



# Route Information Manual

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## ROUTE INFORMATION MANUAL FEEDBACK

Feedback on the contents of this manual is always welcomed and appreciated. The objective is to make this manual as useful and relevant to our simulated world as possible, so whether you have any real-world tips or advice, some feedback based on a visit to an airfield in the sim, or any VATSIM-specific pointers or procedures in use at an airfield or within a region, please do get in touch.

Feedback to: [simon.kelsey@bavirtual.co.uk](mailto:simon.kelsey@bavirtual.co.uk)

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**PORT MORESBY (POM/AYPY)**

Elevation 129ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- The airfield is located 8 km outside Port Moresby and is the largest and busiest airport in Papua New Guinea.
- Terrain rises sharply to the N and E with MSAs of 14,500ft within 30nm

**Threat Based Briefing Topics****CFIT**

- The Owen Stanley Range lies to the north, with very high peaks.
- Mt Victoria at 13,248ft 40nm NE is the highest point in the range
- The 2,000ft contour lies within 5nm, with terrain rising to over 3,000ft within 10nm and 8,000ft within 35nm
- There is also high ground within 5nm either side of the Rwy 14L extended centreline at approx. 7nm

**ARRIVAL**

- No STARs published. Expect radar vectors to final approach.
- A minimum radar vectoring altitudes chart is provided in Lido and should be referenced to verify terrain clearance
- No ILS Rwy 32.

**GROUND**

- Backtrack required for Rwy 32 departures (Worldflight likely to use Twy G)

**DEPARTURE**

- No published SIDs. Expect radar vectoring to enroute track after departure.

**WEATHER**

- Temperatures are relatively constant throughout the year
- Wet season runs Dec-May
- Dry season Jun-Nov associated with SE trade winds
- Mean daily max/min temperatures 32°C/23°C

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift not permitted

<b>IF ONLY Electrical Power is required</b>	<b>Use GPU</b>
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**THULE (THU/BGTL)**

Elevation 252ft

**CATEGORY C**

AV brief not available.

**GENERAL**

- Thule is the USAF's northernmost base, located 650nm north of the Arctic Circle and only 820nm from the North Pole.
- The airfield is located on a plain in northern Greenland, on the south shore of North Star Bay. The settlement of Qaanaaq is some 50nm north of the base and accessible only by air to Qaanaaq Airport (NAQ/BGQQ, LDA 900m).
- Military only airfield operated by the USAF.

**Threat Based Briefing Topics****CFIT**

- Terrain rises sharply S and E of the airfield, with spot heights of 934ft within 1nm NE, 820ft ~1.5nm SE and 3,100ft within 10nm S
- TRUE bearings are used due to the very high westerly variation (48°W). Take care to ensure the correct heading reference is used to ensure correct tracking.
- Altitudes published on IACs are not temperature corrected

**Loss of Control**

- Severe downdraughts and WINDSHEAR can be expected on final with strong southerly winds

**ARRIVAL****Approach**

- The only instrument approaches available are to Rwy 08T, as terrain precludes the establishment of an instrument approach to Rwy 26T.
- DME arc procedures are in use. Note minimum altitudes on the arc and consider temperature correction as appropriate.
- In strong winds, severe turbulence can be generated in the ice cap area to the north of the airfield
- Autopilot **must** be disconnected by 600ft aal on all approaches

**DEPARTURE**

- Initial climb to a Flight Level
- Expect WENSA 2 departure

**WEATHER**

- Thule/Qaanaaq experiences long, cold winters. Temperatures seldom rise above freezing Sept-May, and rarely exceed 10°C in July.
- Average mean daily high/low 7°C/2°C (Jul), -20°C/-28°C (Feb)
- Midnight Sun lasts from Apr-Aug. Days shorten rapidly after August, and there is permanent darkness Nov-Jan.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (keep ground power connected to reduce APU fuel burn)



## OTTAWA (YOW/CYOW)

Elevation 377ft

### CATEGORY A

No AV brief required.

### ARRIVAL

#### Diversion Airports

MONTREAL	YUL/CYUL	082 nm/084°T	CAT A
TORONTO	YYZ/CYYZ	192 nm/236°T	CAT A

### WEATHER

- Snowfall averages 18" per month from Nov to Mar. During snowstorms visibility may reduce to 1,500m with cloud base down to 400ft
- Early morning fog may drift across the airfield from the direction of the river when light NE'ly winds prevail

### OPERATIONAL INFORMATION

Handling Agent	Swissport
Handling Agent VHF	
Potable Water	Not assessed

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

## VANCOUVER (YVR/CYVR)

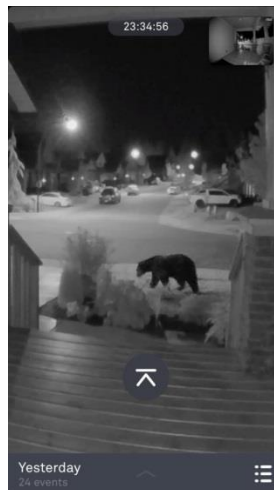
Elevation 13ft

### CATEGORY A

No AV brief required.

