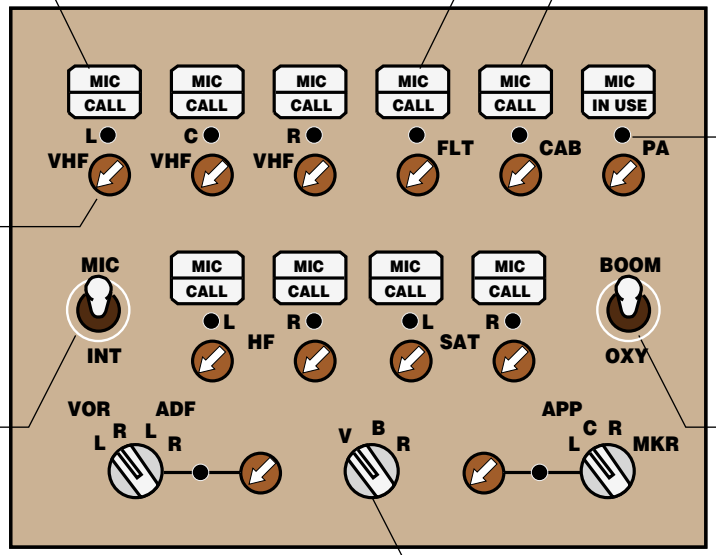
767-200ER/-300ER

Microphone selector switches/lights (white)
- Illuminate when selected
- Select desired transmitting system
- Interlocked to permit only one switch to be selected at a time
- Automatically activate respective receiver

Receiver control
- Push to select ON/OFF (alternate action)
- Rotate for volume control

Push-to-talk switch
- Transmits on selected system with boom microphone or oxygen mask microphone
- Resets SELCAL light for selected radio

Ground call light
- Ground crew call to pilots
- 30-sec reset



Call lights (9)
- VHF, HF, and SATCOM
- ACARS call on VHF-C
- Flight attendant call on cabin interphone
- Resets with transmit switch or PTT activation; SATCOM resets upon termination of call

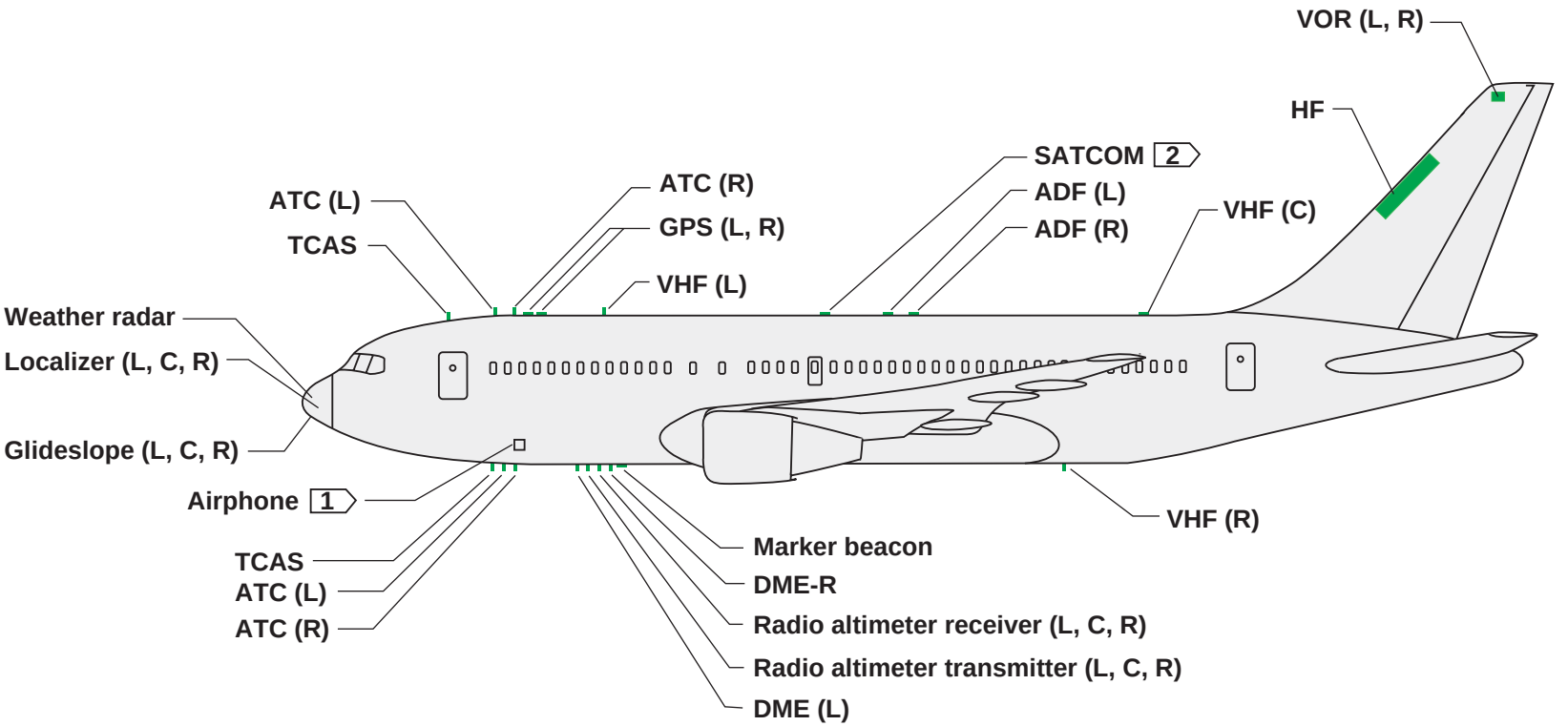
Receive light
- Indicates respective receiver is selected

Boom-oxygen switch
- Selects either boom or oxygen mask microphone for use with selected system

Filter selector
- Filters audio from VOR, ADF, ILS, DME
  - VOICE – voice only
  - RANGE – range (code) only
  - BOTH – voice and range

Antenna Locations

767-200ER/-300ER



1 Structural provisions.

2 Optional installation.

Electrical System

767-200ER/-300ER

90-kVA engine-driven generators
- **Integrated drive generator (IDG)**

90-kVA APU generator
- **Automatic start/shutdown**
- **Start with separate APU battery**
- **Ground or in-flight use**
- **APU generator allows for dispatch with one engine IDG inoperative**

One generator can supply all loads except utility

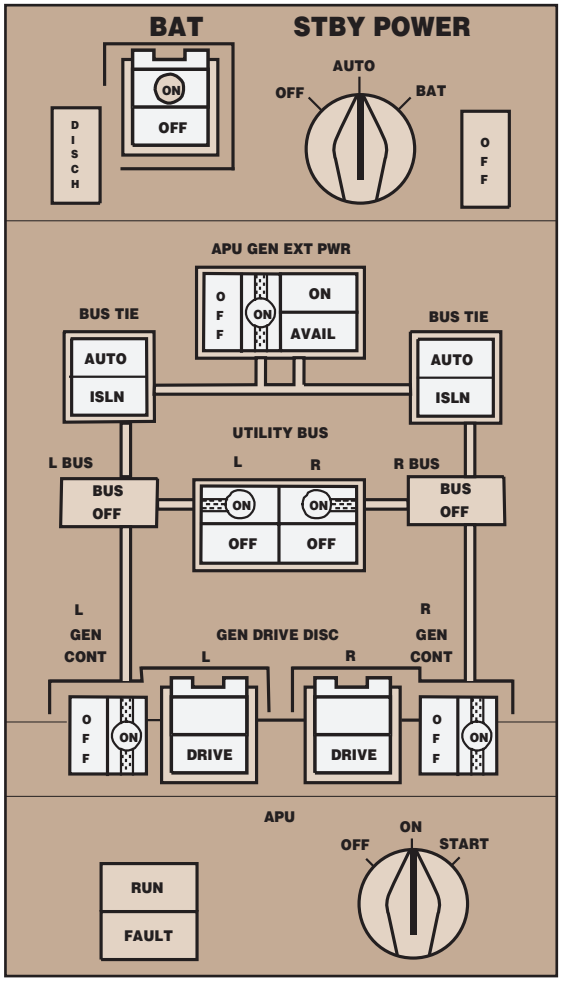
Nonparallel system
- **Left and right sides powered by separate power sources**

Automatic load transfer

Automatic load shed of utility buses
- **For generator loss**
- **For overload**
- **For engine start from APU**

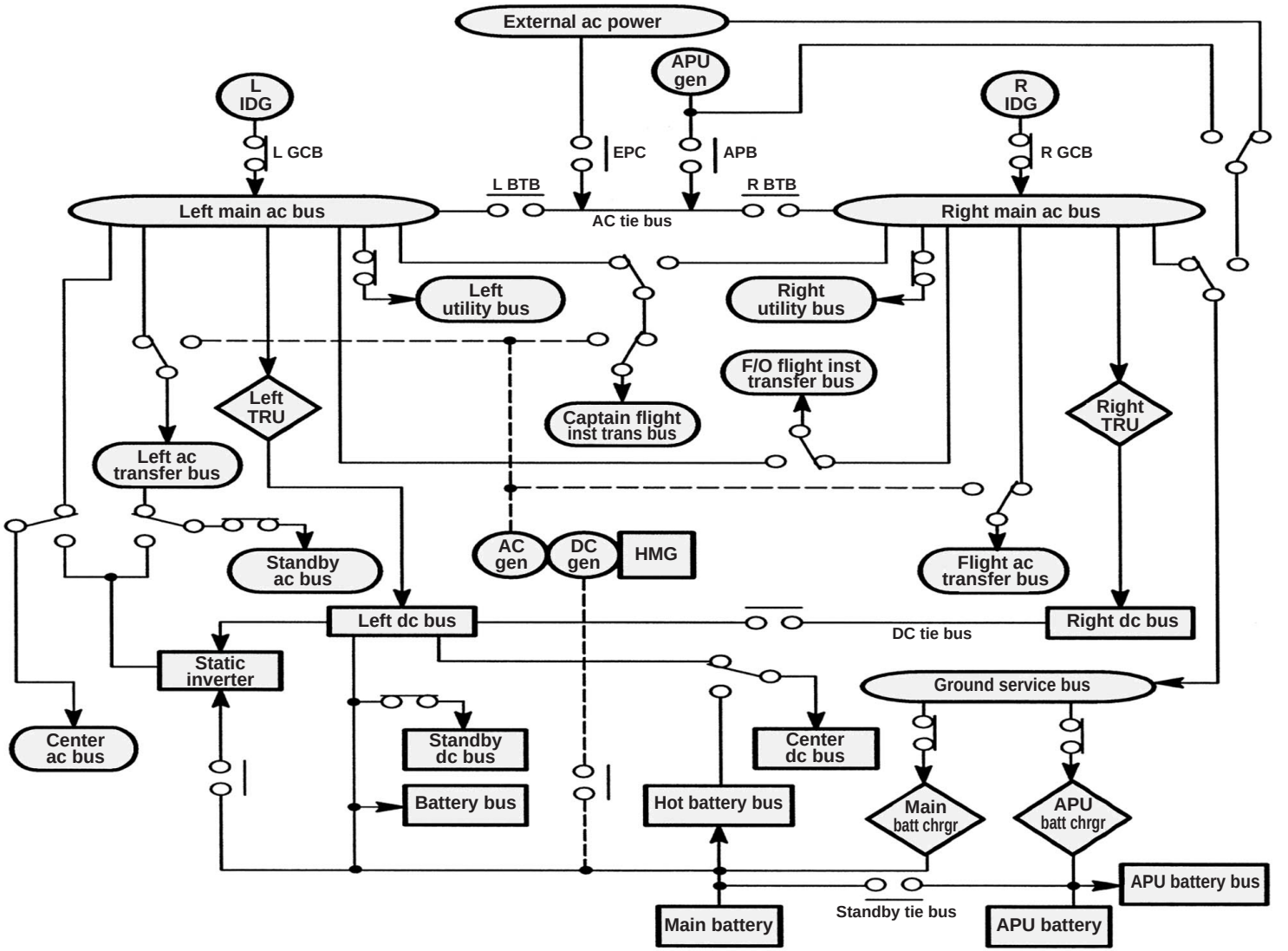
Standby ac and dc buses
- **Powered by main battery**
- **30-min minimum**

Flight instrument transfer bus
- **Automatic transfer**
- **No normal in-flight procedures**



Electrical Power System

767-200ER/-300ER



797-FD-0043
1-21-2-whp/CF

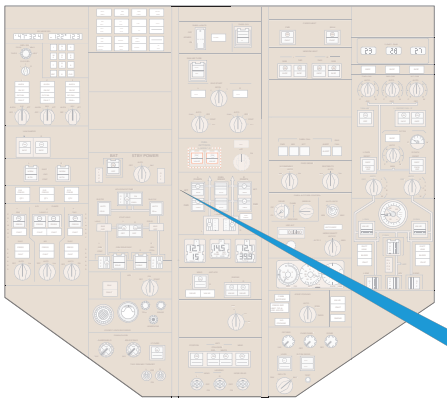
Hydraulic Motor-Driven Generator (HMG)

767-200ER/-300ER

- **Backup electrical power source for extended twin-engine operations**
- **Additional generator to supply 5-kVA ac and 50-A dc power**
  - **Powered by center hydraulic system air-driven pump**
  - **Located in left-hand wheel well on keel beam**
- **An independent power supply for the Captain's flight instruments as well as selected navigation, communication, lighting, and anti-icing loads**
- **Activated automatically when the airplane is airborne with loss of the engine-driven and APU generators**

Hydraulic Motor Generator (HMG)

767-200ER/-300ER



Battery discharge light illuminated
- The main battery is discharging

Battery switch
- ON - Provides backup power from the hot battery bus to the battery and standby buses
- OFF - Disconnects battery bus from hot battery bus

Standby power bus off light
- Illuminated - standby ac or dc bus not powered

Battery charger

Hot bat bus dc

Battery

BAT

ON

OFF

DISCH

AUTO

OFF

BAT

OFF

Standby dc bus

Standby ac bus

Battery bus dc

Left dc

Standby power selector

- OFF - The standby buses are unpowered
- AUTO - The standby buses powered from main ac and dc transfers to battery power if normal ac power is lost
- BAT - The standby buses are powered from the main battery

DC output

Captain flight instrument transfer bus

Hydraulic motor-driven generator (HMG)

AC output

Left transfer bus

Right transfer bus

Flow lines not on panel
- DC power
- AC power

Hydraulic Motor Generator System

767-200ER/-300ER

Systems powered by battery or hydraulic motor generator if operational

- Fire extinguishing systems
- Engine, APU, and cargo and wheel well fire detection systems
- Spar fuel valves
- APU fuel valve
- Fueling system
- Fuel crossfeed valves
- DC fuel pump
- Fuel quantity system
- Engine fuel control valves
- Clock time references
- Captain's clock
- IRS (L and C continuous; R 5 minutes)
- RAT manual deployment
- RAT automatic deployment system
- Parking brake valve
- Landing gear alternate extension
- Passenger address system
- Interphone systems
- Generator controls
- Engine-driven hydraulic pump shutoff valves
- Air-driven hydraulic pump control
- E/E cooling override system
- Antiskid for inboard wheels
- Air/ground system
- Passenger oxygen deployment system
- Standby engine indicating
- Engine start controls
- Engine ignition system
- Engine thrust reverse control
- Left and right pack valves
- Manual wing anti-ice
- Manual engine anti-ice
- Alternate stabilizer trim
- Stab trim shutoff valves
- Manual cabin altitude control
- Aislestand floodlight
- Left yaw damper
- Three spoiler pairs
- Left VHF
- Left stick shaker
- Standby attitude indicator
- Left aural warning speaker
- Rudder trim
- Main panel floodlights
- Left VOR/marker beacon
- Left air data computer
- Left RDMI
- Center MMR
- Duct leak detection
- E/E cooling standby mode
- Standby instrument panel lights
- Right ADF
- WEU (channel B)
- Standby electrical power control
- APU control
- Cabin altitude indicator
- Cabin differential pressure indicator
- Cabin emergency lights
- Emergency evacuation system (if installed)

Note: Standby altimeter and standby airspeed indicator are pneumatically driven.

