BOEING B767-200
B767-300

Introduction
Operations manual
Panel Description
Flight tutorial **KLGA-KATL**

CLS
Commercial Level Simulations

Welcome on board of our
Boeing 767-200/300 Series Commercial Level Simulations manual.

This manual contains everything needed to fly our *767 lite* airplanes, but our intention is to offer more then that.
For your convenience, we have split this manual in the following sub parts:

Chapter I:	User's manual
Chapter II:	Operations manual
Chapter III:	Panel Description
Chapter IV:	Flight tutorial KLGA-KATL
Chapter V:	Appendix

Probably you're that enthusiastic and would like to start flying immediately, however we **advice** you either to print the manual or start reading the **User's Manual** with general aircraft information and of course, the **panel description**. This is almost vital to understand the operation, handling and control in the cockpit as well as some hidden features.
The next logical step is the Operations Manual. Details about the different flight phases, how to handle the aircrafts, tables, charts, step climb details, are right here.

Although you will find it in the appendix, many known FAQ (Frequently Asked Questions) are available for you.

Finally, we welcome you on board of a non scheduled 767-200ER US Airways flight **US833** from **KLGA** (New York/La Guardia) to **KATL** (Atlanta/Hartsfield).
The flight duration will be around 2 hours and will give you a very good idea of the possibilities of the B763 Series.

The flight tutorial use combinations of flying SIDs, STARs, waypoints, VOR and if applicable NDB beacons. In other words, it will cover all kind of possible flight techniques and navigation devices. You need basic **navigation knowledge** and more of those things.

On purpose, we did not use any add-on free- or payware products. You are of course free to use any of those however, flying online at VATSIM or IvAo could give problems with the approach flight phase in relation to the tutorial profile.

Finally, we from CLS, wish you a lot of flying hours with the Boeing 767-200/300 Series.

Kind regards,
The Commercial Level Simulations **team**

Disclaimer
This manual is not provided from, or endorsed by Boeing Commercial Company, or any airline in any way.
Any exact similarities between this manual and Commercial Level Simulations aircraft to actually aircraft, procedures, or airlines carriers are strictly confidential.
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The procedures contained within are the Commercial Level Simulations interpretation of generic flight operations.

These procedures are not always accurate in all situations.
All diagrams have been either been recreated to mimic actual procedures or scenarios, or remain the copyrights of the respective owners. The purpose of the manual is not to claim ownership of the procedures or diagrams herein, rather, to show flight operations of the B767-200/300 based on available information. This manual is not intended for use within the real world flight.
Any aircraft from Commercial Level Simulations is intended as an add-on for Microsoft FS2004 or FSX.

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Introduction CLS 767 Series

The 767 is a twin-engine family of airplanes designed for medium to long range flights.
It is powered by advanced high bypass ratio engines.
Characteristics unique to the 767 include:
Advanced aerodynamics
Stronger and lighter materials
Two-crew cockpit with digital flight deck systems
High bypass ratio engines
Twin-aisle seating
Extended range operations

The **767-200** can carry up to 216 passengers and baggage over 3,900 nautical miles.
The **767-200ER**, with the center fuel tanks can also carry 216 passengers and baggage on routes over 5,200 nautical miles. Seating arrangement varies with airline option. Both airplane models have identical outside dimensions.

The **767-300** and **-300ER** are 21 feet 1 inch longer than the 767-200. The additional length enables the airplane to carry more passengers. The -300ER is also fitted with center fuel tanks for additional range. Except for the longer fuselage, the -300 and the -300ER have dimensions identical to the -200 and -200ER. The -300 and -300ER can be fitted with an optional mid-cabin door to facilitate loading and unloading of passengers. This arrangement also allows alternate passenger accommodations, up to and including maximum passenger capacity (exit limit).

The **767-300 Freighter** is equipped with a main deck cargo door that enables it to load cargo containers and/or pallets on the main deck. The main deck can accommodate either a manual cargo handling system or a powered transfer system (General Market Freighter). The 767-300 Freighter does not have windows and doors, except for the left entry door for crew access.

The **767-200** airplane is also delivered for **military uses**. These derivatives are not mentioned in this document because they are equipped with special equipment used for special missions. Some of the external dimensions may be similar to the standard 767-200 airplane such that some of the data in this document can be used.

Cargo Handling

The lower lobe cargo compartments can accommodate a variety of containers and pallets now used in narrow-body and wide-body airplanes. The optional large FWD cargo door (standard on the 767-200ER, 767-300ER, 767-300 Freighter) allow loading of 96- by 125-in (2.44 by 3.18 m) pallets and also split-engine carriage kits. In addition, bulk cargo is loaded in the aft cargo compartment and the forward cargo compartment where space permits.

Airplane Characteristics
Boeing 767-200

Aircraft Dimensions

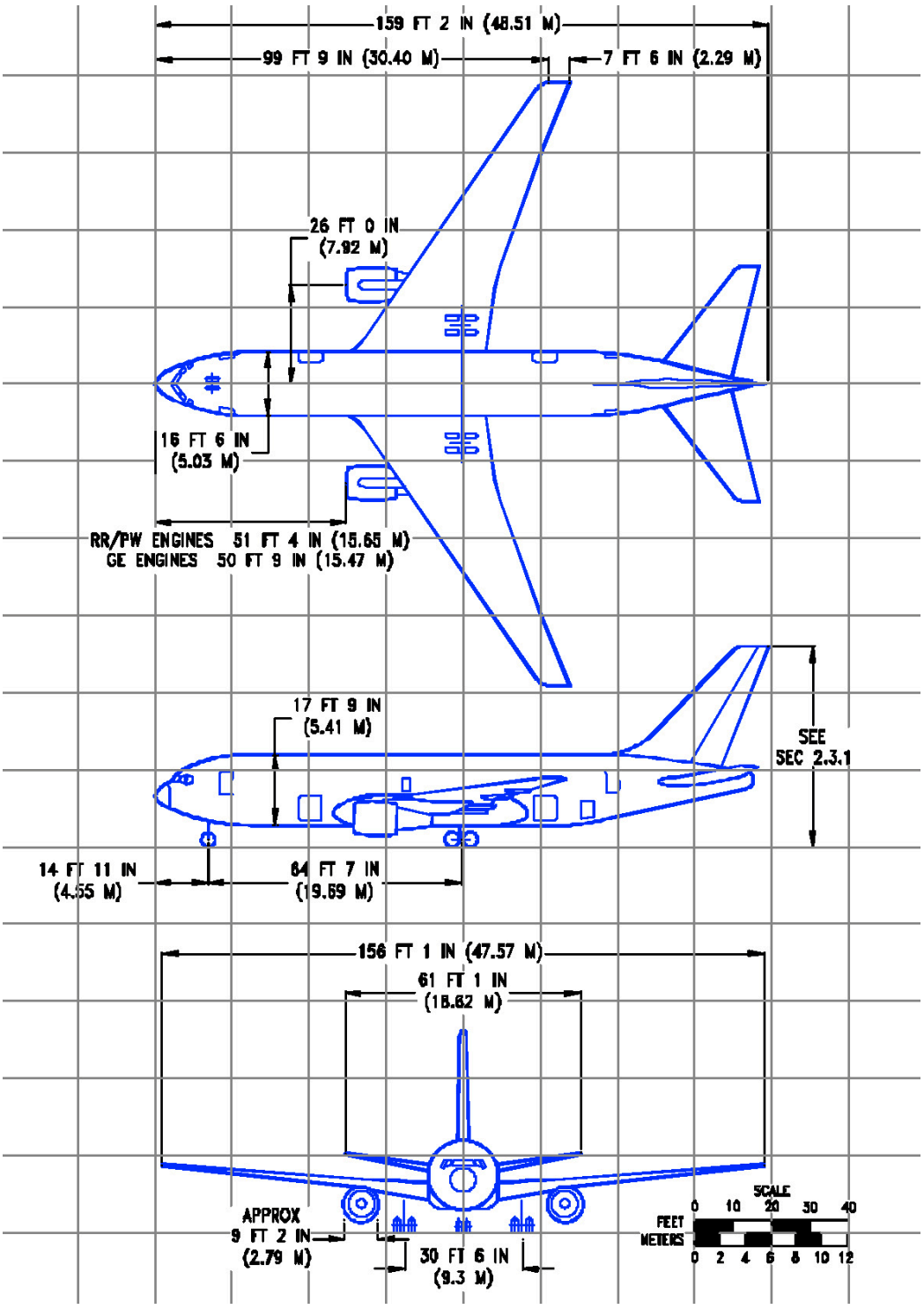
	metric	imperial
Overall length	58.80	188 ft. 8 in.
Height	17.40	57 ft. 1 in.
Fuselage diameter	5.64	18 ft. 6 in.
Maximum cabin width	5.28	17 ft. 4 in.
Cabin length	45.00	147 ft. 8 in.
Wingspan (geometric)	60.30	197 ft. 10 in.
Wing area (reference)	361.60 m^2	3,892 ft^2.
Wing sweep (25% chord)	30°	30°
Wheel base	22.20	72 ft. 10 in.
Wheel track	10.69	35 ft. 1 in.

Basic Operating Data

	metric	imperial
Engines	CF6-80E1 or PW4000 Series RR Trent 700 Series	
Engine thrust range	303-320 kN	68,000-72,000 lbs
Typical passenger seating	253 (3-class) 293 (2 class)	
Range (with maximum passengers)	12,500 km.	6,750 nm.
Maximum operating Mach number (Mno)	0.86 Mach	
BULK hold volume – standard/optional	19.7 / 13.76 m^3	695 / 486 ft^3

Design Weights

	metric	imperial
Maximum Ramp Weight	230.9 (233.9) tons	509 (515.7) lbs. (x1000)
Maximum Take Off Weight (MTOW)	230.9 (233) tons	507 (513.7) lbs. (x1000)
Maximum Landing Weight (MLW)	180 (182) tons	396.8 (401.2) lbs. (x1000)
Maximum Zero Fuel Weight (MZFW)	168 (170) tons	370.4 (374.8) lbs. (x1000)
Maximum Fuel Capacity	139,100 liters	36,750 US Gal.
Typical Operating Weight Empty	119.6 tons	263.7 lbs (x1000)
Typical Volumetric Payload	36.4 tons	80.2 lbs (x1000)



General Dimensions – **Model 767-200/-200ER**

Boeing 767-300

Aircraft Dimensions

	metric	imperial
Overall length	58.80	188 ft. 8 in.
Height	17.40	57 ft. 1 in.
Fuselage diameter	5.64	18 ft. 6 in.
Maximum cabin width	5.28	17 ft. 4 in.
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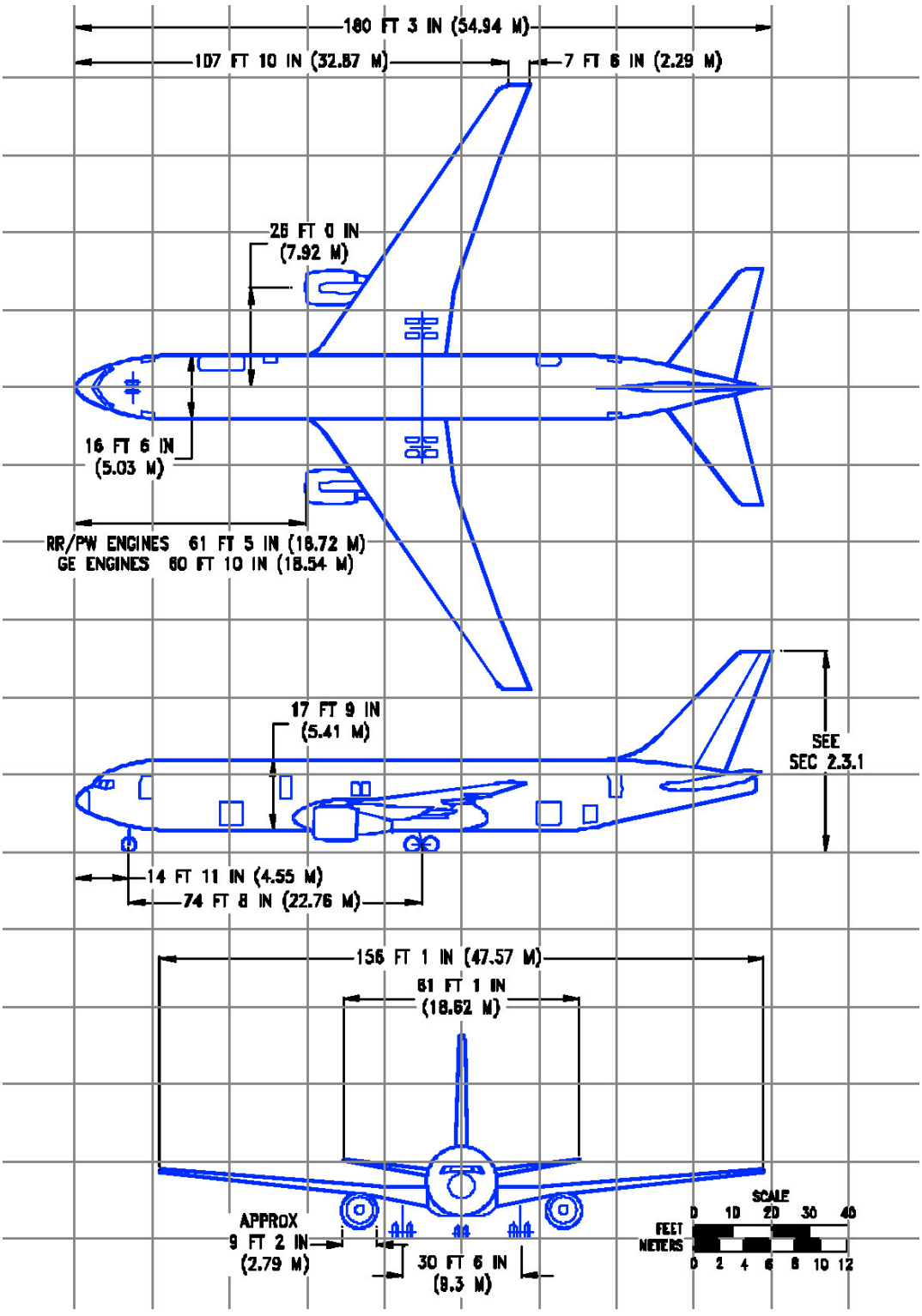
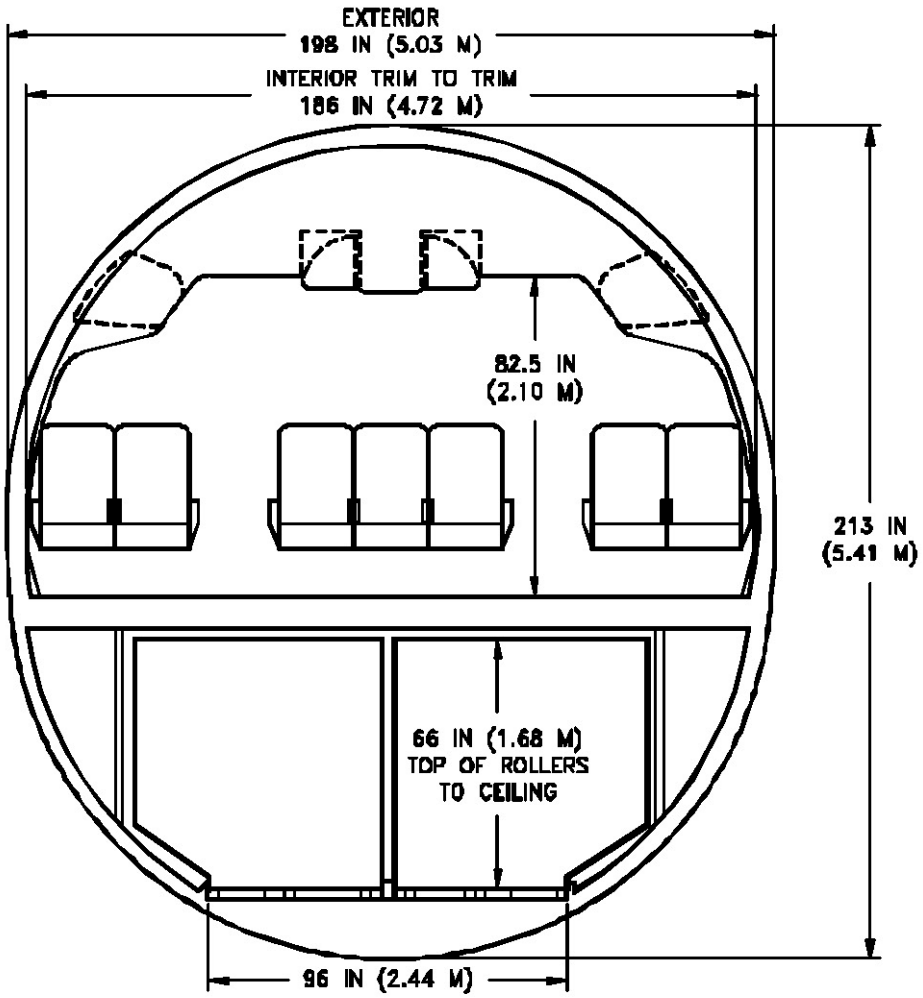
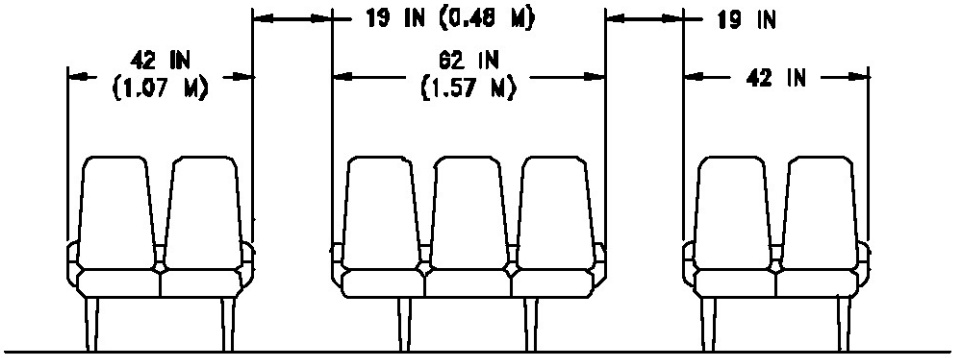


General Dimensions – **Model 767-300/-300ER**

Passenger Compartment Cross-Section



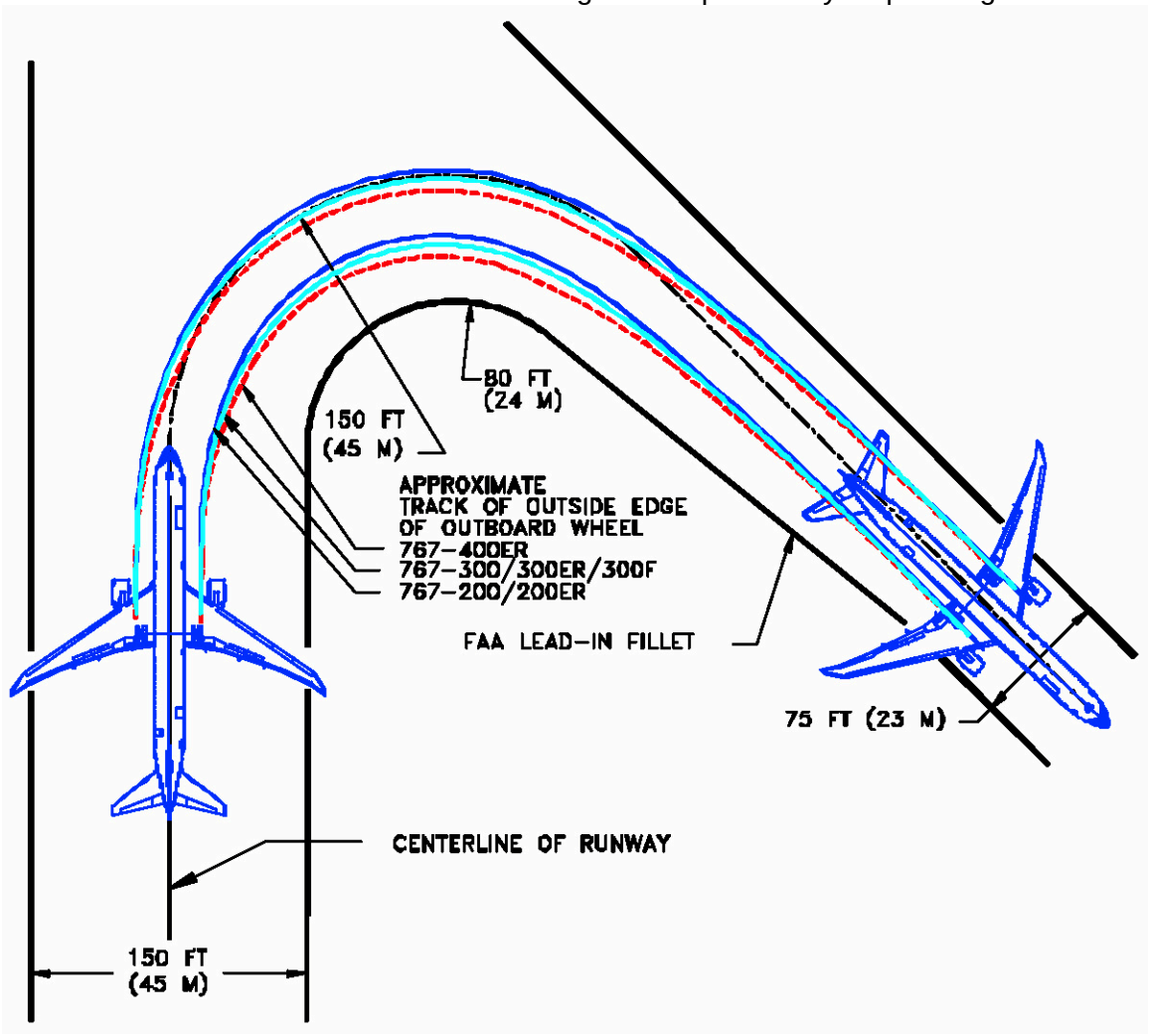


Example of the Economy Class

Boeing 767-200/-300

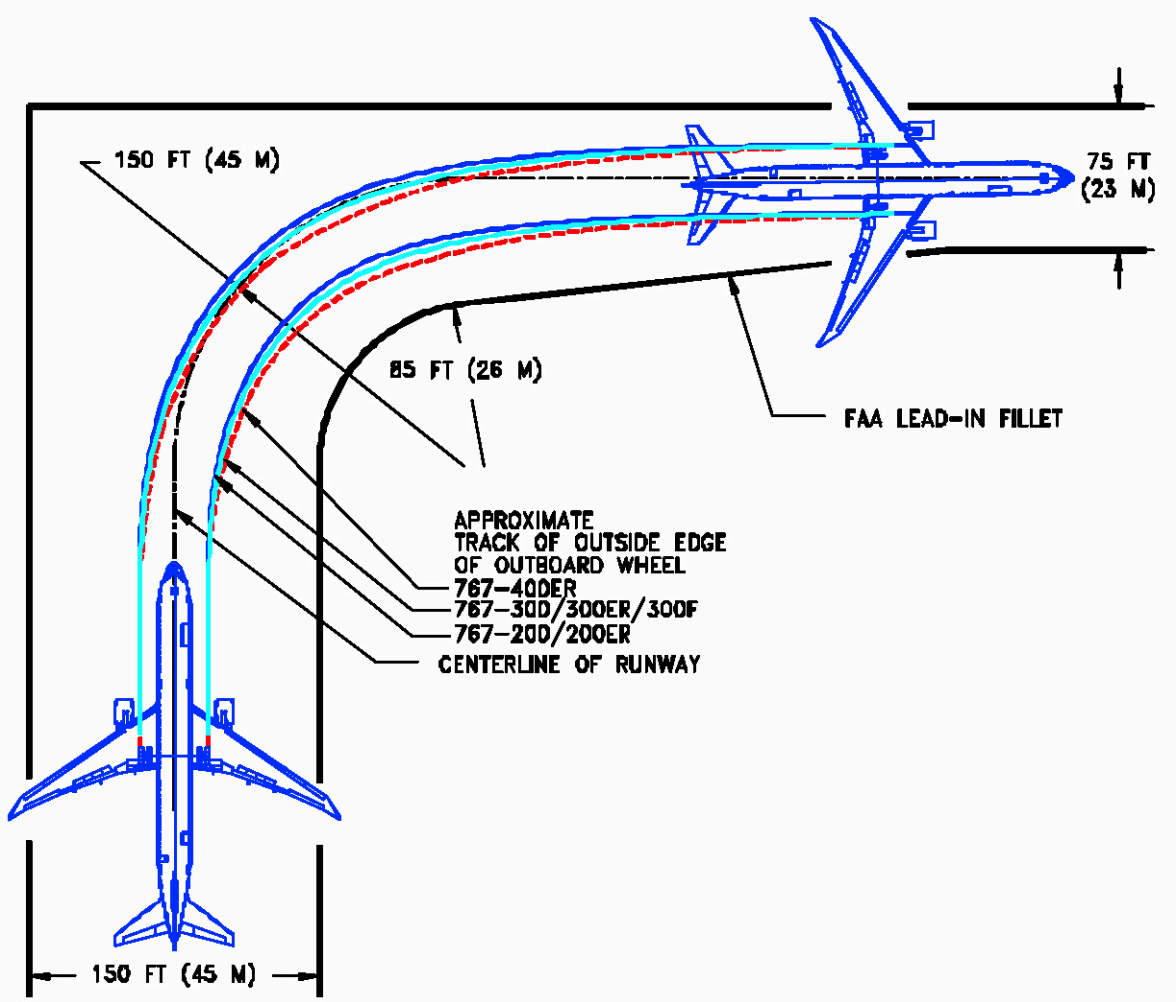
Ground Maneuvering

For ease of presentation, these data have been determined from the theoretical limits imposed by the geometry of the aircraft, and where noted, provide for a normal allowance for tire slippage. As such, they reflect the turning capability of the aircraft in favorable operating circumstances. These data should be used only as guidelines for the method of determination of such parameters and for the maneuvering characteristics of this aircraft.
In the ground operating mode, varying airline practices may demand that more conservative turning procedures be adopted to avoid excessive tire wear and reduce possible maintenance problems.
Airline operating procedures will vary in the level of performance over a wide range of operating circumstances throughout the world. Variations from standard aircraft operating patterns may be necessary to satisfy physical constraints within the maneuvering area, such as adverse grades, limited area, or high risk of jet blast damage. For these reasons, ground maneuvering requirements should be coordinated with the using airlines prior to layout planning.



Runway and Taxiway Turn Paths – > 90° turn

Note: Before determining the size of the intersection fillet, check with the airlines regarding the operating procedures that they use and the aircraft types that are expected to serve the airport.