### GENERAL

- Airfield is situated 2nm to the S of the city of Vancouver at the mouth of the River Fraser
- Significant EASTERLY variation (19°E)
- Known as the Hollywood of the North, the city comes second to Los Angeles in TV production and third in feature film production behind Los Angeles and New York
- Bears may be encountered on movement areas



- All the grey squirrels in Stanley Park are descendants of eight pairs of grey squirrels received as a gift from New York City in 1909

### Threat Based Briefing Topics

#### CFIT

- 30nm W Is Vancouver Island, peaks to ~7,000ft asl
- N is an E-W range of mountains. The 2,000ft asl contour is at a range of 9nm and ~6,000ft asl at 17nm N
- Further N are peaks to ~10,000ft asl
- Cascade Mountain Range rises steeply at 40nm E and SE with peaks to ~11,000ft asl

#### Runway Incursion

- Lido AOI gives details of taxiway restrictions, note advises Rwy 26L arrivals not authorised to turn on to the intersecting Rwy 31 without clearance

#### Loss of Control

- Birds are a hazard, especially during Spring and Autumn
- Bears may also be a concern

**ARRIVAL****Diversion Airports**

SEATTLE	SEA/KSEA	111 nm/162°T	CAT A
SAN FRANCISCO	SFO/KSFO	696 nm/177°T	CAT B
PORTLAND	PDX/KPDX	218 nm/174°T	CAT A
CALGARY	YYC/CYYC	371 nm/072°T	CAT A

**Approach**

- Expect radar vectors
- Converging ILS procedures are published
- Lido AOI has Noise Procedures pages, including details of preferred runways
- Visual Approach procedures are published

**GROUND**

- Call local company frequency with arrival and departure chocks times
- Part of taxiway to the S of Rwy 08R/27L used as a runway; designated Rwy 26A (~1000m)
- Refer to the Lido AOI for notes regarding Coded Taxi Routes
- Steve Williams' house is available for accommodation in the event of aircraft struck by lightning
- Excellent IPA available from the Hearthstone Brewery

**Taxi**

- Numerous A380 taxi restrictions. LIDO charts show A380 taxi routes in green on charts 3-90 and 3-100
- Crew reports indicate that unlit aircraft may be parked to the left of taxiway V in de-icing pans W17, W18 and W19. Wingtip clearance appeared minimal, so taxi with caution.
- Gate 64 preferred for A380 operations, Gate 65 alternative

**DEPARTURE**

- Performance restrictions available from CARD and the Performance Manual
- Rwy 08L/26R full length start-points are Twys M10 and M9

- For take-off data from Twys M8 and M7 select Intersections on the CARD request
- Simultaneous Parallel departures may be in use

**WEATHER**

- Possible poor visibility with NE wind due to smoke
- Fog from October to January – particularly November
- Rain may fall as snow from November to March

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	SIMFEST (Pax)/Swissport (Ramp)
<b>Handling Agent VHF</b>	130.2
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**GOOSE BAY (YYR/CYYR)**

Elevation 160ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- Goose Bay is a military airfield at the SW end of Lake Melville, 120 nm W from the coast.
- Large westerly variation
- Frequent magnetic storms in the area

**Threat Based Briefing Topics****CFIT**

- The low level ground rises gradually to the E and W. To the E are peaks of nearly 2,700ft asl at 37nm and nearly 4,000ft asl at 69nm
- To the WNW are peaks of nearly 2,600ft asl at 75 nm

**Mid Air Collision**

- Daily radiosonde balloons are launched 1115-1345 and 2315-0145

**Special Considerations**

- All runways have arrester cables. Arrester gear may be in use.
- CARD take-off data is available with reduced TORA/ASDA to account for over-run arrester cable in up position.
- TORA/LDA Rwy 08 2941m, TORA/LDA Rwy 16 2255m with arrester cables up

**ARRIVAL**

- Cat D aircraft not authorised to circle NE of Rwy 08/26

**WEATHER**

- Poor visibility in winter resulting from snow or suspended ice crystals (ice fog), the latter giving possible radio interference
- Low ceilings more frequent during spring and autumn
- Snow from Oct to May
- Summer conditions generally good

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Woodward Aviation Services
<b>Handling Agent VHF</b>	122.9
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (keep ground power connected to reduce APU fuel burn)

**ACCRA (ACC/DGAA)**

Elevation 205ft

Feedback: [training@bavirtual.co.uk](mailto:training@bavirtual.co.uk)**CATEGORY A**

No AV brief.