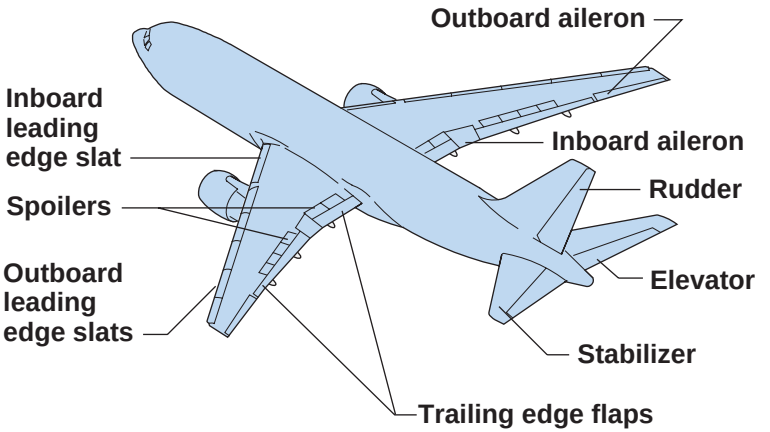
Additional systems powered by hydraulic motor generator

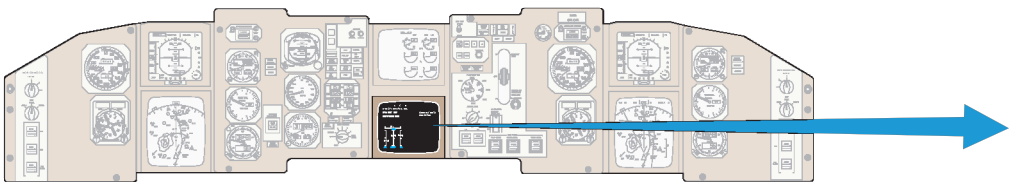
- Left EADI
- Left EHSI
- Left altimeter
- Left Mach/airspeed indicator
- Left EFIS symbol generator
- Center EFIS symbol generator
- Left EFIS control panel
- Left VSI
- Left MMR
- Left radio altimeter
- Captain's instrument and panel lights
- Left FMC and MCDU
- Left DME
- Left HF
- Flap and rudder trim position indicators
- Aislestand and overhead panel lights
- Captain's pitot heat
- Right auxiliary pitot heat
- Left angle of attack heat
- Left and right pneumatic isolation valve
- Cabin pressure controller auto 1 and 2
- Lavatory lights
- Left and right engine probe heat
- Left ATC system
- Cargo heat override control
- Passenger cabin ceiling and night lighting
- Manual flight deck temperature control
- Trim air

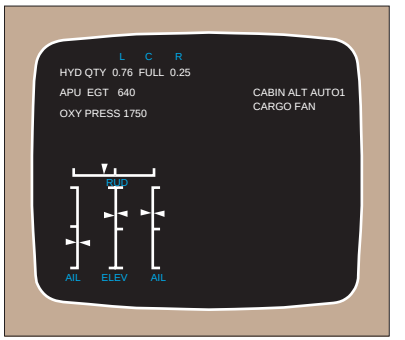
Flight Controls

767-200ER/-300ER

- **The primary flight controls are the ailerons, elevators, and rudder. Flight controls are powered from the three hydraulic systems. There is no manual reversion.**
- **Spoilers assist the ailerons in providing roll control and, in addition, operate as speed brakes.**
- **A variable-pitch stabilizer assists the elevators in providing pitch control. The stabilizer provides trim by varying the horizontal stabilizer angle.**
- **High lift for takeoff and landing is provided by trailing edge flaps and leading edge slats. The flaps and slats can also be operated by an alternate electrical system.**
- **Two independent yaw damper systems operate continuously in flight to improve the airplane's directional stability and turn coordination.**
- **The EICAS status display of flight control surface positions shows the amount of deflection.**





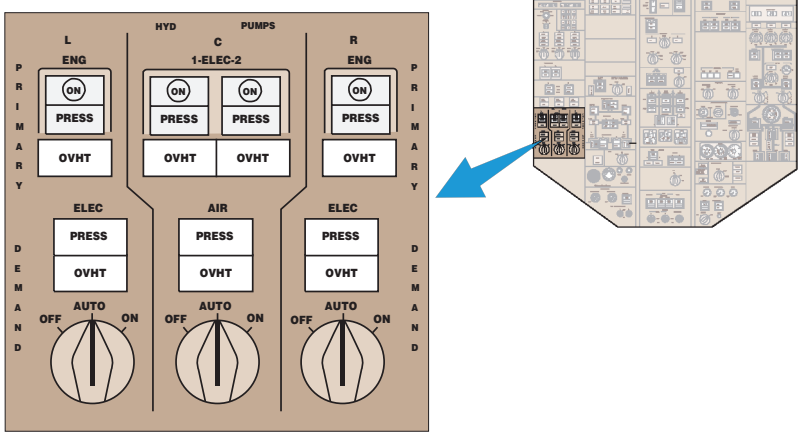


EICAS status page

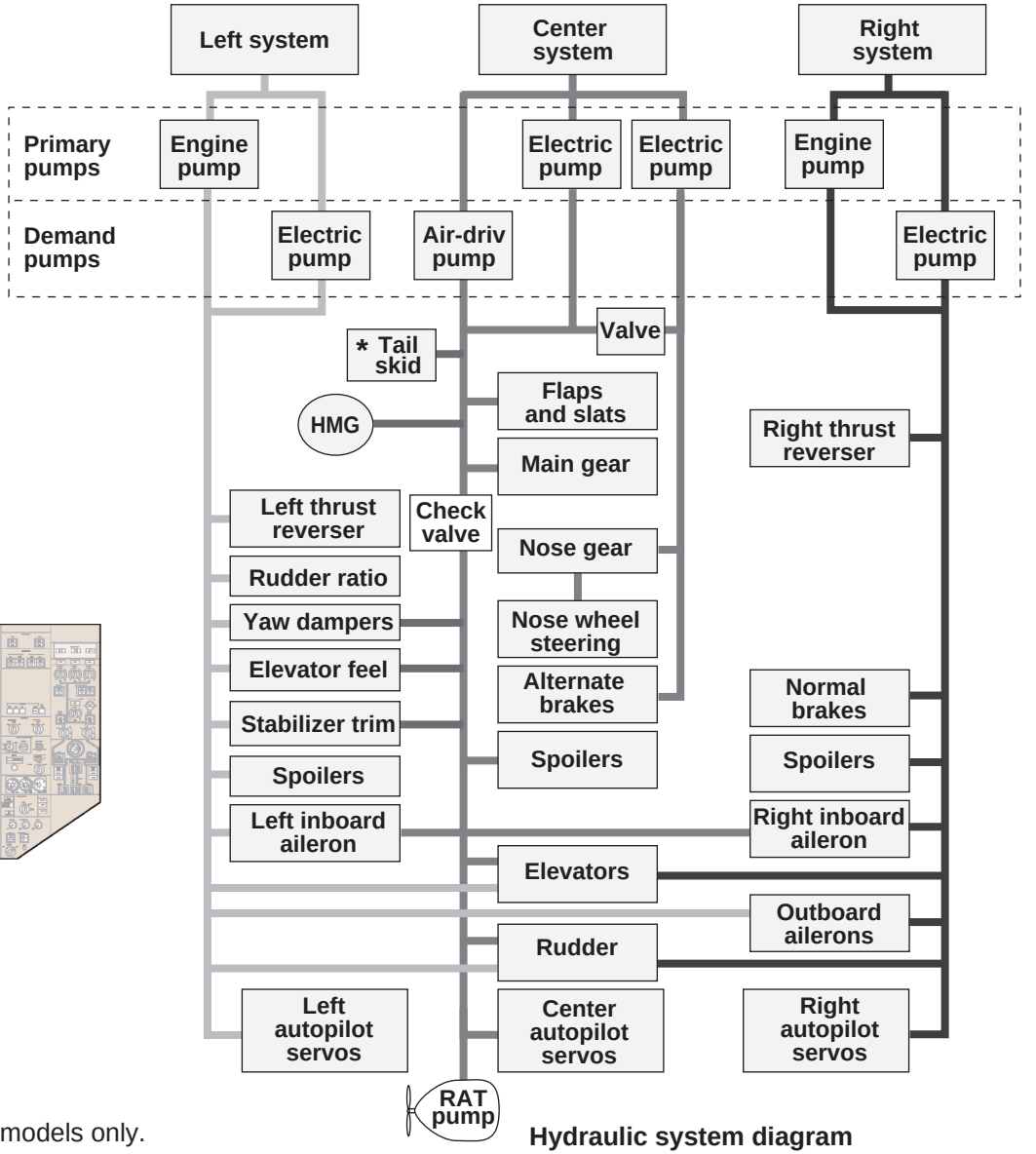
Hydraulic Power

767-200ER/-300ER

- The left and right hydraulic systems are each powered by one primary engine-driven pump and one electric demand pump.
- The center hydraulic system is normally powered by two electric primary pumps and one air-driven demand pump.
- The center system provides power for the hydraulic motor generator during standby electrical power operation.
- Each hydraulic system reservoir is equipped with a low-quantity measuring system to provide information to the EICAS status display for quantity and refill indications.
- RAT (ram air turbine) provides hydraulic pressure to center hydraulic system when deployed.



Hydraulic control panel



Hydraulic system diagram

* 767-300ER models only.

Ice and Rain Protection

Probe and Window Heat, Windshield Wipers

Probe heat

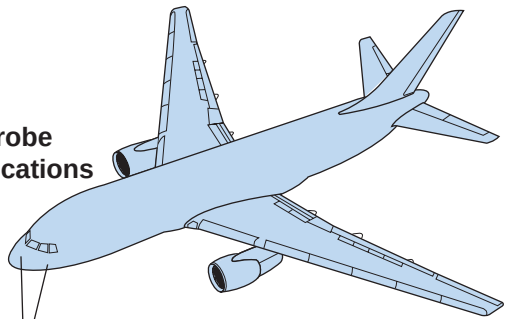
- **Operation is fully automatic**

Window heat

- **Heat control is automatically provided for both left and right no. 1 and no. 2 windows**

Windshield wipers

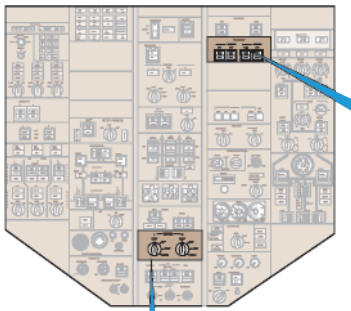
- **Hydrophobic coating on windshield**



Probe locations

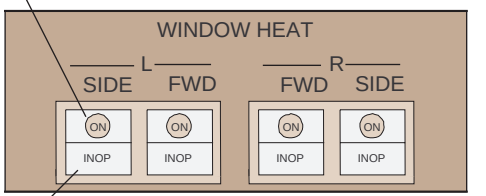
Pitot static probes (2 per side)
Angle of attack probe (1 per side)
Total air temperature probe (left side only)

Overhead panel



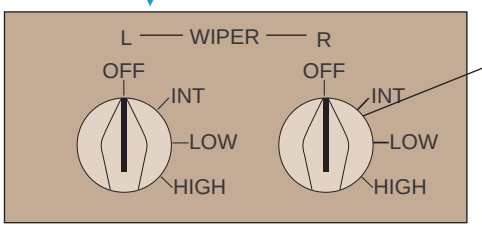
Window heat switch

- **Signals window heat controller to apply heat to associated window**



Window heat inoperative lights

- **Associated window is not being heated**



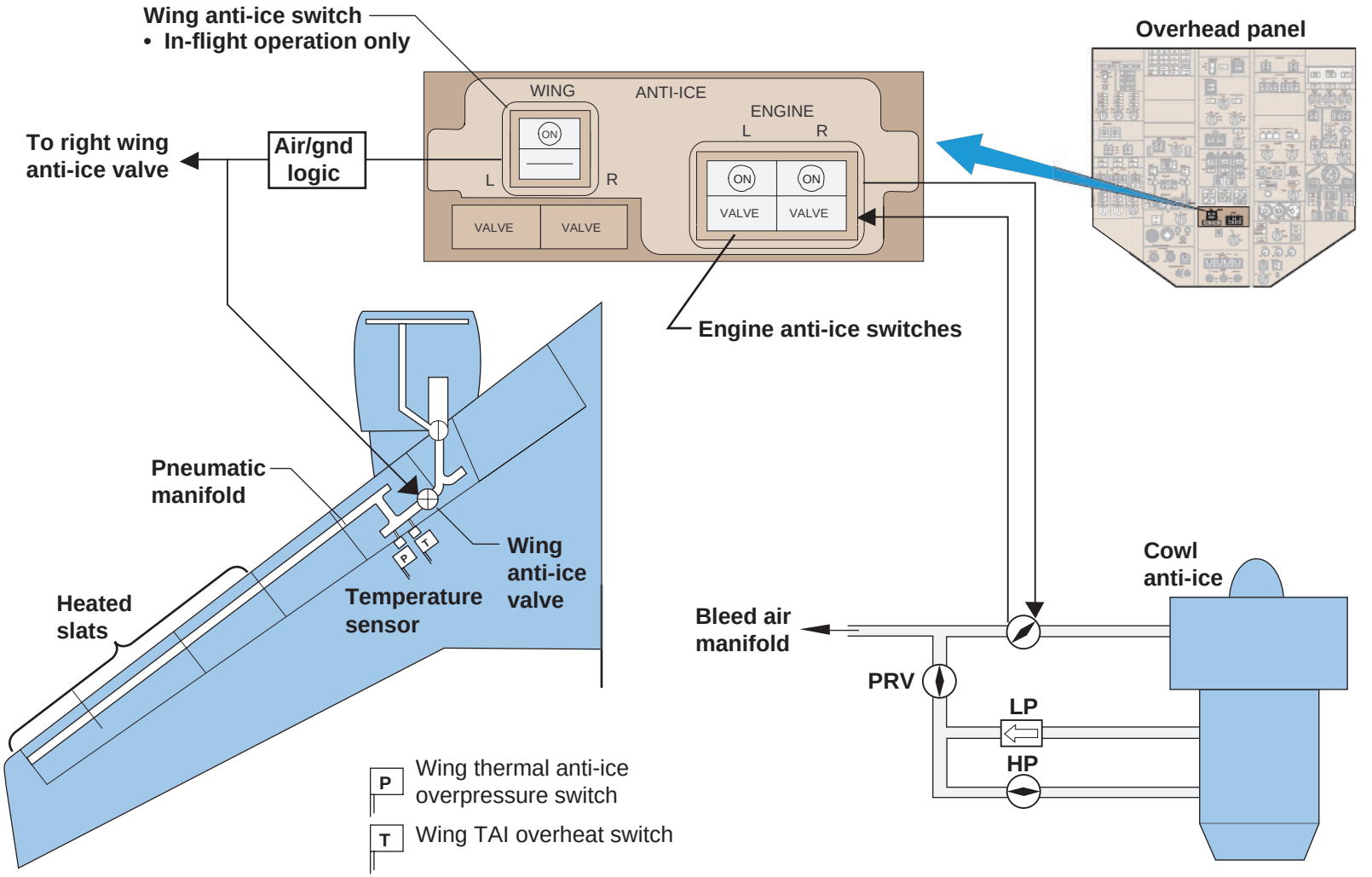
Windshield wiper selector

OFF – Wipers turned off and sequenced to the stowed position
INT – Intermittent operation
LOW – Low-speed operation
HIGH – High-speed operation

Standard selections baseline is dual three-speed (with intermittent) wiper switches

Wing and Engine Anti-Ice

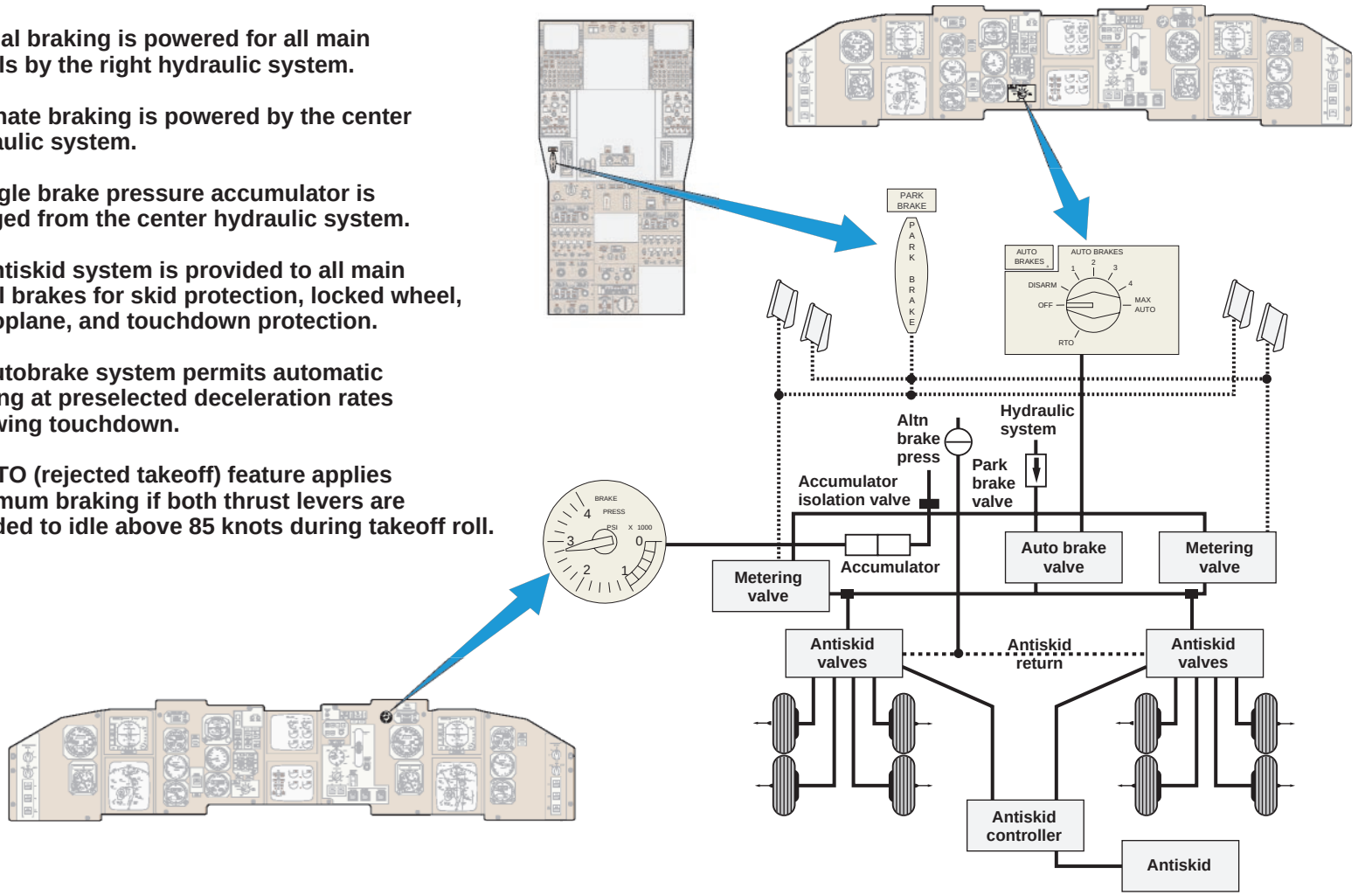
767-200ER/-300ER



Wheel Braking System

767-200ER/-300ER

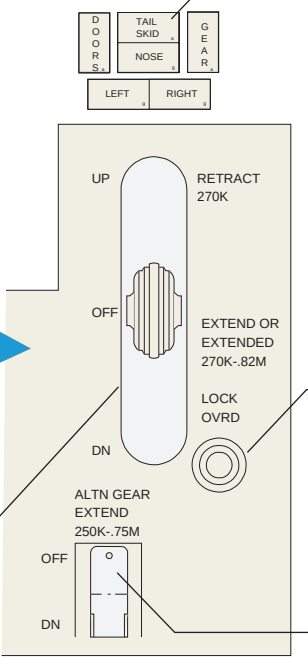
- **Normal braking is powered for all main wheels by the right hydraulic system.**
- **Alternate braking is powered by the center hydraulic system.**
- **A single brake pressure accumulator is charged from the center hydraulic system.**
- **An antiskid system is provided to all main wheel brakes for skid protection, locked wheel, hydroplane, and touchdown protection.**
- **An autobrake system permits automatic braking at preselected deceleration rates following touchdown.**
- **An RTO (rejected takeoff) feature applies maximum braking if both thrust levers are retarded to idle above 85 knots during takeoff roll.**