Runway and Taxiway Turn Paths – > 90° turn

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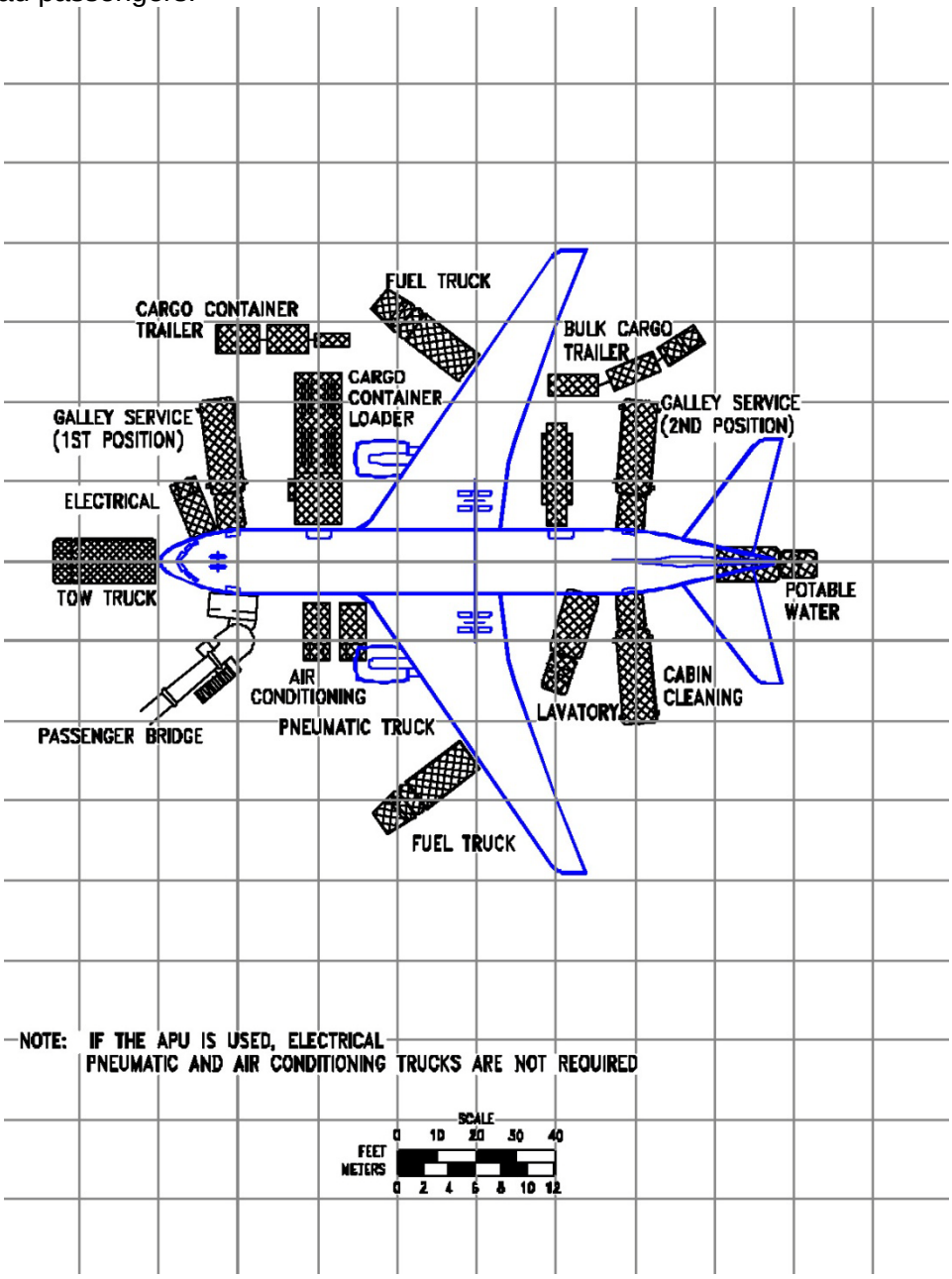
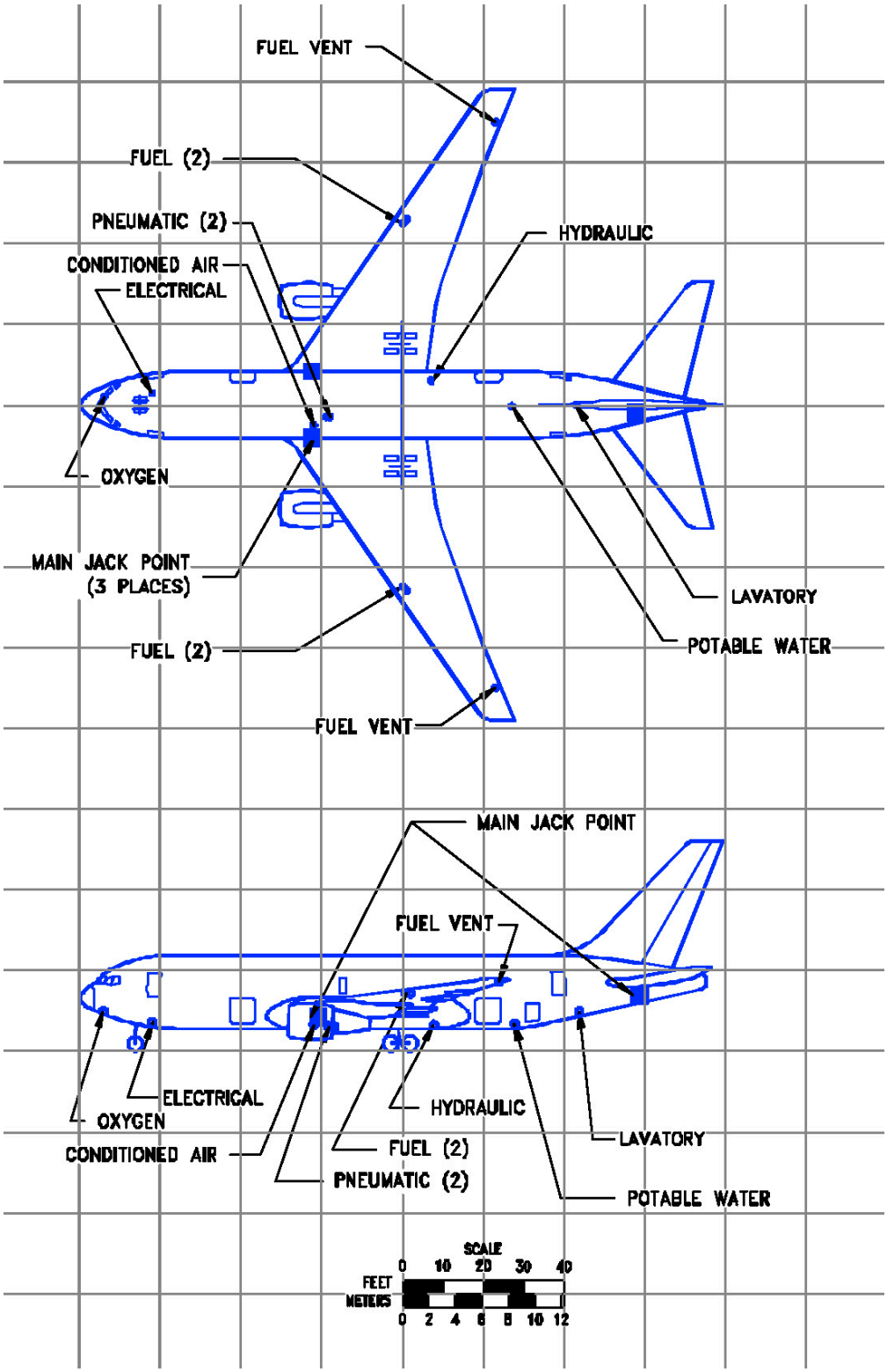
Terminal Servicing

During turnaround at the terminal, certain services must be performed on the aircraft, usually within a given time, to meet flight schedules. This section shows service vehicle arrangements, schedules, locations of service points, and typical service requirements. The data presented in this section reflect ideal conditions for a single airplane. Service requirements may vary according to airplane condition and airline procedure.
It shows typical arrangements of ground support equipment during turnaround. As noted, if the auxiliary power unit (APU) is used, the electrical, air start, and air-conditioning service vehicles would not be required. Passenger loading bridges or portable passenger stairs could be used to load or unload passengers.

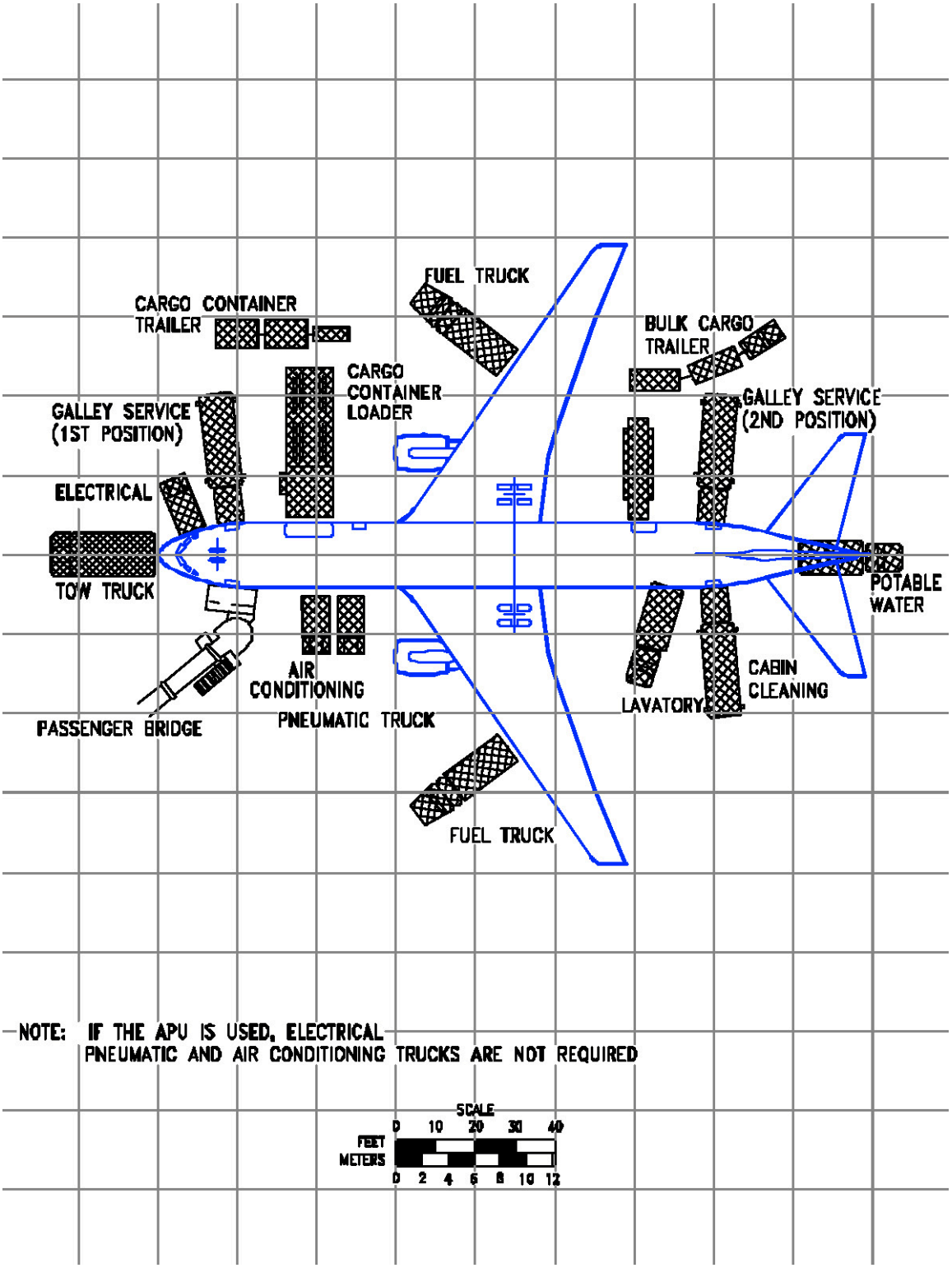


Airplane Servicing Arrangement – Typical Turn-Around **Model 767-200/-200ER**

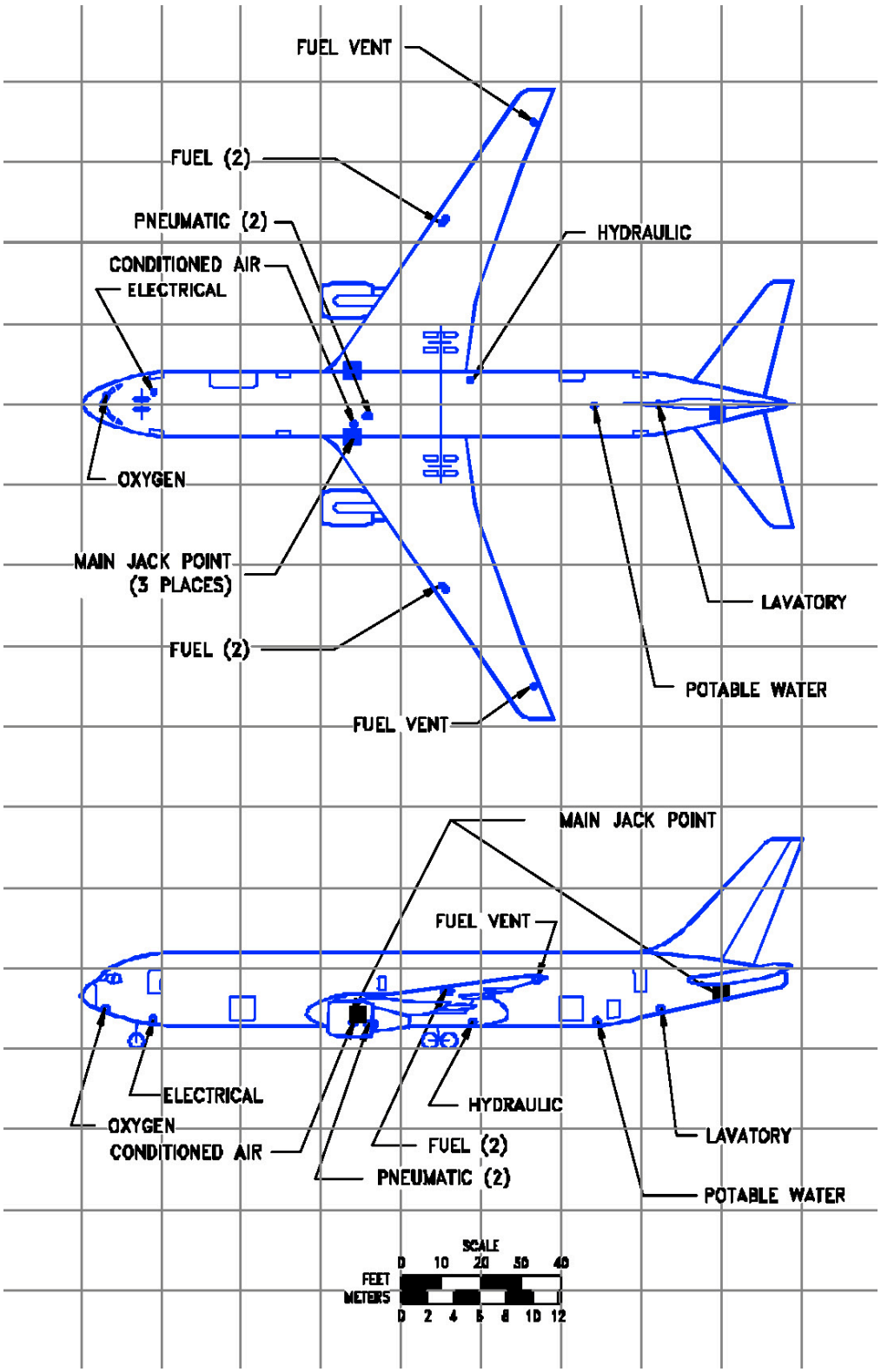
This section shows the locations of ground service connections in graphic form.



Ground Servicing Connections – **Model 767-200/-200ER**



Airplane Servicing Arrangement – Typical Turn-Around **Model 767-300/-300ER**

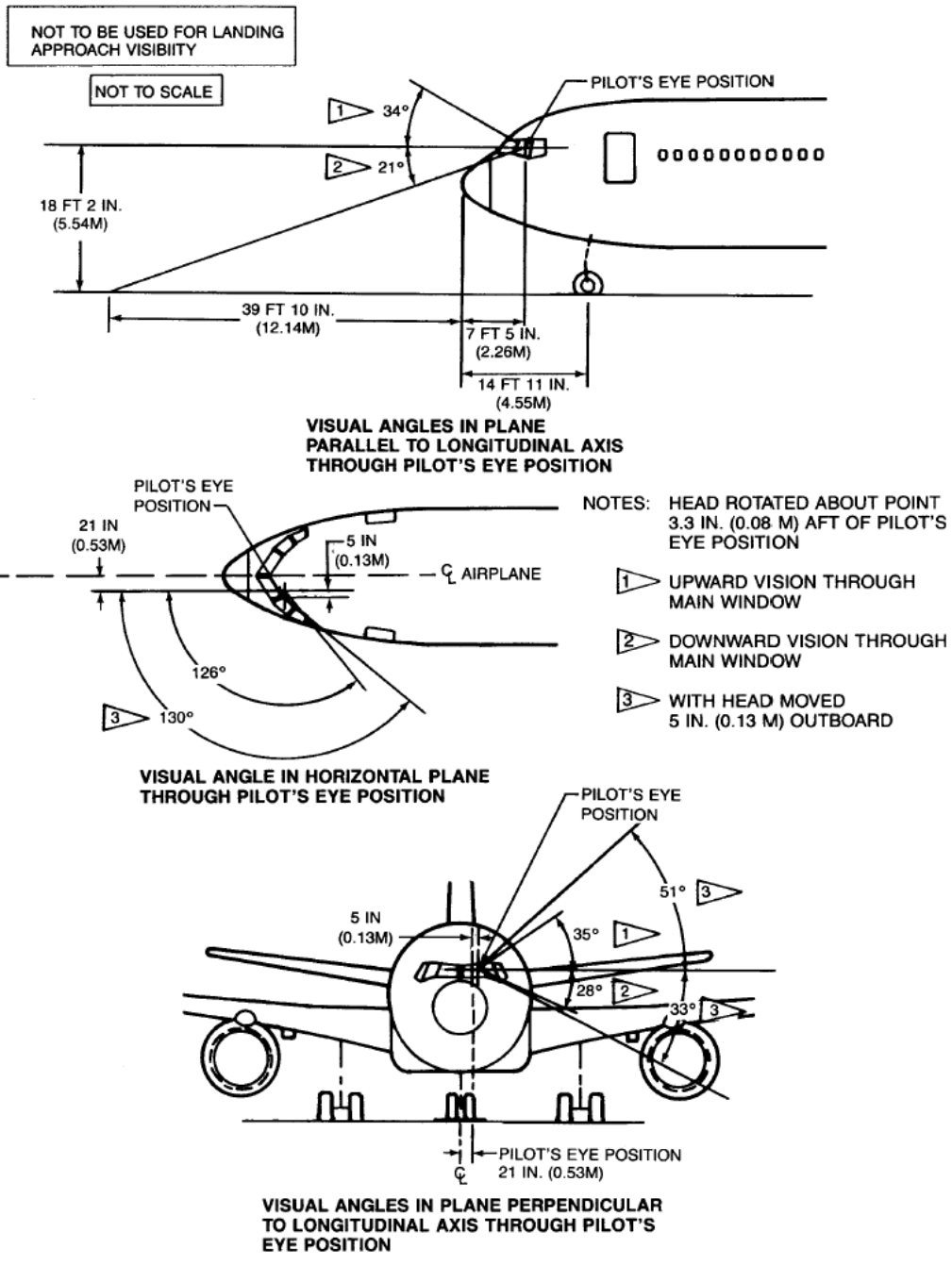


Ground Servicing Connections – **Model 767-300/-300ER**

Chapter Two Operations Manual 1
- Basic Pilot Information 1
- Taxi Phase 2
- Takeoff (TO) Phase 4
- Climb (CL) Phase 6
- Cruise (CR) Phase 7
- Descent Phase 8

Basic Pilot Information

Pilot's view reference point is approximately 18.2 feet from the ground, with ground visibility limited to 48.5 feet looking down at an angle of 21 degrees. For proper engine and aircraft operations, the captain must view the EICAS as the engines and wings **are not** visible from the flight deck. Pilot's rearward view is based on the captain's eye reference point with 130 degrees of travel.

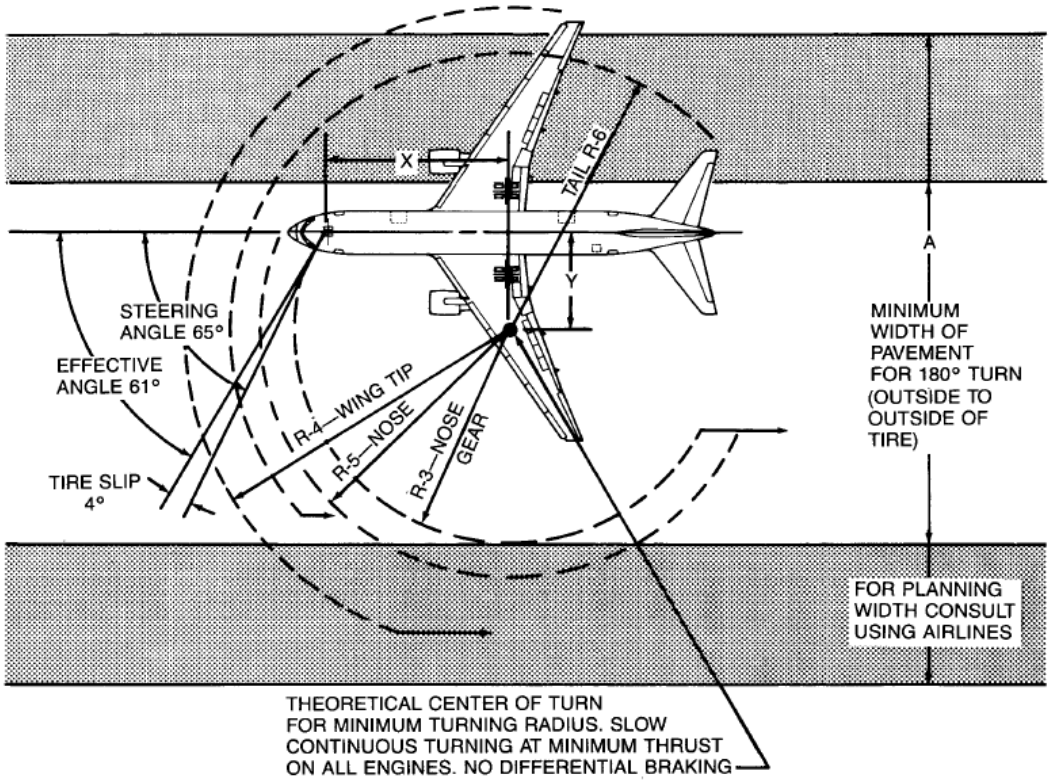


Taxi Phase

1. The nose wheel steering and the engine thrust are used to taxi the airplane.
2. Make sure you have the necessary clearance when you go near a parked airplane or other structures.
3. Set takeoff flaps. We recommended setting is FLAPS 15.
4. When the APU in the taxi airplane or the parked airplane is on you must have a minimum clearance of 50 feet between the APU exhaust port and the adjacent airplane's wingtip (fuel vent).
5. The taxi speed must not be more than approximately 30 knots. Speeds more than 30 knots added to long taxi distances would cause heat to collect in the tires. Recommended speed is 20 knots. Beware of changing GS numbers due to tailwinds during taxi.
6. Before making a turn, decrease the speed of the airplane to a speed of approximately 8 to 12 knots. Make all turns at a slow taxi speed to prevent tire skids.
7. Do not try to turn the airplane until it has started to move.
8. Make sure you know the taxi turning radius.
9. Monitor the wingtips and the horizontal stabilizer carefully for clearance with buildings, equipment, and other airplanes.
10. When a left or right engine is used to help make a turn, use only the minimum power possible.
11. Do not let the airplane stop during a turn.
12. Do not use the brakes to help during a turn. When you use the brakes during a turn, they will cause the main and nose landing gear tires to wear.
13. When it is possible, complete the taxi in a straight-line roll for a minimum of 10 feet.
    Note: This will remove the tensional stresses in the landing gear components, and in the tires.
14. Use the Inertial Reference System (IRS) in the ground speed (GS) mode to monitor the taxi speed.
15. If the airplane taxi speed is too fast (with the engines at idle), operate the brakes slowly and smoothly for a short time.
    Note: This will decrease the taxi speed.
16. If the taxi speed increases again, operate the brakes as you did in the step before.
17. Always use the largest radius possible when you turn the airplane.
    Note: This will decrease the side loads on the landing gear, and the tire wear will be decreased.

Taxi Phase (con't)

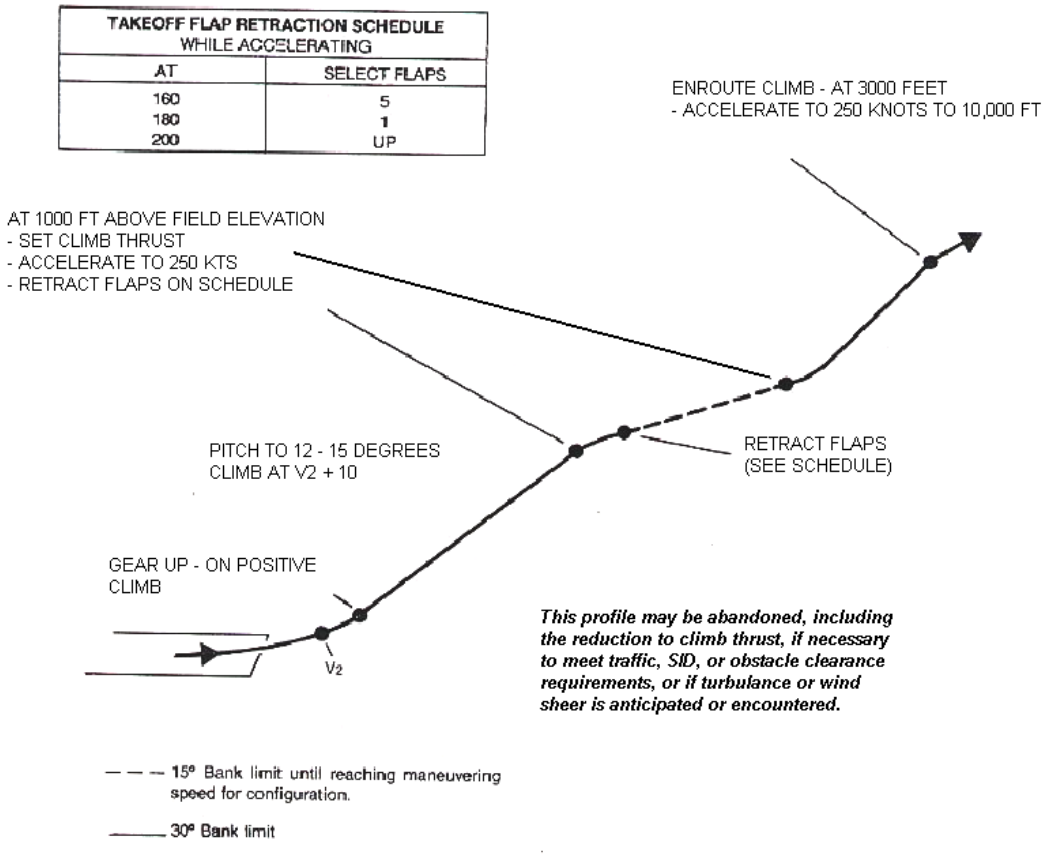
18. Extra care must be given to turn the aircraft due to the fuselage length and wingspan. A minimum distance from the edge of the pavement must be maintained to reverse the aircraft's direction. Minimum distance is 129 feet:



19. Operate the brakes to stop the airplane.
20. Set the parking brake after the airplane has stopped.

Takeoff (TO) Phase

1. Align aircraft with runway centerline.
2. Increase power to approximately 55% N1, pause briefly to verify that engines have stabilized.
3. Watch EICAS indicator for engine problems or aircraft alarms.
4. Increase power smoothly to pre-determined N1 speeds based on aircraft takeoff weight, (85% - 105% N1). This is done manually or using the autothrottle with the autopilot engaged.
5. At VR, smoothly rotate aircraft 8 degrees upwards at a pitch rate of 2 – 3 degrees per second. DO NOT rotate more than 8 degrees to avoid tail strike. Tail strike will occur at 9 degrees rotation (see appendix for speed tables).
6. Hold nose at +12 - 15 degrees after positive rate of climb is confirmed, then raise landing gear after V2 (see below).



Normal TAKEOFF
FLAPS 5 or 15

7. Set initial climb out speed to V2+10 knots.
8. Maintain +15 degrees climb to 1000 feet, or obstacle clearance, whichever is higher +10 degrees climb after 1000 feet.
9. At 1000 feet above field elevation, begin slat retraction per retraction table. Maximum slat speed limits are:

Slat Position	Maximum Speeds (knots)
1	**250**
5	**230**
15	**210**
20	**210**
25	**180**
30	**180**

10. Increase speed to 230 – 250 in accordance with ATC instructions (max 250 knots below 10,000 feet)
11. For full maneuverability beneath 10,000 feet, slats must be fully retracted with aircraft at minimum safe airspeed.

Climb (CL) Phase

1. Select highest CLB N1 setting. Once climb thrust or airspeed is set, the autopilot will compensate for environmental condition changes automatically during the climb.
2. It is recommended that the aircraft be flown manually up to 15,000 feet, weather and ATC traffic conditions permitting. However, in high traffic conditions, to easy the workload of the pilot, the autopilot MCP (Mode control Panel) altitude intervention may be engaged above a minimum altitude of 80 feet with the landing gear up.
3. Climb settings use a 10 – 20% de-rated of thrust up to 10,000 feet, then increases linearly to max thrust at 30,000 feet.
4. For enroute climb, climb at a rate of 1800 - 3000 FPM, pursuant to ATC and traffic conditions. If there is no altitude or airspeed restrictions, accelerate to the recommended speed. The sooner the aircraft can be accelerated to the proper climb speed, the more fuel and time efficient the flight.
5. As engine and wing icing may occur during the climb and descent, the engine anti-icing system should be in the AUTO or ON position whenever icing is possible.
   Note: Failure to do so may result in engine stall, overheating, or engine damage
6. For normal economy climb, follow ATC speed restrictions of 250 knots below 10,000 feet. If permitted by ATC and no speed restriction below 10,000 feet, increase speed to 280 knots. Above 10,000 feet, climb at 300 knots or .785 Mach.
   Climb speed table is as follows:

Altitude	Speed (knots)
Sea Level till 10.000 feet (FL100)	250
Above 10.000 feet (FL100)	300 / 0.785 Mach

7.
8. Max climb speed is 300 knots until reaching .785 MACH at initial cruise altitude.
9. For engine out climb, speed and performance various with gross weight and altitude, however 260 knots at 1000 – 1500 FPM may be used.
10. Set standard barometer above airport transition level (depends on local airport geography).

Cruise (CR) Phase

1. Cruise at .785 - .80 Mach.
2. Headwinds will increase engine power, reduce cruise speed and decrease range.
3. Tailwinds will decrease engine power, increase cruise speed and increase range.
4. Follow previously entered FMC waypoints.
5. Fuel Freeze -- Extended operation at cruise altitude will lower fuel temperature. Fuel cools at a rate of 3°C per hour, with a max of 12°C in extreme conditions. Fuel temperatures tend to follow TAT (Total Air Temperature). To raise fuel temperature/TAT, a combination of factors can be employed:
   - descend into warmer air,
   - deviate to warmer air,
   - increase Mach speed,
   An increase of 0.01 Mach will increase TAT by 0.5 – 0.7°C.

6. Increased fuel burn can result from:
   - high TAT,
   - lower cruiser altitude than originally planned,
   - more than 2,000 FT above the optimum calculated altitude,
   - speed faster or slower than .80 MACH cruise,
   - strong headwind,
   - unbalanced fuel,
   - improper aircraft trim.

7. Fuel penalties are:
   - 2000 FT above optimum – 3 percent increase in fuel usage,
   - 4000 FT below optimum – 5 percent increase in fuel usage,
   - 8000 FT below optimum –12 percent increase in fuel usage,
   - M.01 above M.80 – 3 percent increase in fuel usage,
   - Higher climb rates, 3000 fpm over 29,000 – increased fuel usage.

8. In the case of engine out cruise, it may be necessary to descend.
   Note: For 767 ETOPS (Extended Twin-engine Operations) limitations, divert to the nearest available airfield within 180 minutes (3 hr) to avoid overstressing engines and unnecessary risk. Use good judgment to select an airfield that can accommodate an aircraft of this size. Consideration must also be giving to ground facilities to accommodate number of passengers onboard.
9. Trim aircraft for proper elevator alignment.
10. In case of engine out cruise, trim rudder for directional alignment.
11. Deviate from flight plan for weather, turbulence, or traffic as necessary after receiving clearance from ATC.

