Checklist MS FSX incl. PMDG MD11(F)

IVAO:
Member-#:   _____
Website-PW: _____
Network-PW: _____

Attention:
You should have read the PMDG MD11 introduction, especially where you find all 7 click spots if you operate in 2D-mode like me.
I recommend setting the IRS alignment time to something like 180 seconds if you do not want to wait 10 minutes for the alignment.
You must have the AP Disengage Button Set! Standard Key: Z

Parking Position / Preparation:

- Load & Fuel (at Configurator)   Set
- ZFW, ZFW-CG & TO-CG   Note!
- FSX   Start & load/create 747-flight
- Parkingbreak   Set
- Dark & Cold   Load D&C panel setting
- Fuel (at FSX)   Set
- IVAP-Connection   Activate
- Dep-Metar   Check & note
- Arr-Metar   Check & note
- Flight –Plan   Create at website / program of choice

- Weather Radar Switch   Off
- Fuel Switches   Off
- Spoiler   Retract / Detent & Disarmed
- Flaps   Set to current flap status (standard: Up/Retract)
- Gear   Down
- Dump / Fuel Dump   Stop & Guarded
- MANF Drain   Guarded
- Emergency Power Selector   Off

- Battery   On & Guarded
  --- BAT BUS OFF light should extinguish ---
- Cockpit Lights   On, if required
- Master Caution   Push / Off
  --- If Ext Pwr Light illuminated ---
- EXT PWR Switch   On
  --- Check   Ext Pwr Light   Illuminated
                         AC and DC 1, 2 and 3 Off Lights Extinguished
                         Gen 1, 2 and 3 ARM Lights   Illuminated
                         BUS Off Lights (pwrd busses)   Extinguished ---
- Door(s)   Open (via FMC FS Shortcuts Menu)
- Gangway   Enable (if available) (Ctrl + J)
- Galley (GLX) EXTR PWR   On
- Captains SIS Panel ➔ EIS Source   Aux
  --- Verify normal presentation of AUX DEU on main displays ---

- Captains SIS Panel ➔ EIS Source 1
- Static Air Selector Norm (Static Air Selector labled "ELEC/AIR")
- Display Units Check powered and appropriate indications displayed
- Clock Verify time correct, elapsed time to zero
- Radio Selector Switch VHF-1
- FMC
  - Init Page ➔ INIT
  - FMC-1 ➔ LSK L1
  - F-PLN INIT ➔ LSK R6
  - Check GNS Position ➔ Make corrections if needed
- NAV Light On
- EMER LT (Light) Armed
- EMER LT TEST Switch Push & Hold for 8 seconds
  --- EMER LTS TST PASS (could be) displayed on EAD. ---
- No Smoke Lights On
- Seat Belts Lights Auto

--- Continue here after a turn-around / Cockpit not dark & cold ---

- ENG/APU Fire Test Button Push & Hold
  --- Verify ENG1 Fire, ENG2 Fire, ENG3 Fire sounds played. ---
- ENG/APU Fire Test Button Release
- APU PWR Button On
  --- Check APU PWR AVAIL Light Flashing till available, then …
  APU PWR AVAIL Light Illuminated steady
  AC / DC 1, 2, 3 OFF Lights Extinguished
  AC TIE 1, 2, 3 ARM Lights Illuminated
  GEN 1, 2, 3 ARM Lights Illuminated
  BUS OFF Lights (pwrd busses) Extinguished
  APU Start/Stop Light Illuminated ---
  --- If APU Start fails press APU Start/Stop switch. ---
  --- BAT Charging Alert may be displayed, switches off after 2-5 minutes. ---
- Trim Air Off Light Verify Extinguished (AIR panel)
- Annun LT Test Button Push & hold
  --- Verify Annunciator Lights illuminated and aural overspeed warning played. ---
- Cabin Press SYSTEM Light Verify Extinguished (= cabin press auto mode active)
- Cabin Outflow Valve Verify Open
- AIR ➔ APU Switch On
  --- Verify Flow & Off Lights extinguished. ---
- IRS Selectors 1-3 Nav
  --- Cargo Fire Test should be displayed on EAD. If not, manual test required. ---
- Master Warnings Push / Off
- FMC
  - Init Page ➔ INIT
  - ALIGN IRS ➔ LSK R4
    --- If position needs correction: ---
  - POS REF ➔ LSK R4
  - Enter corrected coordinates if needed ➔ LSK L1
  - Update ➔ LSK R1
    --- If "cruise level above max flight level" is indicated, correct crz lev. at INIT Page. ---
  - F-PLAN INIT ➔ LSK R6
    --- Continue here: ---