Landing Gear

767-200ER/-300ER

- The 767 has two main gear and steerable nose gear
- Landing gear actuation is powered by the center hydraulic system
- A tailskid is installed on 767-300ER airplanes



Tailskid light (amber)
(767-300ER airplanes)
- **Tailskid disagrees with lever position**

Landing lock override switch
Push – Manually releases lever lock

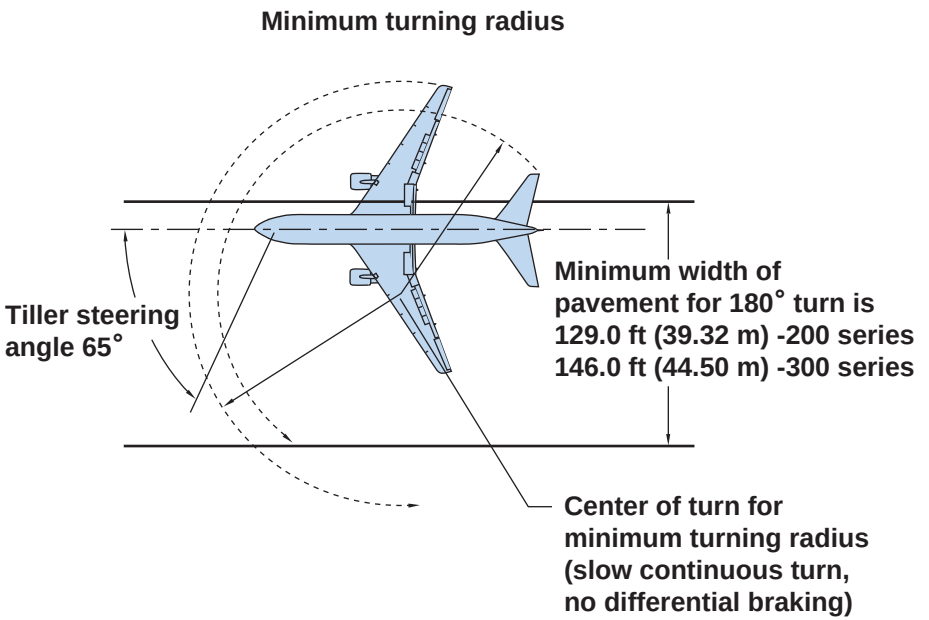
Landing gear level
UP – Releases downlocks
– Pressurizes upside of gear actuator
OFF – Depressurizes landing gear hydraulic system
DN – Releases uplocks
– Pressurizes downside of gear actuator

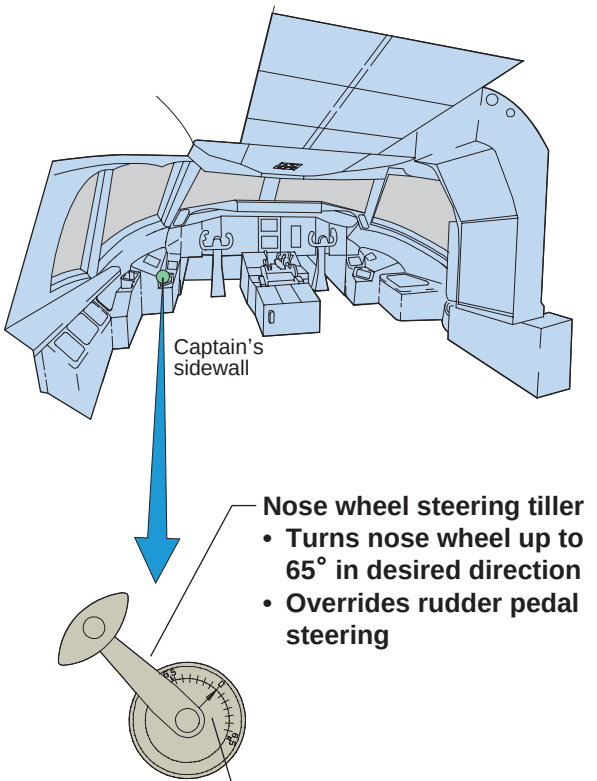
Alternate gear extension switch (toggle, guarded)
OFF – Resets alternate gear extension system
DN – Releases all gear uplocks

Nose Wheel Steering

767-200ER/-300ER

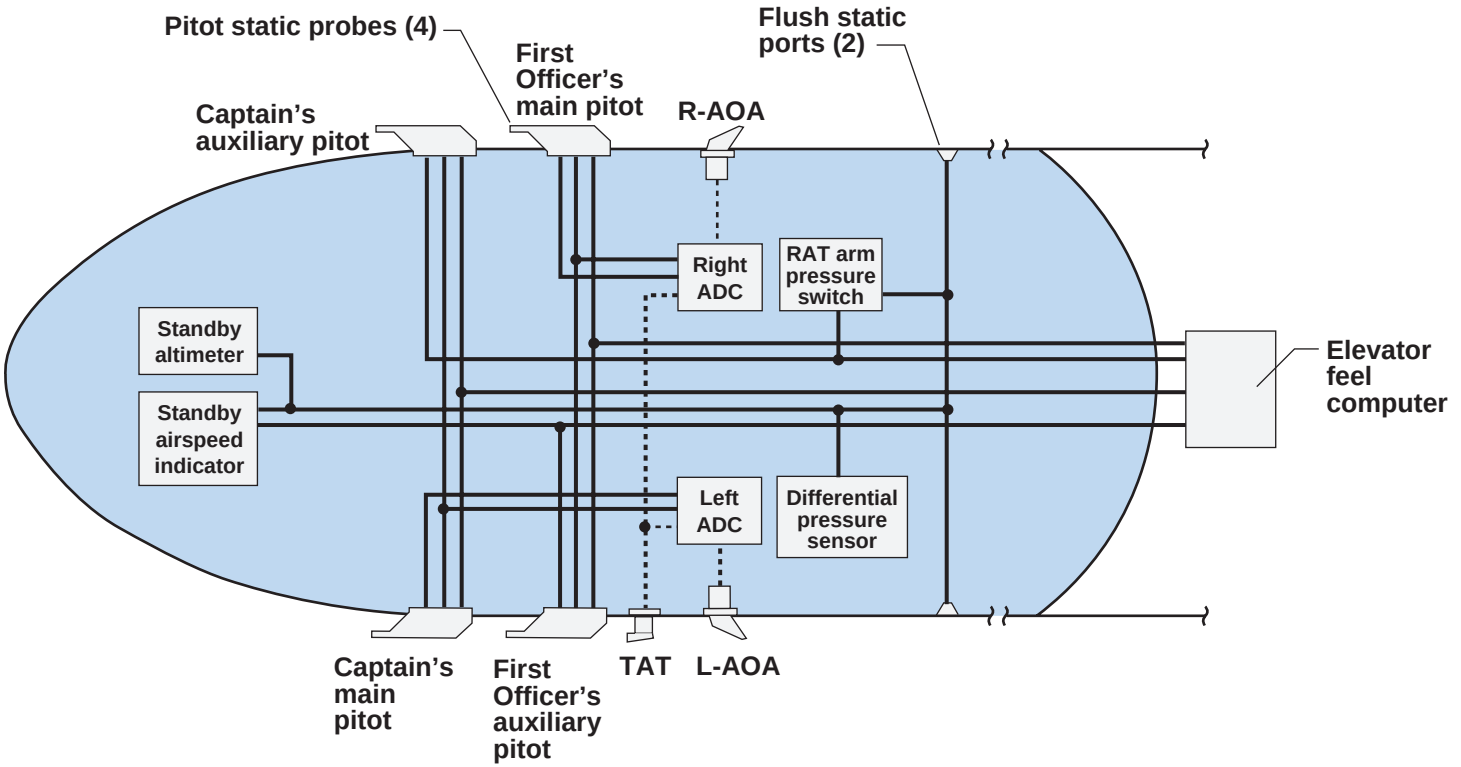
- Nose wheel steering is powered by the center hydraulic system
- Steering is controlled primarily through the left-hand tiller wheel
- Rudder pedals provide up to 6° of steering control





Air Data System

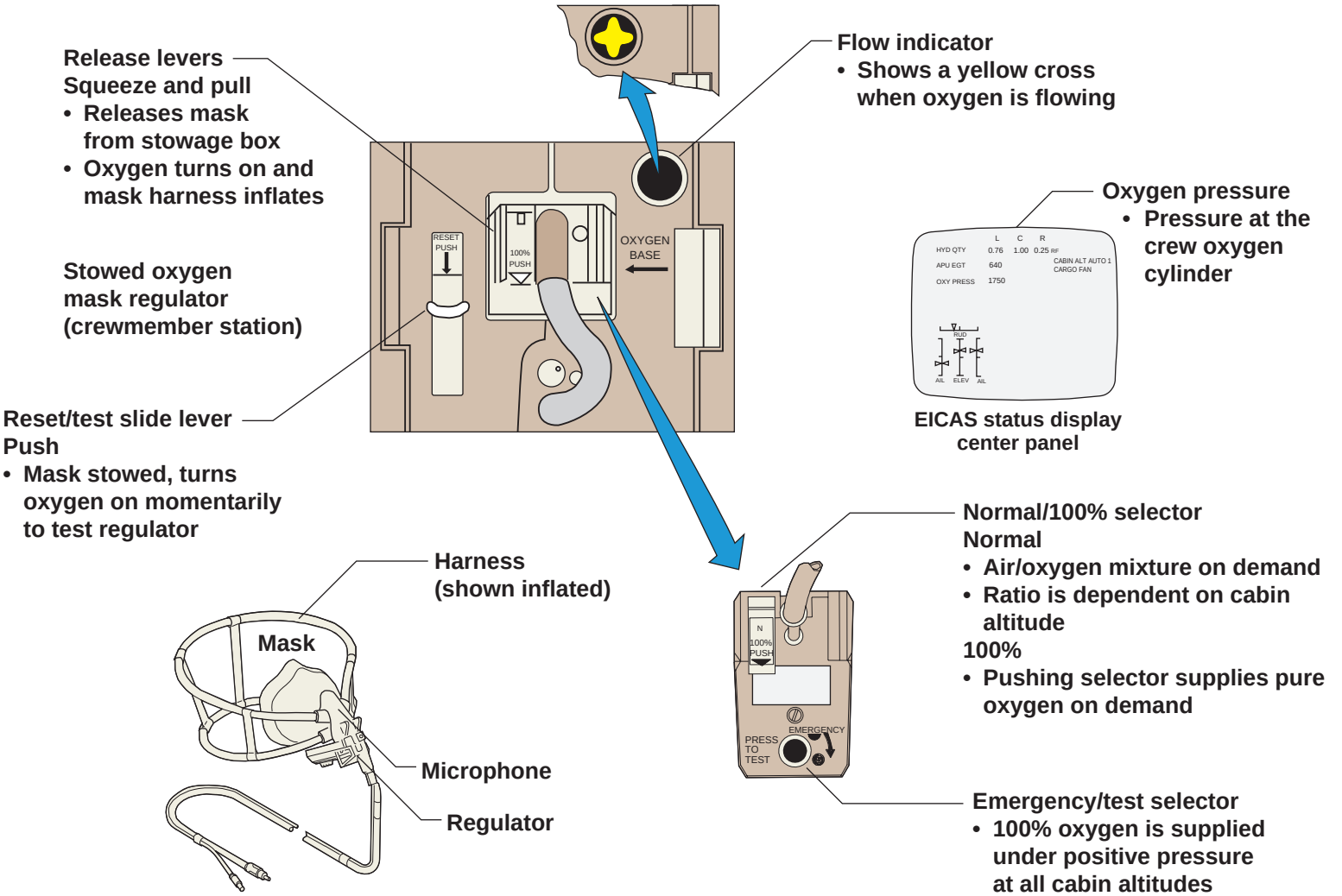
767-200ER/-300ER



- Dual ARINC 706 digital air data computers
- Independent standby instruments
- Auto probe heat
- Dual-level pitot static probe heat
- Dual angle-of-attack (AOA) vanes
- Aspirated TAT probe provides certified TAT for takeoff thrust computations
- TAT display on EICAS
- TAS and SAT available in FMC MCDU

Flight Crew Oxygen

767-200ER/-300ER



Flight Deck and Emergency Lighting

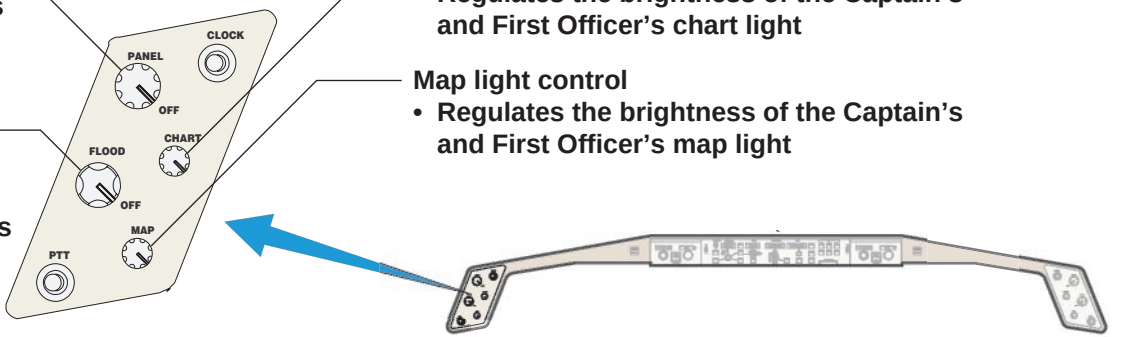
767-200ER/-300ER

Panel light control
- Regulates the brightness of the internal lighting in the Captain's and center panels and standby magnetic compass

Floodlight control
- Regulates the brightness of the floodlighting in the Captain's, center, and First Officer's panels

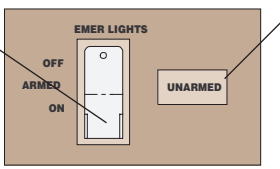
Chart light control
- Regulates the brightness of the Captain's and First Officer's chart light

Map light control
- Regulates the brightness of the Captain's and First Officer's map light

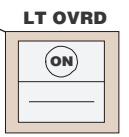


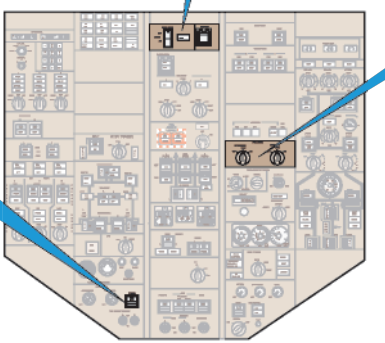
Emergency lights switch (guarded)
OFF – Prevents activation of emergency lighting system when electrical power fails or is turned off
ARMED – All interior and exterior emergency lights illuminated automatically if dc power fails or is turned off
ON – All emergency lights illuminate

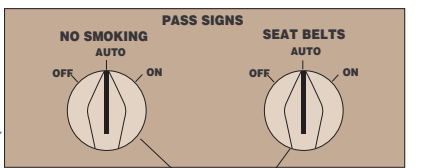
Emergency lights switch unarmed light (amber)



Lights override switch (alternate action)
ON – Turns on the following lights to full brightness: Captain's, center, and First Officer's main panel floodlights, forward and aft dome lights, and aislestand floodlight





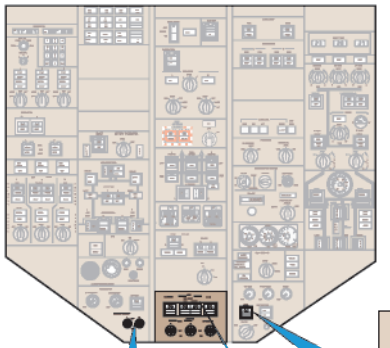


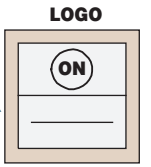
No smoking/seat belt selector
OFF – Turns off the associated passenger signs
AUTO – Selects automatic control of the associated passenger signs
- NO SMOKING signs on when landing gear is down
- SEAT BELT signs on when landing gear is down or flaps are not up