Descent Phase

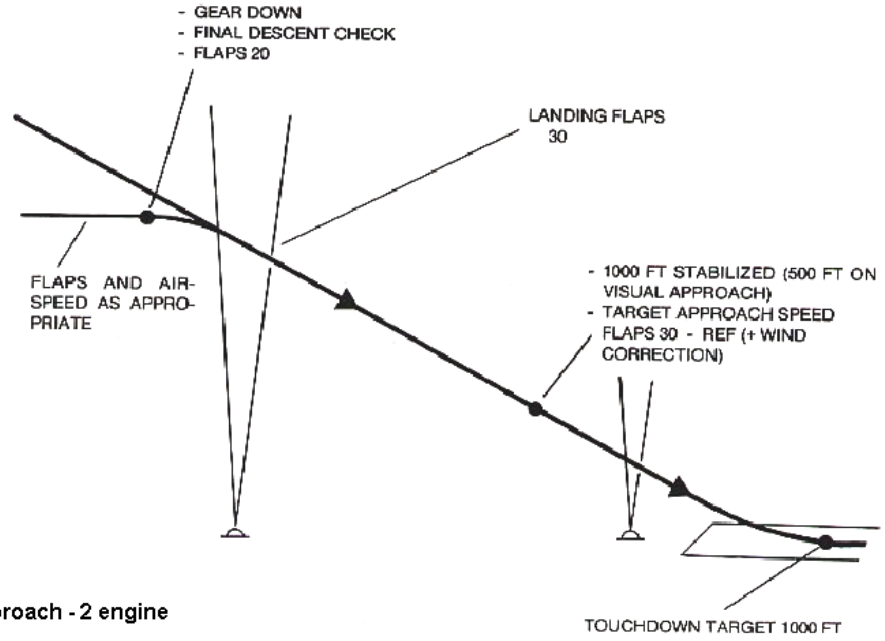
1. Descent at pre-determined TOD (Top of Decent).
2. Descend at 300 knots above 10,000 feet.
3. Use speedbrakes or thrust to minimize vertical path error.
4. Proper descent planning is necessary to ensure proper speed and altitude at the arrival point. Distance required for descent is 3NM/1000 feet.
   Descent rates are as follows:

Intended Speed	Descent Rate	
	CLEAN Configuration	With SPEEDBRAKES
0.785 Mach / 300 knots	2300 FPM	5500 FPM
250 knots	1400 FPM	3500 FPM
VREF 30 + 80 knots	1100 FPM	2400 FPM

5. Plan to descend so that aircraft is at approximately 10,000 feet above ground level, 250 knots, 30 miles from airport.
6. At average gross weights, it requires 60 seconds and 5 Nms to decelerate from 290 knots to 250 knots for level flight without use of the speedbrakes. It requires 100 seconds to slow from 290 knots to minimum clean airspeed. Using speedbrakes will reduce the times and distances by half.
7. Arm speedbrakes and autobraking to position 2 or 3 on initial descent.
8. Set airport altimeter below transition level.
9. Avoid using the landing gear for drag above 180-200 knots to avoid damage to doors or passenger discomfort.
10. Recommended approach planning, ATC and airport rules permitting:
    - 250 knots below 10,000 feet, 30 miles from airport,
    - 180-230 knots, 23 miles from airport,
    - 160 knots, 16 – 17 miles from airport,
    - VREF, 5 – 7 miles from airport.
11. In case of rapid descend due to depressurization, bring aircraft down to a safe altitude as smoothly as possible. Using the autopilot is recommended. Check for structural damage. Avoid high load maneuvering.
12. Bank Angle Protection (BAP) is not available on the 767.
    Over 36 degrees of bank, an audio “bank angle” alarm will sound.
13. Stall recovery can be accomplished by lowering the aircraft’s nose and increasing power at once to gain airspeed. Beware of terrain. Accelerate to VREF 30 + 80 KTS. Do not retract gear until confirmed stall recovery and positive rate of climb. Keep nose at 5 degrees above the horizon or less.
14. If deployed, do not retract slats during the recovery, as it will result in altitude loss.
15. In the event of engine out approach, approach at VREF+5 @ flaps 20.
16. Under normal conditions land at VREF @ flaps 30 (see appendix for speed tables).

17. ILS Approach:
    During initial maneuvering for the approach, extend flaps to 5 and slow to 180-200kts. When the localizer is alive, extend flaps to 15 and slow to 170 knots. At one dot below glideslope intercept, extend the landing gear and flaps to 20. Begin slowing to final approach speed. At the final approach fix, extend flaps to 30 and slow to Vref + 5. Be stabilized by 1000 feet above field level. This means, gear down, flaps 30, Vref +5 and engines spooled. Plan to cross the runway threshold at Vref.
18. Visual Approach:
    Similar to the ILS approach. The major difference is that aircraft must be stabilized by 500 feet above field level, as opposed to 1000 feet.

MINIMUM MANEUVERING SPEEDS	
SELECTED FLAPS	SPEED
UP	220
1	200
5	180
15/20	160



Normal ILS APPROACH

19. A stabilized approach at Vref +5 will result in a pitch attitude of 2-3 degrees nose up. Cross the threshold at Vref. Begin the landing flare at about 30ft. Only about 1-2 degrees of pitch up is necessary. The tail will strike at approximately 9 degrees. Slowly reduce thrust to nearly idle. Landing with thrust at idle will result in a firm touchdown. Set thrust just above idle. At touchdown, fly the nosewheel on. At touchdown, autospoilers should deploy. Deploy reverse thrust. Normally, auto brakes 1 is sufficient stopping power. 2 is sufficient for short or wet runways. Be out of reverse thrust by 80kts to prevent foreign object damage to the engines.

20. For wind correction, add ½ the steady state wind plus all of the gust factor to the Vref. Do not add more than 20 kts. When landing in a crosswind, do not bank excessively as wingtip or engine pod strike may occur.
21. Our modeled 767 is a CATII/III aircraft, meaning the aircraft is capable of landing on autopilot in conditions where visibility is down to 50ft AGL.
22. Land the aircraft.
23. Disengage (autopilot autothrottle will disengage) reverse thrust at 80 knots.
24. Disengage auto braking at 60 knots or as necessary.
25. Turn off onto high-speed taxiways at 30 knots or less.
26. Reverse thrust is most effective at higher speeds. Slow to safe taxi speed with braking and exit the runway.
27. Decelerate to 8 – 12 knots for 90 degree turns.
28. Taxi to gate.

Chapter Three Panel Description 2

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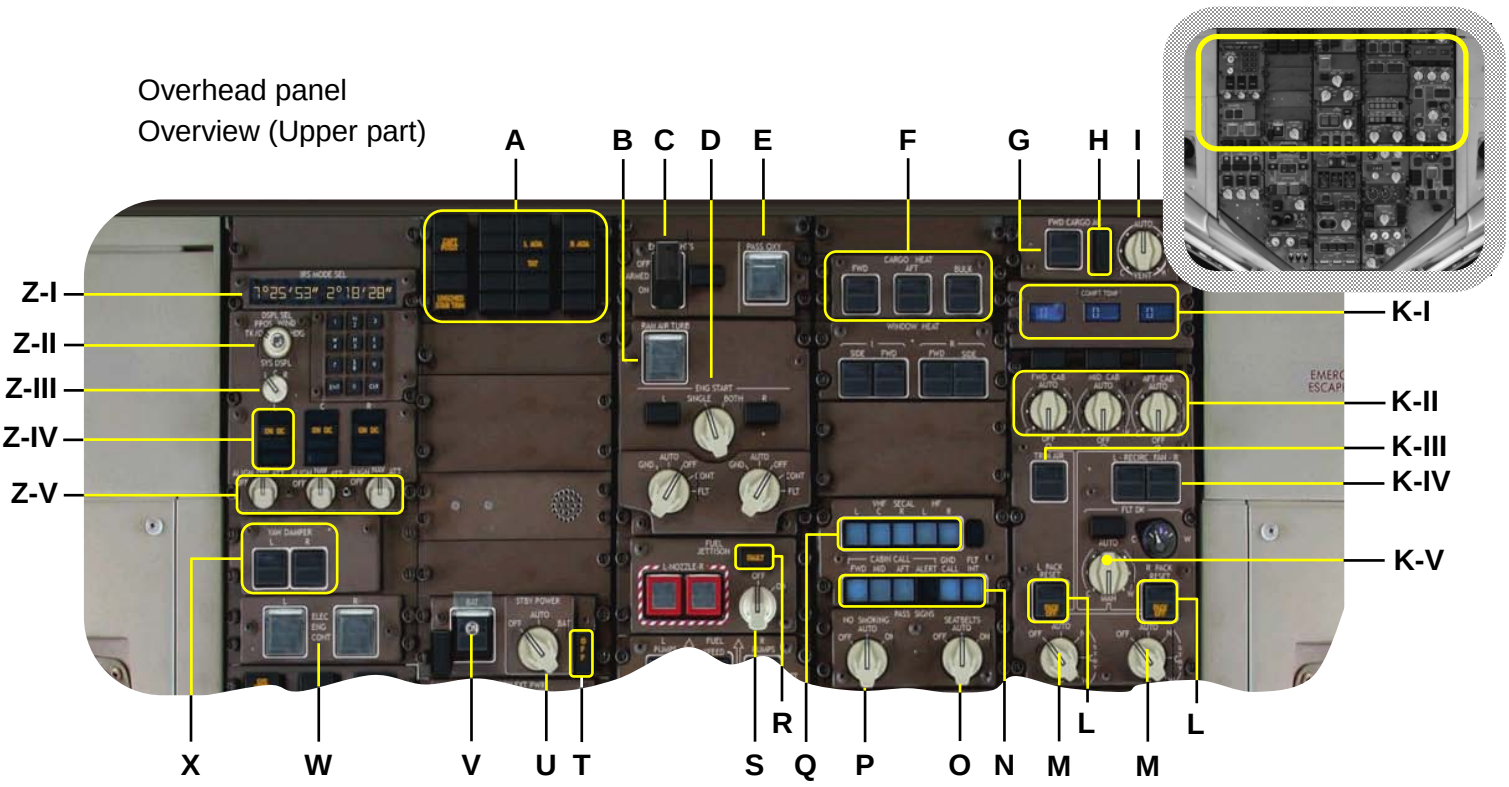
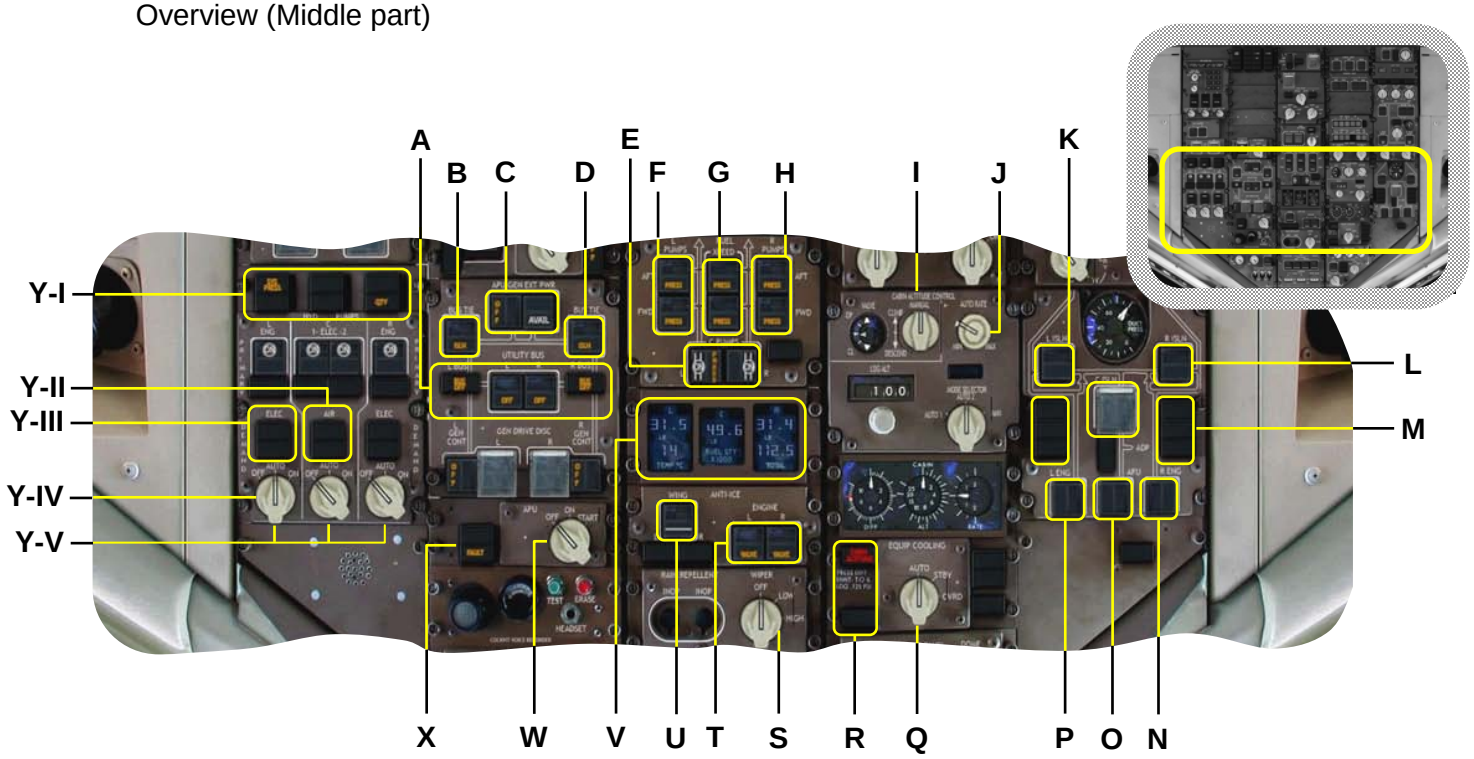
Overhead panel
Overview (Upper part)



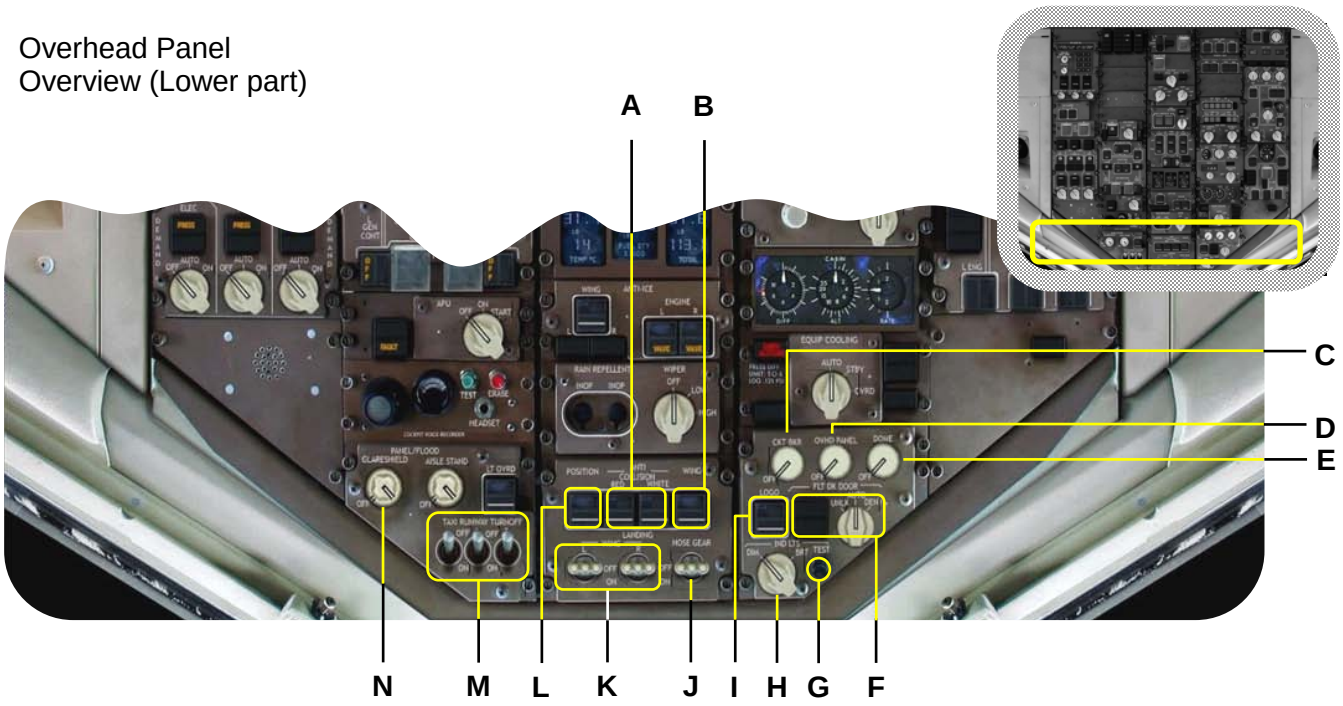
A Annunciator panel
B RAM AIR TURBINE extend button
C EMERGENCY light switch
D L/R ENG START ignition selector
E Manual PAX OXY(gen) control
F CARGO HEAT ON/OFF sel. switches
G FWD cargo HEAT switch
H HEAT fault legend
I FWD CARGO temperature selector
K-I Digital cargo temperature indicator
K-II CABIN temperature selectors
K-III AIR CON trim air control ON/OFF
K-IV CABIN RECIRC(ulation) fans ON/OFF
K-V Flight Deck temperature selector
L R AIR COND PACK caution light and reset switch
M L/R AIR COND PACK selectors
N Interphone and PA selectors
O SEAT BELTS selector OFF-AUTO-ON
P NO SMOKING selector OFF-AUTO-ON
Q VHF-SELCAL-HF selectors
R FUEL JETTISON fault annunciator
S FUEL JETTISON selector
T ELEC STBY PWR OFF legend
U STBY PWR selector switch
V BATTERY switch ON/OFF
W ENG GEN(erator) control switches
X L/R YAW DAMPER switches ON/OFF
Z-I ISDU (Inertial System Display Unit) L/R indication windows
Z-II ISDU mode selector switch
Z-III L/C/R IRU (Unit) selector switch
Z-IV IRU fault legends
Z-V IRU selector switches

Overhead panel
Overview (Middle part)



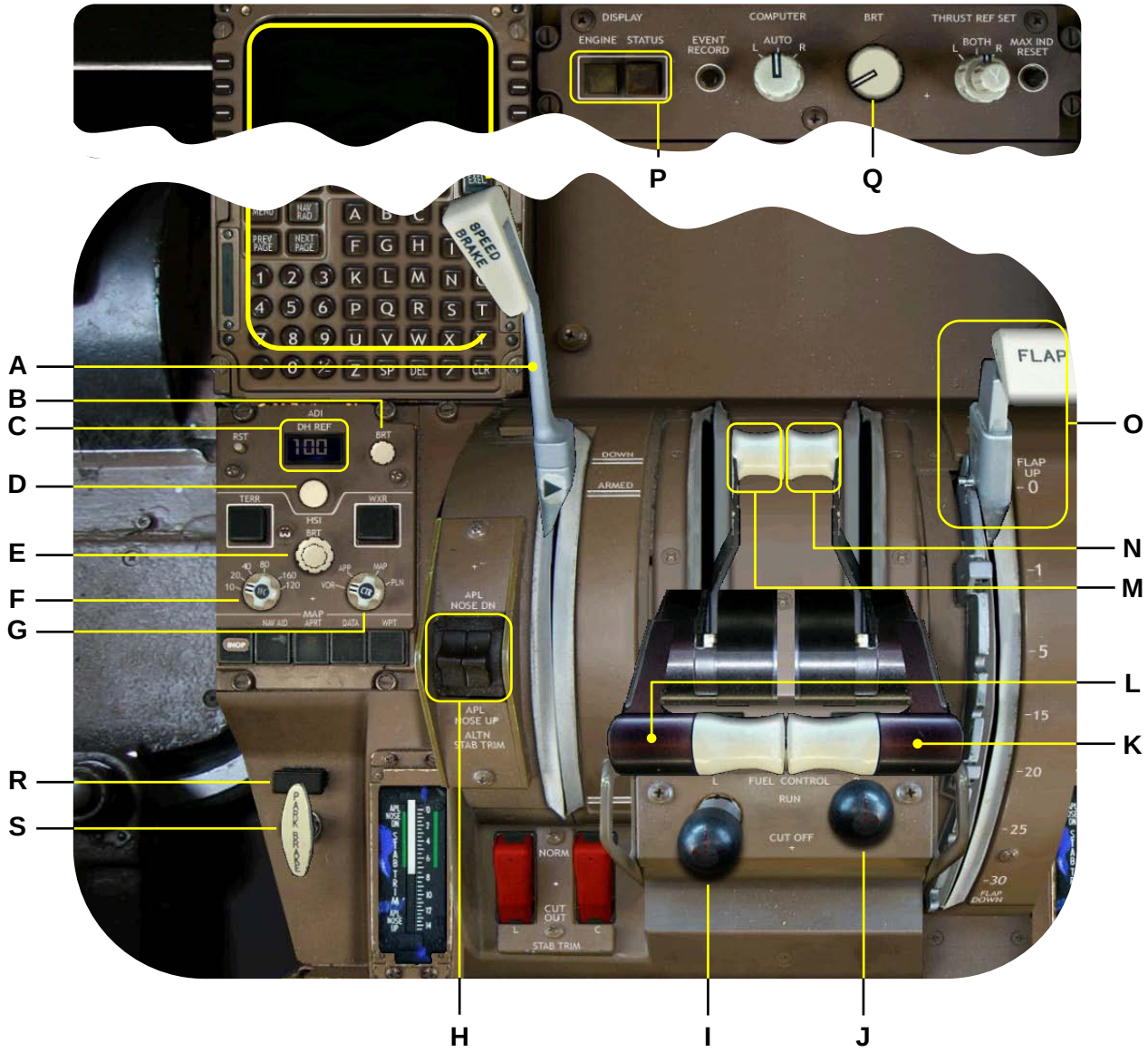
A UTIL BUS selectors and fault legends
B L AC (alternate current) BUS TIE switch
C APU GEN/EXT PWR switches
D R AC (alternate current) BUS TIE switch
E CTR FUEL tank switches
F L AFT/FWD FUEL pump switches
G FUEL X-FEED switches
H R AFT/FWD FUEL pump switches
I CABIN pressurization module
J VS cabin rate selector
K L BLEED ISOLATION switch
L R BLEED ISOLATION switch
M BLEED fault legends
N R ENG BLEED switch
O APU BLEED switch
P L ENG BLEED switch
Q EQUIPMENT cooling switch
R HI CABIN ALT warning
S L/R windshield wiper control
T L/R EAI (Engine Anti Ice) control
U WAI (Wing Anti Ice) control
V Digital fuel quantity indicator
W APU START selector switch
X APU fault legend
Y-I L/C/R HYD fault legends
Y-II HYD AIR driven pump switch ON/OFF
Y-III HYD ELEC driven pump control
Y-IV L HYD EDP (Engine Driven Pump) control switch OFF-AUTO-ON
Y-V C and R HYD EDP selectors

Overhead Panel
Overview (Lower part)



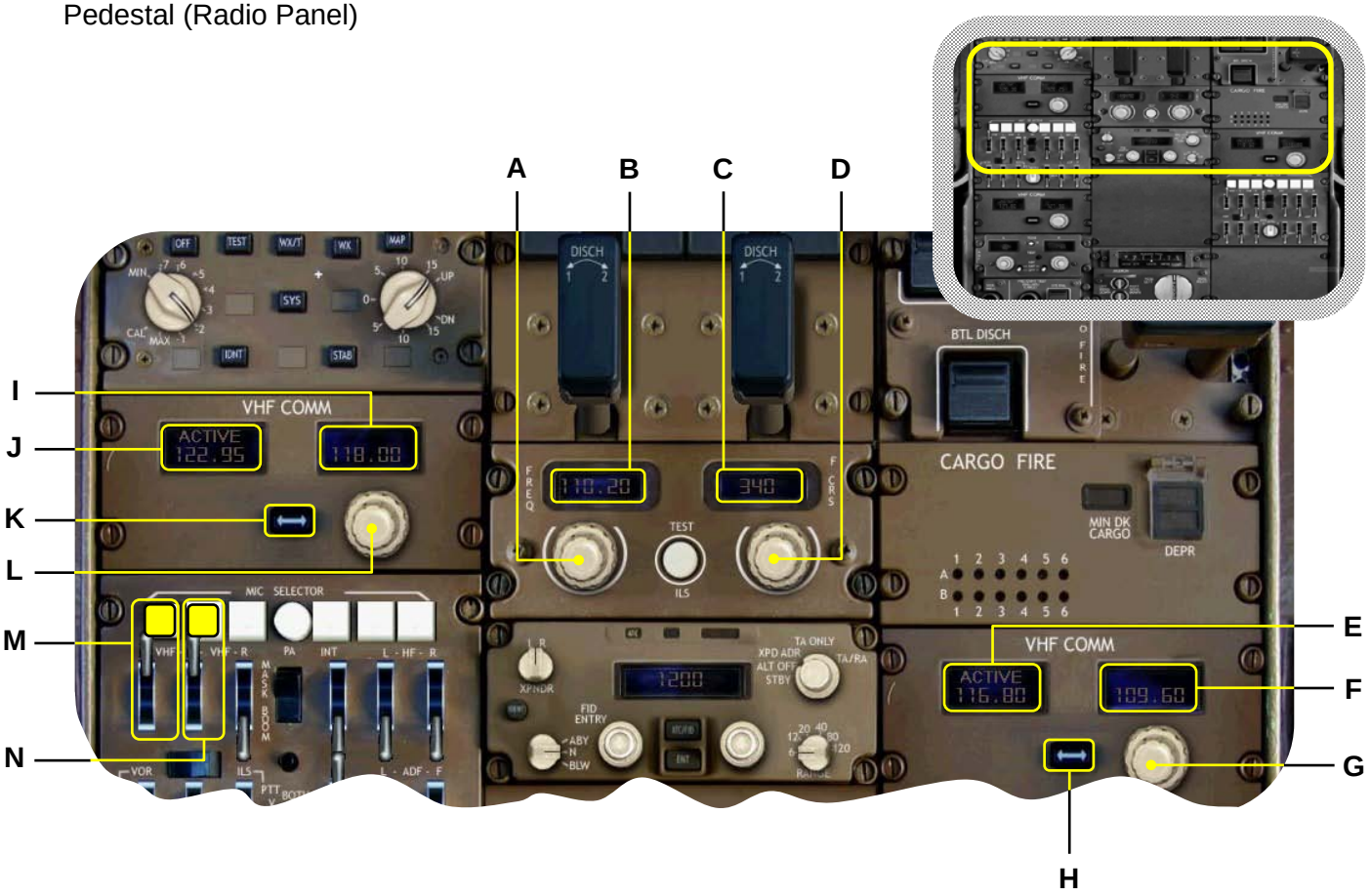
A	RED/WHITE anti-collision light control	H	Annunciator light BRT/DIM control
B	WING light switch	I	LOGO light control switch
C	CKT BKR panel backlight control	J	NOSE LDG GEAR light control
D	OVHD PANEL backlight control	K	LANDING lights control
E	Flight Deck DOME light control	L	NAVIGATION position lights
F	Flight Deck DOOR LOCK control	M	TAXI/RUNWAY TURNOFF control
G	Annunciator light TEST switch	N	GLARESHIELD backlight control

Pedestal (Throttle Quadrant Panel)

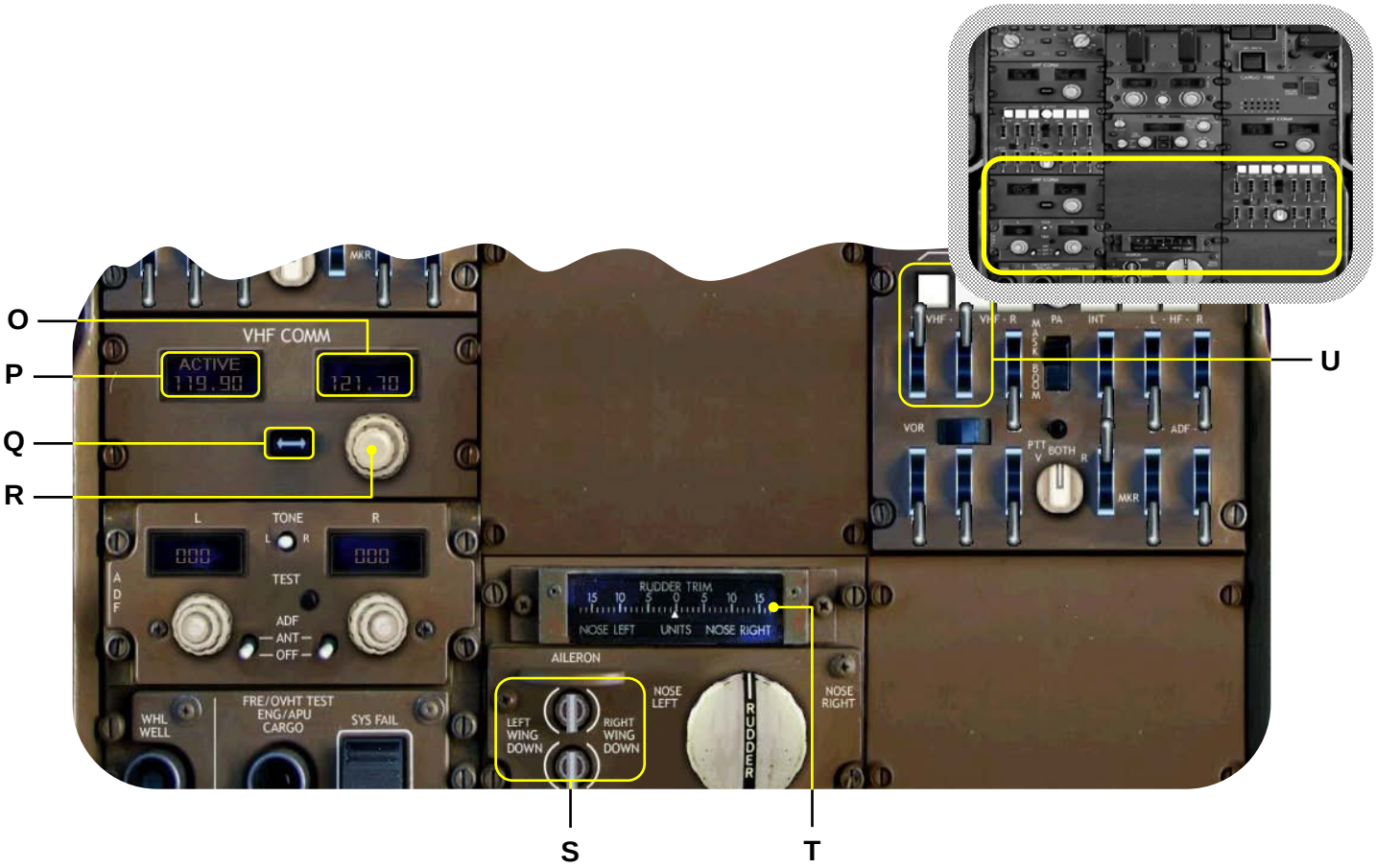


A	SPEEDBRAKE control level	K	Throttle RH ENG
B	ADI brightness knob	L	Throttle LH ENG
C	DH REF (Decision Height) value	M	LH ENG Thrust Reverser
D	Selector knob DH	N	RH ENG Thrust Reverser
E	HSI brightness knob	O	FLAP (and leading edge flaps) handle
F	HSI range knob	P	LOWER EICAS ENG or STS pages select buttons
G	HSI indication (VOR-APP-MAP-PLN)	Q	EICAS display brightness control
H	STAB TRIM control switches	R	Amber PARKING BRAKES SET legend
I	L ENG fuel control switch	S	PARKING BRAKE handle. Pull to SET
J	R ENG fuel control switch		

