

Pre-Flight Sequencing

Captain

First Officer

Elec Power Up
(SP 6.1)

CM Briefing

Exterior Inspection
(1ST SECTOR CAPTAIN)
(FCOM 21.6)

Captain Preflight
(FCOM 21.25)

CDU Preflight Procedure
(WALKAROUND PILOT)
(FCOM 21.3)

Clearance Set
(FMC/MCP/TRANSPONDER)
(FCOM 21.32)

Welcome PA
All (most)
Pax boarded

Final Loadsheet
- REVIEW/ACCEPT
- UPDATE TODC
(FCOM 21.34)

Performance Data
- TODC -> FMC
- STABILIZER TRIM
- MCP A/T & V2
(FCOM 21.34)

Preliminary Pre-Flight
(CAPTAIN OR FO)
- ELECTRICAL POWER UP (SP 6.1)
- CREW CHANGE ITEMS
- ATIS/PERF CALCULATIONS
(FCOM 21.1)

Dependency

Route Check

- FROM, TO, FLIGHT NUMBER, RWY
- AIRCRAFT, WAYP/AWY/WAYP
- TOTAL DISTANCE (NO SID/STAR)
(FCOM 21.31)

Airways Clearance

Pilot Flying

Departure Briefing
(FCOM 21.33)

Final Loadsheet

Before Start Checklist

CDU Preflight Procedure
(NON WALKAROUND PILOT)
(FCOM 21.3)

First Officer Preflight Procedure
(FCOM 21.12)

Pressurise Hydraulics
(FCOM 21.17)

Clearance Recorded
(FCOM 21.32)

Refuelling Complete
- Pumps/Press Lights/Signs
- 3% Check (both Crew Verify)
(FCOM 21.33 A1 9.1.5)

Final Loadsheet
- FMC, STAB TRIM
(FCOM 21.34)

Disclaimer
This document is for Training
Purposes only and is not an
Operational Reference.

Destination/Alternate Planning

Airport ETU's {A1 8.2.1 / C5 4.3.2.1}

Aerodrome	ETU
Departure :	ETD ±30
Take-off Alternate :	ETA ±30
Enroute Alternate :	Earliest ETA -30 to Latest ETA +30
EDTO Alternate :	Earliest to Latest ETA
Destination :	ETA ±30
Dest Alternate :	ETA ±30
Isolated Dest :	ETA -30 / +60

TAF3 & PROB30/40 {A1 8.3.3}

PROB30/40 deteriorations may be ignored during the first 3 hours of validity of a TAF3 forecast.

EDTO Minima Application {A1 13.1.7} {A1 13.1.14}

Prior to Dispatch :	EDTO Planning Minima
Prior to EEP :	Landing Minima
In EDTO :	Safe Outcome

- Landing Minima is based on the most likely & available approach/runway within aircraft capability.
- Prob30 Ceiling may be ignored. TAF3 rules apply.

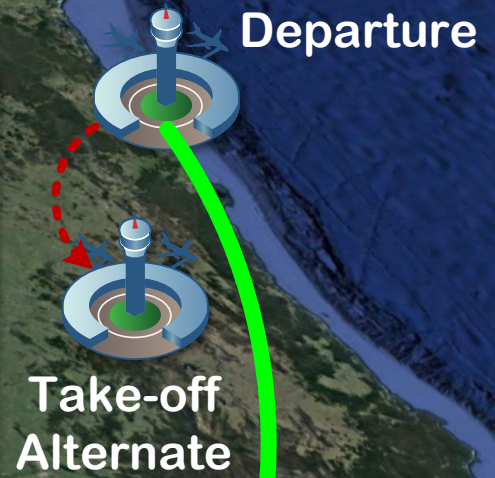
En Route Alternates (ERA) – Non-EDTO & RCF

Non EDTO (60 mins) {C5 4.2.11.3}	<ul style="list-style-type: none"> No Operational Restriction to preclude Landing. ETU is Earliest to Latest ETA. Forecast Weather at least LAND Minima. Ignore INTER/TEMP/PROB & WA Fog Triangle.
Reduced Contingency Fuel Altn {A1 9.1.4.5}	<ul style="list-style-type: none"> No Operational Restriction to preclude Landing. ETU is Enroute Alternate : Earliest-30 → Latest +30 mins Weather at least Alternate Aerodrome Minima

Take-off Alternate {A1 8.3.9}

Dispatch Basis	Distance
Non EDTO (& NZ/Samoa) :	60mins / 350nm
EDTO Dispatch	120min 180min
737-700 22k :	801nm 1196nm
737-700 24k :	N/A
737-800W SFP 24k :	800nm 1173nm
737-800 (All) 26k :	823nm 1198nm
737-8 25k :	790nm 1141nm

- Dep Wxr < OEI Landing ETD ±30 (or Oper Req't).
- Network/Alternate/Adequate may be used.
- CAT I OEI Minima unless OEI Cat IIIA approved.
- INTER/TEMPO with PROB30/40 may be ignored at the Take-off Alternate.
- YWLM not used as a Take-off Alternate {C5 3.3.7}



Inflight Requirements {A1 8.8.3}

- DEPT ARPT/TKOFF ALT must meet LDG MINIMA!
- DEST/ALTN Weather must continue to meet Planning Requirements after Dispatch.
- Any airport other than the CFP DEST must meet ALTN planning requirements (non EDTO).

Alternate Aerodrome Minima {A1 8.3.7}

Approach/Runway Configuration	Cloud Ceiling	Visibility
Straight in Approaches to Two Different / Suitable Runways	2 nd Lowest Instrument Approach Minima +200 ft	2nd Lowest Instrument Approach Minima + 800m
Single Runway with an Instrument Approach	Circling +400 ft	Circling + 1,500 m
No Instrument Approach	Last Route Segment LSALT +500 ft	8,000 m

- Reciprocal Runways are "Different Suitable" for Approach Config {A1 8.3.7}
- GLS & CAT I SA ⇔ CAT IIIB not normally considered by Planners (PIC GLS ok).

Dest (Alt) Aerodrome Minima {A1 8.3.6}

Approach Type	Cloud Ceiling	Visibility
Straight in Approach	Landing Minima +1,000 ft	Landing Minima +2,000m (≥5,000m)
Other	Circling Minima +500 ft	8,000 m

- Use most likely Landing Rwy/Apch (Conservative)
- Circling Minima - Higher of Jepp/Comp

ALTN NIL Fuel {A1 9.1.7.2}

- 15 mins when no ALTN required.

2nd Alternate {A1 8.3.1}

2nd Alternate is required when the Destination Weather Forecast below Landing Minima during ETU or otherwise not available.

- One Alternate with separate non-intersecting runways with at least 1x IAP; or
- One Alternate with a PNR to a Second Alternate.



Commitment To Destination {A1 9.1.7.2}

- Aircraft within 2 hours of Destination
- TAF 3 valid (ETA +30 mins in 1st 3 hours) ¹
- Weather above Landing Minima (no LVO)
- Landing Assured ² with Known WXR/TFC with FXD RES intact
 - Must account for Known Traffic delays ³

- OS equivalent is METAR/TTT with TREND (2 hours)
 - PROB 30/40 can be ignored except for TS/Turb
- Landing Assured must allow for any forecast Wxr deterioration or plausible single failure of airborne/ground equip.
- Known Traffic means EAT or CFP Traffic Holding.

SP 6.1 Electrical Power Up

SP 6.1 Electrical Power Up

Battery Switch..... Guard Closed

- COMPLETE ISFD ALIGNMENT BEFORE MOVING (IF FITTED)
- DEVICES IN FLT DECK AUX PWR NEED TO BE RE-INSERTED

Standby Power switch..... Guard Closed

Alternate Flap master switch... Guard Closed

Windshield Wipers.....Park

Electric Hydraulic PumpsOff

Landing Gear Lever Down

- VERIFY **NOSE LEFT RIGHT GEAR** ILLUMINATED (x2)

- Verify

No **Nose Left Right GEAR** illuminated

External Power

- VERIFY **Grd Power Available** ILLUMINATED (x2)

Ground Power switch On

- VERIFY NO **SOURCE OFF** **TRANSFER BUS OFF**

- VERIFY NO **STANDBY PWR OFF**

APU Power

Engine/APU Fire switches In

- ALERT GROUND PERSONNEL BEFORE FIRE TESTS

Overheat Detector switchesNormal

Test switchFAULT/INOP

- VERIFY 5 LIGHTS:

M/CAUTION x2 **OVHT/DET** **FAULT** **APU DET INOP**

Test switch OVHT/FIRE

- VERIFY 10/11 LIGHTS:

FIRE WARN x2 **M/CAUTION x2** **#1 APU #2**

OVHT/DET **ENG 1 OVERHEAT** **ENG 2 OVERHEAT**

WHEEL WELL - IF AC POWER SELECTED

If FITTED : 2X ENGINE START LEVER FIRE LIGHTS

- TEST 3X BELL CANCEL (**FIRE WARN x2**; **BELL CUT OUT**)

Extinguisher Test switch 1→2 (Hold)

- VERIFY LIGHTS : ● ENG 1 ● ENG 2 ● APU

APU Start

- #1 / LEFT CENTER (>453KG) AC FUEL PUMP ON

When **APU GEN OFF BUS** illuminated:

- APU GENERATOR BUS SWITCHES..... ON

- VERIFY NO **SOURCE OFF** **TRANSFER BUS OFF**

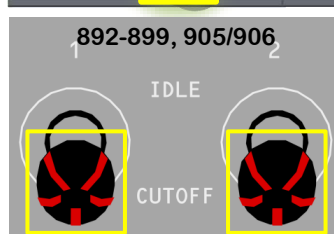
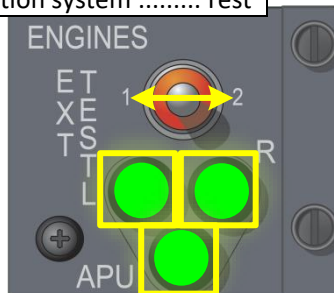
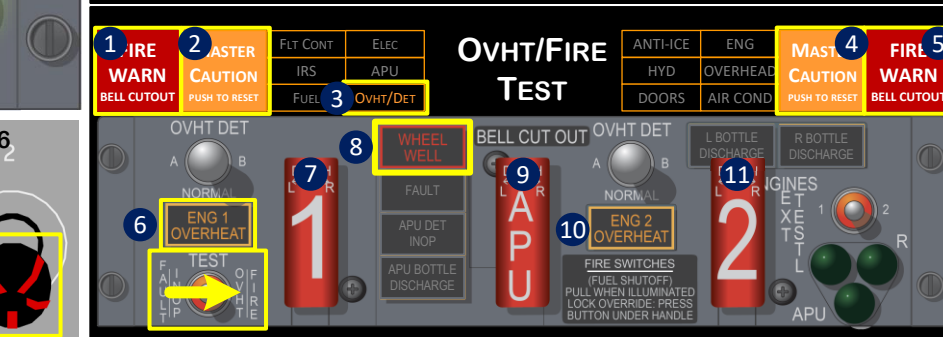
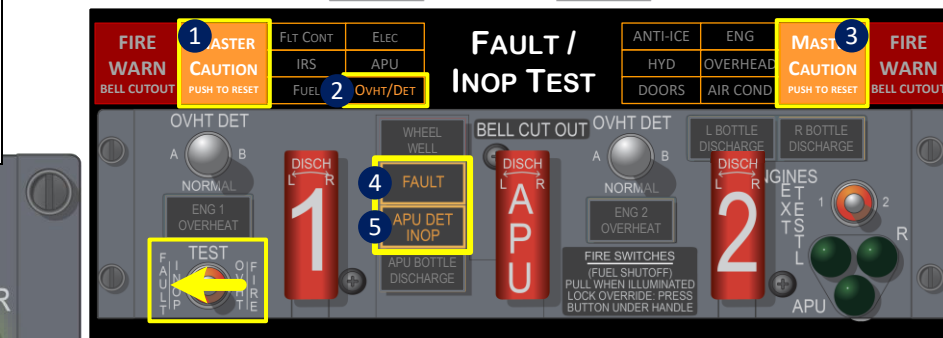
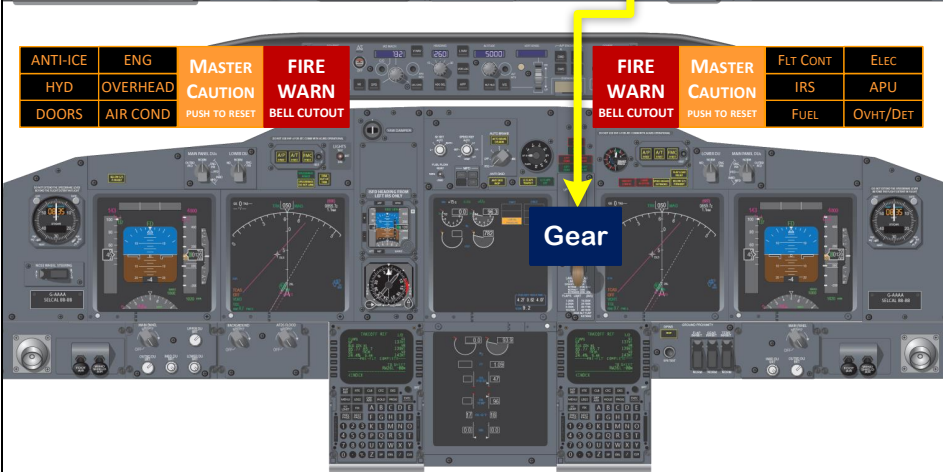
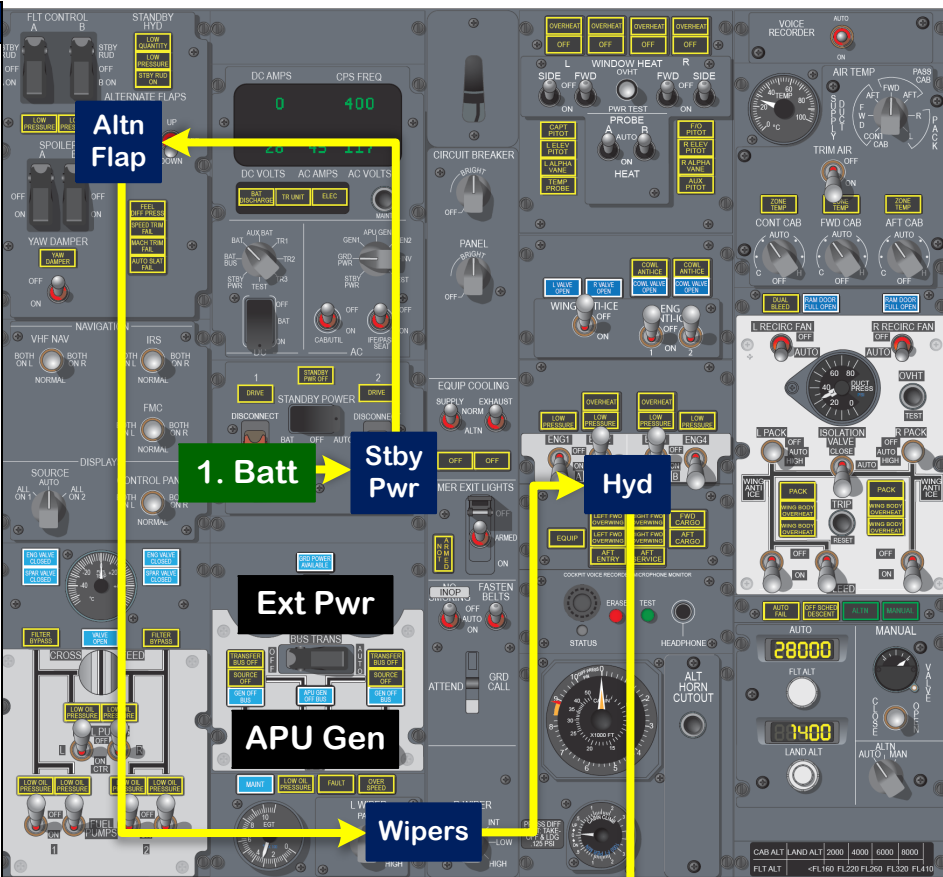
- VERIFY NO **STANDBY PWR OFF**

- VERIFY NO **APU MAINT** **APU LOW OIL PRESSURE**

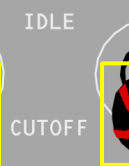
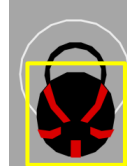
- VERIFY NO **APU FAULT** **APU OVERSPEED**

If not Previously Tested ...

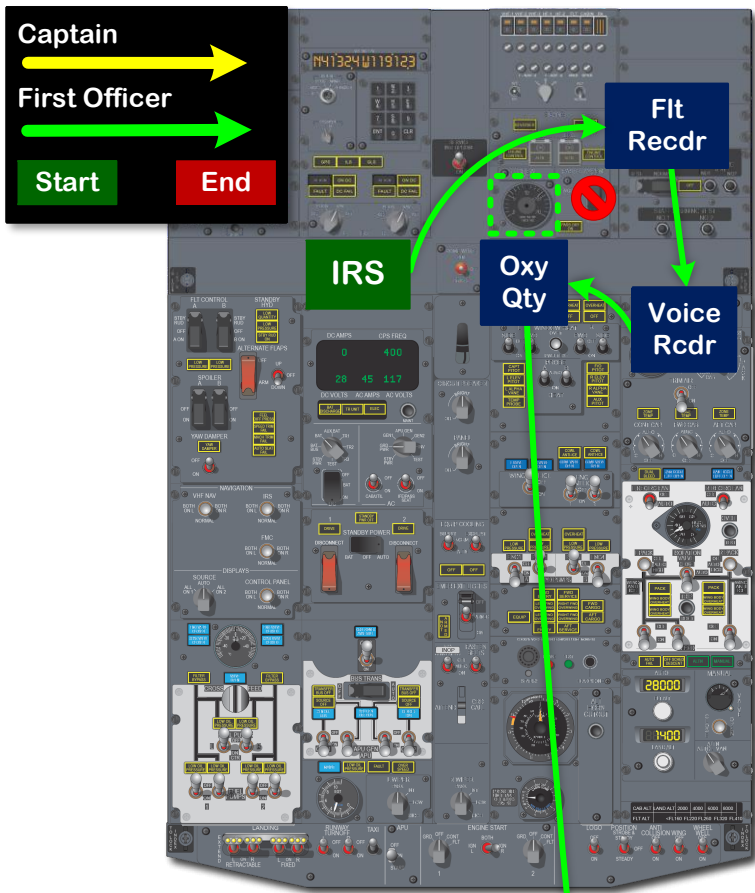
Wheel Well Fire Detection system Test



892-899, 905/906



Preliminary Pre-Flight (FO or CA)



- SP 1.1 FLIGHT DECK DOOR SYS TEST**
- Flt Deck Access System NORM
 - Flt Deck Door Open
 - Flt Deck Door selector AUTO
 - Emergency Access Code Enter & ENT Key
 - Verify **AUTO UNLK**
 - Flt Deck Door Lock selector DENY
 - Verify **AUTO UNLK** extinguishes
 - Flt Deck Door Lock selector UNLKD
 - Flt Deck Access System switch OFF
 - Verify **LOCK FAIL**
 - Flt Deck Access System switch NORM
 - Guard ... Down
 - Verify **LOCK FAIL** extinguishes
 - Flt Deck Access System Guard Up & OFF

PRELIMINARY PRE-FLIGHT

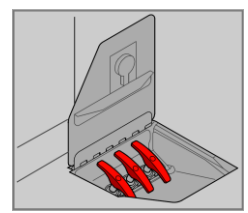
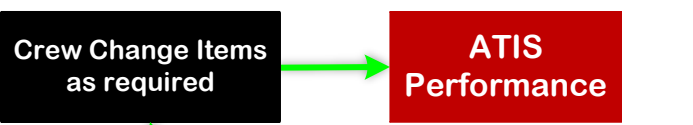
Electrical Power Up (SP 6.1 AS REQ'D) ... Complete
 IRS Mode Selectors OFF; NAV
 - VERIFY **ON DC** LIGHTS & OUT; THEN **ALIGN** LIT
 Flight Recorder Test (SP 10) Complete
 Voice Recorder ON
 Oxygen Pressure Sufficient (737 PSI??)
 Hydraulic Qty (No **RF**) Sufficient
 Eng Oil Qty (MIN 12L : 0.4 - 0.7 L/HR) Sufficient
 Flt Deck Access Sys Guard Up/Off

➤ Crew Change / Maint / Elec Interrupt

Maintenance Docs Check
 Flight Deck Access (SP 1) Complete
 Emergency Equipment Check
 - FIRE EXT; AXE; 2xROPES; 3xL's; PBE, GLOVES; FCB
 ELT Guard Closed
PSEU / GPS / ILS / GLS Extinguished
 Service Interphone switch OFF
 Engine Panel (EEC / **REVERSER / CONTROL**) Set
 Oxygen Panel Set
 Landing Gear Lights Illuminated
 Mach/Airspeed Test Test x2
 Stall Warning Test Text x2
 - REQUIRES AC TRANSFER BUSES FOR 4 MINS
 - FLAPS CAN DROOP WITHOUT HYD PWR & TEST FAILS
 Evacuation Sw (**EVAC** EXT; 900-6) Grd Closed
 Internet Ground Transmit Normal
 P6 Circuit Breakers Check
 Manual Gear Access Door Closed
 P18/Control Stand CCBs Check
 Parking Brake As Required

➤ Crew Change Items Complete

ATIS Copy
 Performance Calculations Complete



Pre-Flight System Tests



FIRE/OVERHEAT TESTS

- System Lights Test (& PTT **WHEEL WELL**)
- Verify Fire Switches ... IN
- AC Power required for Cargo & Wheel Well.
- Init Accept; Crew Chg; Pwr Interrupt; Maint : B4 APU
- Test Cancel with 2x **FIRE WARN** and **BELL CUT OUT**



Fault Detection Test (Engines/APU)

Test → **FAULT/INOP** : **Five Lights**

- 2x **MASTER CAUTION** ; 1x Sys **OVHT/DET**
- Fire Panel **FAULT** & **APU DET INOP**

Fire/Overheat Detection Test (Engines/APU)

Test → **OVHT/FIRE** : **Eleven Lights**

- 2x **MASTER CAUTION** ; 2x **FIRE WARN** + ; 1x **OVHT/DET**
- Fire Panel : **ENG 1** **APU** **ENG 2** (Fire Handles)
WHEEL WELL **ENG 1 OVERHEAT** **ENG 2 OVERHEAT**

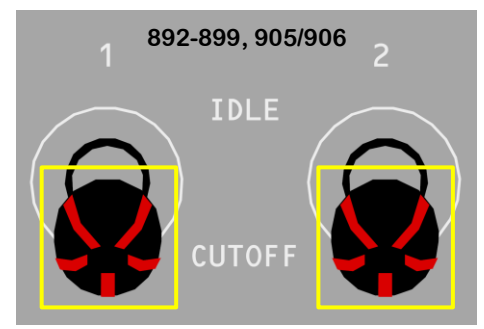
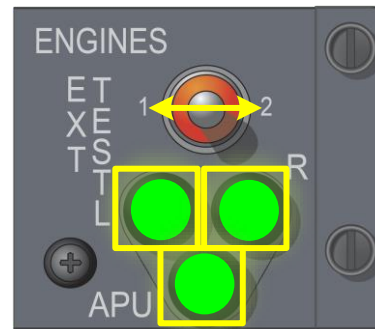
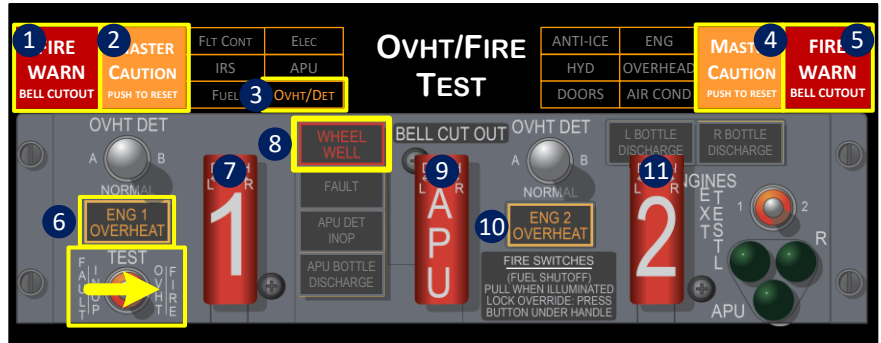
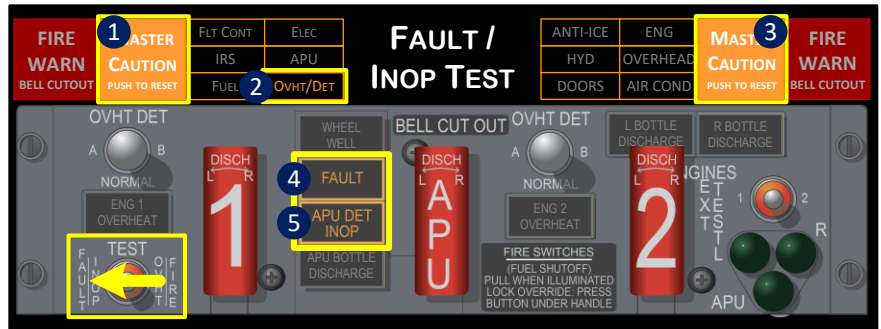
Engines/APU Fire Extinguisher Test

- Test 1 - 2 (Hold) : ● **ENG 1** ● **ENG 2** ● **APU**

Cargo Fire Detection Test

Test → Press & Hold : **Six Lights**

- 2x **FIRE WARN** +
- Extinguisher Test Lights; **FWD** **AFT** **DISCH**



MACH/AIRSPD/FDR TESTS

- Accomplished during Prelim Pre-Flight (CREW CHANGE)

Mach/Airspeed Warning Test

- Press & Hold **No1**; then **No2**
- Verify overspeed clacker heard.

Stall Warning Test

- Requires 4 minutes of AC Transfer power.
- Without Hydraulic power, LE Flaps can droop, resulting in asymmetry and Stall Test fail. Use B pressure to retract flaps and repeat test
- Press & Hold **No1**; then **No2**; Verify **Stick Shaker**.

Flight Recorder Test

- Conducted on ground prior to engine start with electrical power available.
- Flight Recorder switch ... Test; verify **OFF** light ext.



SP 8.1 FIRE/OVHT TEST – INOP LOOP

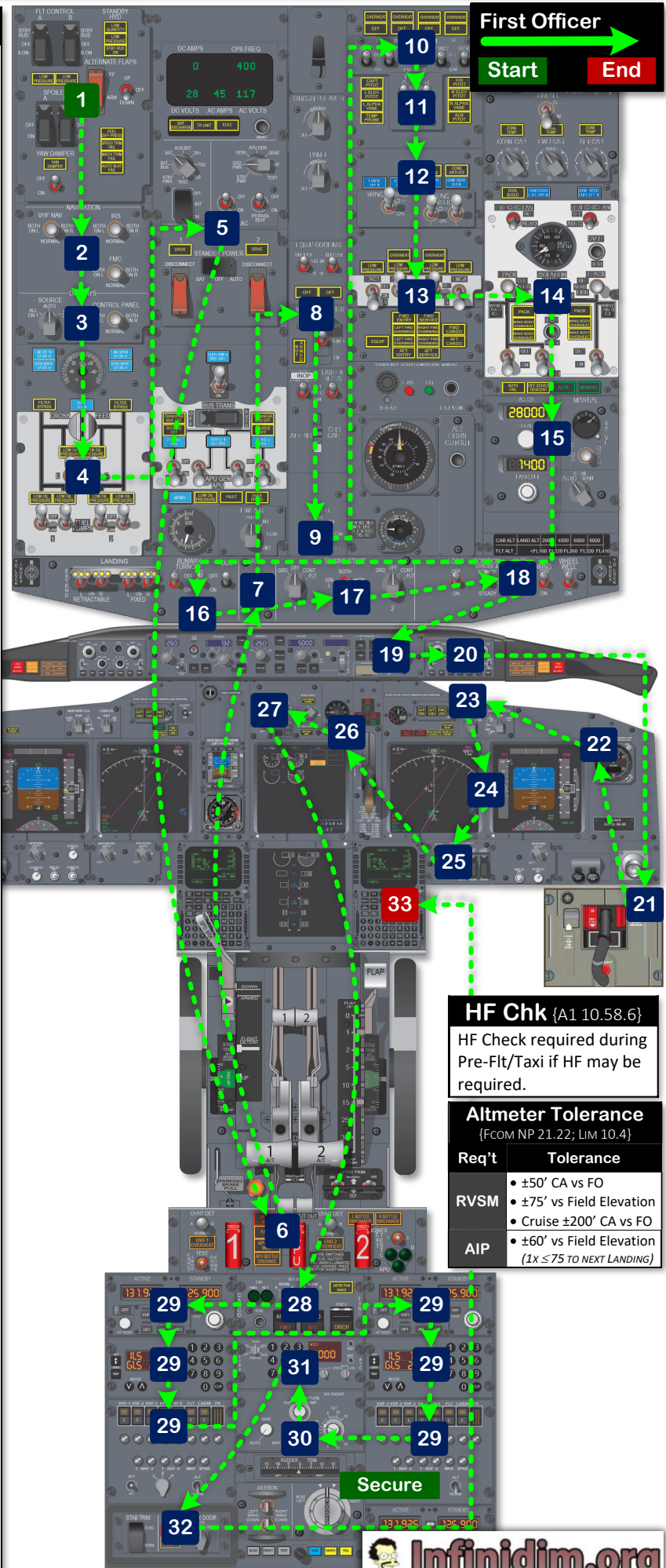
- Single Loop dispatch is possible
- Alternate Single Loop SP verifies Loop

Pre-Flight – First Officer

PRE-FLIGHT – FIRST OFFICER

- 01 Flight Control panel Check
- 02 Navigation panel Set
- 03 Displays Panel Set
- 04 Fuel panel (REFUELLING COMPLETE?) **Set**
- 05 Electrical panel Set
- 06 Overheat & Fire Protection panel ... **Check**
- INITIAL ACCEPT; CREW CHG; PWR INTERRUPT; MAINT
- 07 APU (AS NEEDED) **START**
- **APU GEN OFF BUS**; 2MINS THEN APU BLEED AIR
- 08 Lavatory **SMOKE** (900-906) Ext
Equipment Cooling NORM
Emergency Exit Lights (GUARD CL) **ARMED**
Pax Signs (FUEL DONE?; NO SMOKE 727-30)..... Set
- 09 Windshield Wipers PARK
- 10 Window Heat..... **ON**
- 11 Probe Heat AUTO
- 12 Wing & Engine Anti-Ice OFF
- 13 Hydraulic panel (PRESSURISE) **Set**
- 14 Air Conditioning panel Set
- 15 Cabin Pressurisation panel (FLT/LAND) Set
- 16 Lighting panel (LAND/TURNOFF/TAXI)..... Set
- 17 Ignition Select (R FOR CREW CHG)..... **IGN L/R**
Engine Start OFF/AUTO
- 18 Lighting panel (LOGO/Pos/ANTI-COL/W/W) .. Set
- 19 MCP (PF: COURSE; F/D; 4900)..... Set
- 20 EFIS Control panel..... Set
- 21 Oxygen (MAX -100 PSI; MIC CHK) **Test & Set**
- 22 Clock (GMT) Set
- 23 Display Select panel (NORM)..... Set
TAKEOFF CONFIG / **CABIN ALTITUDE** Ext
- 24 A/P & A/T Disengage Test **1/2**
- 25 **BRAKE TEMP** (900-906) Ext
Ground Proximity Guarded (**INOP** ext)
RAAS Inhibit.... Guarded (**RUNWAY INOP** ext)
- 26 Landing Gear panel Set
Auto Brake (NO **AUTO BRAKE DISARM**) ... **RTO**
ANTI-SKID INOP Ext
- 27 Engine Display Control panel..... Set
- 28 Engine Instruments (MFD C/R) Check
- 29 Cargo Fire panel **Check**
- INITIAL ACCEPT; CREW CHG; PWR INTERRUPT; MAINT
- 29 RTP/ACP/Nav Radio panels **Set**
- 30 Weather Radar panel..... Set
- 31 Transponder panel (SOURCE TO PF SIDE) ... **Set**
SECURE Card Turn Over **Secure**
- 32 Stabilizer Trim Override.....Guard Closed
Seat/Seat Belt/Rudder Pedals Adjust
- 33 Flight Plan Verify

Indicates **Action** Items



First Officer

Start

End

HF Chk {A1 10.58.6}
HF Check required during Pre-Flt/Taxi if HF may be required.

Altimeter Tolerance
{FCOM NP 21.22; LIM 10.4}

Req't	Tolerance
RVSM	• ±50' CA vs FO • ±75' vs Field Elevation
AIP	• Cruise ±200' CA vs FO • ±60' vs Field Elevation (1x ≤ 75 to NEXT LANDING)

Non ACARS FMC Setup

21-Feb-24

FMC INITIALISATION – NON ACARS

INIT REF IDENT Page Select

IDENT Page Verify

Verify MODEL 737- 700W/800W/800W.1

Engine Rating Check

Active Nav Data Base Check Date

POS INIT > LSK Push

Time/Date Verify Correct

Inertial Position Enter

Enter position using the most accurate Lat/Lon available (GPS).

ROUTE > LSK Push

Co Route (IF AVAILABLE) Enter

ORIGIN/DEST (CO ROUTE N/A) Enter

FLT NO (VoZ ###) Enter

Runway Enter

Route (CO ROUTE / WAYPOINT ⇌ AWY ⇌ WAYPOINT) ... Check/Enter

ACTIVATE > LSK Push & **EXEC**

LEGS key Select

RNP Verify for Departure

RTE DATA > LSK Push

Waypoint Cruise Level Winds Enter

VNAV ECON PATH DES Page Select

Descent Winds Enter

Destination Forecast QNH (Pre) Enter

INIT REF PERF INIT Page Select

COST INDEX, ZFW, PLAN FUEL Enter

CRZ ALT, CRZ WIND, T/C OAT Enter

TRANS ALT Verify

N1 LIMIT > LSK Push

SEL°/OPT OAT° Temperatures (VERIFY 727-30) ... Enter/Verify

Thrust Settings (TO/2/1) (VERIFY N1) Select

CLB Thrust Setting Consider

TAKEOFF > TAKEOFF REF 2/2 Push

ACCEL HT, EO ACCEL HT, THR REDUCTION Enter/Verify

TAKEOFF REF 1/1 Select

FLAP Enter

V1, VR, V2 Enter

Other Considerations:

- VNAV CLB Speed/Alt - FIX Page (SEFP)
- VNAV DESC (Crz Mach #/280) & 250/10,000

```

IDENT 1/1
MODEL 737-800W.1 ENG RATING 26K
NAV DATA ACTIVE
U737171001 MAR29APR25/22
    
```

```

MAR01MAR28/22
OP PROGRAM 549849-018 (U12.0)
SUPP DATA
    
```

<INDEX POS INIT>

```

RTE 1 1/2
ORIGIN YMML DEST YSSY
CO ROUTE FLT NO
RUNWAY VOZ123
    
```

```

ACT RTE 1 2/2
VIA DIRECT TO DOSEL
Y59 RIVET
    
```

```

ACT PERF INIT 1/2
GW/CRZ CG TRIP/CRZ ALT
77.0 /26.2% FL374/FL370
PLAN/FUEL CRZ WIND
--.-/18.0 240° / 45
ZFW T/C OAT
59.0 -49° F -45° C
RESERVES TRANS ALT
2.4 10000
COST INDEX PERF INIT
25 REQUEST>
    
```

<INDEX N1 LIMIT>

```

N1 LIMIT 1/1
SEL/OAT RED 24K N1
+37/ +23° C 93.6/ 93.6
26K
<TO CLB>
24K DERATE
<TO-1 <ACT> <SEL> CLB-1>
22K DERATE
<TO-2 CLB-2>
    
```

<PERF INIT TAKEOFF>

```

TAKEOFF REF 2/2
RW WIND RW COND
--.- / --.- DRY / WET / SK-R>
RW SLOPE / HDG SEL / OAT
--.- % / --.- +37 / +23° C
    
```

```

ACCEL HT EO ACCEL HT
1000AGL 1000AGL
THR REDUCTION
CLB-1 1000AGL
    
```

<INDEX>

```

TAKEOFF REF 1/2
FLAPS V1
5° 135KT
RED 24K N1 VR
93.6 / 93.6 142KT
CG TRIM V2
--.- % 147KT
TAKEOFF DATA GW / TOW
<REQUEST 77.0 / 76.3
INTERSECT TO SHIFT
--.- / -00M
    
```

<INDEX>

Cold Soaked Fuel Frost (CSFF)

CSFF .. IN ALL CASES

No Snow/Ice/Frost on:

- Leading Edges
- Control Surfaces
- Tab Surfaces
- Winglet/SSW
- Control Balance Cavities

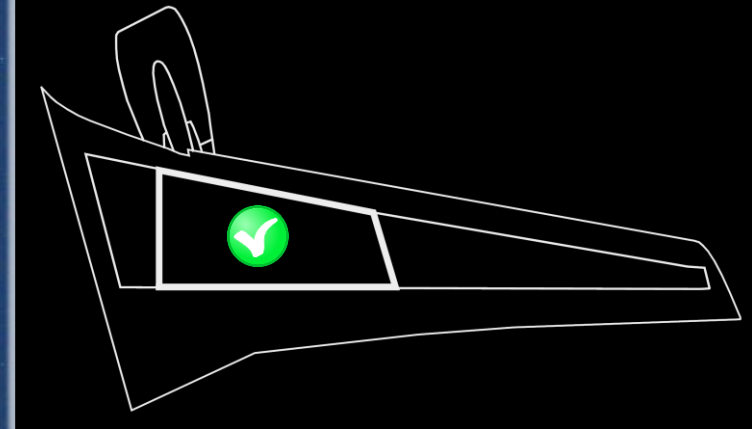
CSFF UPPER WING

Must meet ALL of:

- OAT $\geq +4^{\circ}\text{C}$
- Tank Temp $\geq -16^{\circ}\text{C}$
- No Rain, Snow, Drizzle, Fog ($\leq 1,600\text{m}$)
- CSFF only within defined limits.

CSFF on the
 ↑ Upper Wing Surface ↑

Upper Wing Representative Area



↓ CSFF on the Lower Wing Surface ↓

Cold Soaked Fuel Frost (CSFF) Dispatch {A1 9.1.4.3} {SP 3}

Year Round :	• From YPPH to YMHB / YMLT.	Max FOD :
APR → OCT :	• All Arrivals : YSCB, YMHB, YPKG, YMLT	6.4T unless Operationally Required
FOD :	• Max FOD 6.4T unless Operationally Required	
Notes :	<ul style="list-style-type: none"> • The Presence/Extent of CSFF on the Lower Wing outside Stick #4 can indicate the presence of CSFF on the Upper Wing • CSFF possible between -2°C to $+15^{\circ}\text{C}$ - with Airframe Structure below 0°C • Consider delaying Refuelling until after External Inspection • Additional Fuel can disperse CSFF if required • No changes to CSFF procedures/requirements for B737-Max 	

CSFF LOWER WING

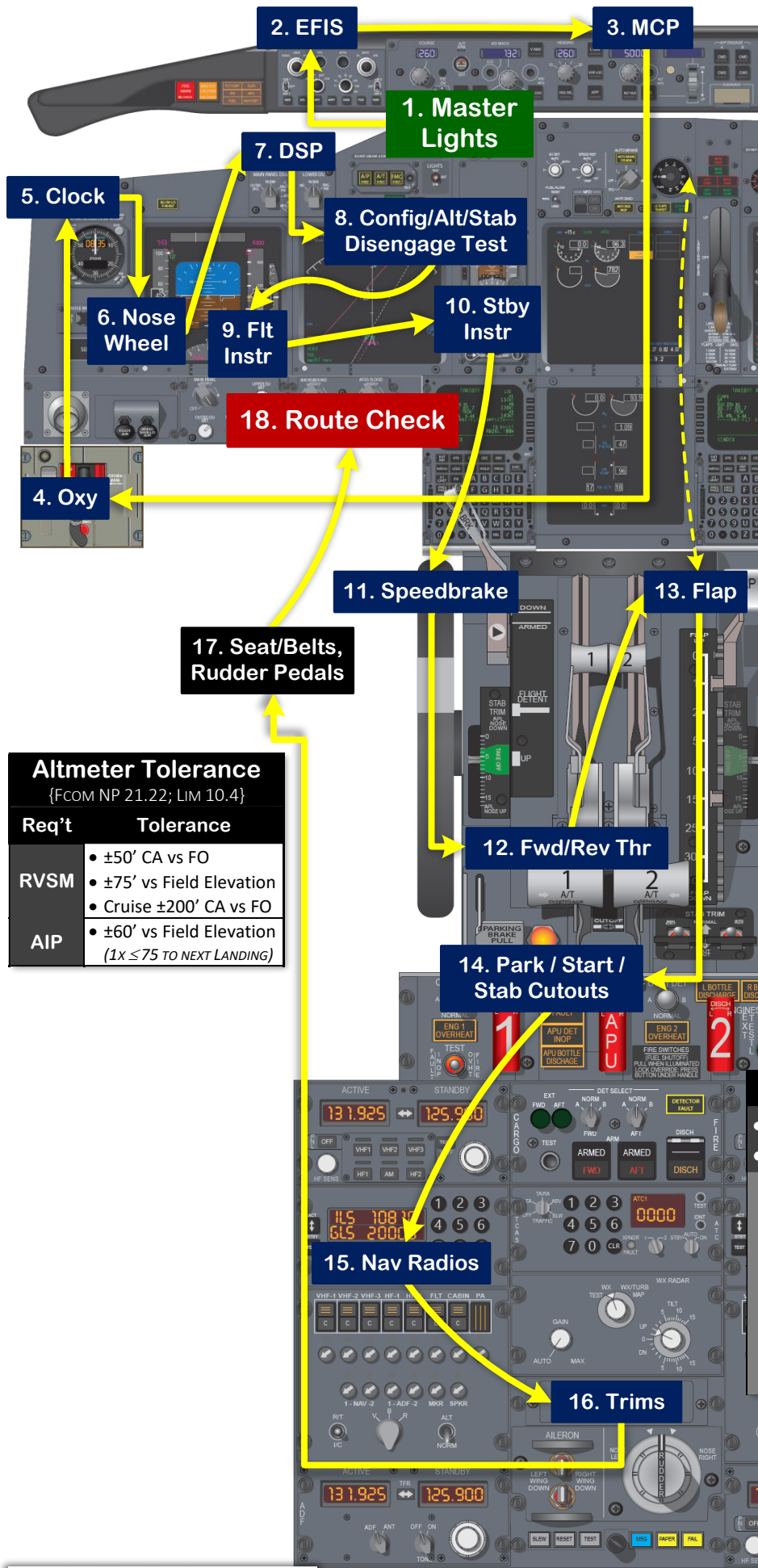
Max CSFF up to 3mm if:

- OAT $\geq +4^{\circ}\text{C}$
- Tank Temp $\geq -16^{\circ}\text{C}$
- No Rain, Snow, Drizzle, Fog ($\leq 1,600\text{m}$)

CSFF LOWER WING

- OAT $\geq +4^{\circ}\text{C}$
- Tank Temp $\geq -16^{\circ}\text{C}$
- No Rain, Snow, Drizzle, Fog ($\leq 1,600\text{m}$)
- No limit on Lower Wing CSFF if all above met.*

Pre-Flight - Captain



PRE-FLIGHT – CAPTAIN

Master **LIGHTS TEST** TEST; Set - SCAN FLOW - TEST SWITCHES/ **Wheel Well** PTT

EFIS Control Panel (Eo Acc ON BARO).....Set

MCP (PF: COURSE; F/D; 4900) SET

Oxygen (MAX -100 PSI; MIC CHK) Test & Set

Clock (GMT)Set

Nose Wheel Steering.....Guarded

Display Select PanelSet

TAKEOFF CONFIG / CABIN ALTITUDE Ext

A/P & A/T Disengage Test..... 1 & 2

STAB OUT OF TRIM Ext

Flight Instruments (IRS ALIGNED)..... Check

Standby Instruments/ISFD/RMI Check

Speedbrake Lever (PUSH)..... Down

Forward Thrust Levers Closed

Reverse Thrust Levers Down

Flap Lever.....Set

Parking BrakeSet

Engine Start Levers.....Cutoff

Stab Trim Cutouts..... Guard Closed

RTP/NAV Radios.....Set

Trims (x3 – LEAVE AIL/RDR AT 0) Check/Set

Seat/Seat Belt/Rudder Pedal..... Adjust

Flight Plan (& ROUTE CHECK) Verify

CA “Pre-Flight Checklist” **Complete**

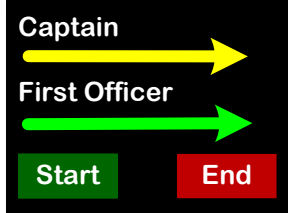
Altimeter Tolerance
{FCOM NP 21.22; LIM 10.4}

Req't	Tolerance
RVSM	<ul style="list-style-type: none"> ±50' CA vs FO ±75' vs Field Elevation Cruise ±200' CA vs FO
AIP	<ul style="list-style-type: none"> ±60' vs Field Elevation (1x ≤75 TO NEXT LANDING)

FMC ROUTE CHECK

- Captain Reads FMC
- First Officer Checks CFP

RTE	<ul style="list-style-type: none"> • Origin, Destination, Flt No (set C/C) • CO Route (if manually entered) • Verify Aircraft Registration (Panel)
Prog CFP	<ul style="list-style-type: none"> • Waypoint/Airway/Waypoint • Select & Verify any Lat/Lon • FMC Route Distance • FO notes Fuel On Board



Airways Clearance

AIRWAYS CLEARANCE

FO Call for Airways Clearance; record on TODC and complete Readback to ATC

CA Set the following IAW the Airways Clearance

- FMC : CONFIRM DESTINATION/RUNWAY, SELECT SID
- MCP : CLEARED ALTITUDE/FIRST ALTITUDE RESTRICTION
- TRXPNDR : CODE, AUTO, TA/RA, ABV (VERIFY ND **TFC**)

CA With Clearance Readback Complete the CA confirms the Clearance Settings with the FO

FMC : "Voz737 Cleared to Sydney , RW34 via the DOSEL 9" (FMC RTE 1→2)

MCP : "Cleared to 5,000"

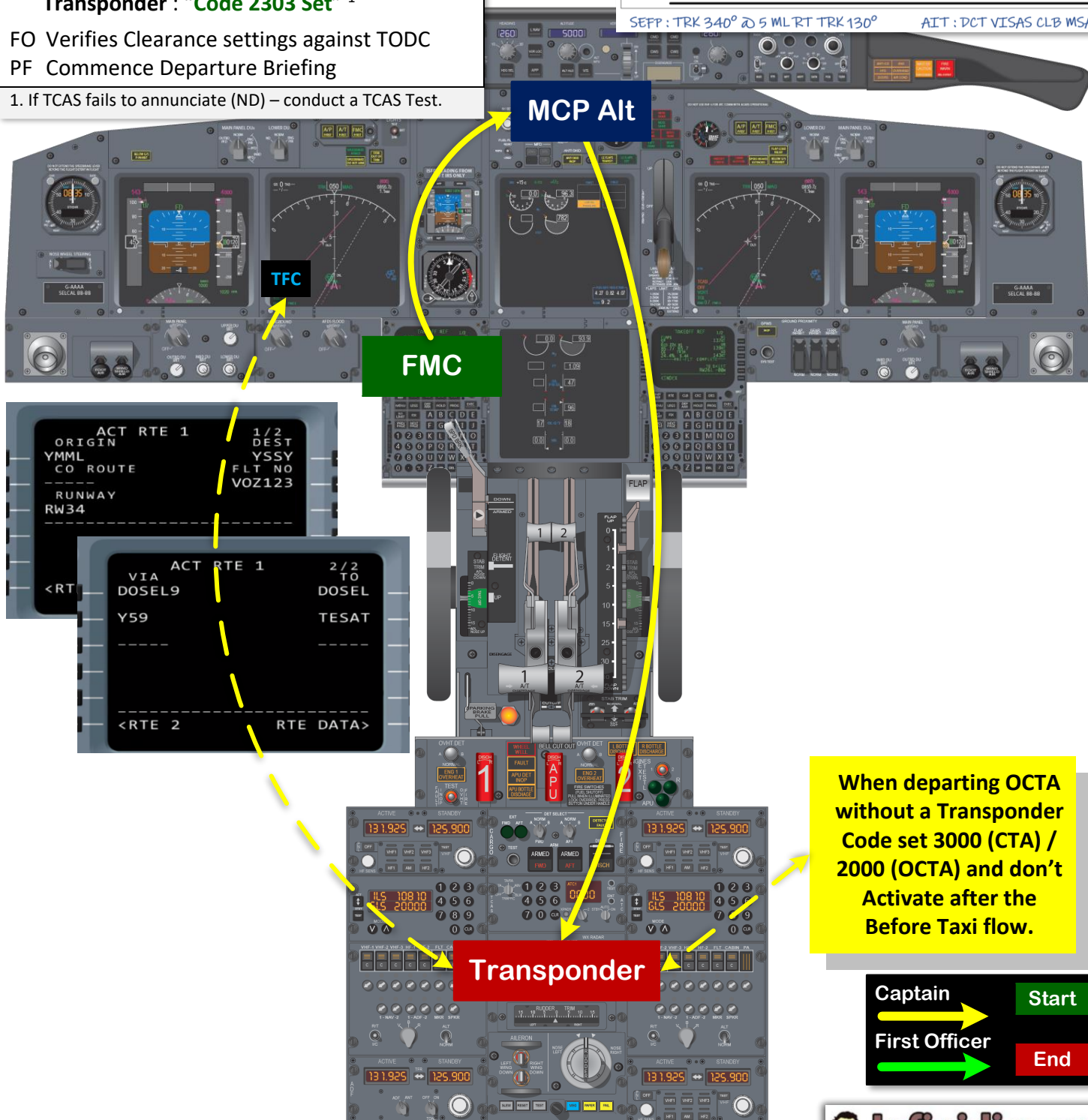
Transponder : "Code 2303 Set" ¹

FO Verifies Clearance settings against TODC

PF Commence Departure Briefing

1. If TCAS fails to annunciate (ND) – conduct a TCAS Test.

RWY 34	27 AUTO 26 OFF 24 DRY 22 WET	ANCE Sel T	IMC/EB 37/25	FLAP 5	BAY
J	INTX	N1	91.5	FUEL REM	
NADP: STD 1 2		V1	136	MEL/CDL	N/A
EO ACC: 1687 (AMSL)		V _R	144	Planned	Actual
1253 (AFE)		V2	148	6.0 Fuel PAX	130+6
COBT		MAC	23%	59.0 ZFW	59.3
				64.9 BRW	65.1
				OPT LMT	66.0
APT YMML	INFO A	RWY	34		
W/V 290/15	(0)	VIS	CAVOK		
CLD		T	23°	Q	1020
RMK 290/15					
CLR YSSY DOSEL DOSEL9 5000 C1297 DEP 118.9					
SEPP : TRK 340° @ 5 ML RT TRK 130° AIT : DCT VISAS CLB MSA					



When departing OCTA without a Transponder Code set 3000 (CTA) / 2000 (OCTA) and don't Activate after the Before Taxi flow.

Captain → Start
First Officer → End

DEPARTURE BRIEFING

BIG PICTURE

- Aircraft Status (Defects/SPs)
- Significant Weather/Terrain
- Airport Factors (NOTAMs, etc)
- Other TEM Factors (FCO, LVTO, EDTO – APU, PBN)
- In all cases - **Identify** and **Mitigate** any threats.

NON NORMAL BRIEFING (1ST SECTOR – SUBSEQUENTLY BRIEF DIFFERENCES)

This is a Left Seat Takeoff using (TO/1 and Assumed Temperature) with a V1 of ___ kts.

- Prior to 80 knots I will Reject the Take-off for most malfunctions (or loss of Visibility - LVTO)
- After 80 knots I will reject for any **Fire** or **Fire Warning**, **Engine Failure**, **Windshear Warning** or **Aircraft** otherwise **Unsafe to Fly**.

In the event of any Malfunction prior to V1, I will call either **“REJECT”** or **“CONTINUE”**.

If the call is **“REJECT”**:

- I will simultaneously close the Thrust Levers, Disengage the Autothrottle and apply Maximum Manual Braking or monitor Autobrake RTO
- I'll raise the Speedbrake Lever and apply Reverse Thrust consistent with the Stopping requirement.
- I'll bring the aircraft to a Stop into Wind (which is from the Left/Right), and stow the Reversers.
- I'll call for you to **“Confirm the Failure”** and complete Checklist or Memory Items as appropriate.
- Depending on the malfunction:
 - I'll set the Parking Brake and stand the crew up **“This is the Captain, Cabin Crew to your Stations.”**
 - Or I'll PA **“Cabin Crew and Passengers, Remain Seated.”**

PM Actions :

- During the Takeoff call any Malfunctions up to V1 and after **“Gear Up”**.
- During the Reject verify my actions and call any omissions, call **“Speedbrake Up”** or **“Speedbrake Not Up”** and monitoring braking calling **“AUTOBRAKE DISARM”** as appropriate; verify Reverse Thrust and call Reverser Status, call **“Sixty Knots”** and advise ATC.

Any Questions on the Reject?

From **V1** or **“CONTINUE”** I will continue the Takeoff as per Company SOPs.

- The SEFP (10-7S) today is ____, and the EO ACC is ____ (set both sides).
- I will fly the Engine Out in (LNAV/HDG SEL) and (VNAV/TOGA) and accelerate after the EO ACC through the MSA of ____ to the cleared altitude of ____ (or ...)
- For a Failure After the Initial Turn (AIT) we will ____ (10-7S) and accelerate after the MSA of ____.

Once the checklists are complete we will review our options, but based on the weather today if the checklist says **Land at Nearest Suitable** I expect Return/Divert to ____ . We (are / are not) over Max Landing weight so the Overweight Checklist (is/is not) a consideration.

Our Immediate Return plan is ____ . Any Questions on the **Continue**?

NORMAL BRIEFING

- We will Taxi as Cleared for RW ____ (Full Length/Intersection ____) Departure (Hotspots/Rwy Crossing)
- The Departure is a STD/NADP1/2 into a ____ (SID/Visual Departure).
- Brief & Check FMC : SID Chart to FMC (Notes, MSA, Track, Speeds, Altitudes, FlyOver Waypoints)
- Cruise Altitude Capability (Plan, OPT/MAX), Destination Weather vs Fuel Over Destination.

FLIGHT DECK SETUP

- Flight Directors On, Master is on the (Left/Right)
- Course Bars Set to ____ for NAV 1/2 Tuned/Ident/Stby

Lateral Modes :

- Heading Bug is set to ____° with 25° Bank, LNAV is ____

Vertical Modes :

- V2 ____ and Cleared Altitude ____, VNAV is ____

PFD :

- PFD V-Speeds, V2, FMA , Altitude ____



Final Loadsheet Check

1 LOADSHEET FINAL XXXX EDNO1

VA123/22 220422 08:00

MEL SYD VH-IJQ 2/4 2

ZFW 59235 4 MAX 52,731

TOF 5845

TOW 65080 5 MAX 79015

TIF 2400

LAW 62680 6 MAX 66360 L

UNDLD 3496

PAX/4/126 TTL 130 3

MACTOW 23.0 7

A4 B31 C31 D31 E33

SEATROW TRIM

SI PREPARED BY WAYNE 1800

33749170828

BW 41221

BI 50.9

SERVICE WEIGHT ADJUSTMENT WEIGHT/INDEX

ADD

MEL POTABLE WATER

151 2.6

DEDUCTIONS

NIL

NOTOC: NO 6

CPT PASCOE 7

SIGNATURE.....

FINAL LOAD SHEET

CA Final Loadsheet Check ... Complete

- FLT NUM, DATE/TIME, ROUTE, REGO
- NUMBER OF CREW / TOTAL PAX
- ZFW, TOF, TIF, LAW (LIMITS)
- MACTOW
- NOTOC Yes/No
- CAPTAIN'S NAME

CA NOTOC Review Complete

- FLIGHT NUMBER, ISSUE DATE/TIME
- AERODROME OF ORIGIN
- SPECIAL LOAD DETAILS
- DANGEROUS GOODS DETAILS
- LOADING SUPERVISOR NAME

CA ACARS FLS Accept

CA ACARS NOTOC Accept

FLS-FMC Entry & Crosscheck

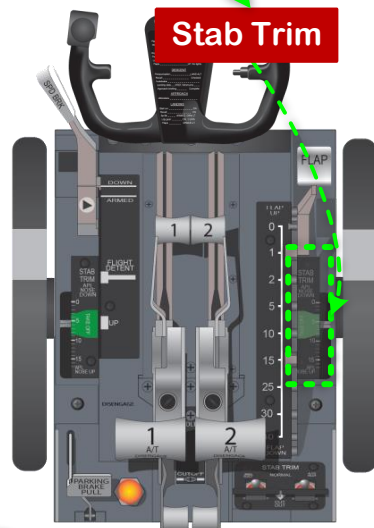
BEFORE START PERFORMANCE CHECK

- Final Loadsheet Verified/Accepted
- CA FLS ⇒ TODC.....Complete
 - PAX+CREW #, ZFW, Tow (BRW), MAC/Tow (MAC)
 - CHECK OPT SELECTED FWD CG VALID
- FO FLS ⇒ CDU (FLS DATA⇒FMC).....Insert
 - UPDATE FMC : ZFW, CG
- FO Stabilizer Trim (FROM CDU TRIM).....Set
- CA Performance Data (TODC ⇔ Fmc).....Check
- PERF INIT 1 : ZFW, FUEL (3%), BRW ⇔ GW / OPT LIM WT
 - CONFIRM FOR FO TO **ACCEPT**> SPEEDS
- N1 LIMIT : D-TO#, SEL°/OAT°, N1 CHK (± 4%), CLB#
- TAKEOFF REF : FLAP, V SPEEDS, CoG, STAB TRIM
- MCP : SPEED V2, A/THR ARM
- PF CDU Display..... TAKEOFF REF
- PM CDU Display.....LEGS
- CR WindowsClosed & Locked
- CA "Before Start Checklist to the Line"

2. FO FLS ⇒ CDU

```

LOADSHEET FINAL EDNO1
VA123/22 220422 08:00
MEL SYD VH-IJQ 2/4
ZFW 59235 MAX 52,731
TOF 5845
TOW 65080 MAX 79015
TIF 2400
LAW 62680 MAX 66360
UNDDL 3496
PAX/4/126 TTL 130
MACTOW 23.0
    
```



3. CA : Perf Check TODC ⇒ CDU

1. CA : FLS ⇒ TODC

RWY 34 J INTX	27 AUTO 26 OFF 24 DRY 22 WET Sel T 37/23 N1 92.8	FLAP 5 BAY FUEL REM
NADP: STD 1 2	V1 136 VR 144 V2 148 MAC 23%	MEL/CDL N/A Planned 6.0 Fuel PAX 130+6 59.0 ZFW 59.3 64.9 BRW 65.1 OPT LMT 66.0

APT YMML INFO A RWY 34
 W/V 290/15 (0) VIS CAVOK
 CLD _____ T 23° Q 1020
 RMK 290/15
 CLR YSSY DOSEL DOSEL9 5000 C1297 DEP 118.9

SEPP : TRK 340° @ 5 ML RT TRK 130° AIT : DCT VISAS CLB MSA

Captain → Start
 First Officer → End

Push/Start Flow and Sequencing

Captain

First Officer

Ground Eng

Ready for Push/Start

- ✓ Before Start Checklist to the Line
- ✓ Cabin Leader Pax Check
- ✓ All Doors Closed (Flight Deck Locked)
- ✓ Ground Power Removed (as req'd)
- ✓ Bridge Clear
- ✓ COBT (Dom) & GEN DEC (Intl)

Optionally ⇌

Gnd Eng

- ✓ "Confirm Ready for Pushback"

⇌ Optionally

Request Pushback

ATC Pushback ... Obtained

Before Start Checklist ... Below the Line

- #### Before Start Checklist
- Flight deck door . . . Closed/Locked
 - Anti-collision light ON
 - Fuel Panel * Set
 - Hydraulic Panel * Set
- Before Start Checklist Complete**

Clear Pushback

- "Confirm Steering Lock-out Pin Installed?"
- "Ready for Pushback"

Gnd Eng

- ✓ Commences Pushback

PRE-FLIGHT FUEL/HYD PRESSURIZING

If the Fuel/Hydraulic Pumps have not been pressurized during pre-flight, this is done during the Before Start Checklist to the Line flow.