**GENERAL**

- A well-provisioned airfield set on the coast
- Cloud bases given in metres

**Threats****CFIT**

- Terrain 8nm N to ~1,500ft asl
- Ensure speed is below 250kt within 20nm of the airfield and exercise caution to avoid triggering EGPWS generated by terrain to the N
- Power lines cross the approach 500m short of Rwy 21 threshold. There is a sharp drop in the terrain in this area which can cause downdraughts.
- This drop in the terrain will also affect radio altimeter readings in the last 150-200ft of the approach.

**Runway Incursion**

- The depiction of the Rwy 21 holding positions on the AGC chart suggests two separate taxiways, but in fact there is one large area, all load-bearing.
- Taxiway lighting and signage in this area is poor and well below the expected standard.

**At North holding (A2):**

- Green taxiway lighting permanently illuminated across the holding point and onto the active Runway.
- There is no STOP board, wig-wags or STOP bar, hence it is **very** easy to taxi onto the runway without clearance

**At South holding (A1):**

- Access to the runway may be completely unlit and should not be used by BAV
- The yellow taxiway line has all but disappeared and there are no yellow lines denoting a holding point.
- Only your aircraft's lighting will provide sufficient guidance to taxi onto the runway.

## ARRIVAL

### Diversion Airports

LAGOS	LOS/DNMM	217 nm/074°T	CAT B
ABUJA	ABV/DNAA	489 nm/065°T	CAT B
COTONOU	COO/DBBB	160 nm/073°T	CAT A
LOME	LFW/DXXX	092 nm/068°T	CAT A

## Approach

- Notes re: approach, focusing on 'gotchas' not immediately obvious from chartage etc.

## GROUND

- Notes re: ground movement e.g. restrictions, etc

## DEPARTURE

- Departure considerations

## WEATHER

- General weather and climactic synopsis, e.g. max/min temps, prevailing winds, likelihood of fog, local meteorological phenomena etc.

## OPERATIONAL INFORMATION

<b>Handling Agent</b>	Aviance Ghana
<b>Handling Agent VHF</b>	118.6
<b>Potable Water</b>	Uplift not permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (keep ground power connected to reduce APU fuel burn)



## LAGOS (LOS/DNMM)

Elevation 135ft

### CATEGORY B

No AV brief required.

### GENERAL

- During the HARMATTAN season (Dec to Jan) whenever the forecast visibility is low, consider an additional one hour's holding fuel
- Number of airspace restriction/danger areas to the S of the airport

### Threat Based Briefing Topics

#### Mid Air Collision

- It is important to maintain communication with other traffic in the area on 126.9/122.8 as long as possible

#### Runway Excursion

- During periods of heavy rain, Rwy 18R/36L may be subject to slow drainage, which could result in standing water. Consider use of appropriate performance data for landing
- Degraded braking action when runway wet

#### Loss of Control

- Extreme caution must be exercised to ensure that the correct DME (VOR or ILS) is used for any procedure relying on DME distances to let down to a decision altitude.

### ARRIVAL

#### Diversion Airports

ACCRA	ACC/DGAA	217 nm/254°T	CAT A
ABUJA	ABV/DNAA	276 nm/058°T	CAT B
COTONOU	COO/DBBB	057 nm/256°T	CAT A
LOME	LFW/DXXX	126 nm/258°T	CAT A

- Inbound clearance must be obtained from Lagos Approach before crossing the Lagos UTA boundary. Note that difficulties are often encountered in establishing contact until within 100nm of the airfield. If not contact try for relay through other aircraft, through Lagos Info on VHF, or on HF. In the event that contact is not possible via any means prior to crossing the Lagos UTA boundary, it should be made clear, on first contact that repeated attempts have been made.
- Runway in use for wide-bodied aircraft normally 18R/36L although late clearance to use 18L/36R is possible.
- Prevailing winds usually favour southerly landings.