Pedestal (Radio Panel)

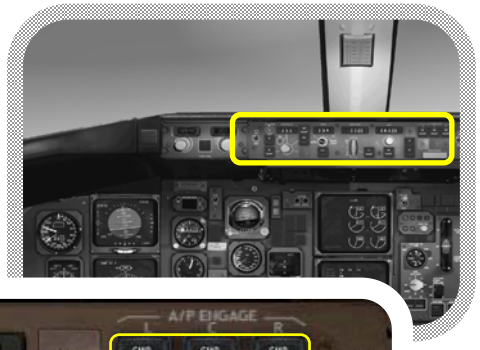


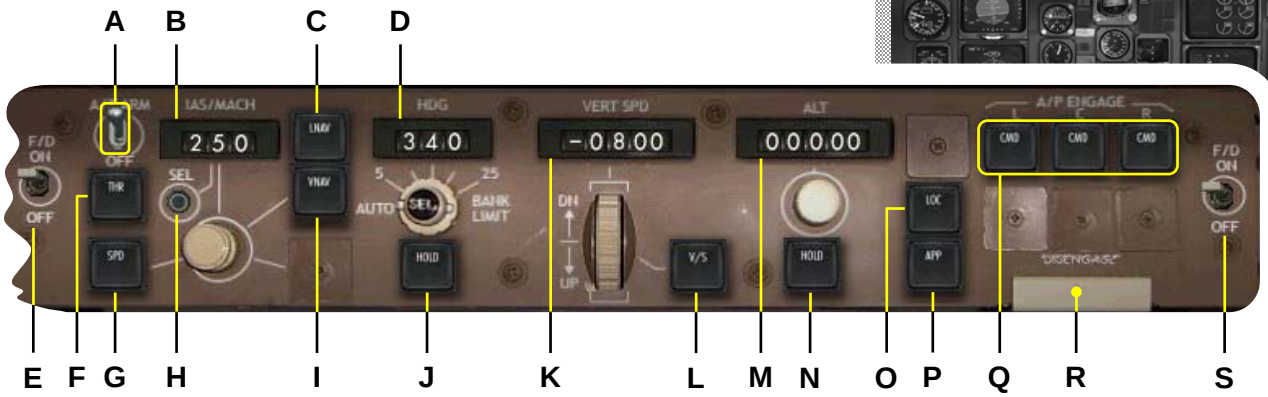
A	ILS frequency selector	H	R TRANSFER switch
B	frequency indicator	I	L Standby VHF COMM indicator
C	ILS course indicator	J	L Active VHF COMM indicator
D	ILS course selector	K	L TRANSFER switch
E	R Active VHF COMM indicator	L	L VHF COMM selector knob
F	R Standby VHF COMM indicator	M	VHF L audio selector
G	R VHF COMM selector knob	N	VHF R audio selector



O	C VHF COMM standby indicator	S	AILERON TRIM switch
P	C VHF COMM active indicator	T	RUDDER TRIM indicator
Q	C TRANSFER switch	U	VHF-L and VHF-R white microphone selector button with receiver control lever.
R	C VHF COMM selector knob		

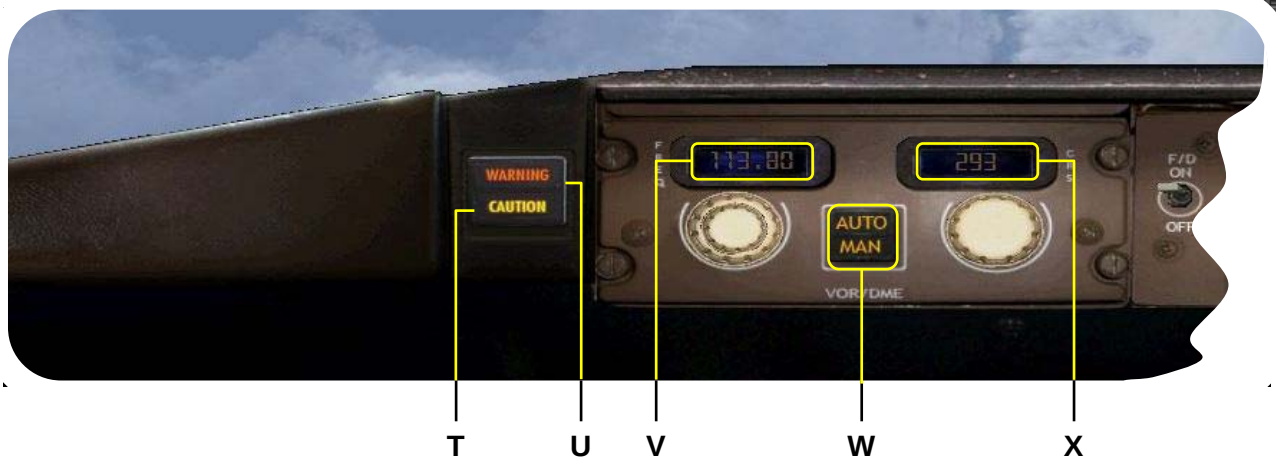
Auto Flight and Navigation Systems
Mode Control Panel (MCP)





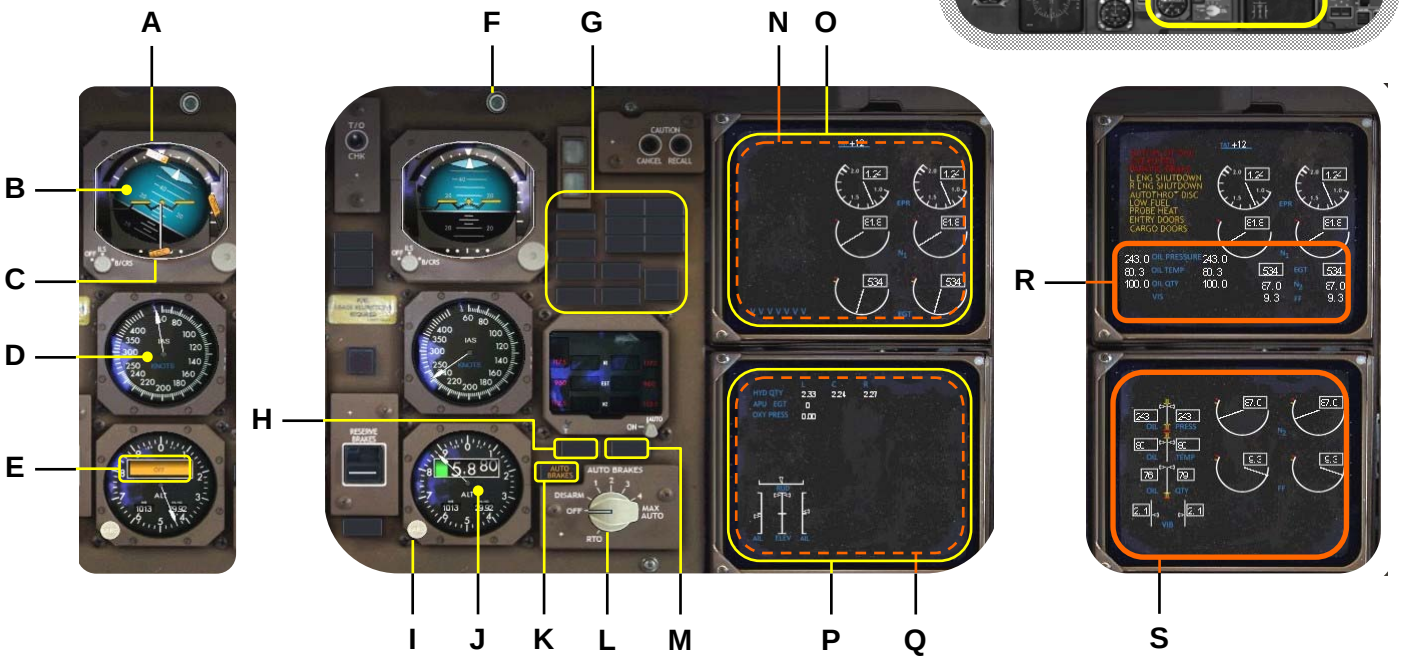
A AT (Auto Throttle) ARM switch
B IAS/MACH speed window
C LNAV selector knob
D HDG window
E L F/D (Flight Director) ON-OFF switch
F THR mode switch
G SPD mode select switch
H Change selector switch MACH/SPD
I VNAV selector knob
J HDG HOLD switch
K VERT SPD indicator
L V/S activation knob
M ALT indicator window
N ALT HOLD switch
O LOC (ILS localizer) select switch
P APP (approach) select switch
Q AP (Auto Pilot) engage switches L-C-R
AP C CMD disengages/engages
disengage switch R.
R AP disengage switch.
Only to disengage the AP's
S R F/D (Flight Director) ON-OFF switch

Auto Flight and Navigation Systems
VHF NAV Control Panel – MC/MW



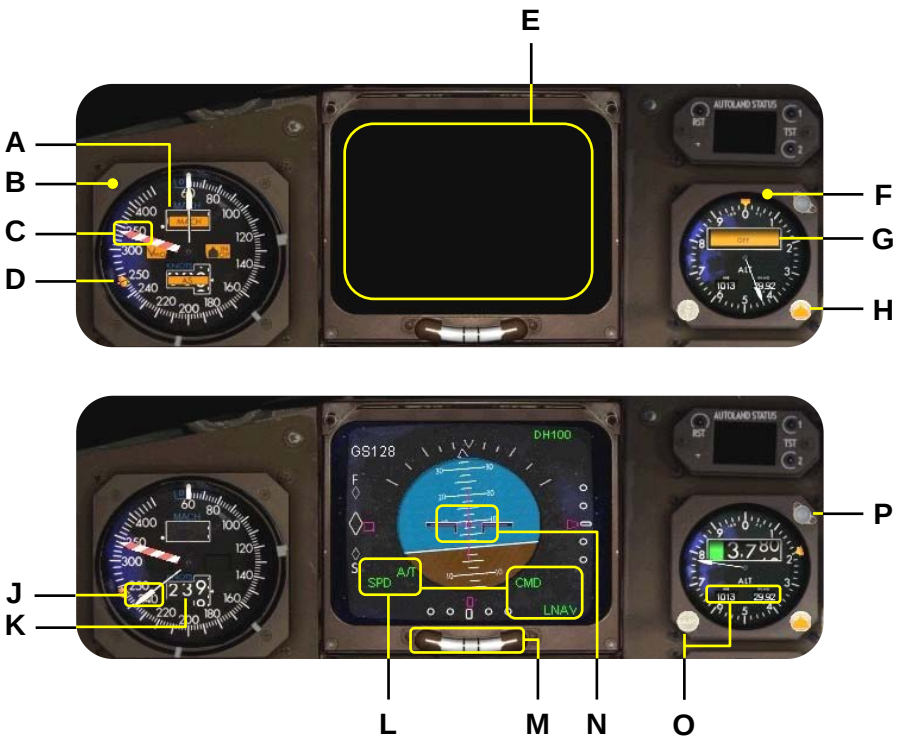
T MASTER **CAUTION** light
U MASTER **WARNING** light
V VOR/DME active frequency indicator
W AUTO/MAN VOR station tuning (not modeled)
X VOR/DME course selector

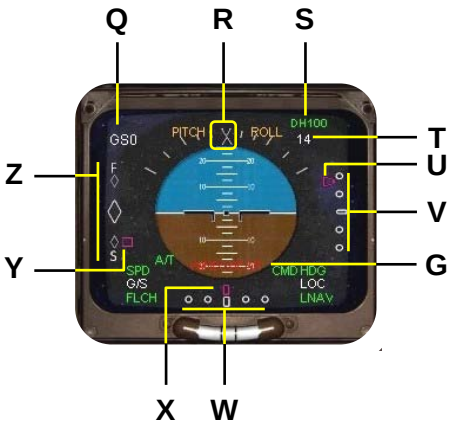
Auto Flight and Navigation Systems
Standby Instruments and EICAS



A Standby instruments
B Standby Attitude Indicator
C HDG failure flag
D Standby IAS indicator
E BARO ALT indicator failure flag
F Annunciator Light Test switch
G Annunciator light panel
H L ENG OIL PRESS legend
I BARO set knob
J Standby Altimeter indicator
K AUTO BRAKES fault legend
L AUTO BRAKE selector knob
M R ENG OIL PRESS legend
N EICAS ENG parameters
O UPPER EICAS DU (Display Unit)
P EICAS STS page
Q LOWER EICAS DU
R Additional engine indicators
S LOWER EICAS engine parameters

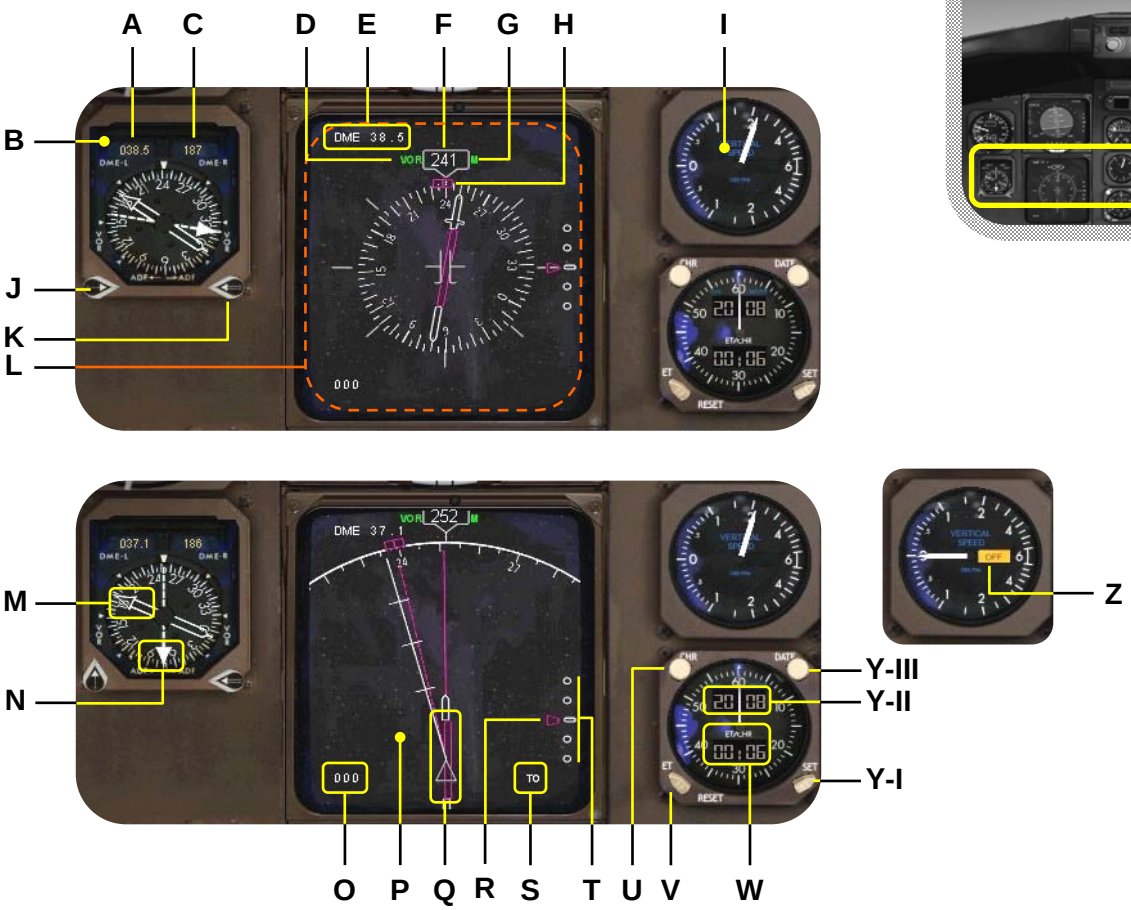
Auto Flight and Navigation Systems
IAS - EADI - Altimeter





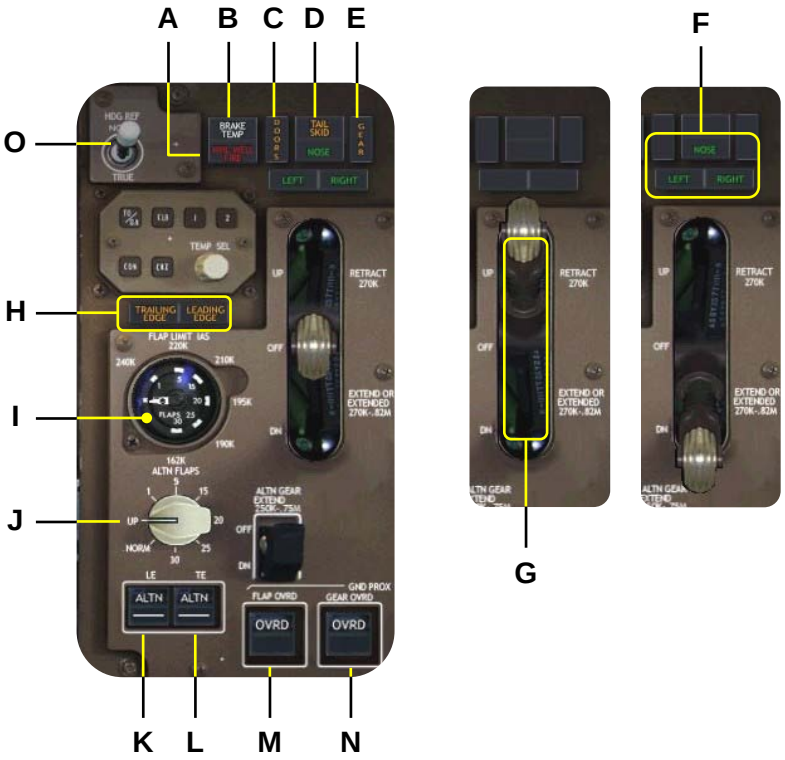
A	SPEED malfunction flag	N	Aircraft symbol with FD needles
B	IAS indicator	O	Barometric setting knob
C	Barber pole needle	P	Light sensor
D	SPD bug	Q	GS (Ground Speed) indication
E	EADI (Electronic ADI)	R	Fault indications
F	Standby altimeter	S	DH (Decision Height) set
G	STBY ALT OFF flag	T	Actual DH
H	DH setting knob	U	Actual GS position indicator
I	WINDSHEAR annunciation	V	ILS GS (Glide Slope) scale
J	SPD needle	W	ILS LOC (Localizer) scale
K	Mach digital indication	X	Actual LOC position indicator
L	FMA (Flight Mode Annunciations)	Y	Speed deviation pointer
M	Slip indicator	Z	Speed deviation scale

Auto Flight and Navigation Systems
RMI - EHSI - IVSI - Clock



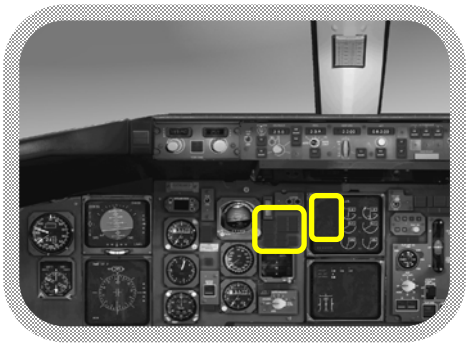
A	DME L actual slant distance
B	RMI (Radio Magnetic Indicator)
C	DME R actual slant distance
D	Tuned VOR station
E	DME distance for this VOR station
F	Actual course
G	VOR tuned
H	Set CRS value
I	VSI (Vertical Speed Indicator)
J	VOR/ADF L selector (single pointer)
K	VOR/ADF R selector (double pointer)
L	HSI (Horizontal Situation Indicator)
M	Double RMI pointer
N	Single RMI pointer
O	Windspeed and if applicable, direction
P	EHSI Electronic Horizontal Situation Indicator
Q	Course Deviation pointer
R	Glide Slope pointer
S	VOR/DME TO/FROM indication
T	Glide Slope scale
U	CHR (chronograph) pushbutton
V	ET (Elapse Time) selector
W	ET/CHR indicator window
Y-I	SET UTC (GMT) time
Y-II	UTC (GMT) indicator window
Y-III	Switch UTC window with DATA info
Z	IVSI instrument failure flag.

Aircraft Systems
FLAPS and GEAR handle

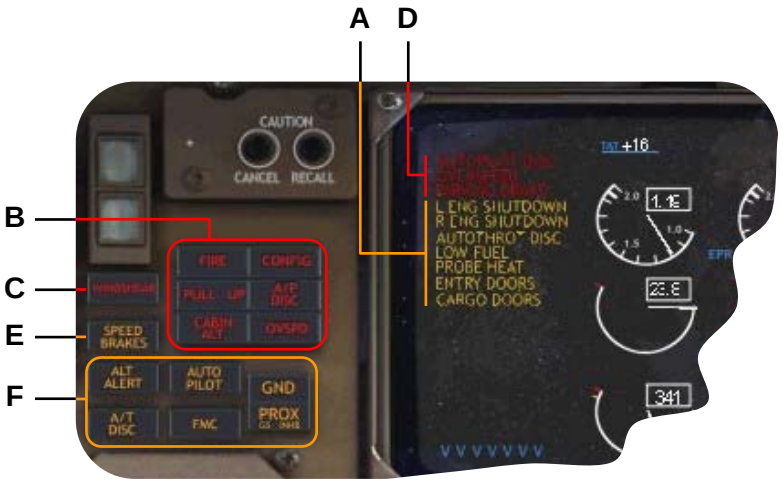


A WHEEL WELL FIRE warning light
B BRAKE TEMP too high
C Landing gear DOOR caution light
D TAIL SKID caution light
E GEAR caution light (unsafe)
F GEAR DOWN and LOCKED lights
G GEAR handle DOWN-OFF-UP
H FLAP system caution lights
I FLAPS indicator
J ALT FLAP selector knob
K LE (Leading Edge) FLAP engage switch
L TE (Trailing Edge) FLAP engage switch
M GND PROX FLAP override switch
N GND PROX GEAR override switch
O GPS/NAV selector switch ON/OFF

Note: Items J, K, L, M and N are not modeled.



Aircraft Systems
WARNING and CAUTION annunciation



A CAUTION EICAS messages
B Warning panel legends
C WINDSHEAR warning legend
D WARNING EICAS messages
E SPEEDBRAKES unsafe legend
F Caution panel legends

Familiarization with the CDU

These pages cover some details of the CDU (FMS[1]), which we need during a normal flight. Although this is an introduction, more information during the tutorial flight.

On the **CDU** check/set ..... - Call-up the CDU (Control Display Unit)

CDU Keys and buttons

- **MAIN MENU** page, click LSK 3L (**< INIT**)
- **INIT** page, select LSK 6R (**ALIGN IRS >**)
- or you can click on the **INIT** menu key

- Click the **MENU** key on the keyboard
- **MAIN MENU** page, click LSK 4L (**< TO/APPR**)
- **TAKE OFF** page,
  Click LSK 1L (**< CALC/SET T/O V SPEEDS**)
- Write on a piece of paper those values:
  V1 **.....** knots
  VR **.....** knots
  V2 **.....** knots

- Click the **MENU** key on the keyboard
- **MAIN MENU** page, click 5L (**< RAD NAV**)
- **RAD NAV** page or click on
  the **RAD NAV** menu key,
  Verify **NAV1** and **NAV1 STBY** frequencies

- Click the **MAIN** key on the keyboard
- **MAIN MENU** page, click 3R (**FLT PLAN >**)
- **FLIGHT PLAN** page or click on
  the **FLT PLAN** menu key
  Here we can find for example the FSNavigator- or the MSFS created flight plan.

- With the **PREV PAGE** and **NEXT PAGE** menu keys, we can change the MCDU display between **TIME /TRK** and **DIST/FREQ.**
- With the **UP/DOWN** arrow next of the PREV/NEXT keys, we can scroll through the flight plan.

- LSK 6L **WEATHER >** is not modeled.

[1] Flight Management System

Call up the CDU **FLT PLAN** page

- Click LSK3R **FLT PLAN >**
- Check your flight plan for all the waypoints according to the FSNavigator/MSFS flight plan. This page shows you **TIME/TRK**

CDU **FLIGHT PLAN** TIME/TRK page

- With the **PREV/NEXT PAGE** key, we can switch to the **DIST/FREQ** page and visa versa.

CDU **FLIGHT PLAN** DIST/FREQ page

Call up the CDU **RAD NAV** page .....

- Click the **MENU** key on the keyboard
- On MAIN MENU page,
  click LSK 5L **< RAD NAV**
- If applicable, select a COM1 and/or COM 2 frequency. These frequencies can also be entered via the pedestal panel

CDU **RAD NAV** page

Call up the CDU **TO/APPR** page .....

- Click LSK 4L **< TO/APPR** or you can click the **DEP ARR** key on the keyboard
- Click LSK 1L **< CALC/SET T/O V SPEEDS**
- Note the values of:
  V_1 ... knots
  V_R ... knots
  V_2 ... knots

CDU **TAKE OFF** page
Your TO speeds could differ from the CDU screenshot!

Call up the CDU **DATABASE** page

- Click the **MENU** key on the keyboard
- On MAIN MENU page,
  click LSK 2R **DATABASE >** or click directly on the keyboard the **DATA** key
- This CDU page shows you average data as pressure, OAT, wind, times in both - if applicable - Metric and the American system.

CDU **DATA** page

Call up the CDU **STATUS** page

Click the **MENU** key on the keyboard

- On MAIN MENU page,
  click LSK 2L **< STATUS**
- The STATUS page shows general (simulated) information like A/C model, navigation data, OP program, engine rating etc.
  It's pure an informative page!

CDU **STATUS** page

Call up the CDU **PROGRAM** page

- Click the **MENU** key on the keyboard
- On MAIN MENU page,
  click LSK 4R **PROG >** or direct access via the **PROG** key on the keyboard
- The PROGRAM page shows actual data calculated by the FMS and retrievable throughout the whole flight.
- The **FUEL PRED >** offers additional information regarding the calculated FUEL and distances.

CDU **PROG** page

Call up the CDU **FUEL PRED** page

- Click on the previous PROGRAM page
  LSK 6R **FUEL PRED >**
- All kind of data related to the arrival, fuel, GW, GMT (UTC) etc. is here.

CDU **FUEL PRED** page

Call up the CDU **INIT** page

- Click the **MENU** key on the keyboard
- On **MAIN MENU** page, click LSK 3L **< INIT** or direct access via the **INIT** key on the keyboard
- The INIT page shows actual data like longitude/latitude information, planned CRZ altitude, FROM/TO information. The screenshot shows the data after a flight plan was loaded. Worth mentioning is LSK 6R, the **ALIGH IRS** >. Clicking LSK 6R simulates the alignment procedure of the IRU's.

CDU **INIT** page

Call up menu key **DIR TO** .....

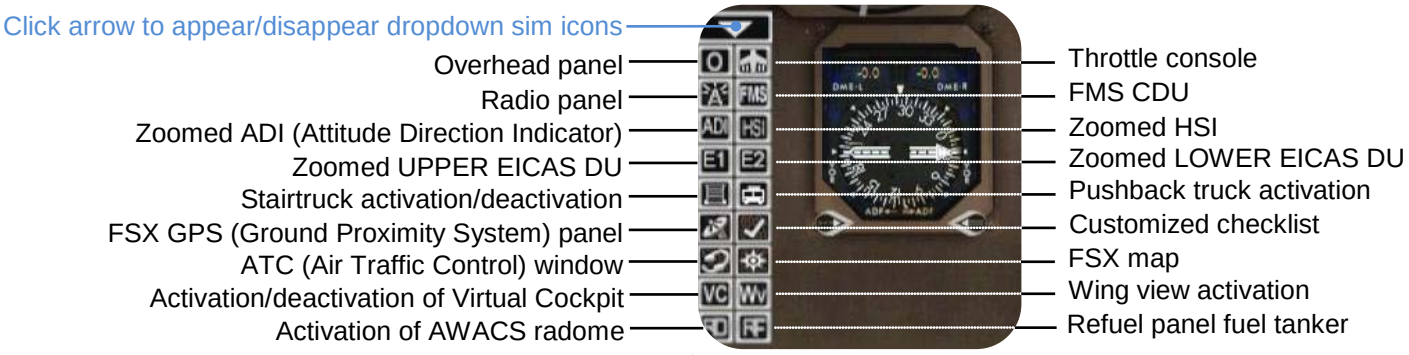
- Click the **DIR TO** key on the keyboard
- The DIR TO (direct to waypoint/VOR) page a part of the flight plan with the current DIR TO waypoint on top between brackets.
  If you want to go direct to SANNY, do the following steps:
- Click LSK 4L **SANNY**

CDU **DIR TO** page

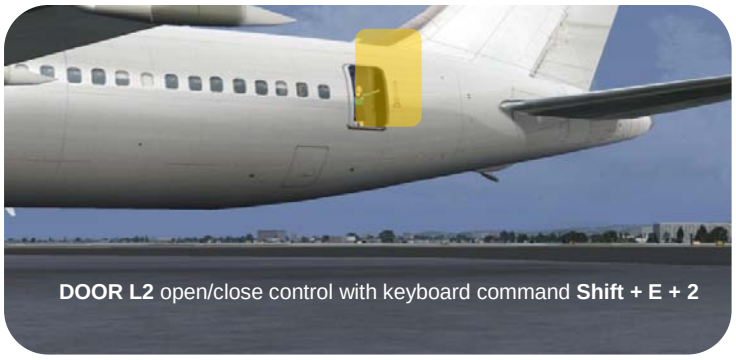
- After you've clicked LSK 4L, the DIR TO page should have changed as can be seen below.
- In-between the brackets, COLZI changed into **SANNY**. DIR TO is now to SANNY.