➤ Fuel Panel (as required)

If the Center Tank fuel quantity exceeds 453 kg:

FO LEFT & RIGHT CENTER Fuel Pumps ON

- VERIFY LOW PRESSURE LIGHTS ILLUMINATE & EXTINGUISH

- IF LIGHTS REMAIN LIT CENTER TANK PUMPS ... OFF

FO AFT & FORWARD Fuel Pumps ON

- VERIFY LOW PRESSURE LIGHTS EXTINGUISHED

FO **Fuel Panel** **Set**

➤ Hydraulic Panel (as required)

CA Obtain a Clearance to Pressurise Hydraulics

FO ELECTRIC Hydraulic Pump Switches ON

- VERIFY ELECTRIC LOW PRESSURE LIGHTS EXTINGUISHED

- VERIFY BRAKE PRESSURE MIN 2,800 PSI

- VERIFY SYSTEM A&B PRESSURE MIN 2,800 PSI


CA Trims Check/Set

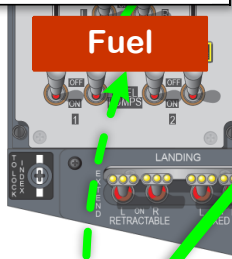
- CHECK EACH TRIM FOR FREEDOM OF MOVEMENT; SET 0

FO **Hydraulic Panel** **Set**

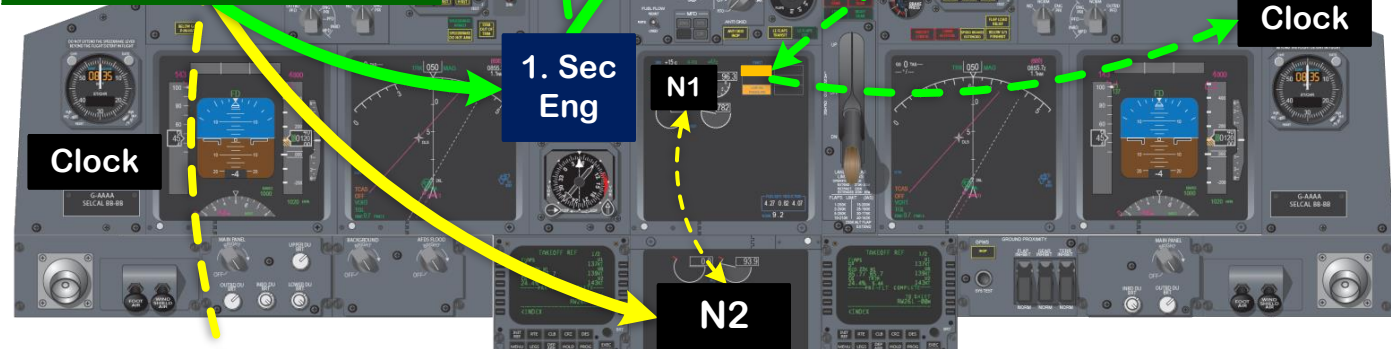
Engine Start

ENGINE START

- CA **"Start ___ Engine"**
- FO Secondary Engine Indications Display
- FO Fuel/Hydraulics (If REQUIRED) Pressurised
- FO **Packs** (USE THE "C") **OFF**
- FO **Engine Start switch**..... **GRD**
 - **START VALVE OPEN** - COMMENCE TIMING.
- CR Verify N2 & N1 Rotation.
- CA Engine Start Lever (CA : START CLOCK) **IDLE**
 - @ N2 25%/MAX MOTOR (MIN 20%) : MM = 1%/5SEC
 - VERIFY **SPAR VALVE CLOSED** Lit & EXT {SP 21.1}
- FO **START VALVE OPEN** Ext **"Starter Cutout"**
 - N2 56% : **ENGINE START SWITCH** **Auto**
- CA Engine Stable (2/4/6/3) no  Check
- CA No **CDS FAULT** / **CDS MAINT** before 2nd Eng Start

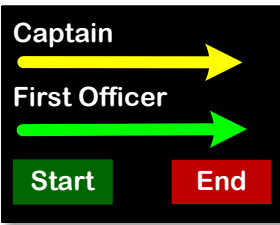


CA : "Start ___ Engine"



SP 2.2 ISOLATED PACK ENG START

- Improves cabin air between engine starts.
- After Engine #2 is Stabilised:
 - ISOLATION VALVE switch CLOSE
 - Right PACK switch AUTO
 - Duct Pressure Stabilized
 - Engine #1 Start
 - After Engine #1 is Stabilised:
 - ISOLATION VALVE switch AUTO



Start Lever ... IDLE

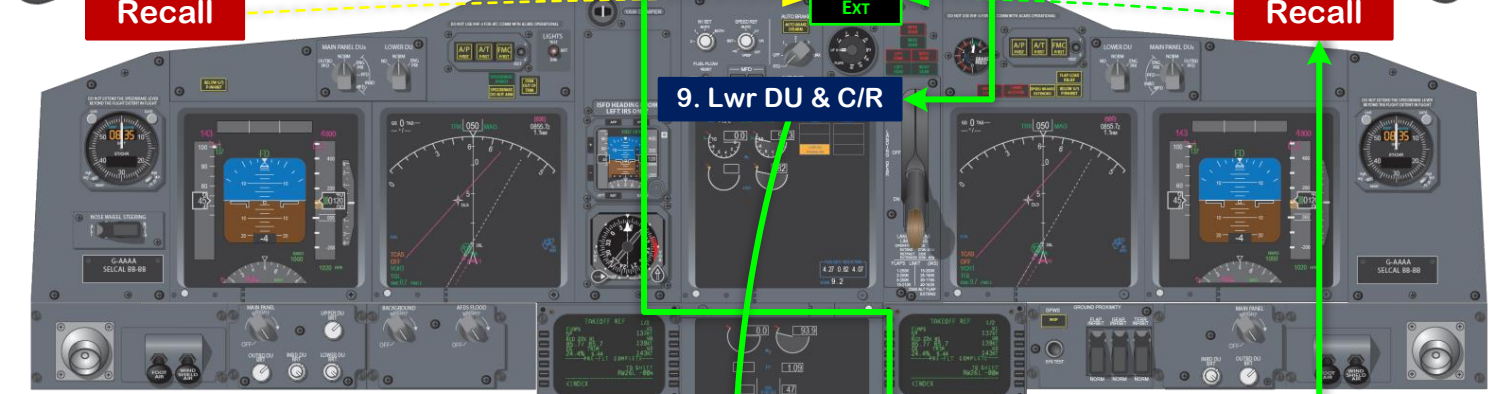
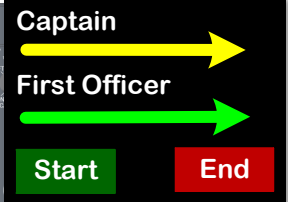
Before Taxi Flow

BEFORE TAXI FLOW

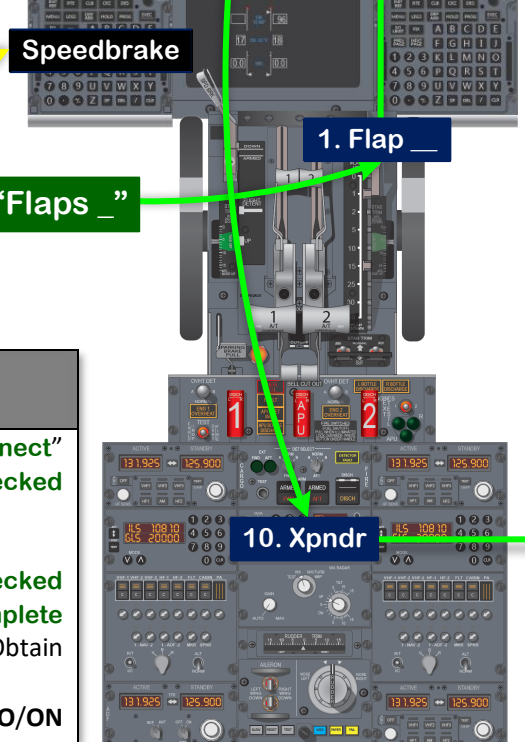
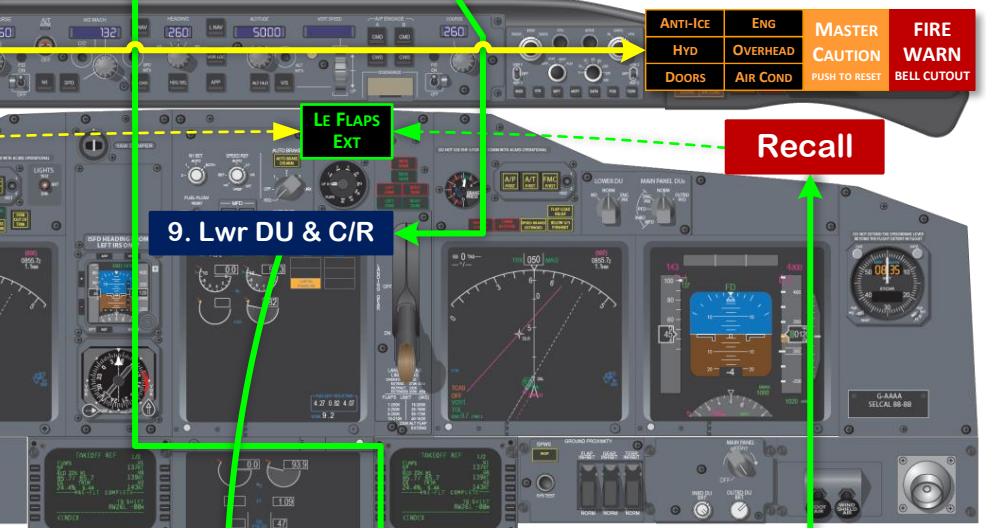
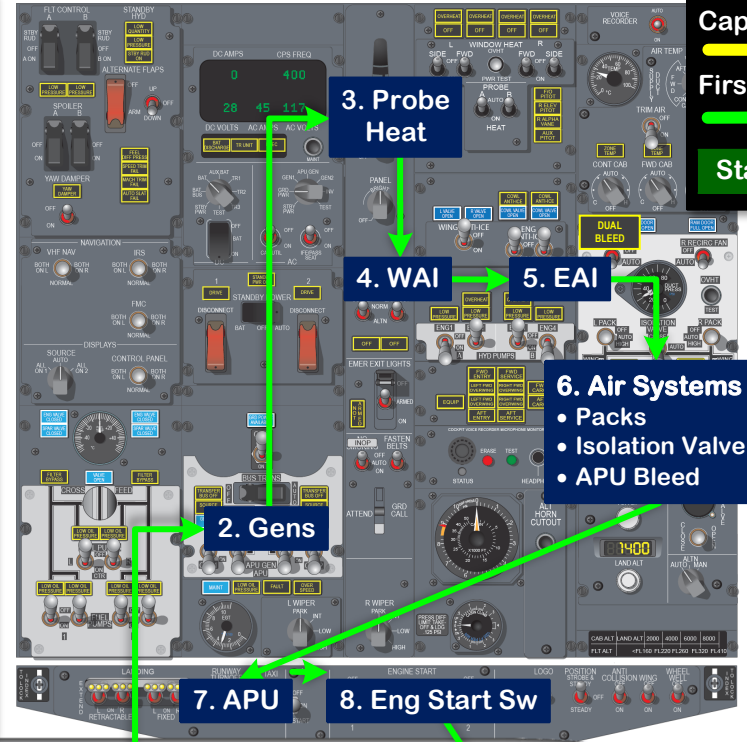
Engines Stab at Idle

- CA Engine Start Levers **IDLE Detent**
- CA "Flaps _" (AS NEEDED FOR TAKE-OFF)
- FO Flap Lever (REFERENCE TODC/FMC)
- FO Generators (GEN1 & GEN2 : **APU GEN OFF BUS**) **On**
- FO Probe Heat switches (A&B) **ON**
- FO Anti-ice
 - WING/ENGINE ANTI-ICE SWITCH(S)As NEEDED
- FO Pack switches (L & R - Use "C") **AUTO**
- FO Isolation valve switch **AUTO**
- FO APU Bleed air switch **OFF**
- FO APU switch As Needed
 - NORMALLY OFF UNLESS REQUIRED FOR TAKE-OFF
- FO Engine Start switches **CONT/AUTO**
- FO Lower DU Blank
- FO Exterior Lights (Logo/WHEEL BAY)Set
- FO MFD C/R Recall
- FO Transponder AUTO; ABOVE; TA/RA
- CR Recall (INCL MFD C/R) **Checked**
 - BOTH **CAUTION** & ALL 2X6 SYS ANNUNTS LIT & EXT
 - Anti-Ice Eng Hyd Overhead Doors Air Cond**
 - Flt Cont IRS Fuel Elec APU Ovht/Det**
 - **LE FLAPS EXT** ILLUMINATED

After Parking Brake Set
 CA Call "Clear to Disconnect"



- Pushback Complete, Recall Checked, Parking Brake Set ...
- CA Advise Ground "Clear to Disconnect"
- CA Flight Controls **Checked**
 - RUDDER CHECK ONCE DISPATCHER IS CLEAR
 - ENSURE SPEEDBRAKE ... DOWN
- CR Dispatch Clearance **Checked**
- CA "Before Taxi Checklist" **Complete**
- FO Taxi Clearance Obtain
 - VERIFY/OBTAIN ATIS AS REQUIRED
- CA TAXI Light **AUTO/ON**



When departing OCTA without a Transponder Code set 3000 (CTA) / 2000 (OCTA) and don't activate (Auto) after the Before Taxi flow.

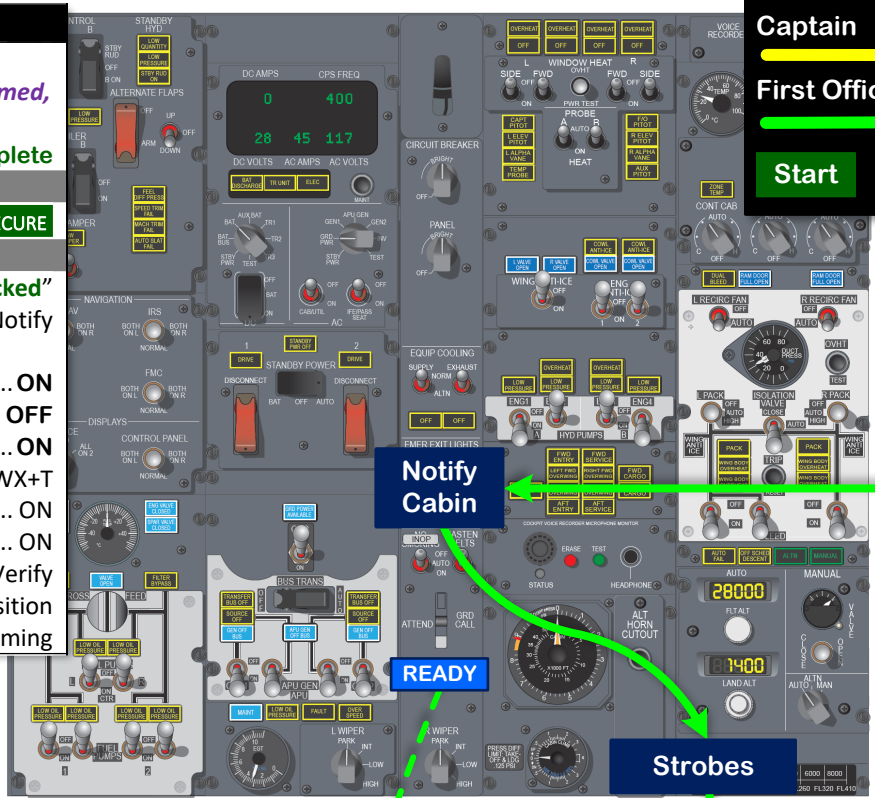
Before Take-Off Flow

BEFORE TAKE-OFF FLOW

- PF Departure Review
"Flap 5, V-Speeds Set. Autothrottle Armed, LNAV and VNAV armed, 5000 set."
- CA "Before Take-off Checklist" Complete
- CABIN READY Signal
- FO Cabin (SECURE CARD) SECURE
- Approaching Runway
- CA "RW_/Int_" "Confirm ... Data Checked"
- FO Cabin (CYCLE FASTEN BELTS – 2xCHIME) Notify
 - BEFORE ENTERING RUNWAY
- CA Landing Light(s) ON
- CA Taxi Light (MUST BE OFF FOR TAKEOFF) OFF
- FO Strobe Light ON
- FO WXR Control Panel AUTO & WX+T
- PM EFIS TERR ON
- PF EFIS WXR ON
- CR EFIS TFC on ND Verify
- PF ND Verify ANP<RNP; Rwy Position
- FO Clock Commence Timing

Captain →
 First Officer →

Start End



Approaching Runway

Runway, Taxi Lights



Approaching Runway



WXR/TERR/TFC

WXR/TERR/TFC

Clock

TFC

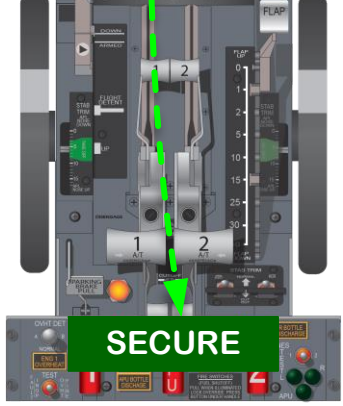
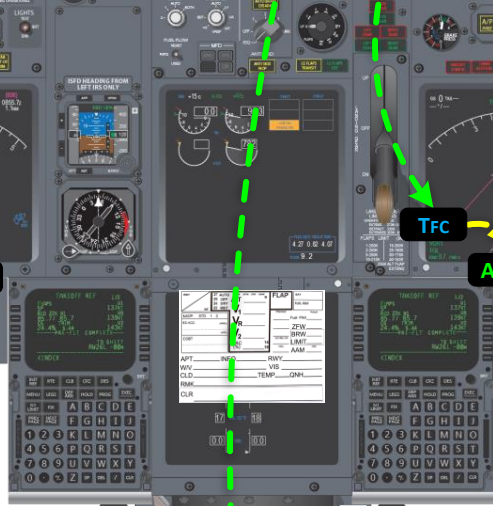
ANP/RNP

TFC

ANP/RNP

"Runway 34, Intersection Juliet."

"Confirmed ... Data Checked"



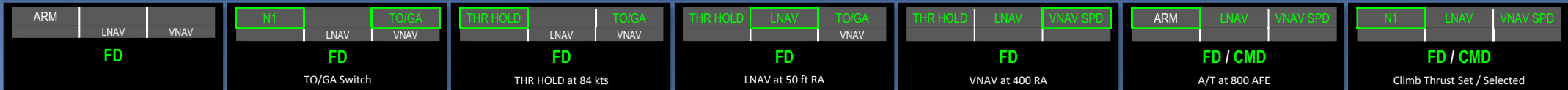
SECURE

Wxr

34	J	34	31/25	FLAP	5	DAY
MADP	110	1	2	WIND	N/A	
EO ACC	1409	W1	136	Pressure	2400	
COBT	1253	VR	144	6.2 Fuel PWR	1304	
		V2	148	54.2 ZFW	54.2	
		MAC	23%	64.8 BRW	65.1	
				OPT LMT	66.0	
APT		YVIML	INFO	A	RWY	34
WV		240/15	(0)	VIS	CAVOK	
CLD				T	23°	Q 1020
RMK		240/15				
CLR YSSY DOSEL DOSELA 5000 C129T DEP 116.4						

SEPP: TRX 340° 20.5 ML BT TRX 150° AET : DCT VEGAS CLB MSA

Take-off Profile – AEO LNAV/VNAV



TAKEOFF WITH LNAV / VNAV

- Both F/D's must be ON (**FD**) prior to TO/GA switch for TO/GA Takeoff.
- To terminate TO/GA mode below 400 ft RA, both F/D's ... OFF and AP disengaged.
- If **VNAV** is armed without LNAV - **HDG SEL** & **VNAV SPD** engage at 400 ft RA.
- VNAV is not used for NADP2 - requires Speed Intervention from **UP** to 3,000 ft AFE.
- TO/GA switch with F/D's OFF gives **TO/GA** until another Vertical Mode engages if:
 - ✓ IAS > 80 kts
 - ✓ RA < 2,000 ft
 - ✓ Time < 150 sec after Lift Off
- F/D commands the following Pitch Attitudes until Acceleration:
 - ✓ -10° to 60 kts; then
 - ✓ +15° until sufficient ROC
 - ✓ MCP Speed (V2) +20 kts

LNAV

- **LNAV** must be armed before TO/GA switch selection and requires:
 - ✓ Active Origin/Runway
 - ✓ 1st Trk ±5° Runway Heading
 - ✓ Both F/D's ... ON
- **LNAV** at 50 ft RA (3nm/5°) and limits Bank Angle to 15° below 200 ft RA; then 30°

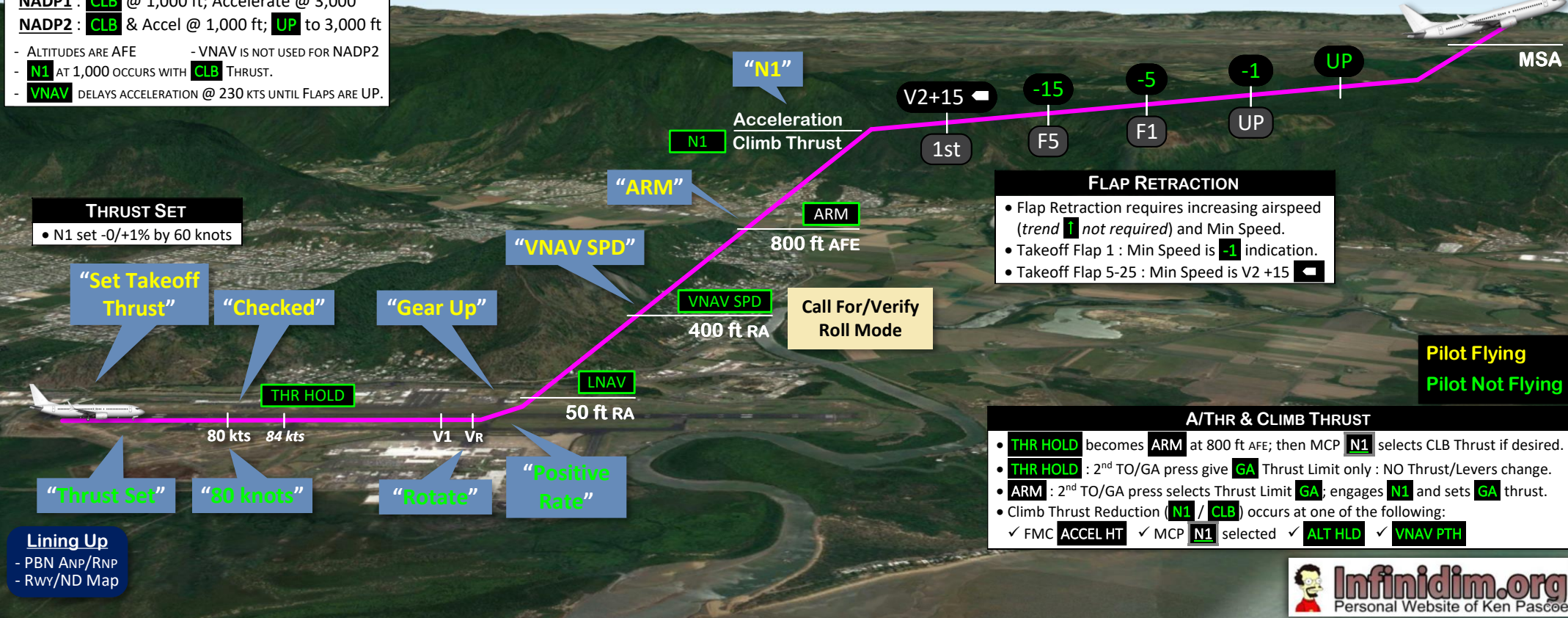
VNAV

- **VNAV** must be armed before TO/GA selection
- **VNAV** engages at 400 ft RA and requires:
 - ✓ Valid FMC Plan/Perf Data
 - ✓ Both F/D's ... ON
- **VNAV** commands MCP (V2) Speed +20 kts until Accel.

NOISE ABATEMENT

- STD** : **CLB** & Accel @ 1,000 ft
- NADP1** : **CLB** @ 1,000 ft; Accelerate @ 3,000
- NADP2** : **CLB** & Accel @ 1,000 ft; **UP** to 3,000 ft
- ALTITUDES ARE AFE
- VNAV IS NOT USED FOR NADP2
- **N1** AT 1,000 OCCURS WITH **CLB** THRUST.
- **VNAV** DELAYS ACCELERATION @ 230 KTS UNTIL FLAPS ARE UP.

After Takeoff Checklist



THRUST SET

- N1 set -0/+1% by 60 knots

"Set Takeoff Thrust"

"Checked"

"Gear Up"

"Thrust Set"

"80 knots"

"Rotate"

"Positive Rate"

"VNAV SPD"

"ARM"

"N1"

Call For/Verify Roll Mode

FLAP RETRACTION

- Flap Retraction requires increasing airspeed (*trend 1 not required*) and Min Speed.
- Takeoff Flap 1 : Min Speed is **-1** indication.
- Takeoff Flap 5-25 : Min Speed is V2 +15

Pilot Flying
Pilot Not Flying

A/THR & CLIMB THRUST

- **THR HOLD** becomes **ARM** at 800 ft AFE; then MCP **N1** selects CLB Thrust if desired.
- **THR HOLD** : 2nd TO/GA press give **GA** Thrust Limit only : NO Thrust/Levers change.
- **ARM** : 2nd TO/GA press selects Thrust Limit **GA**; engages **N1** and sets **GA** thrust.
- Climb Thrust Reduction (**N1** / **CLB**) occurs at one of the following:
 - ✓ FMC **ACCEL HT**
 - ✓ MCP **N1** selected
 - ✓ **ALT HLD**
 - ✓ **VNAV PTH**

Lining Up

- PBN ANP/RNP
- Rwy/ND Map

Take-off Profile – AEO Basic Modes



BASIC MODES TAKEOFF

- Both F/D's must be ON (**FD**) prior to TO/GA switch for TO/GA Takeoff.
- To exit TO/GA mode below 400 ft RA, both F/D's ... OFF and AP disengaged.
- TO/GA switch with F/D's OFF gives **TO/GA** until another Vertical Mode if:
 - ✓ IAS > 80 kts
 - ✓ RA < 2,000 ft
 - ✓ Time < 150 sec after Lift Off
- F/D commands the following Pitch Attitudes until Acceleration.
 - ✓ -10° to 60 kts; then
 - ✓ +15° until sufficient ROC
 - ✓ MCP Speed (V2) +20 kts
- Take-off TO/GA is **FD** only - AP engagement reverts to **HDG SEL** & **MCP SPD**

BANK ANGLE

- Limit Bank Angle to 15° until V2+15 ; then 25°
- **HDG SEL** is limited by MCP Bank Angle selection.

NOISE ABATEMENT

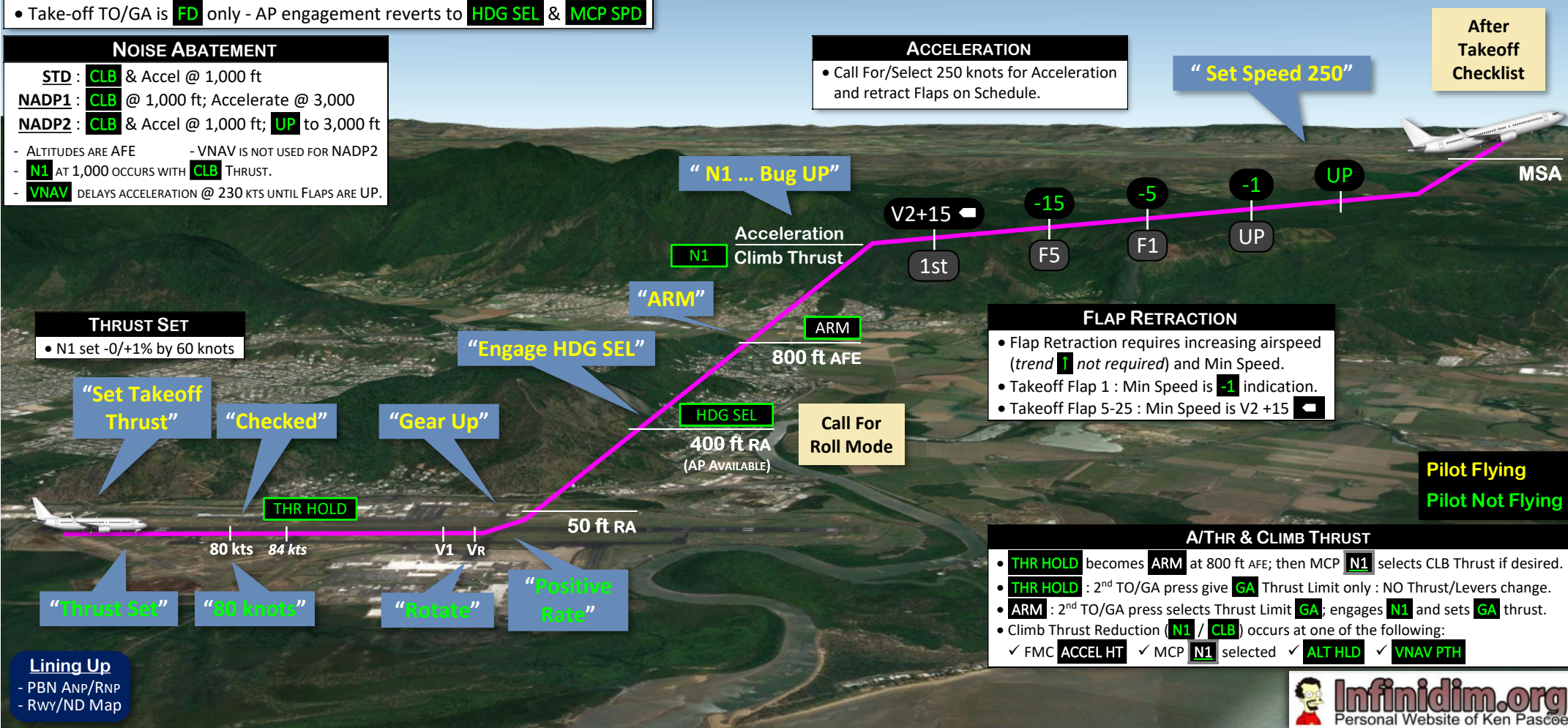
- STD** : **CLB** & Accel @ 1,000 ft
- NADP1** : **CLB** @ 1,000 ft; Accelerate @ 3,000
- NADP2** : **CLB** & Accel @ 1,000 ft; **UP** to 3,000 ft
- ALTITUDES ARE AFE
- VNAV IS NOT USED FOR NADP2
- **N1** AT 1,000 OCCURS WITH **CLB** THRUST.
- **VNAV** DELAYS ACCELERATION @ 230 KTS UNTIL FLAPS ARE UP.

ACCELERATION

- Call For/Select 250 knots for Acceleration and retract Flaps on Schedule.

"Set Speed 250"

After Takeoff Checklist



THRUST SET

- N1 set -0/+1% by 60 knots

"Set Takeoff Thrust"

"Checked"

"Gear Up"

"Engage HDG SEL"

"ARM"

"N1 ... Bug Up"

FLAP RETRACTION

- Flap Retraction requires increasing airspeed (*trend 1 not required*) and Min Speed.
- Takeoff Flap 1 : Min Speed is **-1** indication.
- Takeoff Flap 5-25 : Min Speed is V2 +15

Pilot Flying
Pilot Not Flying

A/THR & CLIMB THRUST

- **THR HOLD** becomes **ARM** at 800 ft AFE; then MCP **N1** selects CLB Thrust if desired.
- **THR HOLD** : 2nd TO/GA press give **GA** Thrust Limit only : NO Thrust/Lever change.
- **ARM** : 2nd TO/GA press selects Thrust Limit **GA**; engages **N1** and sets **GA** thrust.
- Climb Thrust Reduction (**N1 / CLB**) occurs at one of the following:
 - ✓ FMC **ACCEL HT**
 - ✓ MCP **N1** selected
 - ✓ **ALT HLD**
 - ✓ **VNAV PTH**

Lining Up

- PBN ANP/RNP
- Rwy/ND Map

After Take-Off Flow

AFTER TAKE-OFF FLOW

➤ Flap Retraction Complete ...

- PM Flaps **UP, No Lights**
- PM Engine Bleeds **ON**
 - ENG 1 & 2 BLEED ON
 - APU BLEED (IF IN USE) OFF
- PM Packs **AUTO**
- PM Pressurisation (DIFF/CAB ALT) ... Check
 - APU (IF NO LONGER REQ'D) OFF
- PM Engine Start Switches **AUTO/OFF**
- PM AUTO BRAKE **OFF**
- PM Landing Gear **UP and OFF**

Pilot Flying

Pilot Monitoring

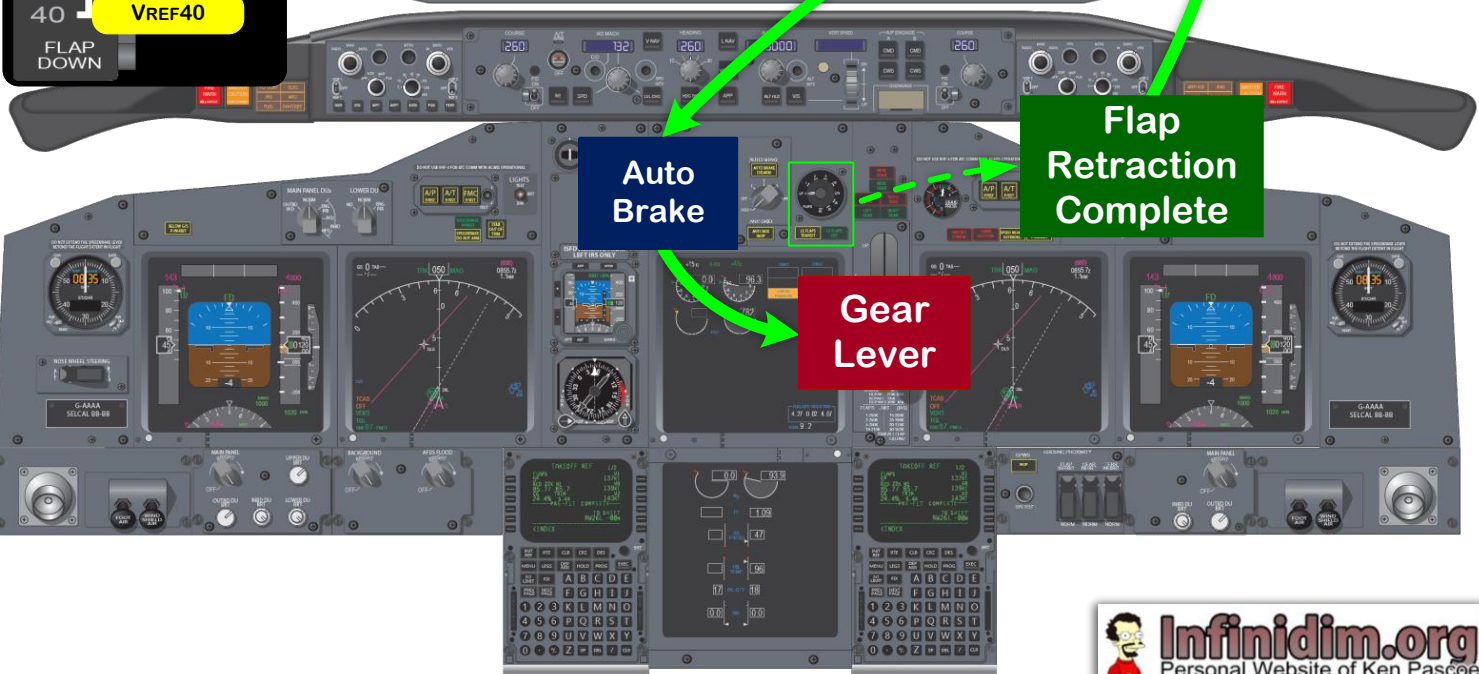
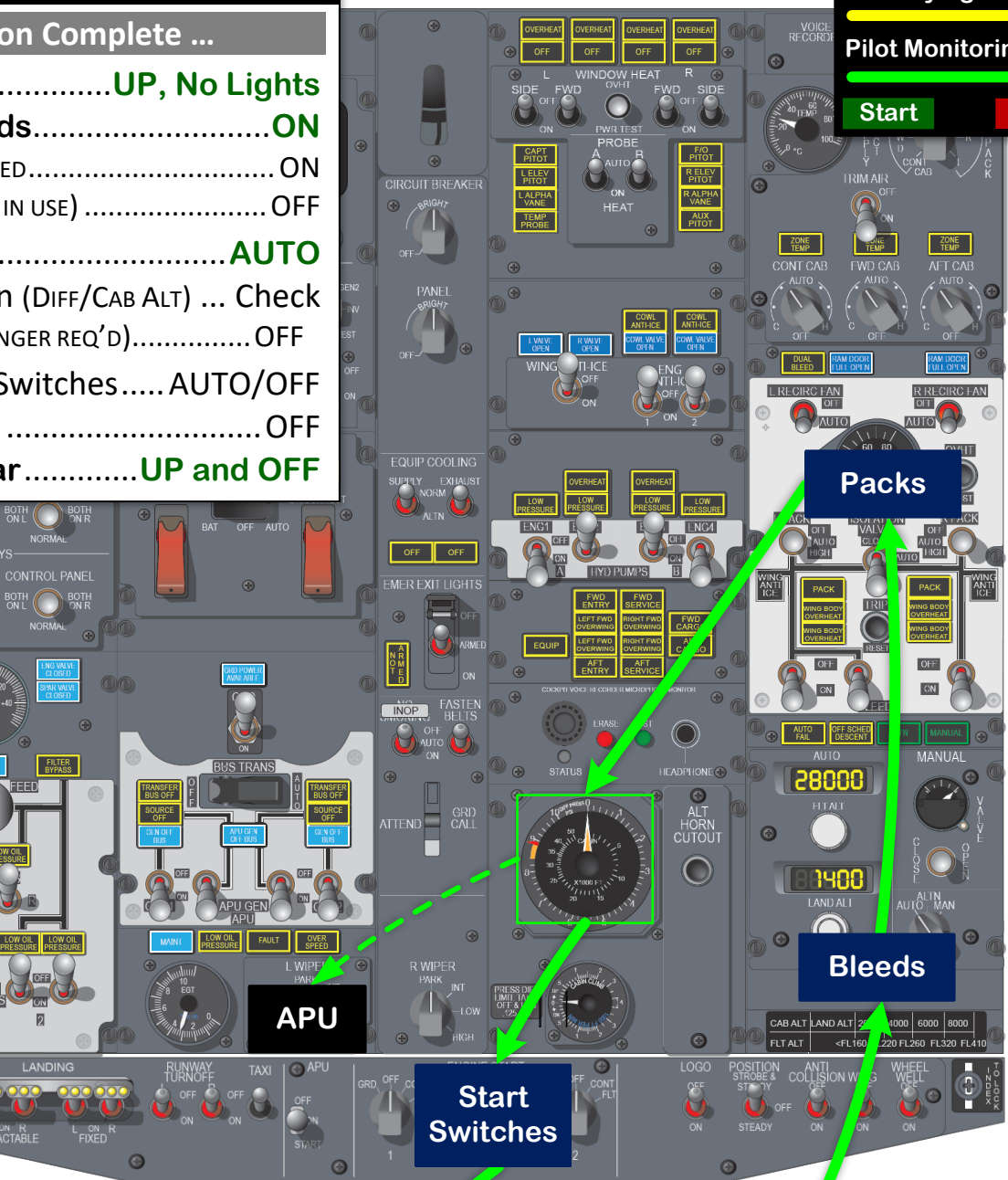
Start

End

FLAP UP

- 0 VREF40 +70
- 1 VREF40 +50
- 2
- 5 VREF40 +30
- 10 VREF40 +30
- 15 VREF40 +20
- 25 VREF40 +10
- 30 VREF30
- 40 VREF40

FLAP DOWN



Sydney MARUB RNAV Departure

YSSY R34R MARUB RNAV DEPARTURE

- Depart in **LNAV** only with MCP Heading from the FMC (105°)
- Manually fly the turn from 500' at 25° AoB.
 - Note the FMC/**FD** can be "lazy" at initiating this turn.
- LNAV will re-draw the ND path indication as the turn updates to intercept the 075°→ track.
- **NADP2** : On 105° & ≥1,000 ft, Bug **UP** & clean up to 3,000 ft.
- Then engage **VS**, select MCP **IAS** 250, & **VERT SPEED** 700 fpm until cleared above 5,000 ft.
 - This reduces the chance of a Level Off from ATC or TCAS alert.
- Once cleared above 5,000 ft – **VNAV** or **LVL CHG** to 10,000 and consider an increased Climb Thr setting to expedite turn to WOL.

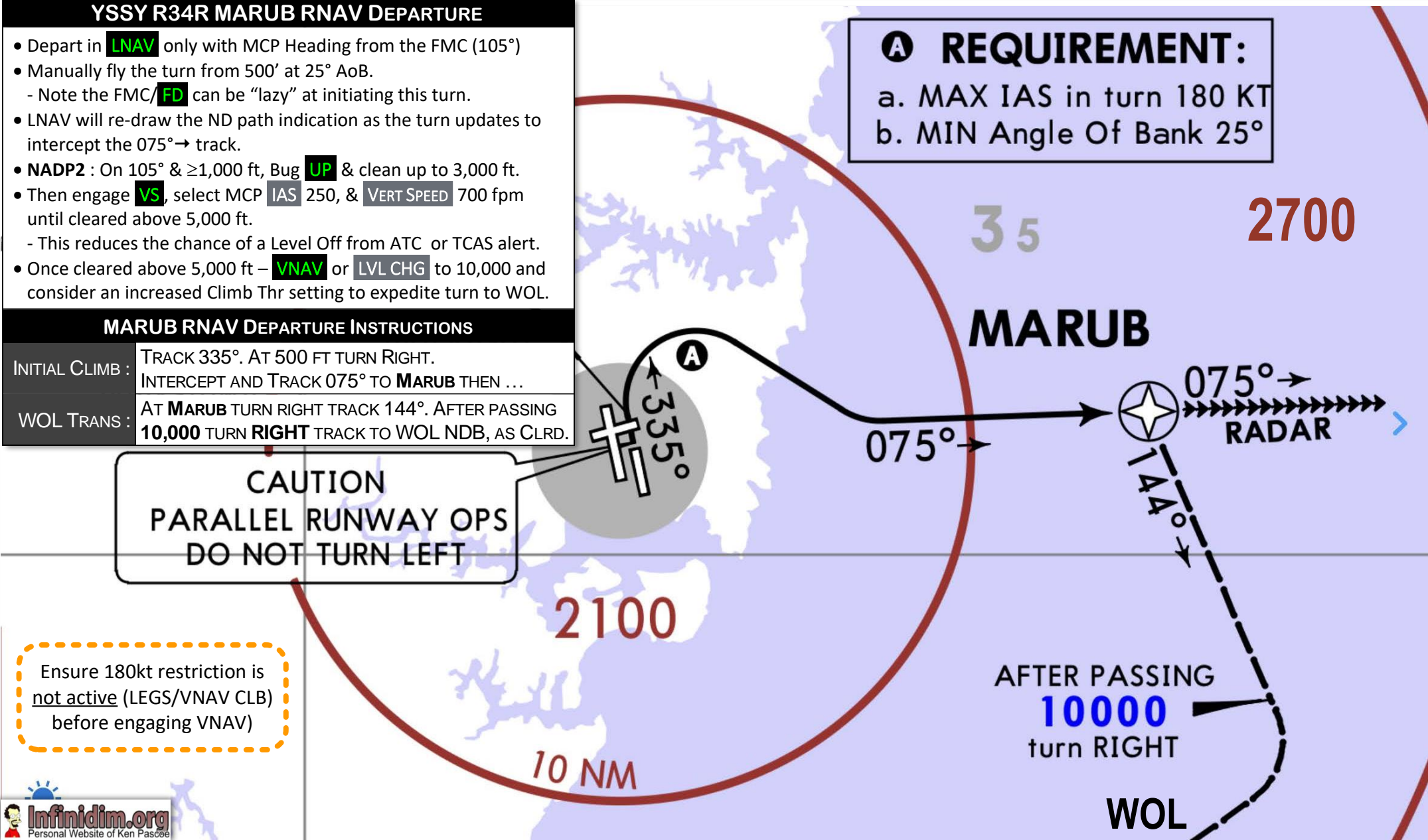
MARUB RNAV DEPARTURE INSTRUCTIONS

INITIAL CLIMB :	TRACK 335°. AT 500 FT TURN RIGHT. INTERCEPT AND TRACK 075° TO MARUB THEN ...
WOL TRANS :	AT MARUB TURN RIGHT TRACK 144°. AFTER PASSING 10,000 TURN RIGHT TRACK TO WOL NDB, AS CLRD.

CAUTION
PARALLEL RUNWAY OPS
DO NOT TURN LEFT

Ensure 180kt restriction is not active (LEGS/VNAV CLB) before engaging VNAV)

A REQUIREMENT:
a. MAX IAS in turn 180 KT
b. MIN Angle Of Bank 25°



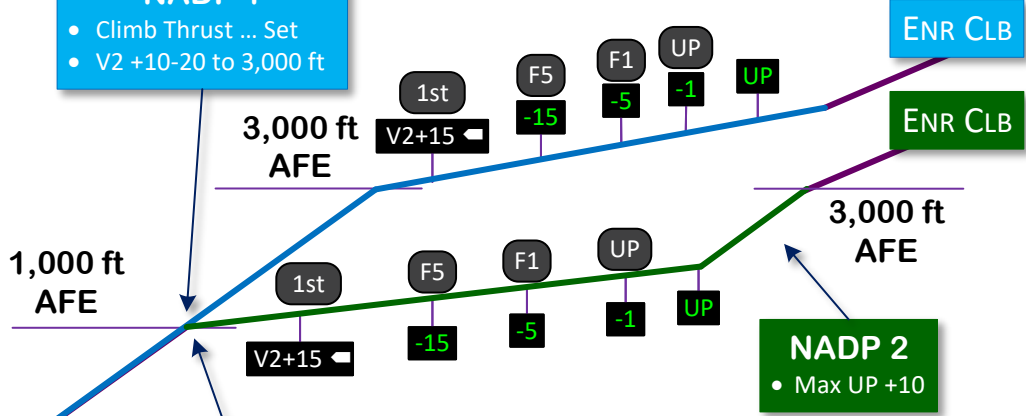
Climb Procedures

Standard

- V2+10-20 to 1,000 ft AFE
- Climb Thrust
- Accel & Retract Flaps
- Accel to Enr Clb Speed

NADP 1

- Climb Thrust ... Set
- V2 +10-20 to 3,000 ft



NADP 2

- Max UP +10

NADP 2

- Climb Thrust ... Set
- Accel to UP (Max +10)
- Retract Flaps on Sched

NOISE ABATEMENT

STD : CLB & Accel @ 1,000 ft

NADP1 : CLB @ 1,000 ft; Accelerate @ 3,000

NADP2 : CLB & Accel @ 1,000 ft; UP to 3,000 ft

- ALTITUDES ARE AFE - VNAV IS NOT USED FOR NADP2
- N1 AT 1,000 OCCURS WITH CLB THRUST.
- VNAV DELAYS ACCELERATION @ 230 KTS UNTIL FLAPS ARE UP.

SEVERE TURBULENCE (SP 16.25)

PM Passenger Signs ON

PM Turbulence PA Complete

"Passengers and Cabin Crew be seated with Seat Belts fastened IMMEDIATELY"

PM Yaw Damper ON

PM Engine Start Switches FLT

PF Autothrottle OFF

PF Thrust Set

PF Autopilot CWS

- AP REVERTS TO CWS R AND CWS P.
- IF SUSTAINED TRIMMING OCCURS - DISENGAGE AP
- VERTICAL/LATERAL PROTECTIONS (ALT) ARE N/AVAIL

CLB : Lower of 280 kts or M0.76

CRZ : FMC TURB N1

DSC : Lower of M0.76 / 280 kts / 250 kts

- 250 kts below FL150 if <Max LDW

ALTITUDE CALLS - CLIMB

➤ Approaching Cleared Altitude/Level

PM : 1,000 to Level PF : Checked

➤ Transition Level / Altitude

PM : Transition ...

PF : Set Standard PM : Standard Set

➤ Climb : FL200 / FL300

PM : FL___ PF : Checked

- VERIFY AIRCRAFT FLIGHT PARAMETERS & AFS STATUS
- FL300 : MCP AOB LIMITER 10° WHEN LEVEL

ASSIGNED CENTER FRQ

- Review Planned Level (OPT/MAX)
- Non ACARS : Departure Report
- OUT/OFF TIMES; ETA; DELAY CODES/TIMES

Top of Climb

- Max OPT + 1,000 (or MAX)
- MCP Limit AoB 10°
- Min Speed VMINM +10
- TCAS Below
- CTR Tank Pumps

WXR AVOIDANCE (A1 10.9.2)

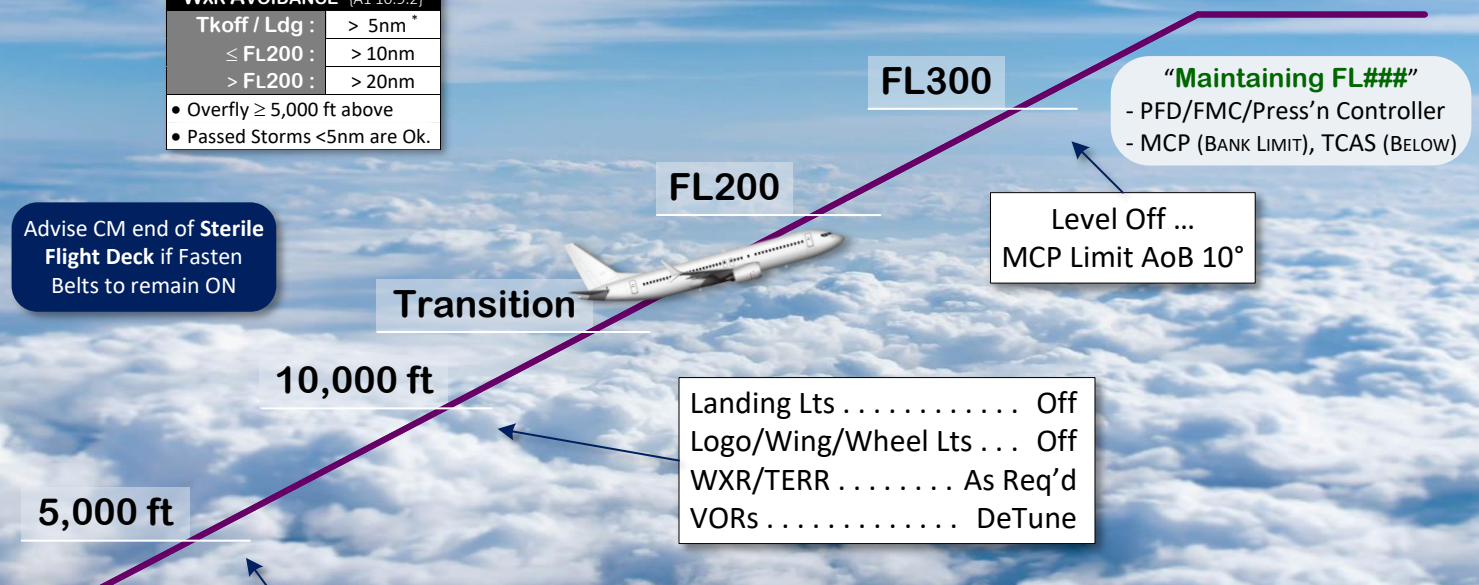
Tkoff / Ldg : > 5nm*

≤ FL200 : > 10nm

> FL200 : > 20nm

- Overfly ≥ 5,000 ft above
- Passed Storms <5nm are Ok.

Advise CM end of Sterile Flight Deck if Fasten Belts to remain ON



Landing Lts Off

Logo/Wing/Wheel Lts ... Off

WXR/TERR As Req'd

VORs DeTune

Fasten Belts ... Auto SECURE Flip

SPEED CONTROL (CLIMB)

Class D Airspace: Max 200 kts ≤ 2,500 ft AFE & 4 nm

- Otherwise Max 250 kts

OCTA Departures

21-Feb-24

OCTA DEPARTURES (NO SID)

- | | |
|----------------------------------|---|
| Day & VMC : (TRAFFIC) | <ul style="list-style-type: none"> Climb & Remain in the Circuit; or Climb to CCT Height +500 ft (≥2,000 ft AFE) and/or 3nm; Establish Departure Track within 5nm. |
| IMC or Night : | <ul style="list-style-type: none"> Remain in the Circling Area and Climb to MSA; or Follow EOSID to MSA. Rqst Tfc for EOSID & Tracking; then If possible establish Departure Track within 5nm; and Ensure reaching enroute LSALT prior to 25nm. |

DEPARTURE CALLS

Non-Surveillance :

"(FIR) Velocity ##### Departed (Dept) Time ##, Tracking (To/Intercept) ### Climbing To ### Estimate @@@ At ##"

Surveillance (SFIS) :

"(Loc) Information & Traffic, B737 Velocity ##### Passing ### Climbing To ###, Estimate @@@ At ## (Loc)"

BEFORE TAXI (CTAF & AREA)

CTAF CALL

"(Loc) Traffic, IFR B737 Velocity ##### is Taxing Runway ## For (Dest), (Loc)"

AREA CALL

"(FIR) B737 POB ###, IFR Velocity ##### is Taxing (Dept) For (Dest) Runway ##"

ENTER RW (CTAF)

"(Dept) Traffic, IFR B737 Velocity ##### is (Entering/Back Tracking) Runway ##, (Dept)"

PILOT ACTIVATE LIGHTING (JEPPI ATC AU-318)

PAL :	3x (1-5 sec Xmit) in 25 secs	≈ 3s - 1s - ≈ 3s - 1s - ≈ 3s
PAL + AA :	3x (1 sec Xmit) in 5 secs	≤ 1s - ≤ 1s - ≤ 1s - ≤ 1s - ≤ 1s
AFRU + PAL :		

- AA/AFRU provide an Audio response to indicate Lighting Status.
- WDI flashes continuously during the last 10 minutes of activation
- AFRU : Low volume 300ms tone indicates TFC in the previous 5 mins

ALL EXTERIOR LIGHTS ON WHILE OCTA

CTA

REMAIN ON CTAF UNTIL EXITING CTAF/MBZ OR FRQ CHANGE BY ATS

DEPARTURE CALL ON CTAF & AREA/SFIS

ESTABLISH DEPARTURE TRACK WITHIN 5NM

TURN AGAINST CCT DIR'N AFTER 3NM / CCT HT +500 FT

GFP LSALT (A1 PP8A.1-18)

- 55nm around Dept/Trk/Dest
- Min 1,500 ft (buffer 1,360 ft)
- LSALT for entire SID/STAR

LSALT (BEFORE 25NM)

ALTITUDE

5000

DEPARTURE OCTA - NOTES

COMMS :	VHF #2 : CTAF VHF #1 : Area, AWIS, Company, PAL
XPNDR :	Assigned Code or 2000 (3000 in Class C/D/IFR E)
MCP ALT :	Highest OCTA Quadrantal Level above LSALT/MSA - SELECTION NEEDS TO BE AT LEAST 1,000 FT BELOW CTA LL
AD CALLS :	Before Taxi : Area/SFIS & CTAF CTAF : Runway Entry/Back Track
AREA FRQ :	Monitor Area Frequency/SFIS until CTA
DEP TRACK :	Day & VFR : SID or Establish Track within 5NM Night/IMC : SID or EOSID to MSA (5NM if poss.)
MSA/LSALT :	IMC : MSA within Circling Area; LSALT by 25NM
NOTES :	Departure Time is Take-off Time or Over/Abeam Turn against Circuit requires >3nm ≥2,000 ft AFE

DEPART VIA CIRCUIT AS REQD

25NM MSA (CIRCLING AREA)

3 nm 4.2 nm 5 nm

15 nm

25 nm

Cruise Procedures

SEVERE TURBULENCE (SP 16.25)

- PM Passenger Signs ON
- PM Turbulence PA Complete
- "Passengers and Cabin Crew be seated with Seat Belts fastened IMMEDIATELY"**
- PM Yaw Damper ON
- PM Engine Start Switches FLT
- PF Autothrottle OFF
- PF Thrust Set
- PF Autopilot CWS
- AP REVERTS TO **CWS R** AND **CWS P**
- IF SUSTAINED TRIMMING OCCURS – DISENGAGE AP
- VERTICAL/LATERAL PROTECTIONS (**ALT**) ARE N/AVAIL
- CLB :** Lower of 280 kts or M0.76
- CRZ :** FMC **TURB N1**
- DSC :** Lower of M0.76 / 280 kts / 250 kts
- 250 kts below FL150 if <Max LDW

CABIN MANAGER DESCENT BRIEF

- Delays, Arrival Time, Gate
- **Weather/Turb on Descent** : PA, Signs, etc
- **Disembarkation** : (Front/Both; Teetering)
- Special Considerations (Terminate)

Cruise Procedures

Min Speed :	Min Manoeuvre (Amber) +10 to ... ??
Step Clb :	Update Winds after Climb.
TAFs :	Update every 60 mins on flight >90 mins
CFP Fuel Chk :	Every 45 mins on flights >90 mins; Otherwise at least once.

Top of Descent

- MCP AoB Limit 25°
- EAI (INCL IN SAT < -40°C)
- DESCENT CHECKLIST?

"Maintaining FL###"

- PFD/FMC/Press'n Controller
- MCP (BANK LIMIT), TCAS (BELOW)

T/C

Top of Climb

- Max OPT + 1,000 (or MAX)
- MCP Limit AoB 10°
- Min Speed VMINM +10
- TCAS Below
- CTR Tank Pumps

WXR AVOIDANCE {A1 10.9.2}

Tkoff / Ldg :	> 5nm *
≤ FL200 :	> 10nm
> FL200 :	> 20nm
<ul style="list-style-type: none"> • Overfly ≥ 5,000 ft above • Passed Storms <5nm are Ok. 	

T/D

"Leaving FL###"

- MCP (BANK LIMIT)

DESCENT PREPARATION

Non ACARS : Inbound Call

- ETA, Serviceability, SSR Changes
- Flight Crew Outbound Flt #

Pressurisation **LAND ALT** ___
Recall **Checked**

- VERIFY ANY RECALL SYS ANNUNCIATORS AND OPERATIONAL IMPACT (NOTES)
- REVIEW AUTOLAND STATUS MFD **C/R**

AutoBrake **Set**

- PERFORM LANDING PERFORMANCE ANALYSIS
- AUTOBRAKE SELECTION FOR STOPPING/EXIT

Landing Data. VREF ___ **Minimums** ___

Approach Briefing **Completed**
PF **"Descent Checklist"**

Landing Performance Analysis

LANDING PERFORMANCE ANALYSIS

1. Sufficient Performance (DISTANCE, MAP CLIMB)
2. Stopping Solution (A/BRAKE SETTING FOR EXIT)
3. Last Point of Touchdown ("Long Landing")
4. Aiming Point, Slope Guidance (MEHT/PAPI)

1. SUFFICIENT PERFORMANCE CHECK

- No Changes since Dispatch; or
- OPT **LDG DISPATCH** check {A1 10.4.3.2}
- OEI & Non Std MAP Climb % {QRH OI 1.10}

2. STOPPING SOLUTION {A1 10.4.4}

- Nominated Rwy Exit & Autobrake Selection
 - LVO (Wet x1.15); Autobrake Contaminated x1.15
 - For Max Manual set Max Autobrake (CHK QTAW)
 - Autobrake LDR must be < LDA
 - LDA-LDR < 150m – Brief reduced margin
 - Conservative settings on +RA Runways
 - No factoring required for NNC Landing ...
- Hi Speed Taxiway Exit Distances {JEPP 10-1P?}

3. Last Point of Touchdown {A1 10.43}

Touchdown ≤ 150 short requires Go-Around

- **Last Point of Touchdown** (THE EARLIEST OF ...)
 - End of Touchdown Zone (≈ 900m); or
 - 1/3 Runway (LDA < 2700m); or
 - Jepp 10-7 nominated.
- **LPoT must have a Visual Ref Marking**

Touchdown beyond Last Point of Touchdown (LPoT) requires Go-Around ("Long Landing")

- Check Jepp 10-9A LDA for Displaced Thresholds.

4. Aiming Point/Slope Guidance

- Electronic (ILS-GLS **G/S** / **VNAV PTH**) overrides Visual (PAPI/VASI)
- Visual Aiming Point (2ND markers) from Minima to Touchdown

Day : Visual Aiming Point (2ND Markers) are the Primary means of Touchdown Guidance.