- o Enter Dep Airport / Arr Airport ➜ LSK R1 ➜ Return ➜ LSK R6
- o Enter Alternate Airport ➜ LSK R2 ➜ Return ➜ LSK R6
- o Enter Flight Number ➜ LSK L4
- o Enter Initial Cruise Level (and step climb level) ➜ LSK L5
- o Enter Cost Index (recommend 80 to 100) ➜ LSK R6
- o Weight Init Page ➜ PAGE
- o Use UFOB Block-Fuel ➜ LSK R1
- o Enter ZFW (xxx.x) ➜ LSK R3
- o Enter ZFW-CG (xx.x) ➜ LSK R6 (easy auto-mode: 1st right click, then left click)
- o Enter TO-CG (xx.x) ➜ LSK R5 (easy auto-mode: 1st right click, then left click)
- o F-PLAN Page ➜ F-PLAN
- o Departure LAT REV Page ➜ LSK L1 (next to Dep Airport)
- o SID ➜ LSK L1
- o Choose Runway ➜ LSK Rx
  - --- Now choose SID leading to the first waypoint of your route. ---
- o Choose SID ➜ LSK Lx
- o Insert ➜ LSK L6
- o First Enroute Waypoint LAT REV Page ➜ LSK Lx (next to First Enr. Wayp. after SID)
- o Airways Page ➜ LSK L2
- o Enter first airway ➜ LSK L1
- o Enter second airway ➜ LSK L2
  - --- Continue with all airways in the same manner. ---
- o Enter exit waypoint for the last airway (last enroute waypoint) ➜ LSK Rx
- o Insert ➜ LSK L6
- o Delete any discontinuities ➜ CLR LSK Lx
- o F-PLAN INIT Page ➜ INIT
- o WEIGHT INIT Page ➜ PAGE
- o Note Block Fuel (xxx.x)
- o FUEL INIT Page ➜ PAGE
- o Enter Block Fuel as REFUEL QTY ➜ LSK L1
- o TAKE OFF Page ➜ TO/APPR
- o Enter Flex Temp (derated 50 to 70 non-derated) ➜ LSK L1
- o Enter appropriate flap settings ➜ LSK L3
- o Enter dep rwy slope (always 0) / rwy wind ➜ LSK R2
- o Enter Outside Air Temperature (OAT) (xxC or xxF) ➜ LSK R3
- o Confirm all V-Speeds ➜ LSK L4 ➜ LSK L5 ➜ LSK L6
  - --- Check V-Speeds now indicated on the PFD. ---
- IVAP-flightplan   Create
- Speed at flightplan   Enter MACH
- Departure Time   Enter (UTC to CET ➜ CET -2 (winter -1))
- IFR Clearence   Request (note Squawk, initial Alt, SID, etc.)
- Squawk   Set
- Voice Recorder Test Button   Push & Hold 5 seconds
  --- You should hear a test tone & see deflection into the green band. ---
- BUS FAULT Lights   Verify Extinguished
- CARGO TEMP   Set FWD & AFT
- ENG IGN OFF Light   Verify Extinguished
- Hydraulic SYSTEM Manual Light   Verify Extinguished (= hyd system auto mode active)
- HYD SYS 1, 2 & 3 PRESS Lights   Verify Illuminated
- HYD PRESS TEST Button   Push
  --- HYD PRESS ALERT should be displayed on EAD. ---
  --- Test will take about 1 minute, wait till TEST Light extinguished before proceeding. ---