ON – Turns on the associated passenger signs

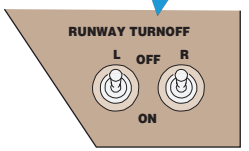
Exterior Lighting

767-200ER/-300ER





Logo light switch

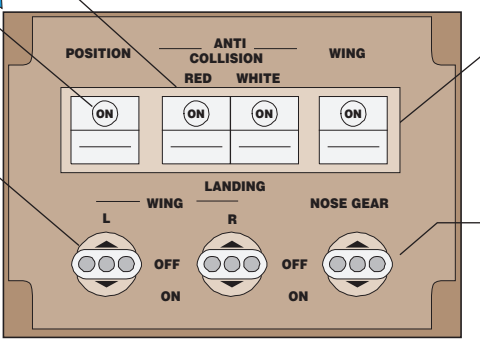


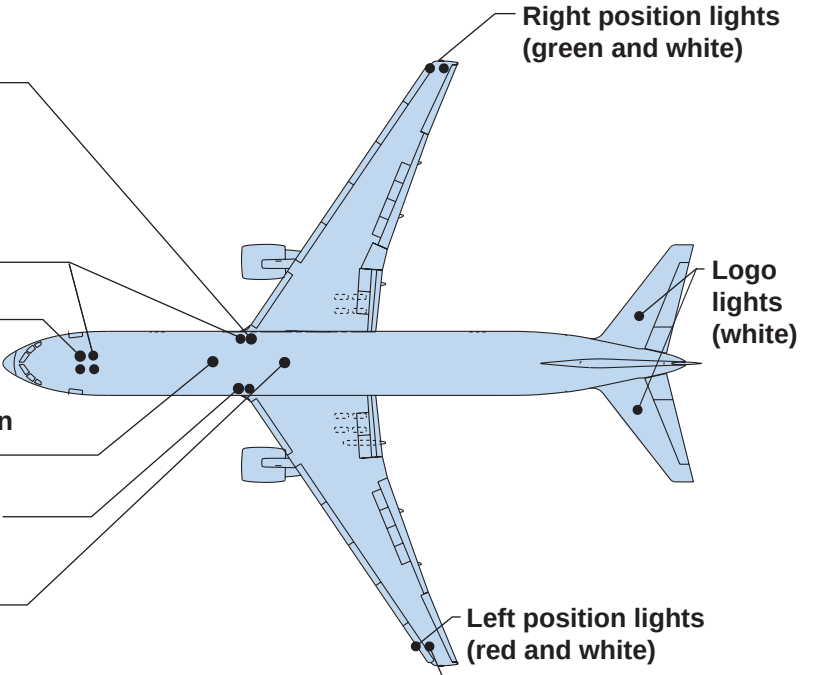
Runway turnoff light switch

Red and white anticollision light switch (alternate action)
ON – Turns on the corresponding red or white strobe lights

Position light switch (alternate action)
ON – Turns on the red, green, and white position lights

Wing landing light switch (alternate action)
ON – Turns on the corresponding left or right wing landing light
– Light intensity is at maximum only when the landing gear lever is down





Taxi runway turnoff lights (left and right)

Landing lights (left, right, and nose)

Taxi lights (optional)

Upper anticollision light (red strobe)

Wing illumination lights

Lower anticollision (red strobe)

Right position lights (green and white)

Logo lights (white)

Left position lights (red and white)

Anticollision lights (left and right) (white strobe)

Wing light switch (alternate action)
ON – Turns on the wing leading edge lights
– Light intensity is at maximum only when the landing gear lever is down

Nose gear landing light switch
ON – Turns on the two nose gear landing lights
– Inhibited if nose landing gear is retracted

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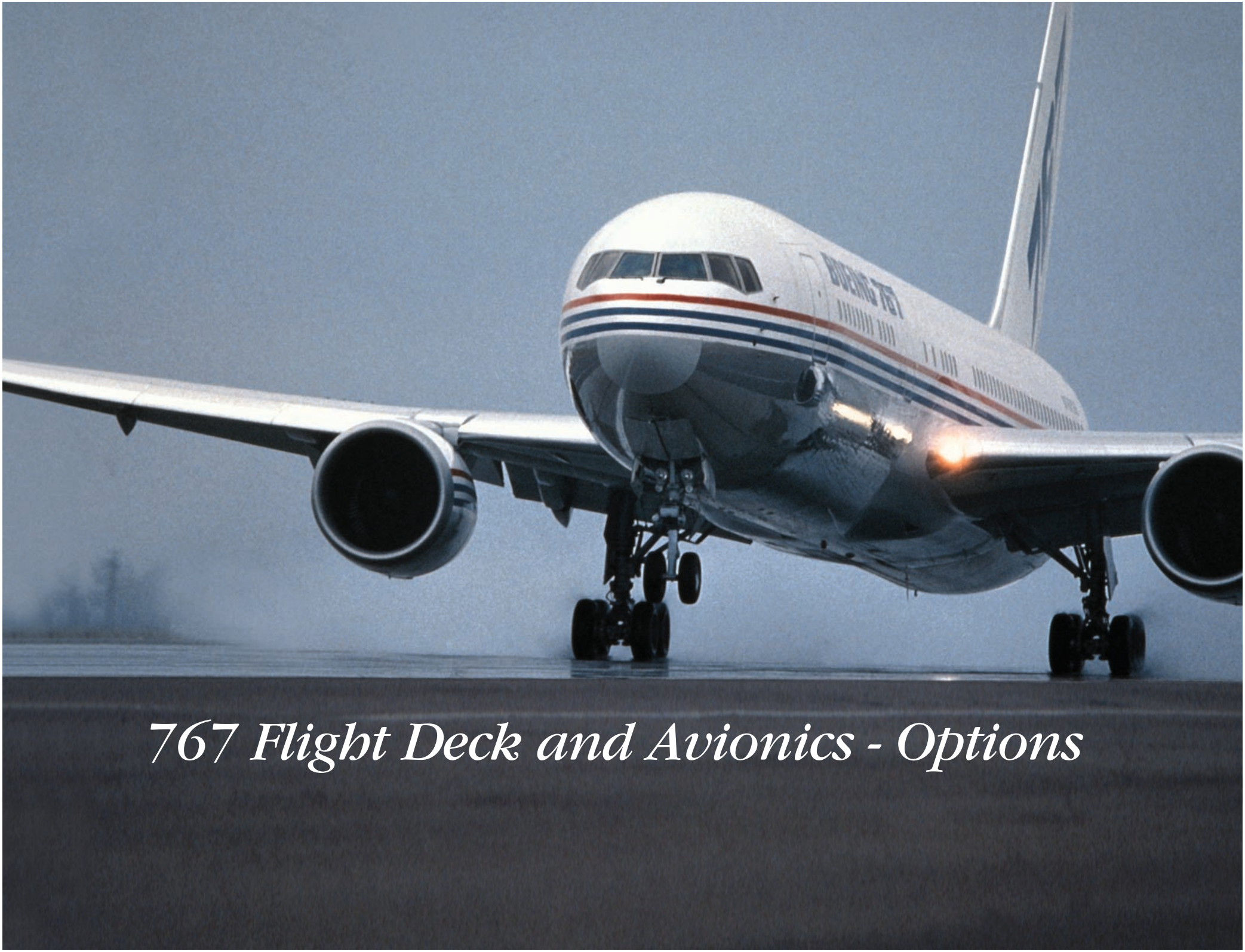


767 Flight Deck and Avionics - Options

767 Options

767-200ER/-300ER

1. Electronic Flight Instrument System
2. Engine Indication and Crew Alerting System
3. Autoflight Systems
4. Flight Management Computer System
5. Communications
6. Navigation System
7. Crew Accommodations
8. Airframe Systems

Options 1 —Electronic Flight Instrument System

767-200ER/-300ER

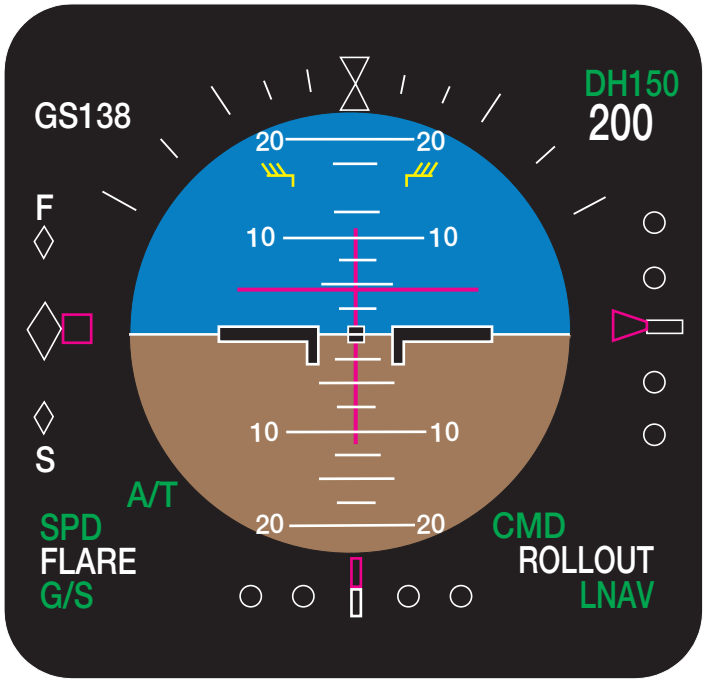
EADI		
Feature	**Basic**	**Option**
Flight Mode Annunciation (FMA)	Bottom of EADI	Top of EADI
Airspeed Tape	Fast/Slow Indicator	Airspeed Tape with Rolling Digits and Trend Vector (Contingent on Top FMA) Airspeed Tape with Hollow Cursor and Trend Vector (Contingent on Top FMA)
Flight Director Command Display and Airplane Symbol	Split Axis	Filled Integrated CueHollow Integrated Cue
Radio Altitude Display	Digital Display	Digital and Round Dial Display
Rising Runway Display	None	Provided on EADI
Radio Altitude Height Alert	None	Shown at 1000 feet Shown at 1500 feet Shown at 2500 feet
ILS Deviation Alert	None	Provided on EADI

EHSI		
Feature	**Basic**	**Option**
Map Mode Orientation	Track Up	Heading Up
Range Arcs	Range Marks	Range Arcs
True Airspeed and Ground Speed display	Ground Speed on EADI only	Ground Speed on EADI and EHSI. True Airspeed on EHSI
Wind Bearing Digital Display	Wind Speed and Direction displayed	Wind Speed, Direction, and Bearing displayed
ADF Pointers	None	Provided on EHSI
TCAS 3nm Range Ring	None	Provided on EHSI

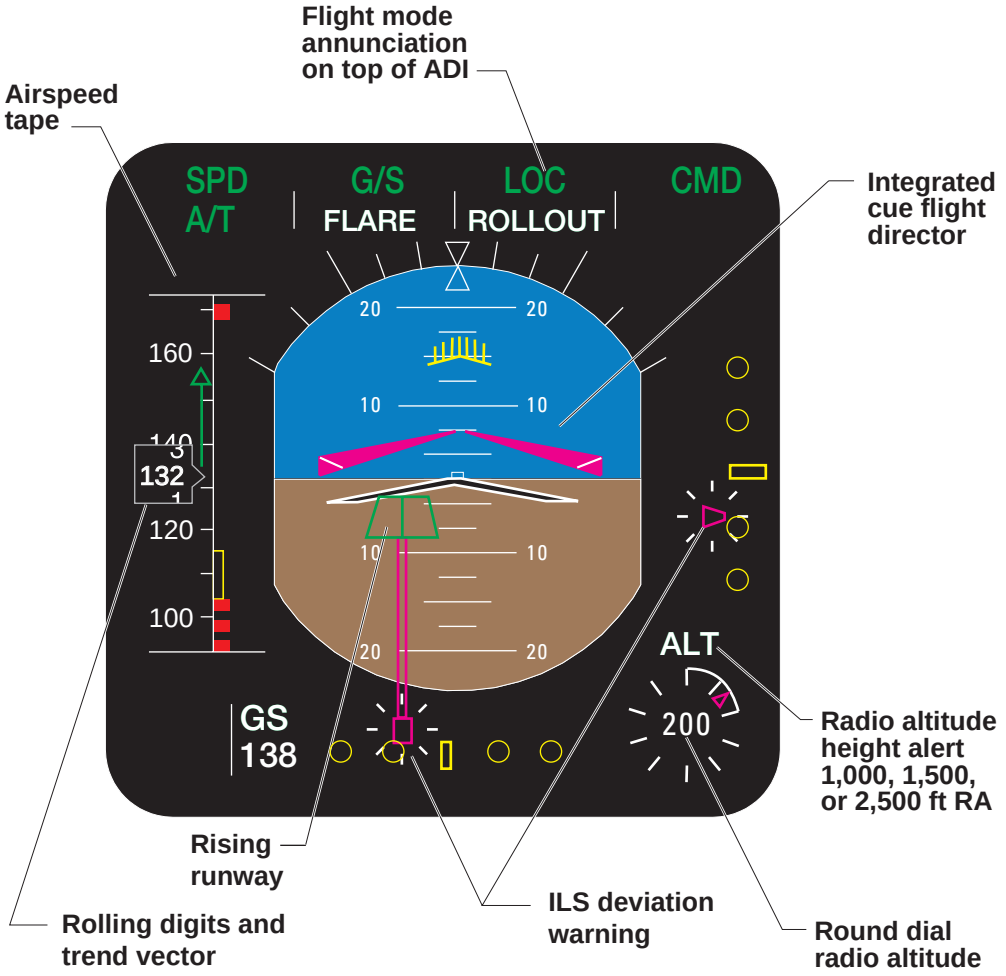
Options 1 —Electronic Flight Instrument System

767-200ER/-300ER

Electronic Attitude Director Indicator (EADI)



Basic EADI

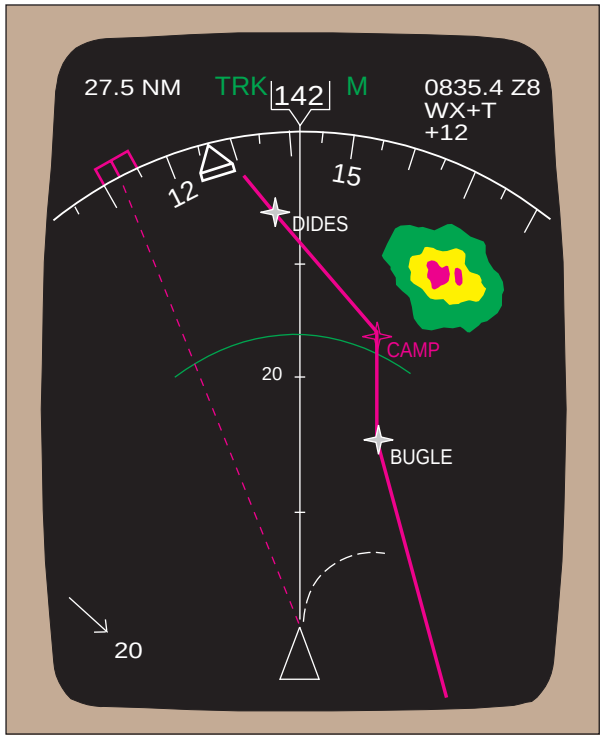


Optional EADI features

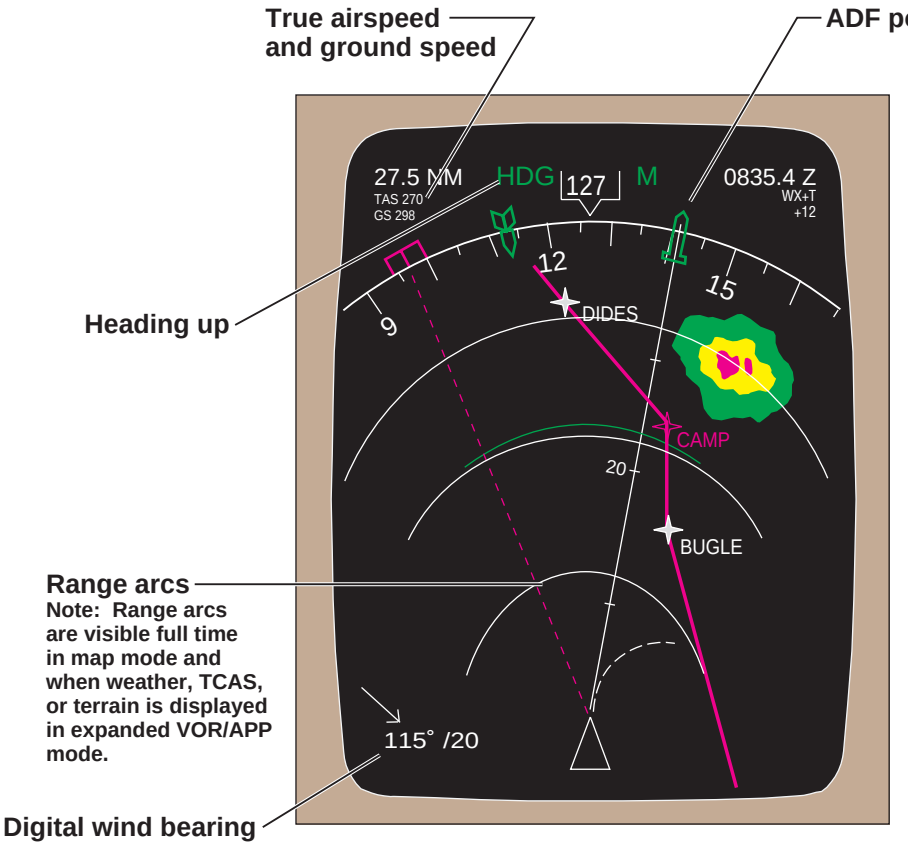
Options 1 —Electronic Flight Instrument System

767-200ER/-300ER

Electronic Horizontal Situation Indicator (EHSI)



Basic EHSI map mode



Optional EHSI map mode features

Options 2 —EICAS

767-200ER/-300ER

Feature	Basic	Option
Engine Fuel Flow Display	Display when Secondary Engine page is selected	Full Time Display
APU Oil Quantity Display	Low APU Oil Quantity message on Maintenance page	APU Oil Quantity Level on Status and Maintenance page
Generator Off and Engine Oil Pressure EICAS Messages	Advisory Level	Caution Level
ECS Parameters	Basic ECS Parameters on Maintenance page	Basic and Additional ECS Parameters on Maintenance page
Hydraulic Pressure	Display on Maintenance page	Display on Status and Maintenance pages
APU RPM	Display on Maintenance page	Display on Status and Maintenance pages
Bulk Cargo Compartment Temperature	None	Display on Maintenance and Status page
Ram Air Door Outlet Position	None	Display on Maintenance Page
Engine Fuel Pressure	Display on Maintenance page for GE and RR engines	Display on Maintenance page for PW engines
EICAS Maintenance Pages Available during flight	Available above 10,000 feet	Not Available during flight
ECS Precooler Outlet Temperature	None	Display on Maintenance page
Brake Temperature Display	None	Display on Status page
Tire Pressure Display	None	Display on Status page

Caution and Warning Options

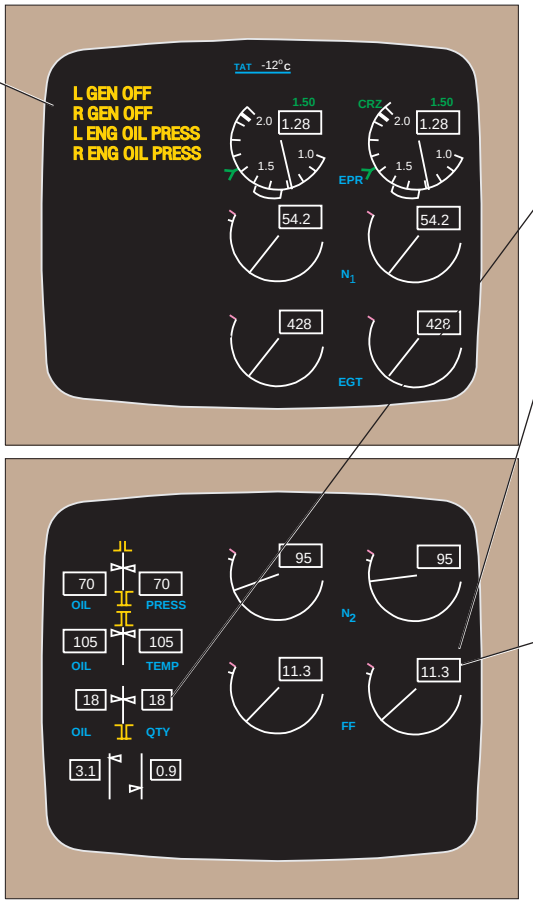
Feature	Basic	Option
Autopilot Disengage Warning	Aural Warning Siren - Aural Inhibited when Autopilot Disconnect Switch double pushed	Aural Warning Wailer - Aural activated for one second when Autopilot Disconnect Switch double pushed
Firebell Aural Warning	1 second on, 9 seconds off	2 seconds on, 3 seconds off
Overspeed Aural Warning	Resettable Warning Siren	Non-resettable Warning Siren

Options 2—EICAS

767-200ER/-300ER

Caution level messages
- **Generator off**
- **Engine oil pressure**

(Default selection shows these messages as advisory level)



Metric engine parameters
- **Fuel flow (FF) shows in kilograms per hour**
- **Oil quantity shows in liters**

Note: This is part of a broader option to show all instrumentation with metric units.