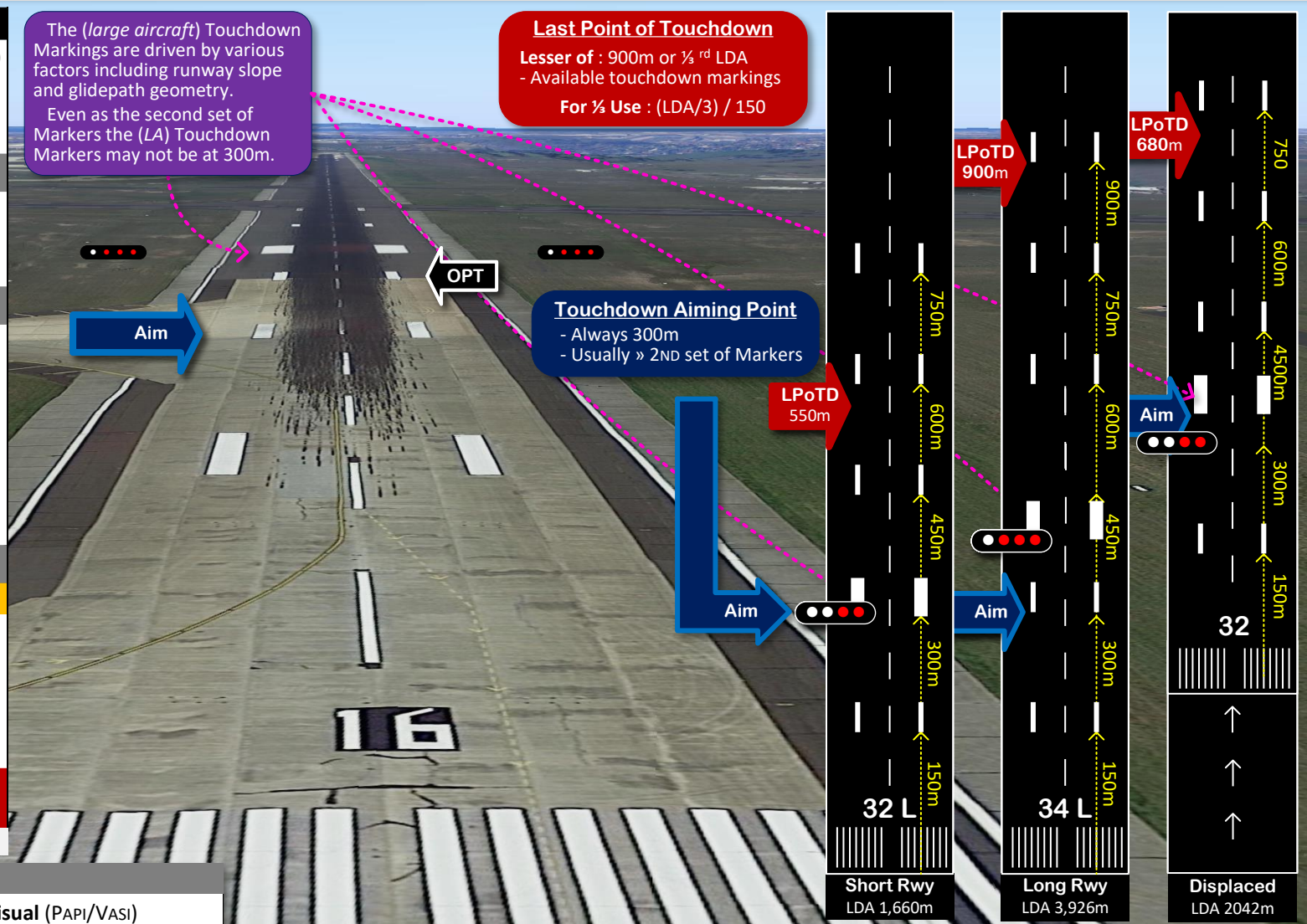
Night : Guidance to Touchdown via Electronic then Visual (PAPI/VASI)

- Check Jepp 10-9A LDA for MEHT to verify PAPI/VASI indications.

The (large aircraft) Touchdown Markings are driven by various factors including runway slope and glidepath geometry. Even as the second set of Markers the (LA) Touchdown Markers may not be at 300m.

Last Point of Touchdown
 Lesser of : 900m or 1/3rd LDA
 - Available touchdown markings
 For 1/3 Use : (LDA/3) / 150

Touchdown Aiming Point
 - Always 300m
 - Usually » 2ND set of Markers



OPT/QRH VS THE PILOT

- Aiming point is 2nd Markers (300m)
- After TALPA ARC, OPT/QTH uses 450m touchdown.

LANDING FLAP SELECTION	
FLAP 15	NNM (BOMB, OEI, FLT CONT, HYD SYS)
FLAP 30	NADP, WINDSHEAR, LIMIT MARGIN
FLAP 40	LVO, LDA/LDR, DESC RATE (Ccr)

JEPP 10-9A MEHT VS PAPI VS LAST PT OF T/DOWN					
Airport	RW	LDA	MEHT	PAPI	Last Pt T/Down
YMLT	32L	1,981m	53'	●●●●	1/3 (660m) / 4 th Markers
YMML	16	3,657m	74'	●●●●	900m / 6 th Markers
YBCG	32	2,042m	53'	●●●●	1/3 (680m) / 4 th Markers

Note : Runway drawings are not to scale ...

Land And Hold-Short Operations (LAHSO)

Land and Hold Short Operations (LAHSO) {A1 10.50}

Active :	Aircraft issued with a Hold Short requirement	
Passive :	Unrestricted Landing (Other Tfc holding short)	
Considerations :	Weight, Surface, Wind, Experience, Windshear	
	LDA ≥ 2,200m	Max Twc : Dry - 5 kts Wet - 0 kts
		Max Xwc : 20 kts
Limitations :	<ul style="list-style-type: none"> No Defects affecting landing distance (Active). Cloud Ceiling at least MVA Visibility ≥ 8 km (5,000 m by ATC) Braking at least GOOD (<i>Same Perf Cat Acft</i>) Ground based Visual/Elec glideslope required No report of Low Level Windshear Simultaneous Take-off & Landing : Day Only Simultaneous Landings : Day or Night 	
	<ul style="list-style-type: none"> LAHSO Runways will have LAHSO LDA on Jepp 10-9 (min 2,200m) LAHO Lighting/Marking at Hold Short Point on Active Runway. Readback Hold Short Requirement as well as Landing Clearance. 	

AIRPORTS/RUNWAYS

YPAD	Rw05 (PASSIVE)
YPDN	Rw29 (ACTIVE/PASSIVE)
YMML	Rw34 ACTIVE/PASSIVE

- Min LAHSO LDA 2200m
- Jepp 10-9A for LAHSO LDA

ATIS : "Land and Hold Short Operations (or LAHSO) in Progress"

- Velocity 123, Negative Active LAHSO
- Velocity 123, Negative Active or Passive LAHSO

"Velocity 123, A320 departing on crossing runway - **Hold Short RW27**, Cleared to Land RW34"

"Hold Short RW27, Cleared To Land RW34, Velocity 123"

"Velocity 678, Landing Aircraft RW34 will **Hold Short**, Cleared to Land RW27"

"Clear to Land RW27, Velocity 678"

Passive
(Full Length)

Active
LAHSO LDA

Ground Based Glideslope (Elec/Visual) Guidance required.

LDA ≥ 2,200 m

PASSIVE PARTICIPATION ...

- No Training required.
- No Limitations on Aircraft Defect Status.
- No Limitation on Braking Action.
- No Ground Elec/Visual Slope requirement.
- Participation at PIC discretion.

LAHSO LIGHTS MAY BE CROSSED ...

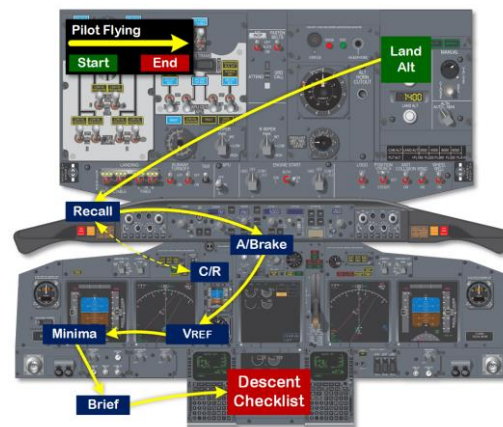
- Cleared for Take-off.
- Cleared to Land **without** a requirement to Hold Short.
- Cleared to cross the Runway after completing LAHSO.

RWY	USABLE LENGTHS				WIDTH
	LANDING BEYOND Threshold	Glide Slope	LAHSO Distance	TAKE-OFF	
16		10,786'			197'
34		3288m	09/27 8654' 2638m		60m

PRIOR TO SETUP / REPEAT BEFORE BRIEFING

➤ Flight Deck Flow

- Pressurisation **LAND ALT** ___
- Recall **Checked**
- VERIFY ANY RECALL SYS ANNUNCIATORS AND OPERATIONAL IMPACT (NOTES)
- REVIEW AUTOLAND STATUS MFD **C/R**
- AutoBrake ___ **Set**
- PERFORM LANDING PERFORMANCE ANALYSIS
- AUTOBRAKE SELECTION FOR STOPPING/EXIT
- Landing Data **VREF** ___ **Minimums** ___
- Approach Briefing **Completed**
- PF **"Descent Checklist"** **Complete**



BIG PICTURE

- **Arrival Fuel** (Weather, Traffic, Altn, NNM)
- **Aircraft Status** (NNMs/Defects/SPs)
- **Airport Factors** (Cat B/C, OCTA, NOTAMs, etc)
- **Significant Weather/Terrain** (LSALT to MSA)
- **Controlled Airspace Compliance** (FMC Fix)
- **Other TEM Factors** (FCON, LVO, Icing, PBN, BHI)

In all cases - Identify & Mitigate Risks & Threats.

CHART BRIEFS

STAR

- **Ident** (Airport, Name, Index, Date)
- **Route** (FMC Crosscheck : Tracks, Speeds, Altitudes)
- **Notes** (RNP, Transition, LSALT/MSA, etc)
- **Controlled Airspace Compliance** (Identify Critical Steps)

- **Approach Chart Ident** (Airport, Name, Index, Date)
- **Chart Notes** (RNP, Transition, MSA, Temperature Requirement/Impact on Slope/Descent Rate)

Briefing Strip →→→→



Further ...

Approach

ILS / GLS

- **ILS/GLS** (Tuned, Ident, Standby Aids)
- **Course** (Set on MCP)
- **Glideslope Check** (3° or ... brief Desc Rate)
- **Minima** (DH/MDA hPa, **Viz**, Verify QNH)
- **Airport Elevation** (Chk Pressurisation)
- **Missed Approach** (FMC, Acceleration, Final)
- **Subsequent Intent** (Hold, Return, Divert)

- **Planned/Likely Holding** (Entry/Limits)
- **Intended Automation Use**
- **Speed Control** (Chart, Cat C)
- **Visual at Minima** (VASI/PAPI, etc)
- **Circling** (if required)

RNP / RNAV

- **RNP** (RAF/RAIM, Temp, other Navaids)
- **Course** (Set on MCP)
- **FAF Check** (3° or ... brief Desc Rate)
- **Minima** (DA/MDA hPa, **Viz**, Verify QNH)
- **Airport Elevation** (chk Pressurisation)
- **Missed Approach** (FMC, Acceleration, Final)
- **Subsequent Intent** (Hold, Return, Divert)

RNP LNAV-VNAV / AR :

- Equipment, Setup, Conduct
- PF** : Wxr/Terr (Terr for AR)
- PM** : LEGS, Terr/Wxr. VSD

Brief Approach (IAF to MAA)

- **Track, Dist, Speed, Altitude, Turns, RNP**
- **Critical Waypoint in Fix** (Speed, FAF, etc)
- **Causes for GA** (XTK, Nav, AP, RA, Deviation)

Land / Taxi

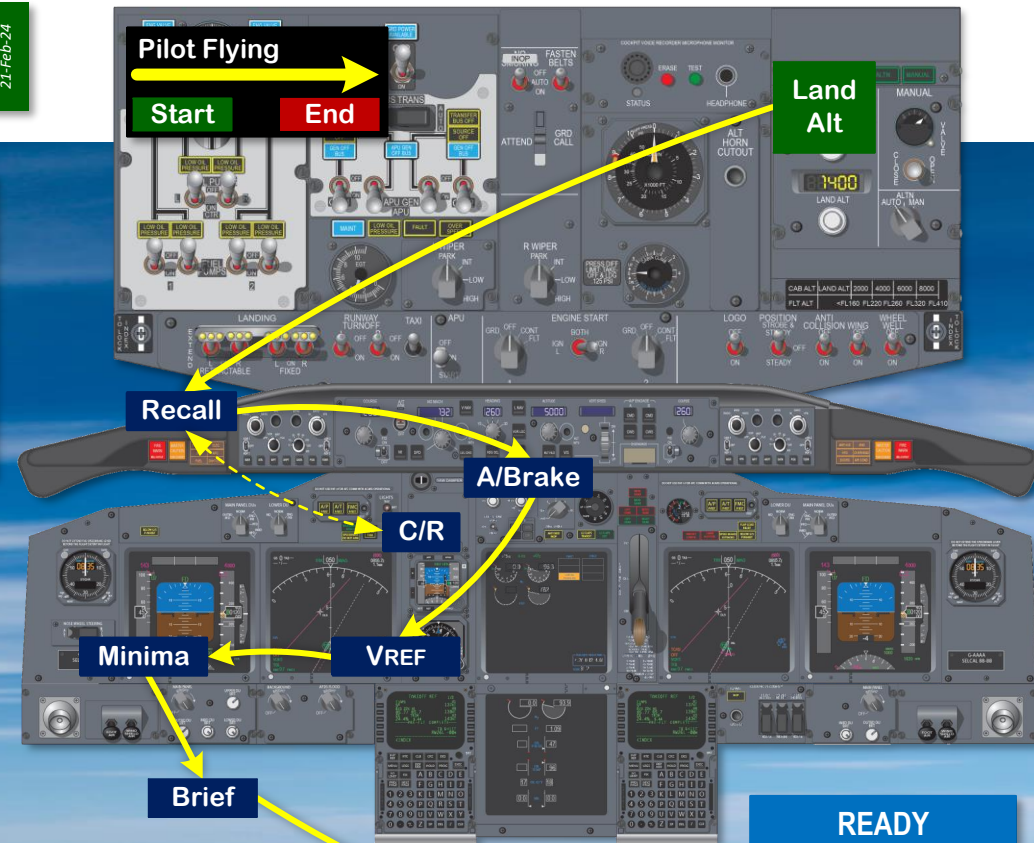
- **Chart Ident** (*as req'd*)
- **Stopping Solution** (A/Brake setting)
- **Touchdown** (Markers, G/S, PAPI, etc)
- **Last Point of Touchdown**
- **Runway Exit** (Autobrake)
- **Taxi Route, Parking Stand** (requirements)

Landing Performance Analysis

- **Sufficient Performance** (Dispatch)
- **Stopping Solution** (OPT Autobrake - 150m)
- **Aiming Point** (2nd Markers - G/S, PAPI)
- **Last Point of Touchdown** (900, 1/3, 10-9)
- **Runway Exit Point** (Autobrake usage)

Descent Procedures

21-Feb-24



ALTITUDE CALLS – DESCENT	
➤ Approaching Cleared Altitude/Level	
PM : 1,000 to Level	PF : Checked
➤ Transition Level / Altitude	
PM : Transition ...	
PF : Set QNH	PM : ___ Set
➤ Descent : 5,000 ft	
PM : 5,000	PF : Checked
• Notify Cabin (Cycle Belts Sign)	

Top of Descent

- MCP AoB Limit 25°
- EAI (INCL IN SAT < -40°C)
- DESCENT CHECKLIST?

T/D

“Leaving FL###”
- MCP (BANK LIMIT)

Consider **DES NOW>** (&/- SPEED>) in ...

- Potential Overspeed conditions
- High Speed / Descent with RTA requirement
- Still Briefing!

WXR AVOIDANCE {A1 10.9.2}	
Tkoff / Ldg :	> 5nm*
≤ FL200 :	> 10nm
> FL200 :	> 20nm
• Overfly ≥ 5,000 ft above	
• Passed Storms <5nm are Ok.	

SPEED CONTROL (DESCENT)	
Initial :	Crz Mach ⇒ 280 kts ±20 kts
≤ 10,000 ft :	Max 250 kts (Hi SPEED @ ATC RQST)
≤ 5,000 ft :	Max 250 kts (Company)
≤ 3,000 ft :	Max 210 kts (Company)
Class D Airspace:	Max 200 kts ≤ 2,500 ft AFE & 4 nm - Otherwise Max 250 kts

Not Below FL200
“Cabin Crew Prepare For Landing”
- Monitor for Cabin PA
(10 mins to Fasten Belts / Crew Seated)

Transition Level / 10,000 ft AFE	
PM	Fixed Landing Lights ON
PM	Logo Lights ON
PM	Fasten Belts ON
PM	EFIS TERR
All	Minima (EO ACC) Reset

PM **“Five Thousand”** *
PM Fasten Belts ... Cycle (5,000 ft or IAF)
* 2 mins from Fasten Belts ... ON

READY
⇒ **SECURE**
⇒ **“Cabin Secure”**

OCTA Arrivals

21-Feb-24

CRZ LVL

2 MINS BEFORE OCTA

- All Exterior Lights ... ON
- Contact/Broadcast Area

2 MINS BEFORE OCTA (CTRL)

"(Loc) (Information and) Traffic, IFR B737 Velocity #### is ## miles (South) Inbound (Dest), On Descent through ###, Estimate (Circuit/Overhead) at ##, (Loc)"
- Advise Intentions to Center/Trc

FL200

(OR 2 MINS TO OCTA)

SPEED CONTROL (DESCENT)

Initial :	Crz Mach ⇒ 280 kts ±20 kts
≤ 10,000 ft :	Max 250 kts (Hi SPEED @ ATC Rqst)
≤ 5,000 ft :	Max 250 kts (Company)
≤ 3,000 ft :	Max 210 kts (Company)
Class D Airspace :	Max 200 kts ≤ 2,500 ft AFE & 4 nm - Otherwise Max 250 kts

FMC SETUP – OCTA ARRIVAL

IAP :	Airway to 25nm; then to IAF (CLEARANCE)
Visual Route :	Airway to Navaid/Fix/ARP -5nm ⇒ Disco Runway with 2nm / 3° Extension
Path :	EOD : 5nm, 150/1,500 ft AAL Calls : ARP 50+30nm;
Fix :	Circle : Ext Rwy/2nm & (4.2nm??) Straight In :Rwy 2nm Ext; 25nm & 5nm
Rte 2 :	IAP/Visual or Route to Alternate
Perf :	Flap 40 (Viz Cct); Reserves 2.2 (or Altn)

ARRIVAL OCTA - NOTES

Comms :	VHF #2 : CTAF VHF #1 : Area, AWIS, Company, PAL
Airspace :	Area/Broadcast Call 2min before leaving CTA into Class G
XPNDR :	Assigned Code or 2000 (3000 in Class C/D/IFR E)
LSALT/MSA :	Maintain LSALT (CFP) to 25nm MSA (STAR??) Maintain 25nm MSA until IAF / Visual (STAR??) Descent below 1,500 ft AGL only at 5nm on Final
Day :	IAP is preferred over Visual Circuit
Night :	Visual Circuit only if Rwy IAP not available
Viz Cct :	Up/Cross/Down Wind – or 5nm Straight In
CTAF Calls :	10,000 ft, 30nm, 15nm, 5nm, 3nm (Straight In)
SAR :	Cancel on Area after Arrival
Notes :	• Prepare Cabin early; Minimise workload OCTA. • Write down Traffic Information. • All Exterior Lights ON when OCTA. • QNH within 15 mins for RNP IAP.

YBNA/BNK To Do ...

CTAF/SFIS :	124.2	PAL :	121.3	AWIS :	134.8
BNE CTR : 120.3 / 226.05					
30 NM	<input checked="" type="checkbox"/> CTR INBOUND CALL, LEAVING CTA ON DESC				
15 NM	<input checked="" type="checkbox"/> CTAF/SFIS INTENTIONS; <input checked="" type="checkbox"/> PAL ; <input checked="" type="checkbox"/> AWIS QNH				
CCT	<input checked="" type="checkbox"/> CTAF/SFIS INBOUND/INTENTIONS; <input checked="" type="checkbox"/> PAL				
IAP	<input checked="" type="checkbox"/> JOINING CIRCUIT; <input checked="" type="checkbox"/> TURNING BASE				
AFTER	<input checked="" type="checkbox"/> INBOUND; <input checked="" type="checkbox"/> 3NM				
	<input checked="" type="checkbox"/> BACKTRACKING; <input checked="" type="checkbox"/> CLEAR RWY (SARWATCH)				

CLEAR RWY (CTAF)

"(Loc) Traffic, B737 Velocity #### (Dest) Runway Vacated, (Loc)"

CANCEL SAR (AREA/SFIS)

BACK TRK (CTAF)

"(Loc) Traffic, B737 Velocity #### Backtracking Runway ## (Dest), (Loc)"

PILOT ACTIVATE LIGHTING (JEPP ATC AU-318)

PAL :	3x (1-5 sec Xmit) in 25 secs	≈ 3s - 1s - ≈ 3s - 1s - ≈ 3s
PAL + AA :	3x (1 sec Xmit) in 5 secs	≤ 1s - ≤ 1s - ≤ 1s - ≤ 1s - ≤ 1s
AFRU + PAL :		

- AA/AFRU provide an Audio response to indicate Lighting Status.
- WDI flashes continuously during the last 10 minutes of activation
- AFRU : Low volume 300ms tone indicates TFC in the previous 5 mins

JOINING BASE

- Rwy Ext 6.0nm 3° with 160/1,500 on LEGS
- Establish Final fully configured @ 5nm

STRAIGHT IN APPROACH

- Broadcast Intent (30/15/3 nm)
- Remain on Inbound Trk until 25 nm
- Maintain 1,500 ft AAL until Est Final at 5 nm
- 3nm Final Call required

CIRCUIT ENTRY

- Circuit Area call at 5nm
- Max 200 kts in Circuit
- LH CCT @ 1,500 FT AAL*
- * Unless otherwise indicated

10,000

5,000

1,500 FT AAL

LSALT (CFP)

- CFP LSALT (A1 PP8A.1-18)**
- 55nm around Dept/Trk/Dest
 - Min 1,500 ft (buffer 1,360 ft)
 - LSALT for entire SID/STAR

25NM MSA

30NM/10K/15NM INBOUND (CTAF)

"(Loc) Traffic, IFR B737 Velocity #### is 30/15 miles South Inbound (Dest), On Descent through ###, Estimate (Circuit/Overhead) at ##, (Loc)"

UPDATE QNH WITHIN 15 MINS OF RNP IAP

MONITOR CTAF FRQ

30 NM INBOUND (CTAF)

MANOEUVRE FOR STRAIGHT IN VISUAL / IAP

15 NM INBOUND (CTAF)

ESTABLISH STRAIGHT IN 5NM 1,500 FT AAL OR ENTER CIRCUIT

VIZ CCT 1,500 FT AAL
ENTER CIRCUIT

50 nm

30 nm

25 nm

15 nm

5 nm

3 nm

RNP (AR) Approaches

21-Feb-24

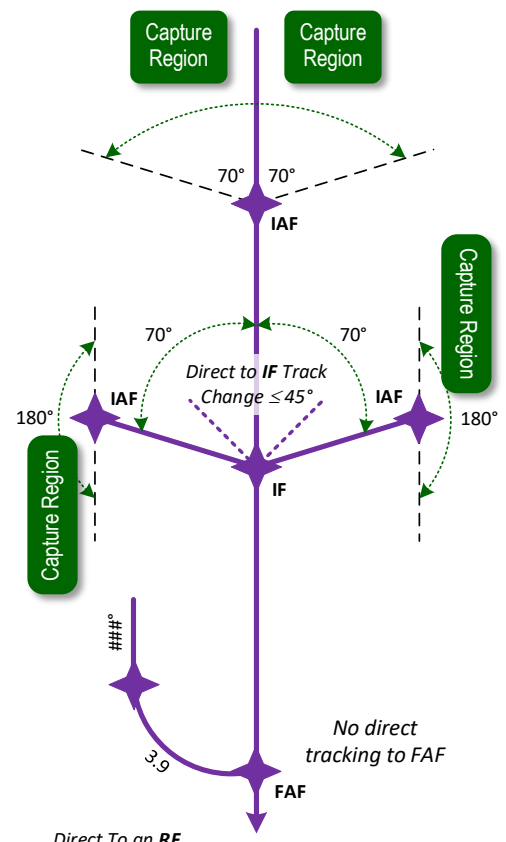
RNP APPROACH BRIEFING SUMMARY

Setup	<ul style="list-style-type: none"> • Chk RAF(AR)/RAIM(FDE); Req'd Equip; Acc. QNH • VNAV (Check ATIS OAT) • Setup : Approach RNP; MCP Courses; Minima • CDU Fix : FAF/Spd Points • Brief : Trk/Dist, Turns. Spd/Alts, Fly By/Over, Coded Angle, PAPI, MAP Dist/Spd/Alt
	<ul style="list-style-type: none"> • Requirement & Usage for : CMD / LNAV / VNAV ... by ... • Direct To a Waypoint before FAF, no later than LIP; not prior to RF leg • MCP Altitude set to Minima when Cleared for the Approach. • MCP Altitude set to MAA : VNAV PTH + ≥300 ft + in compliance
Conduct	<p>PM : LEGS, TERR/WXR, VSD (RNP AR : WXR) PF : WXR/TERR (RNP AR : TERR)</p>

RNP App Equipment		
LNAV	LNAV VNAV	AR
1x ADIRU	2x ADIRU	
1x PFD (PF)	2x PFD	
1x GNSS	2x GNSS	
1x FMC	2x FMC	
1x CDU	2x CDU	
1x FD (PF)	2x FD	
1x RA (PF)	2x RA	
1x ND (PF)	2x ND	
	1x EGPWS	
	1x AP	
	2x Gen (APU)	

RNP Missed Approach		
LNAV	LNAV VNAV	AR
XTK Error Alert		
Position Uncertainty ¹		
Unable LNAV		
Unable VNAV		
Vertical Dev ²		
Unable AP		
Dual RA		
1. CDU : UNABLE REQ NAV PERF RNP; FMC DISAGREE; VERIFY POS		
2. MOMENTARY DEVIATION ABOVE DUE ACFT CONFIG – OK		

FMC "ON APPROACH" LOGIC	
FMC "On Approach" Logic Activates:	
• 2nm of first Approach Waypoint; or 2,000 ft to Airport elevation	
FMC On Approach Logic:	
UNABLE RNP	alerting level higher.
VNAV PTH	descends away from MCP Alt (>300 ft)
VNAV PTH	levels off to intercept Path if >200 ft below
FMC Exits "On Approach"	
• TO/GA select; Landing; MAP WP cycles; Dct to WP after MAP	



Direct To an RF waypoint only via Intercept Course using previous bearing.

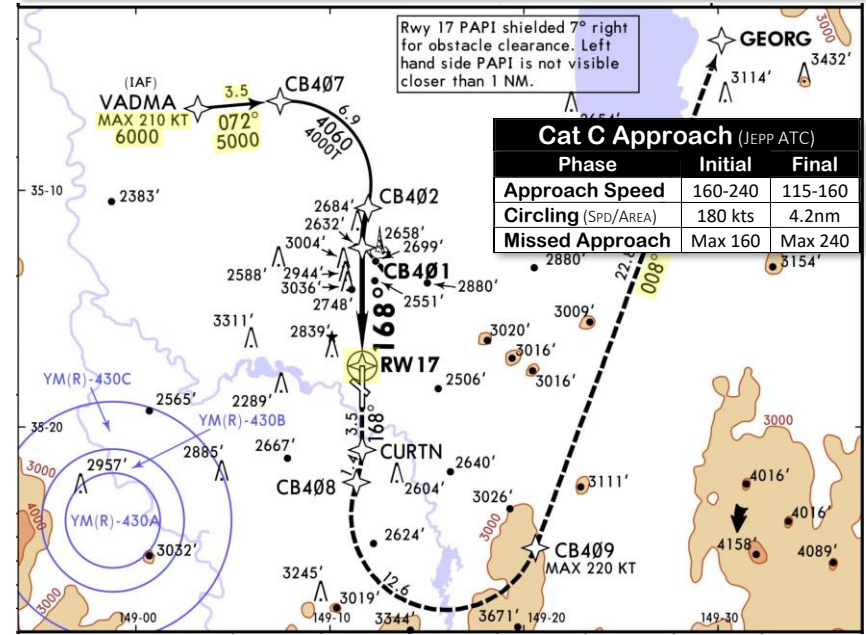
YSCB/CBR CANBERRA 26 NOV 21 (12-21) Eff 2 Dec RNP X Rwy 17 (AR)

*ATIS	116.7 127.45	AWIS 116.7 when ATIS inop.	CANBERRA Approach Within 30 NM (*R) West of Rwy 17/35 East of Rwy 17/35	125.9 124.5	*CANBERRA Tower 118.7 when Twr inop.	CTAF (AFRU+PAL) 118.7	*Ground 121.7
RNAV	Final Apch Crs 168°	CB401 MANDATORY 3520' (1646')	RNP 0.11 DA(H) 2270' (396')	Apt Elev 1886'	Rwy 1874'		

MISSED APCH: Track 168° to CURTN, then via the RNP AR Missed Approach track to GEORG. Climb to 5000'.

RNP AR Apch Alt Set: hPa Rwy Elev: 67 hPa Trans level: FL110 Trans alt: 10000'

1. For CASA approved operators only. 2. RF REQUIRED. 3. Local QNH REQUIRED. 4. Local temperature REQUIRED. 5. Procedure temperature range -10°C to 45°C.



NM to NEXT WPT	CB402	CB401	3.9	3.0	2.0	1.1	RW17	
ALTITUDE	4060'	3520'	3180'	2880'	2560'	2270'		
Gnd speed-Kts	70	90	100	120	140	160		
Glide Path Angle	3.00°	372	478	531	637	743	849	
							PAPI	168°
							CURTN	5000' RNP AR TRACK
STRAIGHT-IN LANDING RWY17				CIRCLE-TO-LAND				
RNP 0.11 DA(H) 2270' (396')				RNP 0.30 DA(H) 3180' (1306')				
A	2.2 km						5.0 km	
B								
C								NOT AUTHORIZED
D								

Visual Circuit

21-Feb-24

DESCENT PATH SA

- VNAV DES page VB/VS information
- On Base VTK of $\approx +300$ • Consider using VSD
- "One Thousand" at ≈ 1 ND Trend Line to RX##

Distance to Rwy 2nm Waypoint

3nm = TOD 2nm = 1,300 1nm = 1,000



FMC FOR VISUAL CIRCUIT

DEP ARR : RW ## - 2.0nm - 3.0°
 LEGS : Direct RX ## - QDM Intercept
 Close Disco; Confirm ... EXEC
 FIX : RW## - 2.0/4.2 NM; QDM $\pm 90^\circ$
 INIT REF : Check Flap 40/Ref Speed

JOINING BASE

- Rwy Ext 6.0nm 3° with 160/1,500 on LEGS
- Establish Final fully configured @ 5nm

Pitch & Power	AEO	OEI
Level Flap 5 / -5	6° - 60/65%	7° - 75%
Level Gear/Flap 15 / -15	6° - 60%	



"Flap 30/40
Landing Checklist"

"Flap 25" *

"Gear Down,
Flap 15"

Flap 5,
Gear Up

Initial Desc 600 fpm
25° AoB Turn

Timing 3xHt (100's)

45 sec

30 sec

20 sec

Abeam

1,500 ft AFE

"Stable"

Wings Level - 20 secs
Higher of : 1,500 ft AFE / Jepp

45°
Rwy QDM

2nm

Both F/D's ...OFF;
then PF \rightarrow PM ... ON

Min 500'
AGL

AEO : Gear & Flap 15
OEI : Clean & Flap 5/10

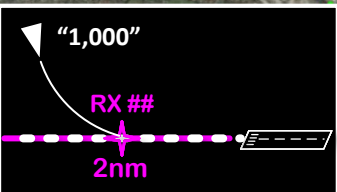
Base
300

100
1/4

Use the Rwy Centreline
1/4 into Trend Vector to
start turn onto Final.

500 ft Callout
 - Wings must be Level
 - Ensure FD's cycled
 - Check MAA/1,500 ft
 - Disconnect A/T for Ldg

Go-Around - VMC INTO VISUAL CIRCUIT
 • AP & A/T after 400 ft RA : HDG SEL & LVL CHG MCP SPD
 • At ALT ACQ/HOLD - Call for Flap -5 Speed & Flap 5
 • A 180° at 25° AoB at -5 should give 2nm spacing
 • PM : After Takeoff C/L; FMC; Descent/Approach C/L, PA



MCP SPD HDG SEL ALT HOLD
CMD
 Reset MCP Selected Altitude to MAA/500.

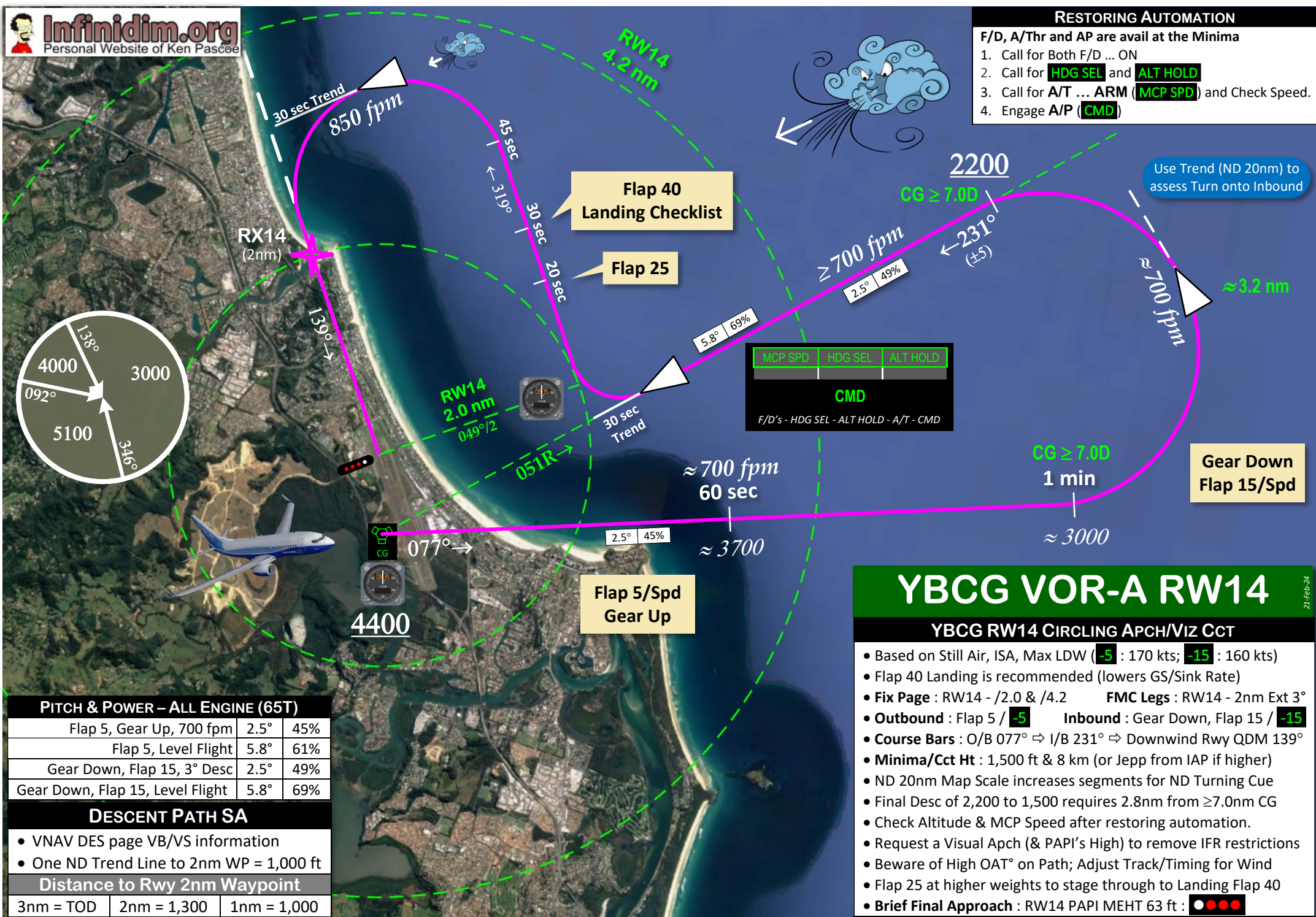
MCP ALTITUDE SELECTION
 1. Leave at Circuit Height for GA; or
 2. Set to MAA for MAP; or
 3. Set 500 ft AFE for HDG SEL VS to Final,
 & Reset when AP Disc/FD's Cycled.

Pilot Flying
Pilot Not Flying

CIRCLING APCH/VIZ Cct
 • Plan to Land Flap 40 (lower GS/Sink Rate); Use 5nm ND Scale in Cct
 • Cct Ht/Minima : Higher of 1,500ft AFE/8k or Jepp.
 • Request a Visual Apch (& PAPI's High) to remove IFR restrictions.
 • Flap 25 is used as required to stage through to Flap 40.
 • Beware of High OAT°/High on Path Adjust Track/Timing for Wind
 • Flight Directors should not be cycled until 300 below MCP Alt

RESTORING AUTOMATION

- F/D, A/Thr and AP are avail at the Minima
1. Call for Both F/D ... ON
 2. Call for **HDG SEL** and **ALT HOLD**
 3. Call for A/T ... ARM (**MCP SPD**) and Check Speed.
 4. Engage A/P (**CMD**)



PITCH & POWER – ALL ENGINE (65T)

Flap 5, Gear Up, 700 fpm	2.5°	45%
Flap 5, Level Flight	5.8°	61%
Gear Down, Flap 15, 3° Desc	2.5°	49%
Gear Down, Flap 15, Level Flight	5.8°	69%

DESCENT PATH SA

- VNAV DES page VB/VS information
- One ND Trend Line to 2nm WP = 1,000 ft

Distance to Rwy 2nm Waypoint		
3nm = TOD	2nm = 1,300	1nm = 1,000

YBCG VOR-A RW14

YBCG RW14 CIRCLING APCH/VIZ CCT

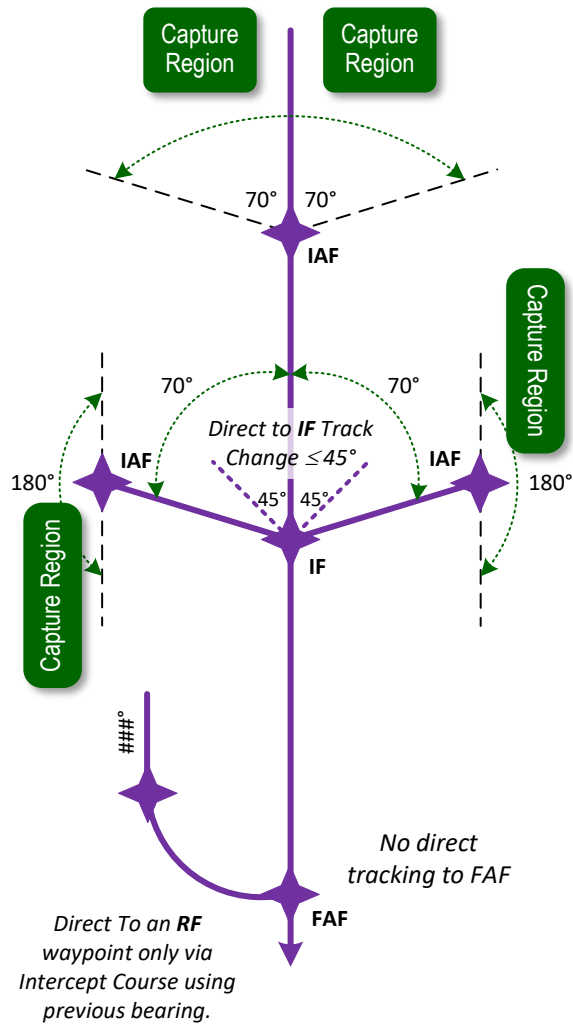
- Based on Still Air, ISA, Max LDW (-5 : 170 kts; -15 : 160 kts)
- Flap 40 Landing is recommended (lowers GS/Sink Rate)
- **Fix Page** : RW14 - /2.0 & /4.2 **FMC Legs** : RW14 - 2nm Ext 3°
- **Outbound** : Flap 5 / -5 **Inbound** : Gear Down, Flap 15 / -15
- **Course Bars** : O/B 077° ⇒ I/B 231° ⇒ Downwind Rwy QDM 139°
- **Minima/Cct Ht** : 1,500 ft & 8 km (or Jepp from IAP if higher)
- ND 20nm Map Scale increases segments for ND Turning Cue
- Final Desc of 2,200 to 1,500 requires 2.8nm from ≥7.0nm CG
- Check Altitude & MCP Speed after restoring automation.
- Request a Visual Apch (& PAPI's High) to remove IFR restrictions
- Beware of High OAT° on Path; Adjust Track/Timing for Wind
- Flap 25 at higher weights to stage through to Landing Flap 40
- **Brief Final Approach** : RW14 PAPI MEHT 63 ft : ●●●●

21-Feb-24

Approach Capture Regions

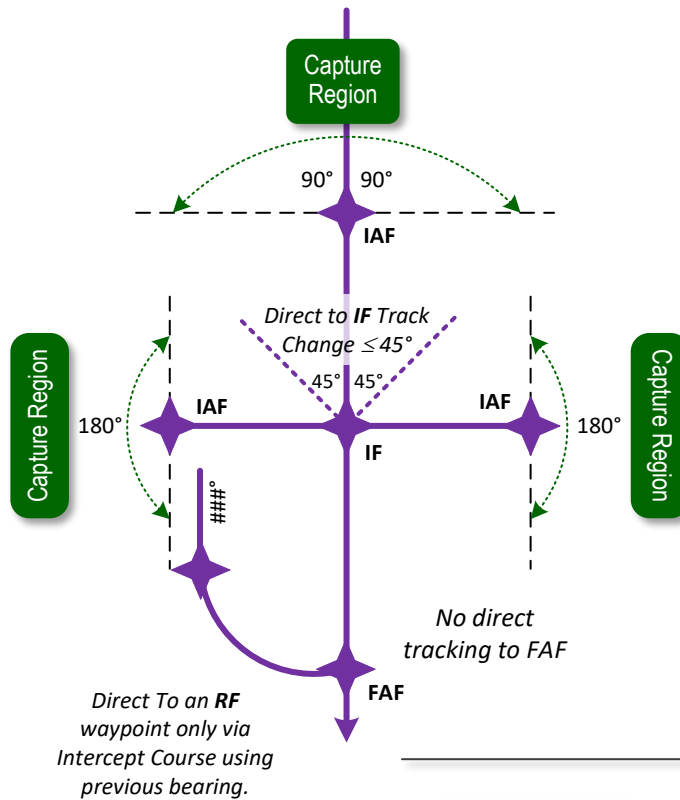
GNSS Y Bar Approach Design

Vectors in Controlled Airspace to the Initial Approach Segment are acceptable.



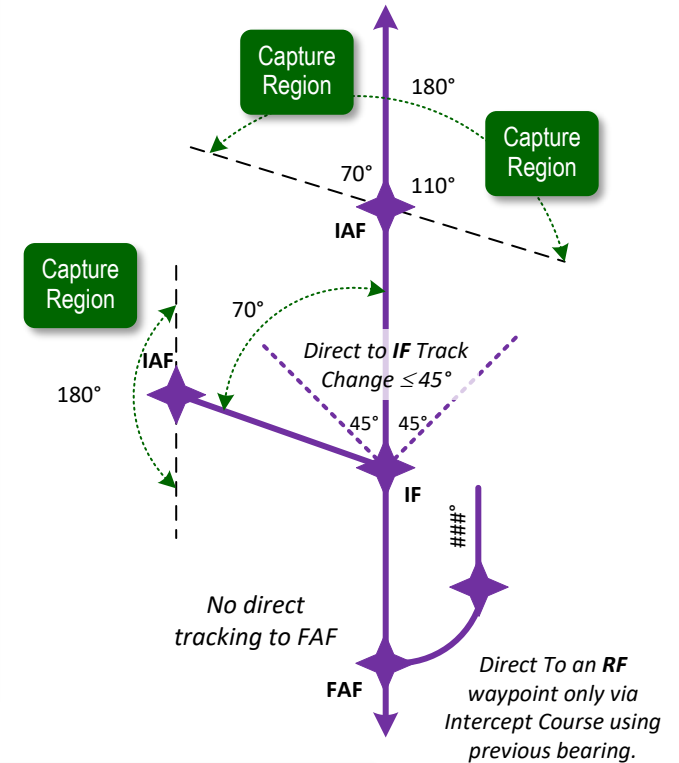
GNSS T Bar Approach Design

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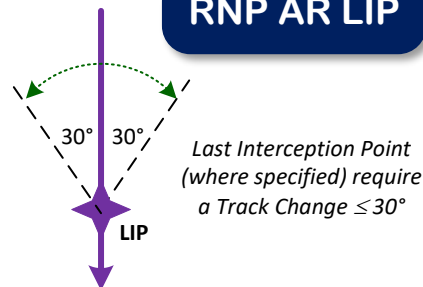


GNSS 2x IAF Approach Design

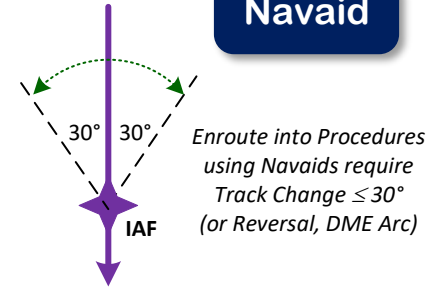
Vectors in Controlled Airspace to the Initial Approach Segment are acceptable.



RNP AR LIP

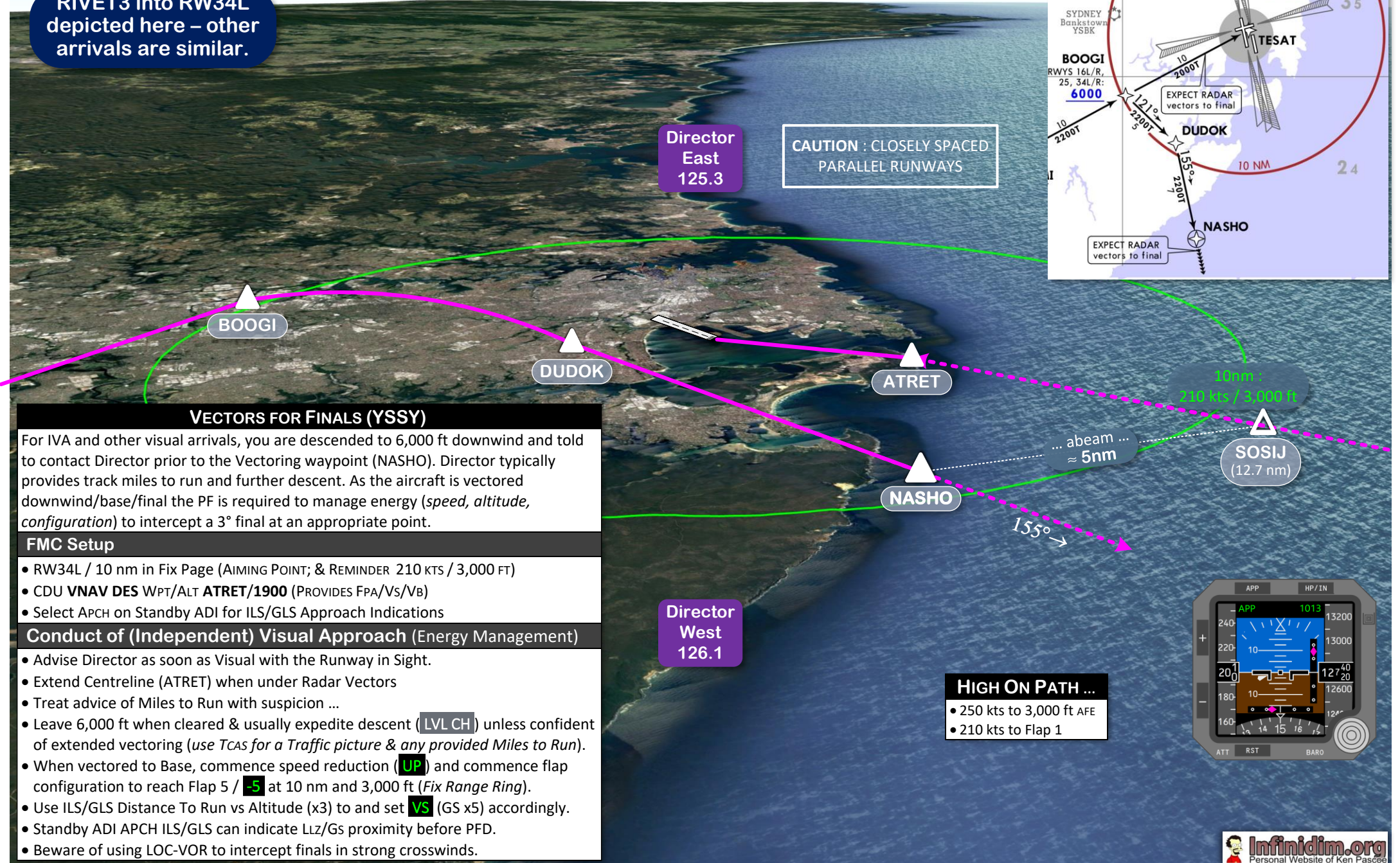


Navaid



Vectors to Final (YSSY)

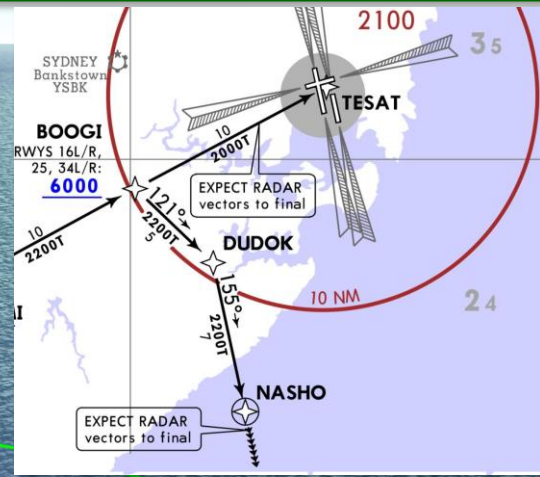
RIVET3 into RW34L depicted here – other arrivals are similar.



CAUTION : CLOSELY SPACED PARALLEL RUNWAYS

Director East 125.3

Director West 126.1



VECTORS FOR FINALS (YSSY)

For IVA and other visual arrivals, you are descended to 6,000 ft downwind and told to contact Director prior to the Vectoring waypoint (NASHO). Director typically provides track miles to run and further descent. As the aircraft is vectored downwind/base/final the PF is required to manage energy (*speed, altitude, configuration*) to intercept a 3° final at an appropriate point.

FMC Setup

- RW34L / 10 nm in Fix Page (AIMING POINT; & REMINDER 210 KTS / 3,000 FT)
- CDU **VNAV DES** WPT/ALT **ATRET/1900** (PROVIDES FPA/Vs/VB)
- Select APCH on Standby ADI for ILS/GLS Approach Indications

Conduct of (Independent) Visual Approach (Energy Management)

- Advise Director as soon as Visual with the Runway in Sight.
- Extend Centreline (ATRET) when under Radar Vectors
- Treat advice of Miles to Run with suspicion ...
- Leave 6,000 ft when cleared & usually expedite descent (**LVL CH**) unless confident of extended vectoring (*use TCAS for a Traffic picture & any provided Miles to Run*).
- When vectored to Base, commence speed reduction (**UP**) and commence flap configuration to reach Flap 5 / **-5** at 10 nm and 3,000 ft (*Fix Range Ring*).
- Use ILS/GLS Distance To Run vs Altitude (x3) to and set **VS** (GS x5) accordingly.
- Standby ADI APCH ILS/GLS can indicate LLZ/Gs proximity before PFD.
- Beware of using LOC-VOR to intercept finals in strong crosswinds.

HIGH ON PATH ...

- 250 kts to 3,000 ft AFE
- 210 kts to Flap 1

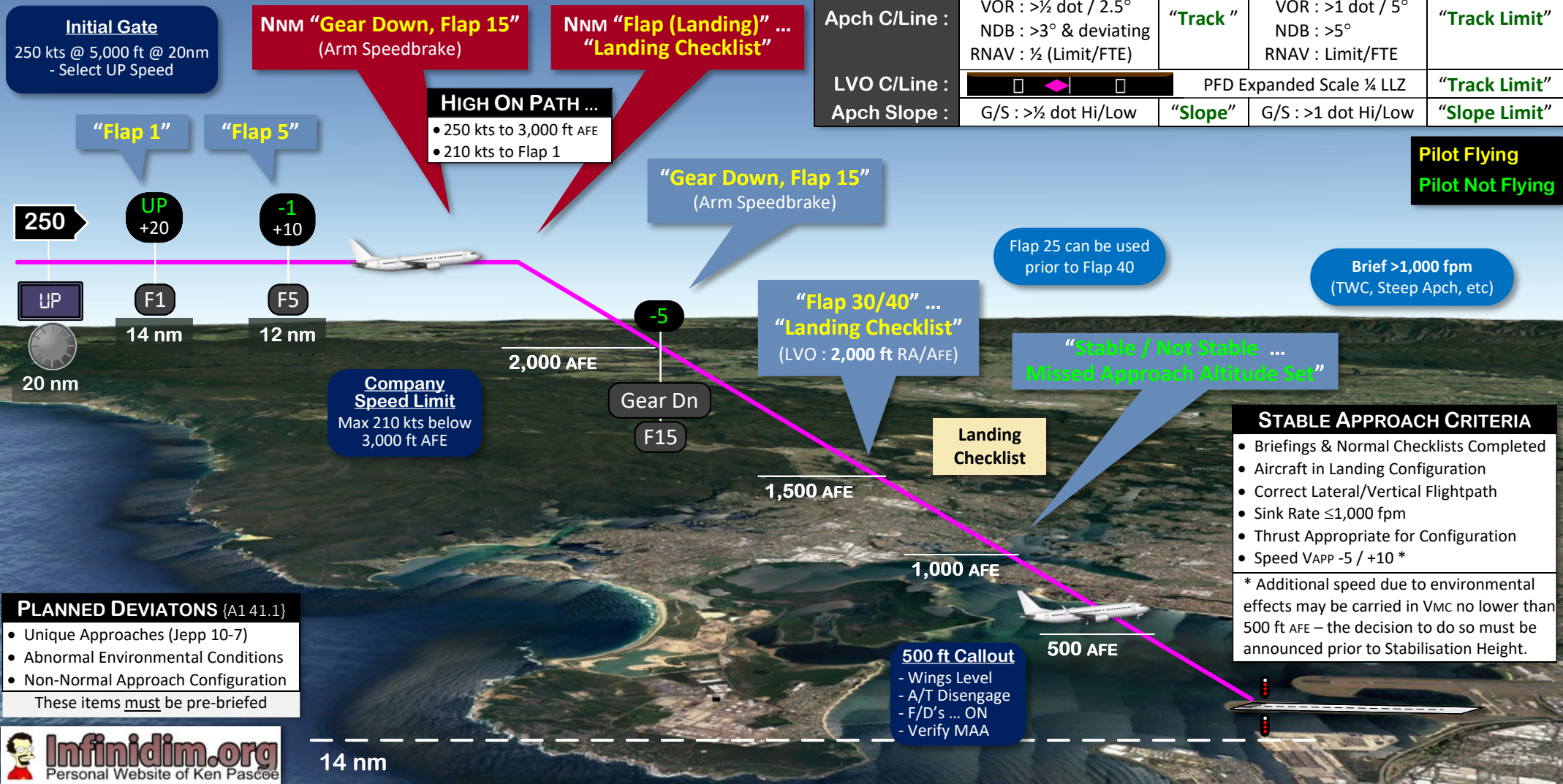


Profiles for Stable Approach

RECOMMENDED APPROACH CONFIG/PROFILE				
Config / Approach	Flap 1	Flap 5	Gear Dn Flap 15	Landing Flap
IAP			2,000 ft AAL	1,500 ft AAL
LVO	14nm ¹ to run	12nm to run	2,500 ft AAL	2,000 ft AAL
NNM NPA			0.5nm to TOD	On GP
NNM IAP			GS ½ Dot	On GS

1. Factors such as High Weight, Tailwind, EAI/WAI can considerably impact distance required to slow to approach speed.

APPROACH DEVIATION PARAMETER ADVISORY / LIMIT CALLS			
	Deviation Call		Limit Call
Sink Rate :	>2,000 fpm below 2,000 ft >1,000 fpm below 1,000 ft		"Sink Rate"
Airspeed :	VAPP +10/-5		"Speed"
PAPI / VASI :	PAPI ≥ 3 Red/White T-VASI ≥ 2 dots High/Low		"PAPI" (BRIEF) "VASI" (BRIEF)
Apch C/Line :	LLZ : >½ dot	"Track"	LLZ : >1 dot
	VOR : >½ dot / 2.5°		VOR : >1 dot / 5°
LVO C/Line :	NDB : >3° & deviating	PFD Expanded Scale ¼ LLZ	NDB : >5°
	RNAV : ½ (Limit/FTE)		RNAV : Limit/FTE
Apch Slope :	G/S : >½ dot Hi/Low	"Slope"	G/S : >1 dot Hi/Low
			"Track Limit"
			"Slope Limit"



PLANNED DEVIATIONS {A1 41.1}

- Unique Approaches (Jepp 10-7)
- Abnormal Environmental Conditions
- Non-Normal Approach Configuration

These items must be pre-briefed

14 nm

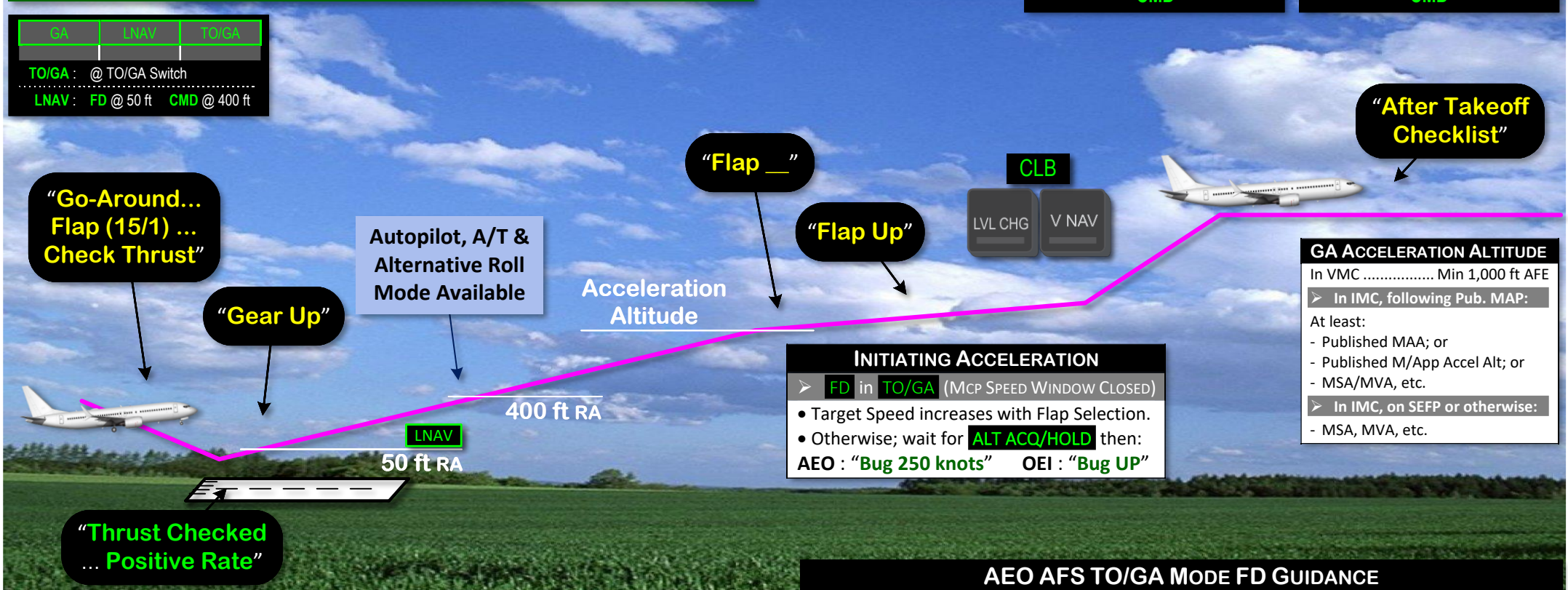
All Engine Go-Around

21-Feb-24

GA	LNAV	TO/GA
TO/GA : @ TO/GA Switch		
LNAV : FD @ 50 ft CMD @ 400 ft		

MCP SPD	LNAV	ALT ACQ
CMD		

MCP SPD	LNAV	ALT HOLD
CMD		



GA ACCELERATION ALTITUDE	
In VMC	Min 1,000 ft AFE
➤ In IMC, following Pub. MAP:	
At least:	
-	Published MAA; or
-	Published M/App Accel Alt; or
-	MSA/MVA, etc.
➤ In IMC, on SEFP or otherwise:	
-	MSA, MVA, etc.