- SMOKE ELEC/AIR Selector   Verify Norm
- DRIVE 1, 2 & 3 Switches   Guarded
- CAB BUS Switch   Guarded
- EMER PWR   Armed
  --- EMER PWR ON Light illuminates for 30sec during tets. ---
- Air MASK Switch   Verify Guarded
- Fuel SYSTEM Manual Light   Off (= fuel system auto mode active)
- Exterior Lights
  - LDG LT   Ret
  - NOSE LT   Off
  - L & R WING & RWY TURNOFF On / Extinguished
  - NAV   Verify On / Extinguished
  - LOGO   On
  - BCN & HI-INT   Off
- FLAP LIMIT / ELEVEL FEEL   Auto & all lights extinguished
- Cabin Press Controller   Verify Auto
- CABIN PRESS Valve   Verify Open (cabin press meter full upper position)
- DITCHING Switch   Verify Guarded
- ANTI-ICE & DEFOG   All extinguished
  --- Next step only if refueling (after turn-around) is planned. ---
- FUEL USED RESET Button   Push
- FMA / Autopilot:
  - IN / HP   Set Barometer to IN or HP as required
  - BAROSET   QNH
  - Barometer   Set to atmospheric pressure
  - MINIMUMS Control Knob   RA
  - HDG Readout   MAG (indicated on ND)
  - ND / PFD   Set as desired (Range, Map, etc.)
  - IAS/MACH   250 (or alternate initial speed)
  - HDG / TRK   HDG (indicated on ND)
  - HDG on ND / Standby Comp. Cross Check
  - Bank Angle Selector   Auto
  - AFS OVRD OFF Switches   Up
  - Altitude   Set assigned initial Altitude
- Oxygen Mask Test/Reset Switch Push & verify oxygen flow (by sound)
- ND clock   Verify correct time displayed
- Gear Lights   Verify 4 green
- CTR GEAR NORM/UP Light   Verify extinguished
- System Display   Open
- System Display Config Page   Config
- Gear Test   Push & Hold (Gear Lever down)
  --- Verify 4 red lights. --- Release. --- Verify four green lights. ---
- System Display   Close
- Throttle 1 Test ➔ Full Up ➔ Verify Warning Horn Sounds ➔ Idle
- Throttle 2 Test ➔ Full Up ➔ Verify Warning Horn Sounds ➔ Idle
- Throttle 3 Test ➔ Full Up ➔ Verify Warning Horn Sounds ➔ Idle
- Flap T.O. Selector   Rotate Wheel to required setting
- HDG   Set HDG of departure runway
- Auto Break   Select T.O. position
- Auto Break ABS disarm Light   Verify extinguished
- Gangway   Disable (Ctrl + J)

- Doors   All closed (via FMC FS Shortcuts Menu)
- Doors Slides   Arm all (via FMC FS Shortcuts Menu)

Engine s/u & Pushback:
- Engine s/u & Pushback p/b clrc   request
- Beacon Light   On
- AUX HYD PUMP 1   On
- ENG IGN A or B   Push
- Fuel SYSTEM Manual Light   Verify Extinguished (= fuel auto mode active)
- Air SYSTEM Manual Light   Verify Extinguished (= air auto mode active)
- Parking break   Off (Push the brakes)
- Pushback   Start (via FMC ➜ Menu ➜ FS Shortcuts Page)

- Engine 3 START Switch   Pull
  --- Observe switch light illuminates. Wait till 15% N2. ---
- Engine 3 FUEL Switch   On
  --- Wait till N1 & N2 stabilized. EGT & ENG OIL in normal range. ---
- Engine 1 START Switch   Pull
  --- Observe switch light illuminates. Wait till 15% N2. ---
- Engine 1 FUEL Switch   On
  --- Wait till N1 & N2 stabilized. EGT & ENG OIL in normal range. ---
- Engine 2 START Switch   Pull
  --- Observe switch light illuminates. Wait till 15% N2. ---
- Engine 2 FUEL Switch   On
  --- Wait till N1 & N2 stabilized. EGT & ENG OIL in normal range. ---