CDU **DIR TO - SANNY** page
(this is just an example how DIR TO could work!)

Cockpit Sim Icons



Passenger DOOR commands



Note: DOOR L1/L2 keyboard commands come automatically with stair trucks. Disabling the stair trucks is done via the **stair truck sim icon**.

Cargo DOOR commands

Pushback truck command

The simulated pushback truck is tied-up to the default pushback command **Cltr+P** and can be hidden by the pushback truck simicon.

Chapter Four Flight tutorial KLGA-KATL 1
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  - IAS (Indicated Air Speed) Settings 3
- Flight Planning 4
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Introduction

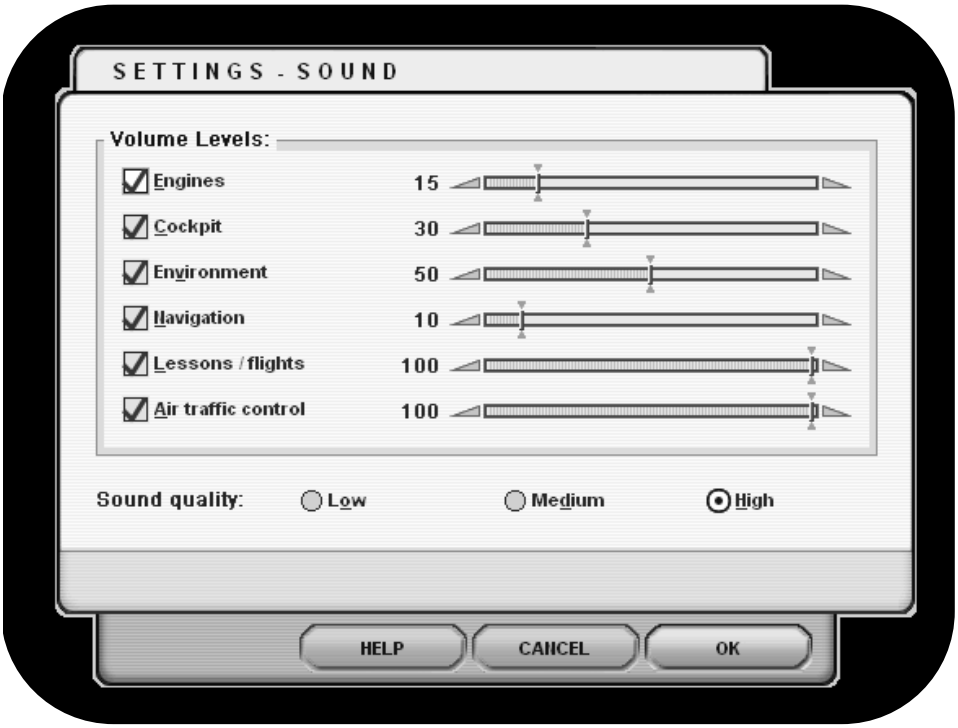
General

The **intention** of this flight tutorial is to give you **an overview** of how to handle the CLS 767 Series. Since this is an F-Lite aircraft, many things have been designed to make aircraft operations easy for you. This means there's no need to perform complicated calculations.
The previously published Operations Manual offers you all the necessary information about aircraft performances as well as limitations. We also assume that you have basic aviation navigation knowledge including making a flight plan, either via the MSFS Flight planner or any add on Flight Planner program. As part of making any flight plan, we also assume you're aware of low and high altitude routes, V- and J-routes for the United States.
Furthermore, this tutorial is a **guide** to helping you **understand** how to handle this aircraft. Some elements within the tutorial **may differ from your flight**!

This and much more information is freely accessible via the
FAA (Federal Aviation Administration), but there's much more. Let's give you more examples of interesting sites; **AirNav**, **ADDS** (Aviation Digital Data Service),
AIM (Aeronautical Information Manual), **MyAirplane.Com** and **VirtualSkies** Navigation.

Sound Settings

Recommended **sound settings** for the Boeing 767 Series are:



Note: Some machines will experience digital “tunneling” or may freeze when certain sounds are played, due to slower processors, smaller amounts of RAM, and the large size of the sound files. If you experience either of these problems, we recommend that you set sound quality to medium or low.

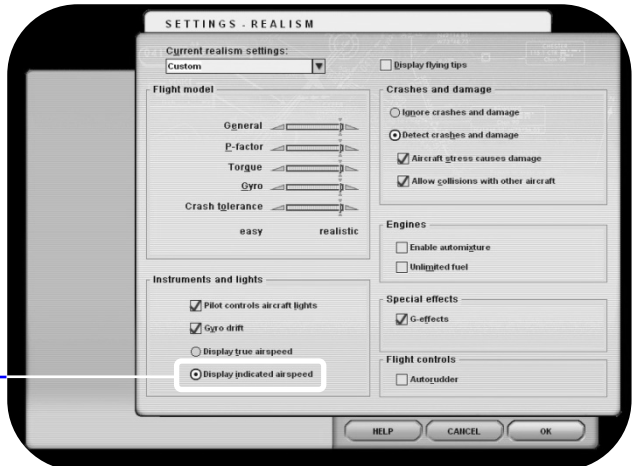
IAS (Indicated Air Speed) Settings

Requirement.
It is mandatory to configure FS9/FSX to display Indicated Airspeed rather than True airspeed.

In the **Flight Simulator 2004/FSX** menu·····

- From the FS menu **Aircraft** select **Realism Settings…**

- In the **Settings – Realism** window:
  - Tick **Display indicated airspeed** in the Instruments and lights part.



FS9 (FSX) menu Realism Settings

Flight Planning

Microsoft Flight Planner or Route Finder

We could use Route Finder (http://rfinder.asalink.net/free/), which is an on-line flight planning system for flight simulations. This route generator "service" does not contain all the logic and features of its counterpart aimed at real aviation users, but it's constantly updated with a current AIRAC. However, for this CLS test flight tutorial we'll use the FS flight Planner. Much easier and keeping in mind the *lite* product philosophy as well as finding in an uncomplicated way a route, this is the best way to start.
To be clear: you could use any other Flight Planner program than the FS Flight Planner, but Microsoft's own flight planner is a good start.

Ok, let's start with our route. We depart from New York's **La Guardia (KLGA – gate A4)** flying to the **city of Atlanta's Hartsfield - Jackson (KATL)**. It's not a long trans Atlantic stretch, but for sure not a short hop and is long enough for you to understand what this CLS 767 can do.

We assume you are familiar with how to open the FSX or FS9 Flight Planner and that you know how to create flight plans here. Ok, suppose you have never done this before, we've created the flight plan file (IFR La Guardia to Hartsfield - Jackson Atlanta.PLN). The flight will be an **IFR** flight from KLGA gate A4 to KATL following High **Altitude Airways** on a cruising altitude of **FL340**.
That is all the information that's needed right now.
Also, for your convenience below you can see the RouteFinder plan for this flight.

RouteFinder
*Route generator for PC flight simulation use - **NOT FOR REAL WORLD NAVIGATION***
(C)2005-2007 ASA srl - Italy

Computed route from **LA GUARDIA** (KLGA, KL) to **HARTSFIELD JACKSON ATLANTA INTKA** (KATL, KA): 18 fixes, 666.5 nautical miles

```
Cruise altitude between FL340 and FL340
KLGA (0.0nm) -DCT-> LAURN (17.6nm) -J42-> RBV (44.7nm) -J191->
BRAND (59.6nm) -J191-> DAVYS (69.7nm) -J42-> OOD (95.1nm) -J150->
STIKY (125.4nm) -J42-> BROSS (132.9nm) -J150-> AGARD (145.4nm) -J42->
GRACO (154.1nm) -J150-> OTT (183.2nm) -J42-> BOOYA (217.4nm) -J150->
GVE (261.5nm) -J37-> LYH (330.2nm) -J37-> SANNY (351.8nm) -J37->
COLZI (417.1nm) -J37-> SPA (516.8nm) -STAR-> KATL (666.5nm)
```

Details:

ID	FREQ	TRK	DIST	Coords	Name/Remarks
KLGA		0	0	N40°46'37.80" W073°52'21.60"	LA GUARDIA
LAURN		233	18	N40°33'05.80" W074°07'13.67"	LAURN
RBV	113.8	232	27	N40°12'08.65" W074°29'42.09"	ROBBINSVILLE
BRAND		240	15	N40°02'06.28" W074°44'09.50"	BRAND
DAVYS		240	10	N39°55'20.60" W074°53'49.77"	DAVYS
OOD	112.8	240	25	N39°38'09.69" W075°18'10.89"	WOODSTOWN
STIKY		236	30	N39°16'47.71" W075°45'58.75"	STIKY
BROSS		236	8	N39°11'28.40" W075°52'49.88"	BROSS
AGARD		236	13	N39°02'36.89" W076°04'11.14"	AGARD
GRACO		235	9	N38°56'29.81" W076°11'59.22"	GRACO
OTT	113.7	251	29	N38°42'21.12" W076°44'41.08"	NOTTINGHAM
BOOYA		248	34	N38°24'20.50" W077°21'46.36"	BOOYA
GVE	115.6	247	44	N38°00'48.96" W078°09'10.89"	GORDONSVILLE
LYH	109.2	237	69	N37°15'16.72" W079°14'11.28"	LYNCHBURG
SANNY		232	22	N37°00'02.59" W079°33'21.07"	SANNY
COLZI		232	65	N36°13'39.45" W080°30'31.73"	COLZI
SPA	115.7	231	100	N35°02'01.13" W081°55'37.37"	SPARTANBURG
KATL		242	150	N33°38'12.00" W084°25'40.80"	HARTSFIELD JACKSON ATLANTA INTKA

Tracks are magnetic, distances are in nautical miles.

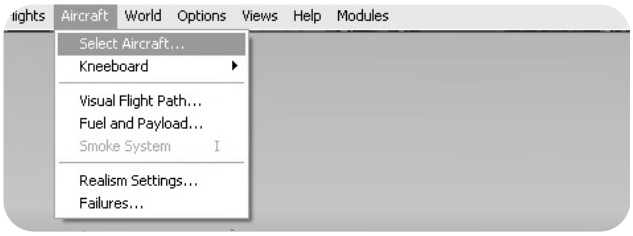
```
KLGA DCT LAURN J42 RBV J191 DAVYS J42 OOD J150 STIKY J42 BROSS J150 AGARD J42 GRACO J150 OTT J42 BOOYA J150 GVE J37 SPA STAR KATL
```

Initialization part I - Selecting manually the CLS Boeing 767-300

The following pictures are made using FSX however, the same procedures are applicable for FS9

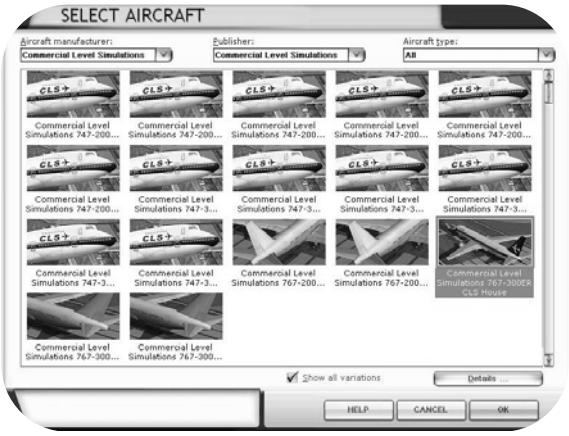
In **Flight Simulator 2004** / **FSX** menu

Select **Aircraft** from the FS menu and from the pull down menu **Select Aircraft**



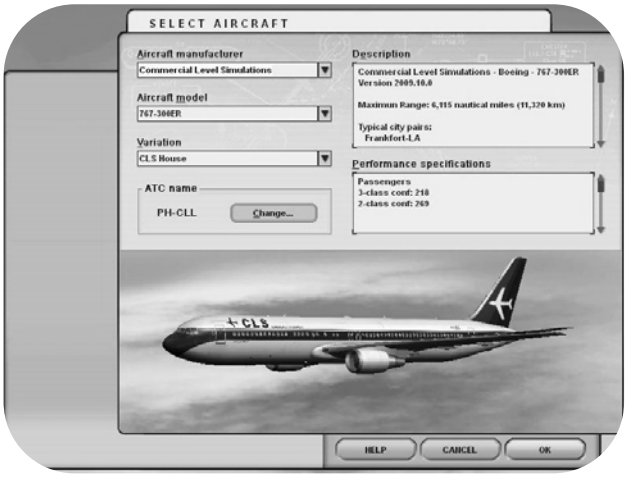
Select Aircraft FS2004 menu (FSX similar)

- Select from the **Aircraft Manufacturer** menu **Commercial Level Simulations**
- Select from the **Publisher** menu **Commercial Level Simulations**
- Tick **Show all variations**
- Choose the **767-300ER CLS House**
- Click the **OK** button to confirm.



Aircraft Selection **FSX** menu

- Select from the **Aircraft Manufacturer** menu **Commercial Level Simulations**
- Select from the **Aircraft model 767-300ER**
- Select from the **Variation CLS House**
- Click the **OK** button to confirm your choice.

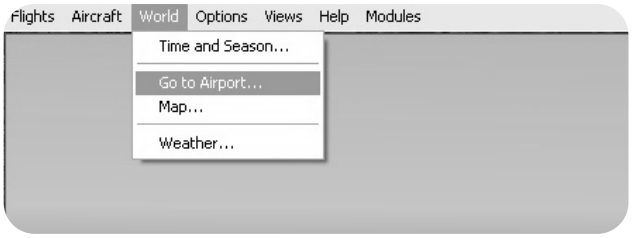


Aircraft Selection **FS2004** menu

Initialization part II - Manually selecting your airport location

In **Flight Simulator 2004** / **FSX** menu

- Select from the FS menu **World** and from the pull down menu **Go to Airport**



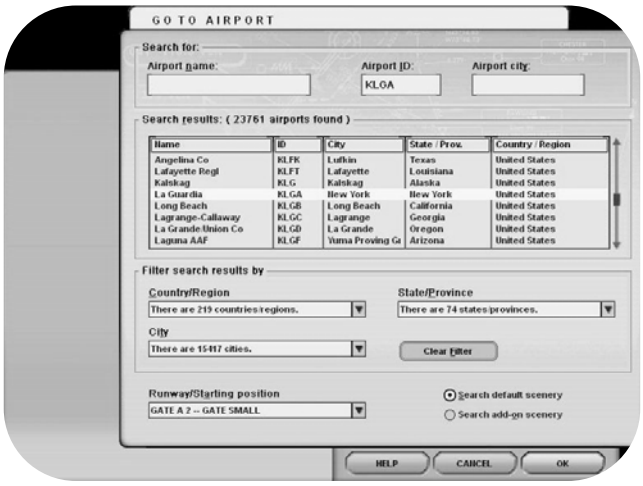
Airport location **FS2004** menu (FSX similar)

- Type it the **Airport ID** window: **KLGA**
- Select out of the Choose runway/Starting position **GATE A4 - GATE MEDIUM**

GO TO AIRPORT **FSX** menu

- Confirm the changes with the **OK** button

- Type in the **Airport ID** window: **KLGA**
- Select from the Runway/Starting position **Gate A2 - GATE SMALL**



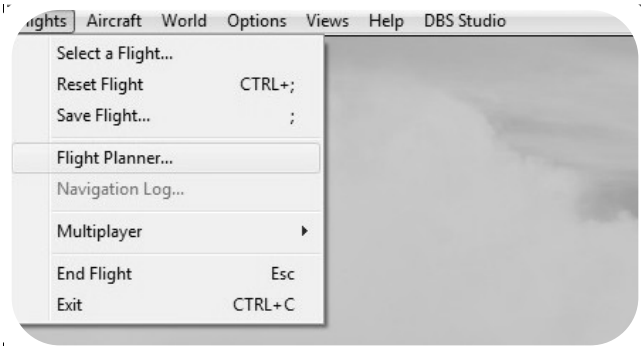
GO TO AIRPORT **FS2004** menu

- Confirm the changes with the **OK** button

Initialization part III – Loading your flight plan

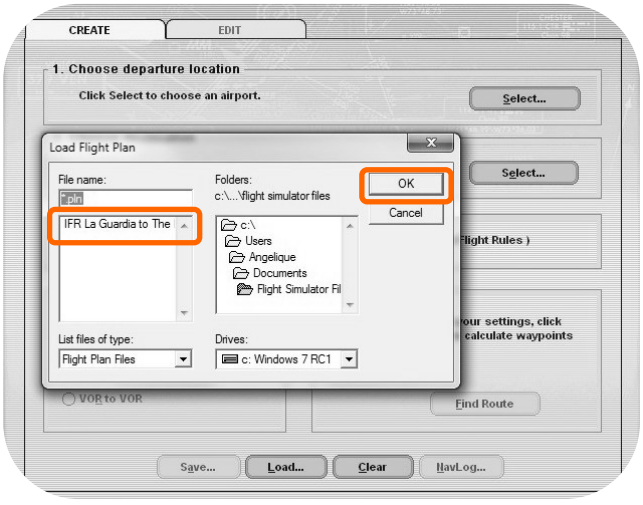
In **Flight Simulator 2004** / **FSX** menu·····

- Select from the FS menu **Flights** followed from the pull down menu **Flight Planner**



Flights-Flight Planner **FS2004** menu (FSX similar)

- Click on the **Flight Planner** window the **Load** button. This results in a **Load Flight Plan** pop-up window, as you can see below.
- Select from the available files **IFR La Guardia to The Hartsfield Atlanta Intl.pln**. See for this action the screenshot below.



Load Flight Plan **FS2004** menu (FSX similar)

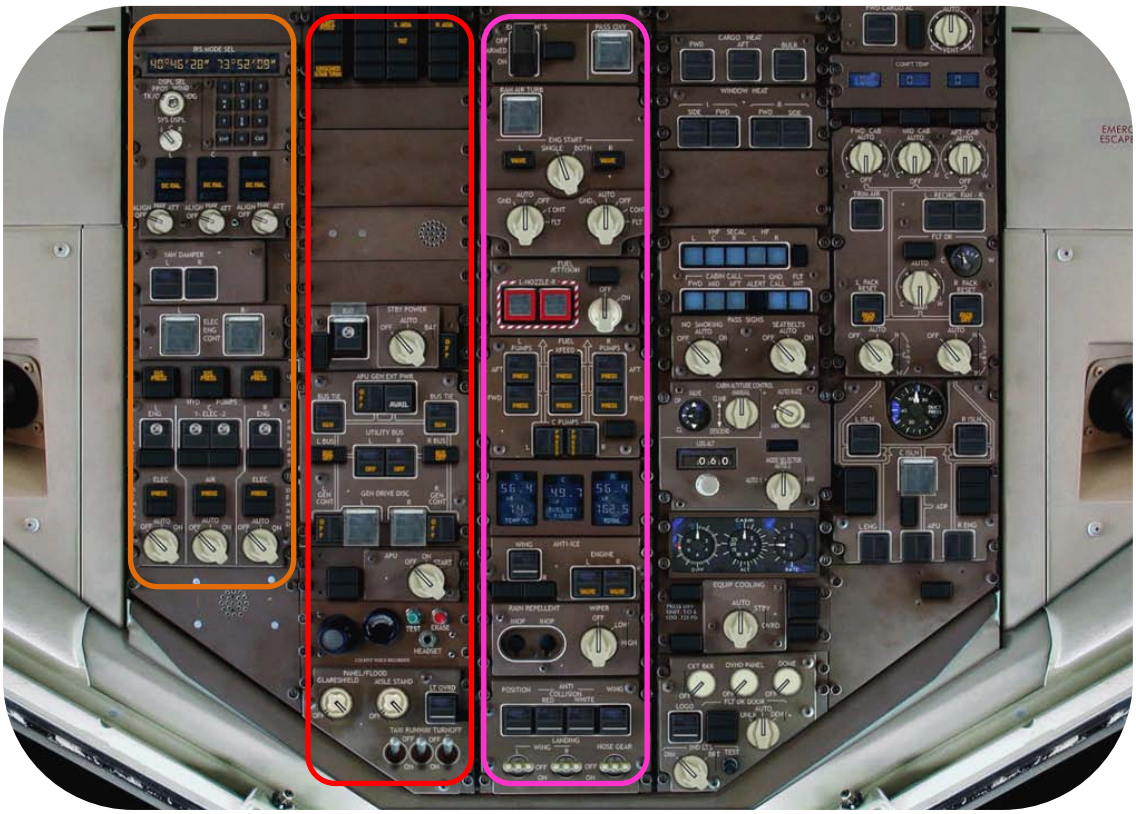
- Confirm the changes with the **OK** button. The selected flight plan will be loaded.
- Confirm this by clicking the **OK** button. A window pops up asking if Flight Simulator should move your aircraft to the departure airport at the assigned position.
- Click the **No** button. Our aircraft is via the previous page already positioned at the correct gate. Flight Simulator will load the flight plan data, but it will not reposition you.

Initialization part IV - Configure a **cold and dark** situation

On the **overhead** panel ..... Set the following switches, selector, knobs and others, in accordance with the figure below:

Note: All knobs (selectors) on the overhead panel are movable via the operation of the mouse buttons.
LH mouse button - counter clockwise
RH mouse button - clockwise

- DEMAND pump switches (3) **OFF**
- YAW DAMPER switches (2) **OFF**
- IRU selectors (3) **OFF**
- TAXI-RWY-TURNOFF-LT OVRD switches **OFF**
- APU selector **OFF**
- UTILITY BUS switches (2) **OFF**
- AC BUS TIE switches (2) **OFF**
- APU GEN switch **OFF**
- STBY POWER switch **OFF**
- LANDING LIGHT switches (2) **OFF**
- POSITION switch **OFF**
- RED-WHITE ANTI COLLISION switches **OFF**
- WING switch **OFF**
- WIPER selector **OFF**
- ANTI-ICE ENGINE and WING switches **OFF**
- FUEL PUMP switches (6) **OFF**
- FUEL XFEED switches **OFF**
- FUEL JETTISON selector **OFF**
- ENG IGNITION selectors **AUTO**
- ENG START selector **SINGLE** or **BOTH**
- EMER LIGHTS switch **OFF**

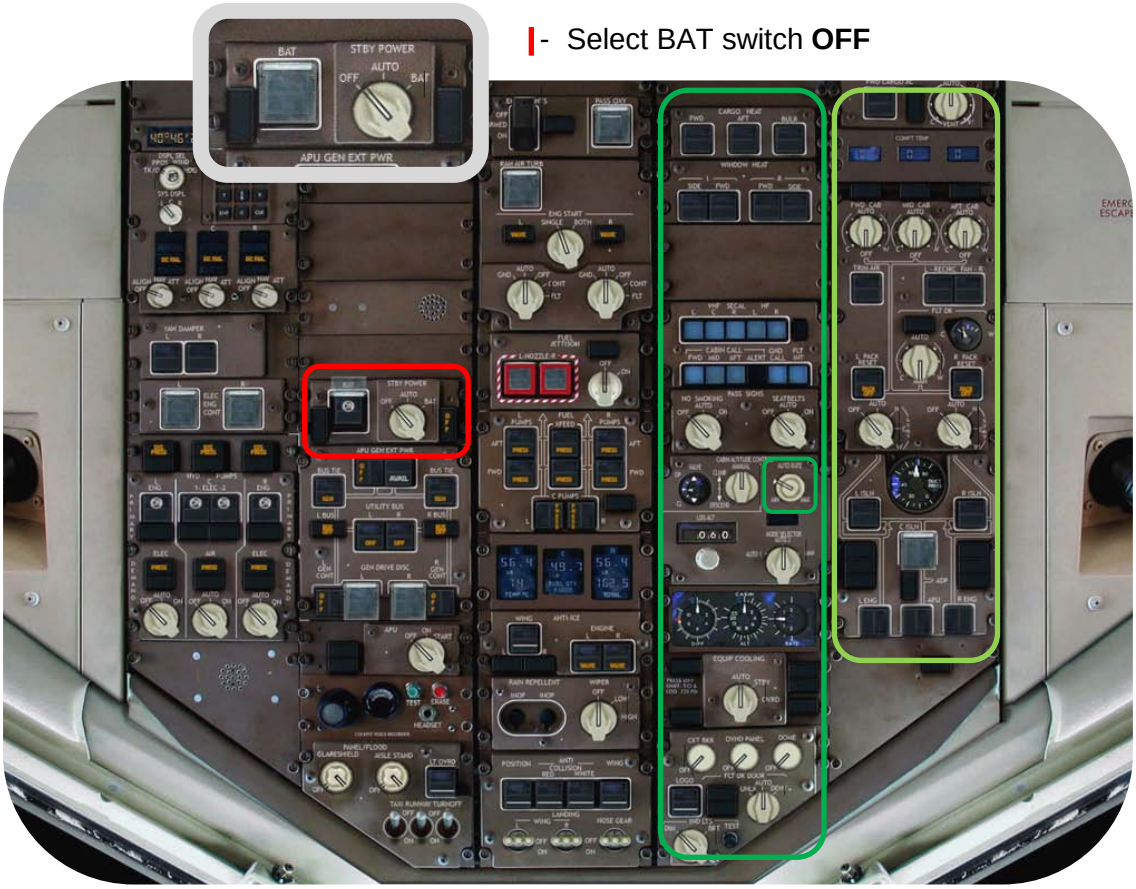


On the **overhead** panel (con't) .....

Set the following switches, selector, knobs and others, in accordance with the figure below:

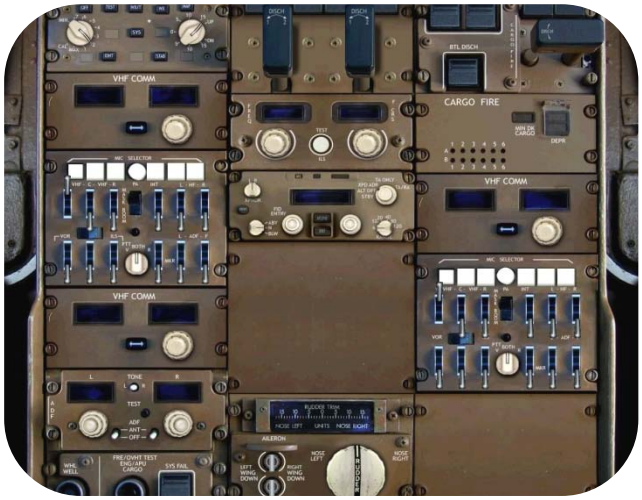
- IND LTS selector **DIM** or **BRT**
- FLT DECK DOOR selector **AUTO**
- LOGO light switch **OFF**
- CKT BRK-OVHD PANEL-DOME selectors **OFF**
- EQUIP COOLING selector **AUTO**
- CABIN ALT MODE selector **AUTO1** or **AUTO2**
- Set LDG ALT to **000**
- CABIN ALT selector **MANUAL**
- CABIN AUTO RATE knob opposite of **pointer**
- NO SMOKING selector **OFF**
- SEAT BELTS selector **OFF**
- WINDOW HEAT switches (4) **OFF**
- CARGO HEAT switches (3) **OFF**
- L/R ENG and APU BLEED switches (2) **OFF**
- L/R ISLN switches (2) **OFF**
- L-R PACK selectors (2) **OFF**
- TRIM AIR switch **OFF**
- L-R RECIRC FAN switches (2) **OFF**
- FWD-MID-AFT CAB selectors **OFF**
- FWD CARGO AC switch **OFF**
- FWD CARGO AC selector **AUTO** (12 o'clock)

- Select BAT switch **OFF**



On the **Radio Control** panel

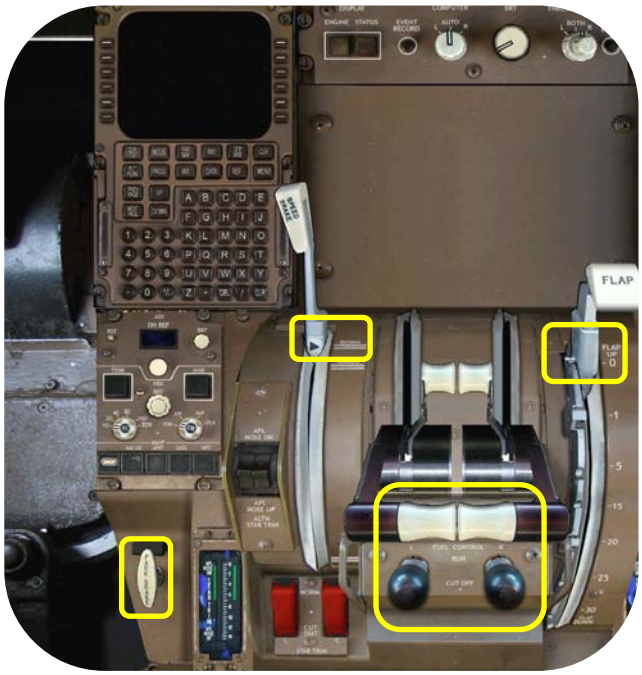
Verify for yourself that in your 767-300ER aircraft the following switches, indicator windows and others match the figure below.