INITIATING ACCELERATION

- **FD** in **TO/GA** (MCP SPEED WINDOW CLOSED)
- Target Speed increases with Flap Selection.
- Otherwise; wait for **ALT ACQ/HOLD** then:

AEO : "Bug 250 knots" OEI : "Bug UP"

AEO AUTOPILOT/MODES & GO-AROUND

- Go-Around AP is only available if AP was in Dual Channel (**FLARE**).
- AP disengages with TO/GA switch as **FD** engages in **TO/GA TO/GA**
- AP is available after RA 400 ft. TO/GA is a Manual Flight only mode, so the AFS Reverts out of any engaged Pitch/Roll **TO/GA** mode.
 - Roll **TO/GA** reverts to **HDG SEL** - Pitch **TO/GA** reverts to **MCP SPD**

Pitch & Power	AEO	OEI
Initial Go-Around	15°	12.5°
Level, Flaps UP-Spd	6° - 60%	6° - 75%
Level Flight, Flaps 5-Spd	6° - 60/65%	7° - 75%



AEO AFS TO/GA MODE FD GUIDANCE

Pitch

- TO/GA** Pitches towards 15°, MCP Speed Window closes & Pitch transitions to **Target Speed** (Flap Manoeuvre @ MTOW) with increasing rate of climb.
- Target Spd : Flap 15 = 173-5 kts Flap 1 = 203-5 kts Flap UP = 223-5 kts**
- B737-700 Min Flap speeds are approximately 10 knots lower than 800SFP speeds

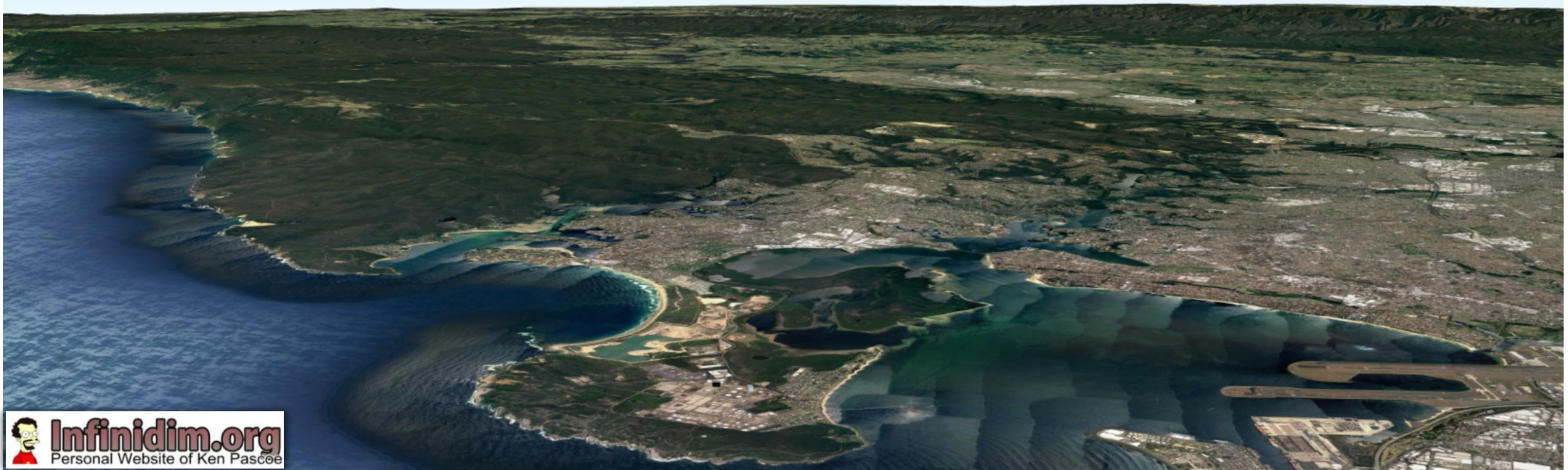
Roll

- TO/GA** commands Gnd Track. **LNAV** at RA 50 (Manual) / RA 400 (AP).
- Autopilot and/or Alternative Lateral Mode available after 400 ft.
- Limit Bank 15° at/below VMINM (AMBER). Delay Accel until after initial turn.
- Go-Around at F15 → F1, limit Bank to 15° until (**VREF +15/+20** or VMINM)

Thrust

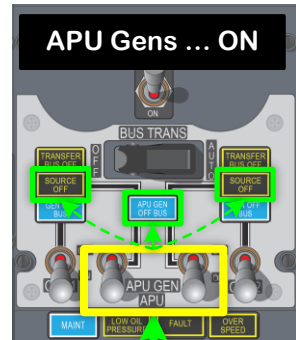
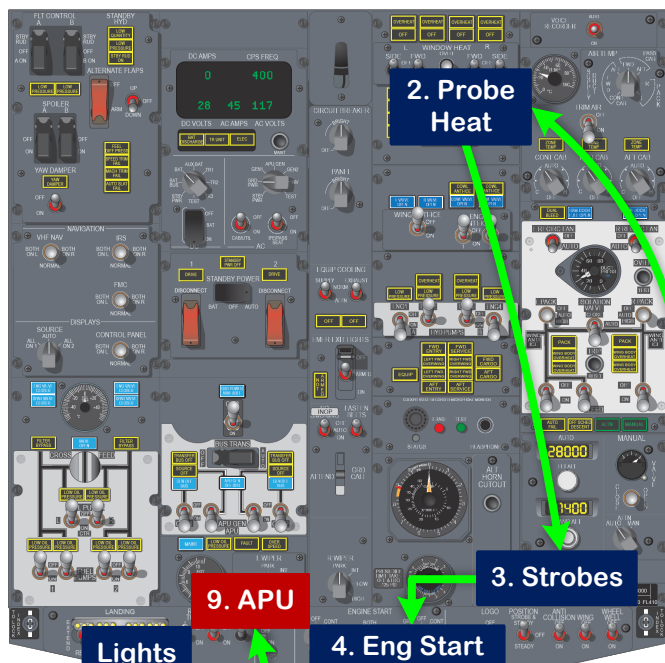
- If A/T is engaged at TO/GA Switch – A/T engages in **GA** or **N1**.
- 1st TO/GA press gives FMA **GA** for 1,000-2,000 fpm
- 2nd TO/GA press gives FMA **N1** and sets Reference Thrust
- Above 2,000 ft RA - FMA **N1** and sets Reference Thrust (1st Press)
- Most GA's are Manual Thrust – Call for "Arm Autothrottle" after 400 ft.

Landing Roll

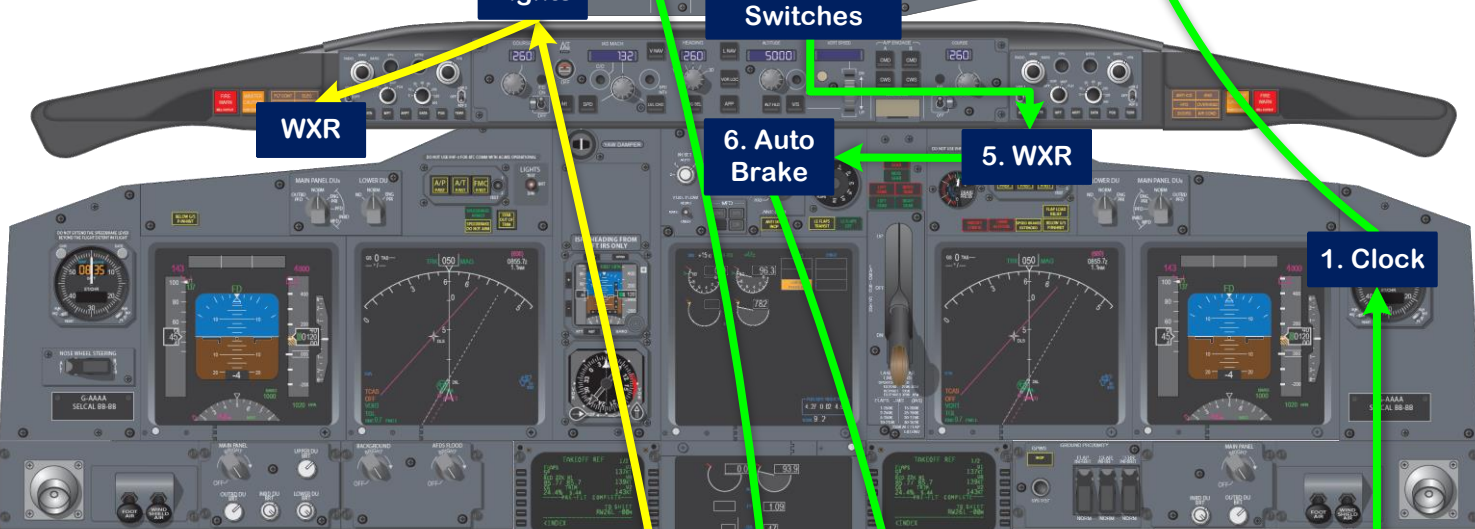


After Landing Flow

Captain
 First Officer
 Start End



"Cabin Crew Disarm Doors and Crosscheck"



AFTER LANDING FLOW

- CA SPD BRK Down
- FO Clock (ENG COOLDOWN 3 MINS) Start
- CA Landing/Turnoff/Taxi Lts (CLEAR OF RWY) ... OFF
- FO Probe Heat A&B switches..... AUTO
- FO Strobe lights (CLEAR OF RWY)As needed
- FO Engine Start switches OFF/AUTO
- CR Weather Radar OFF
- FO Auto Brake selector OFF
- FO Flap lever UP
- FO Weather Radar Panel..... TEST
- FO APU (WHEN REQ'D, 2 MINS TO BLEED USE) START

➤ Approaching Stand ...

- FO PA "Cabin Crew Disarm Doors and Crosscheck"
- FO Electrical PowerSet
- VERIFY APU GEN OFF BUS LIT
- APU GENERATOR SWITCHES ON
- VERIFY APU GEN OFF BUS EXT
- VERIFY 2X SOURCE OFF LIGHTS EXT
- FO "Doors Disarmed, (APU On the Bus / No APU), (3 Minute Cooldown)"

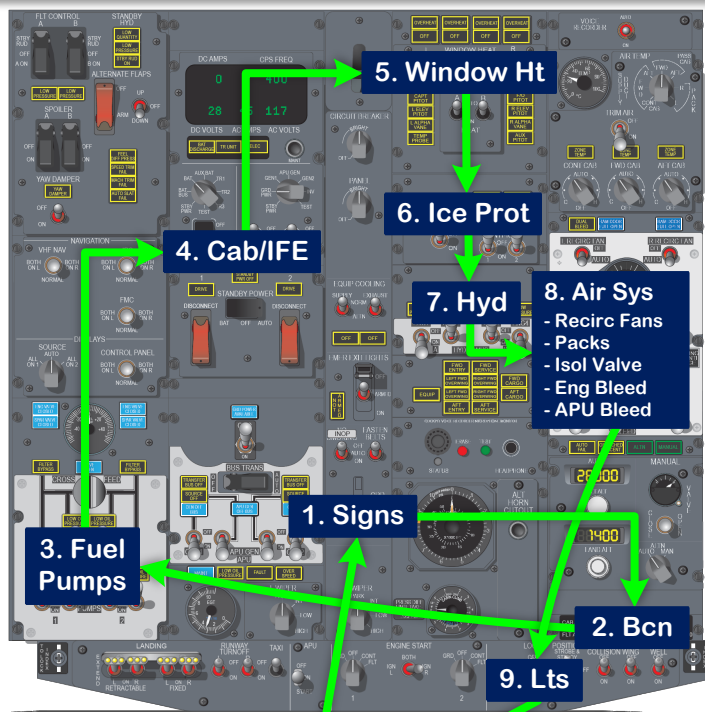
CA : Speed Brake

SP 18.1 Single Engine Taxi In SETI

- Criteria
 - Not in Adverse Wxr, Icing Conditions, LVOPS
 - Not on Slippery/Contaminated Taxi/Ramp
 - Gross Weight < Max Landing Weight
 - No MEL ATA 21 (AirCon) 24 (Elec) 29 (Hyd) 32 (Gear) 36 (Pneu)
 - Check Local Regulations 10-7; APU must be serviceable
- Considerations
 - High OEI Break Away Thrust / Jet Blast effects
 - Direction of Turns; Keep Airplane Moving
 - Crew Workload; Loss of Airplane Systems; Fuel Imbalance
 - Control Difficulties – Stop & Start Engine #2 with APU or Tow
- SETI Procedure
 - Clear of all in-use Active Runways, SMC contacted
 - After Landing Flow complete; 3 minutes cooldown
 - Only Engine #2 to be shut down; APU GEN #2 On Bus

Shutdown Flow

Captain →
First Officer →
Start **End**



SHUTDOWN FLOW	
CA	● Parking Brake; ●● APU Gen; 🕒 3 Mins
	2x GEN OFF BUS AND NO APU GEN OFF BUS ; OR
	- GROUND POWER GRD POWER AVAILABLE
CA	Engine Start Levers CUTOFF
➤	When N1 is 10% ...
FO	Fasten Belts OFF
FO	Anti Collision Lights OFF
FO	Fuel Pumps OFF
	- APU : LEAVE #1 AC PUMP ... ON
FO	CAB/UTIL Power As Needed
FO	IFE/PASS Seat Power As Needed
FO	Window Heat OFF
	- CAN REMAIN ON FOR TRANSITS < 45MIN
FO	Wing Anti-Ice OFF
FO	Engine Anti-Ice OFF
FO	Hydraulic Panel Set
	- ENG PUMPS ... ON; ELEC PUMPS ... OFF (45 MINS)
FO	Recirculation Fans AUTO
FO	Packs (CAN BE OFF 10°C - 21°C) AUTO/OFF
FO	Isolation Valve OPEN
FO	Engine Bleed ON
FO	APU Bleed ON
FO	Exterior Lights As Required
FO	Flight Directors OFF
FO	MCP Altitude Set 4,900
FO	MCP IAS/Mach (USE LVL CH) Set 100
FO	Stabilizer (TRIM STOPS AUTOMATICALLY) ... Set 4 Units
FO	Transponder (SET 2000/3000) STBY
CR	Parking Brake As Needed
FO	APU As Needed
CA	" Shutdown Checklist " Complete

N1

CA : Start Levers

12. Xpndr

11. Stabilizer



Secure Flow

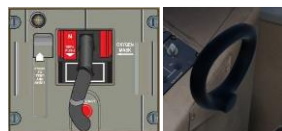
21-Feb-24

B737 NG Flight Deck

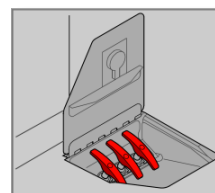
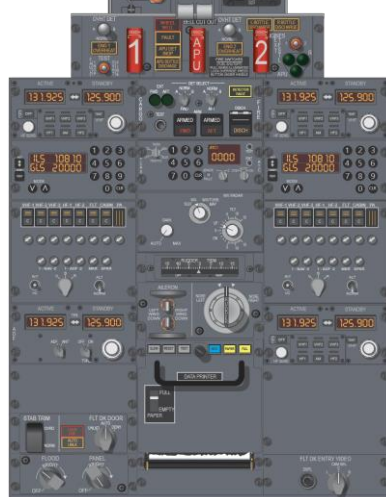


FIRE WARN BELL CUTOFF	MASTER CAUTION PUSH TO RESET	FLT CONT	ELEC
		IRS	APU
		FUEL	OVHT/DET

ANTI-ICE	ENG	MASTER CAUTION PUSH TO RESET	FIRE WARN BELL CUTOFF
HYD	OVERHEAD		
DOORS	AIR COND		



RWY 34	27 (L) 28 (R)	23 (L) 22 (R)	25 (L) 25 (R)	FLAP 5	BAY FUEL REM
J	INTX	N1 91.5	N2 136	MELCDL N/A	
NADR STD 1 2		V1 144	V2 148	Planned 60 Fuel PAX 13046	
EO ACC: 1687	1253	MAC 23%	OPT LMT 66.0	Actual 59.0 ZFW 59.3	
COBT				64.4 BRW 65.1	
APT YMWL INFO A	RWY 34				
WV 290/15	(0)	VIS CAVOK			
CLD		T 23°	Q 102.0		
RMK 290/15					
CLR YSSY DOSEL DOSEL4 5000 C1297 DEP 118.4					
SEPP: TRK 340° 20.5 ML RT TRK 130°		AIT: DCT VISAS CLB WSA			



Holding & Required Time of Arrival

21-Feb-24

Maximum Holding Speeds			
Altitude	Timing	ICAO PANS-OPS	TERPS
0 ... 6,000 ft	1 min ¹	230 Kts	200 Kts
6,001 ... 14,000 ft		(170 kts Cat B)	230 kts
14,001 ... 20,000 ft	1.5 min ¹	240 kts	265 kts
20,001 ... 34,000 ft		265 kts	
Above 34,000 ft		M0.83	

¹ TERPS requires inbound timing. Adjust Outbound to achieve.
- Lesser of 280kts or M0.8 in Turbulence with ATC approval.

· Holding :

- Landing and Turnoff Lights ON when Holding (A1)
- Enter Minimum Holding Altitude as At-Or-Above.
- Review the VNAV DES speed (250 kts) for after hold.

Leaving Hold consider:

- (a) Cruise Altitude;
- (b) Exit Hold;
- (c) Direct to Holding Fix when wings level inbound to ensure
 - (i) Approach Mode in FMC as early as possible; and
 - (ii) T/D indication.

At FL320 a hold turn at Hold Speed took 2:45

- Keep the HOLD PAGE UP
- AND KEEP UPDATING THE BOX
 - Landing lights on
- Approx 3 min in one turn and 2min 30 in other
 - Upto FL140 =230 / 1min
 - FL140/FL200=240/1.5
 - Above FL200=265/1.5
 - RH pattern standard
 - Depart @250kts
 - Can be 1 min early
 - Leaving hold
 - CRUISE ALT
 - Exit hold
 - UP SPEED for min fuel burn
 - Greater than FL250 use vref 40+100 for min
- If leaving a hold in controlled airspace- must be at 250kts unless ATC advise otherwise

3 LIMITATIONS

3.1 Unless otherwise specified, holding procedures are subject to the following limitations:

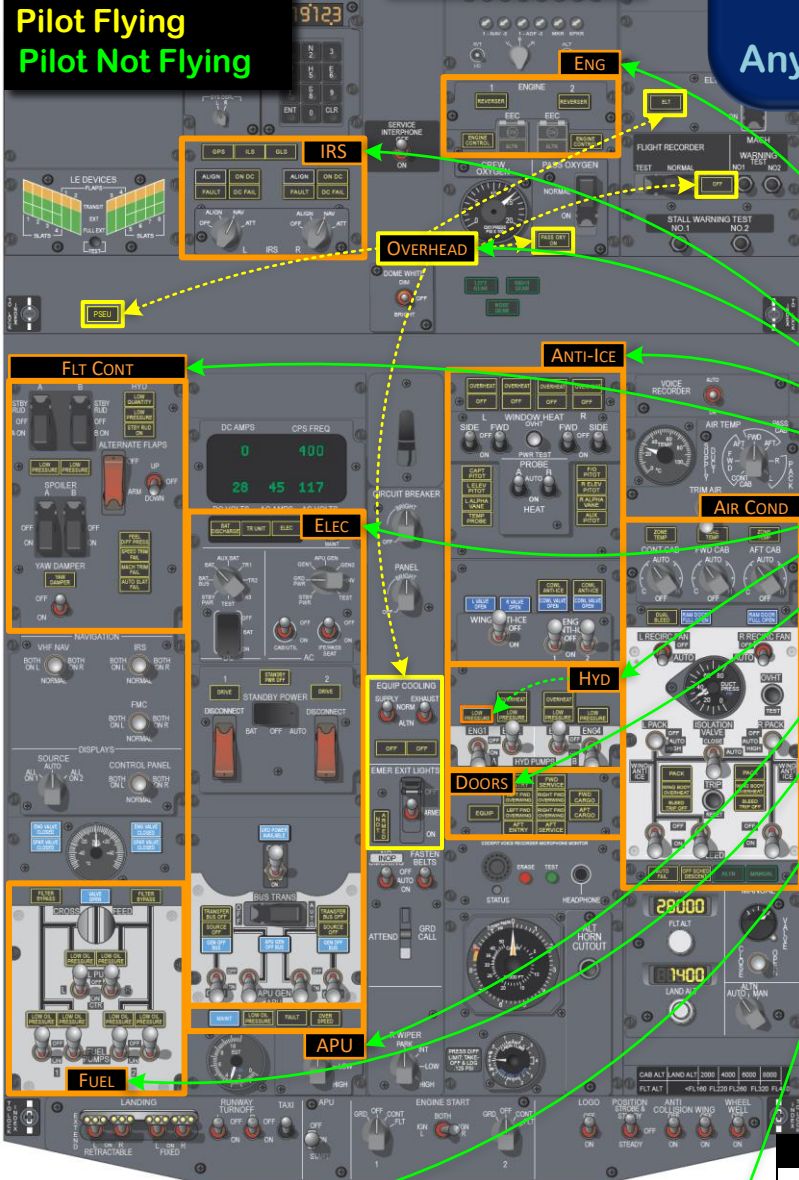
- a. **Speed** — Indicated speed must not exceed
 1. up to and including FL140
 - 230 kt, or
 - 170 kt for holding where the approach is limited to Cat A and B aircraft only;
 2. above FL140 up to and including FL200, 240 kt; and
 3. above FL200, 265 kt.

NOTE: Above the highest MSA in turbulent conditions speeds may be increased to the lesser of 280 KIAS or Mach 0.8 subject to ATC approval in controlled areas (CTA).
- b. **Outbound Timing** — Timing begins abeam the fix or on attaining the outbound heading, whichever comes later.
- c. **Time / Distance Outbound** — The outbound leg must be no longer than:
 1. Up to and including FL140 – 1 minute or the time or distance limit specified on the chart.
 2. Above FL140 – 1.5 minutes or the time or distance limit specified on the chart.

- d. **Turns** — All turns in nil wind should be at a bank angle of 25 degrees or Rate One, whichever requires the lesser bank.
- e. **Wind Allowance** — Allowance should be made in heading and timing to compensate for the effects of wind to ensure the inbound track is regained before passing the holding fix inbound. Full use should be made of indications available from the aid and estimated or known winds.
- f. **Exiting** — For ATC traffic management, jet aircraft in CTA must leave an enroute holding pattern at 250 kt IAS, unless otherwise published or advised by ATC. Pilots may request a variation to this requirement.

B737 NNM Management Flow

CM (Noticing the NNM)
Other CM
Pilot Flying
Pilot Not Flying



ANTH-ICE	ENG	MASTER CAUTION	FIRE WARN	FLT CONT	ELEC
HYD	OVERHEAD	PUSH TO RESET	BELL CUTOFF	IRS	APU
DOORS	AIR COND			FUEL	OVHT/DET

Any CM : "Master Caution ... Hydraulic."

Other CM : "Checked."

PF : "Confirm the Failure."

PM : "Hydraulic Pump ... Low Pressure."

PF : "Confirmed."
PM : (Resets Caution)

PF : "Hydraulic Pump Low Pressure Checklist."
... or ...
PF : "Memory Items ... Checklist."

MASTER CAUTION / FIRE WARNING SYSTEM NOTES

The Master Caution/Fire Warning system monitors the Overhead and Overheat/Fire Protection Panel systems. Fault indications in other areas ("within the direct view of the pilots") need to be monitored and called separately – and reviewed when the PF calls "Confirm the Failure".

In principle the FIRE WARN and MASTER CAUTION systems should not be reset until the Failure has been Identified by the PM and confirmed by the PF.

The following two exceptions are standard deviations to the FCTM.

- For annunciated FIRE WARN ings - it is acceptable to Cancel/Reset (BELL CUTOFF) once the PF has acknowledged the call of "Fire" from the PM. ¹
- For an Engine Failure on Takeoff, it is considered acceptable to Reset the MASTER CAUTION (particularly at night) as the light is in the PF's direct field of vision and considered highly distracting. ²
- Note that this is done as soon as the PF acknowledges the "Fire/Engine Failure" call shortly after the "Positive Rate ... Gear Up" calls – prior to "Confirm(ing) the Failure." ²

1. Using the BELL CUTOFF clears/resets the FIRE WARN annunciator, but any Engine/APU/Cargo fire indications will continue to annunciate on the Overheat/Fire Protection Panel for as long as a Fire Condition is detected.
2. Resetting the Master Caution clears the System Annunciator displays as well as de-activating any indication of Single Channel Fault annunciators.
 - ☑ Ensure you have Identified all illuminated Annunciators from both sides prior to Resetting the Master Caution.
 - ☞ Should you subsequently elect to action a Recall to illuminate the affected System Annunciators - all Annunciators Lights from (1) the Failure; (2) Any previous Failure; and (3) any Single Channel Faults (pre-existing or associated) will also annunciate with the Recall.

NNM MANAGEMENT FLOW – OTHER THAN TAKE-OFF

- The PM is required to call the illuminated **SYSTEM ANNUNCIATORS** to identify which area(s) of the Overhead Panel (or Overheat/Fire Protection Panel) should now be the focus to determine the source/nature of the failure/fault(s).
- The PM must also do an overall review of the Overhead Panel to identify other failure/fault illuminations that might be associated (or not) with the Primary failure/fault(s).
- As part of "Confirm the Failure", the PM should also consider any fault indication in areas other than the Overhead Panel in the "direct view" of the pilots and therefore not referenced by the System Annunciators.
- The **MASTER CAUTION** system should not be Reset until this Review is complete; the Failure Identification stated by the PM and Confirmed by the PF.
 - Engine Failure on Takeoff is treated as an exceptional case ...

PF : "Confirm the Failure"



FIRE WARN BELL CUTOFF

APU Inoperative and Air Systems SP's

SP 2.1 EXTERNAL AIR CART USE

- BAT switch must be ON to enable DC protective circuits
 - APU Bleed OFF
 - Isolation Valve OPEN
 - Packs/Recirc Fans Available
- Min duct pressure 20 PSI. If not the APU can be used to supply air to the Left Pack.

SP 2.2 GROUND CONDITIONED AIR USE

- **PACKS ... OFF** for ground conditioned air to prevent damage. Packs may be used for External Air Cart (SP 2.1)

SP 7.4 STARTING WITH GROUND AIR (ELEC AVAIL)

- Start Engine #1 first due Air Connector near #2 – on stand prior to push back.
 - Ensure APU Bleed Air..... OFF
- Start Engine #1 Normally then disconnect Ext Air

SP 7.5 ENGINE CROSSBLEED START

Not during Pushback. Ensure Parking Brake Set; Towbar Disconnected and Area behind Clear.

- Engine BLEED switches ON
- APU BLEED switch..... OFF
- PACK switches..... OFF
- ISOLATION VALVE switch..... AUTO
- Operating Engine Thrust..... Adv for 30 PSI
 - PRESSURE WILL DROP BELOW 30PSI DURING START – OK
- Normal Engine Start.
- Thrust Idle after Starter Cutout.

SP 2.5 NO ENGINE BLEED TAKEOFF

Takeoff with APU providing Bleed Air to Left Pack. Configure After Engine Start unless Anti-Ice is required for Taxi.

➤ **After Start / Before Takeoff:**

- Right PACK switch..... AUTO
- ISOLATION VALVE switch..... CLOSE
- Left PACK switch AUTO
- Engine #1 BLEED air switch..... OFF
- APU BLEED air switch..... ON
- Engine #2 BLEED air switch..... OFF
- Trim Air switch (811-906) ON
- Wing ANTI-ICE switch OFF
 - REMAINS OFF UNTIL ENGINE BLEED/ISOLATION RESTORED

➤ **After Takeoff:**

Commence the following once the Flaps are UP.

Engine Failure : Delay reconfigure until 1,500 ft or Obstacle Clearance.

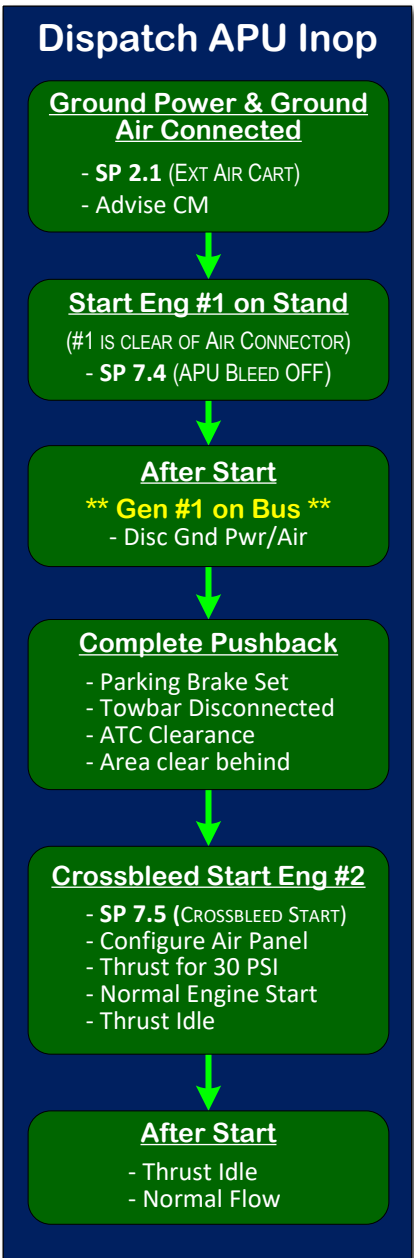
- Engine #2 BLEED air switch..... ON
- APU BLEED air switch..... OFF
 - WAIT FOR CABIN RATE OF CLIMB INDICATOR TO STABILIZE.
- Engine #1 BLEED air switch..... ON
- ISOLATION VALVE switch..... AUTO

SP 2.5 NO ENGINE BLEED LANDING

➤ **Before Landing:**

Provides additional thrust for Go-Around. Assumes APU is running and APU Bleed available. When below 10,000 ft:

- WING ANTI-ICE switch.....OFF
- Right PACK switch..... AUTO
- ISOLATION VALVE switch.....CLOSE
- Left PACK switch..... AUTO
- Engine #1 BLEED air switch.....OFF
- APU BLEED air switch.....ON



SP 2.4 UNPRESSURIZED TAKEOFF/LANDING

Takeoff without Engine/APU Bleed Air.

➤ **Before Takeoff:**

- PACK switches.....AUTO
- ISOLATION VALVE switch..... CLOSE
- Engine BLEED air switches OFF
- APU BLEED air switch..... OFF

➤ **After Takeoff:**

Commence the following once the Flaps are UP.

Engine Failure : Delay reconfigure until 1,500 ft or Obstacle Clearance.

- Engine #2 BLEED air switch..... ON
 - WAIT FOR CABIN RATE OF CLIMB INDICATOR TO STABILIZE.
- Engine #1 BLEED air switch..... ON
- ISOLATION VALVE switch.....AUTO

➤ **Before Landing:**


When below 10,000 ft and turning to final approach:

- Engine BLEED air switches OFF
 - AVOID HIGH RATES OF DESCENT FOR PAX COMFORT.

Engine Start NNMs

ENGINE START NON-NORMALS

➤ Normal Engine Start Procedure

- CA **“Start ___ Engine”**
- FO Secondary Engine Indications Display
- FO **Packs (USE THE “C”)** **OFF**
- FO **Engine Start switch**..... **GRD**
 - **START VALVE OPEN** - COMMENCE TIMING.
 - 2MIN START ⇒ 10SEC COOLING
- CR Verify N2 & N1 Rotation.
- CA Engine Start Lever (CA : START CLOCK) IDLE
 - @ N2 25%/MAX MOTOR (MIN 20%) : MM = 1% / 5 SEC
 - VERIFY **SPAR VALVE CLOSED** LIT & EXT {SP 21.1}
- FO **START VALVE OPEN** Ext **“Starter Cutout”**
 - @ N2 56% : **ENGINE START** SWITCH **Auto**
- CA Engine Stable (2/4/6/3) no  Check
- CA No **CDS FAULT** / **CDS MAINT** before 2nd Eng Start

EEC ABORT

- HOT START
- ENGINE STALL
- EGT EXCEEDANCE
- WET START

ABORT ENGINE START

- No/SLOW N1/N2 AFTER EGT INCREASE
- NO OIL PRESSURE BY STABLE IDLE
- NO EGT 15S AFTER START LEVER IDLE
- EGT QUICKLY NEARS/EXCEEDS LIMIT

All Start NNMs are actioned via the **Aborted Engine Start, START VALVE OPEN, or Tailpipe Fire** checklists.

- Place hand on Engine Start Lever once N1 Rotation and N2 >20% are achieved.
- The EECs may not prevent a Hot Start – Pilot Intervention is required for an impending Hot Start.
- If the Engine Start Switch fails to return to Auto/Off - the FO may select it by Recall – the **START VALVE OPEN** checklist is not required if the **START VALVE OPEN** is extinguished.
- If required, do not re-engage starter until N2 < 20%

ABORTED ENGINE START

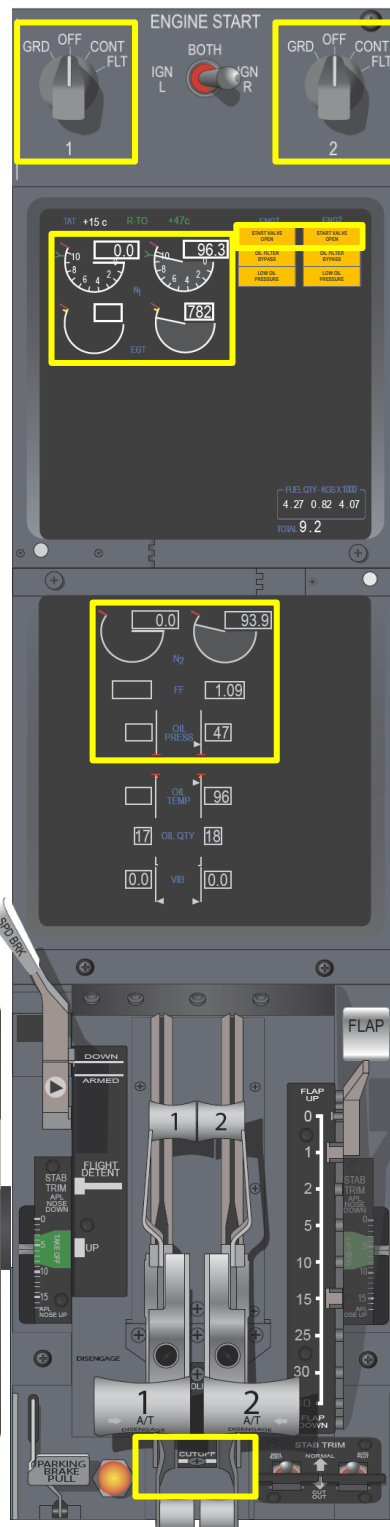
Condition : On the ground, an aborted engine start is needed.
Objective : To shut down the engine and motor it

- 1 Engine start lever (affected engine) CUTOFF
- 2 Choose one:
 - ◆ ENGINE START switch is in **GRD**:
 - | Motor engine for 60 seconds.
 - | ENGINE START switch (affected engine) OFF
 - | ■ ■ ■ ■
 - ◆ ENGINE START switch is in **OFF/AUTO**:
 - ▶▶ Go to step 3
- 3 After N2 decreases below 20%:
 - ENGINE START switch GRD
 - Motor the engine for 60 seconds.
 - ENGINE START switch OFF/AUTO
 - ■ ■ ■

ENGINE TAILPIPE FIRE

Condition : An engine tailpipe fire occurs on the ground with no engine fire warning.

- 1 Engine start lever (affected engine) ... CUTOFF
- 2 Advise the cabin
- 3 Choose one:
 - ◆ Bleed air is **available**:
 - | ▶▶ Checklist motors engine until the tailpipe fire is extinguished.
 - | ■ ■ ■ ■
 - ◆ Bleed air is **not available**
 - | Advise ATC.
 - | ■ ■ ■ ■



START VALVE OPEN START VALVE OPEN

Condition : The START VALVE OPEN alert indicates the start valve fails to close.

- 1 ENGINE START switch OFF/AUTO
- 2 Choose one:
 - ◆ **START VALVE OPEN** alert extinguishes:
 - | ■ ■ ■ ■
 - ◆ **START VALVE OPEN** alert stays illuminated:
 - ▶▶ Checklist removes bleed air until The engine start valve closes.
 - | ■ ■ ■ ■

Memory Items on Take-off

Pilot Flying
Pilot Not Flying



MALFUNCTION ANALYSIS		
<ul style="list-style-type: none"> Initial Call is "Engine Failure" or "Fire"; not to be called between "V1" and "Gear Up". Any FIRE WARN or MASTER CAUTION needs to be acknowledged and RESET After 400 ft PF calls "Confirm the Failure"; PM Identifies Failure; PF responds "Confirmed" or "Negative" N1/N2 Seizure or Airframe Vibration (whether it continues or not) requires Severe Damage. For Engine Malfunction - "Engine Failure" requires at least two engine instrument indications. 		
Malfunction Indications	PM Confirmation	PF Action Call
<ul style="list-style-type: none"> FIRE WARN; ENG 1/2 Fire Indications 	"Fire Engine (#)"	"Confirmed ..." then ... Memory Items ... Engine Fire Checklist"
<ul style="list-style-type: none"> Loss of Engine Indications (Yaw?) Fire Panel FAULT light illuminated 	"Separation Engine (#)"	... Memory Items ... Engine Severe Damage or Separation Checklist"
<ul style="list-style-type: none"> No N1/N2 Rotation, or (Yaw?) Airframe Vibration & Unusual Eng Indications 	"Severe Damage Engine (#)"	(no Memory Items applicable)
<ul style="list-style-type: none"> EGT ENG FAIL indication; and (Yaw?) No Limit Exceedance. 	"Failure Engine (#)"	... Memory Items ... Engine Limit or Surge or Stall Checklist"
<ul style="list-style-type: none"> Engine Surging/Stalling No/Abnormal response to Thrust Lever 	"Surge/Stall Engine (#)"	
<ul style="list-style-type: none"> Limit (N1/N2/EGT/Oil Temp/Pr) Exceedance 	"(Parameter) Limit Engine (#)"	

Analysis runs from Top Down. For example, Indications of a Severe Damage supersede Stall/Surge.



MEMORY ITEMS ... ENGINE FIRE CHECKLIST

- PF Calls for "Memory Items ... (Checklist Title) ... Checklist"
- PM Commences Memory Items by reading from memory the checklist Challenge and Response (*text in brackets is ignored*).
- If Confirmation is not required, PF/PM actions Checklist Item & Re-States the Response.
- If Confirmation is required, PF/PM confirms with "Number One" and PM/PF responds "Confirmed/Negative".
- After the last Memory Item is complete, PM states "Memory Items Complete"

Pilot Monitoring

Pilot Flying

	"Memory Items ENGINE FIRE Checklist"
"Autothrottle ... Disengage"	Disengages Autothrottle ... "Disengaged"
"Thrust Lever ... Confirm ... Close"	Identifies Thrust Lever - "Number One"
"Confirmed" (or "Negative")	Closes Thrust Lever ... "Closed"
"Engine Start Lever ... Confirm ... Cutoff"	
Identifies lever ... "Number One"	"Confirmed" (or "Negative")
Selects CUTOFF ... "Cutoff"	
"Engine Fire Switch ... Confirm ... Pull"	
Identifies lever ... "Number One"	"Confirmed" (or "Negative")
Pulls Fire Switch ... "Pulled"	

- 1** "Fire Switch remains Illuminated"; or **ENG 1 OVERHEAT**: "Engine Overheat remains illuminated"; then
 - "Engine Fire Switch ... Rotate to the Stop and Hold for 1 Second"
 - PM Completes Action ... "Rotate and Hold for 1 second"
 - PM commence Timing for 30 seconds; and verifies **L BOTTLE DISCHARGE**
- (End of Memory Items) -----

If On the Ground – go to the Engine Fire on the Ground checklist.

- After 30 seconds :
- 1** : "Fire Switch remains Illuminated"; or **ENG 1 OVERHEAT**: "Engine Overheat remains illuminated"; then
 - "Engine Fire Switch ... Rotate to the other Stop and Hold for 1 Second"
 - PM Completes Action ... "Rotate and Hold for 1 second"
 - PM "Memory Items Complete"; and verifies **R BOTTLE DISCHARGE**

- PM States :
- 1** : "Fire Switch remains Illuminated"; or **ENG 1 OVERHEAT**: "Engine Overheat remains illuminated"; or "Fire/Overheat is Out"



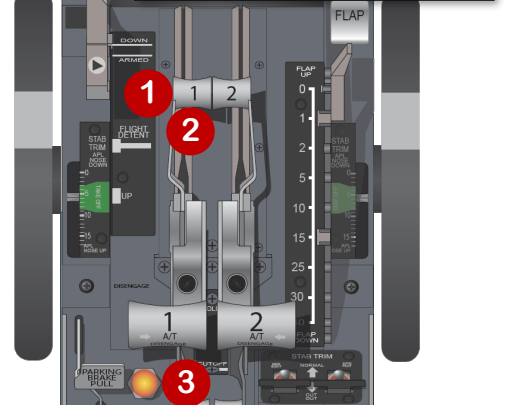
ENGINE FIRE
or **ENGINE SEVERE DAMAGE OR SEPARATION**

Condition : One or more of these occur:

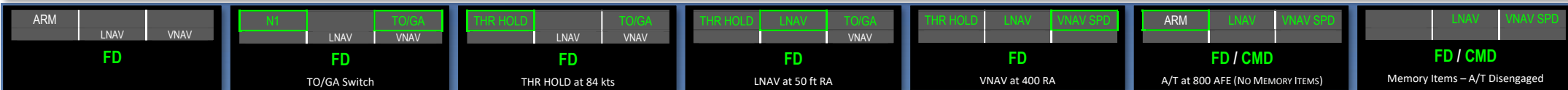
- Engine fire warning
- Airframe vibrations with abnormal engine indications
- Engine separation

- Autothrottle (if engaged) Disengage
- Thrust lever (affected engine) ... ConfirmClose
- Engine start lever (affected engine) ... Confirm ...CUTOFF
- Engine fire switch (affected engine) ... Confirm.....Pull
To manually unlock the engine fire switch, press the override and pull.
- If the engine fire switch or **ENG OVERHEAT** light stays illuminated:
Engine fire switch..... Rotate to the stop and hold for 1 second (& Start the Clock)
----- (End of Memory Items) -----
- Choose one:
 - On the ground:
 - Go to the **Engine Fire on the Ground** Checklist on the page Back Cover.2
 - In flight:
 - Go to **step 7**
 - If after 30 seconds the engine fire switch or **ENG OVERHEAT** light stays illuminated:
Engine fire switch Rotate to the other stop and hold for 1 second

(Checklist Continues ...)



Engine Failure After Take-Off (EFATO)



ENGINE FAILURE ON TAKE-OFF

YAW

- Engine Failure at/before Vr, Squeeze & Freeze Rudder Input & hold through Rotation to Gear Up
- **Trim** : 5 units as a starting setting; Trim for Control Column Neutral.
- Pitch at 1½°-2½°/sec (½° slower than AEO) to 12°-13° (2°-3° lower than AEO) for V₂ ⇒ V₂+20 kts.
- For E/Fail on Ground, **TO/GA** pitches to Lift Off Speed, not less than V₂.

PITCH

- **TO/GA** / **VNAV SPD** command pitch to maintain Current Speed between V₂ ⇒ V₂+20.
- Pitch requires ≈5 seconds of Nose Up Trim before AP engagement.
- At EO ACCEL HT - **VNAV SPD** commands Flap Limit or VREF40+70 **UP**.

ROLL

- Initially maintain Wings Level with Aileron until aircraft is trimmed out.
- Limit Bank Angle to 15° until V₂+15 **UP**, then up to 30° at Take-off Flap above **UP**.
- SEFP is based on 15° and **HDG SEL** may require MCP Bank Limiter.

THRUST

- A/T will remain in **THR HOLD** and then **ARM** until disengaged.
- AP Engagement requires appropriate Pitch Trim and Rudder. Rudder Trim optional for AP Engagement.
- Select **CON** Thrust when Flaps are Up (no **LE FLAPS TRANSIT**) and **-UP**.
- **LVL CHG** (**MCP SPD**) is selected once clean – AP engagement reverts **TO/GA** to **MCP SPD** ⇒ **HDG SEL**

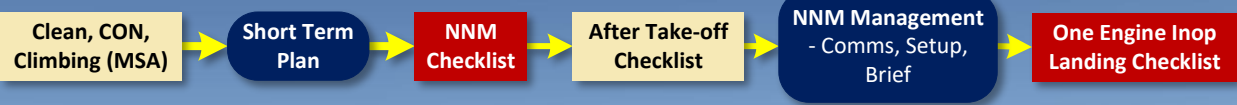
SEPP & ACCELERATION

- For **Immediate** SEPP (DER) – Delay Accel until turn complete.
- Otherwise Acceleration may be commenced during the SEFP.
- Increase Bank (above **UP**) up to 25° to maintain containment.

EFATO during Acceleration/Flap Retraction:

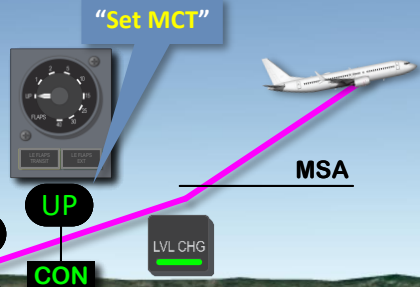
- Set MCT & Maintain Flap & Flap Manoeuvre Speed.
- Climb to MSA (or Obstacle Clearance assured)
- Otherwise Acceleration may be commenced during the SEFP.
- Continue Acceleration & Flap Retraction.

AIT : Climb to MSA/Terrain Clearance before Acceleration

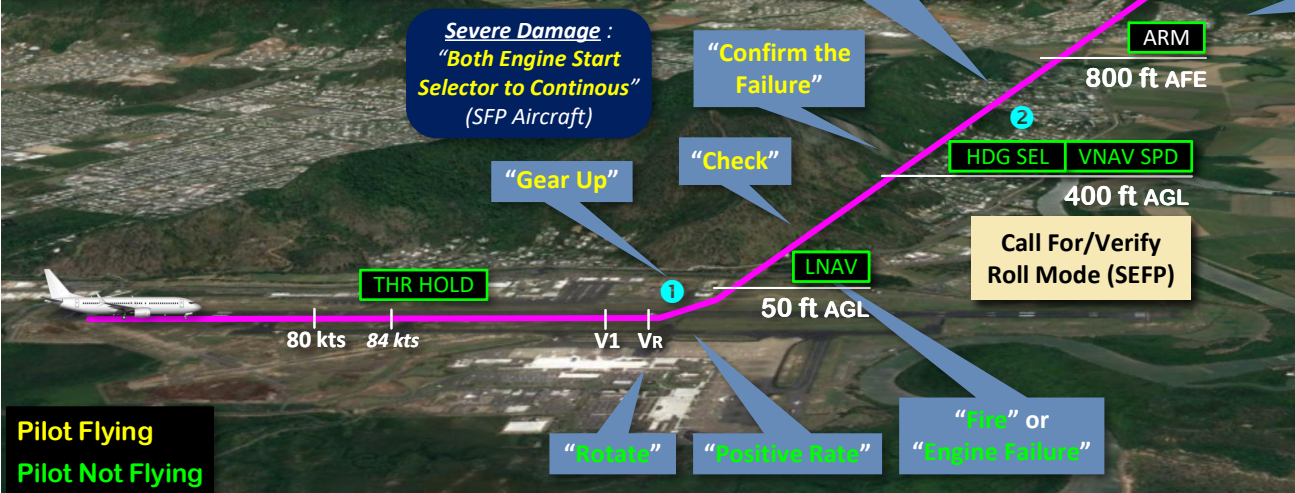


EXTENDING 2ND SEGMENT

- Configuring during Memory Items is not recommended.
- Acceleration during the SEFP may also be undesirable.
- **LVL CHG** (**MCP SPD**) is used to delay Acceleration.
- Beware that LVL CHG sets MCP Speed Window to current speed, which must be ≥ V₂



ATC Call :
- PAN or Mayday
- Consider APU ... Start



NNM MANAGEMENT

- > Clean, **CON**, Climbing (ABOVE MSA) : Mini Plan
- Consider immediate tracking requirements during the completion of NNM Checklists – Diversion/Hold?
- > After Take-off Checklist Complete : FORDEC
- Consider Circuit Breakers ...
- Inflight Engine Start?
- Weather/NOTAMS/FCON for Diversion (LVO/Pbn)
- ATC, Company/Eng, CM, Crew & Pax - Comms
- Landing Performance : Overweight Landing?
- Dangerous Goods (NOTOC)
- QRH **One Engine Inoperative Checklist**
- Recall ... Notes ... Briefing

MALFUNCTION ANALYSIS

- Initial Call is "Engine Failure" or "Fire"; not between V₁ and Gear Up.
- Any **FIRE WARN** or **MASTER CAUTION** needs to be acknowledged and **RESET**.
- After 400 ft PF calls "Confirm the Failure"; PM identifies Failure; PF responds "Confirmed" or "Negative"
- N1/N2 Seizure or Airframe Vibration (whether it continues or not) requires Severe Damage.

Malfunction Indications	PM Confirmation	PF Action Call
• FIRE WARN ; ENG 1/2 Fire Indications	"Fire Engine (#)"	"Confirmed ..." then ... Memory Items ... Engine Fire Checklist"
• Loss of Engine Indications • Fire Panel FAULT light illuminated	"Separation Engine (#)"	... Memory Items ... Engine Severe Damage or Separation Checklist"
• No N1/N2 Rotation, or • Airframe Vibration & Unusual Eng Indications	"Severe Damage Engine (#)"	(no Memory Items applicable)
• EGT ENG FAIL indication; and • No Limit Exceedance.	"Failure Engine (#)"	... Memory Items ... Engine Limit or Surge or Stall Checklist"
• Engine Surging/Stalling	"Surge/Stall Engine (#)"	
• Limit (N1/N2/EGT/Oil Temp/Pr) Exceedance	"(Parameter) Limit Engine (#)"	

Analysis runs from Top Down. For example, Indications of a Severe Damage supersede Stall/Surge.

Pilot Flying
Pilot Not Flying

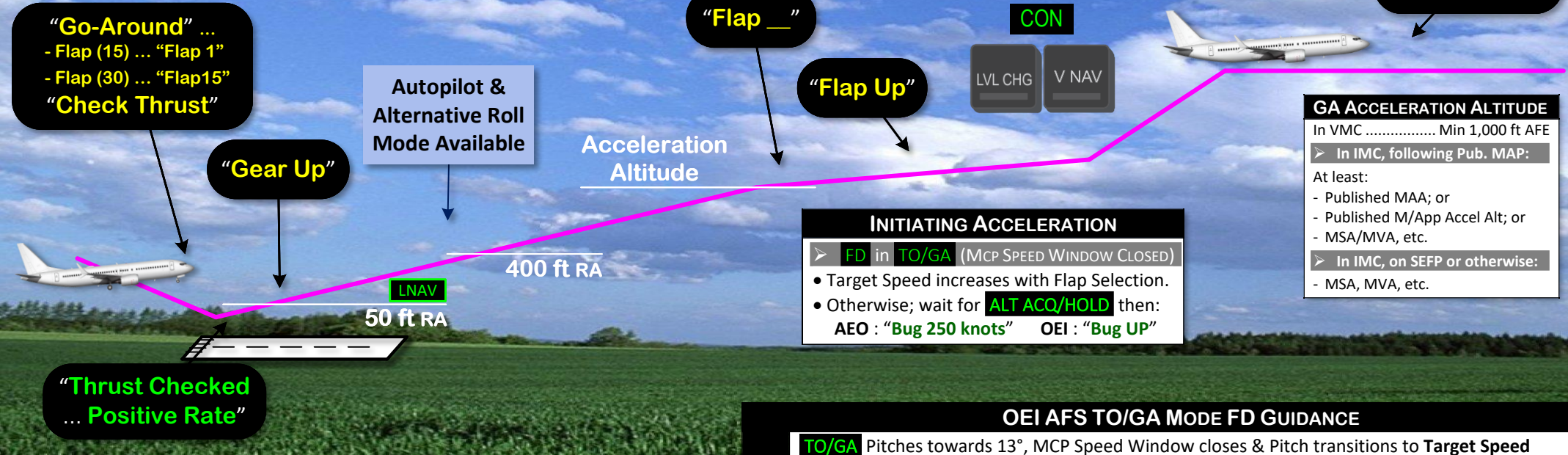
Engine Out Go-Around

21-Feb-24

LNAV TO/GA
 TO/GA : @ TO/GA Switch
 LNAV : FD @ 50 ft CMD @ 400 ft

LNAV ALT ACQ
CMD

LNAV ALT HOLD
CMD



GA ACCELERATION ALTITUDE
 In VMC Min 1,000 ft AFE
 > In IMC, following Pub. MAP:
 At least:
 - Published MAA; or
 - Published M/App Accel Alt; or
 - MSA/MVA, etc.
 > In IMC, on SEFP or otherwise:
 - MSA, MVA, etc.

INITIATING ACCELERATION
 > FD in TO/GA (MCP SPEED WINDOW CLOSED)
 • Target Speed increases with Flap Selection.
 • Otherwise; wait for ALT ACQ/HOLD then:
 AEO : "Bug 250 knots" OEI : "Bug UP"

OEI AUTOPILOT/MODES & GO-AROUND

- Go-Around AP is only available if AP was in Dual Channel (FLARE).
- > Go-Around with Single AP (SINGLE CH)
- AP disengages with TO/GA switch as FD engages in TO/GA TO/GA
- AP is available after RA 400 ft. TO/GA is a Manual Flight only mode, so the AFS will Revert out of any engaged Pitch/Roll TO/GA mode.
 - Roll TO/GA reverts to HDG SEL - Pitch TO/GA reverts to MCP SPD
- > Go-Around with Dual AP (CMD / LAND 3 with FLARE armed)
- AP remains engaged. Rudder is controlled for Fail Operational Aircraft from LAND 2/3 until the AFS leaves TO/GA, at which point the second AP channel and Rudder Servo control drops out.

OEI AFS TO/GA MODE FD GUIDANCE

Pitch
TO/GA Pitches towards 13°, MCP Speed Window closes & Pitch transitions to Target Speed with increasing rate of climb. Target Speed (not below V_2 ??) is as follows:
 - MCP/Approach Speed if failure occurs prior to TO/GA or up to 10 seconds after TO/GA; or
 - Speed at TO/GA; or Current Speed if speed at Engine Failure is >5kts above Speed @ TO/GA
 • If the failure occurs during the go-around, maintain Flap 15 and VAPP, limit bank 15° until "manoeuvring is complete(?) and a safe altitude(?) reached." FCTM 5.88

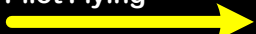
Roll
TO/GA commands Ground Track. LNAV engages at RA 50 (Manual) / RA 400 (AP).
 - Autopilot and/or Alternative Lateral Mode available after 400 ft.
 • Limit Bank 15° at/below VMINM (AMBER). Delay Accel until after initial turn complete.
 • Go-Around at F15 → F1, limit Bank to 15° until (☐ VREF +15/+20 or VMINM)
 • SEFP's are usually 15° AoB - MCP Bank Angle Limit selection may be required.

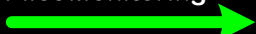
Thrust OEI Go-Around is Manual Thrust Only – Set N1 to Thrust Mode GA > Ref Thrust.



Pitch & Power	AEO	OEI
Initial Go-Around	15°	12.5°
Level, Flaps UP-Spd	6° - 60%	6° - 75%
Level Flight, Flaps 5-Spd	6° - 60/65%	7° - 75%



Engine Fire (Sev Dam/Separation)

Pilot Flying 

Pilot Monitoring 

Start  End 



A/T


**FIRE WARN
BELL CUTOUT**

ENGINE FIRE or ENGINE SEVERE DAMAGE OR SEPARATION

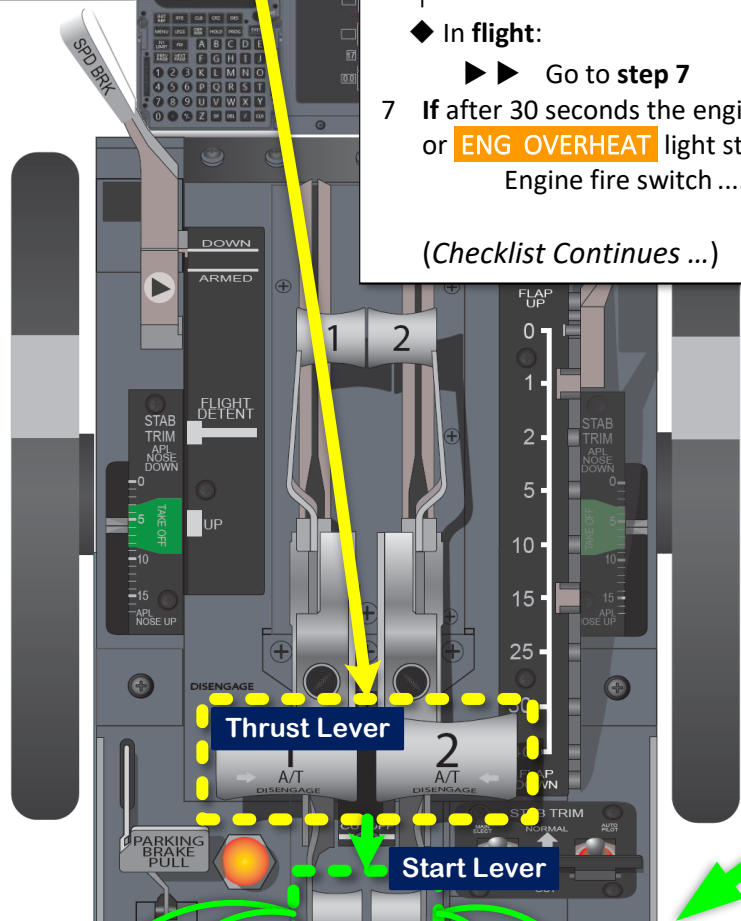
Condition : One or more of these occur:

- Engine fire warning
- Airframe vibrations with abnormal engine indications
- Engine separation

- 1 Autothrottle (if engaged) Disengage
- 2 Thrust lever (affected engine) ... Confirm Close
- 3 Engine start lever (affected engine) ... Confirm..CUTOFF
- 4 Engine fire switch (affected engine) ... Confirm.....Pull
To manually unlock the engine fire switch, press the override and pull.
- 5 If the engine fire switch or **ENG OVERHEAT** light stays illuminated:
Engine fire switch..... Rotate to the stop and hold for 1 second

----- (End of Memory Items) ----- 

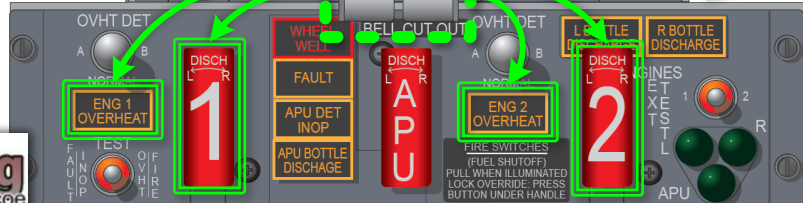
- 6 Choose one:
 - ◆ On the ground:
 - ▶▶ Go to the **Engine Fire on the Ground Checklist** on the page Back Cover.2
 - ■ ■ ■
 - ◆ In flight:
 - ▶▶ Go to **step 7**
 - 7 If after 30 seconds the engine fire switch or **ENG OVERHEAT** light stays illuminated:
Engine fire switch Rotate to the other stop and hold for 1 second
- (Checklist Continues ...)



Thrust Lever

Start Lever

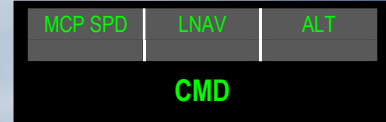
30 Seconds



1

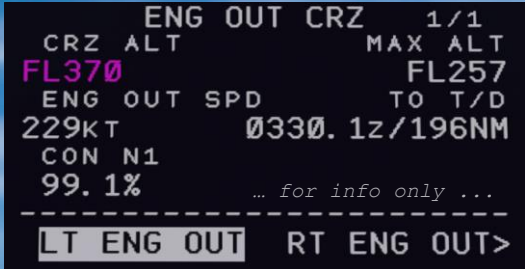
2

Engine Inoperative Drift Down



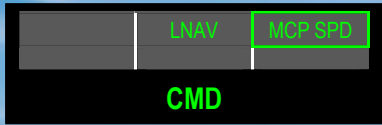
"Select Max Continuous Thrust"

"CON Thrust Set ... Select VNAV ENG OUT"



"CON thrust selected ... N1 99.1%"

"Engine Out Max Alt FL257, Speed 229"



ENGINE INOPERATIVE DRIFTDOWN

- **Fly the Aircraft....** Pitch, Roll, Yaw, Thrust, Speed
 - AUTOTHROTTLEDISENGAGE
 - THRUST (FMC N1 – SELECT CON) ADVANCE TO **CON**
- **Failure Analysis** Memory Items as Required
 - STANDARD PF/PM ENGINE FAILURE PROCEDURES,
 - TIME (CHECK AIRSPEED) PERMITTING.

➤ **Commence Drift Down**

- FMC Select **ENG OUT>**
- Engine Out Target Speed & Altitude Set MCP
 → **Slow to Engine Out Speed** ←
- Heading As Required (RVSM)
- Select **LVL CHG** **MCP SPD**
 - or Speed Intervene ... **VNAV SPD**

Notes:

- AP may disengage; can normally be re-engaged.
- ATC Call to Advise and request Lower Level
- **No FMC** : Initially 240 KIAS and FL240 works.
- Autothrottle is not available Engine Out.
- **MCP SPD** engages at current speed – adjust.
- With MCP Alt change, the FMC may commence a Descent, and **ENG OUT CRZ** page can be lost. Enter OEI Cruise Altitude in VNAV Cruise Page to recover **ENG OUT>** prompt access.