  --- If CARGO DOOR TEST FAIL alert is displayed, perform manual test. ---
- Cargo Door Test Button   Push & Hold for 4 seconds

- Engine & Airfoil Anti-Ice   On if required (< 10° TAT)
- AIR APU   Off (Verify on light extinguishes)
- APU   Verify Off (On light extinguished)
- GLY EXT PWR   Off
- EXT PWR   Off
  --- If FADEC Alternate Mode is displayed and not desired. ---
- FADEC MODE Switches 1 - 3   Open, Push, Guard
- Nose Light   Taxi
- Landing Light   Ext Off
- Logo Light   On
- Pushback   Finish
- IRS / PFD   Verify "TAXI" indicated

Taxi:
- Taxi-Clrc   Request
- Taxiways   Note (if needed)
- Ground-Guidance   Request (if needed)
- Flaps   Select (as filled in FMC)
- Spoilers   Arm
- PFD   Verify flap setting indicated correctly
- TCAS   TA/RA
- Stabilizer Trim   Set as indicated on TO/APPR Page

- FMC T/O Page   Check
- NAV Mode   Push / Arm

h/p:
- Hand-off GND to TWR   Change frequency
- l/u & t/o clrc   Request (rdy for dep h/p xx)
- Landing Lights   On
- HI-INT Lights   On (Off Light should be extinguished)
- IVAP-Transponder   On
- AUTOFLIGHT   Arm
  --- Attention: Applying more then 65% N1 thrust activates auto-thrust now! ---
- EAD   Verify "Green Box" (=t/o config) displayed
  --- "Green Box" will not be displayed with parking break set. ---
- Postion & hold   Taxi & stop on rwy

Ready to Takeoff:
- Parkingbreak   Set
- Thrust Levers   Forward
  --- Move forward till „T/O Thrust" is displayed on the PFD. ---
- Parkingbreak   Release
  --- Verify "T/O Clamp" indicated; following "T/O Thrust". ---
- V1   Takeoff abortion impossible
- VR   Lift nose up
- V2   Lift-off

Takeoff:
- Trim settings   Adjust (when needed)
- Gear   Up (at positive climb rate >500ft)
- Speed   Verify V2+10kts maintained (by nose pitch)
- Autoflight / -pilot   On
  --- Verify blue AP1 or 2 light illuminated & AP off extinguished (PFD). ---
  --- After 1500ft RA: ---
- PROF   On
- Speed   FMS (verify Thrust in magenta color on PFD)
- Airborne   Publish airborne when on Unicom (no ATC)
  --- After 3070 ft RA: ---
- Flaps   Retract (on schedule; PFD displaying "-FR")
- Slats   Retract (on schedule; PFD displaying "-SR")
- Start time   Note (if needed)
- Hand-off TWR to APP(DEP)   Change frequency

Climb:
- VS / Vertical Speed   Set manually if higher climb rate desired
- Landing-/Taxi Lights   Off
- Spoiler   Disarm
- Autobreak   Off
- FMA Altitude   Readjust to next cleared / final FL
- Hand-off APP to CTR   Change frequency
- Anti-Ice (all)   On (under 10°C OAT, see FMC PROG page)
- Altimeter   Readjust (above 18000ft)
- Landing Lights   Ret

- Seat Belts   Off (depends on weather)

Cruise:
- Radio / ATC contact   Maintain (on UniCom watch TCAS)
- FMA (Autopilot) / FMC   Check permanently
- FMC   Check PERF & PROG pages [ETA & EFOB(fuel)]