On the **pedestal**

Set the following switches, levers, handles and others in accordance with the figure below:

- Throttles in **IDLE**
- FUEL CONTROL switches in **CUTOFF** position
- Spoiler handle in **DOWN** position
- FLAP handle **UP** in the **0** position
- PARKING BRAKE **SET (PULL)**

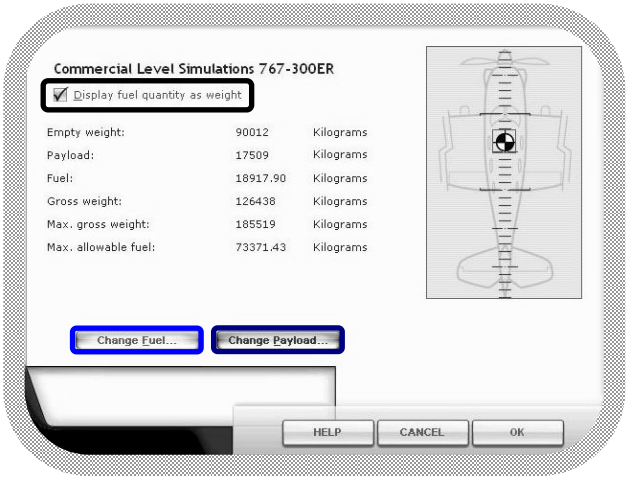


If you have followed the **Cold and Dark** procedure correctly, the Captain's main panel should look like the one shown below. We wish you a pleasant flight.

Fuel and Payload

For this tutorial, MSFS adjustments for fuel- and payload are used and although the screenshots represent FSX, the **settings** and **values** are applicable for FS2004 with minor changes.
For this flight, we need approximately 17.600 kg (kilogram) of fuel. This includes extra fuel for the APU during the flight, holding(s), ATC and others. Let say we **increase** to be safe this **value** to ± **18.900 kg** (121.000 lbs).

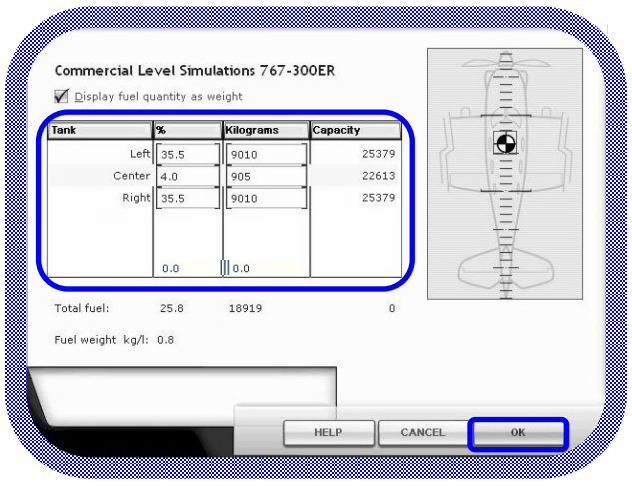
- Select **Aircraft** from the menu
- Select **Fuel and Payload**
- Tick **Display fuel quantity as weight**



Typical **FSX** Fuel and Payload (FS2004 menu similar)

- Select **Change Fuel…**
- Enter ± 9000 kg (32560 lbs) into the left and right fuel tanks. Once you leave the field, the value could slightly change.
- Enter ± 900 kg (27500.0 lbs) for the center fuel tanks. Once you leave the field, the value could slightly change.

- Click the **OK** button

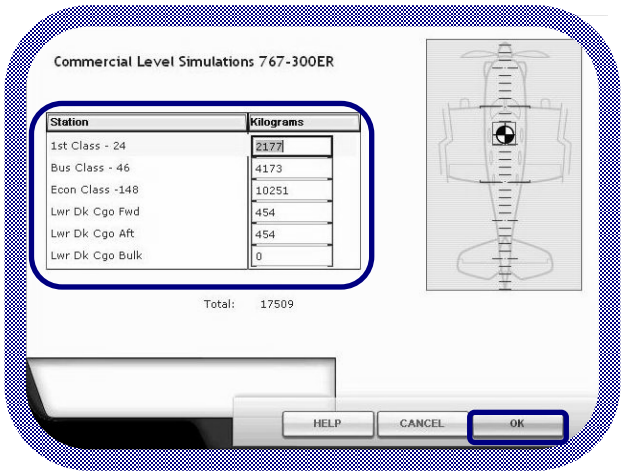


Typical **FSX** Fuel Settings (FS2004 menu similar)

- Select **Change Payload…**
- Enter the values as shown on the screenshot. One you leave the field, the value could slightly change.

- Click the **OK** button

- Click the **OK** button to close the FUEL and PAYLOAD window



Typical **FSX** Payload Settings (FS2004 menu similar)

Cockpit Preparations

Power Up

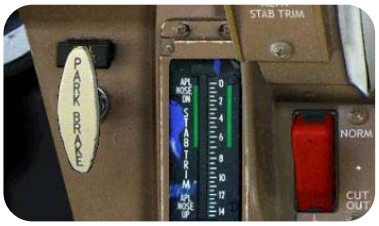
Aircraft Performance data ..... For the necessary calculations and settings, we have got collected the following data for you.

- **Aircraft data**;
  - ZFW ± **90.012** Kilogram (Zero Fuel Weight)
  - GW ± **126.433** Kilogram (Gross Weight)
  - TAKEOFF MAX N1
  - STAB TRIM setting **5°ANU** (Aircraft Nose Up)
  - Approximate TAKEOFF speeds (knots)
    V1 **129**
    VR **136**
    V2 **146**
  - ATC Squawk code **2667**
- **Environmental data:**
  - OAT **15°C** (68 F)
  - Barometric Pressure **1013 hPa** (29.92")
  - Weather conditions **calm**
  - Runway **22** (225°) and **dry**

On the **overhead** panel ..... To get the aircraft up and running, we need to connect the aircraft battery, STBY POWER and APU electrical and pneumatic power.

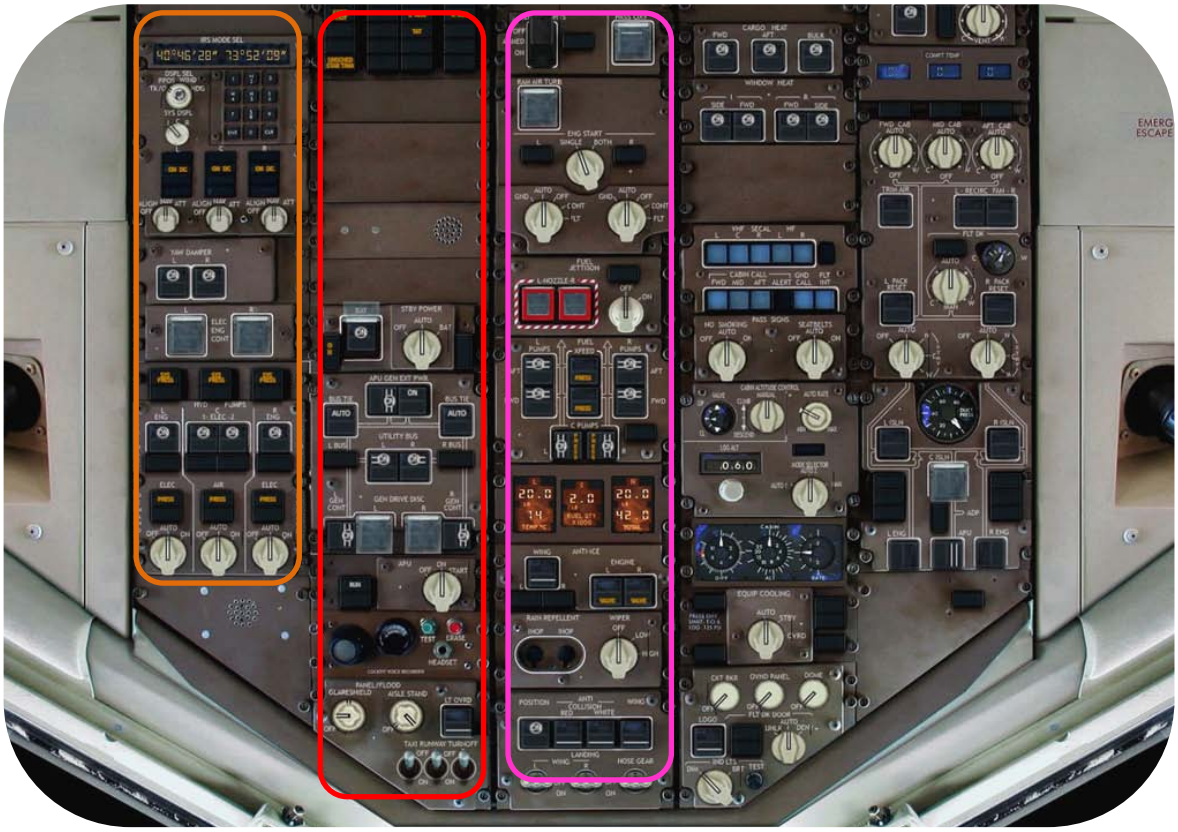
- Select the BATTERY switch **ON**.
- Set the STBY POWER selector to **AUTO**. Selecting to AUTO extinguishes the OFF legend while the ON legend illuminates.
- Place the APU selector to **START** and release the knob. The knob returns to the ON position while the white RUN legend illuminates.
- The APU GEN is automatically connected to the aircraft electrical system.

On the **pedestal** ..... - Verify that the PARKING BRAKE is **SET**



On the **overhead** Panel .....

- Set HYD DEMAND selectors in **AUTO**
- Select L and R YAW DAMPER switches **ON**
- Set all three IRU selector in **NAV**
- Select GLARESHIELD panel light selector **ON**
- Press L and R GEN CONT switches **ON**
- Select L and R UTIL BUS switches **ON**
- Select both BUS TIE switches **ON**
- Select POSITION (NAV) light switch **ON**
- Select all FUEL PUMP switches **ON**
- Select EMER LIGHTS in **ARMED** (light out)
- Verify that the ENG START selectors are in the **AUTO** position and the upper selector is set to the **SINGLE** position.



On the **overhead** Panel (con't) .....

- Select LOGO light switch as required
- Select NO SMOKING selector **AUTO** or **ON**
- Select SEATBELTS selector **AUTO** or **ON**
- Select all four WINDOW HEAT switches **ON**
- Set FWD/MID/AFT CARGO HEAT switches **ON**
- Select APU BLEED switch **ON**
- Select L and R PACK selectors in **AUTO**
- Select TRIM AIR switch **ON**
- Select L and R RECIRC FAN switches **ON**
- Set all three CABIN TEMP selectors in **AUTO**
- Select FWD CARGO AC switch **ON**

On the **main instrument** panel .....

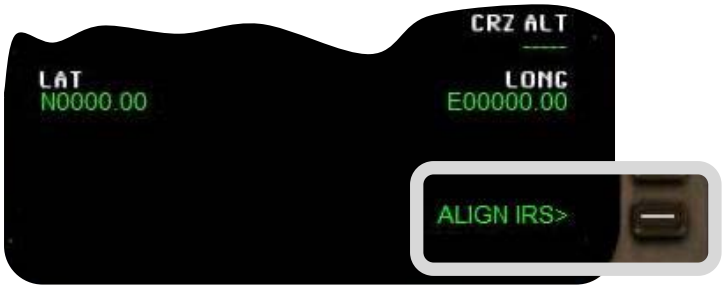
- Set baro setting to **1013**hPa or **29.92**inHg.
  Follow the **+/-** procedure as identified below.

The Captain and First Officer Virtual Cockpit indicators are interconnected therefore no need to make additional changes.

Call-up the **FMS CDU**

Note: For detailed FMS CDU description and operation look for **Chapter III Panel Description**.

- The FMS CDU should appear with the MAIN MENU page active. If not, click the MENU key on the CDU keyboard.
- Click LSK 3L **<INIT**
  This brings up the initialization page with some interesting data like CRZ altitude, flight plan going from KLGA to KATL etc.
- Click LSK 6R **ALIGN IRS>**
  When correctly done, the ALIGN IRS message disappears from the CDU screen.



- To continue to the next check, click the **MENU** key on the CDU keyboard.
- Click LSK 3R **FLT PLAN>** or you can use the **FLT PLAN key** on the **CDU** keyboard.
- This will confirm that your flight plan is loaded and that the loading process worked correctly.

- With the **UP**/**DOWN** keys on the CDU keyboard you can **scroll** thru the flight plan.
- The **PREV**/**NEXT PAGE** keys on the CDU allow you to switch between **TIME/TRK** and **DIST/FREQ** pages.

Call-up the **FMS CDU** (con't) .....

- Click on the CDU keyboard the **DEP/ARR** key.
- Click LSK 1L **<CALC/SET T/O V SPEEDS**
  This action leads to a calculation of V1, VR and V2 speeds as well as data for flap, gear and slat retraction and appears in the CDU display.

Values could slightly differ from your configuration.

- Bring the FMS CDU display to the normal pre-flight condition by clicking the **FLT PLAN** key on the CDU keyboard.

On the **MCP** (Mode Selector Panel) .....

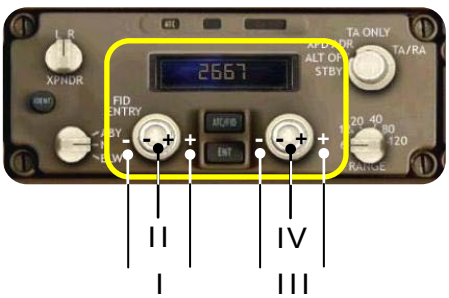
Make the following adjustments:

- Set the FD (Flight Director) switch to **ON**
- Set the A/T (Auto Throttle) switch to **ARM**
  Confirm the green **A/T** message on the EADI
- Set a speed in the ATS window of **156**
- Dial a HDG of **225°**
- Set an initial VS of **1800**
- Set an initial altitude of **6000** feet

On the **radio control** panel .....

- Set a transponder code of **2667**.

I 1st digit
II 2nd digit
III 3rd digit
IV 4th digit



On the **pedestal** .....

- Place the mode selector in **MAP** and click on the **CTR** text. This will bring the EHSI in the ROSE mode. Clicking again on the CTR text brings it in the EXPANDED mode.
- Set the range selector to **160** (nautical miles).

ROSE MAP mode

EXPANDED MAP mode

Clearly visible on the ROSE EHSI is the flight plan: RBC-BRAND-DAVYS-OOD etc.

For **clarity** during **TO** (takeoff) and **initial climb**:

- Set the RANGE selector back to **10** or **20** NM.
- Set the **EXPANDED MAP** mode.

On the **MCP** .....

Although not really needed since our flight will be FMS **flight plan controlled**, it is a good idea to select the first VOR/DME beacon (**RBV 113.8**). This gives us apart of the flight plan also some indication on the RMI.

- Dial **113.8** on the panel.
  There is no need to enter a CRS value.

I left digits
II right digits

On the **main instrument** panel ..... Perform an ANNUNCIATOR (filament) LIGHT check as follows:

- Click the **marked button** on the screenshot.
  All the annunciator lights on the main instrument panel and overhead panel as you can see below on the two screenshots.

For this tutorial we only display the main instrument panel and overhead panel. You can check the radio panel for faulty filaments on your own.

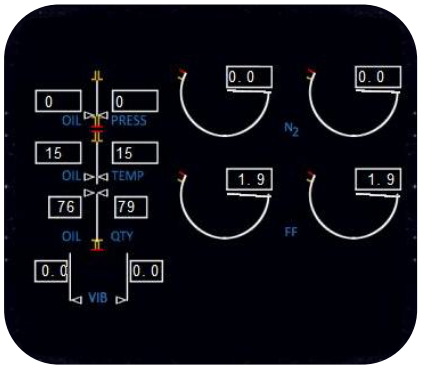
Before Engine Start

On the **pedestal** .....

- Please double check that the PARKING BRAKE is **SET** before engine start.
  When the brakes are correctly set, the **PARK BRAKE** light as indicated below should illuminate. Further more PARKING BRAKE is written on the upper EICAS DU (Display Unit).

- Confirm that the UPPER and in particular the LOWER EICAS DUs (Display Unit) shows the correct information for engine starting.
  See the two EICAS Displays on the left.

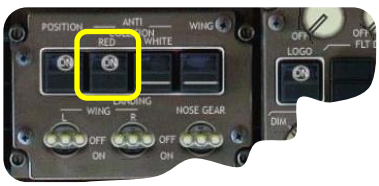
  Correct information is all the available engine data like N1, N2, EPR, EGT, OIL, VIB and FF.



- Push the **ENGINE** and/or **STATUS** pushbuttons to get the same display information as shown on the left EICAS screenshots.

On the **overhead** panel .....

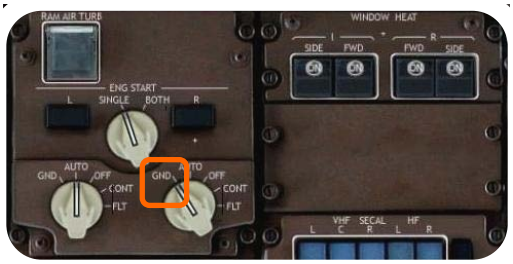
- Push the RED ANTI COLLISION switch to **ON**

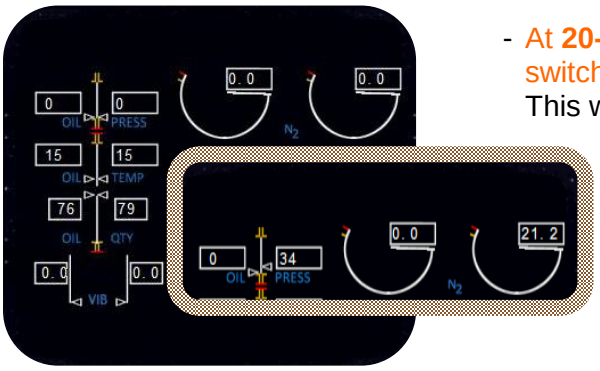


Engine Start

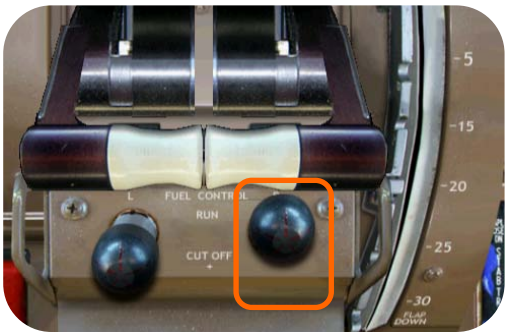
On the **overhead** panel .....

- Select **ENG START** selector engine number **2** to the **GND** position.
  The air starter will drive the N2 spool, which is visible on the respective LOWER EICAS N2 indicator. Also the OIL PRESS will rise and be visible on the LOWER EICAS display.





- At **20-22% N2**, select the **FUEL CONTROL** switch number 2 to **RUN**.
  This will start the ignition and fuel supply.



- The result is an **EGT rise**, a further increase of the **N1 and N2 spool**.
  Very important is the oil pressure increase.
  Wait until all parameters are stabilized.
- At the end of this start cycle, double check that **ENG START** selector number **2** has returned to the **AUTO** position.

Starting other engine ..... Ok, it is now up to you to start engine number 1 using the same procedures that we used to start engine 2.

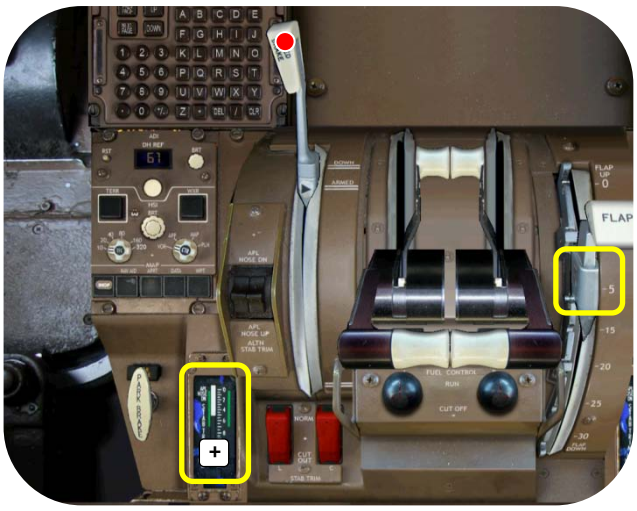
On the UPPER EICAS display ..... Check that all the amber messages are gone except for the PARKING BRAKE, which is set.

After Engine Start

Finalizing settings and adjustments

On the **pedestal** .....

- Set **STAB TRIM** to **5° ANU** (Aircraft Nose Up). Click the **"+"** area to adjust the stabilizer until the pointer equals value **5**.
- **ARM** the speed brakes by clicking once on the marked area -●- on the handle (see below).
- Select **FLAPS 5** units.
  Monitor actual FLAP position on the flap indicator on the main instrument panel.
  It also illuminates the amber TRAILING/LEADING EDGE indicator lights.



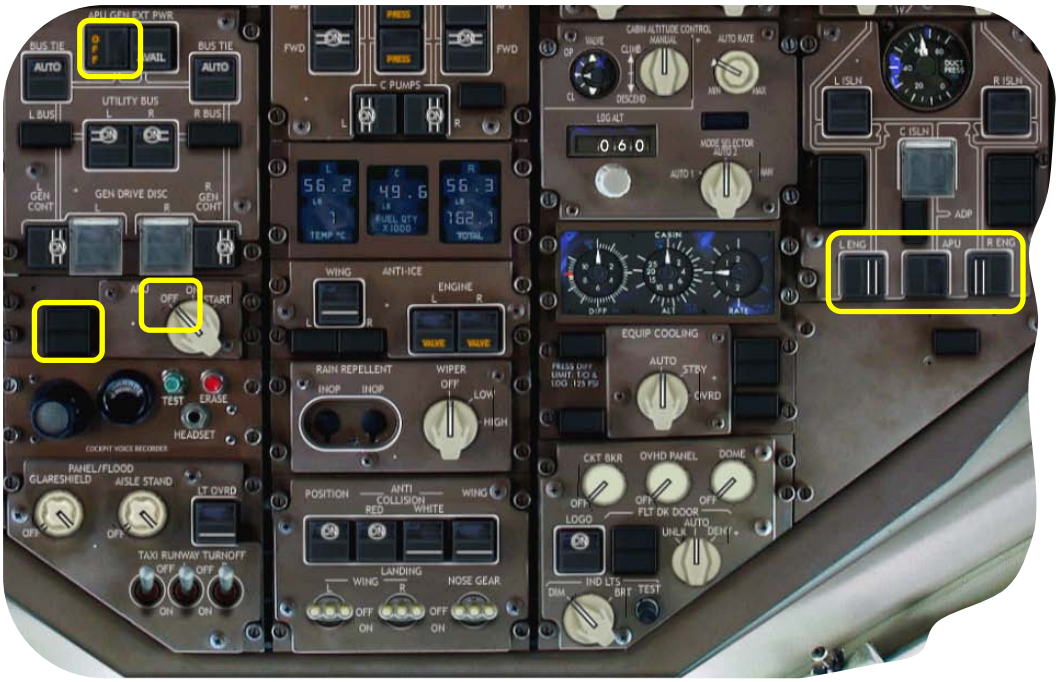
On the **main instrument** panel .....

- Verify that the **GPS NAV** switch is in the **ON** position. This connect the *lite* FMS to the AP.
- Select **AUTOBRAKES** to **RTO**.
- Click one time in the middle of the ENGINE STBY indicator. This will active the indication.

On the **overhead** panel .....

- Press the LH / RH ENG BLEED switches **ON**.
- Select the APU BLEED switch **OFF**.

- After you have selected the APU BLEED switch to OFF, you can turn the APU switch to **OFF**. This action results in the **extinguishing** of the APU **RUN** legend and the **illumination** of the APU GEN **OFF** legend.



Taxi Profile

After receiving ATC clearance (if applicable) we request the ground crew to start with the pushback.

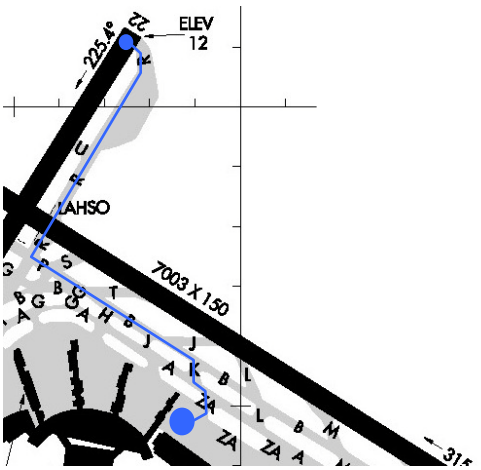
- PARKING BRAKES Press PERIOD (.) to release
- Start the pushback via keyboard combination "**Shift** + **P**". For further details for left/right rotation at the end of the pushback, see MSFS.
- For more realism, connect the CLS pushback truck via the simicon.

On the **overhead** panel .....

- After our pushback and cleared for taxi, we need to perform the following actions:
  - Select the RUNWAY TURNOFF switches **ON**
  - Select the WING switch **ON**

Taxi to **runway 22** .....

Taxi from your gate **A4** (gate A2 for FS9) via taxiways ZA - K - B - P - R to **holding point** runway **22**



TO Profile

On the **overhead** panel .....

- Select the WING and NOSE GEAR LANDING lights switches **ON**.
- Select the WHITE ANTI COLLISION switch **ON**

Commence Take Off .....

- Align the aircraft with runway centerline
- Press the brake pedals - if you have them - to keep the aircraft in the current position.
- Increase the throttles to approximately 60% N1, pause briefly to verify that the engines have run-up properly.
- Watch the **EPR**, **N1**, **EGT** and **N2** gauges on the main instrument panel.
- Advance the throttles to **MAX TO** thrust.
- While TO in progress, watch your V SPEEDS

Overview Captain's/Co-Pilots panel during T/O

At aircraft rotation ..... - At **V_R**, gentle pull and bring the aircraft into approximately **10°** PITCH UP position.

When there's a positive climb ..... - While holding the pitch **raise the landing gear** after **V_2** as follows;
- Click the landing gear handle **UP** or use the **keyboard** command **G**.
- Verify all **gear lights extinguish**.

- Maintain a speed equal to **V2+10** That is our earlier set 156 knots at the MCP.
- Maintain runway **HDG 225°** as set on the MCP.

Note: After take off the **AUTOBRAKE** selector returns automatically to the **OFF** position.

Climb Profile

At Thrust Reduction Altitude (1500') .....

- Retract FLAPS in steps to **0** units
  Note the maximum speeds limits:

FLAP position	Maximum Speeds (knots)
1	**250**
5	**230**
15	**210**
20	**210**
25	**180**
30	**180**

See also CLS 767 Series **Operations Manual**.

On the **MCP** .....

- Press/select the **SPD** button.
- Engage **C CMD** AP channel
  This extinguishes the **AUTOPILOT DISC** information on the upper EICAS and the annunciator panel as well as the AUTO PILOT message on the annunciator panel.
- Press/select the **LNAV** button.
  This connects your FMS flight plan to the AP.
- Press/select the **ALT HOLD/VS** pushbuttons

On the **EADI** flight annunciations .....

- Integrated in the EADI you will find the Flight Mode Annunciations. After you have selected the different modes on the MCP and engaged the CENTER AP, the EADI shows:
  - **SPD** mode active.
  - **A/T** (Auto Throttle) mode engaged.
  - **ALT HOLD** mode engaged.
  - **LNAV** (Lateral Navigation) mode active.
  - **CMD** - CENTER AP (Auto Pilot) engaged.

On the **overhead** panel .....

- Set the RUNWAY TURNOFF switches to **OFF**.
- Select the WING light switch to **OFF**.

On the **pedestal** ..... - DISARM - see● - the speed brakes or move the handle to the DOWN position.

Passing FL070 (7000')
On the **MCP** ..... Although we have just passed FL070, we already receive a clearance for FL220 (22,000 feet). Make the following settings:

- Set the altitude to **22,000 feet**
- Increase the SPD to **250**
- Align the HDG with the actual track. In this example, this is **HDG 233**. The reason to do this is to keep the HDG selector/indication on the MCP and EHSI equal to the A/C TRACK.

Somewhere between FL075 and FL090
On the **main instrument** panel ..... Below you'll find explanation of the **EHSI** and the **DRMI** (Distance Radio Magnetic Indicator).

You have tuned for VOR **RBV** (113.80). According to the EHSI and DRMI **RBV**, you are ± 7NM from that waypoint. The flight plan shows you in magenta that it's tuned for RBV.

We are 3.8NM ahead of RBV however, the flight plan is pointing to BRAND because it is now magenta. According to the EHSI, we are 17.7NM from BRAND.

We have passed RBV 4.5NM (still tuned). The RVB indicator arrow is pointing backwards. The flight plan tells you that BRAND is still 11.6NM to go.

Passing FL100 (10,000 feet)
On the **overhead** panel ..... - Select **WING** and **NOSE GEAR LANDING** switches to the **OFF** position.

On the **MCP** ..... - Increase the SPD to **300**

At TRANSITION altitude (18,000 feet)
On the **main instrument** panel ..... - Set BARO PRESSURE on altimeter to Standard Atmosphere.
While we started from LGA with 1013 mbar, there is no need to adjust this.

Approaching FL220 (22,000 feet)
On the **main instrument** panel ..... Before reaching FL220, you can proceed directly to your final cruising altitude.
- Set an altitude of **34,000 feet**.

On the **MCP** panel ..... - Set NAV 1 to **112.80** (VOR/DME **OOD**)

On the **main instrument** panel ..... These images show you the influence of different **DME** indications on the DRMI and the EHSI.

The DRMI shows via the VOR 1 selector arrow the direction and distance of VOR/DME beacon **OOD**. This is shown as 39.3 NM. Remember, the indications are from the VOR 1 panel left of the MCP. One step before, we entered frequency **112.80**, which is from VOR/DME **OOD**.

The EHSI is connected to the FMS via the GPS NAV switch and shows the distance to the upcoming waypoint BRAND. Remember, the first waypoint is always magenta!
Waypoint BRAND is no more then 3.8NM away from us and before you know it, the FMS changes to DAVYS.
Not yet visible on the EXPANDED MAP mode, the next waypoint will be OOD.

Approaching FL300
On the **MCP** .....

- Press the SEL button underneath the SPD window. The display changes to Mach.
- Deal via the SPD knob to **0.78** Mach. Confirm that the **SPD** message on the EADI disappears. This confirms MACH is active.

Approaching FL340
On the **main instrument** panel .....

Aircraft is approaching our cruise altitude, which means that;

- **ALT ALERT** message illuminates.
- V/S indicator returns to 0 when actual altitude is equal to selected altitude.

Cruise Profile

Relax and enjoy

Although our cruise lasts for only a few hours, it is still a relaxing time. The landscape passing under us is not the most impressive that you could hope for. Nevertheless, when you have installed some of the add-on programs, it all becomes more attractive.
Anyway, enjoy this short cruise flight moment of relative rest before the descent starts.