RVSM CONTINGENCY PROCEDURES

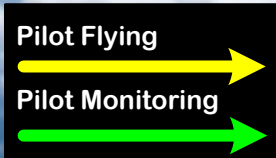
If unable to continue in accordance with ATC Clearance – advise ATC.

If Clearance cannot be obtained:

- Turn on Exterior Lights
- Leave assigned route with initial 90° turn

If unable to maintain Assigned Level:

- Wherever possible minimise rate of descent while turning to acquire and maintain a 15nm track offset from the assigned route.
- Select a level offset by 500 ft from normal level
- Broadcast Urgency signal on 121.5 / 123.45



Cabin Altitude

CABIN ALTITUDE

CABIN ALTITUDE WARNING or RAPID DEPRESSURIZATION

Condition : One or more of these occur:

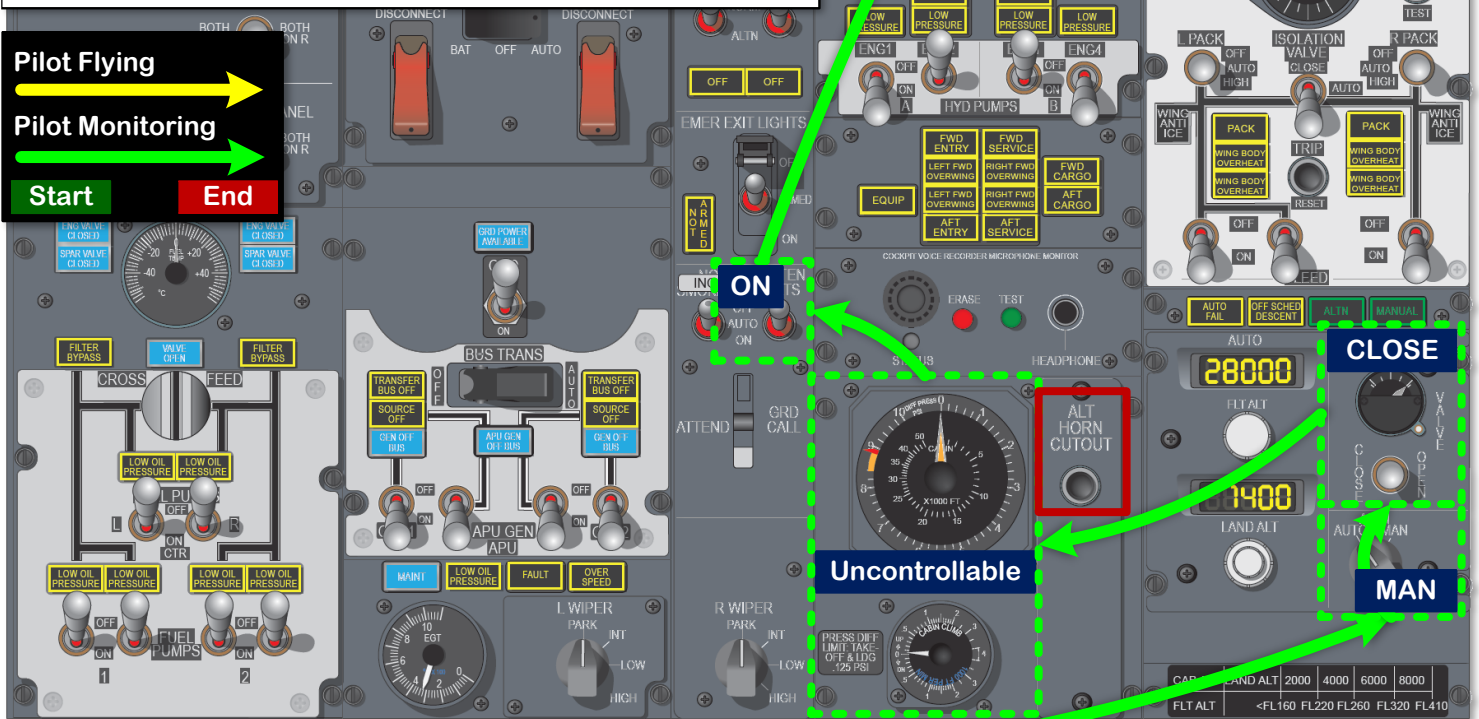
- A cabin altitude exceedance
- In flight, the intermittent cabin altitude/configuration warning horn sounds or a **CABIN ALTITUDE** light illuminates

- 1 Don oxygen masks and set regulators to 100%.
- 2 Establish crew communications.
- 3 Pressurisation mode selector MAN
- 4 Outflow VALVE switch Hold in CLOSE until the outflow VALVE indication shows fully closed
- 5 If cabin altitude is **uncontrollable**:
 Passenger signs ON
 PASS OXYGEN switch ON
 ▶▶ Go to the Emergency Descent checklist.

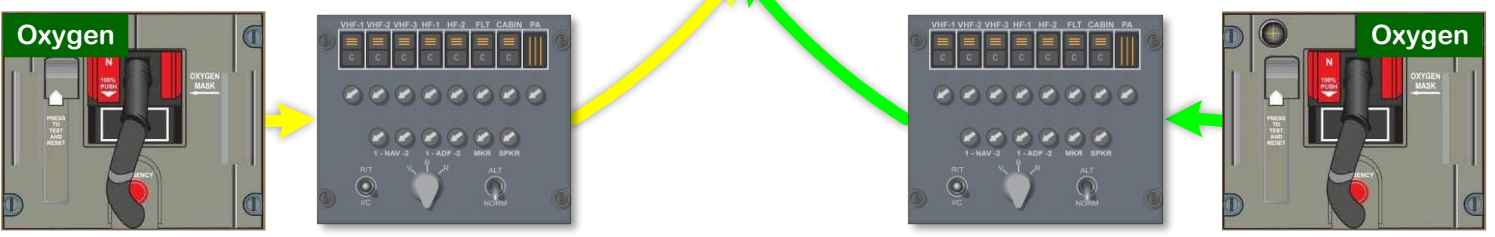
Pilot Flying →

Pilot Monitoring →

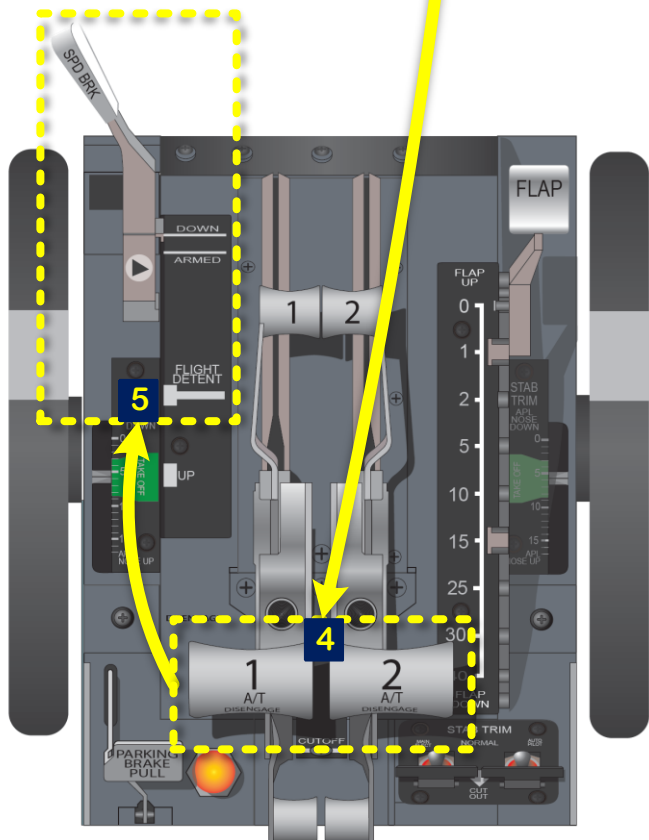
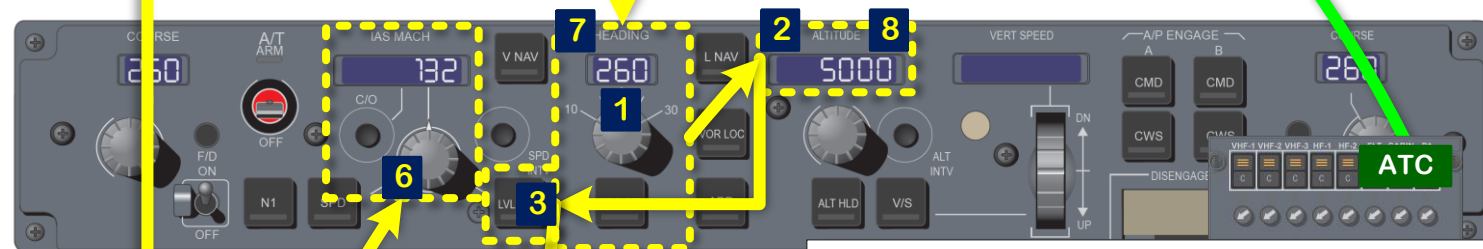
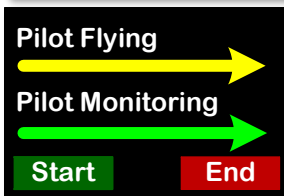
Start **End**



"Captain on Oxygen"
"First Officer on Oxygen"



Emergency Descent



EMERGENCY DESCENT

Condition : One or more of these occur:

- Cabin altitude cannot be controlled
- A rapid descent is needed.

1 Announce the emergency descent. The pilot flying will advise the cabin crew, on the PA system, of impending rapid descent. The pilot monitoring will advise ATC and obtain area altimeter setting.

PF : **"This is the Captain, Emergency Descent"**

- 2 Passenger signs..... ON
- 3 **Without delay**, descend to the lowest safe altitude or 10,000 feet, whichever is higher.
- 4 ENGINE START switches (both) CONT
- 5 Thrust levers (both) Reduce thrust to minimum or as needed for anti-ice
- 6 Speedbrake.....FLIGHT DETENT
- 7 Set target speed to MMO/Vmo.

If structural integrity is in doubt, limit speed as much as must a possible and avoid high manoeuvring loads.

Emergency Descent on Autopilot

1. Initiate a turn in **HDG SEL** if required
2. Select MCP Altitude (10,000 ft or MSA)
3. Engage **LVL CHG**
4. Thrust Levers..... IDLE
5. SpeedbrakeFLIGHT DETENT
6. Select MCP Speed MMO/Vmo or Limited
7. Refine MCP **Heading** selection.
8. Refine MCP **Altitude** selection.

Approaching Level Off Altitude:

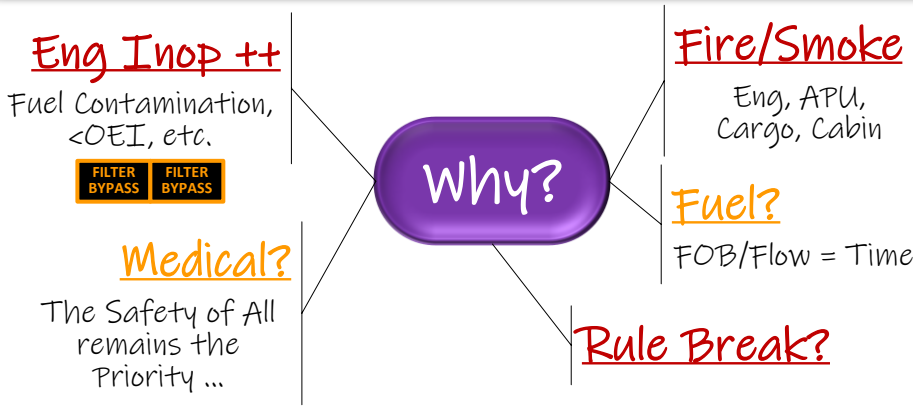
- Reduce MCP Speed to LRC/300 Knots (away from Vmo)
- Stow Speedbrake smoothly to avoid overspeed

PM Flow – Further Consideraitons

PM flow should include considerations of:

- Engine Anti-Ice for the Descent
- Transponder 7700, TCAS Below

Immediate Return



Fly The Plane
- F/O to be PF?
- Keep Monitoring!
- SA: Terrain, Wxr, TFC, etc.
- Config (Flap 5?)

Maintain SA
Speed, Altitude, Terrain, Weather, Fuel ...

NM Checklists/Procs
- After Take-off
- Gear, Flap, Press
- Config (Flap 5?)

How?

What do we need to be Safe in the Air?

NNM Checklists

The Captain can elect not to action a NNM Checklist – but You should mitigate the Flight Safety Impact of the Reference Items.
- Primary NNM (Fire/Fail, ???)
- OEI Landing
- Overweight Landing?

What do we need to become Safe on the Ground?

The Usual ...
- An Approach ...
- Autobrake, Vref, Minimums
- Landing (RUNWAY LDA/LDR)
- Considerations of Missed Approach

NM Checklists
- Desc / Appr
- Landing (LDA/LDR)
... From the Column ...

IMMEDIATE RETURN

When Flight Path is under control and Memory Items Complete – consider handing over to the First Officer.
Continue to Monitor
Flight Path, Navigation and Maintain SA

CA **Decide!** Airport, Runway, Approach
CA **ATC** (TELL THEM – DON'T ASK!) Inform
CA **After Takeoff Checklist** Complete
CA **CM (Crew/Pax)** Inform

CM Call : “We have (**the Left Engine on Fire**) and are returning for an **Immediate (Return to) Landing at (Airport)** in (**8 mins**). I need you to prepare the Crew and Inform the Passengers to **Expect an Evacuation** after Landing.”

CA **FMC** As Required
- **ROUTE** DEST (IF REQUIRED)
- **DEP ARR** APPROACH/RUNWAY
- **LEGS** EXTEND CENTERLINE
- **INIT REF** (LANDING WEIGHT/FLAP) .. VREF 15 (ICE) / 30 / 40

CA **Flight Deck Setup** Required
- OEI FLAP 15 : GPWS ... FLAP INHIBIT; VREF ICE (F15 +10)
- **APPROACH** : COURSE BARS, EFIS MINIMA ... SET
- **AUTOBRAKE** : LDR vs LDA CONSIDERATIONS ... SELECT

CA **Non-Normal Considerations** As Required
- **APU** (STARTED WITH THE MAYDAY?) START
ENG FIRE : ISOLATION VALVE CLOSED
PACK (AFFECTED SIDE) OFF
APU BLEED OFF
APU (IF NOT ALREADY) START
OVER WT : AEO FLAP 30 RECOMMENDED
GPWS INHIBIT (MAX ONLY) RWY INHIBIT

CA **Complete Descent, Approach Landing Checks**
- FROM COLUMN ... CHALLENGE/RESPONSE/RESPONSE

Once ready – Captain becomes PF for the Landing.
Note : None of this is documented Procedure/SOP.

Memory Items

- 2x Eng/Inop - Restart
- Preserve Life (Oxy/Smoke)
- Fire the Bottles
- Secure the Engine
- Start the APU with **MayDay** ...

NNM Items

- Fire/Sev Dam/Sep**
- Severe Vibration continues ...
- Bleed/Air (ISOL/PACK/APU BLEED)
- Start the APU
- TCAS TA?
- OEI Landing**
- Flap 15/30 (Vref/Ice*)
- LDA/LDR/GA -> Auto Brake
- Go-Around Review (Flap 1 until -1)

Flap 15 -> Ice & Gnd Prox Flap
.. or Flap 30 (SFP) gives Autoland.

Airspeed Unreliable

Airspeed Unreliable

- Memory Items
- Probe Heat
- Reliable Indications
- Attitude, N1, GS, RA

Can a Reliable
Airspeed Indication
be Determined?

- Compare CA/FO/Stby

No

Yes

Captain or First
Officer has Reliable
Airspeed?

Yes

No

CA or FO ASI Reliable

- FD ... ON (Reliable Side Only)
- AP ... CMD (Reliable Side Only)
- A/T ... Not Available
- RVSM ... May not be Available
- ALT SOURCE ... 1/2 (Reliable Side)
- Transponder ... TA ONLY

---- Deferred Items ----

- PFD Baro Mins ... Set Reliable Side
FO Side : No DH/MDA Callouts
- Review Go-Around Procedure
- Pitch Attitude / Thrust Setting
- TO/GA may remove Pitch Bar



Only Standby ASI Reliable

- AP, A/T, FD ... N/Avail
- " **Negative RVSM** "
- Transponder ... ALT/RPTG OFF
- Note - TCAS ... N/Avail

---- Deferred Items ----

- PFD Baro Mins ... N/Avail
- No DH/MDA Callouts
- Review Go-Around Procedure
- Pitch Attitude / Thrust Setting
- Do Not Use TO/GA



No Reliable Airspeed Indication

- Pitch/Thrust from QRH PI tables
- NNC Landing Distance ... Check
- Visual Conditions if possible
- Establish Landing Config Early
- Electronic/Visual Glidepath preferred
- AP, A/T, FD ... N/Avail

---- Deferred Items ----

- PFD Baro Mins ... Set Reliable Side
- No DH/MDA Callouts
- Review Go-Around Procedure
- Pitch Attitude / Thrust Setting
- Do Not Use TO/GA



AIRSPEED UNRELIABLE

Condition : Airspeed or Mach indications are suspected to be unreliable.

Objective : To identify a reliable airspeed indication, if possible, or to use the Flight With Unreliable Airspeed table in the Performance Inflight chapter for the remainder of the flight.

- 1 Autopilot (if engaged) Disengage
- 2 Autothrottle (if engaged) Disengage
- 3 F/D switches (both)..... OFF
- 4 Set the following gear up pitch attitude and thrust:
 - Flaps extended 10° and 80% N1
 - Flaps up 4° and 75% N1

Further Considerations:

- If the Captain's ASI is erroneous and over-reads, **Flap Load Relief** can prevent the Flaps achieving the selected Landing Flap.
- Load Relief retracts flap a Single Selection, so selecting Flap 40 should achieve Flap 30 for landing - with **FLAP LOAD RELIEF** illuminating.

NNM Manoeuvres – Stall & Upset Recovery

APPROACH TO STALL OR STALL RECOVERY

Pilot Flying

- **Initiate** the Recovery:
 - Hold the control column firmly
 - Disengage AP and A/T
 - Smoothly apply nose down elevator to reduce the angle of attack until buffet or stick shaker stops.
 - Nose down stabilizer trim may be needed. ¹
- **Continue** the Recovery:
 - Roll in the shortest direction to wings level if needed. ²
 - Retract the Speedbrakes.
 - Do not change gear or flap configuration, except:
 - During liftoff, if the flaps are Up, call for Flaps 1.
- **Complete** the Recovery:
 - Check airspeed and adjust thrust as needed.
 - Establish Pitch Attitude.
 - Return to the desired flight path.
- Re-engage the AP and A/T if desired.

Pilot Monitoring

- Monitor altitude and airspeed.
 - Verify all needed actions have been done and call out any omissions.
 - Call out any trend toward terrain contact.
-
- Monitor altitude and airspeed.
 - Verify all needed actions have been done and call out any omissions.
 - Call out any trend toward terrain contact.
 - Set the FLAP lever as directed
-
- Monitor altitude and airspeed.
 - Verify all needed actions have been done and call out any omissions.
 - Call out any trend toward terrain contact.
 - Set the FLAP lever as directed

1. If the control column does not provide the needed response, stabilizer trim may be needed. Excessive use of pitch trim can aggravate the condition, or can result in loss of control or in high structural loads.
2. Excessive use of pitch trim or rudder can aggravate the condition, or can result in loss of control or in high structural loads.

Notes/Techniques:

- Recover from Approach to Stall as if the Stall has occurred.
- Immediate recovery at the first indication of Stall (Buffet/Stick Shaker).
- Do not use Flight Director commands during the recovery.
- Aim for a Pitch Rate of 2.5°/sec, keep 2.5° away from the PLI's, towards an initial pitch attitude of 2.5°.
- As the Pitch Attitude lowers to 10° (un-stalled) this is a reasonable time to roll wings level.

UPSET RECOVERY

Pilot Flying

- Recognise and confirm the developing situation – if necessary, Stall Recovery.
- Disengage Autopilot & Autothrottle

Nose High Recovery

- **Recover:**
 - Apply as much nose-down elevator as needed to obtain a nose down pitch rate.
 - Apply appropriate nose down stabilizer trim ¹
 - Reduce thrust ²
 - Roll (adjust bank angle) to obtain a nose down pitch rate ¹
- **Complete the Recovery:**
 - When approaching the horizon, roll to wings level
 - Check airspeed and adjust thrust
 - Establish pitch attitude.

Nose Low Recovery

- **Recover:** (Recover from Stall, if needed)
 - Roll in the shortest direction to wings level.
 - If bank angle is more than 90°, unload and roll ¹
- **Complete the Recovery:**
 - Apply nose up elevator
 - Apply nose up trim, if needed ¹
 - Adjust thrust and drag (Speedbrake, Gear), if needed

1. Excessive use of pitch trim or rudder can aggravate an upset, result in loss of control or result in high structural loads.
2. Thrust reduction here typically refers requiring a thrust reduction to generate a nose down pitching moment.

Notes/Techniques:

- Upset Condition is any time an aircraft is diverting from the intended airplane state. Traditional Values are Pitch +25°/-10°; Bank >45°; Inappropriate Airspeed.
- Aim for a Pitch Rate of 2.5°/sec, keep 2.5° away from the PLI's, towards an initial pitch attitude of 2.5°.
- For Nose High - as the Pitch Attitude lowers to 10° (un-stalled) this is a reasonable time to roll wings level.

Pilot Monitoring

- **Call Out** attitude, airspeed and altitude throughout the recovery.
- **Verify** all needed actions have been done and call out any continued deviation.

NNM Manoeuvres – Terrain Escape

GPWS ALERTS & TERRAIN ESCAPE

TERRAIN CAUTION

SINK RATE, TERRAIN, DON'T SINK, GLIDESLOPE, BANK ANGLE, TOO LOW FLAPS/GEAR/TERRAIN, GLIDESLOPE, BANK ANGLE, AIRSPEED LOW, CAUTION TERRAIN/OBSTACLE

- Correct the Flight Path, Aircraft Configuration or Airspeed.

TERRAIN WARNING

PULL UP, OBSTACLE OBSTACLE PULL UP; other situations resulting in unacceptable flight towards terrain.

- Accomplish the Terrain Escape Manoeuvre.

TERRAIN ESCAPE MANOEUVRE

Pilot Flying

- Disengage Autopilot & Autothrottle
- Aggressively apply Maximum Thrust ¹
- Simultaneously roll wings level and rotate to an initial pitch attitude of 20°.
- Retract Speedbrakes.
- If terrain remains a threat, continue rotation up to the pitch limit indicator (if available) or stick shaker or initial buffet.
- Do not change gear or flap configuration until terrain separation is assured.
- Monitor radio altimeter for sustained or increasing terrain separation.
- When clear of terrain, slowly decrease pitch attitude and accelerate.

Pilot Monitoring

- Assure maximum thrust. ¹
- Verify all needed actions have been done and call out any omissions.
- Monitor vertical speed and altitude (radio altitude for terrain clearance and barometric altitude for a minimum safe altitude.)
- Call out any trend toward terrain contact.

TERRAIN ESCAPE RECOVERY PROCEDURE

- Set appropriate Pitch/Power settings and establish Performance.
Eg : Pitch 15°, N1 90%, After Take-off Climb Performance
- Call for MCP Altitude Selector setting.
- Call for Flight Directors Cycle / ON (as required)
- Call for Autothrottle switch ... ARM (verify MCP Speed)
- Call for Vertical (LVL CHG) and Lateral (HDG SEL) modes
- Satisfy Flight Directors, Trim & engage Autopilot as required.
- Make appropriate selections at the direction of the PF
- ATC Calls as appropriate

1. Maximum thrust can be obtained by advancing the thrust levers full forward if the EECs are in the normal mode. If terrain contact is imminent, advance thrust levers full forward.

Notes/Techniques:

- **CAUTION** : If a terrain caution occurs when flying under daylight VMC, and positive visual verification is made that no obstacle or terrain hazard exists, the alert may be regarded as cautionary and the approach may be continued.
- **WARNING** : As above, however positive visual verification must be made **before** terrain/obstacle warning.
- Below Glideslope Deviation can be cancelled or inhibited for Localizer/Back Course; Circling from an ILS; when a deliberate approach below glideslope is required.
- Aft control column force increases as the airspeed decreases. In all cases, the pitch attitude that results in intermittent stick shaker/initial buffet is the upper pitch attitude limit. Flight at intermittent stick shaker may be needed to obtain a positive terrain separation. Use smooth, steady control to avoid a pitch attitude overshoot and stall.
- Do not use Flight Director commands.
- Be wary of excessive performance in the recovery, typically indications of positive windshear.

NNM Manoeuvres – Windshear Alerting/Detection

21-Feb-24

WINDSHEAR CAUTION/WARNING AND WINDSHEAR ESCAPE

Precautions	Takeoff :	<ul style="list-style-type: none"> • Maximum Rated Thrust; Flaps 5/10/15; Increased VR (+20) as available • Longest Runway away from Windshear – or ... Don't Take-off!
	Approach :	<ul style="list-style-type: none"> • Flap 30; Approach with Electronic Glidepath • Most suitable runway away from reported Windshear
WINDSHEAR CAUTION	MONITOR RADAR DISPLAY - Manoeuvre as needed to avoid the Windshear.	
WINDSHEAR WARNING	Takeoff	Pilot Detected : Lack of Acceleration; Shift in IAS/GS. - (very) Prior to V1 ⇒ Reject. - (near) After V1 ⇒ Windshear Escape Manoeuvre
		Predictive : WINDSHEAR AHEAD, WINDSHEAR AHEAD - Prior to V1 ⇒ Reject. - After V1 ⇒ Perform the Windshear Escape Manoeuvre
	Approach	Pilot Detected : Unacceptable flight path deviations from normal steady state flight conditions below 1,000 ft AAL Speed ± 15 kts VS ± 500 fpm Pitch ± 5° ± 1 dot G/S - unusual thrust lever position for a significant period of time. - “Windshear TO/GA” ⇒ Windshear Escape Manoeuvre
		Reactive : (Two-Tone) & WINDSHEAR WINDSHEAR WINDSHEAR - “Windshear TO/GA” ⇒ Windshear Escape Manoeuvre
		Predictive : GO-AROUND WINDSHEAR AHEAD - “Windshear TO/GA” ⇒ Windshear Escape Manoeuvre; or - Normal Go-Around



AFS OPERATION IN WINDSHEAR

Take-off/Go-Around	Approach & Landing
<ul style="list-style-type: none"> • Target Speed maintained until ≈600 fpm; then • Pitch to 15° Nose Up; increasing until Stick Shaker; • Pitch to maintain Intermittent Stick Shaker • Commands Reverse as Aircraft clears Windshear. 	<ul style="list-style-type: none"> • AP & FD maintain Glideslope without regard to Angle of Attack or Stick Shaker activation. • Airspeed can decrease below Stick Shaker into Stall without Pilot Intervention.

NNM Manoeuvres – Windshear Escape

21-Feb-24

WINDSHEAR ON TAKE-OFF

- If windshear is encountered before V1, there may not be sufficient runway remaining to stop if an RTO is initiated near/before V1. If there is insufficient runway to stop at the earlier of VR / no later than 2,000ft/600m to the end of the Runway - rotate at a normal rate toward a 15° pitch attitude.
- Ensure maximum thrust is set.

Captain :Call “**Windshear - Continue**” and set Maximum Thrust.

Pilot Flying :Once airborne, perform the Windshear Escape Manoeuvre.

WINDSHEAR ESCAPE MANOEUVRE (AFTER TAKEOFF OR ON APPROACH)

Pilot Flying

- Call “**Windshear TOGA**”

Pilot Monitoring

Manual Flight

- Disengage Autopilot
- Push TO/GA Switch
- Aggressively apply maximum thrust ¹
- Disengage Autothrottle
- Simultaneously Roll Wings Level, and Pitch towards 15° ²
- Retract Speedbrakes
- Follow Flight Director TO/GA guidance (if available) ²

Automatic Flight

- Push TO/GA Switch ³
- Verify **TO/GA** annunciation.
- Verify N1 **GA** thrust.
- Retract Speedbrakes
- Monitor system performance ⁴

- Verify Maximum/GA Thrust
- Verify all needed actions have been completed and call any omissions
- Advise ATC “**Windshear Escape**”

- Do not change gear/flap configuration until Windshear is no longer a factor.
- Monitor vertical speed and altitude.
- Maintain wings level unless a turn required for obstacle clearance.
- Do not attempt to regain lost airspeed until Windshear is no longer a factor.

- Monitor vertical speed and altitude ⁵
- Call out any trend toward terrain contact, descending flight path or significant airspeed changes.

Windshear Escape Recovery Procedure

- Set appropriate Pitch/Power settings and establish Performance.
Eg : *Pitch 15°, N1 90%, After Take-off Climb Performance*
- Call for MCP Altitude Selector setting.
- Call for Flight Directors Cycle / ON (as required)
- Call for Autothrottle switch ... ARM (verify MCP Selected Speed)
- Call for Vertical (LVL CHG) and Lateral (HDG SEL) modes
- Satisfy Flight Directors, Trim & engage Autopilot as required.

- Make appropriate selections at the direction of the PF
- ATC Calls as appropriate

1. Maximum thrust can be obtained by advancing the thrust levers full forward if the EECs are in the normal mode. If terrain contact is imminent, advance thrust levers full forward.
2. Do not exceed the Pitch Limit Indicators (PLI).
3. Selecting TO/GA without Dual AP engagement (**FLARE**) disengages the AP - revert to **Manual Flight Windshear Escape**.
4. **WARNING** : Severe windshear can exceed the performance of the AFDS. Be prepared to disengage the autopilot and autothrottle and fly manually.
5. PM should consider calling out Body Angle/Pitch Attitude where appropriate (excessive).

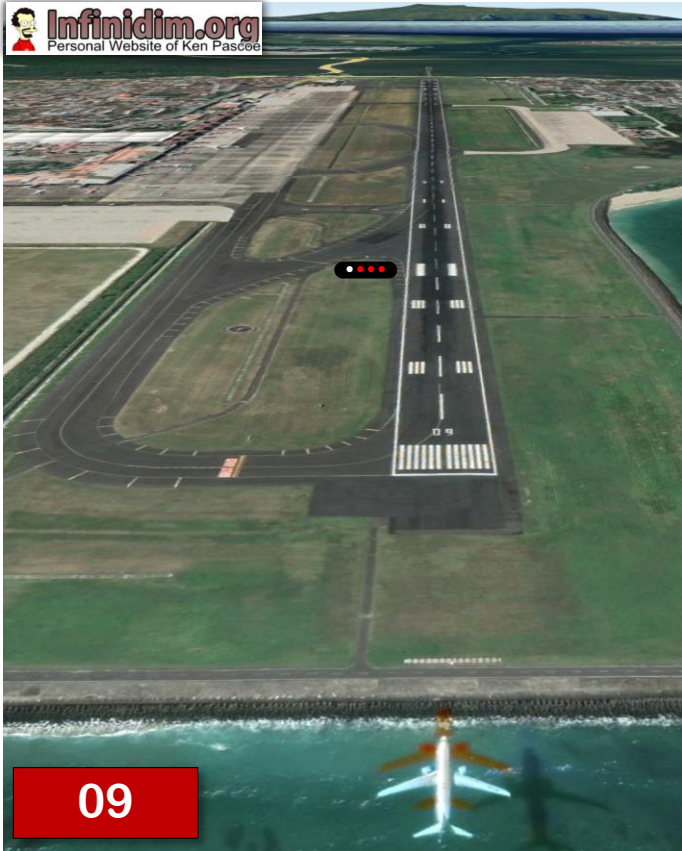
Notes/Techniques:

- Aft control column force increases as the airspeed decreases. In all cases, the pitch attitude that results in intermittent stick shaker or initial buffet is the upper pitch attitude limit. Flight at intermittent stick shaker may be needed to obtain a positive terrain separation. Use smooth, steady controls to avoid a pitch attitude overshoot and stall.
- Selecting TO/GA does not disarm **LNAV** or **VNAV** - be wary of automatic engagement after Take-off in Windshear.
- Be wary of excessive performance in the recovery, typically indications of positive windshear.

Bali (WADD/DPS) Runways

15-Jan-24

Infinidim.org
Personal Website of Ken Pascoe

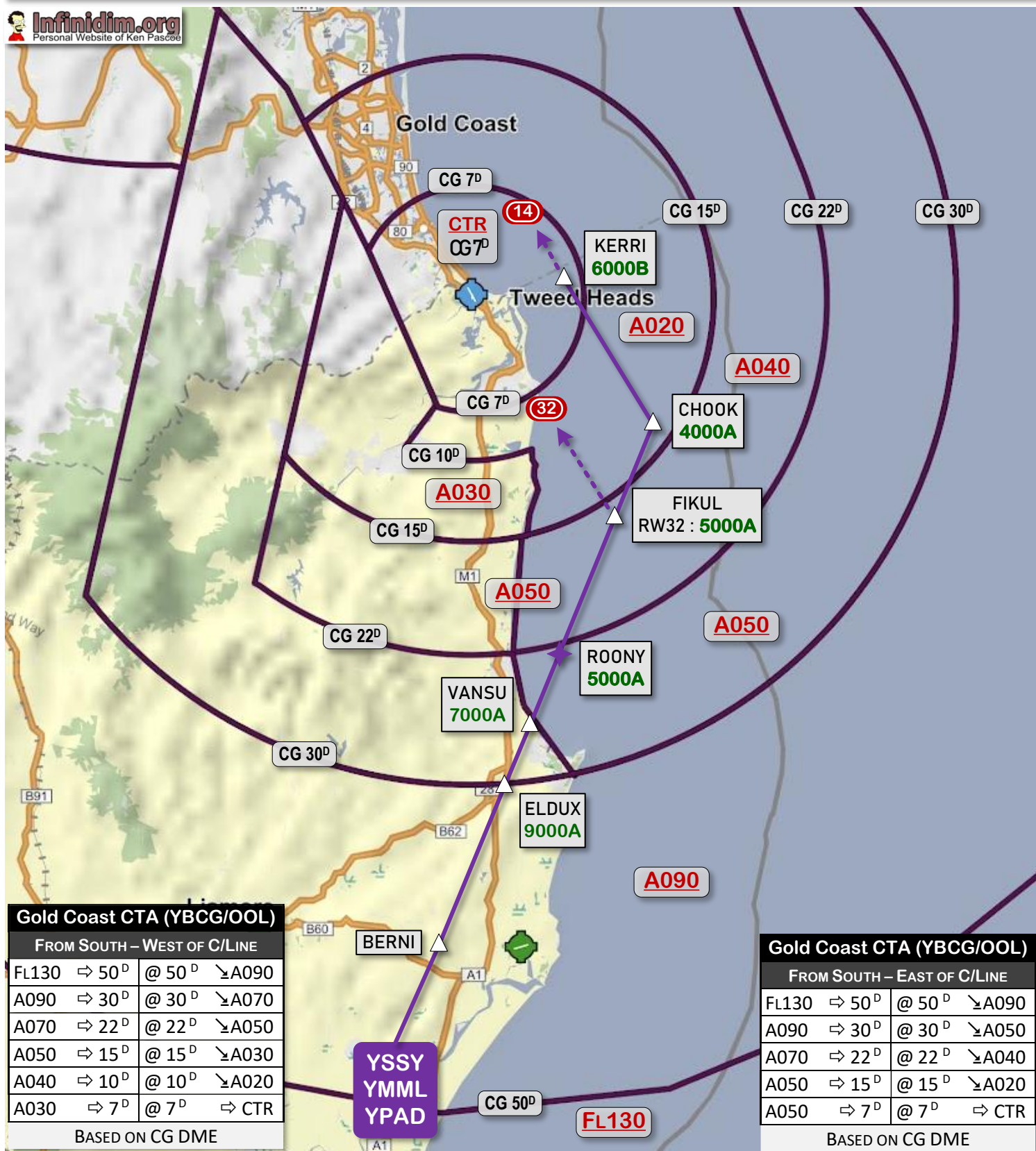


Bali (WADD/DPS) Alternate Planning

15-Jan-24



Gold Coast Airspace (YBCG/OOL)



Gold Coast CTA (YBCG/OOL)

FROM SOUTH – WEST OF C/LINE

FL130	⇒ 50 ^D	@ 50 ^D	↘ A090
A090	⇒ 30 ^D	@ 30 ^D	↘ A070
A070	⇒ 22 ^D	@ 22 ^D	↘ A050
A050	⇒ 15 ^D	@ 15 ^D	↘ A030
A040	⇒ 10 ^D	@ 10 ^D	↘ A020
A030	⇒ 7 ^D	@ 7 ^D	⇒ CTR

BASED ON CG DME

Gold Coast CTA (YBCG/OOL)

FROM SOUTH – EAST OF C/LINE

FL130	⇒ 50 ^D	@ 50 ^D	↘ A090
A090	⇒ 30 ^D	@ 30 ^D	↘ A050
A070	⇒ 22 ^D	@ 22 ^D	↘ A040
A050	⇒ 15 ^D	@ 15 ^D	↘ A020
A050	⇒ 7 ^D	@ 7 ^D	⇒ CTR

BASED ON CG DME

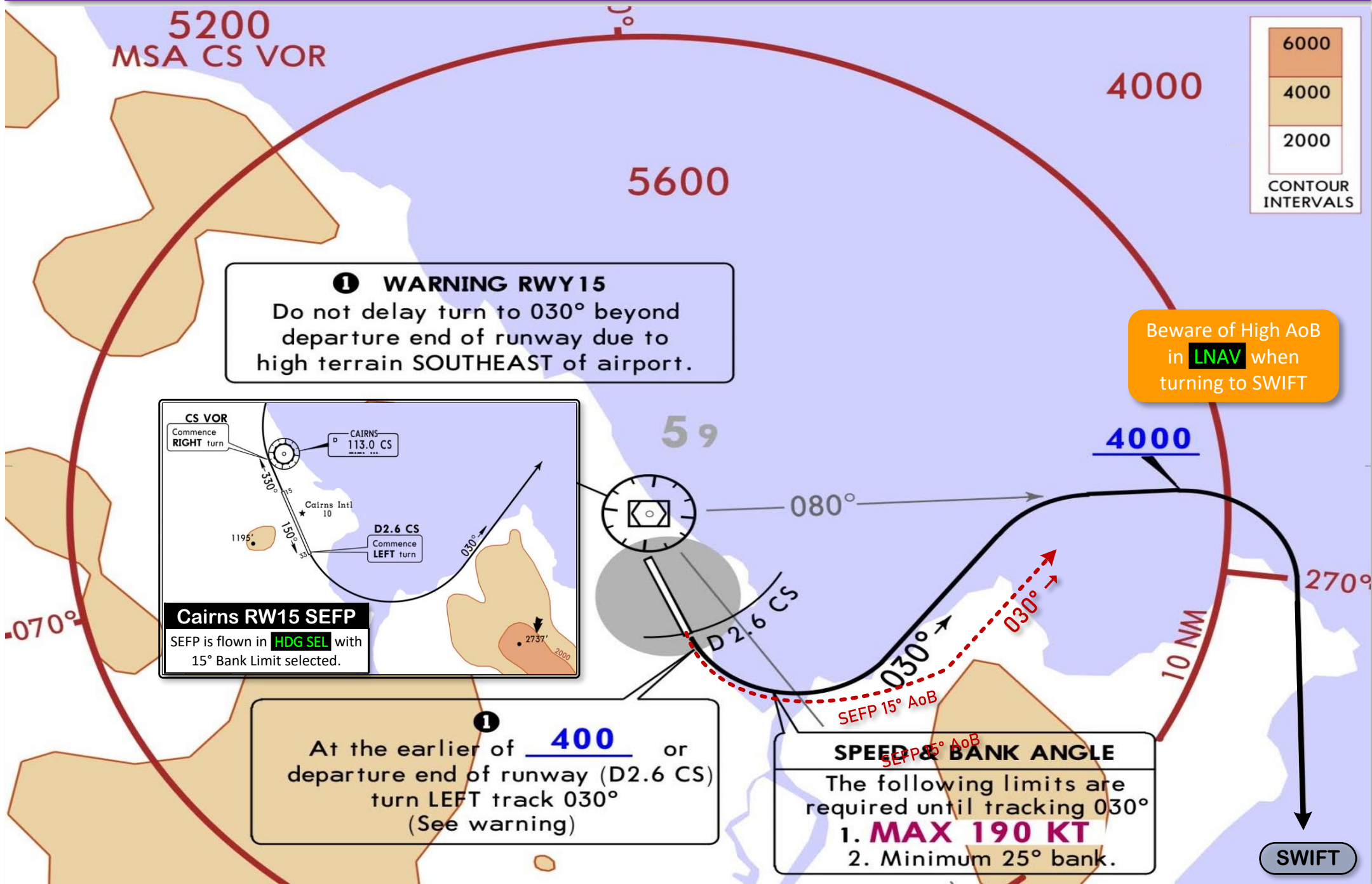
YSSY
YMML
YPAD

FL130

Cairns (YBCS/CNS) Circling Area



Cairns (YBCS-CNS) SID SWIFT 8 vs SEFP



6000
4000
2000
CONTOUR INTERVALS

1 WARNING RWY15
Do not delay turn to 030° beyond departure end of runway due to high terrain SOUTHEAST of airport.

Beware of High AoB in **LNAV** when turning to SWIFT

CS VOR
Commence **RIGHT** turn

CAIRNS 113.0 CS

Cairns Intl 10

1195'

150°

330°

D2.6 CS
Commence **LEFT** turn

030°

Cairns RW15 SEFP
SEFP is flown in **HDG SEL** with 15° Bank Limit selected.

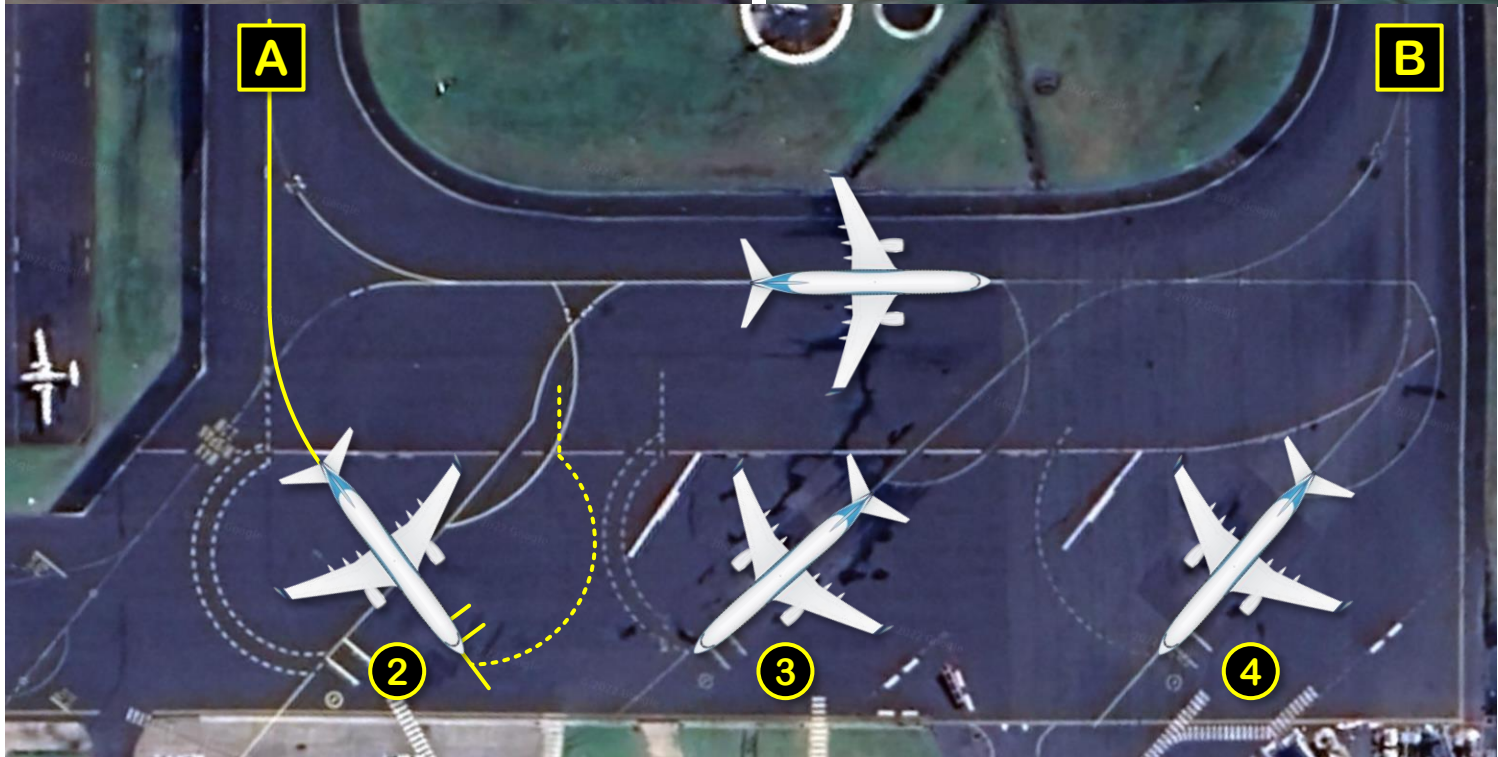
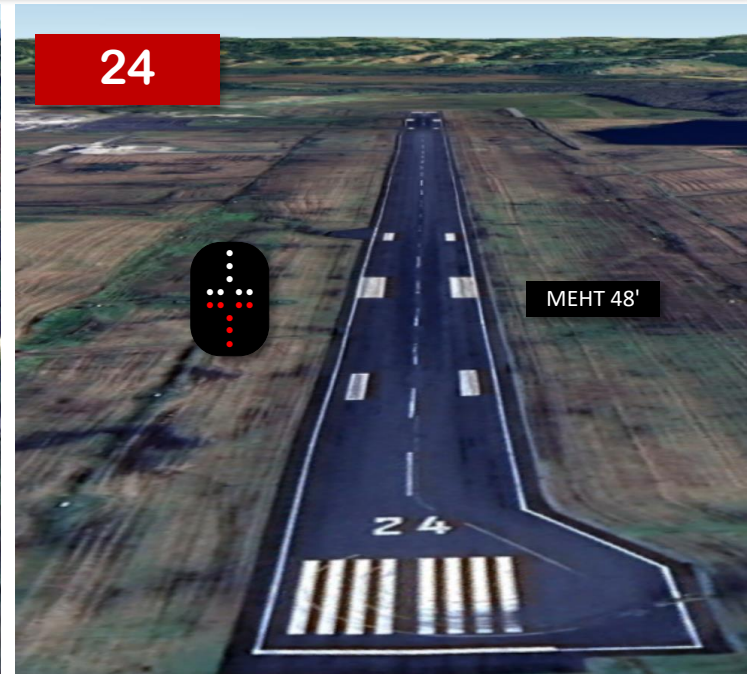
1 At the earlier of 400 or departure end of runway (D2.6 CS) turn **LEFT** track 030° (See warning)

SPEED & BANK ANGLE
The following limits are required until tracking 030°
1. **MAX 190 KT**
2. Minimum 25° bank.

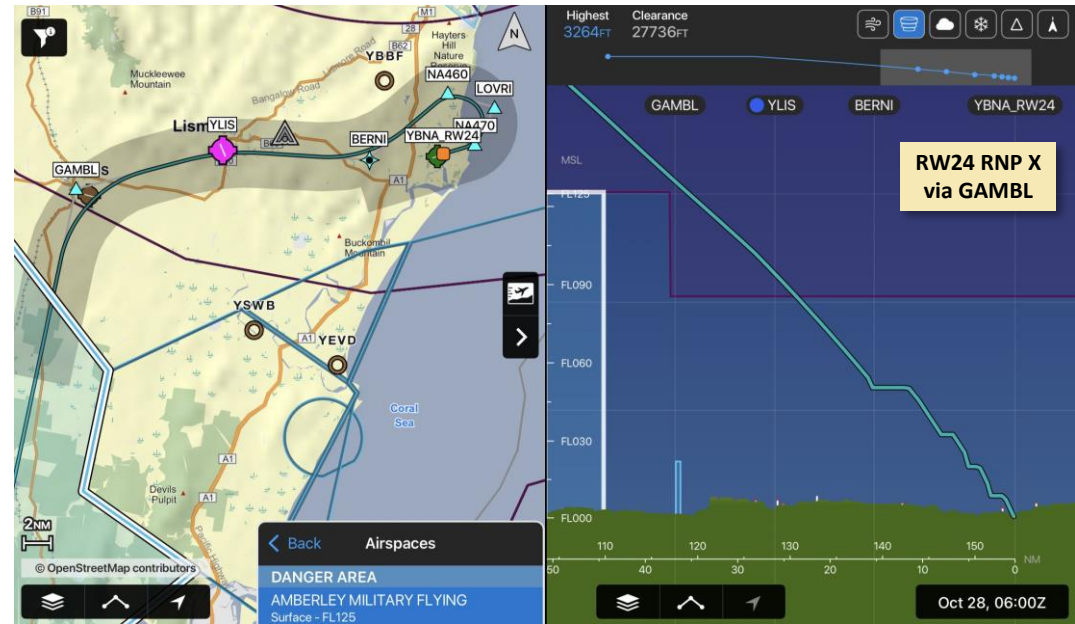
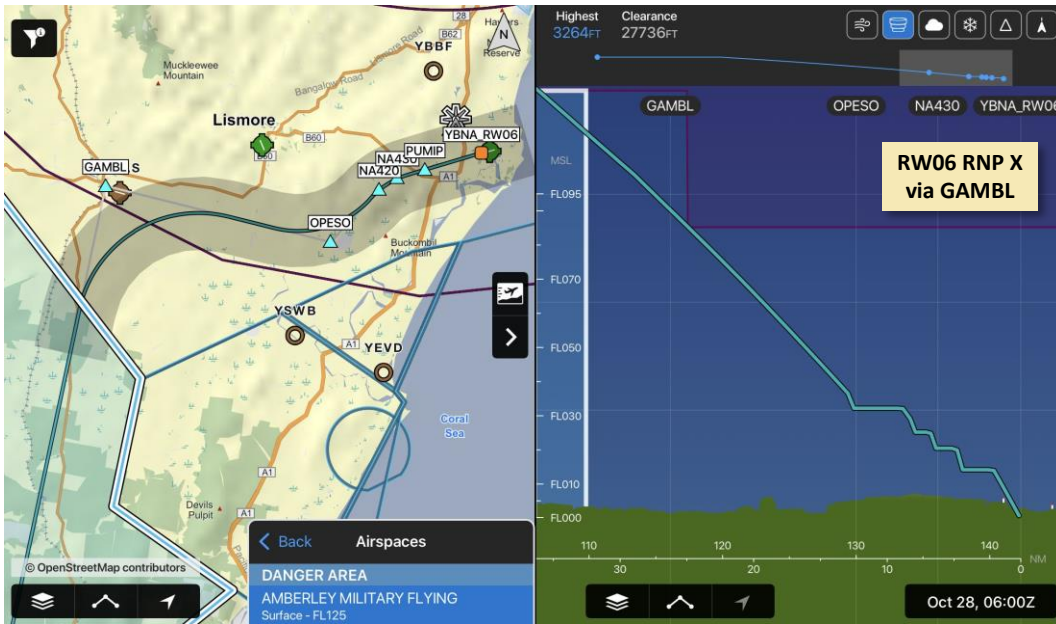
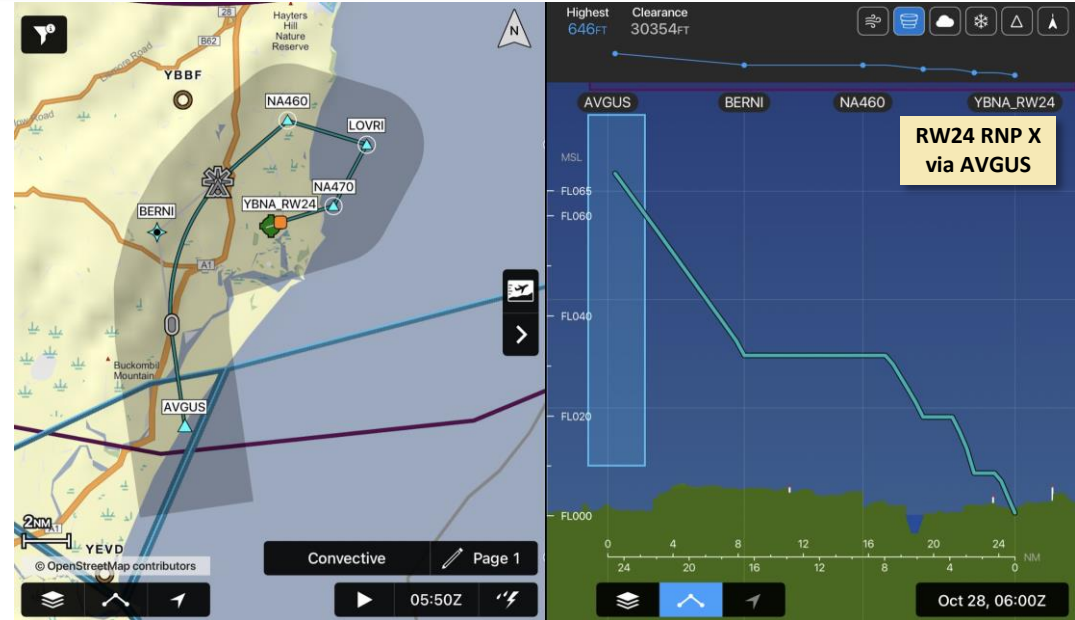
SWIFT

Ballina (YBNA/BNK) Runways

15-Jan-24

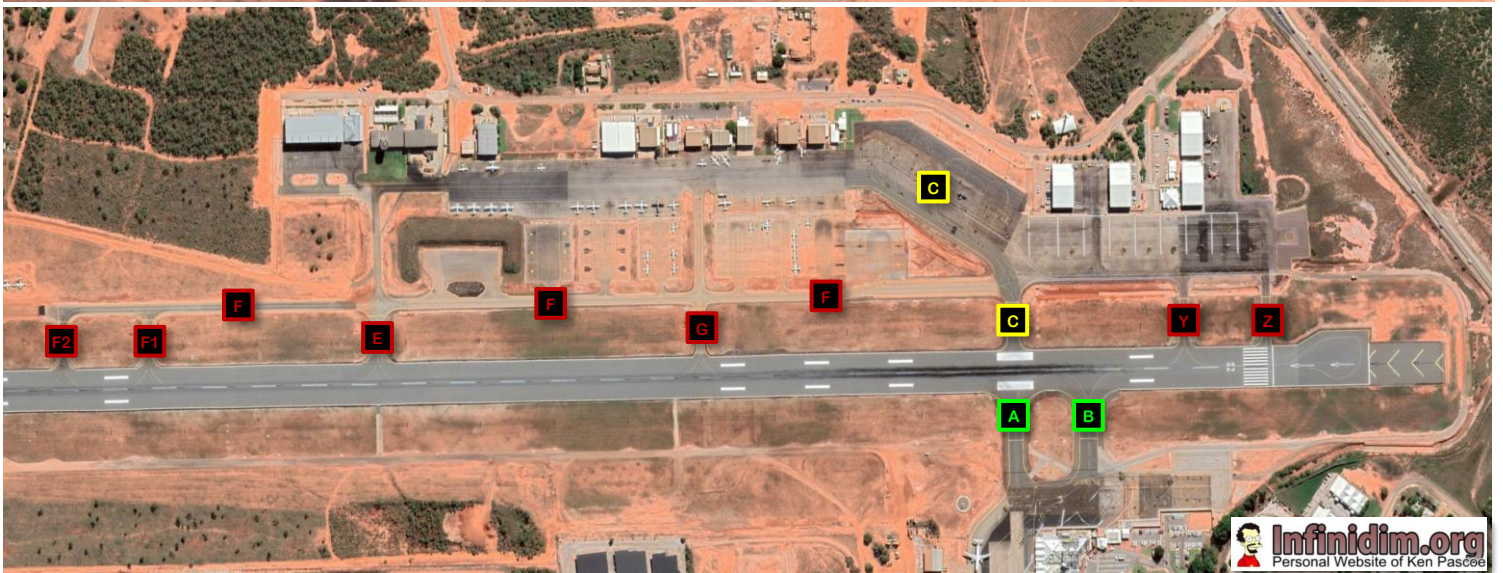


Ballina (YBNA/BNK) Airspace/Approach



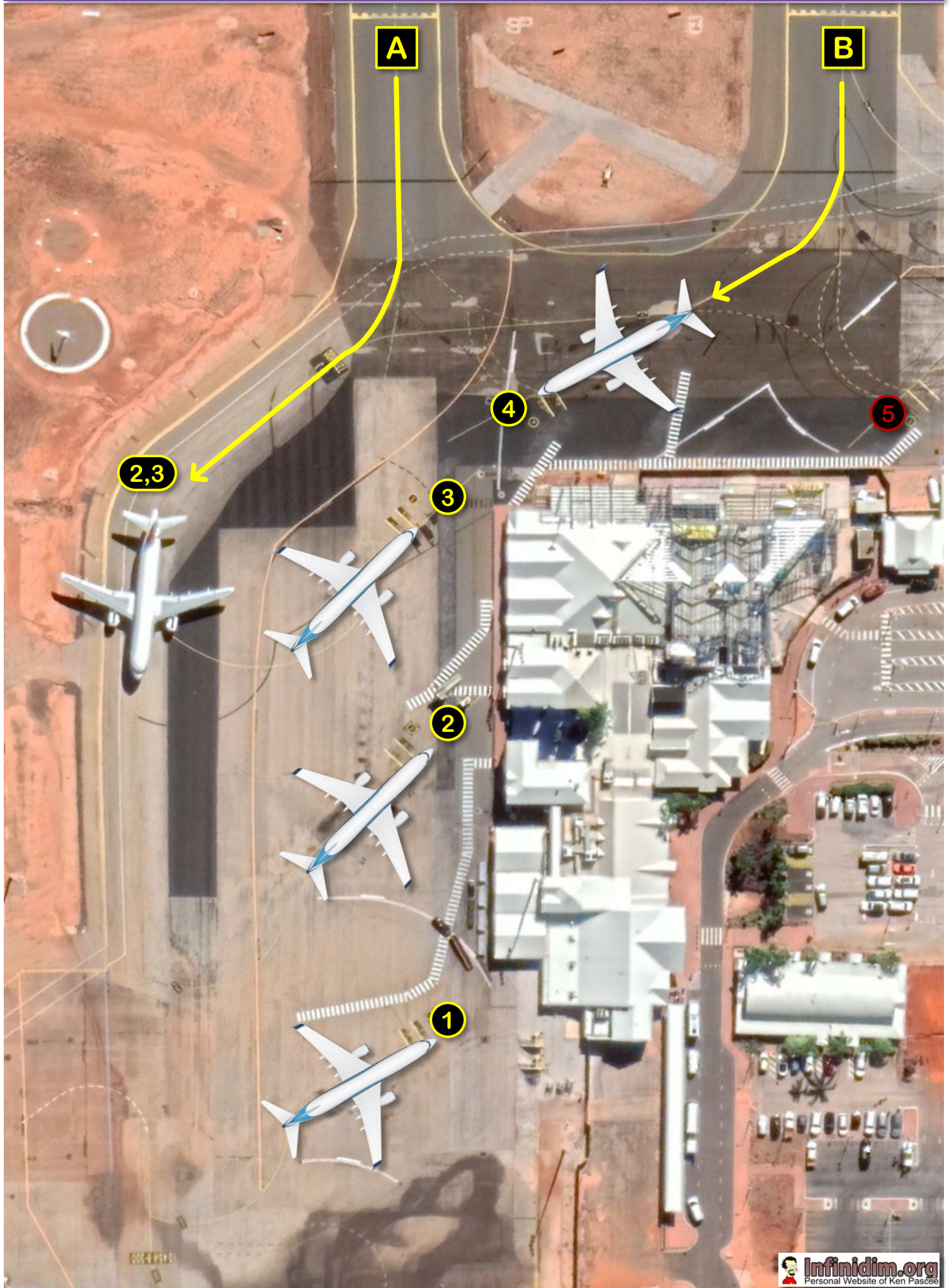
Broome (YBRM/BME) Apron/Runways

15-Jan-24



Broome (YBRM/BME) RPT Apron

15-Jan-24



Broome Airspace (YBRM/BME)