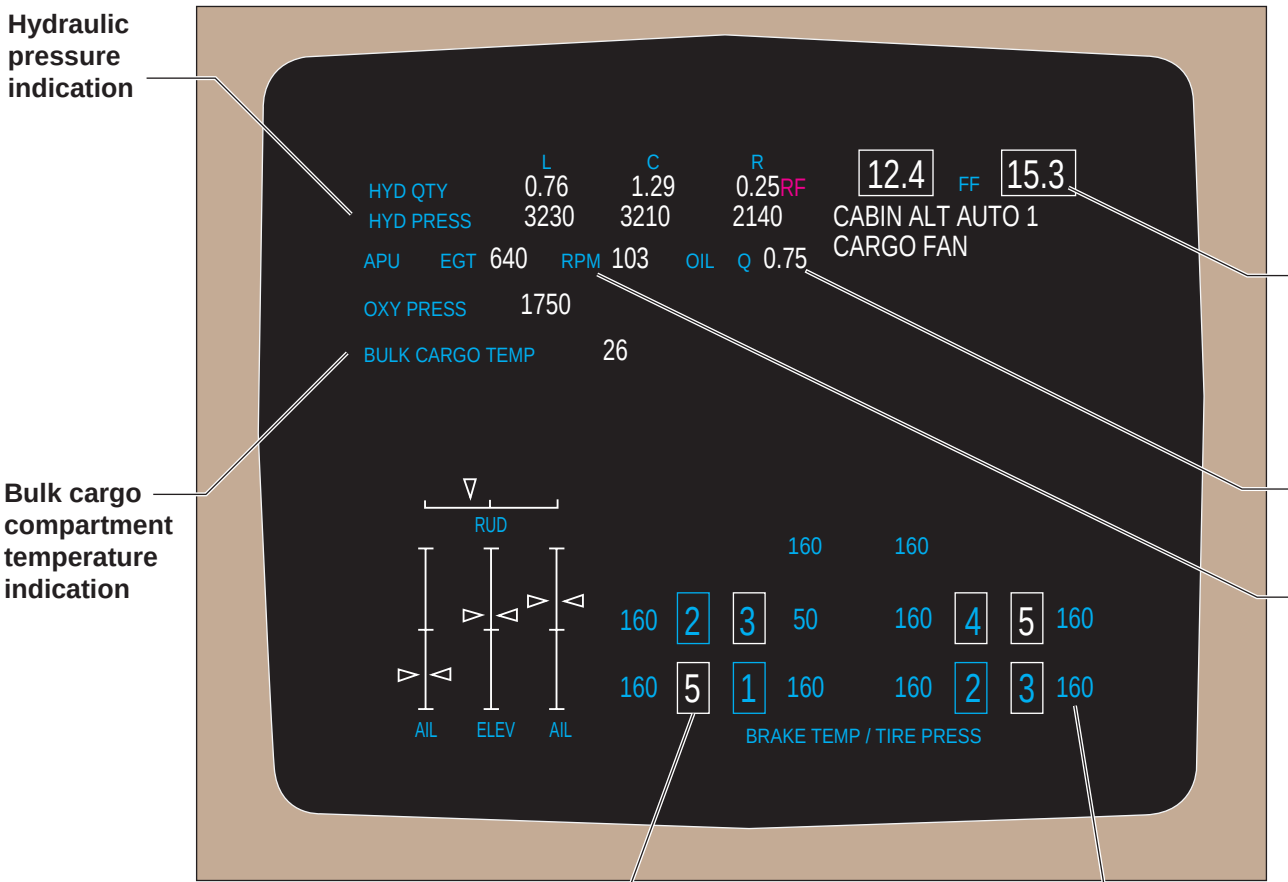
Full-time display of fuel flow

(Default selection shows this only when secondary engine display is selected)

Primary and secondary displays

Options 2 —EICAS

767-200ER/-300ER



Hydraulic pressure indication

Full-time fuel flow

Bulk cargo compartment temperature indication

APU oil quantity level indication

APU RPM indication

Brake temperature indications

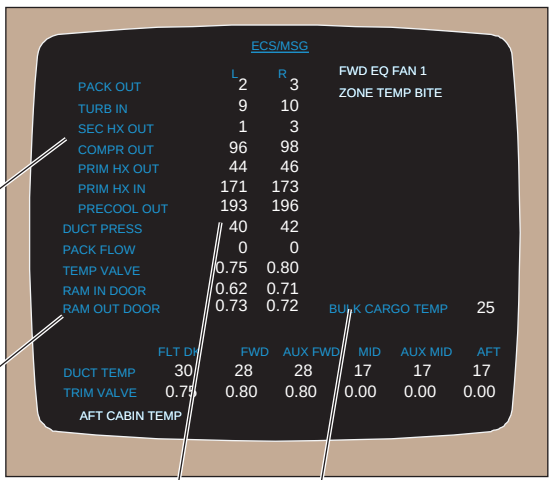
Tire pressure indications

Status page

Options 2 —EICAS

767-200ER/-300ER

ECS/MSG maintenance page



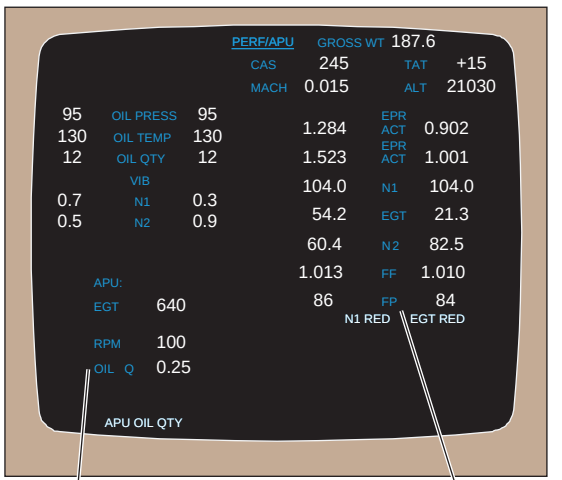
Additional ECS parameters

Ram air outlet door position

ECS precooler outlet temperature

Bulk cargo compartment temperature

PERF/APU maintenance page



APU oil quantity level

Interstage fuel pump pressure (basic with General Electric and Rolls-Royce engines)

Options 3 —Autoflight Systems

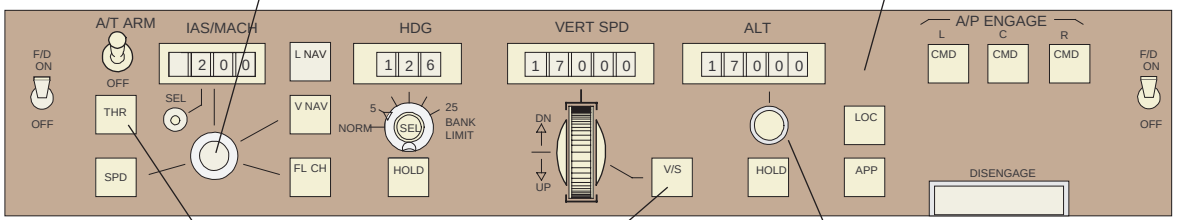
767-200ER/-300ER

Feature	Basic	Option
Glideslope Capture	Inhibit Glideslope Capture prior to Localizer Capture	Enable Glideslope Capture prior to Localizer Capture
Mach Display on Mode Control Panel (MCP)	Two-digit Mach display	Three-digit Mach display
Autopilot Triple-Channel Selection in Approach Mode	Automatic	Manual
Autopilot Command Engage Default Roll Mode	Heading Hold	Bank Angle Hold
Flight Director	Part Time Display (Flight Director display inhibited whenautopilot and flight director are referenced to the same FCC)	Full Time Display (Flight Director always displays when selected)
Mode Control Panel (MCP)	757/767 Baseline MCP	757/767 Baseline MCP without Backcourse Switch747-400 MCP
Fixed Derates	Climb Fixed Derates	Takeoff and Climb Fixed Derates
Climb Fixed Derate Washout	10,000 feet to 12,000 feet	10,000 feet to 30,000 feet
FCC Software Loading Capability	On-board Software Loadable	Not Software Loadable

Options 3 —Autoflight Systems

767-200ER/-300ER

747-400 mode control panel



Knob shape modified to provide tactile difference from heading and altitude knobs

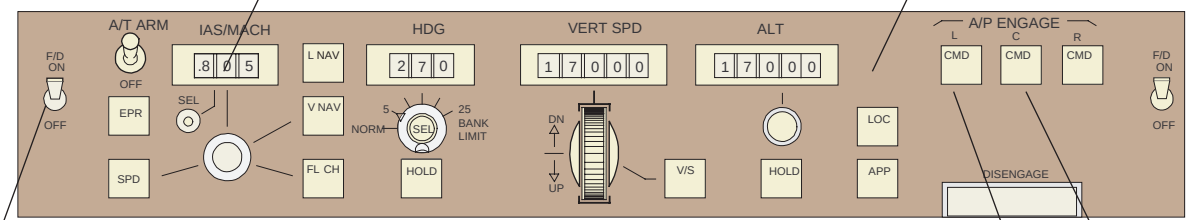
Backcourse mode deleted

Changed EPR or N1 nomenclature to THR (provides commonality with all engine types)

All pushbutton switches modified to provide positive tactile feel

Added push action switch to altitude select knob (provides VNAV altitude intervention capability)

757 and 767 mode control panel options



Three-digit Mach display

Backcourse mode deleted

Full-time flight director: Command bars stay in view when same A/P is selected

Bank angle hold on A/P or F/D engagement if bank between 5 and 30

Individual channel selection in approach mode

Options 4 —Flight Management Computer System

767-200ER/-300ER

Feature	Basic	Option
Runway Position Shift Units	Feet	Meters
Flight Crew Alertness Monitor	Inhibited	Enabled
Navigation Database	Boeing Supplied	Customer Supplied
Offpath Descent Circles & DME Range Rings	Inhibited	Displayed
Altitude Intervention	Inhibited	Enabled (Contingent on selecting 747-400 MCP)
Airline Modifiable Information (AMI)	Boeing Supplied	Customer Supplied
Required Time of Arrival (RTA)	Inhibited	Enabled
Air Traffic Services Datalink (ATS DL)	Inhibited	Enabled (Contingent on selecting Datalink capability)
Airline Operational Communciations Datalink (AOC DL)	Inhibited	Enabled (Contingent on selecting Datalink capability)
Takeoff Datalink	Inhibited	Enabled (Contingent on selecting AOC DL)
FMC Printer Interface	Inhibited	Enabled (Contingent on selecting a printer)
ADF Approaches	Inhibited	Enabled
GPS Approaches	Inhibited	Enabled
Display of Vertical Bearing, Flight Path Angle, and Vertical Speed	Inhibited	Enabled

Options 4—Flight Management Computer System

767-200ER/-300ER

Future Air Navigation System (FANS)

FANS is an International Civil Aviation Organization (ICAO) concept of a phased approach to Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) implementation.

FANS 1 allows:

- **Reduced separations**
- **More timely altitude change authorizations**
- **Flexible routine operations**
- **Dispatch on required navigation performance (RNP) only routes**
- **Efficient crossing track operations**

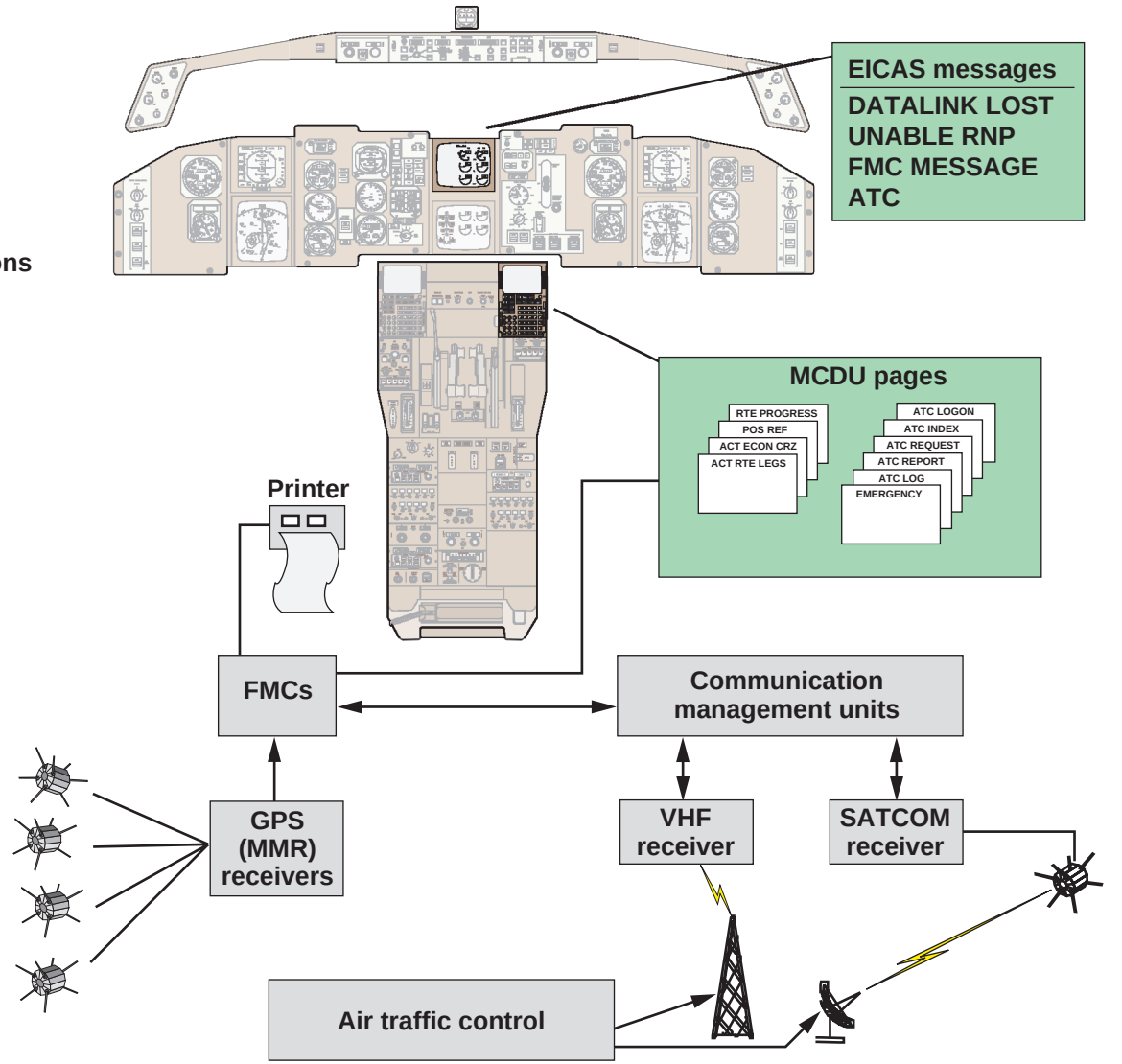
The Pegasus FMC is FANS 1 capable. Global positioning system (GPS) and required navigation performance (RNP) are basic features.