100NM or earlier before VOR **SPA** ·····

Wake up!
It's time to study the following three pages before your actual descent and approach starts.
You also need to enter the VOR SPA frequency to have additional DRMI DME data available.

- Enter VOR/DME **SPA** frequency **115.70**

Descent, approach and landing preparations

Top Of Descent (TOD)

It is a good moment to review our descent, approach and landing at KATL.
Proper descent planning is necessary to ensure proper speed and altitude at the arrival point.
Descent rates are as follows:

Intended speed	**Descent Rate**	
	Clean Configuration	with **speed brakes**
0.785/ 300 knots	**2300** FPM	5500 FPM
250 knots	**1400** FPM	3500 FPM
VREF 30 + 80knots	**1100** FPM	2400 FPM

Generally, plan the descent so that your aircraft is approximately at FL100 / 250 knots at 30 NM from the airport.
To calculate the point of beginning of our descent, we will use the old-fashioned rule of thumb, saying that distance to descent roughly equals the number of thousands of feet of altitude that we are to descend multiplied by three, plus five.
Oops, that seems complicated! Let us take this flight as example. In our case, we have to descend from 34,000 feet to roughly sea level. This means the distance from our destination at which we should start our descent is then (34000/1000) x 3 = 102NM.

In our case, it is good to **start your descent** between waypoint **COLZI** and VOR/DME station **SPA.** When we tune for SPA (115.70) and the DRMI indicates roughly between 80 to 50NM, than it is a good moment to start the descent.

ID	FREQ	TRK	DIST	Coords	Name/Remarks
KLGA		0	0	N40°46'37.80" W073°52'21.60"	LA GUARDIA
LAURN		233	18	N40°33'05.80" W074°07'13.67"	LAURN
RBV	113.8	232	27	N40°12'08.65" W074°29'42.09"	ROBBINSVILLE
BRAND		240	15	N40°02'06.28" W074°44'09.50"	BRAND
DAVYS		240	10	N39°55'20.60" W074°53'49.77"	DAVYS
OOD	112.8	240	25	N39°38'09.69" W075°18'10.89"	WOODSTOWN
STIKY		236	30	N39°16'47.71" W075°45'58.75"	STIKY
BROSS		236	8	N39°11'28.40" W075°52'49.88"	BROSS
AGARD		236	13	N39°02'36.89" W076°04'11.14"	AGARD
GRACO		235	9	N38°56'29.81" W076°11'59.22"	GRACO
OTT	113.7	251	29	N38°42'21.12" W076°44'41.08"	NOTTINGHAM
BOOYA		248	34	N38°24'20.50" W077°21'46.36"	BOOYA
GVE	115.6	247	44	N38°00'48.96" W078°09'10.89"	GORDONSVILLE
LYH	109.2	237	69	N37°15'16.72" W079°14'11.28"	LYNCHBURG
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
COLZI		232	65	N36°13'39.45" W080°30'31.73"	COLZI
SPA	115.7	231	100	N35°02'01.13" W081°55'37.37"	SPARTANBURG
KATL		242	150	N33°38'12.00" W084°25'40.80"	HARTSFIELD JACKSON ATLANTA INTKA

Overall approach planning with ATC/airport clearance available:
- 250 knots below FL100 at around 30NM from the airport
- 180-230 knots while 23 NM out of the airport
- Slow down to VREF at GS[1] capture
  VSPEEDS can be found at the CDU APPROACH page.

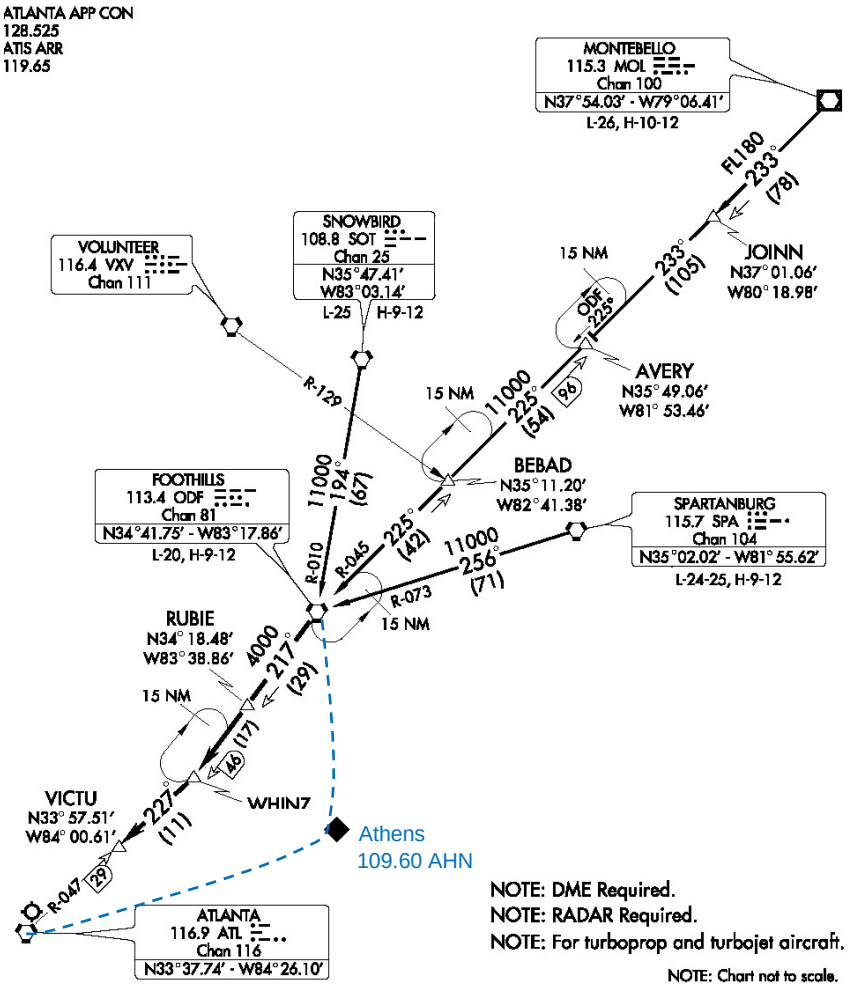
[1] Glide Slope, part of the Instrument Landing System (ILS)

Standard Terminal Arrival Route (STAR)

To make it a little easier this time, let's assume our landing at KATL is on **runway 26R**, which is a CAT II runway. For this runway the intended STAR to use is **WHINZ ONE ARRIVAL** (WHINZ.WHINZ.1). The STAR starts at waypoint or VOR/DME station **MOL**, while our last flight plan waypoint is SPA. This discrepancy is normal. So we can either remove the last waypoint from the flight plan and end with MOL or leave it as it is and fly to SPA. In real life, mostly the last part of the flight is via radar vectors.

We will now have a closer look at the STAR **WHINZ ONE ARRIVAL** (WHINZ.WHINZ.1).
For clarity, I removed some parts of the original drawing otherwise it becomes too complicated.
Suppose we maintain the flight plan as it is, then we should pass **VOR/DME SPA** at **FL110**.

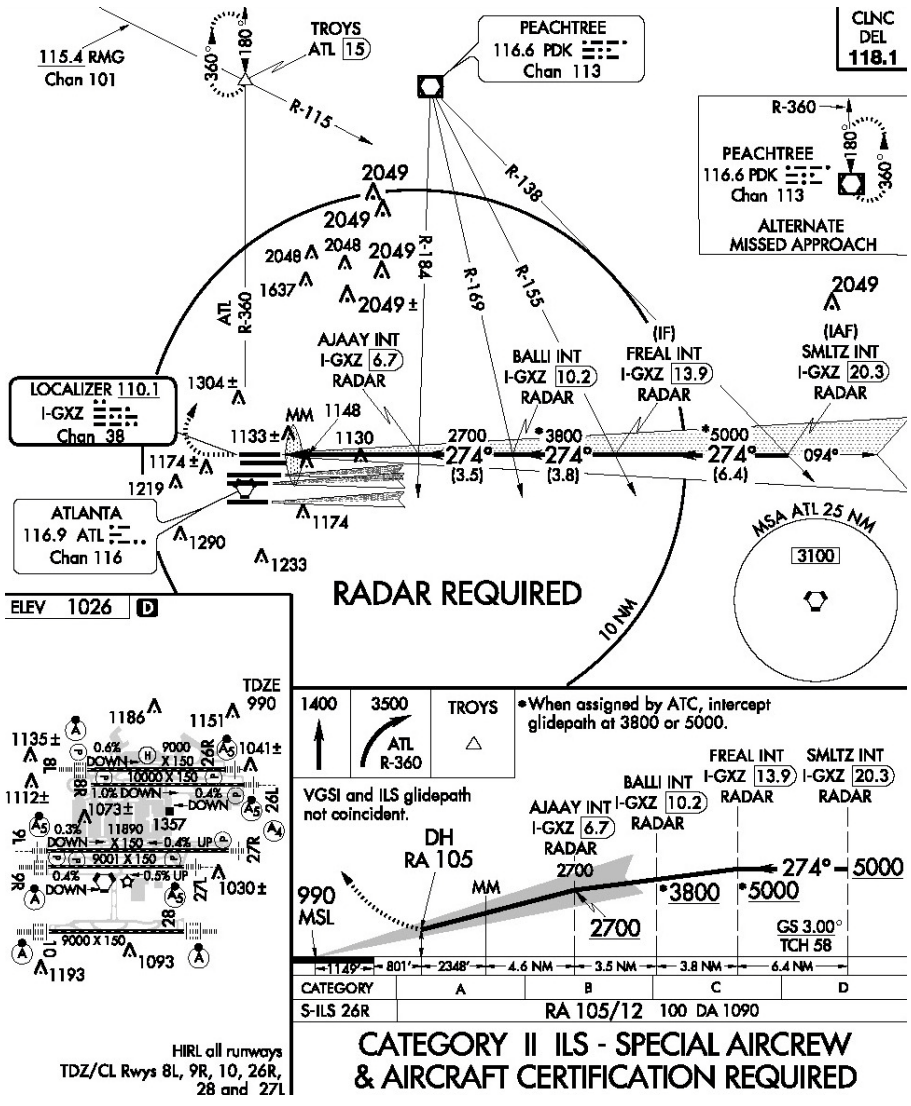
The previous calculation is based on flying via SPA to KATL. On a heading of HDG 256°, in approximately 71NM we arrive at **VOR ODF** where we need to be at 8000 feet. Since the other waypoints on the original flight plan don't have a VOR station, we divert to **VOR/DME AHN** (109.60), which is located to the right of KATL. After AHN, we tune to **VOR/DME ATL** (116.90) and fly in this direction.
Ok, a lot of information and therefore, we at CLS advise you to print out this page and keep it next to you when we start our descent, approach, final approach and landing.



ILS CAT II runway 29R KATL

We have already discussed the planned or proposed runway for landing at Atlanta.
For making a successful landing we need the **ILS frequency** or I should say the **LOC** (localizer) frequency, which is **110.1** with a course of **274°**. That's it!
Since the CLS 767 doesn't have a functional IRS (Inertial Reference System) or GPS, for navigation we can only use VOR and/or NDB beacons. Let's stick to VOR beacons; we could enter the DRMI reading VOR/DME beacon ATL (Atlanta).
This beacon is of course not in line with our ILS, but it's close and will help us when we've passed VOR beacon **AHN**.

Conclusion:
Flying towards VOR/DME AHN (109.60), we change the frequency 10NM before this beacon to VORTAC ATL (116.90). When we're close enough to ATL (roughly 15-20NM), we change to the ILS frequency (110.10 with a course of 274) for runway 26R. As you can see below on the drawing, this is slightly different but don't worry, you'll manage it.
When we've done all of this, it should not go wrong, so let's go for it!



Descent Profile

Approximately **75NM before** VOR **SPA**
On the **MCP** .....

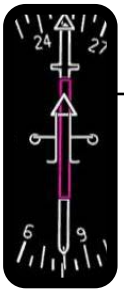
Make the following settings:
- Set an initial altitude of **11,000** feet.
- Press the **SEL** button next to the THR pushbutton. The speed window will change from Mach to IAS.
- Enter an IAS of **280** knots.
- Set a vertical speed of **-2200** fpm.
  Because of the selected vertical speed, you may need to use the speed brakes.
  Use of the speedbrakes will help to keep the IAS within limits.

Passing thru FL180 (18,000')
On the **main instrument** panel .....

- Press **B** on your keyboard.
  This will sets the current barometric pressure belonging to your MSFS environmental conditions. Via ATIS[2] additional weather information can be retrieved on frequency 119.65.

[2] Automatic Terminal Information Services

Approximately **10-15NM** before VOR **SPA**
Make the following settings



On the **MCP** / **VOR1** panel:
- Dial **113.4** (VOR/DME station ODF) and enter a course which results in the **CDI**[3] coming **in-line** with the EHSI **needle**.
- Press the **HDG** button and dial a heading that equals the previous entered course where the CDI is in-line with the needle.
  Remember that this alignment process, adjusting the VOR course on the VOR1 panel and the HDG value on the MCP, becomes more frequent the closer you come to the VORTAC station.

On the **main instrument** panel:
- Set the GPS NAV switch to **OFF**.
  This disconnects the FMS from the Auto Pilot.

On the **pedestal**:
- Select CTR or EXPANDED **VOR** mode for the EHSI instrument.

[3] Course Deviation Indicator

Oops, that was a lot of information so let's split it into understandable sections.
Our original flight plan runs from VOR SPA directly to KATL and that's not what we want.
We want to **fly** from VOR SPA to **VOR ODF**. To get this working we need to leave the flight plan behind us thus we need to select the **GPS NAV switch** to **OFF**.

Doing this automatically **disables** the **LNAV flow bar** in the pushbutton on the MCP. Now we need to tell the Auto Flight system that we want to go to VOR ODF, but therefore, we need to change the **EHSI indication** from EXPANDED MAP mode to **CTR** or **EXPANDED VOR** mode.

Then we need to enter not only the **VOR 1 (ODF)** frequency but also the course information. The frequency is **113.40** and the course depends on your actual flight situation, but it isn't difficult.
The only thing you need to do by entering a course, is to make sure look that the **CDI** (Course Deviation Indicator) is in line with the needle. In this example (EHSI in EXPANDED VOR mode) we've entered the correct frequency, but not the correct course.
As you can see in the EXPANDED VOR EHSI, the selected course is 256 and the CDI (magenta double needle) is not in line with the magenta single needle. Just turn the course knob until the magenta needles are in line. Aligning the CDI is easier when you choose the CTR VOR mode, as can be seen in the first EHSI picture.

Finally, you need to **enter** a **HDG** that equals the CDI indication thus the course you just selected. In this tutorial, this is a HDG of 232°. Remember that these values could differ from yours and that the **AP follows** the **HDG selection** on the **MCP** and not the COURSE setting entered on the VOR 1 panel. That is used only to tune for a specific VOR station!

Let me give you one last example regarding the HDG window on the MCP versus the EHSI CTR VOR indication.
As you can see, I've selected a HDG of 264° on the MCP. On the EHSI, this is the magenta HDG bug. While the aircraft is paused, the actual aircraft HDG is 250° and the selected COURSE for the VOR beacon is also 250°. The selected course in the VOR1 window is only for the CDI.
The moment you release the MSFS pause condition, the aircraft will directly follow a HDG of 264° because the course selection has nothing to do with the Auto Pilot control.

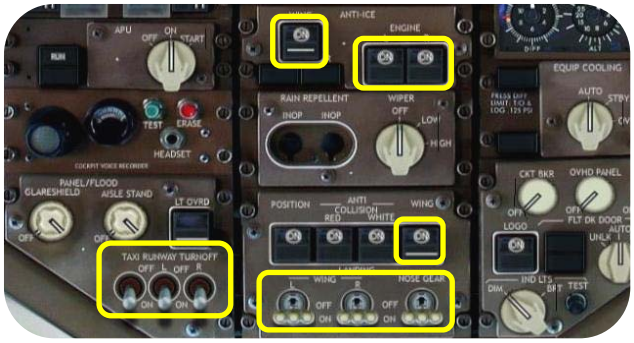
I hope this additional information has helped you with the HDG, COURSE, VOR settings and possible indications.

Approximately **50NM** before VORTAC **ODF**
On the **MCP** ..... - Enter a new altitude of **8000** feet, followed by a vertical speed of **-1200**.

Passing thru FL100 (10,000')
On the **MCP** ..... - Reduce the speed to **250** knots.

On the **overhead** panel ..... Just after you have passed FL100, set the following light switches in the correct position:

- WING and NOSE GEAR LANDING lights switches **ON**
- RUNWAY TURNOFF switches **ON**
- WING light switch **ON**
- WING ANTI-ICE as required
- ENGINE ANTI-ICE as required



Leveling off at FL080 (8000') ..... You should reach this altitude at or close to VORTAC **ODF** (Foothills).

Important **approach data** .....

- Passed VOR **AHN**:	FLAPS 1 (210 knots)
- 55NM for VOR **ATL**:	FLAPS 5 (203 knots/↻ 3000')
- leveling 4000':	FLAPS 10 (183 knots)
- Localizer alive:	FLAPS 20 (152 knots)
- Glide Slope alive:	FLAPS 25 (135 knots)
	GEAR DOWN
- Final ILS:	FLAPS 30 (134 knots)
- **ILS 26R KATL:**	**110.10 (274°)**

Approach Profile

Approximately **10NM** before VORTAC **ODF**
On the **MCP** .....

Note: The **COURSE** and **HDG** values in this example could differ from yours. Remember, you're never at the same longitude and latitude position as in this tutorial.

- Enter a new altitude of **6000** feet, followed by a vertical speed of **-1200**
- Reduce the speed to **227**
- Enter frequency **109.60** (VORTAC AHN) in VOR 1 panel and set a **COURSE** in such a way that the CDI becomes in-line with the needle.
- Adjust the **HDG** knob to the **same value** as selected in the previous VOR 1 panel.
  This results in a HDG change because the AP is connected to the HDG knob. When the CDI moves slightly out of the middle, adjust as far as needed to get it back, followed by the HDG.

Approximately **10NM** before VORTAC **AHN**
On the **MCP** .....

- Dial frequency **116.90** (VORTAC ATL) in VOR 1 panel and set a **COURSE** in such a way that the CDI becomes in-line with the needle.
- Adjust the **HDG** knob to the **same value** as selected in the previous VOR 1 panel.

After you have entered the above frequency, the EHSI and DRMI will approximately indicate 60-65NM. This is the current distance to VORTSAC ATL and not to runway 26R.

Passed VORTAC **AHN** .....

On the **pedestal**:
- Select **FLAPS 1**
- **ARM** the speed brakes.

On the **MCP**:
- Enter a speed of **210**

On the **main instrument** panel:
- Select the AUTOBRAKE switch in position **2**

Approximately **55NM** before VORTAC **ATL**
On the **MCP** .....

- Set a speed of **200** knots
- Set FLAPS **5** on the pedestal or use **F7**
- Select an altitude of **4000'**
- Select a vertical speed of **-1200**

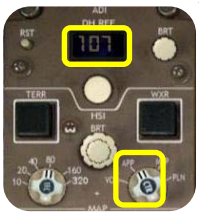
Leveling off at 4000'
On the **MCP** / **pedestal** .....

- Reduce the speed to **183** knots
- Set FLAPS **15** on the pedestal

Approximately **25NM** before VORTAC **ATL**
On the **MCP**

- Set your final altitude of **3000'**
- Select a vertical speed of **-1200**

Approximately **20NM** before VORTAC **ATL**



On the **pedestal**:

- Select for the EHSI the **CTR APP** mode. You can leave the RANGE selector in any position since in CRT mode it has no function.
- Enter a DH (Decision Height) of **107**. According to your drawing on page 35, the official value should be 105.

On the **MCP**:

- Enter in the VOR1 panel the **ILS** frequency **110.10** of runway 26R including a runway course of **274°**. You can also enter the frequency and course on the dedicated ILS panel, located in the middle of the radio panel.
  Note: The HDG mode is still active!

Final Approach

Approximately **10-15NM** before VOR **ATL**

LOC signal alive .....

On the **MCP**:
- Reduce the airspeed to **152**
- Set FLAPS **20** on the pedestal or via **F7**
- Select the **APP** pushbutton. Automatically the **LOC** (localizer) button flowbar will illuminate as well.
- Deselect the **HDG** button

G/S signal alive .....

On the **MCP**:
- Reduce the airspeed to **135**
- Set FLAPS **25** on the pedestal or via **F7**
- Select the gear handle on the main instrument panel **DOWN** or use the **G** keyboard command. Monitor for three green lights.

Stabilized on the **ILS** path .....

On the **MCP**:
- Reduce the airspeed to **134**
- Set FLAPS **30** on the pedestal or via **F7**
- Dial a **HDG** of **275** and set already a missed approach altitude of **3500'**.

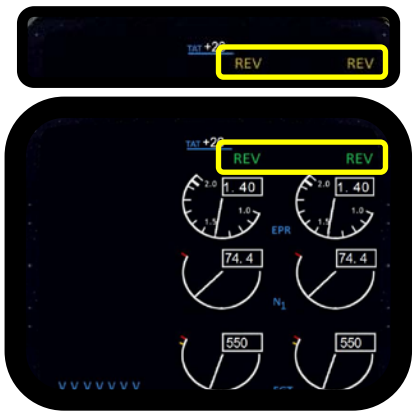
At approximately **400' RA** .....

On the **MCP**:
- Disconnect the C AP with the **DISENGAGE** bar. This will extinguish the C CMD and SPD flow bar in the pushbuttons.
- Disconnect **A/T** switch

These actions result in the following warnings and cautions on EICAS and the annunciator panel:
- AUTO PILOT DISC
- AUTO THROTTLE DISC
- A/P DISC
- AUTO PILOT
- A/T DISC

Touchdown and taxi

On the **pedestal** .....



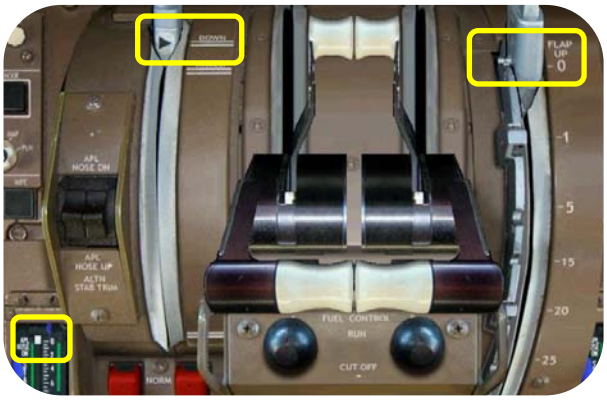
- Select ENGINE **REV THR**
  During reverser doors transit, the upper EICAS shows in **REV**. When fully deployed **REV** turns into green.

Taxi to gate ……

On the **pedestal** ……

Taxi to a gate of your choice however, during taxi make the following settings:

- Select FLAPS **0**
- Disarm the SPEED BRAKES.
  Confirm that the amber SPD BRK light extinguishes on the annunciator panel.
- Return the thrust reversers to **FWD IDLE**
- Return the **Horizontal Stabilizer** to **0**



On the **overhead** panel……

- Select the LANDING light switches **OFF**
- Select the WHITE COLLISION light switch **OFF**

On the **MCP** ……

- Disconnect the **FD** (Flight Director) switch
- Disconnect the **APP** pushbutton

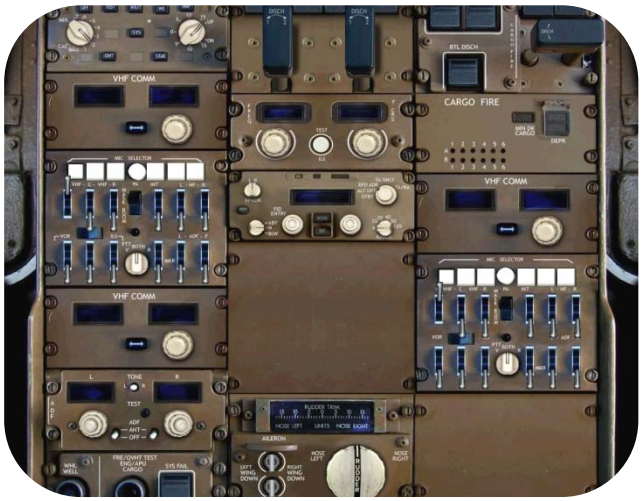
Cockpit Termination

Arriving at your assigned gate

On the **pedestal** .....

- PARKING BRAKES Press PERIOD (.) to release
  This will illuminate the amber **PARKING BRAKE** legend as well as a message on EICAS.
- Select the Engine FUEL LEVERS **OFF**

On the **radio control** panel ..... Verify for yourself that in your 767-300ER aircraft the following switches, indicator windows and others are in accordance with the figure below.



On the **overhead** panel

Set the following switches, selector, knobs and others, in accordance with the figure below:

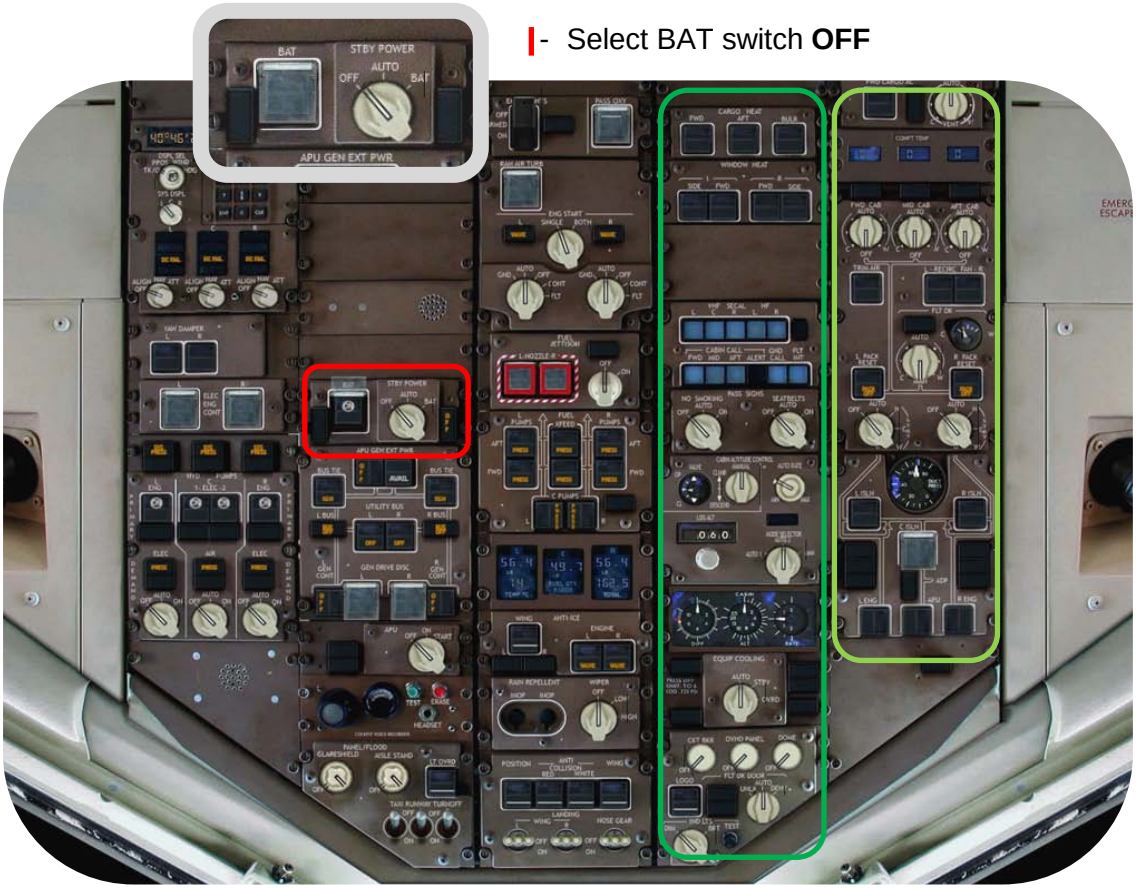
- DEMAND pump switches (3) **OFF**
- YAW DAMPER switches (2) **OFF**
- IRU selectors (3) **OFF**
- TAXI-RWY-TURNOFF-LT OVRD switches **OFF**
- APU selector **OFF**
- UTILITY BUS switches (2) **OFF**
- AC BUS TIE switches (2) **OFF**
- APU GEN switch **OFF**
- STBY POWER switch **OFF**
- POSITION switch **OFF**
- RED ANTI COLLISION switch **OFF**
- WING switch **OFF**
- WIPER selector **OFF**
- ANTI-ICE ENGINE and WING switches **OFF**
- FUEL PUMP switches (6) **OFF**
- FUEL XFEED switches **OFF**
- FUEL JETTISON selector **OFF**
- ENG IGNITION selectors **AUTO**
- ENG START selector **SINGLE** or **BOTH**
- EMER LIGHTS switch **DISARM**

On the **overhead** panel (con't) .....

Set the following switches, selector, knobs and others, in accordance with the figure below:

- IND LTS selector **DIM** or **BRT**
- FLT DECK DOOR selector **AUTO**
- LOGO light switch **OFF**
- CKT BRK-OVHD PANEL-DOME selectors **OFF**
- EQUIP COOLING selector **AUTO**
- CABIN ALT MODE selector **AUTO1** or **AUTO2**
- Set LDG ALT to **000**
- CABIN ALT selector **MANUAL**
- CABIN ALT AUTO RATE opposite of **arrow**
- NO SMOKING selector **OFF**
- SEAT BELTS selector **OFF**
- WINDOW HEAT switches (4) **OFF**
- CARGO HEAT switches (3) **OFF**
- L/R ENG and APU BLEED switches (2) **OFF**
- L/R ISLN switches (2) **OFF**
- L-R PACK selectors (2) **OFF**
- TRIM AIR switch **OFF**
- L-R RECIRC FAN switches (2) **OFF**
- FWD-MID-AFT CAB selectors **OFF**
- FWD CARGO AC switch **OFF**
- FWD CARGO AC selector **AUTO** (12 o'clock)

- Select BAT switch **OFF**



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CLS Frequently Asked Questions

Question **Why is there a 767 Easy version?**

Answer *In the Commercial Level D simulators, I found that the previous FDE versions for the 767 had the correct performance, however, the feel was not correct. I adjusted the FDEs to reflect the actual aircraft performance and feel. This will cause the plane to be extremely difficult to fly for beginners, those who do not have much flight experience, or simply do not care about realism. The N767EZ FDE will allow users to fly as they wish, without realistic performance.*
Note, however, no support will be giving by CLS on this easy version, as the FDE is merely a converted default Microsoft 777. If you can fly the 777, then you can fly the N767EZ.