## Approach

- Radio aids are often subject to unserviceability at short notice, at times without the knowledge of ATC. Power cuts have blacked out the entire airfield including ATC.
- Although Radar is shown as available it is normally unserviceable
- Airfield lighting is unreliable
- Confusion over landing clearance has occurred: change to Tower frequency in good time calling airfield/runway in sight as soon as practicable
- Expect a call for aircraft registration and Souls on Board just after landing
- Crew report that the Rwy 18R G/S fluctuates all approach from approx. 10 DME

## GROUND

- Exercise caution during taxi due uncontrolled vehicular and pedestrian movements
- Due to previous incidents take extreme care when taxiing on 18L/36R eastern parallel taxiway. If in doubt about wingtip clearance with parked aircraft, stop and request marshalling assistance
- There is a marked upslope from Twy A (18R) via Twy F to the parking apron
- Consideration should be given to where single engine taxi is appropriate, especially if flight is planned to a high landing weight due fuel tinkering
- Usual parking stand E63
- **Parking Stand Tow on Procedure:** Due to issue with jetty position stop 50m short of arrival stand, shut down engines and await tow on to stand.

## DEPARTURE

- Request for start-up clearance should be made 15 mins before ETD giving expected start time. Also be prepared to give Souls on Board info and aircraft fuel endurance at this time.
- ATC clearance normally issued on taxi out. Company frequency (Speedbird Engineering 131.8) may assist if final loadsheet figures are delayed.
- For aircraft routing between Lagos and Accra it is usual to establish radio contact with Accra prior to being released by Lagos and vice versa.

## WEATHER

- Surface wind and visibility reports may be inaccurate particularly in adverse weather conditions
- It is difficult to obtain Lagos weather until in VHF contact (~150nm) however, on occasions it may be possible via HF

- Weathers for Lome, Cotonou, Accra, Niamey and Abidjan are usually available from NIAMEY. It is rarely possible to obtain Kano weather until either in VHF contact (~110nm) or on occasions on HF. Rarely does Lagos have the Kano weather available and vice versa.
- Although instability rain may occur during any month of the year the rainy season is from May to July when the ITCZ (ITF) is moving north. Rainfall is of the monsoon type during this period.
- A secondary maximum occurs in October when the ITCZ moves south.
- The worst period of LINE SQUALLS (from the east is prior to the MONSOON, i.e. during March to May, when about five squalls per month can be predicted. These squalls are more severe than at Accra.
- In Dec/Jan thick dust haze can occur when the HARMATTAN may reach the coast.
- Low cloud is frequent in the early morning with fog almost a daily occurrence in December and January, forming an hour or two before dawn but almost invariably burning off by 0900Z.

#### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Nahco Aviance Handling
<b>Handling Agent VHF</b>	131.8
<b>Potable Water</b>	Uplift ban

<b>IF ONLY Electrical Power is required</b>	Use for 60mins ONLY – then use APU
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services for 60 mins ONLY – then use APU

**DUSSELDORF (DUS/EDDL)**

Elevation 147ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Diversions to Dusseldorf planning to arrive at 2230z or later will not normally be allowed to take off until the night curfew is over

**Threat Based Briefing Topics****Mid Air Collision**

- Crews should be aware that VFR aircraft may be operating in the vicinity of major German airports
- These aircraft may be operating up to the ceiling of Class E airspace adjacent to airspace used by SIMFEST crews
- Not all of these aircraft will be transponder-equipped

**ARRIVAL****Diversion Airports**

COLOGNE	CGN/EDDK	29 nm/150°T	CAT A
BRUSSELS	BRU/EBBR	89 nm/255°T	CAT B
AMSTERDAM	AMS/EHAM	97 nm/309°T	CAT A
FRANKFURT/MAIN	FRA/EDDF	102 nm/137°T	CAT A

Others that may be used include Hannover, Stuttgart and Hamburg

**Approach**

- When RNAV approach in use, ATC may use alternative RNAV transition waypoints which are associated with ILS charts (e.g. DL524 & DL555)
- Track shortening and late descents are typical of arrivals in to DUS

**OPERATIONAL INFORMATION**

Handling Agent	Acciona (Ramp), Menzies (Pax)
Handling Agent VHF	131.8
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

## ROVANIEMI (RVN/EFRO)

Elevation 643ft

### CATEGORY A

No AV brief required.

### GENERAL

- Rovaniemi is located in Lapland, approximately 6 miles south of the Arctic Circle.

### Threats

#### Runway Excursion

- Northern third of Rwy 03/21 and Twy T slopes downhill by approximately 25ft. Taxi with caution due to the combination of slope and reduced friction if Rwy or Twy is slippery.
- Use reported braking friction measurement with caution. These are based on accurate spot measurements by a vehicle, but this does not necessarily represent the full width of the Rwy/Twy and there may be spots which are more slippery than that reported.
- RVN is a military airfield with a squadron of F/A-18s. Where they operate, their engine heat can lead to a polishing effect on the surface, leaving a narrow track which is more slippery.
- Military on the northern side of the Rwy, so their operation does not usually affect Twy T, but on the runway and especially at intersections this is worth considering.