These options are required to enable FANS operation:

- **Air traffic services data link (ATS DL). This option also provides automatic dependent surveillance (ADS)**
- **ACARS or VDL mode 2/AOA data link**
- **SATCOM, if FANS operations are desired outside of VHF data link range**

These options are available, but not required for FANS operations:

- **Required time of arrival (RTA)**
- **FMC printer interface**



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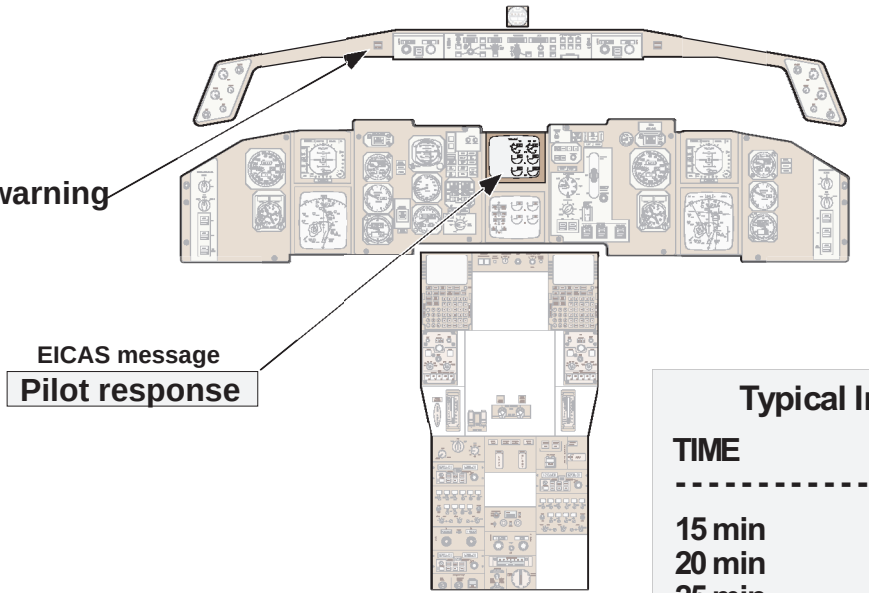
Options 4—Flight Management Computer System

767-200ER/-300ER

Crew Alertness Monitor



Typical Implementation

TIME	ALERT
Cruise	
15 min	EICAS advisory
20 min	EICAS caution
25 min	EICAS warning
Descent	
5 min	EICAS advisory
6 min	EICAS caution
7 min	EICAS warning

Monitors time since last pilot button-push

- Mode control panel
- EFIS control panels
- EICAS control panel
- MCDUs
- VHF/HF microphone push-to-talk
- VOR control panel

Airline defines criteria in policy file

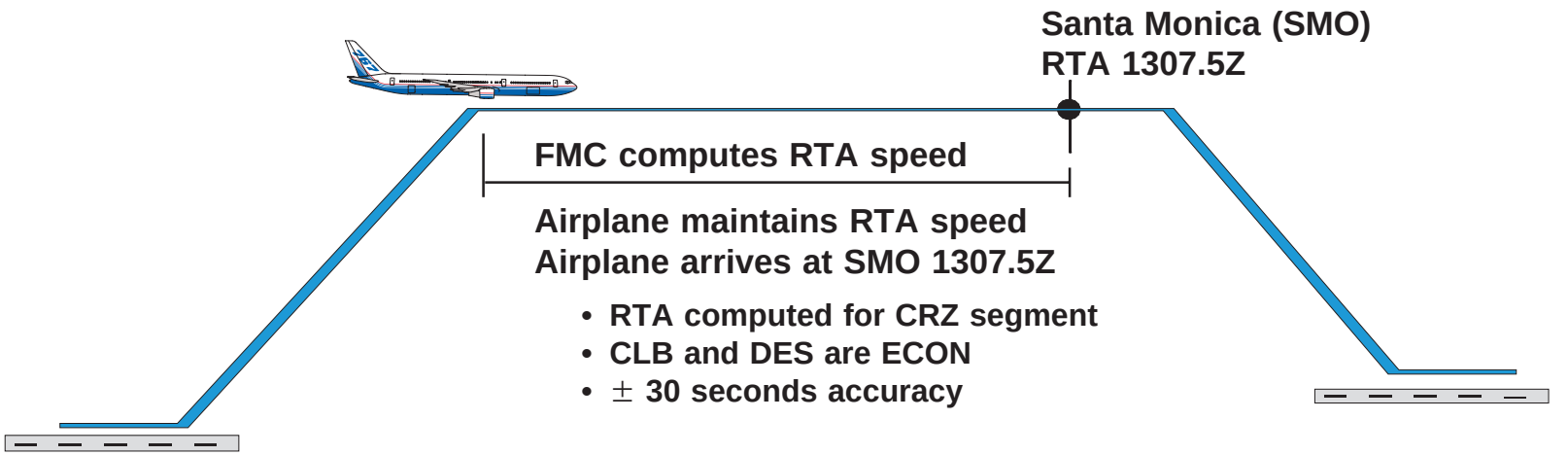
- Entire feature selectable on or off
- EICAS alerting levels selectable on or off
- Timing criteria selectable within predefined limits
- Requires option for customer supplied Airline Modifiable Information (AMI)

Options ④ —Flight Management Computer System

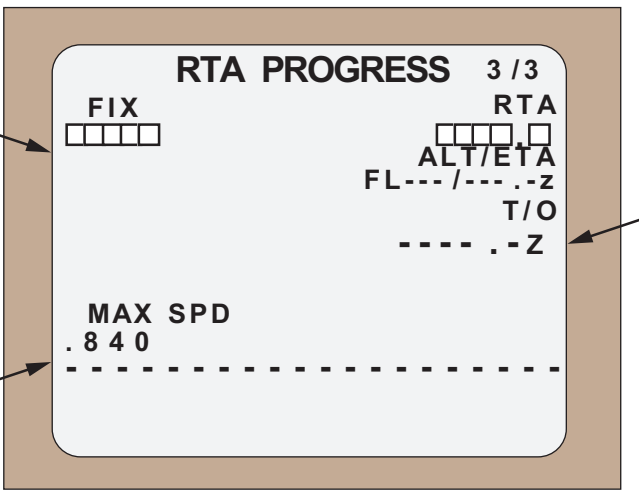
767-200ER/-300ER

Required Time of Arrival (RTA)

- **RTA provides the capability to specify a required time of arrival for an existing flight plan fix**



RTA fix
- **Any waypoint in active flight plan**



Takeoff
- **Initially displays dashes**
- **Displays recommended takeoff time following entry of RTA time**
- **If no RTA fix or time is entered, expected takeoff time can be entered and all trip predictions will be based on entered takeoff time**

Maximum speed
- **Defaults to MMO minus 0.02**
- **Crew can enter a maximum speed if desired**

Options 4 —Flight Management Computer System

767-200ER/-300ER

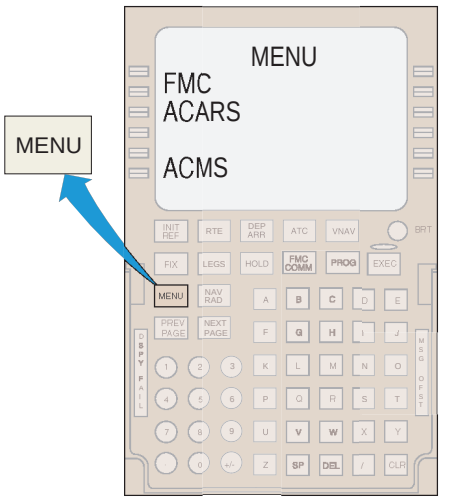
ACARS Interface

Options can be selected for

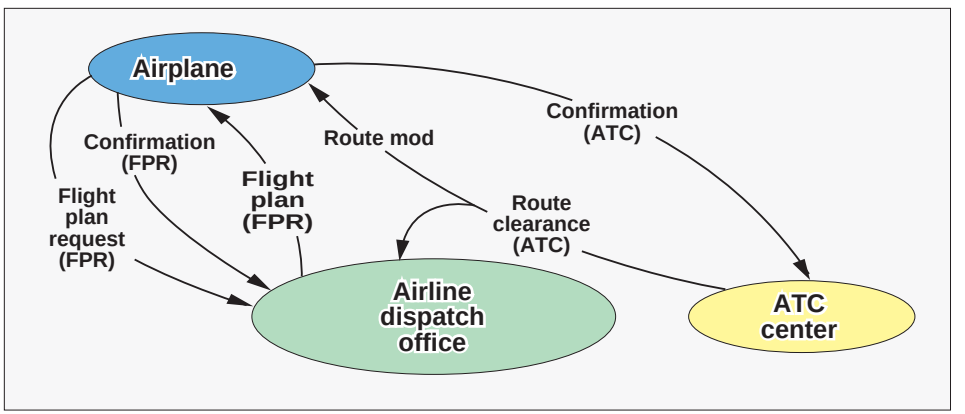
- **Airline operations communication data link (AOC DL)**
- **Air traffic services data link (ATS DL)**
- **Takeoff data link**
- **Contingent on installation of ACARS MU/CMU system**

FMCS/ACARS data link

- **Access ACARS menu through FMC (MCDU) or multipurpose interactive display unit (MIDU)**
- **Provides adequate message flexibility while minimizing communication load**
- **Mode S function compatibility**
- **SATCOM compatibility**
- **Requires MCDU or MIDU and ACARS or VDL mode 2**
- **Provisions for ACARS or VDL mode 2 offered that would provide for future implementation of ACARS or VDL mode 2**
- **Partial provisions offered for future upgrade from ARINC 724B ACARS to ARINC 758 communication management units (CMU)**
- **Voice mode protection available to allow center VHF system to be used for both voice and data transmission**



Multifunction CDU (MCDU)

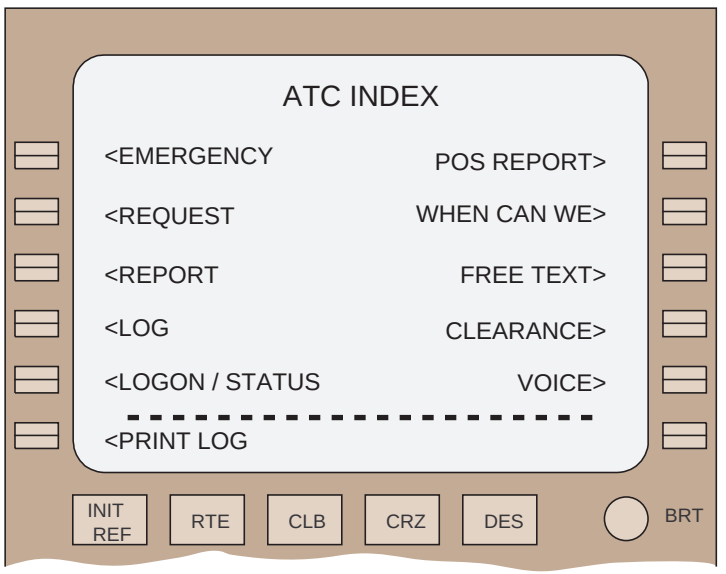


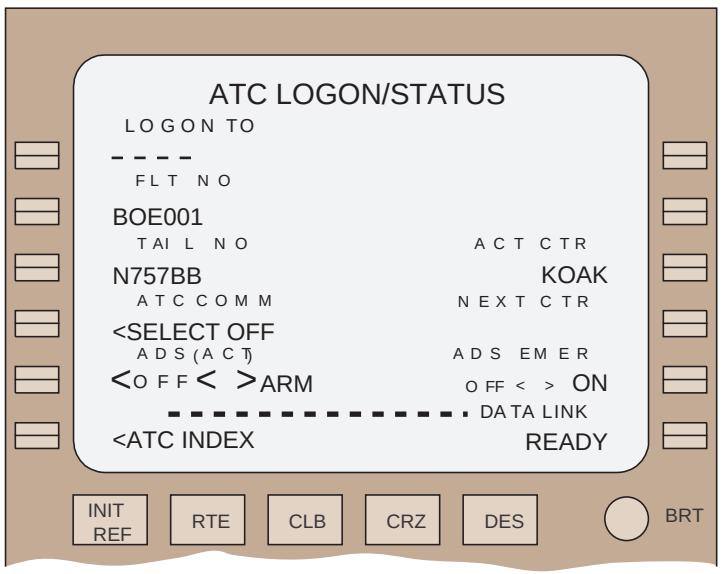
Options ④ —Flight Management Computer System

767-200ER/-300ER

ATS Data Link

- **Air traffic services data link (ATS DL) is an optional feature of the Pegasus FMC. ATS DL is contingent on selection of VDL mode 2/AOA or ACARS data link.**
- **The ATS DL combines the functions of ATS facilities notification (AFN), automatic dependent surveillance (ADS), and air traffic control data link (ATC DL). The AFN notifies air traffic control that the airplane is equipped and ready to receive data link communications. ADS allows for automatic reporting of aircraft position and intent data. The ADS is capable of simultaneously reporting to four ATC facilities and one airline facility. The capability to disable ADS through the multifunction control display unit (MCDU) is provided.**
- **The ATC DL allows two-way text messages to be sent between pilot and controller. The messages are received and created using the MCDU. The capability to store and recall messages and to load rate information into the flight plan is provided.**

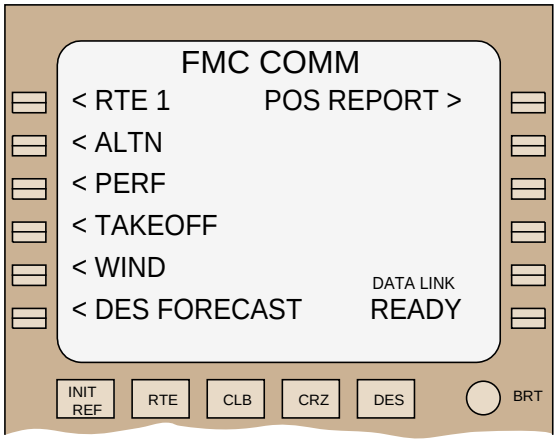


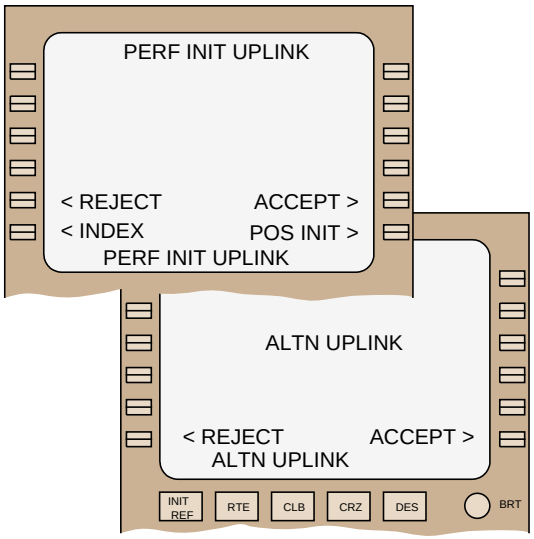


Options ④ —Flight Management Computer System

767-200ER/-300ER

Airline Operational Communications Data Link (AOC DL)





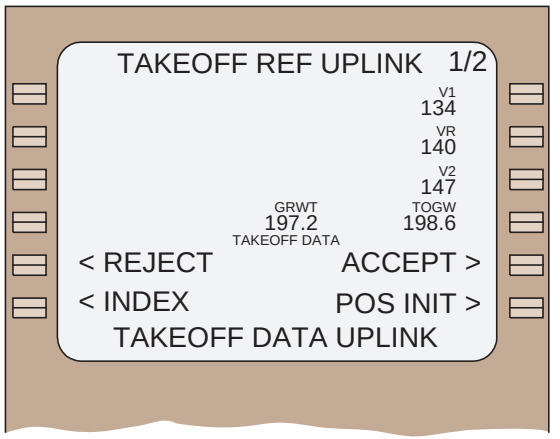
- **AOC data link is an optional feature of the Pegasus FMC. AOC data link is contingent on selection of VDL mode 2 or ACARS data link.**
- **This feature provides data link communication of performance, takeoff route, waypoint winds, reporting waypoints, descent forecasts, route modifications, and alternate airport information directly into the FMC.**

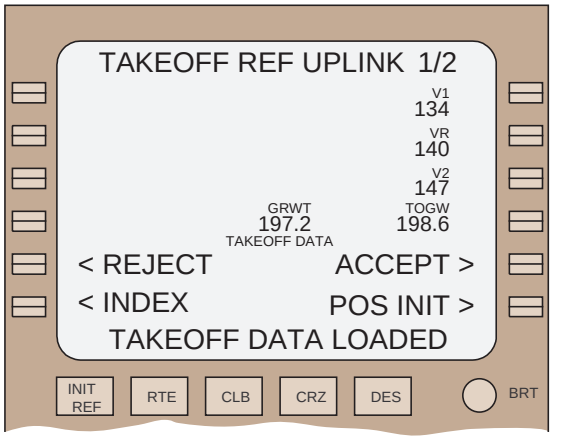
Options ④ —Flight Management Computer System

767-200ER/-300ER

Takeoff Data Link

- **FMCS takeoff data link (shown below) is a separate option contingent on selection of AOC DL. This feature allows uplinks of takeoff data to the FMC.**





Options ④ —Flight Management Computer System

767-200ER/-300ER

Printer Interface

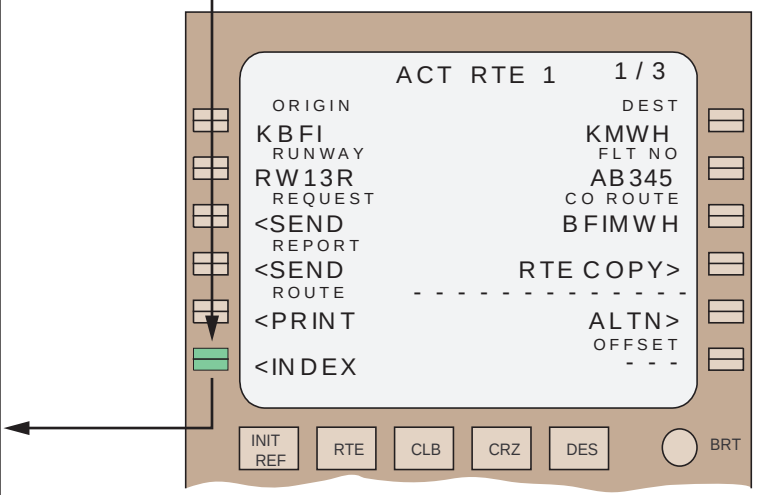
- **Provides for the printing of the FMC flight plan and ATC data link messages**
  - **Option available for FMC printer interface**
  - **FMC prints uplinked and downlinked ATC messages**
  - **FMC interfaces with an ARINC 740, 744 or 744A printer**