Descent & Approach:
- Descent preparations   Begin 30 to 50nm before T/D (Top of Descent)
- Airport-/Meta-Information   Retrieve
- FMC:
    - F-PLAN Page ➔ F-PLAN
    - Last EnRoute Waypoint Lat Rev Page ➔ LSK Lx
    - STAR & App Selection Page ➔ LSK R1
    - Choose Arrival Runway ➔ LSK Rx
    - Choose corresponding STAR ➔ LSK Lx
    - Insert ➔ LSK L6
    - Select App Transition if available & desired ➔ LSK Rx
    - Check F-PLAN for discontinuities
- Seat Belts   On
- Descent   Request start of descent
- FCP / Autopilot Altitude   Reset to next (cleared) Flight Level

    --- Verify airplane starts descent at T/D ---

    --- Repeat last step whenever cleared to next FL ---
- FMC
    - TO/APPR Page ➔ TO/APPR
    - Set landing flaps or leave default setting (35°) ➔ LSK L4
    - Note Final Approach Speed ➔ LSK L5
    - Verify Landing Wight under Maximum LW ➔ LSK R1

    --- If magenta ADD DRAG message appears: ---
- Speedbrakes / Spoiler   Up (if required / too fast / too high)
- Altimeter   Readjust (under 18000ft)
- Hand-off CTR to APP   Change frequency
- Landing lights   On
- Taxi light   Land
- Speedbrakes / Spoiler   Off & Arm
- Autobreaks   Set

    --- After STAR, entering Approach / overflying Transition: ---
- Flaps   15 (or as required)

Final approach & Landing (Autoland):
- FCB Autopilot APPR/LAND   Arm

    --- Verify LAND ARMED indicated on PFD. ---
- Flaps   Lower as required till reaching 35° after "Gear Down"

    --- Stabilize on glide slope /ILS app. ---
- ILS captured   Announce (on Unicom state final app)

    --- Verify white "LOC" & "G/S" indicated on PFD. ---
- Hand-off APP to TWR   Change frequency
- Gear   Down
- Landing clrc   Request (or state intention on Unicom)

- Verify 1400ft above ground:
    - PFD ➔ Speed at App Speed

- o PFD ➔ Green DUAL LAND indication
- o PFD ➔ Flaps 35
- o EAD ➔ Green Box
- Throttles   Idle (Important: Before flare & touchdown!!!)
  --- Flare & Touchdown: ---
- Verify on PFD:
  - o White RETARD
  - o Green FLARE
- Thrust reversers   Engage (if needed)
- Thrust reversers   Disengage (at 60kt) (Throttles idle)
- Autopilot (FCP)   Disengage (AP Disengage Button)
- Warnings   Off
- Brakes   Tip toe brakes to disable auto-break
- Runway   Vacate („rwy vacated")

Final approach & Landing (w/o Autoland):
- Flaps   Lower as required till reaching 35° after "Gear Down"
- --- Stabilize on glide slope /ILS app. ---
- ILS captured   Announce (on Unicom state final app)
- Gear   Down
- Hand-off APP to TWR   Change frequency
- Autopilot (FCP)   Disengage (AP Disengage Button)
- Warnings   Off
  --- Continue approach & landing manually – hand-flying: ---
- Trim settings   Adjust (when needed)
- Landing clrc   Request (or state intention on Unicom)
  --- Touchdown: ---
- Throttles   Idle
- Thrust reversers   Engage (if needed)
- Thrust reversers   Disengage (at 60kt) (Throttles idle)
- Brakes   Tip toe brakes to disable auto-break
- Runway   Vacate („rwy vacated")

Taxi:
- Transponder   Stdby
- Hand-off TWR to GND   Change frequency
- Taxiways   Note and follow (with active ATC)
- (Ground-Guidance   Request if required)
- Flaps   Set 0
- Speedbrakes   Disengage
- Autobrakes   Off
- Landing lights   Off
- Taxi Light   On / Taxi
- HI-INT Light   Off
- Landing time   Note (if needed)
- APU PWR   On
  --- Verify AVAIL Light flashing indicating APU start. ---
- Air APU Bleed   On

Parking Position:

--- Before turning into gate / parking position: ---

- Taxi Light   Off

--- At parking position: ---

- Parking brake   Set
- ATC contact   End (state "on blocks, thx for service, bye")
- Engine 1 & 3 Fuel Flow Switches   Off