Question **The FDE is much harder to fly than before.**
The plane is more difficult to handle. What happened?

Answer *After spending time in DC-10, 737, 747-400, 757, 767, and 777 Level D simulators, I realized that the performance for the previous generation of FDEs was there, however, I grossly underestimated the actual "feel" of large aircraft. In large commercial airliners the control surfaces are effective, however, the sheer mass and inertia of the plane cause delays in how quickly the aircraft reacts to inputs.*

To date, all FDEs I have flown (including my own) have failed to capture this critical element – inertia. This new generation of FDEs is designed to show the average flight simmer exactly how difficult it is to fly a large aircraft, particularly in adverse weather or emergency conditions. I have flown small aircraft, Level D simulators, and have been designing FDEs for nearly 10 years now.
I can confidently say now, THIS is how the real aircraft FEELS and PERFORMS.

I feel I have captured about 95% of how the actual aircraft feels in a Commercial Level D simulator and actual flight. The remaining 5% I could not capture are things such as airframe vibration through wing flap (fueled wings which are off-center have quite a lot of inertia of their own) and control surface slip (first the control surfaces "bite" into the air, then they begin to move the aircraft after some point in time– this feeling is difficult to mimic without an actual motion sim, although I have added more "slip).
The control surfaces are heavy, but effective. If you actually take the time and LOOK at a large aircraft, you will notice the control surface, say an aileron, has only a small surface area in relation to the rest of the plane. These surfaces must "push" the aircraft in the desired direction. As in the actual aircraft, you will find yourself often "overcompensating" and correcting when you fly manually until you become used to the feel.
If you find the aircraft a challenge to fly, imagine an engine out emergency, landing in gusty or side wind conditions, or on wet/icy runways. My goal is to show you what an actual commercial pilot experiences.

Question **But the controls are SO heavy. Are you sure this is right?**
Answer *The control surfaces require 45 – 55 lbs of force to move the yoke, control wheel and rudders. This new generation of FDEs places emphasis on both performance AND feel. I am not trying to make a video game – I'm designing flight simulator dynamics.*

Question **It's hard to keep her on the runway with a stiff crosswind. What do I do?**
Answer *Typically, you will want to crab into the wind as you approach the airport. On reaching the threshold, you want to aim at the side of the runway into the wind. As you touchdown, use the rudder to yaw the aircraft straight. You will feel the tires scrubbing across the pavement as the wind and your momentum pushes you across the runway with the direction of the wind.*

Question **It's hard to stop. Reverse thrust is very un-effective. How do I stop more effectively?**
Answer *The majority of stopping power when landing is from the brakes. The thrust reversers do almost nothing to stop the airplane. Set your auto brakes to position 2 on initial decent, but don't be afraid to use position 3. On shorter fields and higher gross weights, it may be necessary to use position 4 or max braking.*

Question **I just can't get the hang of these new FDEs. I'm new to FS or have no previous experience flying aircraft. What can I do?**
Answer *I suggest you learn how the real aircraft feels so you have a better understanding of the real plane. If that fails, use the 767 Easy Version FDE included in the package. Remember, as N767EZ is basically a default 777, no product support is offered.*

Question **I can't climb as high as I thought. What is wrong? Am I too heavy?**
Answer *You have a maximum and an optimum altitude based on your weight. Depending on how heavy you are, wind conditions, route restrictions, and ATC, you may not climb as high or as quickly as you might have expected. You don't just crank it up to 43,000 ft, sit back with your arms crossed and expect to pull 6000 fpm all the way there. Keep in mind at 400,000 lbs max weight, your maximum altitude would be 35,000 ft. Also remember, your maximum altitude may not be your optimum altitude. Typically, you would select the optimum altitude to save money on fuel economy. If you insist on climbing up, up, and away however, then I suggest you fly the N767EZ FDE.*

Question **Why is it that when I load the aircraft in FS2004, it's usually overweight?**
Answer *Typically, when you load an aircraft into FS2004, it maximizes everything – both fuel and payload. I design the FDEs so that you know the MAXIMUM capacity of the payload or fuel tank on a typically route. It is up to you, the pilot, to REMOVE fuel for higher payload capacity. Conversely, for longer range, you must add fuel and REMOVE payload. I design the FDEs this way to eliminate questions on "what is my maximum or typical allowed capacities". If you don't want to focus on weight management, then use the N767EZ FDE.*

Question **I noticed that EPR/EGT shows red with the MSFS default panels / with other panels, EPR/EGT is low, doesn't match, etc. What happened?**

Answer *EGT and EPR are difficult to model in FS2004. Basically you can define a limit, and a rate of change, but you cannot control the values throughout the entire range of the band. What I have from the 767 manuals is that max EGT = 1130, max EPR = 1.65%. I base FDEs off of the MSFS standard panels, so the values will show correctly most of the time, except for very high altitude cruise.*

Question **What is that sound I hear when the engines are shut down?**

Answer *This is the sound of the APU running. This will sound even if you have not engaged an APU switch. Basically, this is modeled into the FDE, and I wanted to model something that has not yet been accurately modeled in sound files before. Although you could run off of the Ground Power Unit (GPU), typically, the APU is used for engine startup. Also, in case of engine out flight or Ram Air Turbine (RAT) deployment, the APU is used in flight for additional power.*

Question **What is that whirring sound I hear when I touchdown?**

Answer *This is the sound of the auto spoiler mechanism engaging.*

Question **Why don't I hear the flap motors when I engage the flaps?**

Answer *Because these sounds were recorded for the flight compartment, hence, you will hear the flap level click into the detent notch.*

Question **When I taxi, I can't turn. What's wrong?**

Answer *You must slow down to 30 knots for high speed turnoff taxiways, 8 to 12 knots for 90 degree turns, and about 3 - 5 knots for turns over 120 degrees. Basically, the maximum turn angle of the 767 nose gear is 65 degrees. Slip causes you to only achieve between 61 – 64 degrees of effective steering. Attempting to turn at higher speeds will result in tire rollover and push, resulting in the airplane still going straight ahead.*

Question **How can I perform trip/flight planning and fuel planning?**

Answer *Use the default Microsoft flight planner and navigation log.*
When you plan your trip, then look at the navigation log for the fuel required for your trip. The value listed at the top includes your as trip block fuel
However, it does NOT include your taxi and reserve/deviation fuel quantities.
For the 767, add 15,000 lbs of reserve fuel, plus 2000 lbs taxi fuel, for a total of 17,000 extra lbs of fuel.
To use the flight planner:
- Load the aircraft,
- Download real-world weather or set your weather,
- Use the trip planner, then
- Review your navigation log.

The 767 FDE is now adjusted for the default Microsoft Fuel Planner, however, you will notice on longer haul flights with real world wind, the Flight Planner does not take into account headwinds/tailwinds.

Question **What happened to the default and alternate gear points?**
You only have the 767 footprint in the FDE now.
What is the aircraft footprint?

Answer *The aircraft footprint is the actual location of the aircraft tires on the ground. I now only use aircraft footprints in the FDEs. Basically, I have modeled the true aircraft gear into the FDE, including gear tilt. What this means is that you now have all 10 wheels and tires on the 767: nose gear (2 wheels), left main gear (4) and right main gear (4). All MSFS default aircraft and other FDEs merely offer 3 simple gear points: nose (1), left main (1) and right main (1). By using the actual aircraft footprint from the Boeing specs, this offers redundancy and more realistic feeling. This prevents landing gear "breaking" due to un-flatten scenery or "holes" in runway/taxiways.*

Question **When I rotate the 767 on the takeoff transition, how do I know when the gear has lifted off the ground? How do I avoid tail strike?**

Answer *As you rotate listen for/watch the auto braking knob. The knob will "Click" and turn to the OFF position, indicating the main gear are off the ground and the gear have tilted into place. Then watch the vertical speed indicator. When you see a positive rate of climb (400 fpm or higher), then raise the landing gear to the UP position. You will see the landing gear transition. When they are stored and the transition lights go out, then move the gear lever to "OFF" to disengage the hydraulics. Remember, although your nose gear is off the ground, the mains far behind you are still rolling. As the wings "bite in", they will generate lift and raise the entire plane off the ground.*

Question **For the different 767 variants, are all the engines mounted in the same place?**

Answer *No, the 767 GE engines are mounted 6 inches further forward than the Rolls Royce or Pratt and Whitney engines. Small details like this are modeled into both the visual and FDE models. Other small details included in the FDE, not noticeable by the average simmer but equally important, are that the tire sizes are different for nose gear vs. main gear, the fan sizes/diameters and number of engine stages are different for the various 767 engine types, and different performance based on variant.*

Question **The thrust reversers are very ineffective. I can't stop? Is this right?**

Answer *The thrust reversers are very ineffective. 80% of the stopping power actually comes from the wheel brakes*

Question **Will the 767-300 have the same range as the 767-300ER?**

Answer *No, at maximum payload, the 767-300R/ER's range is some 3000 nms less than a standard 767-300ER due to the lack of center fuel tanks. Also, keep in mind that at many airports such as Japan domestic airports, there are ramp weight restrictions, thus the necessity to keep the weight down – another reason why some carriers have the -300 option. The lower weight and lesser fuel capacity shorten the range of the 767-300.*

Question **So what are these scenarios? Why did you create scenarios?**

Answer *These scenarios are designed to show the flight simulator community how a 767 truly feels in flight, and what levels of difficulty commercial pilots face. I honestly feel that many sim pilots rely on pretty panels with FMCs and PFDs, however, do know truly know how to fly, nor understand the actual feel of a large aircraft. Many of us merely fly dumbly from place to place. An FMC can only give you the data you put into it, but it cannot teach you how to fly. These scenarios are intended to test your basic flight skills and knowledge of emergency procedures. In these, you must rely on your piloting skills, not merely the autopilot or FMC. Any one part of each scenario is easy to overcome by itself, but it's the combination of factors which makes the scenarios difficult.*

Question **Why does the nose gear hang open when the landing gear is deployed? Is there any way to close it?**

Answer *If you look closely, the nose gear door is actually open on the 767. This is controlled by the visual model animation, not the FDE. But the open gear door is accurate.*

Question **What is the proper trim for takeoff?**

Answer *It depends on your weight and station loading according to the MAC% of the plane for your flight. However, in general, it should be about neutral trim at 7 degrees, to nose up of 7.5 degrees. In flight, it may be necessary to adjust your trim up or down depending on your conditions. Note, if you takeoff and the plane either noses up too early, or is hard to lift the nose with excessive nose down attitudes, you are mis-trimmed and would need to adjust your trim settings.*

Question **Please explain a takeoff.**
Typically, what do you guys do at v1/vR/v2, and how do you avoid tail strike. Example, do you rotate smoothly to about 8 degrees, then hold it there until you confirm a positive rate of climb? If you guys have longer fields, do you take off shallow past v2, then climb out at about 12 - 15 degrees deck angle?

Answer *Well, V1 is decision speed - stop or continue. Vr is the speed that you begin to rotate the aircraft. Also, it is the speed that the aircraft can climb with 1 engine. v2 is the speed that the aircraft begins to fly (takeoff speed). At vR the pilot applies back pressure at the rate of about 3 degrees per second. At that rate, the aircraft lifts off before the tail can impact the tail skid.*

Question **I've seen various numbers from Boeing. Typically, for most carriers, over 10,000 ft, do you guys what are you climbout/decent speeds?**

Answer *These climb and descent numbers are computed by the flight management computer and is based on weight of the aircraft. Nominal speeds are 250 knots to 10,000 ft, approx 300 during climb until capturing climb Mach approx .78 or .80 then climbing at .78 or .80 Mach until cruise altitude. Descent is approx the same, just backwards*

Question **So in real life, how does a 767 handle?**

Answer *Pitch is effective but heavy--like a truck, don't need to over control but you need to give positive pressure. Turning, the outboard ailerons lock fully out at about 270 kts with both ailerons functioning, roll rate is very brisk-very light on the control, i.e. better than the 777 with the outboards locked out. The roll rate is much slower, very stiff and much more solid with outboard ailerons locked out.*

Question **What determines your decision for a high-speed descent? For instance, ATC cleared you behind your decent profile, etc?**

Answer *First, an emergency, that's for worse case scenario.*
Second, when directed by ATC.

Question **How are the speed brakes?**

Answer *Speed brakes are so-so, not super effective but not ineffective. The 767 is somewhat tough to slow up in flight because it has so much mass. Proper decent planning is essential. You don't want to get caught behind your decent profile, or in a late decent*

Question **How is landing a 767?**

Answer *Landing attitude is relatively flat, only about 1-3 degrees above horizon on the approach. The 767 on landing wants to pitch up after the mains touch. Auto-spoiler when set deploys on touchdown - all spoilers deploy on landing. There is no delay. The 767 will pitch upwards on landing, tends to want to pitch nose up. It is very easy to strike the tail. You have to push forward on the yoke at touchdown*

Question **How are the brakes on a 767?**

Answer *Brakes on 767-300s are carbon fiber. Very smooth and very effective. Older –200 brakes are steel. Takes more effort.*

Question **Please explain the anti-skid button on the overhead panel?**
Answer *Anti skid has nothing to do with over rotation. The anti-skid system is installed in order to keep from locking the brakes during handing or high speed aborted takeoffs. If the wheels lock up due to applying heavy brake pressure, the tires will burst and go flat. This will cause directional control problems while attempting to stop*

Question **Is 767 evacuation is the same at 777?**
In what I got in 777 training, if the rear doors are inaccessable, once you stop on the ground, you'd open the side window and toss out the rope.
Answer *Yes, EVAC on 767 is the same. Rope is above each pilot in overhead compartment.*

Question **Let's be honest, this thing is certified up to 41,000 – 43,000 ft, but can it really make it?**
Answer *Climb rates are dependant on aircraft loading. Above 10,000 ft, you can go 2000 fpm, but then dropping to 1500 fpm higher up. When up at FL390 to FL410 it really dogs out. It is certified up to FL430. You can always make FL410 unless it is very hot out and you are very heavy.*

Question **For the 767-200s, what happens if you loose an engine on takeoff?**
Answer *Well, no one wants that. Many pilots worry about loosing an engine, especially in mountainous areas like Zurich. You must drop the nose the gain airspeed, rudder it out, but watch for terrain. The 767-200s are really underpowered.*

Question **Do you cut the throttles completely when landing?**
Answer *Typically, we keep the throttles going all the way down to touchdown. The 767 can land heavy, so you don't want to crunch it in.*

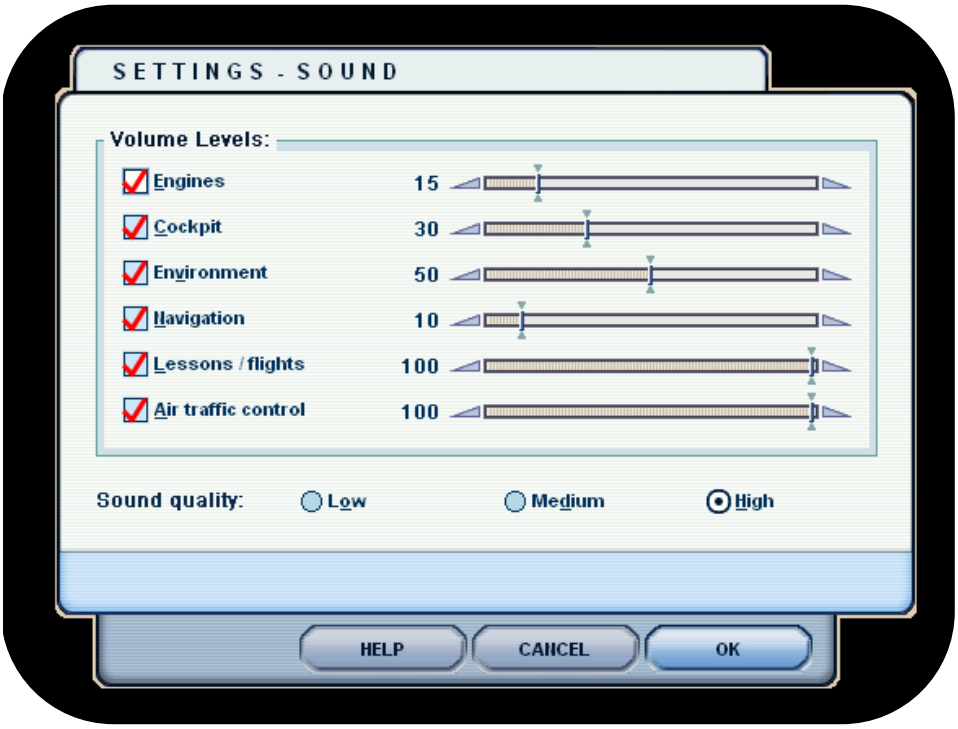
Question **We've seen 767s with national flags sticking out of the windows. How does that work?**
Answer *Yes, we can display a flag, but only on the ground. We merely crank back the side windows and stick the flags out of the side when carrying VIPs or troops.*

Question **Per your checklists, I noticed packs are not on all the time, correct?**
Answer *Correct, but they are when we're in the air.*

Question **Could you explain the bleed air?**
Answer *Bleed air operates the hydraulics. The pneumatic tunnels show when the bleed air is running off the APU or engines.*

Sound Settings

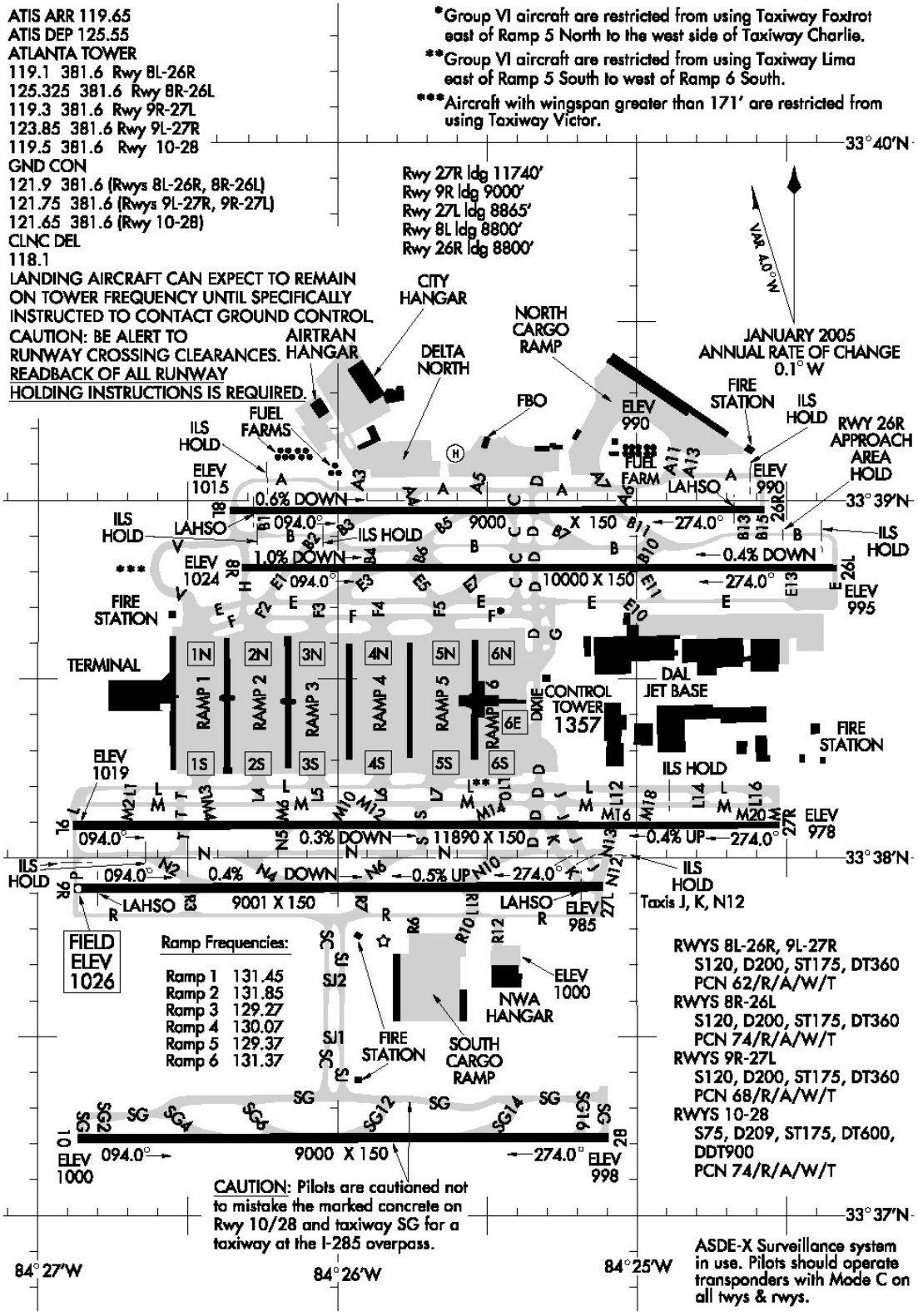
Recommended **sound settings** for the Boeing 767-200/-300 Series are:



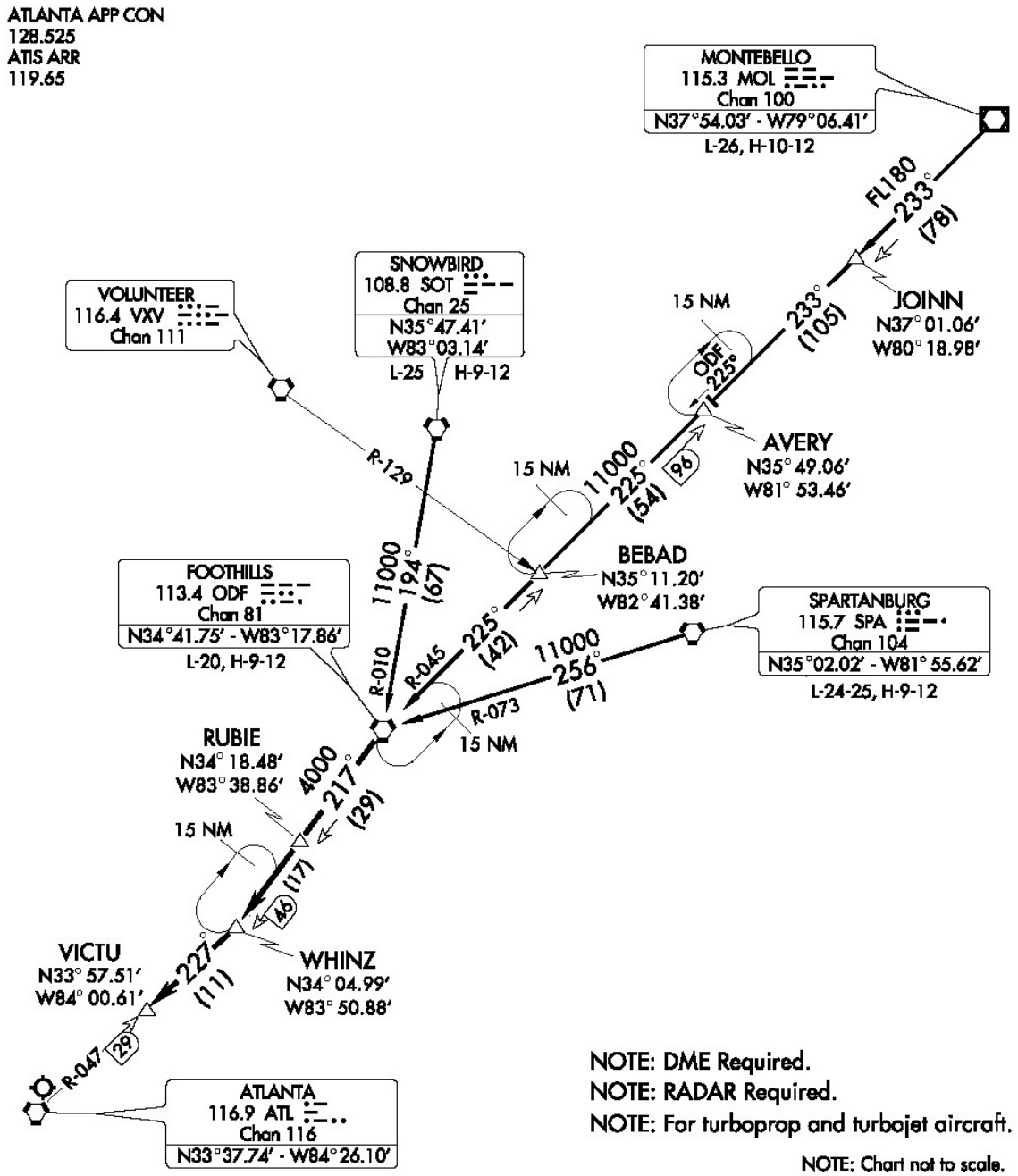
Note: Some machines will experience digital “tunneling” or may freeze when certain sounds are played, due slower processors, lower amounts of RAM, and the large size of the sound files. If you experience either of these problems, we recommend that you set sound quality to medium or low.

Diagrams

Airport KATL (Hartsfield - Jackson Atlanta International Airport)

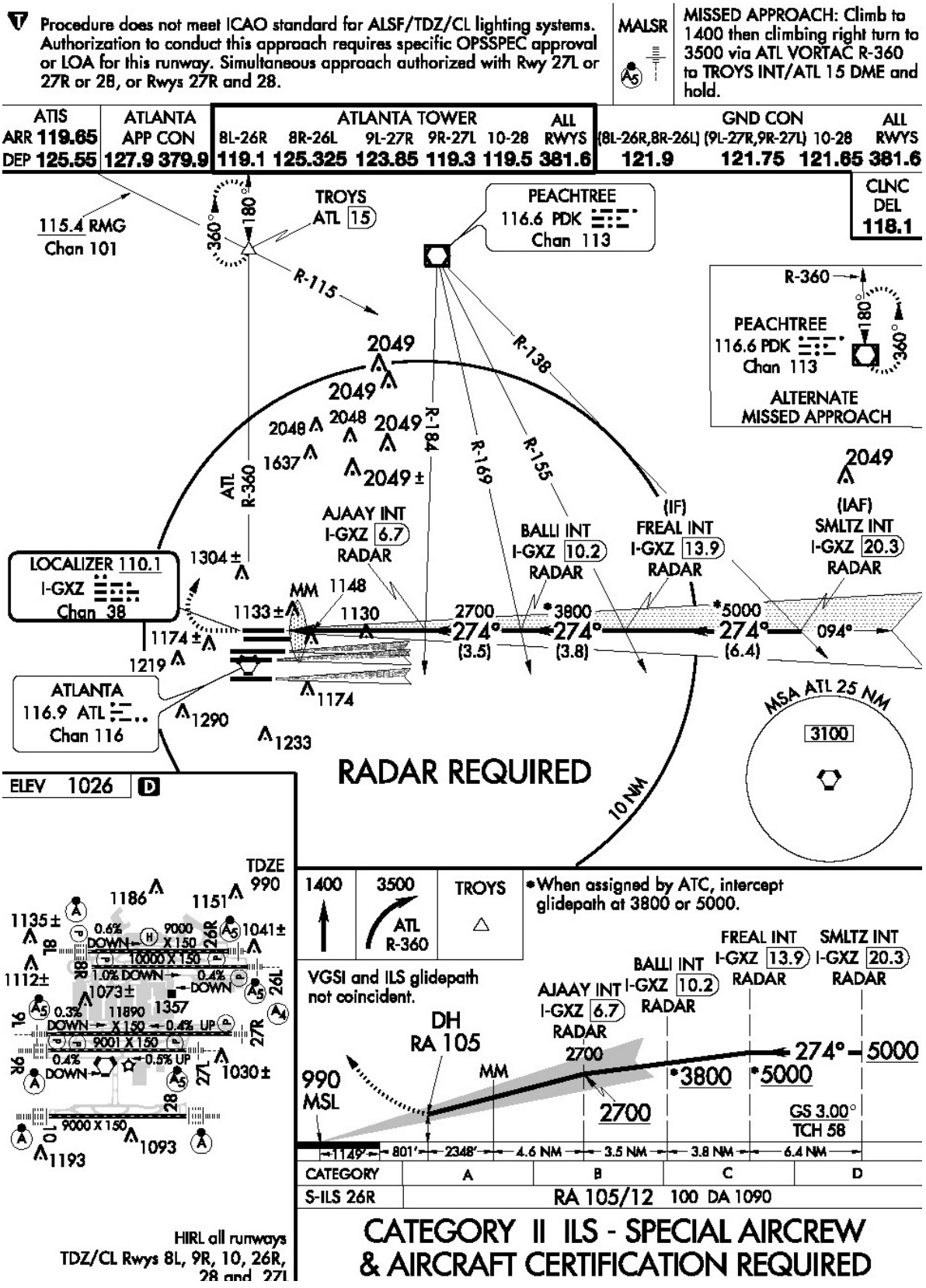


WHINZ ONE ARRIVAL (WHINZ.WHINZ1) – KATL



MONTEBELLO TRANSITION (MOL.WHINZ1): From over MOL VOR/DME via MOL R-233 and ODF R-045 to ODF VORTAC. Thence. . . .
SNOWBIRD TRANSITION (SOT.WHINZ1): From over SOT VORTAC via SOT R-194 and ODF R-010 to ODF VORTAC. Thence. . . .
SPARTANBURG TRANSITION (SPA.WHINZ1): From over SPA VORTAC via SPA R-256 and ODF R-073 to ODF VORTAC. Thence. . . .
. . . .From over ODF VORTAC via ODF R-217 to WHINZ. Then via ATL R-047 to VICTU. Expect radar vectors to final approach course after VICTU.

ILS or VOR RWY 26R - KATL



Airport KLGA (New York / La Guardia)