<PRINT
Prints entire flight plan

```
------ CURRENT AIRCRAFT DATA ---------
LAST POS: YKM
ATA AT LAST POS: 1328Z
FUEL AT LAST POS: 131.7
FMC LAT/LON: N4700.0W12516.4
NAV SOURCE: INERTIAL
RNP/ACTUAL: 2.0/0.4
FLT PHASE: CRZ
ALT: 21100
TAS: 405KT
GS: 425KT
WIND: 270T/14KT
OAT: -38C
CURRENT FUEL: 128.7
ORIGIN/ATD: KBFI/1300Z
DEST/ETA: KMWH/1610Z
CO ROUTE: BFIMWH
CRZ ALT: FL210
ZFW: 300.0
RESERVES: 25.0
CRZ CG: 30.0%
COST INDEX: 90

------------ ACT RTE 1 --------------
VIA/TO     SPD/ALT            ETA/FUEL
---------------------------------------
LACRE3.VAMPS
   080    1199NM           1320Z/141.3
  VAM01    250/FL270AFL290B
V2
   070      30NM           1325Z/140.3
  ELN      (305)/(FL210)
DIRECT
   120      40NM           1330Z/139.3
----------- ENTERED WINDS ------------
FIX       ALT    DIR/SPD       ALT/OAT
---------------------------------------
VAM01     FL270 240/130     FL210/-44C
          FL250 240/120
          FL230 230/ 80
          FL210 220/ 30
---------- DESCENT FORECAST ----------
 ALT     WIND DIR/SPD
FL210       180/ 30KT
17000       170/ 20KT
13000       150/ 10KT
9000        120/  5KT

---------- RTA FIX/TIME --------------
YKM/1329.1Z
--------- ALTERNATE AIRPORTS ---------
KRNT        1335Z    132.2
KSEA <SEL>  1333Z    130.2
KPDX        1334Z    131.2
KPWT        1336Z    133.2
```

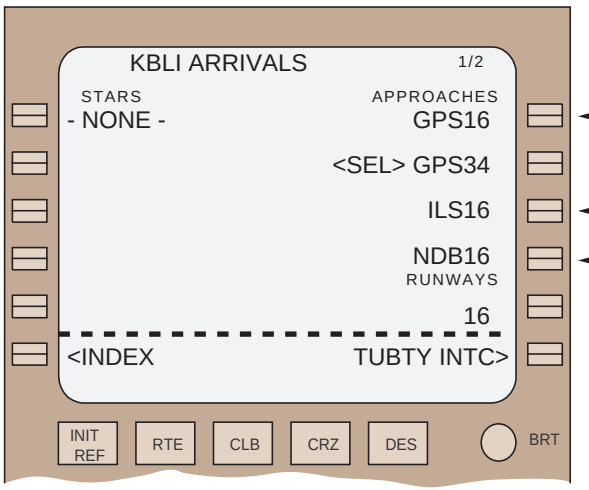


Options 4 —Flight Management Computer System

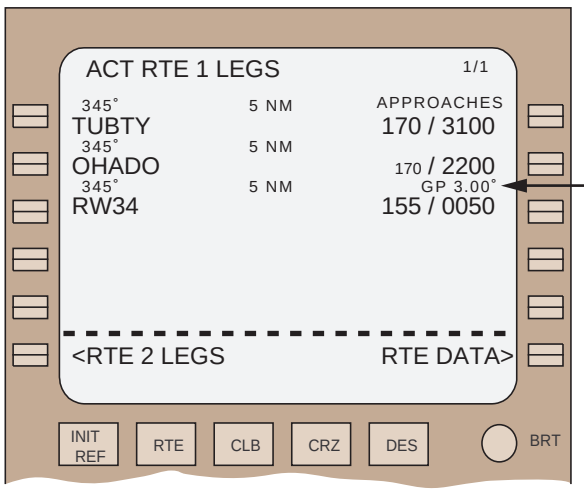
767-200ER/-300ER

GPS and NDB Approaches

- **Option available for selection of FMC nondirectional radio beacon (ADF) approaches in the NAV database**
- **Separate option available for selection of FMC GPS "nonprecision" approaches in the NAV database**



NDB and GPS approaches are selected on arrivals page on MCDU

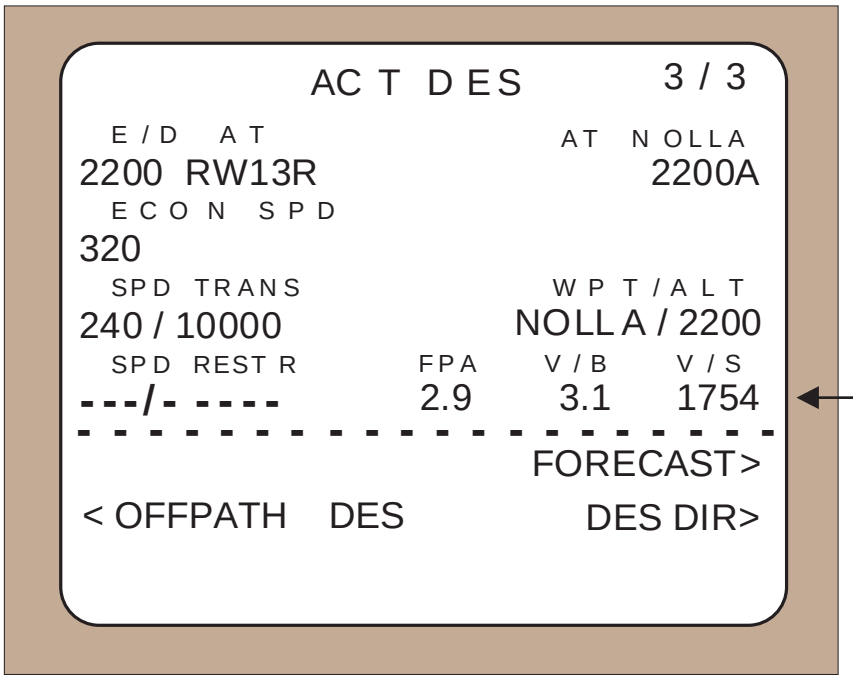


GPS final approach and any approach with a specified vertical angle (on which the VNAV approach path is based) results in display of angle on RTE LEGS page

Options 4 —Flight Management Computer System

767-200ER/-300ER

Flight Path Angle—Vertical Bearing—Vertical Speed



- **Flight path angle**
  - **Actual**
- **Vertical bearing**
  - **To waypoint and altitude in 3R**
- **Vertical speed**
  - **Required to maintain vertical bearing**

Options 5 —Communications

767-200ER/-300ER

Feature	Basic	Option
HF Data Link	None	Installation and Activation of HF Data LinkPartial Provisions
8.33 kHz VHF Channel Spacing	None	Activation Partial Provisions
SATCOM	None	SATCOM System Installation Partial Provisions
ACARS/Data Link	None	VDL Mode 2/AOA Installation Level 0A CMU InstallationARINC 724B ACARS InstallationPartial Provisions
Voice Mode Protection	None	Provided
Emergency Locator Transmitter (ELT)	None	ELT InstallationPartial Provisions
Pilots Call Panel	PA-in-Use Light not included	PA-in-Use Light included
Boom Microphone Headset Jacks	Two Pin Jacks	Five Pin Jacks
Push to Talk Switch on Glareshield	None	Provided
Cockpit Voice Recorder Monitor Jack	None	Provided

Options 5 —Communications

767-200ER/-300ER

Satellite Communications (SATCOM)

- **Options available for SATCOM system, or partial provisions for SATCOM**

- **SATCOM provides two-way voice/data communication for the flight crew and cabin passengers anywhere in the world covered by INMARSAT global/spot beam**

- **The services include**
  - **Flight deck voice, allowing instantaneous communication with Operations, Maintenance and Air Traffic Control**
  - **Flight deck data link data communication**
  - **64 kbps circuit mode PC data communication planned for future with AERO-H+ system**

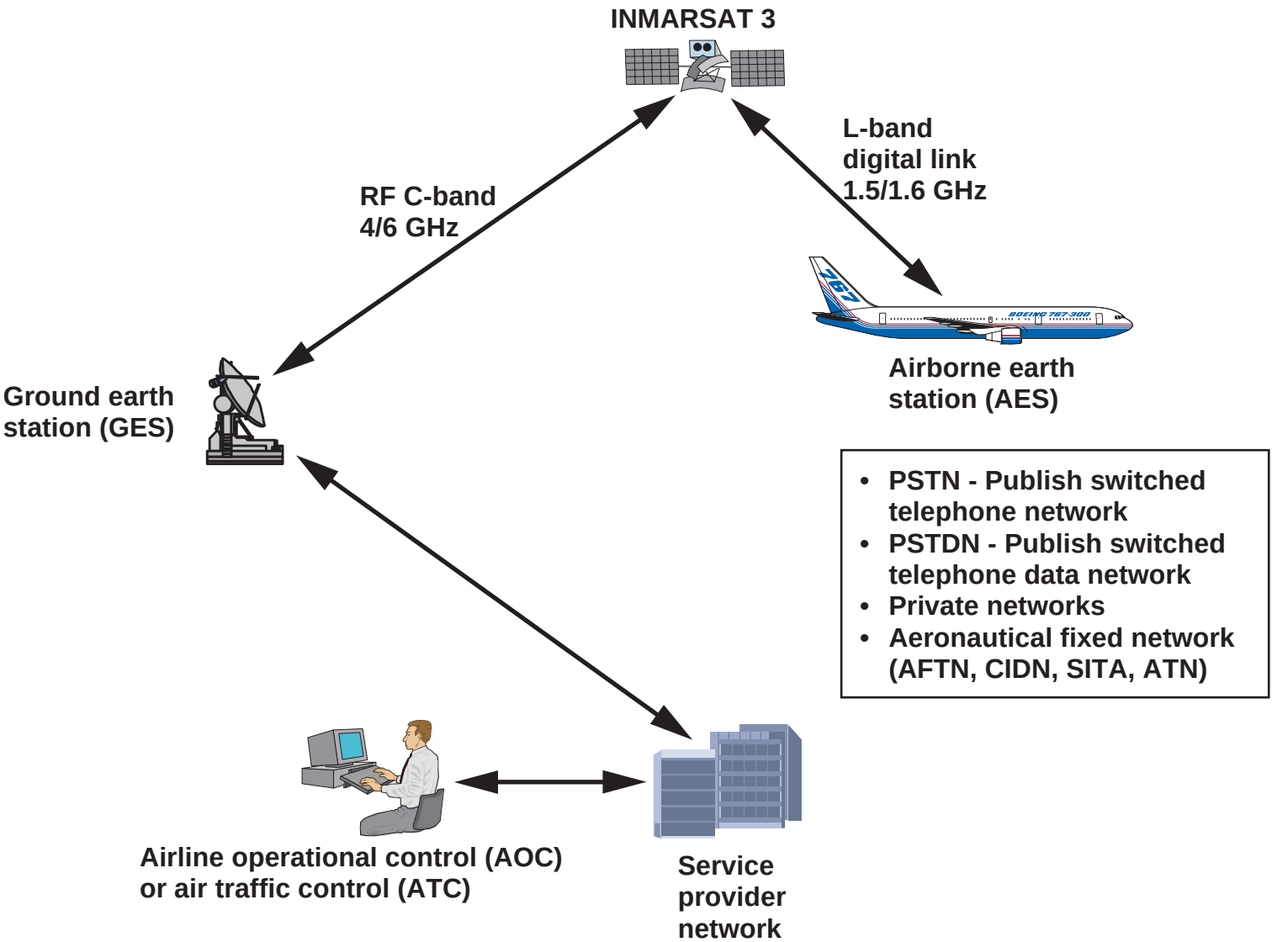
- **A SATCOM installation consists of the following equipment**
  - **Avionics equipment**
    - **— Satellite data unit (SDU)**
    - **— Radio frequency unit (RFU) – not required on all SATCOM systems**
    - **— High power amplifier (HPA)**

  - **Antenna systems – customers can select either an AERO-H+ or AERO-I system**
    - **— High-gain antenna (HGA) – AERO-H+ system**
    - **— Intermediate-gain antenna (IGA) – AERO-I system**

  - **Pilot interface**
    - **— Multipurpose control and display unit (MCDU) – basic feature – no option required**
    - **— Audio control panel (ACP) – basic feature**
    - **— EICAS (communication messages) – basic features – no option required**

Options 5 —Communications

767-200ER/-300ER
Satellite Communications (SATCOM)



Options 5 —Communications

767-200ER/-300ER
Data Link

- **Data link provides a high-speed digital data transmission between the airplane and ground facilities. By transmitting and receiving data automatically, without the flight crew intervening, data link reduces flight crew workload. Pilots use the MCDU or an optional MIDU to interface with the data link system. Data link is used to exchange airline operations information and airplane operating data.**

- **Options are available for installation of a flight deck printer.**

- **Options are available for airline operational control data link (AOC DL) and air traffic services data link (ATS DL). See FMC system options 4 for further information on these optional features.**

- **Three levels of data link provisions/installations are available: ARINC 724B ACARS, ARINC 758 level 0A, and ARINC 758 VDL mode 2/AOA.**

ARINC 724B ACARS

- **ARINC 724B aircraft communications addressing and reporting system (ACARS) transmits character-oriented data at 2.4 kbits/second. The modem, converting data to/from VHF sound transmission, is contained in the ACARS management unit.**

- **The following options are required for ARINC 724B ACARS operations:**
  - **Partial provisions for a single ARINC 724B ACARS management unit.**
  - **Installation of an ARINC 724B ACARS management unit into partial provisions.**

Options 5 —Communications

767-200ER/-300ER
Data Link

ARINC 758 level 0A data link

- **Level 0A data link transmits character-oriented data at 2.4 kbits/second. The modem is contained in the communications management unit (CMU).**

- **The following options are required for level 0A data link operation.**
  - **Partial provisions for a single ARINC 724B ACARS management unit**
  - **Limited partial provisions for dual ARINC 758 CMUs compatible with existing single ARINC 724B ACARS provisions**
  - **Installation of an ARINC 758 CMU into partial provisions**

ARINC 758 VDL mode 2/AOA data link

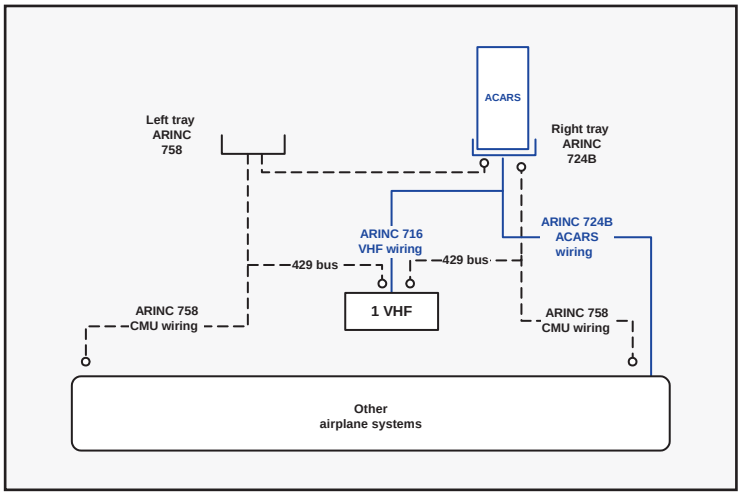
- **VDL mode 2/AOA (VHF data link mode 2/aircraft communications addressing and reporting system over aviation VHF link control) transmits high-speed character-oriented data at 31.5 kbits/second to suitably equipped ground stations. VDL model 2/AOA transmits character-oriented data at 2.4 kbits/second to ground stations not equipped for VDL mode 2/AOA high-speed data. The modem is contained in the VHF data radio transceivers (VDR).**

- **The following options are required for VDL mode 2/AOA operation.**
  - **Partial provisions for a single ARINC 758 CMU. Partial provisions are also available for dual ARINC 758 CMUs to provide a possible future installation of a second CMU**
  - **Installation of an ARINC 758 CMU into partial provisions**
  - **Installation of ARINC 716/750 capable VHF data radio (VDR) transceivers**

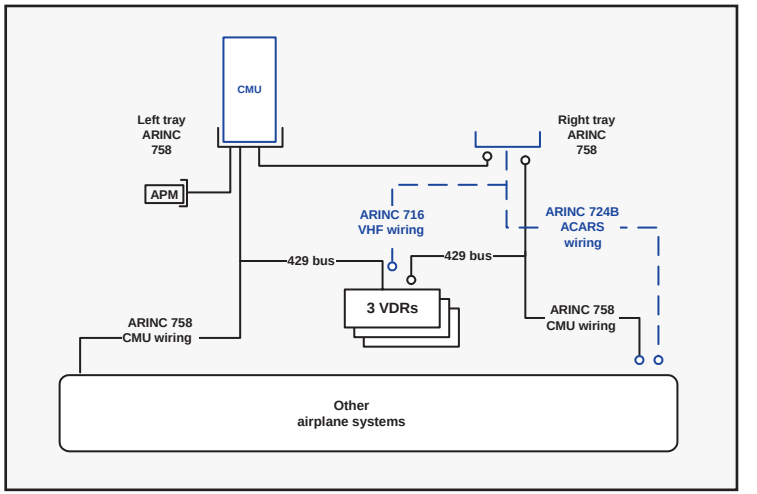
Options 5 —Communications

767-200ER/-300ER - Data Link Installations

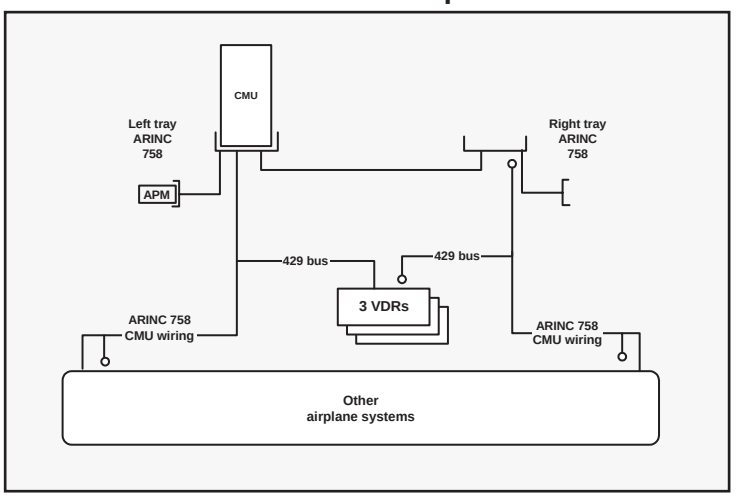
ARINC 724B ACARS with dual ARINC 758 CMU provisions