--- Verify APU AIR/ELEC On" alert on EAD: ---

- Engine 2 Fuel Flow Switch   Off
- Seatbelts   Off
- Doors   Disarm all (via FMC FS Shortcuts page)
- Doors   Open
- Gangway   Enable (Ctrl + J)
- IRS Selectors 1 – 3   Off
- All exterior lights (expect NAV)   Off
- EXT PWR   On
- GLY EXT PWR   On
- TCAS   Stdby
- Anti-Ice   All Off
- Cargo Temp   Off
- APU   Off

--- Aircraft ready for turn-around /next flight. ---

--- Continue if "Cold & Dark" required: ---

- EMER LT   Off
- NAV Light   Off
- GLY EXTR PWR   Off
- EXT PWR   Off
- Cockpit Lights   All Off
- Battery   Off

Attachments

for
Checklist MS FSX incl. PMDG MD11(F)
by Carsten Rau

MD-11F --- Fuel Planning Charts:

MD-11 see next page!

Flightplan Fuel only (lbs)	CI = 80 ! No Winds! MZFW !	MZFW 461.300 lbs	Break Release to Landing	Climb: 250 / 300 kt M 0.78	Cruise: M 0.82	Descend: M 0.70 290 / 250 kt
MD-11 max. Range at MZFW: 3500nm						
Distance (nm)	Fuel (lbs) at FL 290/300	Fuel (lbs) at FL 310/320	Fuel (lbs) at FL 330/340	Fuel (lbs) at FL 350 - 430		
100	12.000	≈ 97% of FL290	≈ 96% of FL290	≈ 95% of FL290		
200	16.000					
300	21.000					
400	25.000					
500	29.000					
600	33.000					
700	37.000					
800	41.000					
900	45.000					
1000	49.000					
1500	68.000					
2000	91.000					
2500	109.000					
3000	135.000					
3500	156.000 *					
After 3500nm Payload has to be traded for fuel. **						
4000	172.000	≈ 97% of FL290	≈ 96% of FL290	≈ 95% of FL290		
4500	191.000					
5000	210.000					
5500	228.000					
After 5500mm Payload has to traded for range (max. fuel capacity reached). **						
6000 - 7000	245635	≈ 97% of FL290	≈ 96% of FL290	≈ 95% of FL290		

* At MZFW the maximum range of 3500nm can only be achieved with additional reserves limited to 16.500 lbs (instead of 21.000 lbs), otherwise MTOW of 630.500 lbs will be exceeded.
➜   Additional 2000 lbs of taxi fuel can be loaded a GW of 632.500 lbs. These 2000 lbs have to be consumed with APU & taxi before takeoff.

** Flying in higher altitudes - consuming less fuel - it is possible to carry the same payload over a longer range with the trade-off between the fuel, range and payload affecting the aircraft after a longer distance.

MD-11 --- Fuel Planning Charts:

Flightplan Fuel only (lbs)	CI = 80 ! No Winds! MZFW !	MZFW 461.300 lbs	Break Release to Landing	Climb: 250 / 300 kt M 0.78	Cruise: M 0.82	Descend: M 0.70 290 / 250 kt
MD-11 max. Range at MZFW: ≈ 4500nm						
Distance (nm)	Fuel (lbs) at FL 290/300	Fuel (lbs) at FL 310/320	Fuel (lbs) at FL 330/340	Fuel (lbs) at FL 350 - 430		
100****	12.000					
200	16.000					
300	21.000					
400	25.000					
500	29.000					
600	33.000					
700	37.000					
800	41.000	≈ 97% of FL290	≈ 96% of FL290	≈ 95% of FL290		
900	45.000					
1000	49.000					
1500	68.000					
2000	90.000					
2500	110.000					
3000	130.000					
3500	150.000					
4000	171.000					
4500	191.000					
After 4500nm Payload has to be traded for fuel. ***						
5000	208.000					
5500	227.000					
6000	254.200 **					
After 6000mm Payload has to traded for range (max. fuel capacity reached). ***						
6500 - 7000	245635	≈ 97% of FL290	≈ 96% of FL290	≈ 95% of FL290		