Broome CTA	
KAPNI / Y31	
FL120	⇒ 50 ^D
A090	⇒ 40 ^D
A070	⇒ 31 ^D
A060	⇒ 25 ^D
A040	⇒ 18 ^D
A030	⇒ 13 ^D
A015	⇒ 11 ^D

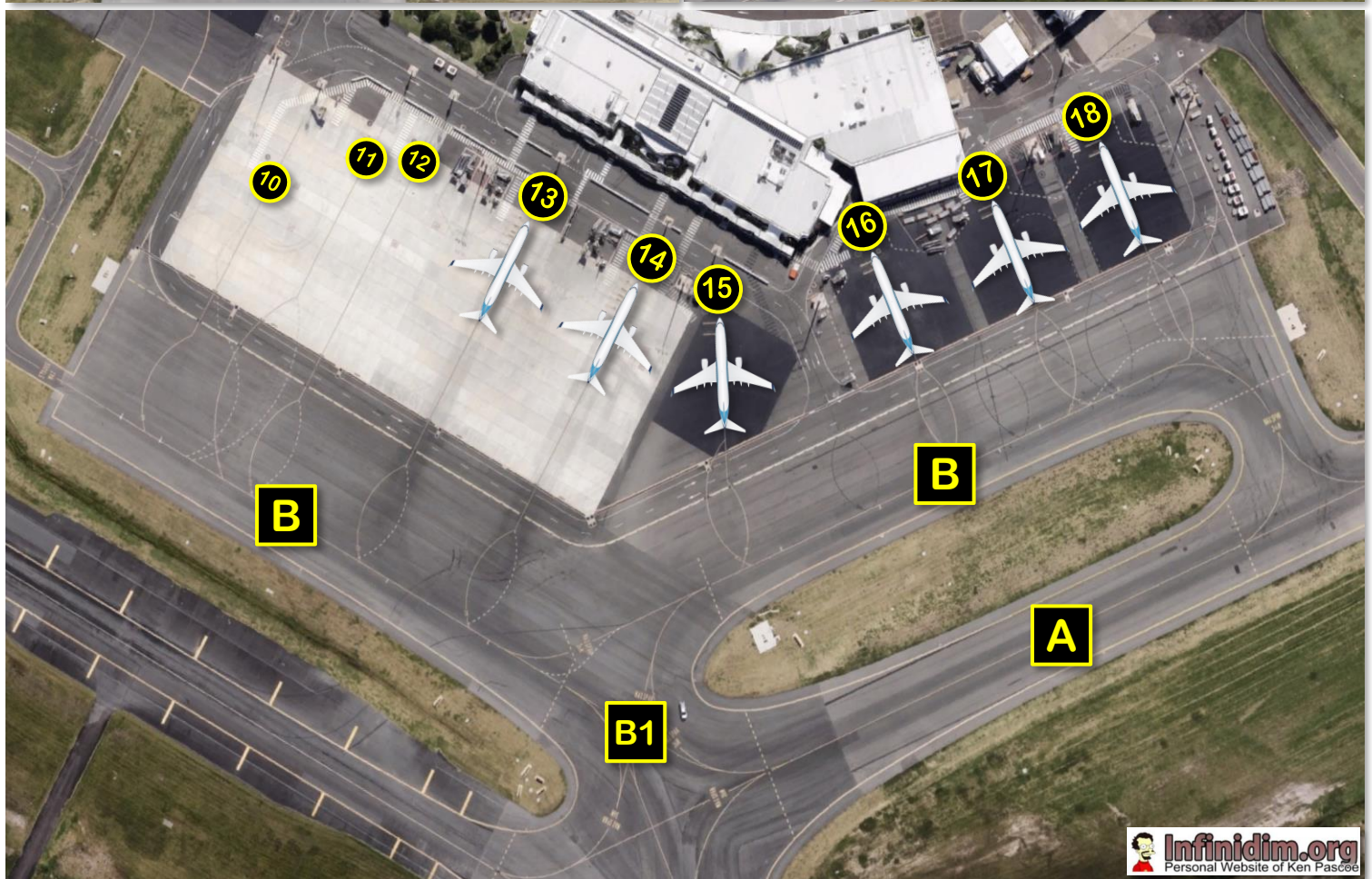
- BASED ON BRM DME
- YELLOW INDICATES CAT D AIRSPACE

Sunshine Coast (YBSU/MCY)

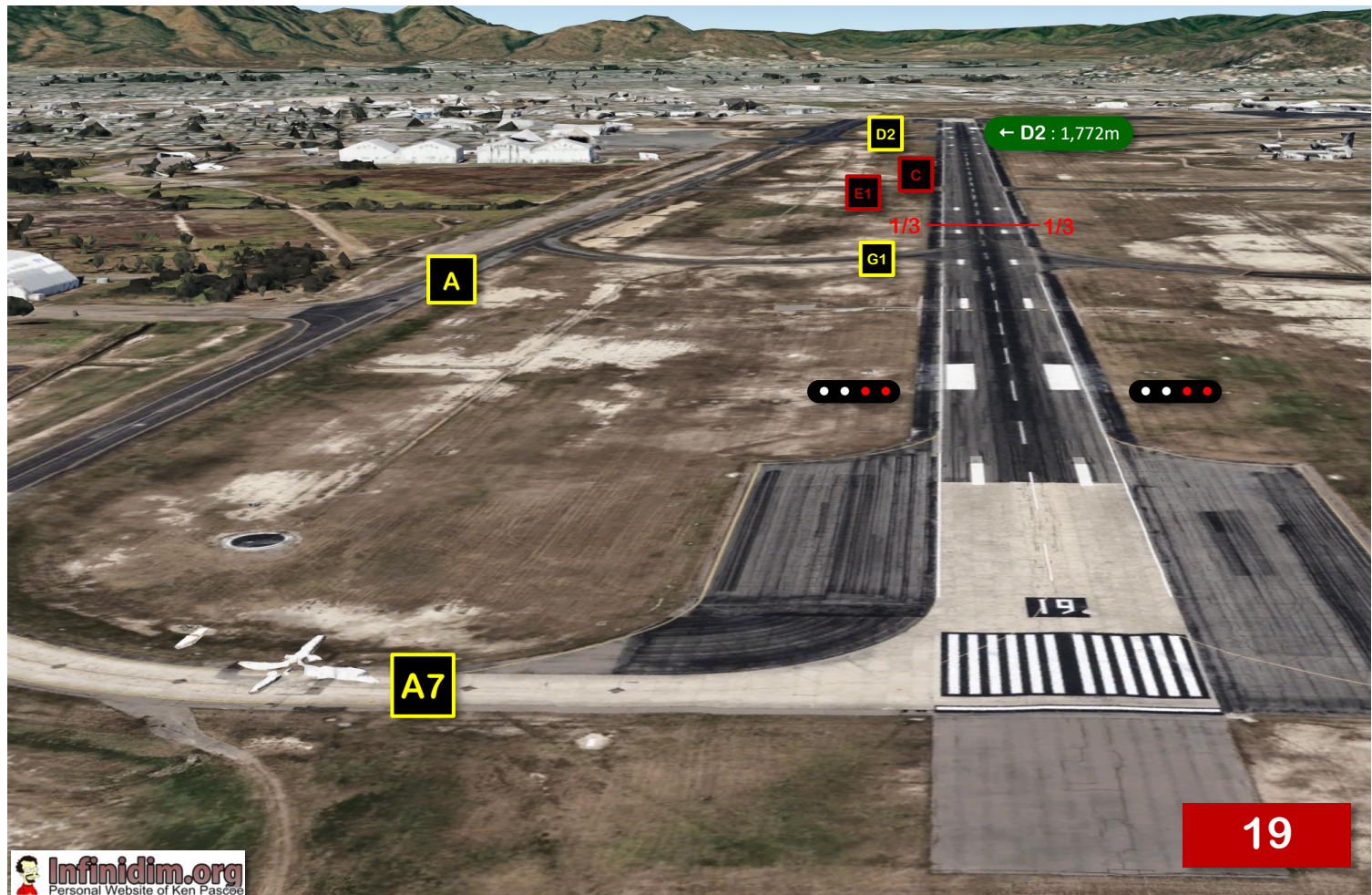


YBSU Rwy Exit

Rwy - Twy	Dist
RW13 - A2	1,400m
RW13 - A1	2,450m
RW31 - A2	1,040m

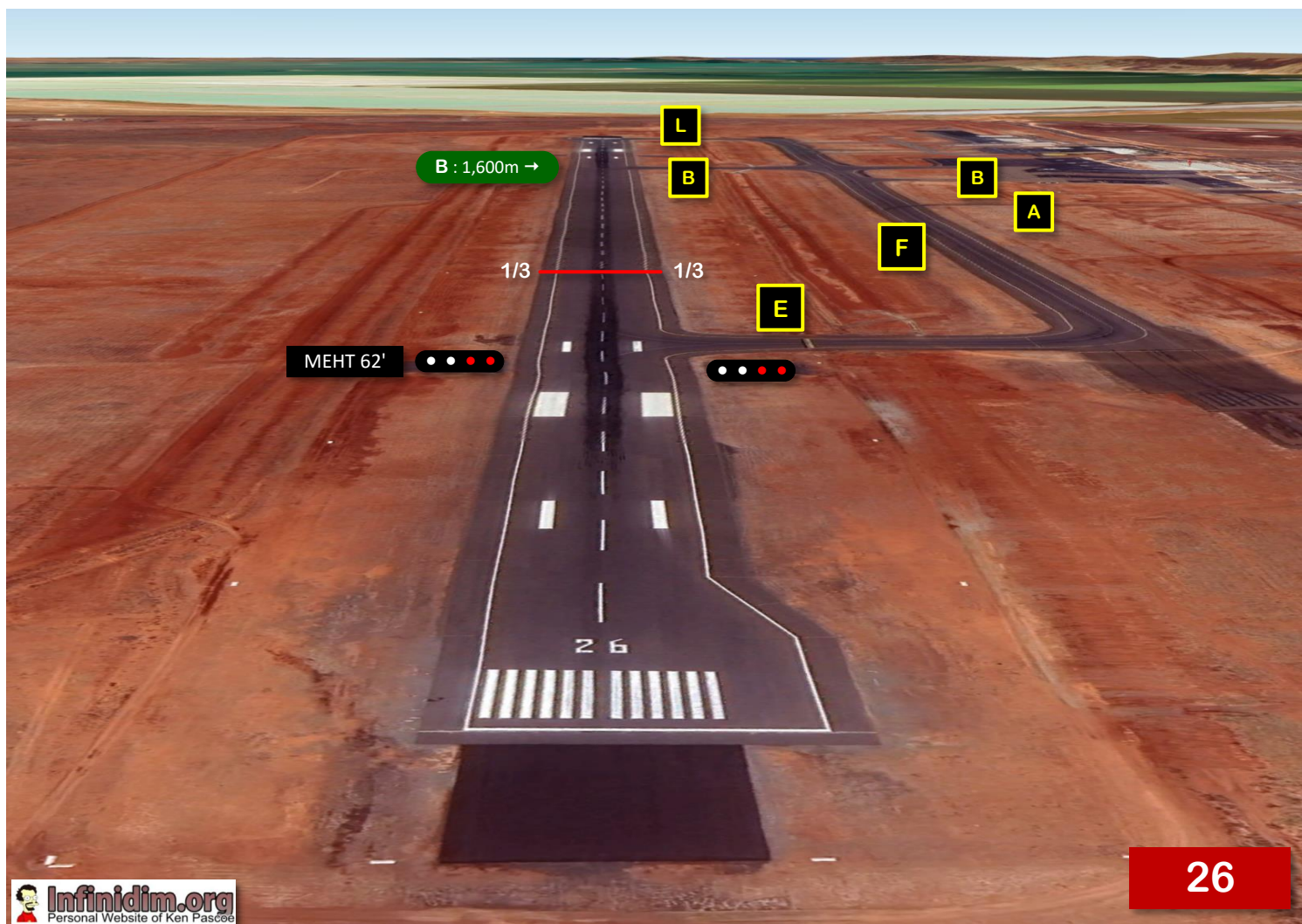
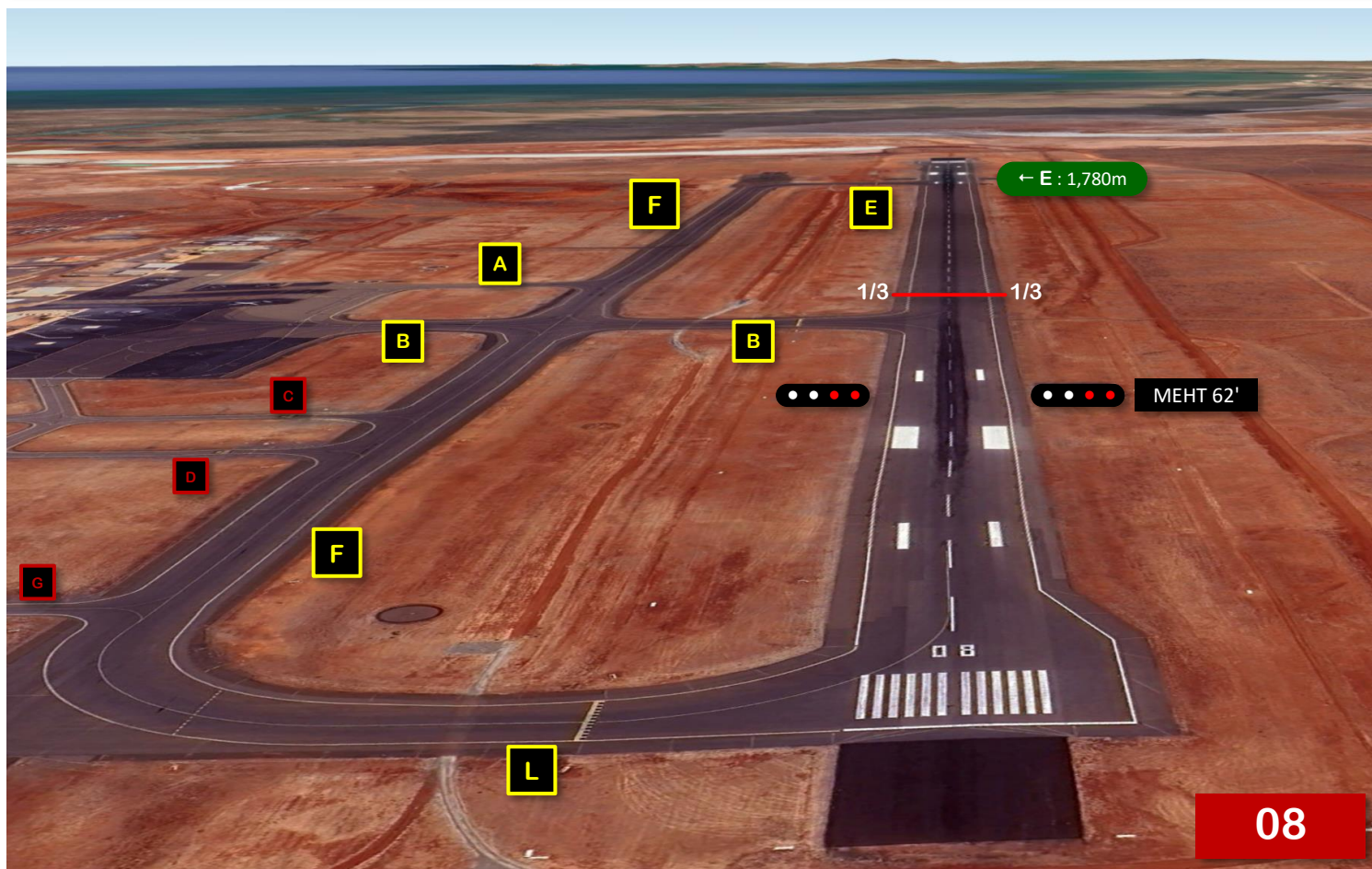


Townsville (YBTL/TSV) Runways



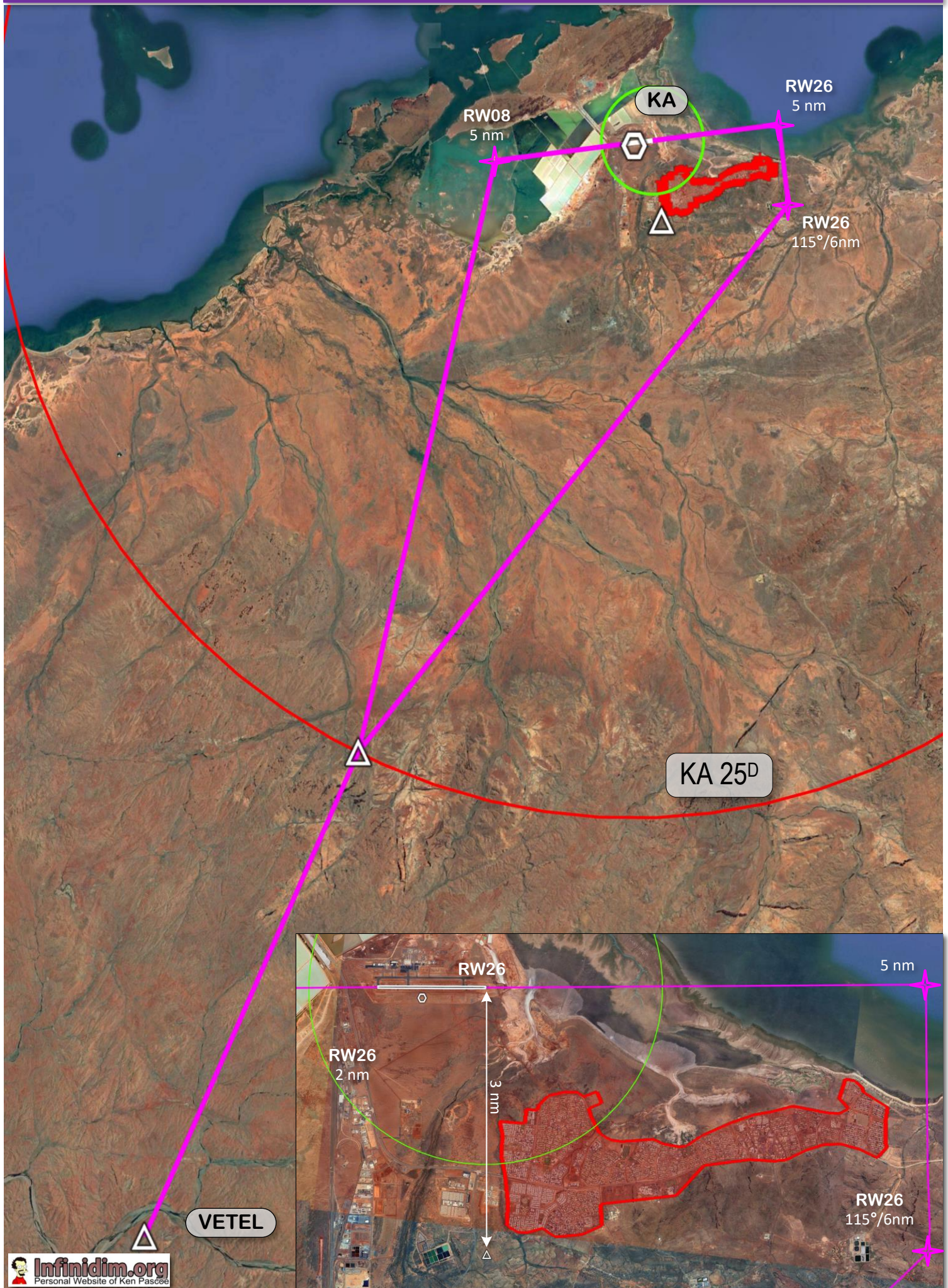
Karratha (YPKA/KTA) Runways

15-Jan-24

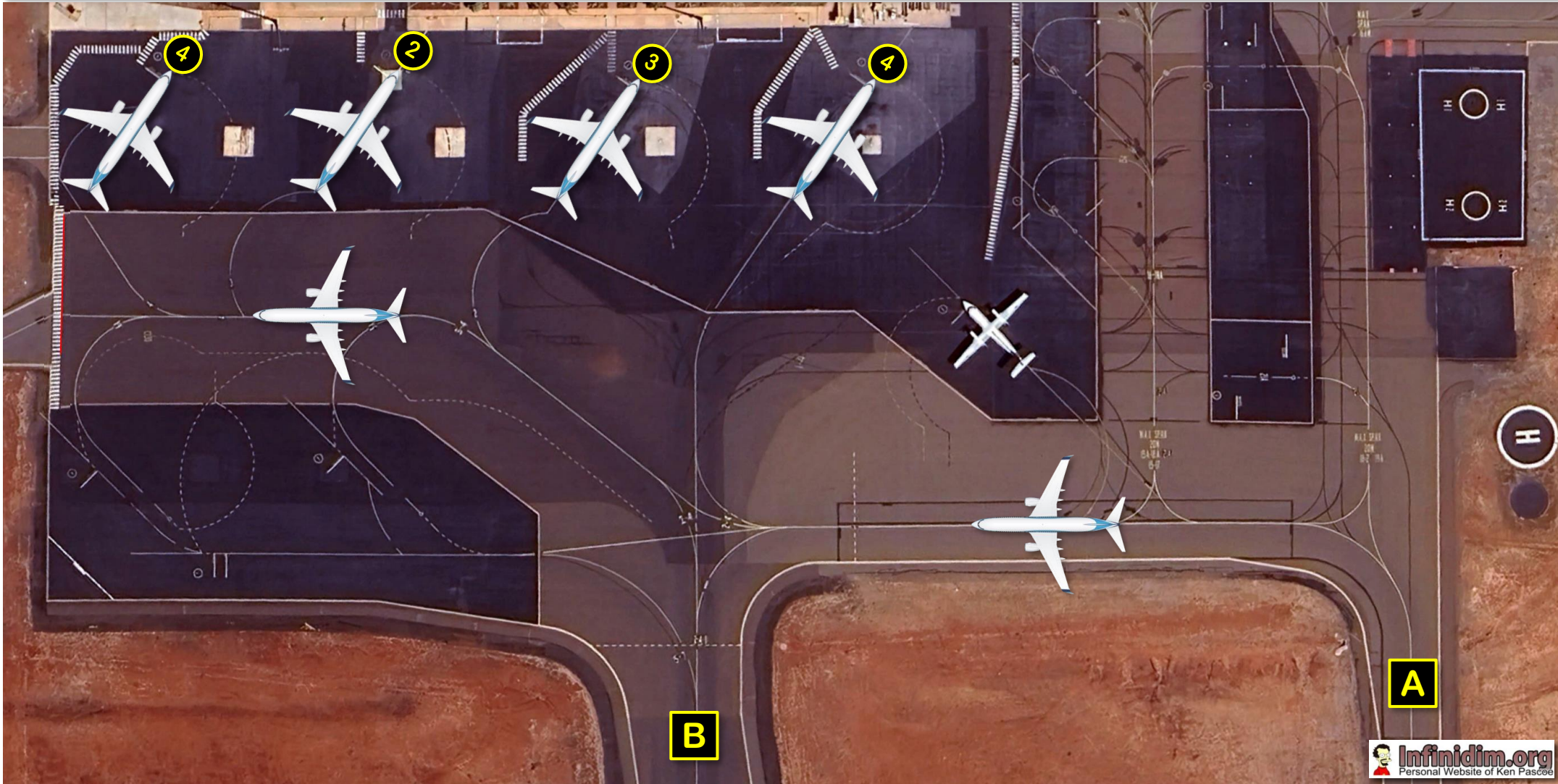


Karratha (YPKA/KTA) Arrival

15-Jan-24



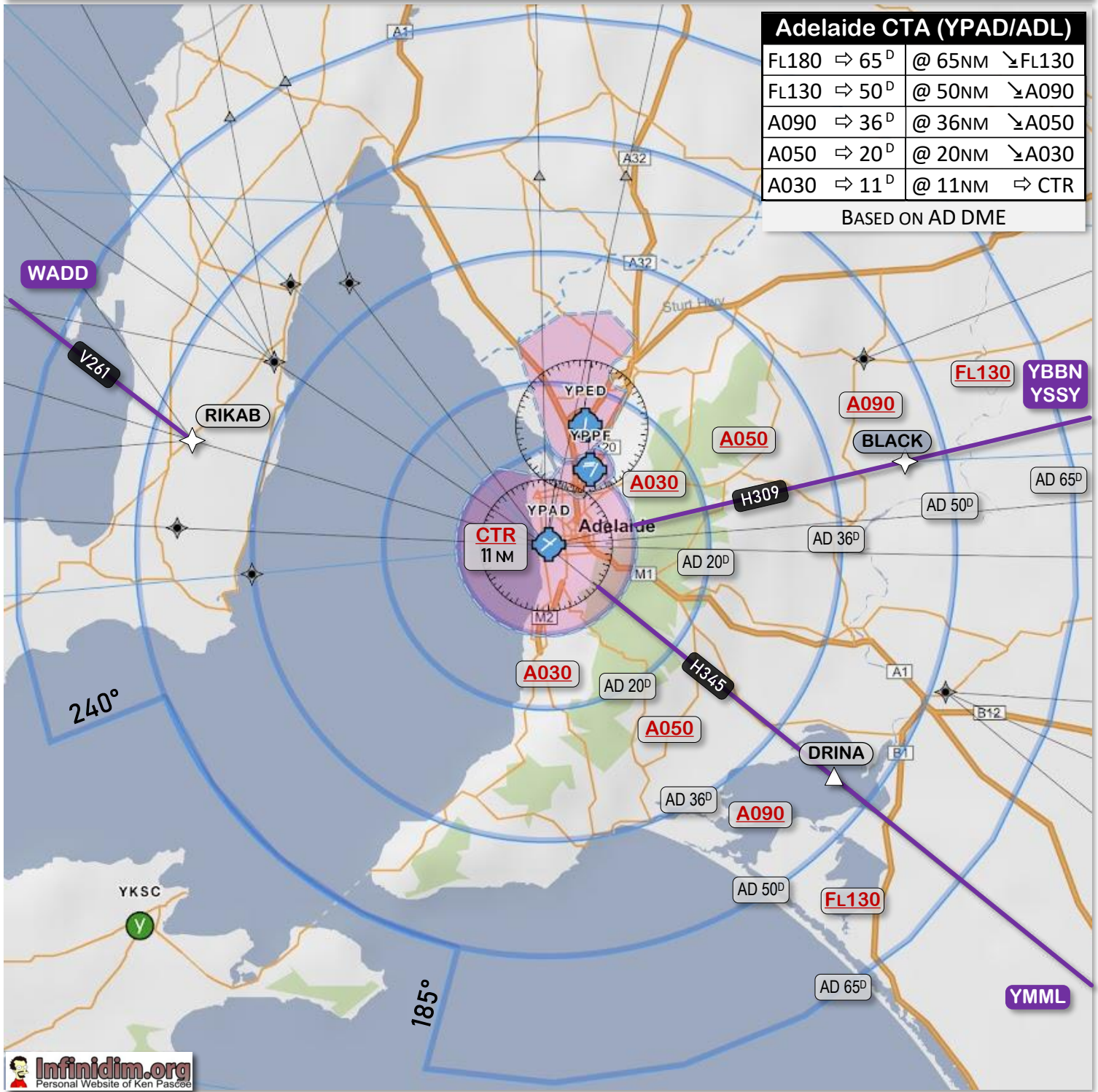
Karratha (YPKA/KTA) Apron



Adelaide Airspace (YPAD/ADL)

Adelaide CTA (YPAD/ADL)		
FL180	⇒ 65 ^D	@ 65NM ↘ FL130
FL130	⇒ 50 ^D	@ 50NM ↘ A090
A090	⇒ 36 ^D	@ 36NM ↘ A050
A050	⇒ 20 ^D	@ 20NM ↘ A030
A030	⇒ 11 ^D	@ 11NM ⇒ CTR

BASED ON AD DME

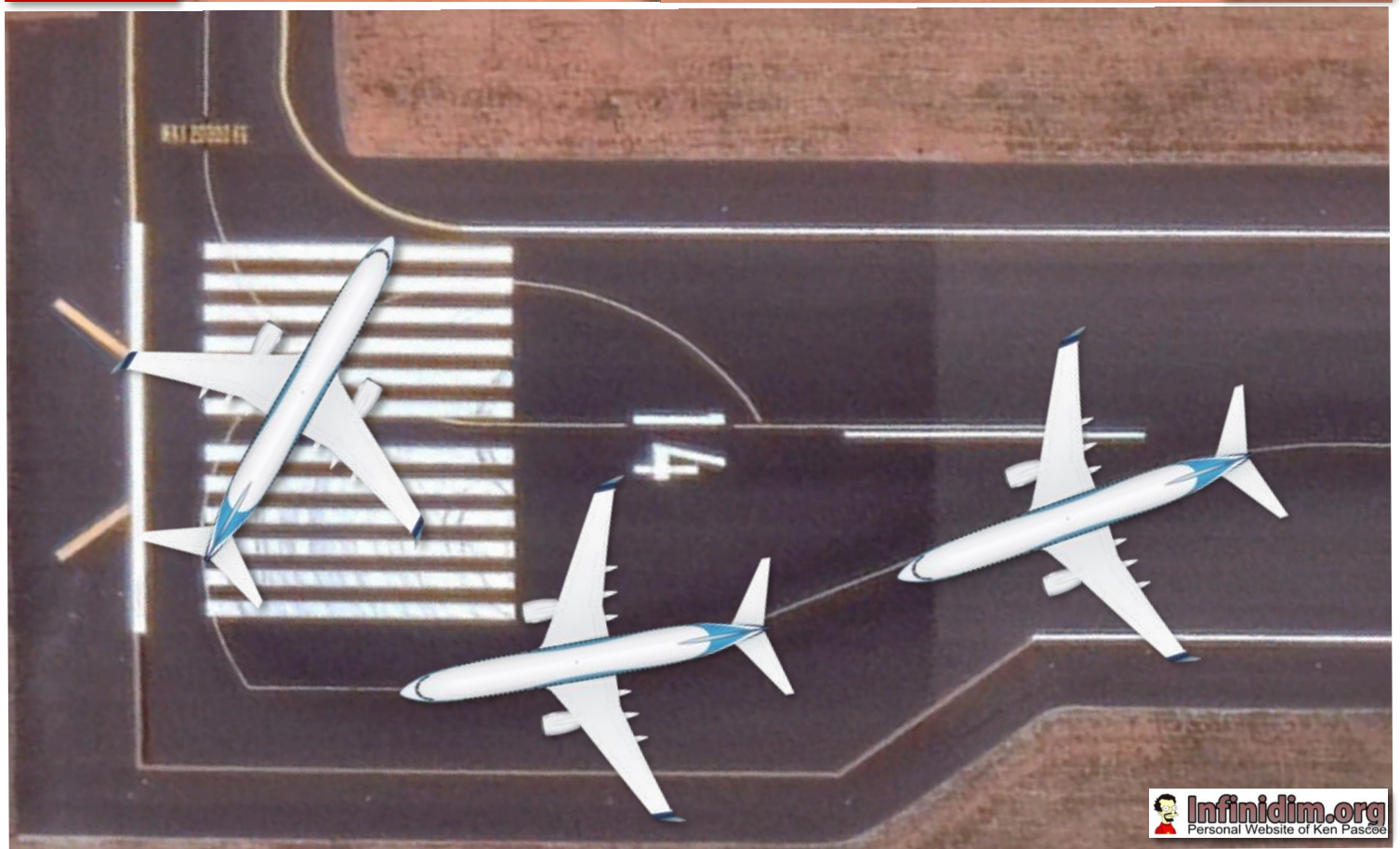
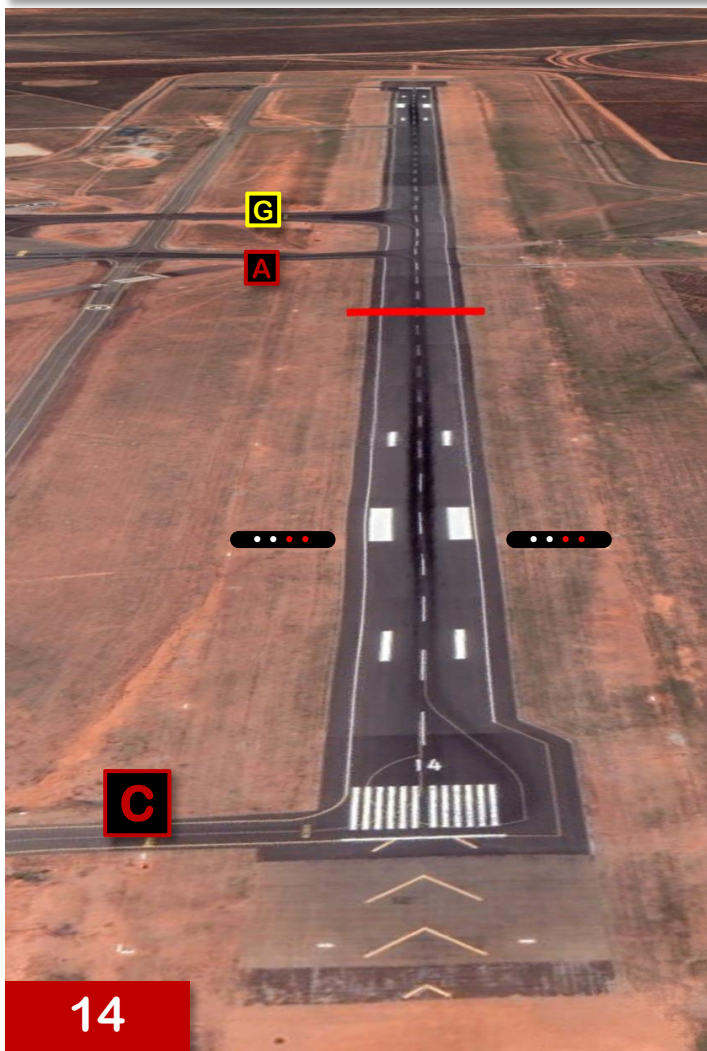


Port Hedland Apron (YPPD/PHE)



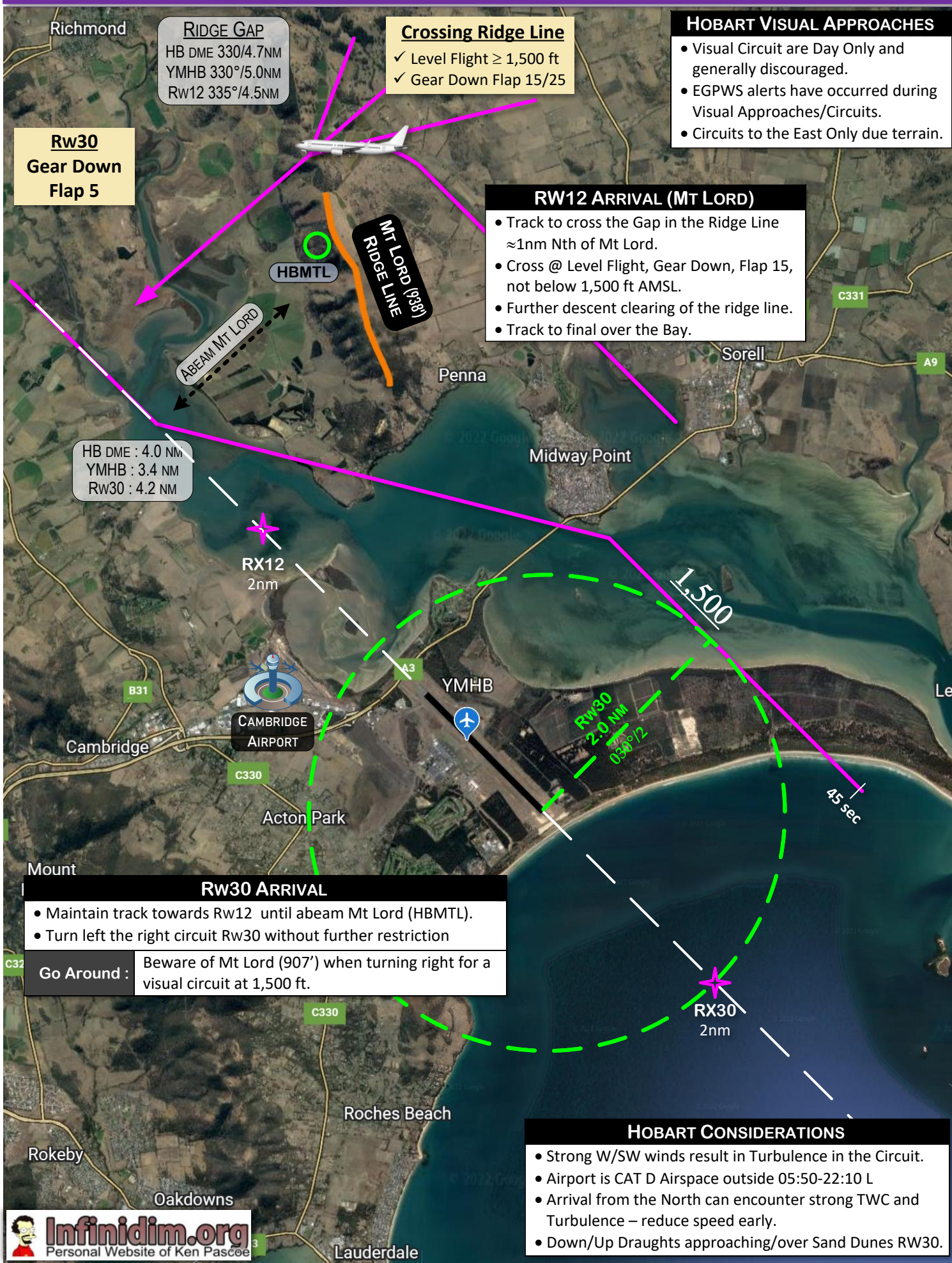
Port Hedland (YPPD/PHE) Runways

15-Jan-24



Hobart (YMHB/HBA) Visual Procedures

15-Jan-24



RIDGE GAP
 HB DME 330/4.7NM
 YMHB 330°/5.0NM
 RW12 335°/4.5NM

Crossing Ridge Line
 ✓ Level Flight ≥ 1,500 ft
 ✓ Gear Down Flap 15/25

HOBART VISUAL APPROACHES

- Visual Circuit are Day Only and generally discouraged.
- EGPWS alerts have occurred during Visual Approaches/Circuits.
- Circuits to the East Only due terrain.

Rw30
 Gear Down
 Flap 5

RW12 ARRIVAL (MT LORD)

- Track to cross the Gap in the Ridge Line ≈1nm Nth of Mt Lord.
- Cross @ Level Flight, Gear Down, Flap 15, not below 1,500 ft AMSL.
- Further descent clearing of the ridge line.
- Track to final over the Bay.

HB DME : 4.0 NM
 YMHB : 3.4 NM
 RW30 : 4.2 NM

RX12
 2nm

1,500

45 sec

RW30
 2.0 NM
 030°/2

RW30 ARRIVAL

- Maintain track towards Rw12 until abeam Mt Lord (HBMTL).
- Turn left the right circuit Rw30 without further restriction

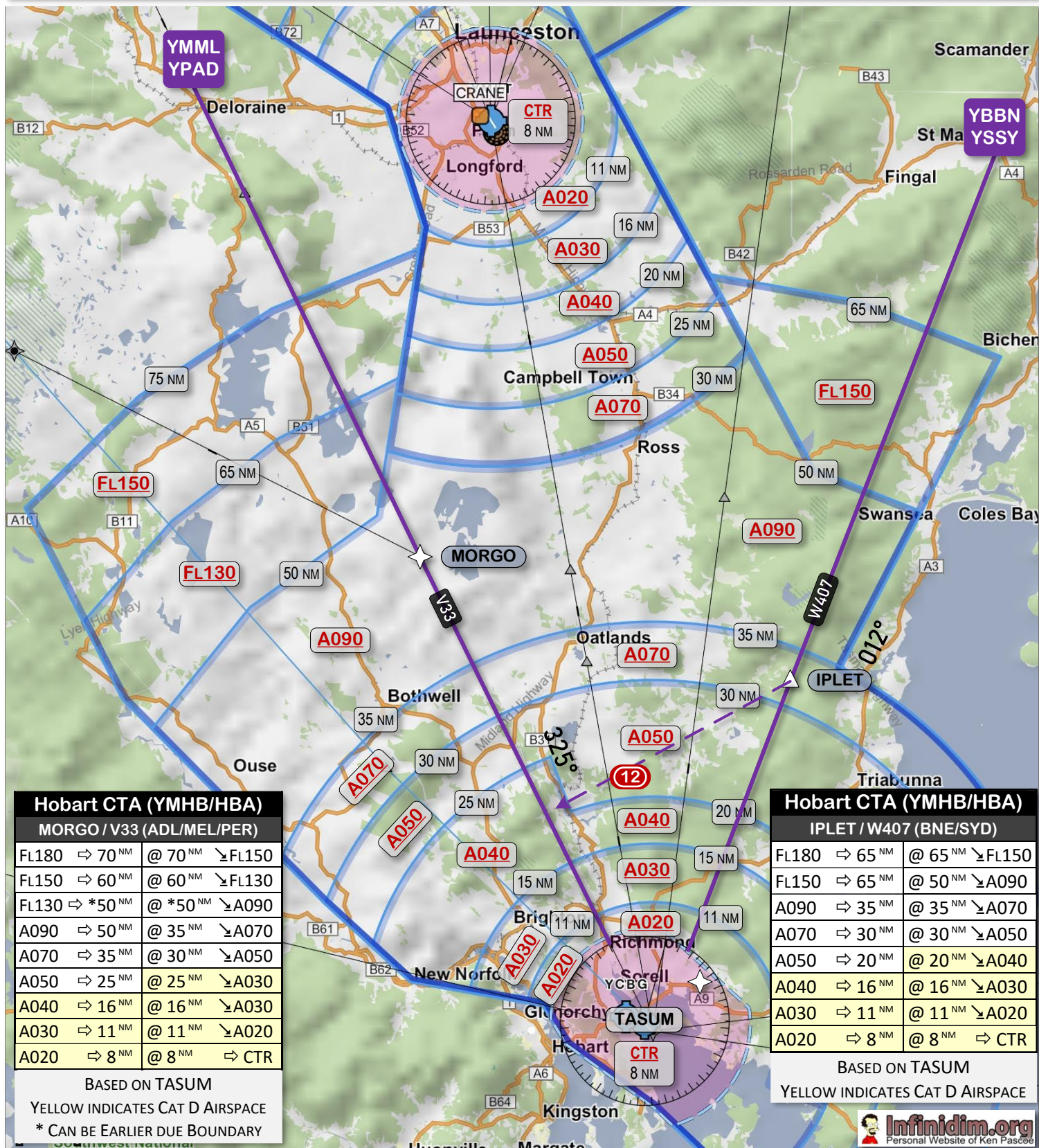
Go Around : Beware of Mt Lord (907') when turning right for a visual circuit at 1,500 ft.

RX30
 2nm

HOBART CONSIDERATIONS

- Strong W/SW winds result in Turbulence in the Circuit.
- Airport is CAT D Airspace outside 05:50-22:10 L
- Arrival from the North can encounter strong TWC and Turbulence – reduce speed early.
- Down/Up Draughts approaching/over Sand Dunes RW30.

Hobart Airspace (YMHB/HBA)



Hobart CTA (YMHB/HBA)		
MORGO / V33 (ADL/MEL/PER)		
FL180 ⇔ 70 ^{NM}	@ 70 ^{NM}	∖ FL150
FL150 ⇔ 60 ^{NM}	@ 60 ^{NM}	∖ FL130
FL130 ⇔ *50 ^{NM}	@ *50 ^{NM}	∖ A090
A090 ⇔ 50 ^{NM}	@ 35 ^{NM}	∖ A070
A070 ⇔ 35 ^{NM}	@ 30 ^{NM}	∖ A050
A050 ⇔ 25 ^{NM}	@ 25 ^{NM}	∖ A030
A040 ⇔ 16 ^{NM}	@ 16 ^{NM}	∖ A030
A030 ⇔ 11 ^{NM}	@ 11 ^{NM}	∖ A020
A020 ⇔ 8 ^{NM}	@ 8 ^{NM}	⇔ CTR
BASED ON TASUM		
YELLOW INDICATES CAT D AIRSPACE		
* CAN BE EARLIER DUE BOUNDARY		

Hobart CTA (YMHB/HBA)		
IPLET / W407 (BNE/SYD)		
FL180 ⇔ 65 ^{NM}	@ 65 ^{NM}	∖ FL150
FL150 ⇔ 65 ^{NM}	@ 50 ^{NM}	∖ A090
A090 ⇔ 35 ^{NM}	@ 35 ^{NM}	∖ A070
A070 ⇔ 30 ^{NM}	@ 30 ^{NM}	∖ A050
A050 ⇔ 20 ^{NM}	@ 20 ^{NM}	∖ A040
A040 ⇔ 16 ^{NM}	@ 16 ^{NM}	∖ A030
A030 ⇔ 11 ^{NM}	@ 11 ^{NM}	∖ A020
A020 ⇔ 8 ^{NM}	@ 8 ^{NM}	⇔ CTR
BASED ON TASUM		
YELLOW INDICATES CAT D AIRSPACE		

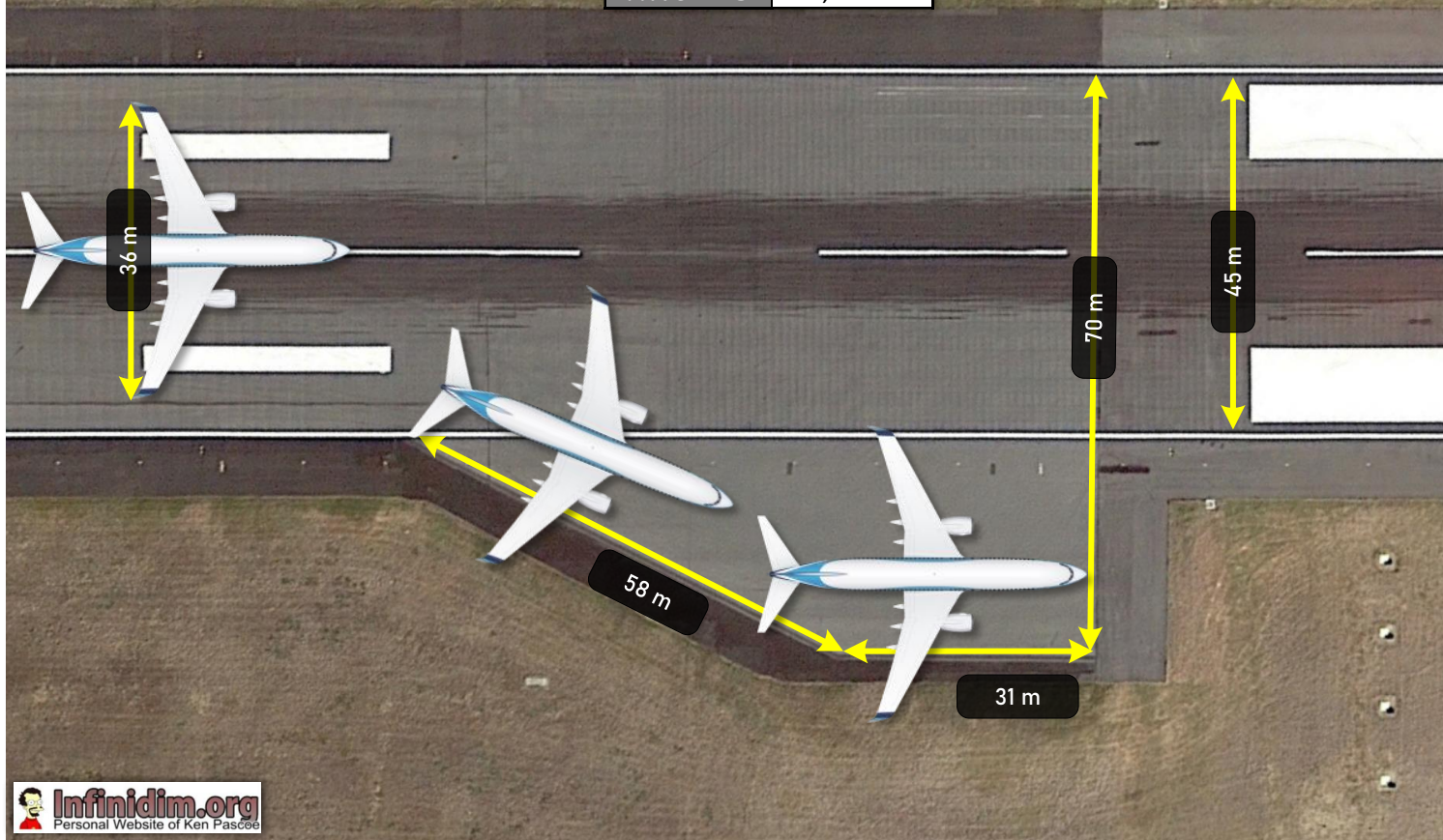
Hobart (YMHB/HBA) Runways

15-Jan-24

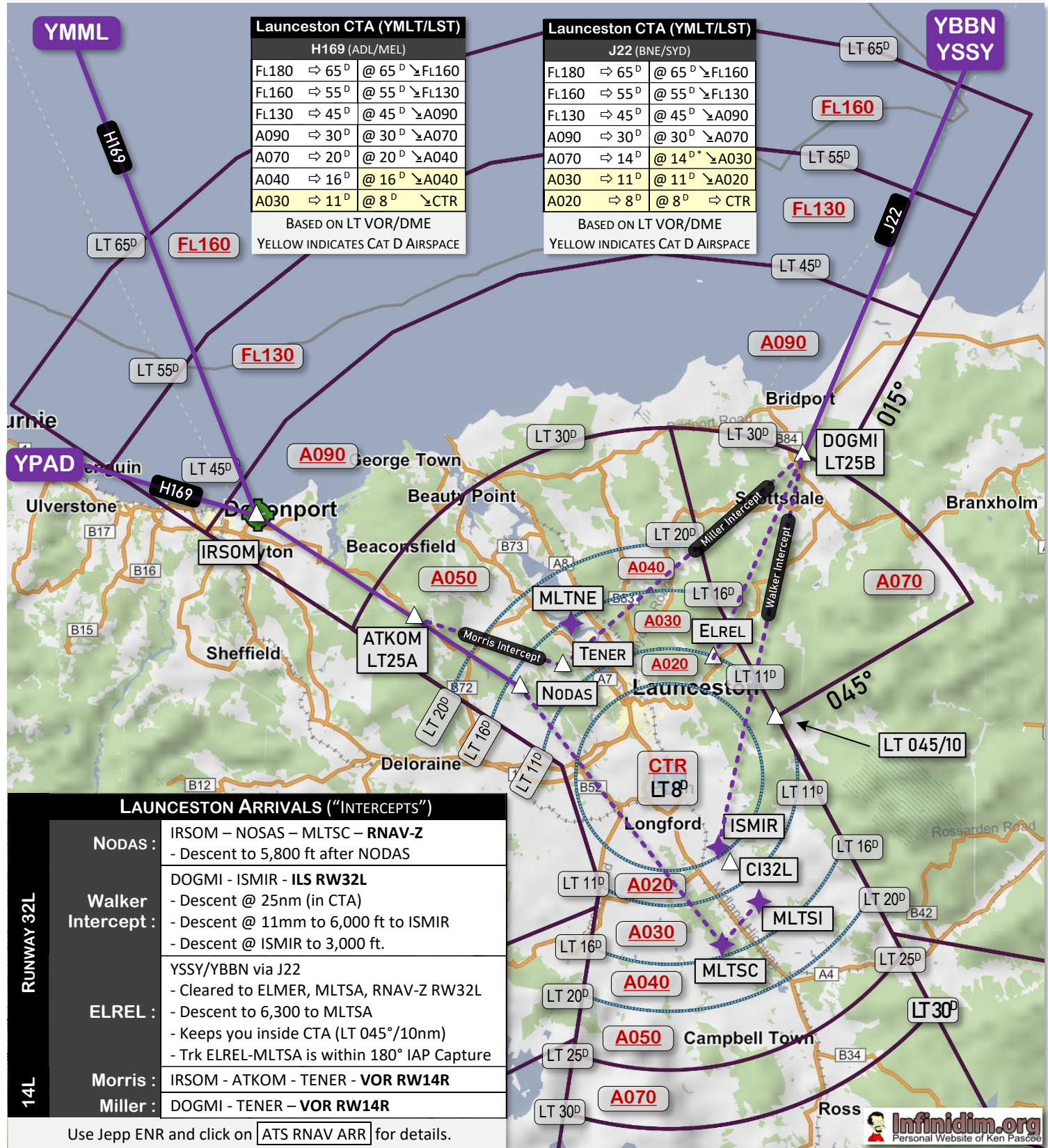


YMHB Rwy Exit

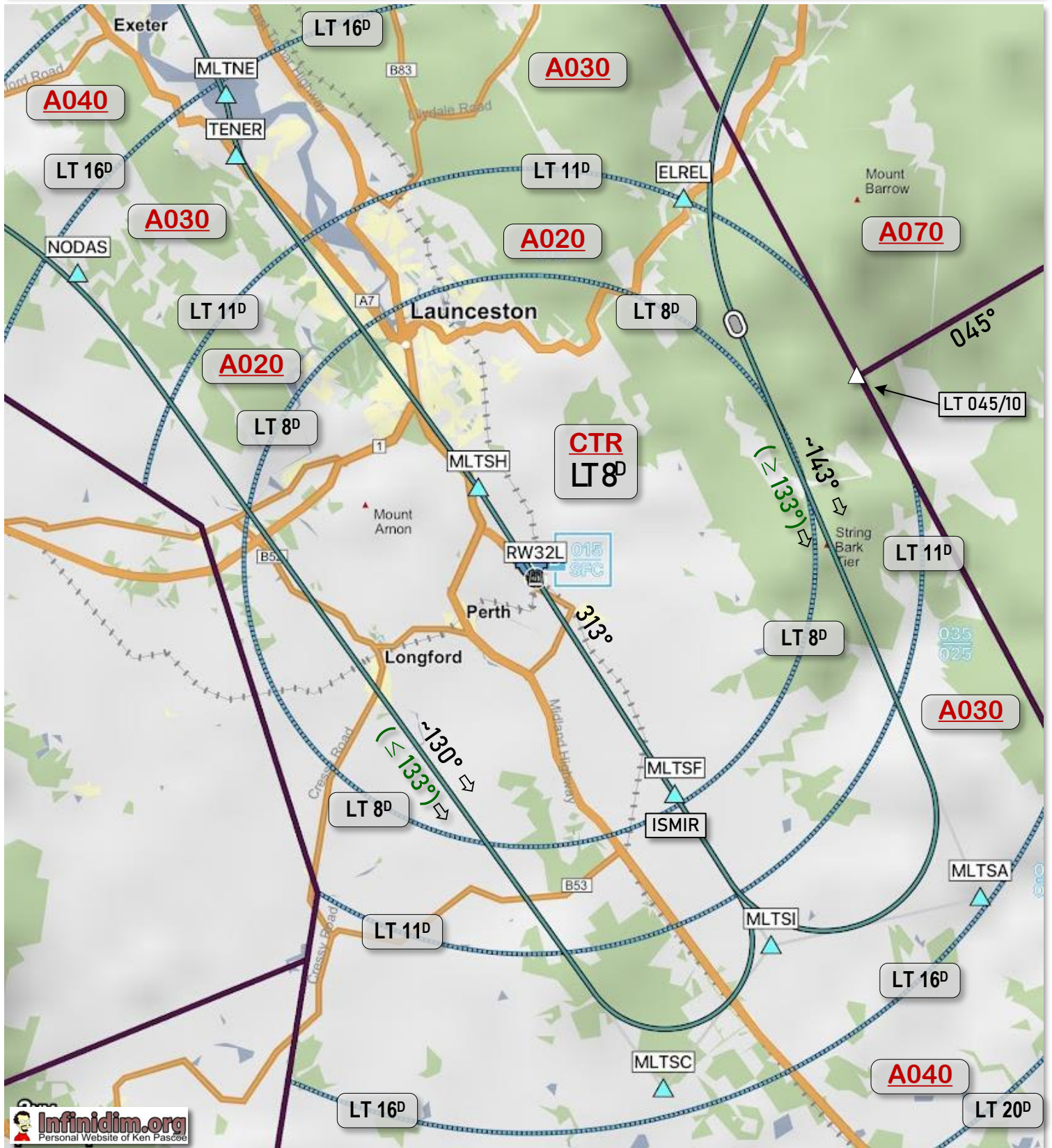
Rwy - Twy	Dist
RW12 - D	1,230m
RW30 - D	1,220m
RW30 - C	1,930m



Launceston Airspace (YMLT/LST)



Launceston RW32L Arrivals (YMLT/LST)



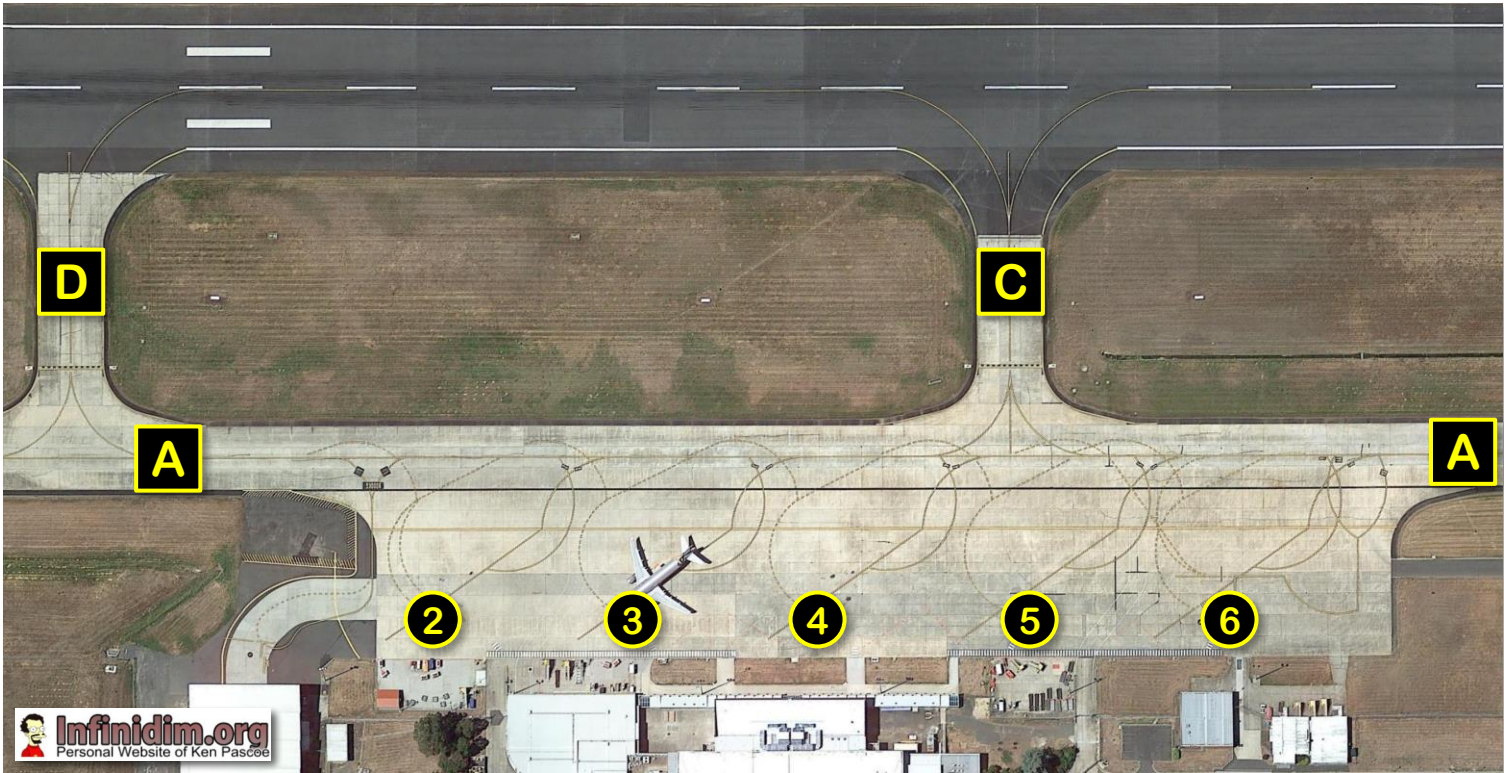
Launceston ISMIR Hold (YMLT/LST)