Level 0A data link with single ARINC 724B, ACARS MU provisions, and dual ARINC 758 CMU provisions



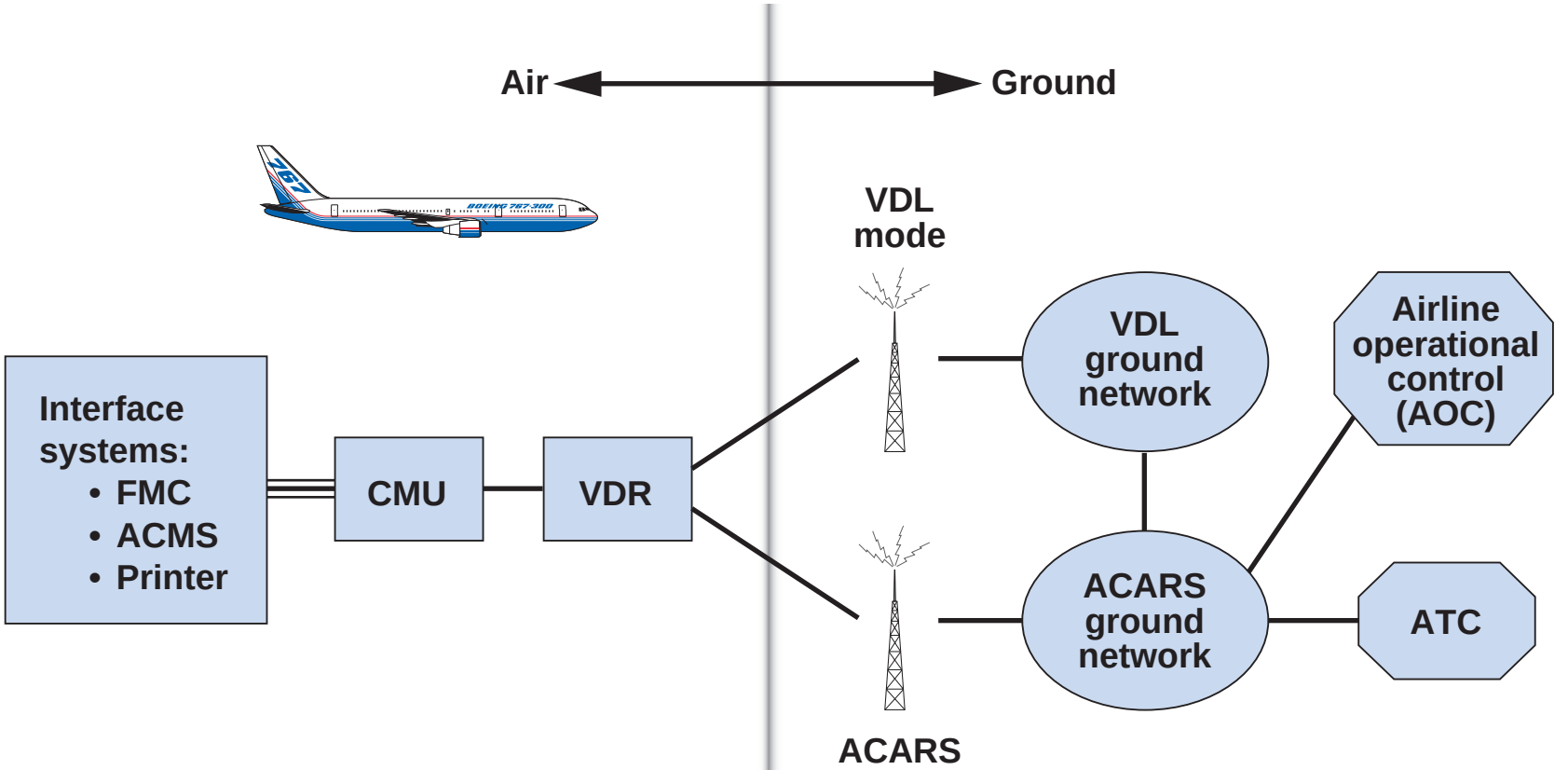
VDL mode 2 / AOA data link with dual ARINC 758 CMU provisions



Options 5 —Communications

767-200/767-300 - VDL Mode 2/AOA Architecture

Data Link



- VDL mode 2/AOA data link interface with VDL mode 2/AOA ground stations and conventional ACARS ground stations

Options 6 —Avionics

767-200ER/-300ER

Feature	Basic	Option
Data Loader	Airborne Data Loader	Portable Data Loader Connector
Printer	None	ARINC 744 PrinterARINC 740 Printer
ACMS - Expanded Engine Parameter Recording	Basic Parameters	Basic and Expanded Parameters
MIDU (Multipurpose Interactive Display Unit)	None	Provided
Engine out Takeoff Thrust Operation	Five Minutes	Ten Minutes
ECS Temperature Indications	Celsius	Fahrenheit
Instrumentation Display Units	English units	Metric units

Navigation Systems

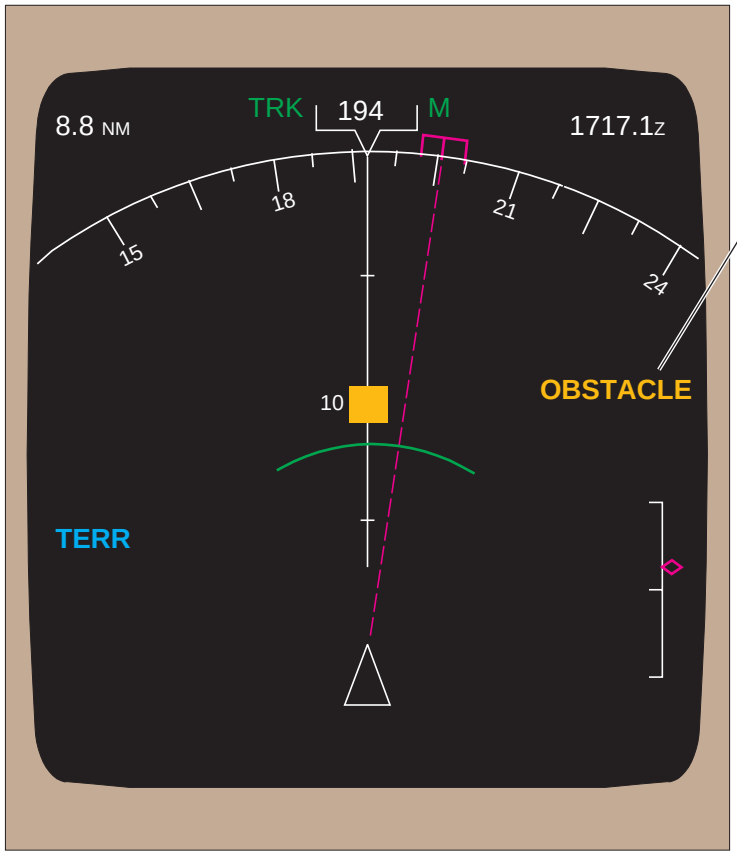
Feature	Basic	Option
Metric Altimeters	None	Two Metric Altimeters with Digital Display One Metric Altimeter with Analog DisplayTwo Metric Altimeters with Digital Display and One Metric Altimeter with Analog Display
Standby Attitude Indicator	Backcourse Switch Included	Backcourse Switch Deactivated
Weather Radar System	Single System	Dual System Single System with Auto-Tilt Dual System with Auto-Tilt
EGPWS Peaks & Obstacles	Inhibited	Enabled
EGPWS Altitude Callout Volume	Standard Volume	Low Volume
EGPWS "Smart 500" foot Callout	Inhibited	Enabled
EGPWS Altitude Callouts	Inhibited	Many options available

Options 6 —Navigation Systems

767-200ER/-300ER

Peaks and Obstacles

- **Option provides for the display of man-made obstacles on the EHSI when an obstacle is contained in the Enhanced Ground Proximity Warning Computer (EGPWC) terrain database and a conflict is identified. Aural and visual caution and warning alerts are provided.**

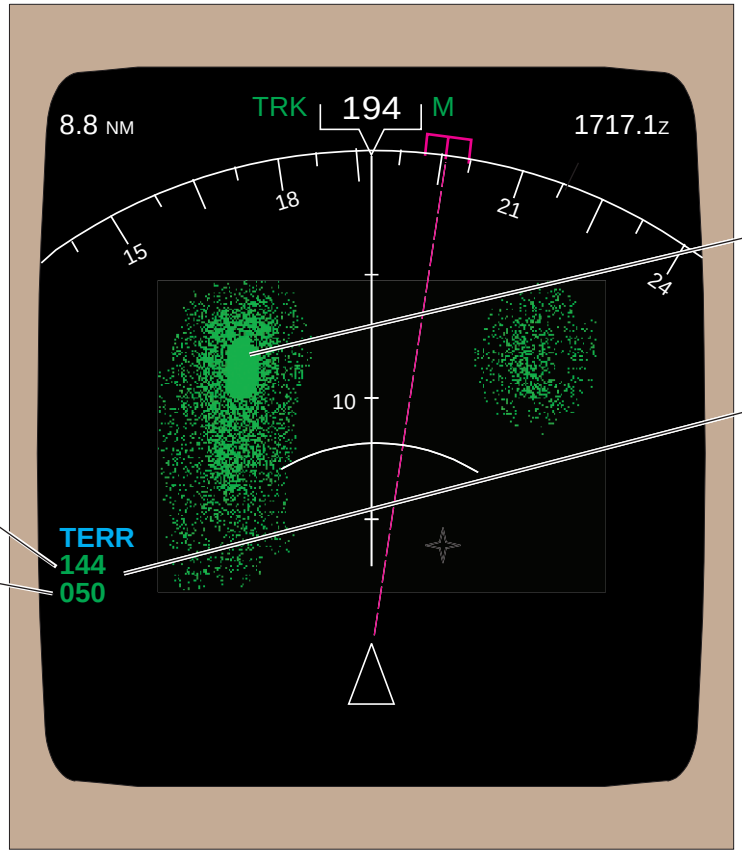


Options 6 —Navigation Systems

767-200ER/-300ER

EGPWS Peaks and Obstacles

Peaks Display



Highest peak

Height of surrounding terrain

- **Peaks and obstacles is an optional feature of the EGPWS**
- **Provides a “look down” to the highest terrain ahead of the airplane**
- **Displays terrain**
- **Displays terrain altitudes**
- **Blends with normal terrain colors when flying near terrain altitude**
- **Peaks display when more than 2,000 feet above terrain**

Options 7 —Crew Accommodations

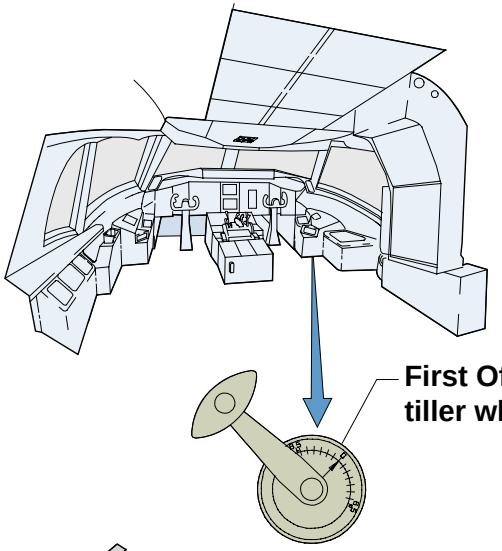
767-200ER/-300ER

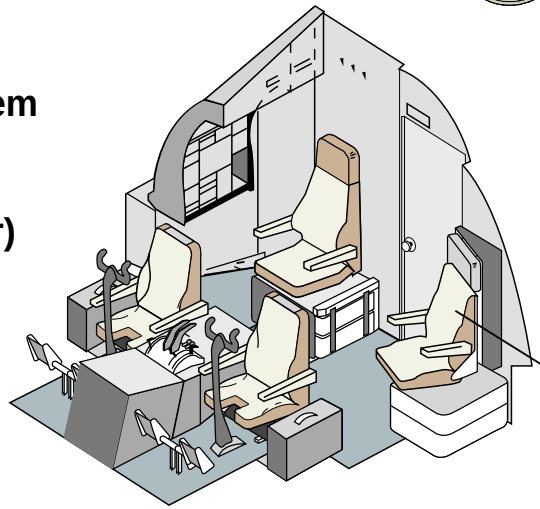
Flight Deck Accommodations		
Feature	**Basic**	**Option**
Captain's and First Officer's Seats	Manually Operated Seats	Power Operated Seats
First Observer's Seat	Wall Mounted	Track Mounted
Second Observer's Seat	None	Provided
Sun Visors	Standard Sun Visors	Roller Sunshades and improved Sun Visors
Portable Breathing Equipment	None	Provided
Flight Deck Flashlights	None	One Flashlight with ShieldTwo Flashlights Two Flashlights with Shield
Emergency Evacuation Signal System	None	Provided

Options 7 —Crew Accomodations

767-200ER/-300ER

- **Powered IPECO Captain's and First Officer's seats**
- **Second Observer's station (not available on 767 Freighter)**
- **Track-mounted First Observer's seat (basic on 767 Freighter)**
- **Flashlights**
- **Protective breathing equipment**
- **Emergency evacuation signal system**
- **First Officer's nose wheel steering tiller (not available on 767 Freighter)**





Second Observer's seat
- **Two headphone jacks**
- **Oxygen mask**
- **Life vest**
- **Audio selector panel (optional)**

Options 8 —Airframe Systems

767-200ER/-300ER

Feature	Basic	Option
Bulk Cargo Heating and Ventilation	None	Provided
Catalytic Converters for Ozone Control	None	Provided
APU - Additional Starting Capability	None	Provided
Duct Leak Detection System	Single Loop System	Dual Loop System (PW & GE engines only)
APU Fire Extinguisher Bottle	Single Standard APU Bottle	Single APU Bottle, common with Engine fire bottlesDual Standard APU BottlesDual APU Bottles, common with Engine fire bottles
Ice Detection	None	Advisory Ice DetectionAutomatic Anti-Ice System
APU Hour Meter	None	Provided on Flight Deck Provided in E/E Bay
APU Cycle Meter	None	Provided on Flight Deck Provided in E/E Bay

Acronyms and Abbreviations

ACARS – Aircraft communications addressing and reporting system
ACMS – Airplane condition monitoring system
ADC – Air data computer
ADF – Automatic direction finder
ADL – Airborne data loader
AFDS – Autopilot/flight director system
A/G – Air-ground
ALTN – Alternate
AOA – Angle of attack
A/P – Autopilot
APU – Auxiliary power unit
ASP – Audio selector panel
ATC – Air traffic control
AUX – Auxiliary
BFE – Buyer-furnished equipment
BITE – Built-in test equipment
CONF – Configuration
CRT – Cathode ray tube
DME – Distance measuring equipment
EADI – Electronic attitude director indicator
ECS – Environmental control system
E/E – Electrical/electronic
EEC – Electronic engine control
EFIS – Electronic flight instrument system
EGPWS – Enhanced ground proximity warning system
EGT – Exhaust gas temperature
EHSI – Electronic horizontal situation indicator
EICAS – Engine indication and crew alerting system
ELEC – Electrical
ENG EXCD – Engine exceedance
EPCS – Electronic propulsion control system
EPR – Engine pressure ratio
ER – Extended range
ETOPS – Extended-range twin-engine operations
FADEC – Full-authority digital engine control
FCC – Flight control computer
F/D – Flight director
FMC – Flight management computer
FPR – Flight plan request
GA – Go-around
GMT – Greenwich mean time
GPS – Global positioning system
GS – Ground speed
HDG – Heading
HMG – Hydraulic motor generator
HYD – Hydraulics
IAS – Indicated airspeed
ILS – Instrument landing system
IRS – Inertial reference system
LAT/LON – Latitude/longitude
LNAV – Lateral navigation
LRC – Long-range cruise
LRU – Line replaceable unit
MASI – Mach/airspeed indicator
MCDP – Maintenance control and display panel
MCDU – Multifunction control display unit
MCP – Mode control panel
MMR – Multi-mode receiver
MSG – Message
OVRD – Override
PA – Passenger address
PERF – Performance
PLI – Pitch limit indicator
PWS – Predictive windshear system
QAR – Quick access recorder
RA – Resolution advisory (or radio altimeter)
RAT – Ram air turbine
RDMI – Radio distance magnetic indicator
RTO – Refused takeoff
RVR – Runway visual range
SAT – Static air temperature
SATCOM – Satellite communications
SEL – Standby engine indicator
SELCAL – Selective calling
SID – Standard instrument departure
STAR – Standard terminal arrival route
STBY – Standby
TAI – Thermal anti-ice
TAS – True airspeed
TAT – Total air temperature
TCAS – Traffic alert and collision avoidance system
TMC – Thrust management computer
TMSP – Thrust mode select panel
TO – Takeoff
TRK – Track
VHF – Very high frequency
VNAV – Vertical navigation
VOR – Very high frequency omni range
VSI – Vertical speed indicator
WEU – Warning electronics unit
WPT – Waypoint
WXR – Weather radar