* At MZFW the maximum range of 3500nm can only be achieved with additional reserves limited to 11.500 lbs (instead of 21.000 lbs), otherwise MTOW of 630.500 lbs will be exceeded.
- ➔ Additional 2000 lbs of taxi fuel can be loaded a GW of 632.500 lbs. These 2000 lbs have to be consumed with APU & taxi before takeoff.

** At a payload of ≈ 100.000 lbs the maximum range of 6000nm can only be achieved with additional reserves limited to 10.000 lbs (instead of 21.000 lbs), otherwise MTOW of 630.500 lbs will be exceeded.
- ➔ Additional 2000 lbs of taxi fuel can be loaded a GW of 632.500 lbs. These 2000 lbs have to be consumed with APU & taxi before takeoff.

*** Flying in higher altitudes - consuming less fuel - it is possible to carry the same payload over a longer range with the trade-off between the fuel, range and payload affecting the aircraft after a longer distance.

**** For a distance of 100nm altitudes of 15000ft maximum are assumed.

Fuel planning notes --- MD-11 & MD-11F:

	Basic Operating Weight (OEW)	291.100	LBS	(11F: 248.500 LBS)
+	Payload (passengers & cargo)	XXX.XXX	LBS	
=	Zero Fuel Weigh (ZFW)	XXX.XXX	LBS	(max 461.300 LBS)
+	Minimum Landing Fuel	008.000	LBS	
+	Alternate Fuel (200nm distance)	005.000	LBS	
+	Contingency Fuel (holding, taxi, etc.)	008.000	LBS	
=	Planned Landing Weight (PLW)	XXX.XXX	LBS	(max 491.500 LBS)
+	Flight Plan Fuel (fuel for route)	XXX.XXX	LBS	
=	Planned Takeoff Weight (PTOW)	XXX.XXX	LBS	(max 630.500 LBS)

➔**Flight Plan Fuel + 21.000 LBS = Total Fuel = Block Fuel**

➔ *Total fuel = Enough fuel for route, 1h contingency (holding & taxi), problematic winds, alternate fuel for 200nm and a minimum landing fuel (1h+). Modify alternate value as needed.*

➔ Load all wing tanks with same amount of fuel; outer tanks full ➔ inner tanks ➔ center tanks.