15-Jan-24

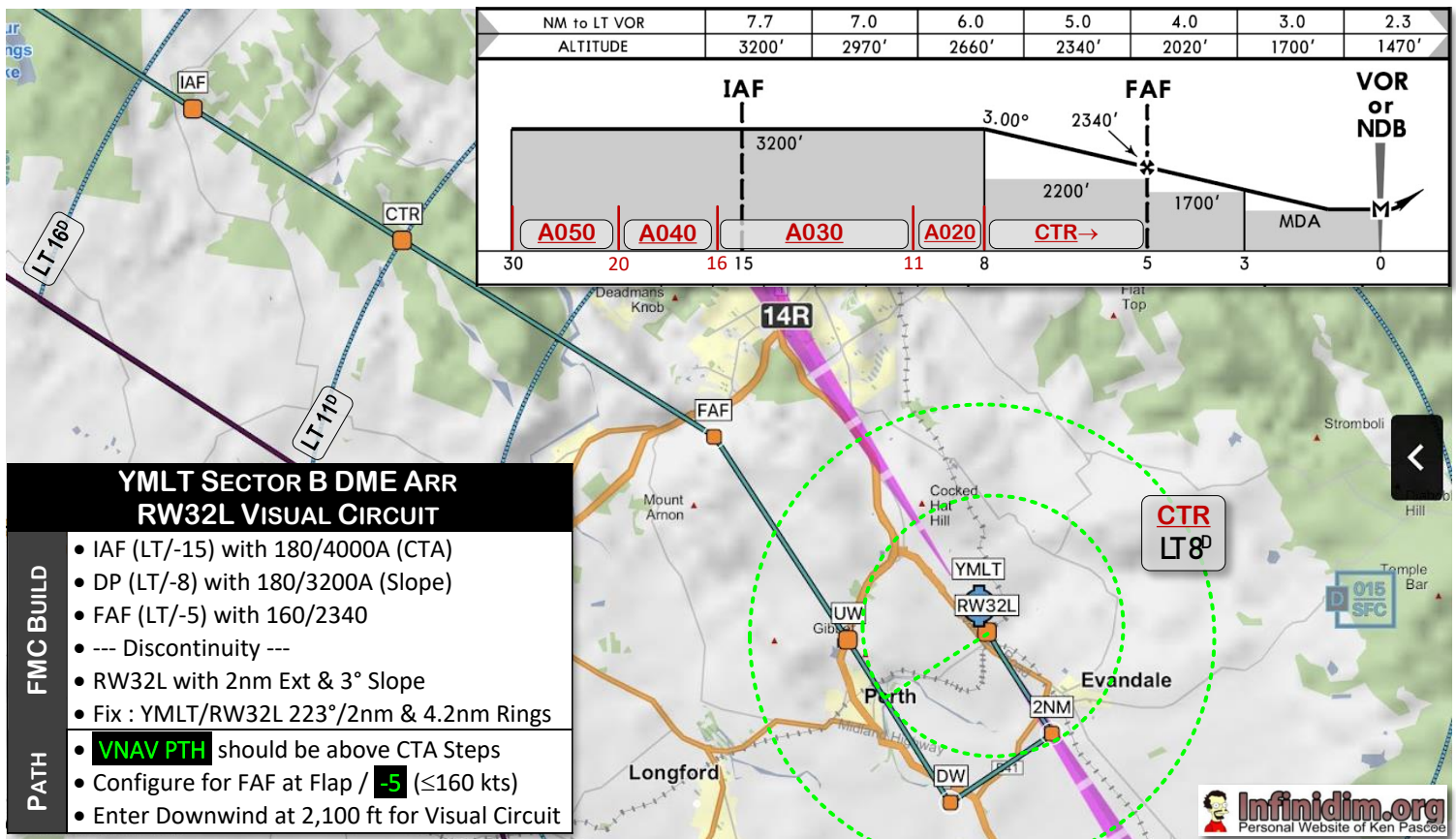
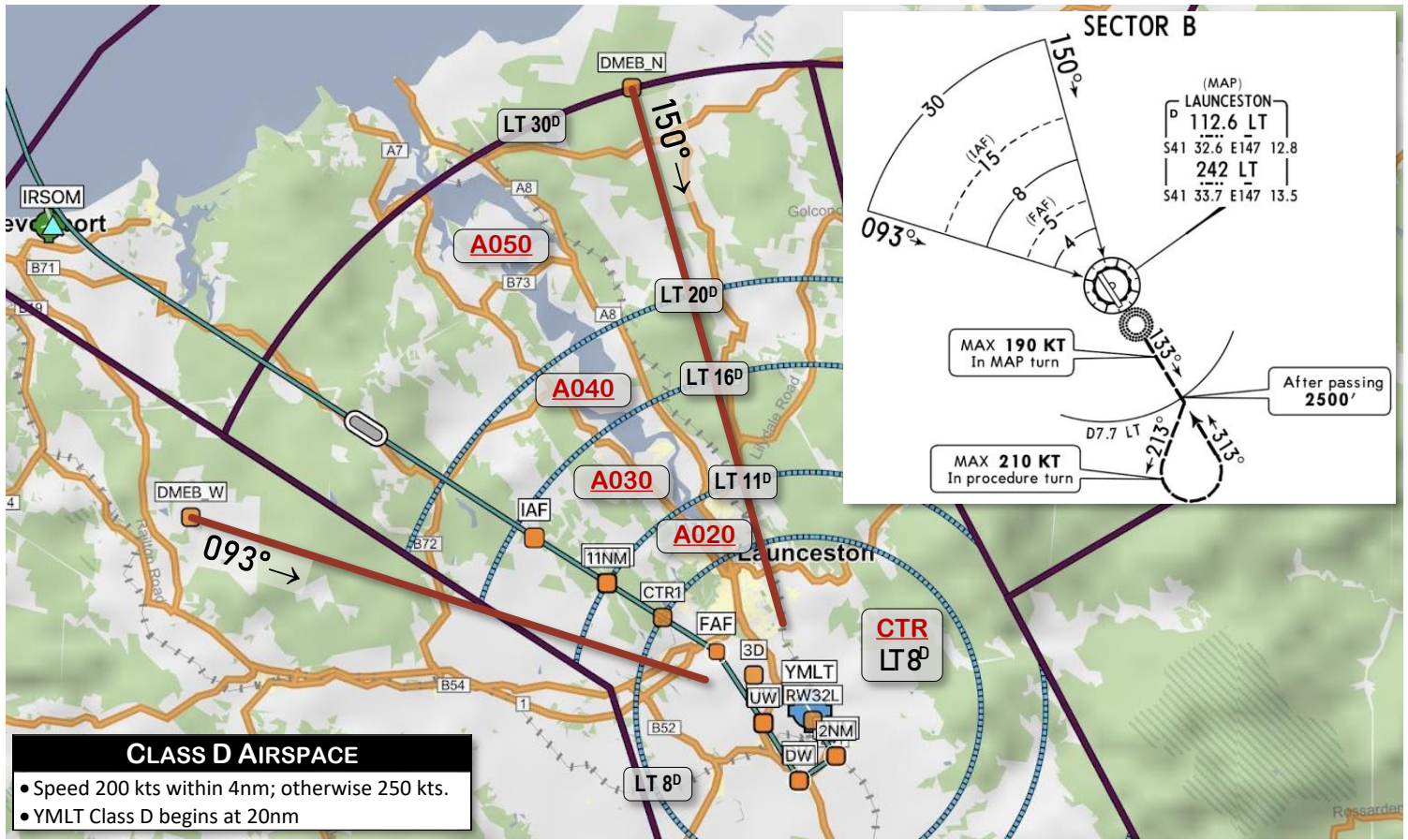


Launceston (YMLT/LST) Apron/Runways

15-Jan-24

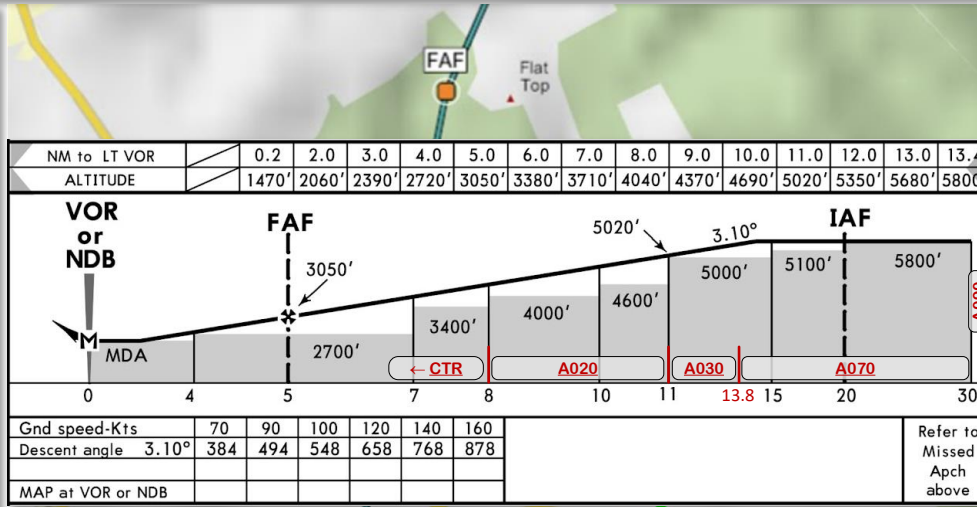
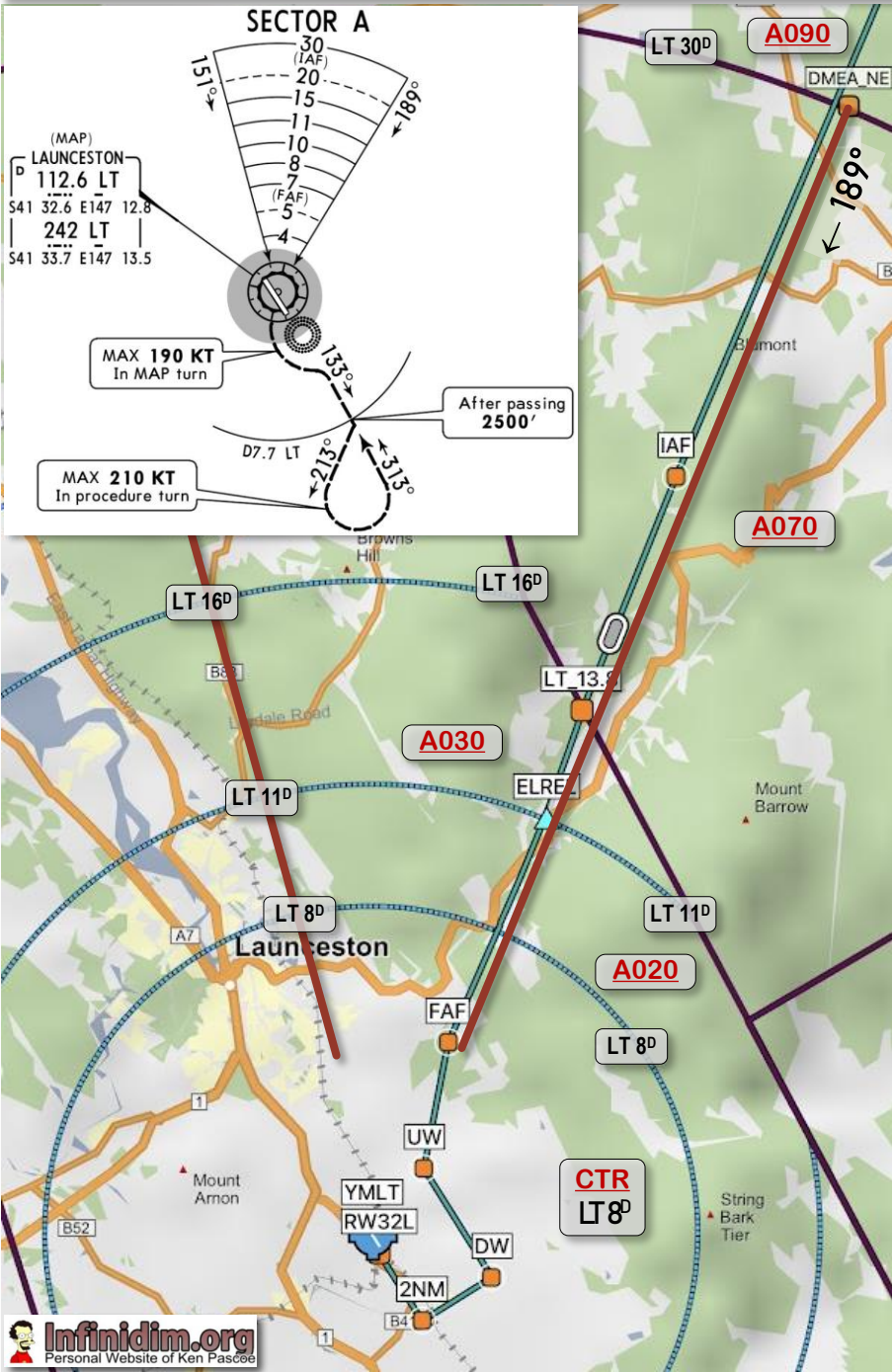


Launceston DME ARR-B RW32L Visual Circuit



Launceston DME-A Arrival RW32L Visual Circuit

15-Jan-24



CLASS D AIRSPACE

- Speed 200 kts within 4nm; otherwise 250 kts.
- YMLT Class D begins at 20nm

YMLT SECTOR A DME ARR RW32L VISUAL CIRCUIT

FMC BUILD

- IAF (LT/-20) with 200/7000A (CTA)
- DP (LT/-14) with 200/7000 (CTA)
- FAF (LT/-5) with 160/3050
- --- Discontinuity ---
- RW32L with 2nm Ext & 3° Slope
- Fix : YMLT/RW32L 223°/2nm & 4.2nm Rings

PATH

- CTA requires 7,000 ft until LT/-14 DME
- To cross FAF @ 3,050 requires 4.22°
- Plan to cross LT/-14 at 200/7000
- Track miles LT/-14 to Base is 15nm
- From 7,000 to 2,100 this is 3.1°

Sydney MARUB RNAV Departure

YSSY R34R MARUB RNAV DEPARTURE

- Depart in **LNAV** only with MCP Heading from the FMC (105°)
- Manually fly the turn from 500' at 25° AoB.
 - Note the FMC/**FD** can be "lazy" at initiating this turn.
- LNAV will re-draw the ND path indication as the turn updates to intercept the 075°→ track.
- **NADP2** : On 105° & ≥1,000 ft, Bug **UP** & clean up to 3,000 ft.
- Then engage **VS**, select MCP **IAS** 250, & **VERT SPEED** 700 fpm until cleared above 5,000 ft.
 - This reduces the chance of a Level Off from ATC or TCAS alert.
- Once cleared above 5,000 ft – **VNAV** or **LVL CHG** to 10,000 and consider an increased Climb Thr setting to expedite turn to WOL.

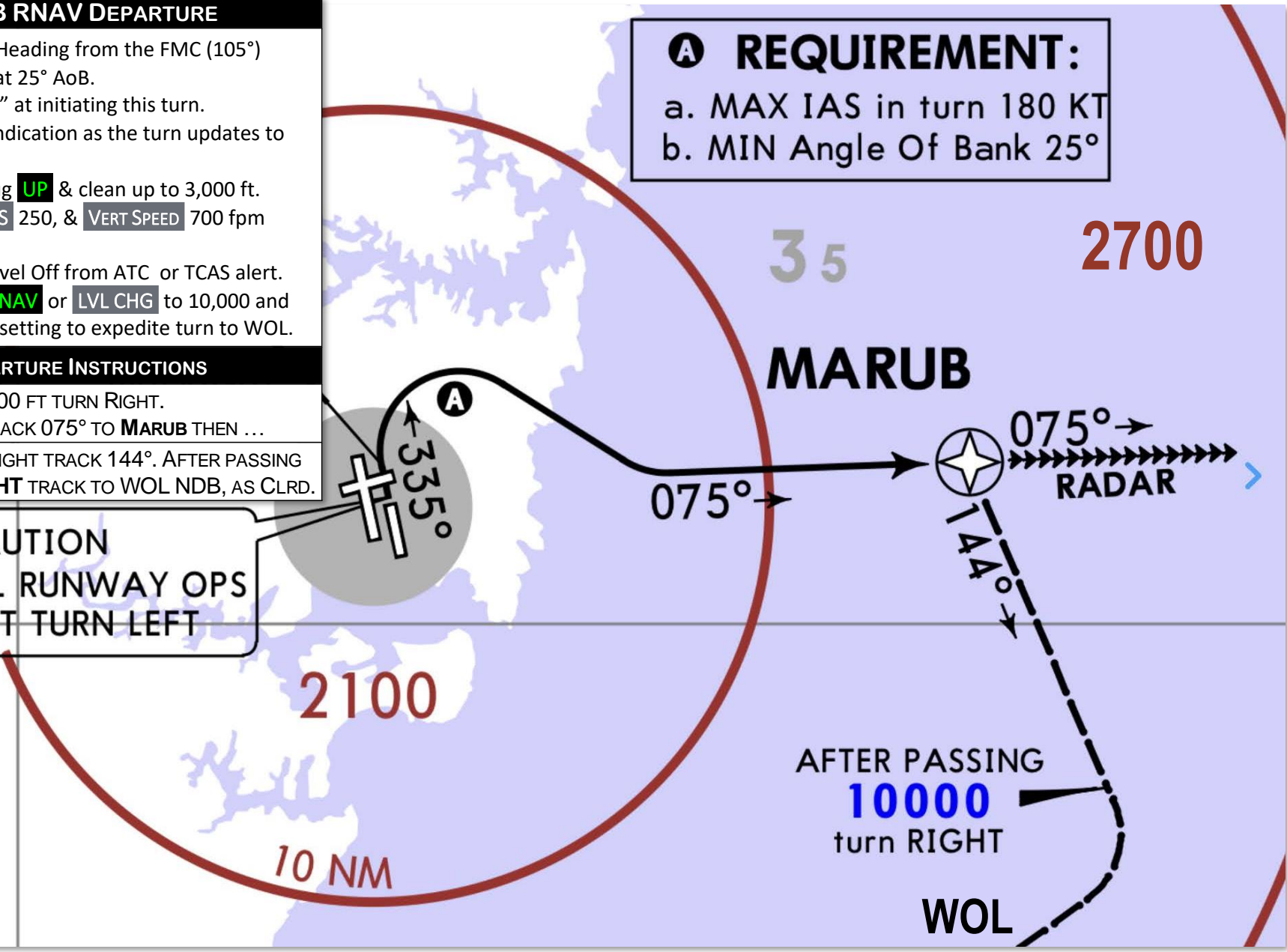
A REQUIREMENT:
 a. MAX IAS in turn 180 KT
 b. MIN Angle Of Bank 25°

MARUB RNAV DEPARTURE INSTRUCTIONS

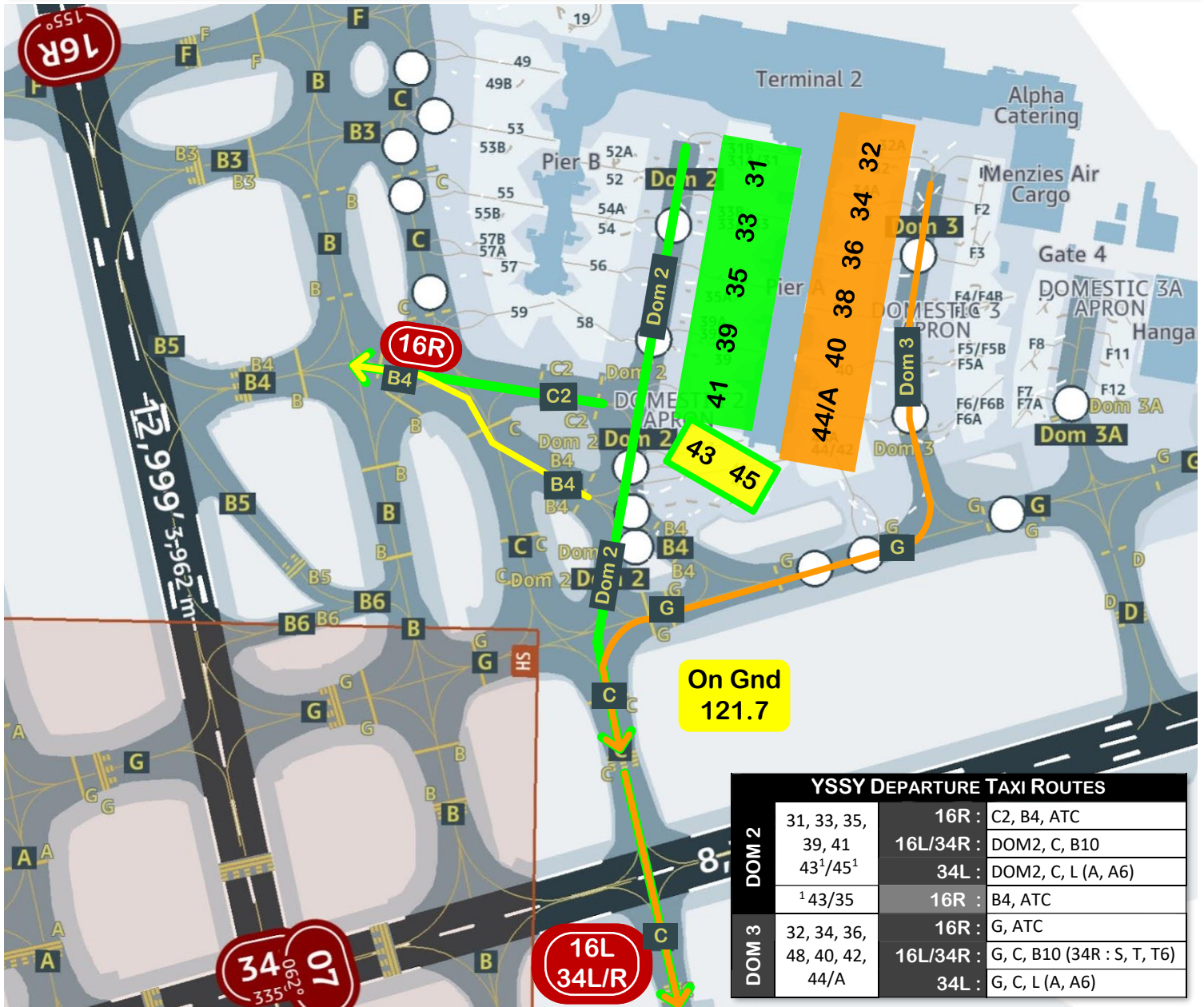
INITIAL CLIMB :	TRACK 335°. AT 500 FT TURN RIGHT. INTERCEPT AND TRACK 075° TO MARUB THEN ...
WOL TRANS :	AT MARUB TURN RIGHT TRACK 144°. AFTER PASSING 10,000 TURN RIGHT TRACK TO WOL NDB, AS CLRD.

CAUTION
 PARALLEL RUNWAY OPS
 DO NOT TURN LEFT

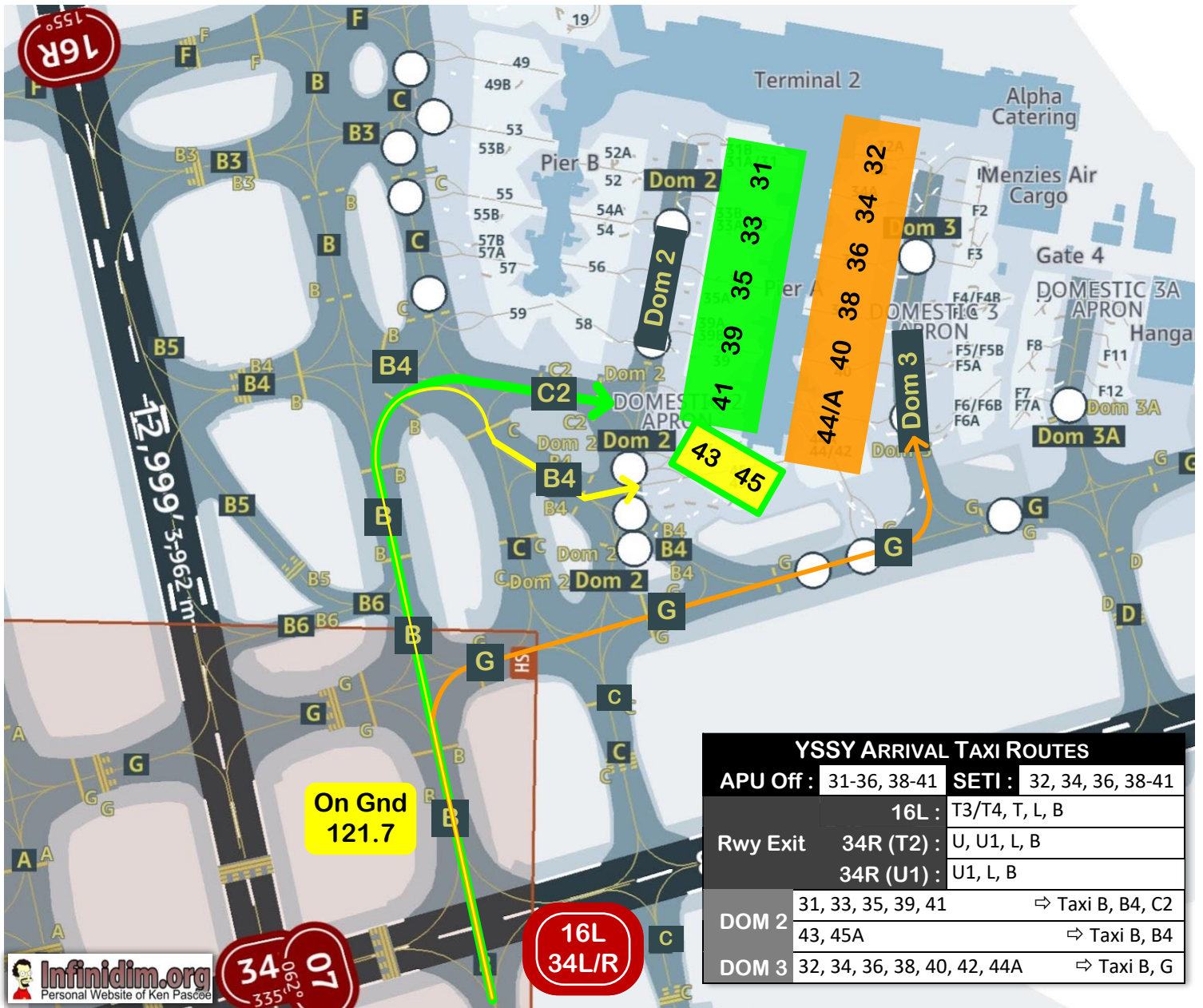
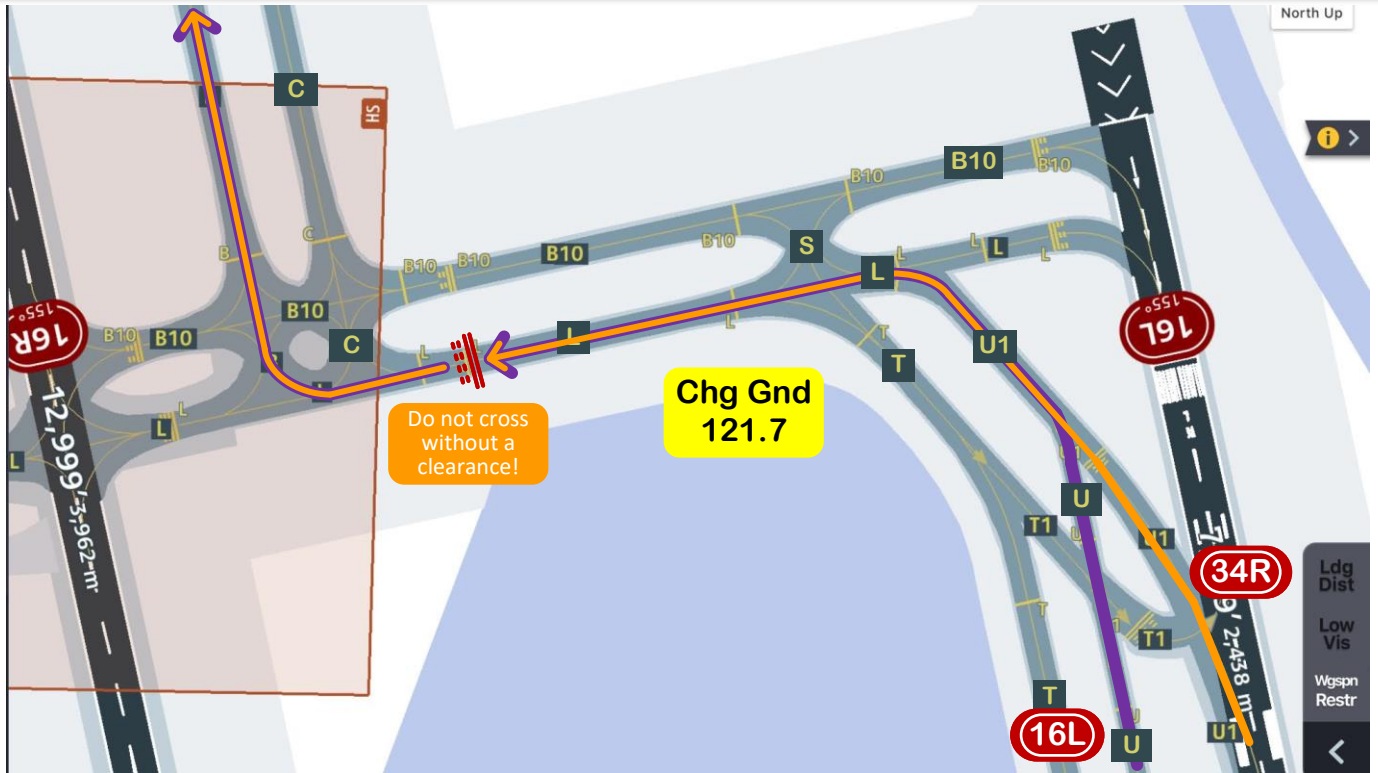
Ensure 180kt restriction is not active (LEGS/VNAV CLB) before engaging VNAV)



Sydney Departure Taxi Routes



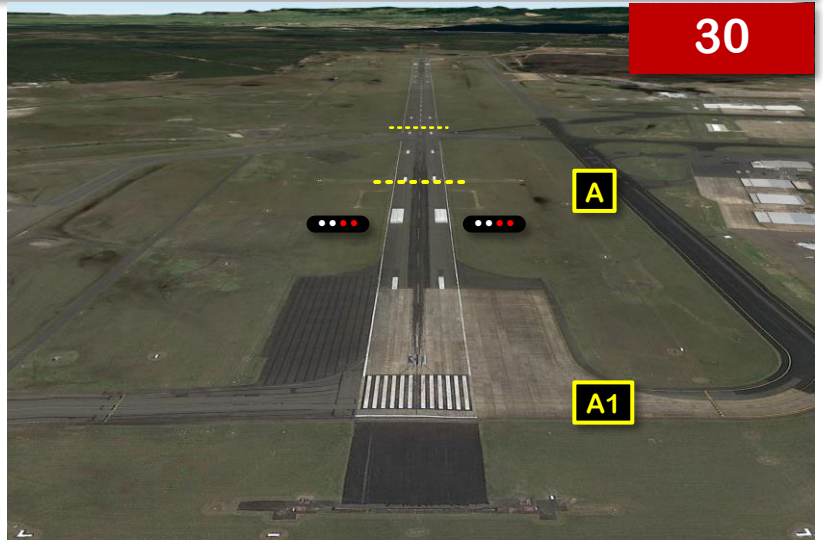
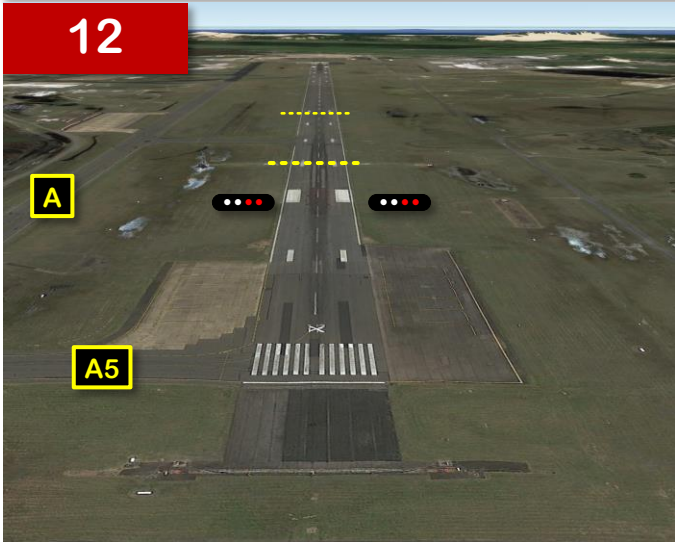
Sydney Arrival Taxi Routes



YSSY ARRIVAL TAXI ROUTES	
APU Off :	31-36, 38-41
SETI :	32, 34, 36, 38-41
16L :	T3/T4, T, L, B
Rwy Exit 34R (T2) :	U, U1, L, B
34R (U1) :	U1, L, B
DOM 2	31, 33, 35, 39, 41 ⇨ Taxi B, B4, C2
	43, 45A ⇨ Taxi B, B4
DOM 3	32, 34, 36, 38, 40, 42, 44A ⇨ Taxi B, G

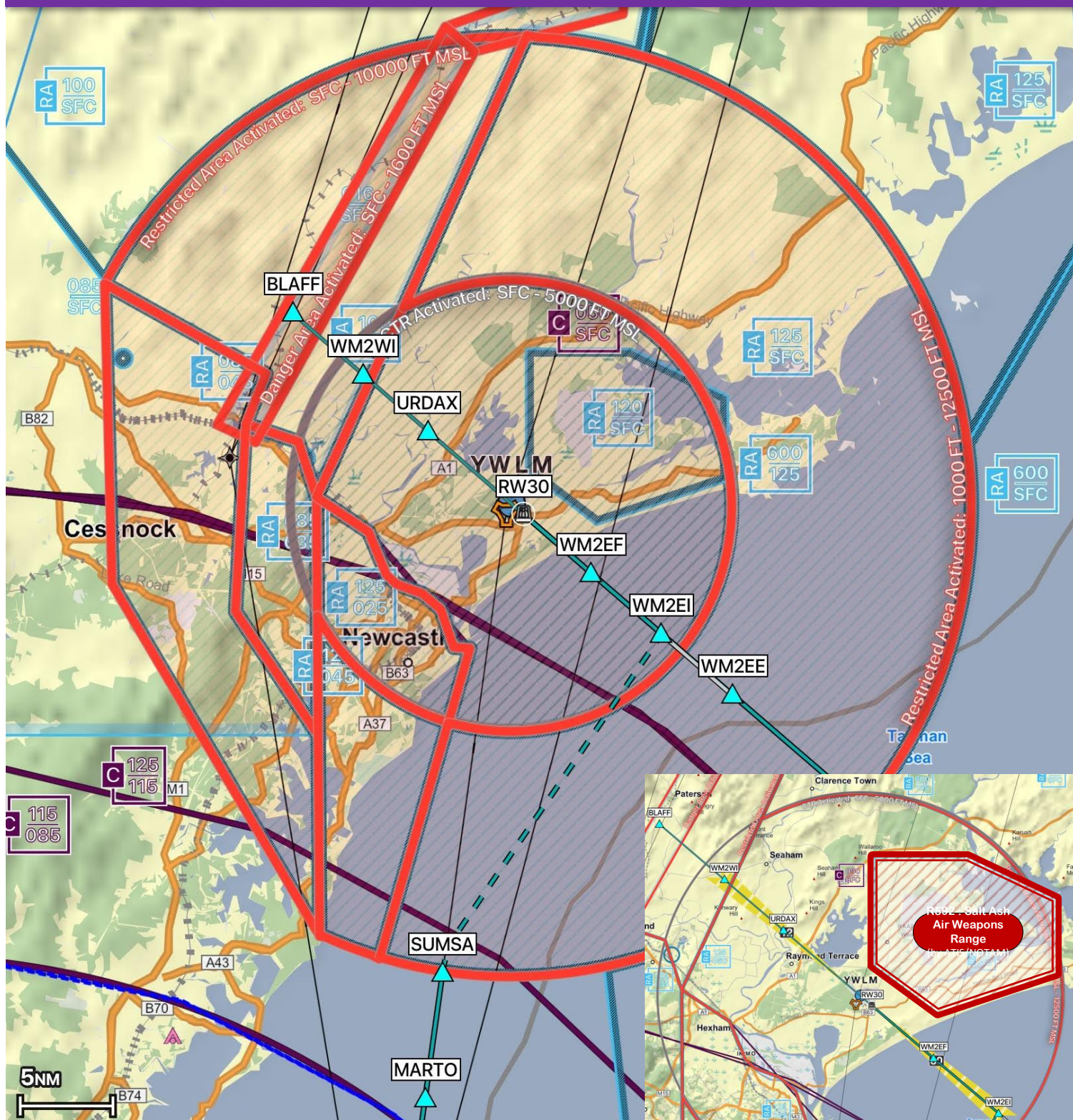
Williamstown/Newcastle (YWLM/NTL) Runways

15-Jan-24



Williamstown/Newcastle (YWLM/NTL) Airspace

15-Jan-24



Useful Tables #1

22-Feb-24

Destination Airport – Requirement for an Alternate

Destination Airport		Further Criteria		ALTN?	A1
Useable Instrument Approach during ETU?		No ⇨		1x ALTN	8.3.5.1
AWIS Unserviceable?	Yes ⇨	No Tower or Arrival <60 min of no Tower?	Yes ⇨		8.4.2
Night time Arrival? ¹	Yes ⇨	Standby Runway Power?	No ⇨		8.3.4.2
		If PAL - Responsible Person attending?	No ⇨		8.3.4.3
International Destination? ²	Yes ⇨	Two separate non-intersecting runways with at least one IAP meeting Dest Wxr {A1 8.3.6)?	No ⇨		8.3.2
Fog Triangle Destination? ³	Yes ⇨	YBRM YPPD YPKA YOLW : (01APR-31OCT - 1400-0000z)	Yes ⇨		C5 3.3.2
Destination is Island/Remote? ⁴	Yes ⇨	Alternate required that is not Island/Remote	Yes ⇨		9.1.4.4
Destination Airport Curfew?	Yes ⇨	Arrival within 00:30 of Curfew Start? ⁵	Yes ⇨	12.3.5	
Weather Forecast available for ETU?		No ⇨		2x ALTN ⁷	8.3.1
Forecast Weather below expected Landing Minima for ETU? ⁶		Yes ⇨			8.3.1
Forecast TS or Severe Turbulence for the ETU? ⁸		Yes ⇨		1x ALTN	8.3.3
Forecast Wind in excess of Aircraft Wind Limitations for the ETU? ⁹		Yes ⇨			8.3.3
Forecast Cloud >SCT ¹⁰ in ETU below :	Expected straight in IAP MNM +1,000 ft		Yes ⇨		8.3.6.1
	If required, Circling MNM +500 ft		Yes ⇨		
Forecast Viz during ETU below :	Expected straight in IAP MNM +2,000m (≥5km)		Yes ⇨	8.3.6.2	
	If required, Circling MNM +2,000m (≥8km)		Yes ⇨		
Otherwise :	⇨	⇨	⇨ ... wait for it ... ⇨	No ALTN ¹¹	?.?.?.?

- Fundamentally – for an ALTN to be valid – it cannot require and ALTN for any of the above reasons.
 - RFF 5 (by NOTAM 4) required for NZ and Samoa. OS EDTO ALTNS require 4 with ≤ 30 mins notice.
- Required Lighting** : Rwy Edge (REL), Threshold, Wind Direction Indicator, Taxi Lighting, Apron Flood.
Partial Rwy Lighting failure (≥2x increase spacing in REL) : Incr MNM Viz by x1.5 in Night & <VMC (5k/1,500m)
- When an International DEST requires an ALTN – at least one ALTN must be a Designated International ALTN {A1 8.3.8}
- Planned to a Fog DEST /Diversion ETA 00:00z-14:00z requires a non-Fog ALTN 01Apr ... 31Oct
- Remote/Island DEST are YPXM, YPCC, YSNF, YLHI – all require a non-Remote/Island ALTN.
- Flights with an ETD such that ETA is within 30 minutes (*Include required Traffic/Weather holding*) of Curfew require an ALTN,
- During the first 3 hours of a TAF3 – PROB30 and PROB40 deteriorations do not need to be considered.
- Only 1x ALTN required if that ALTN has separate non-intersecting Rwys with at least 1x IAP (DEST planning minima A1 8.3.1)
 - When 2x ALTNS are required, Fuel for the closest ALTN is planned plus a PNR to the second ALTN.
- Thunderstorm/Severe Turbulence from INTER/TEMPO can be offset with 30/60 minutes holding instead of an ALTN.
- Application of Forecast Wind must account for Gusts.
- For multiple reported Cloud types/layers : FEW+FEW=SCT; FEW+SCT=BKN; SCT+SCT ≥ BKN.
- Planning with No ALTN requires 15mins (Holding @1,500 ft @ LDW) of ALTN NIL fuel that must be maintained Post Dispatch.

Alternate Aerodrome Minima {A1 8.3.7}

Approach/Runway Configuration	Cloud Ceiling	Visibility
Straight in Approaches to Two Different / Suitable Runways	2 nd Lowest Instrument Approach Minima +200 ft	2nd Lowest Instrument Approach Minima + 800m
Single Runway with an Instrument Approach	Circling +400 ft	Circling + 1,500 m
No Instrument Approach	Last Route Segment LSALT +500 ft	8,000 m

- Reciprocal Runways are "Different Suitable" for Approach Config {A1 8.3.7}
- GLS & CAT I SA ⇨ CAT IIIB not normally considered by Planners (PIC GLS ok).

Take-off Alternate {A1 8.3.9}

Dispatch Basis	Distance	
Non EDTO (& NZ/Samoa) :	60mins / 350nm	
EDTO Dispatch	120min	180min
737-700 22k :	801nm	1196nm
737-700 24k :	N/A	
737-800W SFP 24k :	800nm	1173nm
737-800 (All) 26k :	823nm	1198nm
737-8 25k :	790nm	1141nm

- Dep Wxr < OEI Landing ETD ±30 (or Oper Req't).
- Network/Alternate/Adequate may be used.
- CAT I OEI Minima unless OEI Cat IIIA approved.
- INTER/TEMPO with PROB30/40 may be ignored at the Take-off Alternate.
- YWLM not used as a Take-off Alternate {C5 3.3.7}

Useful Tables #2

22-Feb-24

Airspace Classification (AIP ENR 1.4-4.1)

Class	Flight Type	Separation	Service	Speed	Comms	Clrnce
A	IFR (no VFR)	All Acft	ATC	None	2-Way	Required
	IFR	All Acft	ATC	None		
C	VFR	VFR from IFR	ATC for IFR Info for VFR/VFR	250 kts below 10,000 ft	2-Way	Required
	Special VFR	S/VFR from S/VFR in <VMC	ATC			
D	IFR	IFR from IFR IFR from S/VFR	ATC TFC about VFR	200 kts below 2,500 ft AAL within 4 nm; otherwise 250 kts	2-Way	Required
	VFR	None	ATC; TFC on all other flights ¹			
	Special VFR	S/VFR from S/VFR in <VMC	ATC			
E	IFR	IFR from IFR	ATC on VFR as practicable	250 kts below 10,000 ft	2-Way	Required
	VFR	None	FIS Info			
G	IFR	None	FIS Info	250 kts below 10,000 ft	2-Way	None
	VFR		(Workload Ok)		VHF ² >5,000 ft	None

1. Traffic avoidance advice on request.
2. Two-Way VHF required above 5,000 ft AMSL and at Aerodromes where radio is required.

Cat C Approach (JEPP ATC)

Phase	Initial	Final
Approach Speed	160-240	115-160
Circling (SPD/AREA)	180 kts	4.2nm
Missed Approach	Max 160	Max 240

OS RFF Requirement (A1 8.3.12.1)

Location	Min	Reduction
NZ / Samoa	RFF 5	RFF 4
EDTO Altn	RFF 4 (≤ 30 mins)	

- RFF not required inside Australia

Maximum Holding Speeds

Altitude	Timing	ICAO PANS-OPS	TERPS
0 ... 6,000 ft	1 min ¹	230 Kts	200 Kts
6,001 ... 14,000 ft		(170 kts Cat B)	230 kts
14,001 ... 20,000 ft	1.5 min ¹	240 kts	265 kts
20,001 ... 34,000 ft		265 kts	
Above 34,000 ft		M0.83	

¹ TERPS requires inbound timing. Adjust Outbound to achieve.

- Lesser of 280kts or M0.8 in Turbulence with ATC approval.

CASR61 MOS Check Tolerances {Sch 8; Tbl 2/5 20.May.21}

Taxi	± 1.5m of centerline
Heading	± 5°; Initial Assy ± 20°; Steep Turns ± 10°; Lim Panel ± 15°
Airspeed	Climb: -0/+5 kts; Level/Descent/Limited Panel : ± 10 kts (M.02) Glide: -5/+10 kts; Final/Assy: -0/+5 kts
Altitude	± 100 ft; Limited Panel: ± 200 ft; Minima -0/+100 ft
Turns	Angle of Bank: ± 5°
Landing	Touchdown: Within TD Zone; Centerline: ± 2 m
Limited Panel	Heading ± 15°; Altitude ± 200 ft; Speed ± 10 kts
Steep Turns	Angle of Bank: ± 5°; Altitude ± 100 ft
2D/3D Lateral	± 5° or Azimuth Track Guidance
	± ½ scale CDI deflection Within specified RNP
3D Vertical	± ½ scale deflection; or
	± 75 ft RNP BARO VNAV - Transients in excess of 75 ft / ½ scale for Config acceptable.

Useful Tables #3

LMC Limitations (C6 3.7)		
LMC Type	Comp FLS	Manual L&T
Standard LMC	300 kg ²	Process ¹
Fuel LMC	500 kg ²	500 kg
Std/Fuel Mix	✓ Max Fuel LMC 100 kg ✓ Max LMC Total 300 kg	
Standard LMC Weights	Pax : 100 kg Bag : 15 kg - Fuel/Cargo as Actual Weight - Infants 0 with Adult	
	M Male : 88 (87/97 kg) ³ F Female : 73 (87/97 kg) ³ C Child : 46 kg I Infant : 16 kg B Bag : 16 (15/15 kg) ³ Z Zone (A/B/C/D/E)	
ACARS LMC		

- Catering/Potable Water LMC **Prohibited**.
- ¹ Stab Trim re-calculation required here.
- ² Check Relative & Absolute (Balance) Wt Chg
- ³ Oz-DPS-HIR, then (South Pacific / APW)
- Chk Relative Weight Change against FLS UNLDL
- Note LMC on FLS & update TTL Pax Number.
- FLS: " -1xMale/Zone C/-100Kg "
- ACARS: " **LMC +1M ZC** "
- " 12345 " (PIC Staff Number)

Standard Weights {A1 8.13.2}			
Item	A	B	C
LMC Adult	100		
LMC Cargo Bag	15		
¹ Male	88		
¹ Female	73		
¹ Adult		87	97
¹ Child	46		
¹ Infant (LMC = 0)	16	15	15
¹ Flt Crew/JS	95		
¹ Cabin Crew/CJS	85		
Crew Bag	15		
² Cabin Load	38		

Area Zones (A/B/C Pax Weights)			
A	B	C	
All except APW/TBU	-	APW/TBU	
¹ Carry-on Baggage Allowance included.			
² Guide Dog, Musical Instrument, etc			

B737 Cabin Zones – Rows : Seats (C6 3.6)

	#	Exit	A	B	C	D	E
B737-700 (#723-724)	128	10	@1-2 : #8	@3-6 : #24	@7-12 : #36	@13-17 : #30	@18-22 : #30
B737-700 (#???-???)	134	11	@1-2 : #12	@3-5 : #18	@6-11 : #36	@12-17 : #36	@18-23 : #36
B737-700 (#725-731)	138		@1-2 : #12	@3-6 : #24	@7-12 : #36	@13-17 : #30	@18-23 : #36
B737-800 (#900-903)	170	13/14	@1-2 : #8	@3-6 : #24	@7-15 : #48	@16-23 : #48	@24-30 : #42
B737-800 (170 SEATS)							@23-29 : #42
B737-800 (176 SEATS)	176			@7-14 : #48	@15-22 : #48		@23-30 : #48
B737-8 (176 SEATS)	176	13/14					
B737-8 (176 SEATS)	182	14/15		@3-4 : #12	@5-13 : #54	@14-22 : #54	@23-31 : #54

Business Class Rows 1+2

Exit – Exit Row

- Number of Seats

APW/TBU Pax Seat Limits (98kg) (C6 3.10)			
Rows/Seats	162Y	168Y	IWQ/IJQ
Max 5 Adults	4-12, 15-29	5-11, 15-30	5-10, 15-30
6 th Seat Child	4-8, 15-29	5-11, 15-21	5-10, 15-23
6 th Seat Infant	9-12	22-30	24-30
Max # Adults	8J + 138Y	8J + 145Y	8J + 140Y

- Use of 98 kg Restricts the use of seats in Economy.
- No restriction on Business Class seat assignment (8J).
- Applicable to **Apia (APW/NSFA)** and **Tonga (TBU/NFTF)**

Seating Capacity (VAGP-FO-350)

Aircraft	Seats	Adults/Inf
B737-700	128	128 + 15 = 143
	134	134 + 15 = 149
	138	138 + 15 = 153
	170	170 + 15 = 185
B737-800	170	170 + 15 = 185
	176	176 + 15 = 191
B737-8	176	176 + 15 = 191
B737-10	194	194 + 15 = 209

- Infants limited by L/J & Seat Belt Ext.

Useful Tables #4

Takeoff Performance Limitations (C6 1.11.2)

Item	SEL °	TO 1/2	IMCLB	WET	NRW
Anti-Skid	No		No	No	
EEC Alternate Mode	No	No			
Park Brake Valve	No		No	No	
Reverser Light					No
Rudder Pedal Nosewheel Steering					No
Thrust Reverser				WP	No
Thrust Reverser Blocker Door Cap(s) Missing				WP	
Wind Shear	No	No			

- Operations prohibited on Contaminated Runways; Damp Runways are considered Wet
 - Narrow (Nrw) Runways are ≥30m and <45m WP = Weight Penalty

Takeoff Minima and Zones Required (QRH OI 1.4)

Reported Visibility RV/RVR	Runway Zone RVR or RV			RW Mark'g / Lgts	X-wind Limit
	TDZ	MID	END		
RVR < 200m	≥ 125	≥ 125	≥ 125	HI REDL & RCLL	10 kts
RVR 200 ... 350 m	≥ 200	≥ 200	≥ 200		15 kts
RV/RVR ≥ 350 m	≥ 350	≥ 350	≥ 350	REDL & (RCLM or RCLL)	

Any RVR < 200m : All Zones Required All RVR ≥ 200 m : TDZ Required; Either (MID/END) Inop.
 Viz < 350m : Viz by RVR only ATC N/A : Min RVR 550 Day/RV 800 Night Pilot Assess (Zones N/App)
 REDL : Rwy Edge Lights (≤ 60m) RCLL : Rwy Centerline Lighting RCLM : Rwy Centerline Marking

Domestic Regulatory Docs (A1 16.4.1)

B737 QRH (VS)
Flight Log Folder (AS)
- Flight Log pad (AS) (VAGP-ENG-086)
- Aircraft Load Data Sheet (AS)
Maintenance Log Folder (AS)
- Aircraft Readiness Log (AS) {VAGP-ENG-101}
- ADD Register (AS) {VAGP-ENG-010}
- Maint Log Pad {VAGP-ENG-087}
2x Flight Crew License/Medical (Elec/Paper)
2x FCM Certificate of Check (Elec/Paper)

International Add'n Docs (A1 16.4.2)

2x Flight Crew License/Medical (Paper)
2x FCM Certificate of Check (Paper)
Certificate of Registration (AS)
Certificate of Airworthiness (AS)
Radio Station Licence (AS)
Aircraft Noise Certificate (AS)

Wildlife Strike (A1 10.49)

- Do not retract Flaps/Slats after Landing
 - RRM required (soon as practicable)
 - **Engineering Support Available** : Maint Log Entry
- **Engineering Support Not Available:**
- Captain performs an Interim Check
 - Fuselage, (LE) Wings, Radome, Empennage, Landing Gear, Eng Cowls, Fan Blades, Intakes, Aerials, Probes.
 - **Damage/Ingestion Found** :
 - Maintenance Log Entry.
 - **No Damage/Ingestion Found** :
 - Retract Flaps prior to Pax Boarding
 - Maintenance Log Entry at next Engineering Port – Suspected Wildlife Strike has occurred.

SEFP Abbreviations (C6 1.6.6)

@	At
nnABC	nn DME from ABC
AIT	After Initial Turn
ARC	DME Arc
CLB	Climb
DER	Departure End of Runway
FLW	Follow
INT	Intercept
LT	Left Turn
RT	Right Turn
MSA	Minimum Safe Altitude
RMN	Remain
RT	Right Turn
R-nnnABC	nnn° Radial from ABC
SEFP	Special Engine Failure Procedure
SID	Standard Instrument Departure
TRK nnn/nnnn	Track nnn° or to nnnnn waypoint

Useful Tables #5

Approach Effect of Downgraded Ground Equipment (A1 11.3.16)

RVR with Equip Failure	SA CAT I	SA CAT II	CAT II	CAT IIIA	CAT IIB DH	CAT IIIB No DH
ILS Standby Transmitter	No effect				200	No Apch
Outer Marker	No effect if replaced by height check after glide path intercept.					
Middle Marker	No effect					
TDZ RVR	No Apch	No Apch	No Apch	No Apch	No Apch unless any two RVR values are available.	
MID/END RVR	No effect					
ALS	800	700	No Apch	No Apch for DH>50	No effect	
ALS (Last 210m Ok)	650	600	No Apch	No effect		
ALS (Last 420m Ok)	550	450	No effect			
Standby ALS Power	No effect					
Rwy Edge, Thr, End Lts ¹	Night : No Apch			Ngt : 550	No Effect	
RCLL	No effect	TDZL : 400 No TDZL : 450	Day : 350 Ngt : 400 ²	Day : 300 Ngt : 400	No Apch	Day : 200 Ngt : No Apch
RCLL Spacing 30m	No effect				150	
TDZ Lights	No effect	No RCLL : 450	Day : 300 Ngt : 550	Day : 200 Ngt : 300	No effect	
Taxiway Lights	No effect – expect delays due movement congestion.					

1. Runway Edge, Threshold and End Lights are only required at Night, No Effect on Day Operations.
2. Without RCLL, CAT II RVR 400 with Autoland; RVR 550 without Autoland.
3. Multiple failures of runway lights are not permitted accept in accordance with this table.
4. For Cat II/III combined Runway Lighting/RVR failures are not permitted.

Approach Minima and RVR Limits (QRH OI 1.8)

	DA (RA)	TDZ	MID	END	Lights Required at Minima
¹ SA CAT I	150 ft	450 m ²	125 m ³	75 m ³	3x Long + Lateral
SA CAT II	100 ft	350 m ²	125 m ⁴	75 m ⁴	3x Long + Lateral
CAT II	100 ft	300 m ²	125 m ⁴	75 m ⁴	3x Long + Lateral
⁵ CAT III A	50 ft	175 m	125 m	75 m	1x Long ⁷
⁶ CAT III B	No DH	75 m	75 m	75 m	No Requirement ⁸

SA CAT I :	¹ US requires HUD - Manual Landing for equipment fail <u>after</u> DH if aligned and Visual Cues established.	² TDZ is required. ³ MID/END are required only if reported
SA CAT II :	² TDZ is required.	⁴ MID/END can be Inop – any reported RVR is required.
CAT II :	² TDZ is required. - Manual Landing for equipment fail <u>after</u> DH if aligned and Visual Cues established.	⁴ MID/END can be Inop – any reported RVR is required.
CAT III A :	LAND 2/3 required.	⁵ Fail Passive – Either MID/END may be inoperative.
CAT III B :	LAND 3 required	⁶ Fail Operational – Any single RVR may be inoperative
Lighting :	⁷ Fail Passive : 3x (RCLL/REDL)	⁸ Fail Operational (with DH) : 1x (RCLL)

Useful Tables #6

Approach Minima and RVR Limits (QRH OI 1.8)

	DA (RA)	TDZ	MID	END	Lights Required at Minima
¹ SA CAT I	150 ft	450 m ²	125 m ³	75 m ³	3x Long + Lateral
SA CAT II	100 ft	350 m ²	125 m ⁴	75 m ⁴	3x Long + Lateral
CAT II	100 ft	300 m ²	125 m ⁴	75 m ⁴	3x Long + Lateral
⁵ CAT III A	50 ft	175 m	125 m	75 m	1x Long ⁷
⁶ CAT III B	No DH	75 m	75 m	75 m	No Requirement ⁸
SA CAT I :	¹ US requires HUD ² TDZ is required. ³ MID/END are required only if reported - Manual Landing for equipment fail <u>after</u> DH if aligned and Visual Cues established.				
SA CAT II :	² TDZ is required. ⁴ MID/END can be Inop – any reported RVR is required.				
CAT II :	² TDZ is required. ⁴ MID/END can be Inop – any reported RVR is required. - Manual Landing for equipment fail <u>after</u> DH if aligned and Visual Cues established.				
CAT III A :	LAND 2/3 required. ⁵ Fail Passive – Either MID/END may be inoperative.				
CAT III B :	LAND 3 required ⁶ Fail Operational – Any single RVR may be inoperative				
Lighting :	⁷ Fail Passive : 3x (RCLL/REDL) ⁸ Fail Operational (with DH) : 1x (RCLL)				

LVO/Autoland Wind Limits (QRH OI 1.7)

RVR	Head Wind	Cross Wind	Tail Wind
Any RVR < 200m	25 Kts	10 kts	15 Kts
All RVR ≥ 200m; Any RVR < 550m		15 kts	
All RVR ≥ 500m		25 kts ¹	
¹ 723-852 Max Autoland Crosswind 20 kts			

ILS Installation Categories

Class I	A	B	C	T	D	E
1-2-3-4	CAT I – Autoland Not Approved			CAT I		
Class II	T	D		E		
1	CAT I					
2-3-4	CAT II					
Class III	D		E			
1	CAT I					
2	CAT II					
3	CAT IIIA / CAT IIIB +DH					
4	CAT IIIA / IIIB +DH		CAT IIIB No DH			

LVO Sensitive Systems (DDG R27 27Jan22)

Auto Flight	Autopilot; Control Wheel AP Disc; Autothrottle; MCP Switches; TO/GA Switches
Bleed/Air	Pack Airflow Shutoff Valve
Ice/Rain	Wipers
Gear/Brakes	Park Brake Valve/Light; Antiskid; Autobrake
Lights	Aircraft Exterior Lights
Nav	Flight Directors; Radio Altimeters; ISFD
<i>This is an <u>indication</u> of LVO Sensitive Systems – refer to DDG.</i>	

Useful Tables #7

22-Feb-24

Wake Turbulence Separation Standards (Jepp ATC 5.2)

Aircraft Ahead	Arrival	Displaced Threshold	Opposite Direction	Departure Full Length	Departure Intermediate	Follow Distance
Super	3 mins	3 mins	3 mins	3 mins	4 mins	7nm
Heavy	2 mins	2 mins	2 mins	2 mins	3 mins	5nm
Super : A380/AN225	Heavy : ≥ 136 ton			Medium : 7 ... <136 ton		

- This chart only references B737 separation requirement (Medium).
- Intermediate applies when the following aircraft departs from the same runway (or a parallel runway separated by less than 760m) from 150m after the takeoff point of the preceding aircraft.