Reduced & Conventional Vertical Separation Minima - CVSM & RVSM

CVSM 180° -359°	CVSM 000° -179°	RVSM 180° -359°	RVSM 000° -179°	RVSM (North-South) 270° -89°	RVSM (North-South) 90° -269°	RVSM (meter) 180° -359°	RVSM (meter) 000° -179°	CVSM (meter) 180° -359°	CVSM (meter) 000° -179°
FL 040	FL 050	FL 040	FL 050	FL 040	FL 050	1,200 m (3,900 ft)	1,500 m (4,900 ft)	1,200 m (3,900 ft)	1,500 m (4,900 ft)
FL 060	FL 070	FL 060	FL 070	FL 060	FL 070	1,800 m (5,900 ft)	2,100 m (6,900 ft)	1,800 m (5,900 ft)	2,100 m (6,900 ft)
FL 080	FL 090	FL 080	FL 090	FL 080	FL 090	2,400 m (7,900 ft)	2,700 m (8,900 ft)	2,400 m (7,900 ft)	2,700 m (8,900 ft)
FL 100	FL 110	FL 100	FL 110	FL 100	FL 110	3,000 m (9,800 ft)	3,300 m (10,800 ft)	3,000 m (9,800 ft)	3,300 m (10,800 ft)
FL 120	FL 130	FL 120	FL 130	FL 120	FL 130	3,600 m (11,800 ft)	3,900 m (12,800 ft)	3,600 m (11,800 ft)	3,900 m (12,800 ft)
FL 140	FL 150	FL 140	FL 150	FL 140	FL 150	4,200 m (13,800 ft)	4,500 m (14,800 ft)	4,200 m (13,800 ft)	4,500 m (14,800 ft)
FL 160	FL 170	FL 160	FL 170	FL 160	FL 170	4,800 m (15,700 ft)	5,100 m (16,700 ft)	4,800 m (15,700 ft)	5,100 m (16,700 ft)
FL 180	FL 190	FL 180	FL 190	FL 180	FL 190	5,400 m (17,700 ft)	5,700 m (18,700 ft)	5,400 m (17,700 ft)	5,700 m (18,700 ft)
FL 200	FL 210	FL 200	FL 210	FL 200	FL 210	6,000 m (19,700 ft)	6,300 m (20,700 ft)	6,000 m (19,700 ft)	6,300 m (20,700 ft)
FL 220	FL 230	FL 220	FL 230	FL 220	FL 230	6,600 m (21,700 ft)	6,900 m (22,600 ft)	6,600 m (21,700 ft)	6,900 m (22,600 ft)
FL 240	FL 250	FL 240	FL 250	FL 240	FL 250	7,200 m (23,600 ft)	7,500 m (24,600 ft)	7,200 m (23,600 ft)	7,500 m (24,600 ft)
FL 260	FL 270	FL 260	FL 270	FL 260	FL 270	7,800 m (25,600 ft)	8,100 m (26,600 ft)	7,800 m (25,600 ft)	8,100 m (26,600 ft)
FL 280	FL 290	FL 280	FL 290	FL 280	FL 290	8,400 m (27,600 ft)	8,900 m (29,100 ft)	8,600 m (28,200 ft)	9,100 m (29,900 ft)
CVSM	CVSM	RVSM	RVSM	RVSM	RVSM	RVSM	RVSM	CVSM	CVSM
FL 310	FL 330	FL 300	FL 310	FL 300	FL 310	9,200 m (30,100 ft)	9,500 m (31,100 ft)	9,600 m (31,500 ft)	
		FL 320	FL 330	FL 320	FL 330	9,800 m (32,100 ft)	10,100 m (33,100 ft)		10,100 m (33,100 ft)
FL 350	FL 370	FL 340	FL 350	FL 340	FL 350	10,400 m (34,100 ft)	10,700 m (35,100 ft)	10,600 m (34,800 ft)	
		FL 360	FL 370	FL 360	FL 370	11,000 m (36,100 ft)	11,300 m (37,100 ft)		11,100 m (36,400 ft)
FL 390	FL 410	FL 380	FL 390	FL 380	FL 390	11,600 m (38,100 ft)	11,900 m (39,100 ft)	11,600 m (38,100 ft)	
		FL 400	FL 410	FL 400	FL 410	12,200 m (40,100 ft)	12,500 m (41,100 ft)		12,100 m (39,700 ft)
CVSM	CVSM	CVSM	CVSM	CVSM	CVSM	CVSM	CVSM	CVSM	CVSM
FL 430	FL 450	FL 430	FL 450	FL 430	FL 450	13,100 m (43,000 ft)	13,700 m (44,900 ft)	13,100 m (43,000 ft)	14,100 m (46,300 ft)
FL 470	FL 490	FL 470	FL 490	FL 470	FL 490	14,300 m (46,900 ft)	14,900 m (48,900 ft)	15,100 m (49,500 ft)	16,100 m (52,800 ft)
1 Step = 4000 ft		1 Step = 4000 ft				1 Step = 1200 m		1 Step = 2000 m	

RVSM: All countries (inlcuding the Atlantic Ocean) with the following exeptions:

RVSM (North-South): France, Italy, Portugal, Spain & New Zealand.

RVSM (meter): China, excluding Hong Kong, Macau and Taiwan.

CVSM (meter): Russia, Mongolia, North Korea, Kyrgyzstan, Kazakhstan, and 6,000 m or below in Turkmenistan (where feet is used for FL210 and above).