B737-700 Flap Limit / Minimum Maneuvring Speeds

	B737-700			B737-800 SFP 26K			B737-800 SFP 24K			B737-800 SFP 26K		
	Limit	MLW	MTW	Limit	MLW	MTW	Limit	MLW	MTW	Limit	MLW	MTW
Flaps Up :	340 kts	202 kts	215 kts	340 kts	213 kts	225 kts	340 kts	211 kts	223 kts	340 kts	211 kts	223 kts
Flaps 1 :	250 kts	182 kts	195 kts	250 kts	193 kts	205 kts	250 kts	191 kts	203 kts	250 kts	191 kts	203 kts
Flaps 2 :	250 kts			250 kts			250 kts			250 kts		
Flaps 5 :	250 kts	162 kts	175 kts	250 kts	173 kts	185 kts	250 kts	171 kts	183 kts	250 kts	171 kts	183 kts
Flaps 10 :	210 kts	162 kts	175 kts	210 kts	173 kts	185 kts	210 kts	171 kts	183 kts	210 kts	171 kts	183 kts
Flaps 15 :	195 kts	152 kts	165 kts	200 kts	163 kts	175 kts	200 kts	161 kts	173 kts	200 kts	161 kts	173 kts
Flaps 25 :	170 kts	142 kts	155 kts	190 kts	153 kts	165 kts	190 kts	151 kts	163 kts	190 kts	151 kts	163 kts
Flaps 30 :	165 kts	134 kts	147 kts	175 kts	150 kts	163 kts	175 kts	149 kts	161 kts	175 kts	149 kts	161 kts
Flaps 40 :	156 kts	132 kts	145 kts	162 kts	143 kts	155 kts	162 kts	141 kts	153 kts	162 kts	141 kts	153 kts

B737 Dimensions (FCOM)

Dimension	-700	-800	SSW	Max8
Width	35.8m		35.9m	
Length	33.6m	39.5m		
Height	12.5m			
Wingtip Height	6.5m	???	???	
Wheel Base	5.7m			
Nose ⇒ Mains	12.6m	15.6m		
Wingtip Turning Radius	17.0m	23.0m	23.1m	22.9m
Nose Turning Radius	17.0	20.1		20.4
Tail Turning Radius	20.0m	22.8m		22.9m
Minimum 180° Width	20.4m	24.3m		24.4m
Min Turnaway - Nose	9.8m	7.4m		7.1m
Min Turnaway - Wingtip	5.4m	5.4m		4.6
Nosewheel Steering Angle	75°			73°

Flap/Gear Limit Speeds

Config	-700	-800	Max8
Flap 1/2/5	250 kts		
Flap 10	210 kts		
Flap 15	195	200 kts	
Flap 25	170	190 kts	
Flap 30	165	175 kts	
Flap 40	156	162	166
ALTN Flap	230 kts		
GEAR EXT	270 kts / M0.82		
GEAR RET	235 kts		
EXTENDED	320 kts / M0.82		

Missed Approach Fuel (C5 2.3.1)

Profile	Fuel	Mins
ILS	850 kg	12 mins
Visual Circuit	300 kg	9 mins
NZQN RNP	1,400 kg	-

Cabin Manager Briefings {A1 15.4}

Pre-Departure Briefing

- Aircraft Serviceability (Cabin Defects) – any SP's
- Taxi Time, Flight Time, Refueling Status
- **Weather/Turb** : Climb, Cruise, Descent, Destination
- Flight Deck Access Password
- Short Sector Turbulence – Consider no Hot Drinks
- **Clearance To Board.**

Pre-Descent Briefing

- Arrival Time, Weather Descent (PA, Signs), Dest Wxr
- **Arrival Gate** : Front/Back Disembarkation
- Aircraft Termination

MIL Arrestor Hook Cables {FCOM L.10.12}

Activity	Main Gear ¹	Nose Gear ^{1,2}
Taxi	No Restriction ³	< 25 kts
Take-off ⁵	No Restriction	< 25 kts
Landing	No Restriction	No Restriction ⁴

1. Main and Nose Gear restrictions applicable for cable raised up to 15.2cm
2. Nose Gear restrictions are structural up to MTOW
3. Avoid Hard Braking while traversing the Cable
4. No Restriction for Landing refers to lower weights (up to MLW)
- Take-off at <MLW continue to meet Take-off restriction
5. An OPT analysis may be required for departure

Useful Tables #8

Commercial Slot System (A1 12.2)		
Port	Dom	Intl
Adelaide	Yes	Yes
Auckland	No	±15
Brisbane	<3 hr ±15	>3 hr ±30
Cairns	No	Yes
Christchurch	No	Yes
Darwin	Yes	Yes
Denpasar	-	Arr : >3hr ±30 Dep : -15/+30
Gold Coast	No	Yes
Melbourne	No	Yes
Perth/Sydney	<3 hr ±15	>3 hr ±30
Townsville	No	Yes
Wellington	No	Yes

COBT Compliance (A1 12.6.1)	
Type of COBT	Compliance Window
Arrivals (BNE/MEL/PER/SYD)	-5 / +15
Departures (PER)	-5 / +10

ICAO Aircraft Design Groups			
Design Group	Wing Span	Gear Width	Example
A	< 15m	< 4.5m	S.E. Acft
B	15 ⇨ < 24m	4.5 ⇨ < 6m	SF340
C	24 ⇨ < 36m	6 ⇨ < 9m	B737
D	36 ⇨ < 52m	9 ⇨ < 14m	B767
E	52 ⇨ < 65m	9 ⇨ < 14m	B747

B737 : Wingspan 35.9m Gear Width 5.7m

Ground Engine Op (A1 15.9)	
Power	Min Dist
Normal slow taxi thrust	30 m
Thrust used to initiate Taxi	46 m

DG Max Dry Ice (A1 20.3.4)		
Compartment	Limit	
Forward	1	100
	2	100
Aft	3	100
	4	100
Maximum Total Cargo		200
Maximum in Cabin		200
Total Dry Ice per Aircraft		400

LAHSO (A1 10.50)	
Active :	Aircraft issued with a Hold Short requirement
Passive :	Unrestricted Landing (Other TFC holding short)
Airports :	YMML RW34 (ACT+PASS), YPDN RW29 (ACT+PASS), YPAD RW05 (PASSIVE)
Considerations :	Weight, Surface, Wind, Experience, Windshear
	LDA ≥ 2,200m
	Max TWC : Dry 5 kts Wet : 0 kts Max XWC : 20 kts
Limitations :	<ul style="list-style-type: none"> No defects affecting landing distance (Active). Cloud Ceiling at least MVA Viz ≥ 8 km (5,000 m by ATC) Braking at least GOOD (<i>Same Perf Cat Acft</i>) Ground based Visual/Elec glideslope required
<ul style="list-style-type: none"> LAHSO Runways will have LAHSO LDA on Jepp 10-9 LAHO Lighting/Marking at Hold Short Point on Active Runway. Readback Hold Short Requirement as well as Landing Clearance. 	

DG Powder Restrit's (A1 18.15.2)	
Inorganic Powders (Restrictions Apply)	Organic Powders (No Restriction)
Salt, Salt Scrub, Sand	Powdered baby formula
Some talcum powders	Powdered food
Some powdered deodorant	Coffee, Flour, Spices, Sugar
Certain foot powders	Most cosmetics
Powdered detergent and cleaning products	Epsom salt

Airport ETU's {A1 8.2.1 / C5 4.3.2.1}	
Aerodrome	ETU
Departure :	ETD ±30
Take-off Alternate :	ETA ±30
Enroute Alternate :	Earliest ETA -30 to Latest ETA +30
EDTO Alternate :	Earliest to Latest ETA
Destination :	ETA ±30
Dest Alternate :	ETA ±30
Isolated Dest :	ETA -30 / +60

EDTO Alternate Weather Minima {A1 13.1.7}		
Instrument Approach	Cloud Ceiling	Visibility
Approach with a DA(H)	DA(H) + 200 ft	Min Viz + 800m
Non-Precision Approach without DA(A)	MDA(H) + 400 ft	Min Viz + 1,500m

The following deteriorations may be ignored:

- PROB30 affecting Cloud Ceiling.
- PROB30/40 contained in the ETU for the first 3 hours of TAF3.

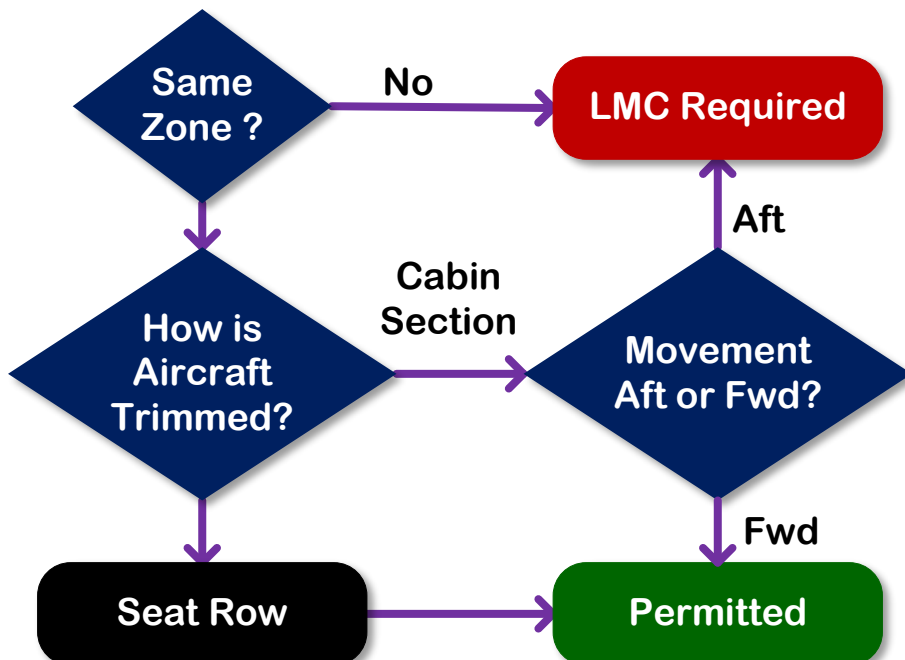
Useful Tables #9

EDTO Maximum Diversion Distance (A1 13.1.4.1)																		
Aircraft Type	60 min Non EDTO				120 min EDTO				180 min EDTO									
	Spd Schd	Ref Wt	Opt FL	Dist	Spd Schd	Ref Wt	Opt FL	Dist	Spd Schd	Ref Wt	Opt FL	Dist						
B737-700 22K	M0.82 340 KIAS	66,777	N/A	415	M0.80 290 KIAS	65,624	FL200	801	M0.79 290 KIAS	62,226	FL206	1196						
B737-700 24K				422	N/A													
B737-800 24K		75,304		418	M0.80 310 KIAS	72,615	FL154	800	M0.79 290 KIAS	70,146	FL193	1173						
B737-800 26K		75,304		431	M0.79 310 KIAS								73,989	FL183	823	70,146	FL211	1198
B737-8 25K		78,224		414	M0.80 310 KIAS								75,870	FL149	790	73,609	FL174	1141

EDTO Sensitive Systems (DDG R27 27Jan22)	
APU	Starter, Generator, Inlet Door, Bleed/Fuel Valve, Fire Detection/Suppression
Anti-Ice	Engine/Wing Anti-Ice/Lights (120); Probe Heat/Lights (120)
Bleed Air	Bleed/Isolation Valves/Lights (120), Check Valves (120)
Cargo	Fire Detection/Suppression/Test
Engine	Start Valve, Generator, Bleed Valves/Trop Off Lights (120), Fire/Overheat Detection/Suppression, Ignition
Fuel	Quantity, Pumps, Crossfeed Valve
Pressurisation	Packs, Flight Deck Indications, Outflow Valve, Pressure Relief Valves, Temperature Control, Equip Exhaust Valves
Misc	STAB OUT OF TRIM light, Wing Overheat Detection

*This table is an indication of EDTO Sensitive Systems – refer to DDG.
(120) indicates EDTO 120 (might be) available.*

Passenger Reseating Requirements



Minimum Toilets {DDG 5.03-000.0}			
Num Pax	<1hr	1-3 hrs	>3 hrs
< 100	0	1	1
100-150	0	1	1
160	0	1	2

- Guidance Only. Consider Young/Elderly.
- Pax must be advised before boarding if no lavatories will be available.

Useful Tables #10

Use of PEDs (A1 14.3)		
PEDs	Example	Procedures
Prohibited	HF/VHF/UHF Radio transceivers; Remote Controlled devices; Portable LCD TV; Two Way Pagers	
Small <1kg and <25cm	Kindle, iPad/Tablets, Smartphones	Approved Gate to Gate in Flight Mode. Secured for Taxi, Takeoff, Landing and Belts On.
Large >1kg and >25cm	Laptops, etc.	Flight Mode on. Stowed for Taxi, Takeoff, Landing, Belts On.
Unrestricted	Hearing Aids, Medical Implants, Electronic Watches, GPS, Cameras, Calculators, Shavers	

De/Anti Ice Type 1 Fluid Mix/Temp Limits (A1 15.1.6)	
Mixture Fluid/Water	Lowest OAT
25% / 75%	+2°C
50% / 50%	-15°C
60% / 40%	-27°C

Problem Pax Management (A1 14.5.7)	
Prior to/During Boarding	During Flight
Guest Services identify behavior	CM assesses the passengers in light of the three types and requests person to stop.
GSM assess for carriage and request person to stop. Boarding denied if necessary	With Captain's permission, CM to advise person they are in violation of CASRs.
If behavior is identified after boarding, CM calls GSM and advises Captain.	With Captain's permission CM notifies Person they are in violation of CASRs.
GSM is responsible for Pax assessment in consultation with CM/Captain. GSM manages any off-load actions.	Captain/CM decide whether to report the incident or have the person met on arrival by authorities.
If boarding/carriage is denied, bags are to be offloaded. GSM/CM to file a formal report.	In the case of violent behavior, Captain is to consider restraint.

Diversion Pax/Bag Offload (A1 14.4.1)	
Diversion Due	Procedure
<ul style="list-style-type: none"> Weather Enroute or at Destination Destination unsuitable due Emergency/Event Curfew at Destination In sufficient Fuel Remaining for Destination Aircraft Malfunction ATC/CASA Govt Instruction/Direction 	If a passenger wishes to disembark then approval to leave baggage on the aircraft must be provided by the Duty Security Officer (DSO).
<ul style="list-style-type: none"> Security/Safety incident occurred on board Medical Emergency on board Other diversion reason 	If a passenger wishes to disembark then approval to leave baggage on the aircraft must be provided by the DSO <u>and</u> Dept of Home Affairs.

Aerobridge Re-Alignment {A1 15.4}	
TOO FAR	Fwd/Aft results in the Primary Door unable to fully open and latch without aerobridge contact. The aircraft must be re-aligned prior to passenger disembarkation.
Requirements :	
<ul style="list-style-type: none"> Ground crew will advise of the requirement to re-align. Tractor/Towbar/Towbarless will need to be called. Advise CM (PA) : All Pax to be Seated, Signs ON, All Cabin Entry/Service Doors Closed. Aircraft Dispatcher to ensure Aircraft clear of Service Equipment / Personnel and the Aerobridge is fully retracted. Steering Lockout Pin will be required (otherwise consider de-powering HYD SYS A) Standard Calls/Procedures for Pushback. 	

Useful Tables #11

22-Feb-24

Aerodrome Curfews (C5 3.3.1)

	Curfew LT	Dest	Altn	Details
YBSU	23:00-05:30	???	???	Outside Hours use requires prior approval.
	23:00 - 06:00	No		Diversions cannot then Depart in Curfew. ¹
YPAD	06:00 - 07:00	Rwy	Ok	B737 must land on the Duty Rwy during "Shoulder Periods".
	21:00 - 23:00			
YBLN	23:59 - 06:00		Ok	Diversions cannot then Depart in Curfew.
YBCG	23:00 - 06:00	No	Ok	Diversions cannot then Depart in Curfew. ¹
YWLM	22:00 - 06:00	No	No	Available as EDTO Altn or Enr ADQ always
	23:00 - 06:00	No	No	Approved aircraft Arrive RW34L/Depart RW16R
YSSY	06:00 - 06:59 ²	AFIX	Ok	Arrivals require AFIX and RW34L only. ³
	22:00 - 23:00	Ok	Ok	Departures from RW16 L/R only. ^{3,4}
NFTF	Sunday	No	No	Prohibited without prior approval.
NZWN	00:00 - 06:00	No	Ok	Diversions cannot then Depart in Curfew.

1. International Diversions may subsequently Depart during Curfew.
2. YSSY 06:00-07:00 and 22:00-23:00 requirements are Sat/Sun only.
3. Unless another Rwy is nominated by YSSY ATC (22:45-23:00 Depart RW16L/R only)
4. Aircraft receiving a Taxi Clearance before Curfew may depart RW16R after Curfew.

Aerodrome Specific Planning Requirements {C5 3.3}

AGGH NVVV	No Ground Start Equipment – Fuel must be provided for APU Burn from Departure to Destination.
NZQN	Cannot be planned as an Alternate (Take-off, Destination, En-Route, Adequate). Night RNP restrictions apply.
YWLM	- Prior permission required as an Alternate (Take-off, Destination, En-Route).
	- Can be used as an EDTO/Adequate without restriction.
YBNA	- Planning requires 30 mins holding fuel in addition to standard requirements {Jepp 10-7}
	- B737 is Weight Limited (B737-700 61,000 kg; B737-800 66,360 kg) in Ballina YBNA/BNK - Beware of Tankering in with potentially a subsequent increase in departure traffic load.

Note : Curfew (YPAD, YBLN, YBCG, YWLM, YSSY, NFTF, NZWN) requirements described separately.

BARS/CHECK Requirements {A1 3.3.2/3}

Qual/Exp	BARS		CHEX ¹		BHPR ¹	
	Capt	F/O	Capt	F/O	Capt	F/O
Licence	ATPL	CPL	ATPL	CPL	ATPL	CPL
Instrument Rating	CIR ME	CIR	-	-	-	-
Total Hours	3,000	500	4,000	1,000	3,000	500
Total Command Hours	2500	-	2,500	-	2,500	-
Total Multi Engine >5,700 kg			1,500	-	1,500	100
Multi Engine Command Hours	500 PIC	100	2,000	100	500	-
Total Multi Engine Hours			-	500		
Total Hours on Type	100 PIC	50	100 ²	100 ²	100 ²	100 ²
Turbine Hours			500 PIC	250	500 PIC	250
Last 90 Days			50	50	50	50
Jet Command Hours			1,250	-		

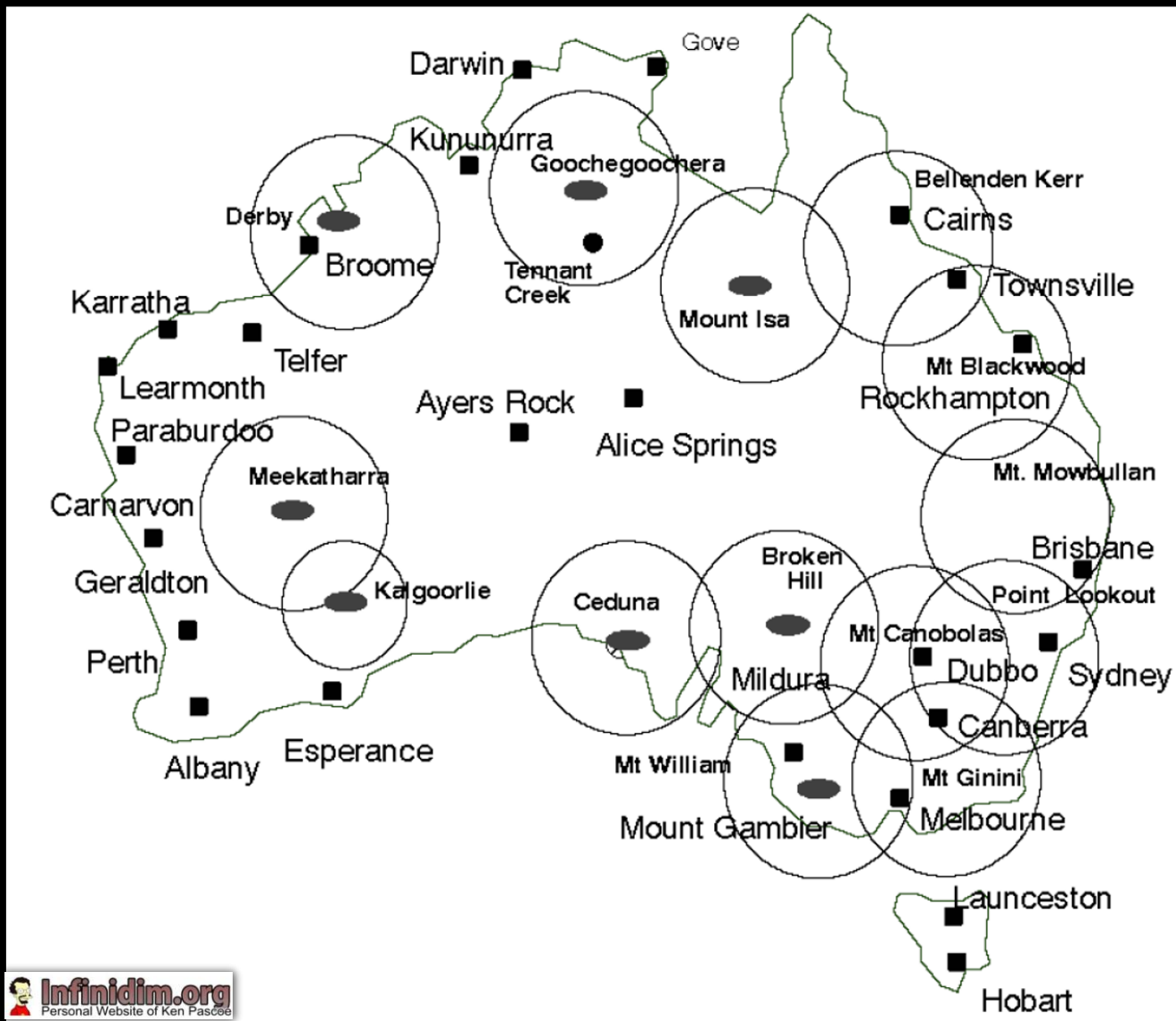
1 : LFUS not permitted on CHEX/BHPR

2 : Hours since Check To Line.

Useful Tables #12

22-Feb-24

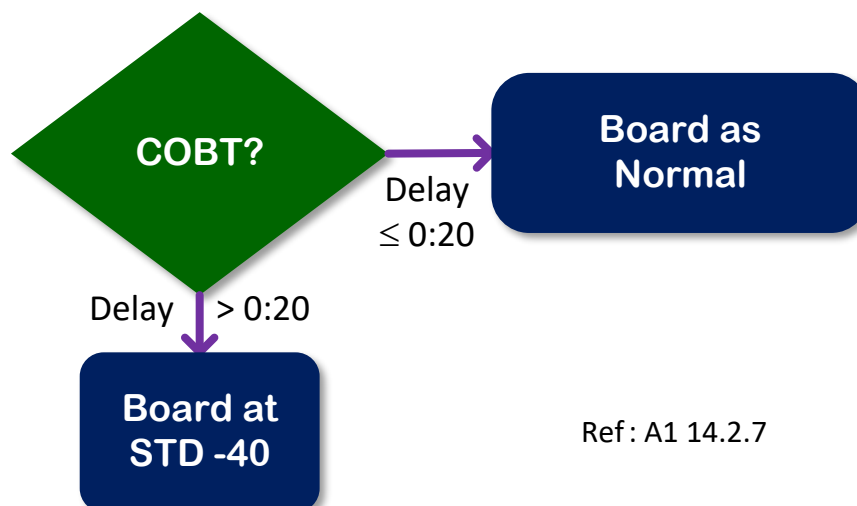
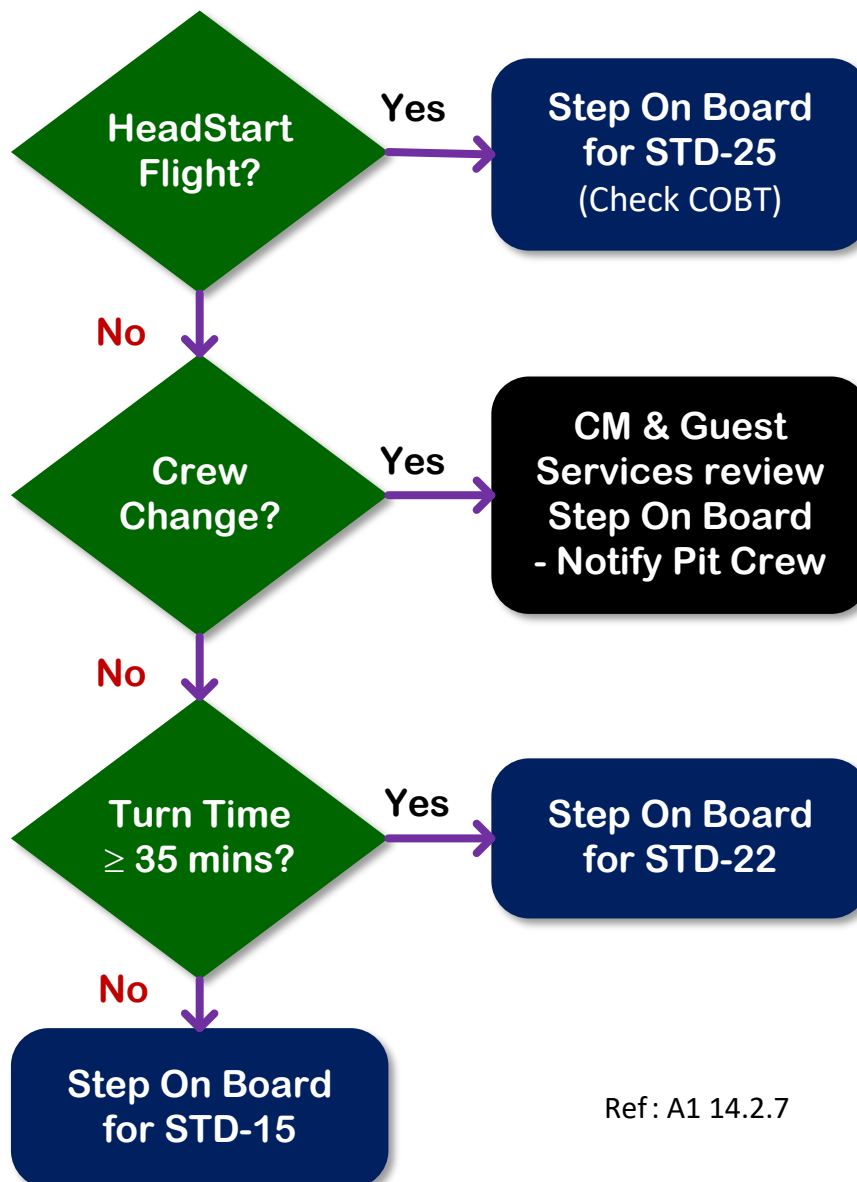
AERIS (API GEN-FIS-1 30Nov23)



Alice Springs	6,676 11,387	H00→H05 H30→H35	Adelaide, Brisbane, Cairns, Darwin, Melbourne, Perth, Sydney, Townsville.
Bellenden Kerr	119.75	H24/Cont.	Amberley, Brisbane, Cairns, Hamilton Island, Mackay, Rockhampton, Townsville.
Broken Hill	128.25	H24/Cont.	Adelaide, Alice Springs, Amberley, Brisbane, Darwin, Melbourne, Sydney.
Ceduna	128.45	H24/Cont.	Adelaide, Alice Springs, Kalgoolie, Melbourne, Perth, Sydney.
Derby	128.45	H24/Cont.	Broome, Darwin, Kununurra, Meekatharra, Perth, Port Hedland.
Goochegoochera	128.45	H24/Cont.	Alice Springs, Cairns, Darwin, Tennant Creek, Tindal, Townsville.
Kalgoolie	128.25	H24/Cont.	Adelaide, Alice Springs, Ceduna, Kalgoolie, Laverton, Perth.
Meekatharra	128.45	H24/Cont.	Broome, Karratha, Meekatharra, Mount Magnet, Paraburdoo, Perth, Port Hedland.
Mt Blackwood	119.85	H24/Cont.	Amberly, Brisbane, cairns, Hamilton Island, Mackay, Rockhampton, Townsville.
Mt Canobolas	127.70	H24/Cont.	Adelaide. Alice Springs, Amberley, Brisbane, Melbourne, Perth, Sydney, Williamtown.
Mt Ginini	128.65	H24/Cont.	Adelaide, Canberra, Hobart, Melbourne, Wagga Wagga.
Mt Isa	120.35	H24/Cont.	Alice Springs, Amberley, Brisbane, Cairns, Mt Isa, Tindal, Townsville.
Mt Mowbullan	119.95	H24/Cont.	Amberley, Brisbane, Gold Coast, Mackay, Rockhampton, Sunshine Coast, Sydney.
My William	119.75	H24/Cont.	Adelaide, Hobart, Launceston, Melbourne, Mildura, Perth.
Point Lookout	119.75	H24/Cont.	Amberley, Brisbane, Canberra, Gold Coast, Melbourne, Rockhampton, Sydney, Williamtown.

- AERIS broadcasts are METAR/SPECI observations. Where forecast information is included it is valid for 3 hours.
 - Elements from Forecasts (TAF/TAF3/FIR SIGMET) are only included only if they occur in the 3 hours of the VOLMET and are "Significant"
Significant Weather : is Weather (Viz/Cloud >SCT) below the (AIP DAP) Alternate Minima; any Thunderstorms or Turbulence

Useful Tables #13



Useful Tables #14

SP 18.1 Single Engine Taxi In SETI

Criteria

- Not in Adverse Wxr, Icing Conditions, LVOPS
- Not on Slippery/Contaminated Taxi/Ramp
- Gross Weight < Max Landing Weight
- No MEL ATA 21 (AirCon) 24 (Elec) 29 (Hyd) 32 (Gear) 36 (Pneu)
- Check Local Regulations 10-7; APU must be serviceable

Considerations

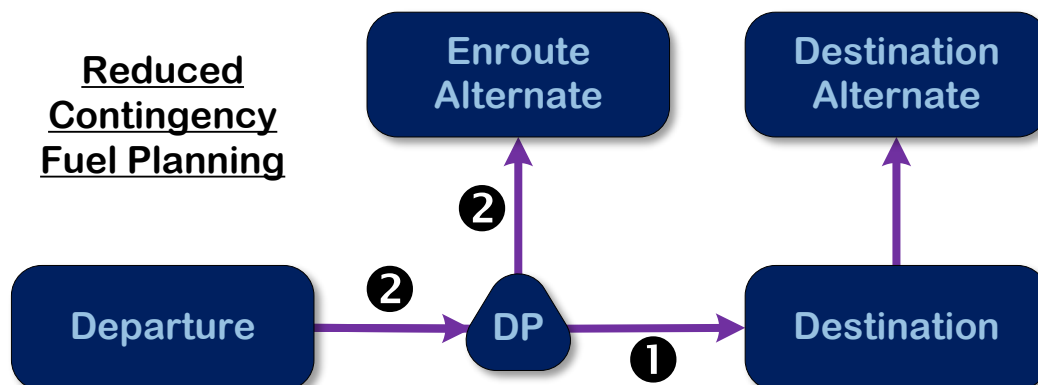
- High OEI Break Away Thrust / Jet Blast effects
- Direction of Turns; Keep Airplane Moving
- Crew Workload; Loss of Airplane Systems; Fuel Imbalance
- Control Difficulties – Stop & Start Engine #2 with APU or Tow

SETI Procedure

- Clear of all in-use Active Runways, SMC contacted
- After Landing Flow complete; 3 minutes cooldown
- Only Engine #2 to be shut down; (APU GEN #2 On Bus ??)

SETI Engine Shutdown

Com/Action	Call Out
When ready :	CA : “Shutdown Number 2 Engine”
Confirm Start Lever :	PM/CA places hand on #2 Start Lever: “Engine Start Lever #2 ... Confirm”
Confirm :	PF/FO : “Confirmed” or “Negative”
Complete Action :	PM/CA selects #2 Start Lever ... Cutoff PM/CA : “Cutoff”
Start Lever By :	Aircraft Moving : PM (FO) Aircraft Stationary : CA



Fuel is provided for the Greater of:

- ① Contingency on DP – Destination only
- ② Contingency on Dest – DP – Enroute Altn

Useful Tables #15

22-Feb-24

RVSM Sensitive Systems (DDG R29 01Dec22)

Auto Flight	Autopilots (CMD, Disengage Sw/Warn/Lts)
Landing Gear	Gear Down Dispatch
Navigation	Transponders; Altitude Alerting; IRS

This indicates RVSM Sensitive Systems – refer to DDG.

B737 Performance Review 1

B737-800WSFP/26K - Gear Up vs Gear Down Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to Gear Down Holding Fuel Flow

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	46%	49%	51%	53%	52%	53%	56%	62%
45 Ton	50%	51%	50%	51%	51%	53%	58%	64%
50 Ton	49%	51%	52%	53%	54%	54%	58%	
55 Ton	49%	51%	52%	53%	53%	58%	62%	
60 Ton	49%	50%	51%	52%	54%	59%	65%	
65 Ton	49%	50%	51%	53%	54%	60%		
70 Ton	48%	50%	50%	52%	55%	60%		
75 Ton	49%	50%	51%	53%	56%			
80 Ton	49%	51%	51%	53%	57%			
85 Ton	49%	51%	52%	54%	58%			

Average : 53% Max : 65%

B737-800WSFP/24K - Gear Up vs Gear Down Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to Gear Down Holding Fuel Flow

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	46%	49%	51%	53%	52%	53%	56%	62%
45 Ton	50%	51%	50%	51%	51%	53%	58%	64%
50 Ton	49%	51%	52%	53%	54%	54%	58%	
55 Ton	49%	51%	52%	53%	53%	58%	62%	
60 Ton	49%	50%	51%	52%	54%	59%	65%	
65 Ton	49%	50%	51%	53%	54%	60%		
70 Ton	48%	50%	50%	52%	55%	60%		
75 Ton	49%	50%	51%	53%	56%			
80 Ton	49%	51%	51%	53%	57%			
85 Ton	49%	51%	52%	54%	58%			

Average : 53% Max : 65%

B737-800W/26K - Gear Up vs Gear Down Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to Gear Down Holding Fuel Flow

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	46%	49%	52%	53%	53%	54%	57%	
45 Ton	50%	52%	51%	52%	53%	54%	59%	
50 Ton	50%	52%	53%	54%	54%	55%	59%	
55 Ton	50%	52%	53%	54%	54%	59%	63%	
60 Ton	50%	51%	52%	53%	55%	60%	66%	
65 Ton	50%	51%	52%	54%	55%	61%		
70 Ton	50%	51%	52%	53%	56%	62%		
75 Ton	49%	51%	52%	53%	57%	64%		
80 Ton	49%	51%	52%	54%	57%			

Average : 54% Max : 66%

B737-700W/22K - Gear Up vs Gear Down Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to Gear Down Holding Fuel Flow

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	47%	50%	52%	53%	53%	54%	58%	62%
45 Ton	50%	52%	52%	52%	53%	54%	58%	65%
50 Ton	50%	52%	52%	53%	54%	54%	59%	
55 Ton	49%	51%	52%	52%	54%	58%	62%	
60 Ton	50%	51%	51%	52%	54%	59%	65%	
65 Ton	49%	51%	51%	52%	55%	59%		
70 Ton	49%	50%	51%	53%	55%	61%		
75 Ton	49%	50%	51%	52%	56%	62%		
80 Ton	49%	50%	51%	52%	56%			

Average : 54% Max : 65%

B737 Performance Review 2

B737-800WSFP/26K - All Eng vs OEI Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to OEI Holding Fuel

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	-17.7%	-15.8%	-14.5%	-14.2%	-13.8%	-12.1%	-10.0%	-0.7%
45 Ton	-14.3%	-13.5%	-14.3%	-12.8%	-12.5%	-10.8%	-5.8%	
50 Ton	-13.6%	-12.4%	-11.1%	-10.7%	-9.2%	-8.7%	-1.2%	
55 Ton	-12.6%	-11.5%	-10.7%	-9.4%	-8.5%	-4.3%		
60 Ton	-11.8%	-10.6%	-9.9%	-8.2%	-6.8%	-1.0%		
65 Ton	-11.4%	-9.9%	-9.2%	-7.6%	-5.9%	3.7%		
70 Ton	-10.3%	-9.3%	-8.6%	-6.6%	-3.8%			
75 Ton	-9.7%	-8.7%	-7.7%	-5.8%	-1.2%			
80 Ton	-9.2%	-7.9%	-6.9%	-4.7%	2.2%			
85 Ton	-8.7%	-7.5%	-5.8%	-3.4%				

Average : -9% Max : 4% Min : -18%

B737-800WSFP/24K - All Eng vs OEI Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to OEI Holding Fuel

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	-18%	-16%	-14%	-14%	-14%	-12%	-10%	-1%
45 Ton	-14%	-14%	-14%	-13%	-13%	-11%	-6%	
50 Ton	-14%	-12%	-11%	-11%	-9%	-9%	-1%	
55 Ton	-13%	-12%	-11%	-9%	-8%	-4%		
60 Ton	-12%	-11%	-10%	-8%	-7%	-1%		
65 Ton	-11%	-10%	-9%	-8%	-6%	4%		
70 Ton	-10%	-9%	-9%	-7%	-4%			
75 Ton	-10%	-9%	-8%	-6%	-1%			
80 Ton	-9%	-8%	-7%	-5%				
85 Ton	-9%	-7%	-6%	-3%				

Average : -9% Max : 4% Min : -18%

B737-800W/26K - All Eng vs OEI Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to OEI Holding Fuel

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	-27%	-25%	-24%	-24%	-23%	-23%	-21%	-19%
45 Ton	-25%	-24%	-24%	-24%	-24%	-23%	-21%	-18%
50 Ton	-25%	-24%	-23%	-23%	-23%	-23%	-21%	
55 Ton	-25%	-24%	-24%	-23%	-23%	-21%	-18%	
60 Ton	-25%	-25%	-24%	-23%	-23%	-20%	-17%	
65 Ton	-25%	-25%	-24%	-23%	-23%	-20%		
70 Ton	-25%	-24%	-24%	-24%	-22%	-19%		
75 Ton	-25%	-24%	-24%	-23%	-22%	-18%		
80 Ton	-25%	-24%	-24%	-23%	-21%			

Average : -23% Max : -17% Min : -27%

B737-700W/22K - All Eng vs OEI Comparison
Holding Altitude (Fuel Flow)
Fuel Flow % Increase to OEI Holding Fuel

Weight	1,500	5,000	10,000	15,000	20,000	25,000	30,000	35,000
40 Ton	-27%	-25%	-24%	-23%	-24%	-24%	-21%	-19%
45 Ton	-25%	-24%	-24%	-24%	-24%	-23%	-21%	-18%
50 Ton	-25%	-24%	-24%	-23%	-23%	-23%	-20%	
55 Ton	-25%	-25%	-24%	-24%	-23%	-21%	-19%	
60 Ton	-25%	-24%	-24%	-24%	-23%	-20%	-18%	
65 Ton	-25%	-25%	-24%	-24%	-23%	-20%		
70 Ton	-26%	-25%	-24%	-24%	-23%	-20%		
75 Ton	-25%	-25%	-24%	-24%	-22%	-19%		
80 Ton	-26%	-25%	-24%	-24%	-22%			

Average : -23% Max : -18% Min : -27%

B737 Performance Review 3

B737-700W/22K - OEI Gear Dn Compare Holding Altitude (Fuel Flow)

FF % Inc to Gear Down OEI

Weight	1,500	5,000	10,000	15,000
40 Ton	34%	37%	41%	45%
45 Ton	38%	41%	42%	46%
50 Ton	38%	41%	45%	50%
55 Ton	39%	42%	46%	
60 Ton	40%	44%		
65 Ton	41%	45%		
70 Ton	42%			

Average : 42% Max : 50% Min : 34%

B737-800W/26K - OEI Gear Dn Compare Holding Altitude (Fuel Flow)

FF % Inc to Gear Down OEI

Weight	1,500	5,000	10,000	15,000
40 Ton	33%	37%	40%	45%
45 Ton	37%	40%	42%	46%
50 Ton	38%	42%	46%	51%
55 Ton	39%	43%	47%	57%
60 Ton	41%	44%	49%	
65 Ton	42%	46%	52%	
70 Ton	43%	47%		
75 Ton	44%	49%		
80 Ton	46%			

Average : 44% Max : 57% Min : 33%

B737-800WSFP/24K - OEI Gear Dn Compare Holding Altitude (Fuel Flow)

FF % Inc to Gear Down OEI

Weight	1,500	5,000	10,000	15,000
40 Ton	32%	35%	39%	44%
45 Ton	37%	39%	40%	45%
50 Ton	37%	41%	45%	50%
55 Ton	38%	42%	46%	
60 Ton	40%	43%	48%	
65 Ton	41%	45%		
70 Ton	42%			
75 Ton				
80 Ton				

Average : 41% Max : 50% Min : 32%

B737-800WSFP/26K - OEI Gear Dn Compare Holding Altitude (Fuel Flow)

FF % Inc to Gear Down OEI

Weight	1,500	5,000	10,000	15,000
40 Ton	32.3%	35.4%	39.5%	43.9%
45 Ton	36.6%	39.4%	40.5%	45.1%
50 Ton	36.6%	40.5%	45.0%	49.7%
55 Ton	38.3%	42.0%	45.9%	55.7%
60 Ton	39.8%	43.1%	47.6%	
65 Ton	40.9%	44.8%	50.4%	
70 Ton	42.1%	46.2%		
75 Ton	43.3%	47.9%		
80 Ton	45.1%			

Average : 43% Max : 56% Min : 32%

B737 Performance Review 4

22-Feb-24

B737-800WSFP/26K - Long Range Cruise Control - SAR

Weight	25,000	27,000	29,000	31,000	33,000	35,000	37,000	39,000	41,000
40 Ton	4.9	4.8	4.6	4.4	4.2	4.0	3.9	3.8	3.8
45 Ton	5.1	4.9	4.7	4.5	4.4	4.3	4.2	4.1	4.0
50 Ton	5.3	5.1	4.9	4.7	4.6	4.5	4.4	4.3	4.2
55 Ton	5.5	5.3	5.1	5.0	4.9	4.7	4.6	4.6	4.5
60 Ton	5.7	5.5	5.4	5.3	5.1	4.9	4.9	4.9	5.0
65 Ton	5.9	5.8	5.7	5.5	5.3	5.2	5.2	5.3	
70 Ton	6.2	6.1	5.9	5.7	5.6	5.5	5.5		
75 Ton	6.5	6.3	6.1	6.0	5.9	5.8	6.1		
80 Ton	6.7	6.5	6.4	6.3	6.2	6.3			
85 Ton	7.0	6.8	6.6	6.5	6.5				

Average : 5.3 Max : 7.0 Min : 3.8

B737-800WSFP/26K - OEI Long Range Cruise Control - SAR

Weight	10,000	15,000	17,000	19,000	21,000	23,000	25,000	27,000	29,000	31,000
40 Ton	5.9	5.3	5.1	4.9	4.7	4.6	4.4	4.3	4.2	4.1
45 Ton	6.2	5.6	5.4	5.2	5.0	4.9	4.7	4.6	4.5	4.5
50 Ton	6.5	5.9	5.7	5.5	5.4	5.2	5.1	5.0	4.9	
55 Ton	6.8	6.2	6.0	5.8	5.7	5.5	5.4	5.4		
60 Ton	7.1	6.5	6.3	6.2	6.0	5.8	5.8			
65 Ton	7.4	6.9	6.7	6.5	6.3	6.2				
70 Ton	7.7	7.2	7.0	6.8	6.7					
75 Ton	8.0	7.5	7.3	7.1						
80 Ton	8.3	7.8	7.6	7.5						
85 Ton	8.6	8.1	8.0							

Average : 6.0 Max : 8.6 Min : 4.1

B737-800WSFP/26K

All Engine vs OEI LRC SAR Change

Weight	25,000	27,000	29,000	31,000
40 Ton	-10%	-9%	-8%	-5%
45 Ton	-7%	-5%	-3%	+0%
50 Ton	-4%	-2%	+1%	
55 Ton	-2%	+2%		
60 Ton	+2%			
65 Ton				

Average: -4% Max: 2% Min: -10%

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B737-800WSFP/26K - Long Range Cruise Control - SAR

Weight	25,000	27,000	29,000	31,000	33,000	35,000	37,000	39,000	41,000
40 Ton	4.9	4.8	4.6	4.4	4.2	4.0	3.9	3.8	3.8
45 Ton	5.1	4.9	4.7	4.5	4.4	4.3	4.2	4.1	4.0
50 Ton	5.3	5.1	4.9	4.7	4.6	4.5	4.4	4.3	4.2
55 Ton	5.5	5.3	5.1	5.0	4.9	4.7	4.6	4.6	4.5
60 Ton	5.7	5.5	5.4	5.3	5.1	4.9	4.9	4.9	5.0
65 Ton	5.9	5.8	5.7	5.5	5.3	5.2	5.2	5.3	
70 Ton	6.2	6.1	5.9	5.7	5.6	5.5	5.5		
75 Ton	6.5	6.3	6.1	6.0	5.9	5.8	6.1		
80 Ton	6.7	6.5	6.4	6.3	6.2	6.3			
85 Ton	7.0	6.8	6.6	6.5	6.5				

Average : 5.3 Max : 7.0 Min : 3.8

B737-800WSFP/26K - Gear Down Long Range Cruise Control - SAR

Weight	10,000	21,000	23,000	25,000	27,000	29,000	31,000	33,000	35,000
40 Ton	10.8	8.6	8.2	8.0	7.7	7.5	7.3	7.0	6.9
45 Ton	11.3	9.1	8.8	8.5	8.3	8.0	7.8	7.6	7.6
50 Ton	11.9	9.7	9.3	9.1	8.8	8.6	8.4	8.4	
55 Ton	12.4	10.2	9.9	9.6	9.3	9.2	9.1		
60 Ton	13.0	10.8	10.4	10.1	9.9	9.9			
65 Ton	13.5	11.3	11.0	10.7	10.6				
70 Ton	14.1	11.8	11.5						
75 Ton	14.7	12.4							
80 Ton	15.2								
85 Ton	15.7								

Average : 10.0 Max : 15.7 Min : 6.9

B737-800WSFP/26K All Engine vs Gear Down LRC SAR Change

Weight	25,000	27,000	29,000	31,000	33,000	35,000
40 Ton	+61%	+63%	+65%	+67%	+69%	+71%
45 Ton	+68%	+70%	+72%	+73%	+73%	+78%
50 Ton	+72%	+74%	+75%	+77%	+82%	
55 Ton	+75%	+76%	+78%	+82%		
60 Ton	+78%	+79%	+83%			
65 Ton	+80%	+83%				
70 Ton						

Average : 74% Max : 83% Min : 61%

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22-Feb-24

B737-800WSFP/26K - OEI Gear Down Long Range Cruise Control - SAR

Weight	5,000	7,000	9,000	11,000	13,000	15,000	17,000	19,000	21,000	23,000
40 Ton	21.8	21.0	20.2	19.5	19.0	18.4	17.8	17.3	17.1	17.4
45 Ton	23.0	22.3	21.5	20.9	20.3	19.8	19.3	19.2		
50 Ton	24.3	23.6	22.9	22.3	21.7	21.3	21.4			
55 Ton	25.6	24.9	24.3	23.7	23.4					
60 Ton	27.0	26.4	25.7	25.3						
65 Ton	28.5	27.8	27.4							
70 Ton	29.9									

Average : 22.4 Max : 29.9 Min : 17.1

B737 Cold Weather Missed Approach Climb Gradient Capability

Aircraft Type	↗	Flap 1 ≤ 600 ft			Flap 1 ≤ 1,900 ft			Flap 1 ≤ 2,500 ft		
		EAI	EAI+WAI	ICE ACC	EAI	EAI+WAI	ICE ACC	EAI	EAI+WAI	ICE ACC
VOK (Non SFP 26K) <i>MLW : 66,360</i>	2.5%	MTOW	MTOW	MTOW	MTOW	MTOW	78,200	MTOW	MTOW	76,900
	3.3%	MTOW	MTOW	75,600	MTOW	MTOW	73,100	MTOW	MTOW	71,900
	4.0%	MTOW	78,200	71,500	76,700	75,700	69,200	75,300	74,300	68,100
	5.0%	73,000	72,200	66,500	70,700	69,900	64,400	69,500	68,700	63,300
	6.0%									
YIA (SFP 26K) <i>MLW : 66,360</i>	2.5%	MTOW	MTOW	MTOW	MTOW	MTOW	77,400	MTOW	MTOW	75,900
	3.3%	MTOW	MTOW	74,900	MTOW	MTOW	72,500	MTOW	78,500	71,100
	4.0%	78,600	77,800	70,900	76,200	75,300	68,600	74,900	73,900	67,500
	5.0%	72,700	71,900	66,100	70,400	69,600	63,900	69,100	68,300	62,700
	6.0%	67,700	66,900	61,800						
8IA (Max 25K) <i>MLW : 69,308</i>	2.5%	MTOW	80,700	74,500	80,500	77,600	71,700			
	3.3%	78,000	75,500	70,200	75,100	72,600	67,500			
	4.0%	73,700	71,500	66,900	71,000	68,700	64,300			
	5.0%	68,400	66,600	62,600	65,800	64,000	60,200			
	6.0%	63,900	62,400	59,000						
B737-700 (22k) <i>MLW : 58,604</i>	2.5%	MTOW	MTOW	69,500	MTOW	MTOW	68,100	MTOW	MTOW	67,400
	3.3%	MTOW	69,800	65,400	68,700	68,200	64,000	68,000	67,400	63,200
	4.0%	64,400	66,000	62,100	64,900	64,400	60,700	64,200	63,600	60,000
	5.0%	61,600	61,200	57,900	60,100	59,800	56,500	59,400	59,000	55,800
	6.0%	57,400	57,000	54,200						
B737-700 (24K) <i>MLW : 58,604</i>	2.5%	MTOW	MTOW	MTOW	MTOW	MTOW	MTOW	MTOW	MTOW	MTOW
	3.3%	MTOW	MTOW	69,200	MTOW	MTOW	67,400	MTOW	MTOW	66,700
	4.0%	MTOW	69,800	65,800	68,600	68,000	64,000	67,800	67,200	63,300
	5.0%	65,400	64,800	61,300	63,600	63,000	59,600	62,800	62,200	58,900
	6.0%									
B737-800 (SFP 24k) <i>MLW : 66,360</i>	2.5%	MTOW	MTOW	73,400	MTOW	MTOW	71,400	MTOW	78,300	70,500
	3.3%	76,400	75,800	68,700	74,400	73,800	66,900	73,500	72,700	66,100
	4.0%	72,000	71,400	65,100	70,100	69,500	63,400	69,300	68,500	62,500
	5.0%	66,500	66,000	60,600	64,700	64,100	59,000	63,900	63,300	58,300
	6.0%									

Chart Assumptions : Icing Conditions for Approach/Landing; Engine Bleeds OFF; OAI ≤ 10°

NOT FOR OPERATIONAL USE - COMPARITIVE/EDUCATIONAL PURPOSES ONLY.

< Max Landing Weight

B737 Performance Review 7

22-Feb-24

Landing Analysis - B737-800 SFP 26K : Launceston (YMLT/LST)

LDA : 1,981 m	Max Man	Max Auto	AutoBrk 3	Auto Brk 2	Auto Brk 1
Normal F30 :	1,493 m	1,469 m	1,977 m	2,427 m	2,645 m
Normal F40 :	1,661 m	1,603 m	2,111 m	2,618 m	2,872 m
Airspeed Unreliable F15 :	1,455 m	1,669 m	2,921 m	2,699 m	2,921 m
Airspeed Unreliable F30 :	1,400 m	1,596 m	2,084 m	2,505 m	2,700 m
Airspeed Unreliable F40 :	1,351 m	1,520 m	1,941 m	2,363 m	2,562 m
All Flaps UP :	1,872 m	2,198 m	3,082 m	3,831 m	4,189 m
Antiskid Inop F15 :	2,122 m				
Antiskid Inop F30 :	2,031 m				
Antiskid Inop F40 :	1,953 m				
Jam/Res Flight Controls :	1,411 m	1,608 m	2,121 m	2,603 m	2,828 m
LE Flaps Transit :	1,557 m	1,805 m	2,424 m	2,918 m	3,147 m
Loss Sys A F30 :	1,566 m	1,648 m	1,998 m	2,581 m	2,952 m
Loss Sys A F40 :	1,499 m	1,555 m	1,857 m	2,379 m	2,737 m
Loss Sys B :	1,624 m				
Loss Sys A&B :	2,276 m				
Manual Reversion :	2,276 m				
Engine Inop F15 :	1,447 m	1,651 m	2,120 m	2,710 m	3,062 m
Engine Inop F30 :	1,394 m	1,579 m	1,985 m	2,509 m	2,807 m
Stab Trim Inop :	1,411 m	1,608 m	2,121 m	2,603 m	2,828 m
TE Flap Asym Flap 1 .. <15 :	1,539 m	1,816 m	2,464 m	2,960 m	3,191 m
TE Flap Asym Flap 15 .. <30 :	1,411 m	1,608 m	2,121 m	2,603 m	2,828 m
TE Flap Asym Flap 30 .. 40 :	1,360 m	1,540 m	1,992 m	2,413 m	2,615 m
TE Disagree Flap 1 .. 15 :	1,539 m	1,816 m	2,464 m	2,960 m	3,191 m
TE Disagree Flap 15 .. <30 :	1,411 m	1,608 m	2,121 m	2,603 m	2,828 m
TE Disagree Flap 30 .. 40 :	1,360 m	1,540 m	1,992 m	2,413 m	2,615 m
TE Flaps UP :	1,690 m	1,971 m	2,713 m	3,351 m	3,657 m
Conditions : Max LDW, Wet/SKR, Nil Wind, ISA	Factored	Unfactored	< 150m	Insufficient	

B737 Performance Review 8

22-Feb-24

Landing Analysis - B737-800 SFP 26K : Launceston (YMLT/LST)

LDA : 1,981 m	Max Man	Max Auto	AutoBrk 3
Normal F30 :	1,493 m	1,469 m	1,977 m
Normal F40 :	1,661 m	1,603 m	N/A
Airspeed Unreliable F15 :	1,455 m	1,669 m	N/A
Airspeed Unreliable F30 :	1,400 m	1,596 m	N/A
Airspeed Unreliable F40 :	1,351 m	1,520 m	1,941 m
All Flaps UP :	1,872 m	N/A	N/A
Antiskid Inop F15 :	N/A	N/A	N/A
Antiskid Inop F30 :	N/A	N/A	N/A
Antiskid Inop F40 :	1,953 m	N/A	N/A
Jam/Res Flight Controls :	1,411 m	1,608 m	N/A
LE Flaps Transit :	1,557 m	1,805 m	N/A
Loss Sys A F30 :	1,566 m	1,648 m	N/A
Loss Sys A F40 :	1,499 m	1,555 m	1,857 m
Loss Sys B :	1,624 m	N/A	N/A
Loss Sys A&B :	N/A	N/A	N/A
Manual Reversion :	N/A	N/A	N/A
Engine Inop F15 :	1,447 m	1,651 m	N/A
Engine Inop F30 :	1,394 m	1,579 m	N/A
Stab Trim Inop :	1,411 m	1,608 m	N/A
TE Flap Asym Flap 1 .. <15 :	1,539 m	1,816 m	N/A
TE Flap Asym Flap 15 .. <30 :	1,411 m	1,608 m	N/A
TE Flap Asym Flap 30 .. 40 :	1,360 m	1,540 m	N/A
TE Disagree Flap 1 .. 15 :	1,539 m	1,816 m	N/A
TE Disagree Flap 15 .. <30 :	1,411 m	1,608 m	N/A
TE Disagree Flap 30 .. 40 :	1,360 m	1,540 m	N/A
TE Flaps UP :	1,690 m	1,971 m	N/A
	<150m	Factored	Unfactored

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22-Feb-24

Landing Analysis - B737-800 SFP 26K : Gold Coast (YBCG/OOL) RW32

LDA : 2,042 m	Max Man	Max Auto	AutoBrk 3	Auto Brk 2	Auto Brk 1
Normal F30 :	1,468 m	1,447 m	1,945 m	2,374 m	2,577 m
Normal F40 :	1,420 m	1,373 m	1,809 m	2,229 m	2,434 m
Airspeed Unreliable F15 :	1,426 m	1,639 m	2,187 m	2,632 m	2,837 m
Airspeed Unreliable F30 :	1,373 m	1,567 m	2,046 m	2,444 m	2,624 m
Airspeed Unreliable F40 :	1,325 m	1,493 m	1,907 m	2,306 m	2,492 m
All Flaps UP :	1,829 m	2,158 m	3,028 m	3,736 m	4,065 m
Antiskid Inop F15 :	2,068 m				
Antiskid Inop F30 :	1,980 m				
Antiskid Inop F40 :	1,904 m				
Jam/Res Flight Controls :	1,384 m	1,581 m	2,087 m	2,543 m	2,750 m
LE Flaps Transit :	1,526 m	1,773 m	2,383 m	2,846 m	3,056 m
Loss Sys A F30 :	1,533 m	1,618 m	1,966 m	2,536 m	2,881 m
Loss Sys A F40 :	1,469 m	1,527 m	1,827 m	2,340 m	2,675 m
Loss Sys B :	1,590 m				
Loss Sys A&B :	2,219 m				
Manual Reversion :	2,219 m				
Engine Inop F15 :	1,419 m	1,621 m	2,085 m	2,658 m	2,986 m
Engine Inop F30 :	1,368 m	1,552 m	1,952 m	2,460 m	2,738 m
Stab Trim Inop :	1,384 m	1,581 m	2,087 m	2,543 m	2,759 m
TE Flap Asym Flap 1 .. <15 :	1,510 m	1,785 m	2,421 m	2,888 m	3,101 m
TE Flap Asym Flap 15 .. <30 :	1,384 m	1,581 m	2,087 m	2,543 m	2,750 m
TE Flap Asym Flap 30 .. 40 :	1,335 m	1,513 m	1,960 m	2,359 m	2,545 m
TE Disagree Flap 1 .. 15 :	1,510 m	1,785 m	2,421 m	2,888 m	3,101 m
TE Disagree Flap 15 .. <30 :	1,384 m	1,581 m	2,087 m	2,543 m	2,750 m
TE Disagree Flap 30 .. 40 :	1,335 m	1,513 m	1,960 m	2,359 m	2,545 m
TE Flaps UP :	1,656 m	1,937 m	2,667 m	3,270 m	3,551 m
Conditions : Max LDW, Wet/SKR, Nil Wind, ISA	Factored	Unfactored	< 150m	Insufficient	



This analysis is Approximations Only for Familiarity and NOT OPERATIONAL USE



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22-Feb-24

Landing Analysis - B737-800 SFP 26K : Gold Coast (YBCG/OOL) RW32

LDA : 2,042 m	Max Man	Max Auto	AutoBrk 3
Normal F30 :	1,468 m	1,447 m	1,945 m
Normal F40 :	1,420 m	1,373 m	1,809 m
Airspeed Unreliable F15 :	1,426 m	1,639 m	N/A
Airspeed Unreliable F30 :	1,373 m	1,567 m	N/A
Airspeed Unreliable F40 :	1,325 m	1,493 m	1,907 m
All Flaps UP :	1,829 m	N/A	N/A
Antiskid Inop F15 :	N/A	N/A	N/A
Antiskid Inop F30 :	1,980 m	N/A	N/A
Antiskid Inop F40 :	1,904 m	N/A	N/A
Jam/Res Flight Controls :	1,384 m	1,581 m	N/A
LE Flaps Transit :	1,526 m	1,773 m	N/A
Loss Sys A F30 :	1,533 m	1,618 m	1,966 m
Loss Sys A F40 :	1,469 m	1,527 m	1,827 m
Loss Sys B :	1,590 m	N/A	N/A
Loss Sys A&B :	N/A	N/A	N/A
Manual Reversion :	N/A	N/A	N/A
Engine Inop F15 :	1,419 m	1,621 m	N/A
Engine Inop F30 :	1,368 m	1,552 m	1,952 m
Stab Trim Inop :	1,384 m	1,581 m	N/A
TE Flap Asym Flap 1 .. <15 :	1,510 m	1,785 m	N/A
TE Flap Asym Flap 15 .. <30 :	1,384 m	1,581 m	N/A
TE Flap Asym Flap 30 .. 40 :	1,335 m	1,513 m	1,960 m
TE Disagree Flap 1 .. 15 :	1,510 m	1,785 m	N/A
TE Disagree Flap 15 .. <30 :	1,384 m	1,581 m	N/A
TE Disagree Flap 30 .. 40 :	1,335 m	1,513 m	1,960 m
TE Flaps UP :	1,656 m	1,937 m	N/A
	<150m	Factored	Unfactored



Conditions : Max LDW, Wet/SKR, Nil Wind, ISA

This analysis is Approximations Only for Familiarity and NOT OPERATIONAL USE

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22-Feb-24

B737-800 SFP 26K Brake Energy										
Adjusted Brake Energy Per Brake - No Reverse Thrust										
REFERENCE BRAKE ENERGY PER BRAKE (MILLIONS OF FOOT POUNDS)										
LANDING	EVENT	10	20	30	40	50	60	70	80	90
	RTO Max Man	10	20	30	40	50	60	70	80	90
	Max Man	7.8	16.3	25.3	34.7	44.7	55	65.7	76.6	87.9
	Max Auto	7.5	15.4	23.6	32.4	41.8	51.8	62.5	74.1	86.5
	Autobrake 3	7.3	14.7	22.3	30.2	38.6	47.6	57.4	68.1	80
	Autobrake 2	7	13.8	20.5	27.4	34.8	42.7	51.5	61.3	72.4
	Autobrake 1	6.7	13.1	19.2	25.3	31.8	38.8	46.6	55.4	65.5
Adjusted Brake Energy Per Brake - Two Engine Reverse Thrust										
REFERENCE BRAKE ENERGY PER BRAKE (MILLIONS OF FOOT POUNDS)										
LANDING	EVENT	10	20	30	40	50	60	70	80	90
	RTO Max Man	10	20	30	40	50	60	70	80	90
	Max Man	7	14.6	22.8	31.4	40.5	49.9	59.7	69.8	80
	Max Auto	5.8	12.3	19.5	27.2	35.6	44.5	53.9	63.7	74.1
	Autobrake 3	4.3	9.2	14.7	20.7	27.2	34.4	42	50.2	59
	Autobrake 2	2.5	5.6	9.1	13.1	17.8	23	28.8	35.2	42.3
	Autobrake 1	1.8	3.8	6.1	8.8	11.9	15.5	19.6	24.4	29.8
Increase in Brake Energy for No Reverse Thrust										
LANDING	Max Man	11%	12%	11%	11%	10%	10%	10%	10%	10%
	Max Auto	29%	25%	21%	19%	17%	16%	16%	16%	17%
	Autobrake 3	70%	60%	52%	46%	42%	38%	37%	36%	36%
	Autobrake 2	180%	146%	125%	109%	96%	86%	79%	74%	71%
	Autobrake 1	272%	245%	215%	188%	167%	150%	138%	127%	120%

B737-800SFP/26K Recommended Brake Cooling Schedule Brake Energy (Million Foot Pounds)

≤ 16	17	19	20.9	23.5	26.9	29.4	30 TO 41	≥ 41
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BTMS Indications

INFLIGHT GEAR DOWN GROUND	≤ 2.5	2.6	3.0	3.3	3.8	4.5	4.9	5.0 .. 7.1 CAUTION	≥ 7.1 FUSE PLUG MELT ZONE
	NO SPECIAL PROCEDURE REQUIRED	1.0	4.0	5.0	6.0	7.0	7.6		
		6.7	16.0	24.1	34.2	45.9	53.3		

Numbers are Cooling Time in Minutes (Inflight Gear Down or On Ground). Observe Max QTW.