#### Loss of Control

- Arrester cable located 758m from Rwy 03 THR.

#### Mid Air Collision

- Joint civil/military airfield

### ARRIVAL

#### Diversion Airports

KITILA	KIT/EFKT	72 nm/341°T	CAT B
OULU	OUL/EFOU	99 nm/186°T	CAT A
IVALO	IVL/EFIV	129 nm/016°T	CAT B
TAMPERE	TMP/EFTP	315 nm/190°T	CAT A
HELSINKI	HEL/EFHK	134 nm/007°T	CAT A
TURKU	TKU/EFTU	376 nm/183°T	CAT A
STOCKHOLM/ARLANDA	ARN/ESSA	467 nm/207°T	CAT A

### Approach

- Rwy 21 has an ILS CAT 2.

**GROUND**

- Taxi with caution – refer to Runway Excursion section above for more information.

**WEATHER**

- Rovaniemi has a subarctic climate so experiences short, cool summers and long, cold and snowy winters.
- December averages just under six minutes of daily sunshine.

**OPERATIONAL INFORMATION**

Handling Agent	AIRPRO
Handling Agent VHF	131.675
Potable Water	

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

**MANCHESTER (MAN/EGCC)**

Elevation 257ft

Feedback: [training@bavirtual.co.uk](mailto:training@bavirtual.co.uk)**CATEGORY A**

No AV brief required.

**ARRIVAL****Diversion Airports**

BIRMINGHAM	BHX/EGBB	58 nm/160°T	CAT A
LIVERPOOL	LPL/EGGP	21 nm/266°T	CAT A
EAST MIDLANDS	EMA/EGNX	47 nm/132°T	CAT A
LONDON HEATHROW	LHR/EGLL	131 nm/149°T	CAT A

Others that may be used include Newcastle, London Stansted, London Gatwick and Prestwick.

**Approach**

- Approach terrain 05L: when crossing the Bollin Valley on approach to 05L the radio altimeter will fluctuate at approximately 380ft QNH (170ft servo height) and read approximately 280R.

**GROUND****Parking**

- Manchester has one pier served stand (12) and one remote stand (62) available for A380 parking. An A380 can also be parked on Twy Papa (Stand 80) though this is dependent on certain nearby stands also being vacant.

**OPERATIONAL INFORMATION**

Handling Agent	Menzies
Handling Agent VHF	131.405
Potable Water	Permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times



**LONDON/HEATHROW (LHR/EGLL)**

Elevation 83ft

**CATEGORY A**

No video brief available.

**GENERAL**

- Heathrow has very high traffic densities
- CAT3B on all runways and RNAV GNSS arrivals
- RNAV SIDs under trial and slowly replacing conventional nav SIDs
- There is a great deal of useful information in Lido AOI pages

**Threats****Runway Incursion**

- Departures from 09R have a history of runway incursions. Distraction, poor visual cues on the taxiway and TEAM arrivals may be contributory factors.
- Note Hot Spot 1 and 4 on the taxi chart.
- When no VATSIM ATC is available there may be confusion around which runway to expect, especially with northerly or southerly winds.

**Loss of Control**

- False localiser captures may be experienced when acquiring the 27L localiser at extended range. This is particularly likely when track shortening from LAM is offered.

**Mid Air Collision**

- Note the lower level-off height necessary after a missed approach from 27L and requirement to climb without further clearance at LON D6
- High rates of climb on departure can lead to TCAS RA if your departure track crosses the OCK or BNN arrival routes. Use of lower rates of climb is recommended if appropriate
- There have been numerous airprox reports from BAV crews arriving and departing an uncontrolled LHR on VATSIM.

**Ground Collision**

- Limited wingtip clearance on taxiways near the A1/A2/A3 holding area adjacent to 27R, particularly for A380.

**ARRIVAL**

- Expect speed control in the descent. Strict adherence to 160kt to 4DME is expected.
- Reduced separation on approach can be expected with a minimum of 2.5nm achievable between pairs of aircraft not requiring vortex separation
- On missed approach you will be sequenced in to the normal arrival stream and can expect around 40 track miles to approach
- Do not expect priority unless you declare an emergency
- Know when you can use a 'Land After' clearance.

- An uncontrolled LHR on VATSIM can be chaotic at times. Make maximum use of UNICOM, TCAS, lookout and other resources and integrate in to the traffic flow as best as possible. Note that many pilots will not broadcast their intentions.
- There is a westerly preference with tailwinds up to 5kt but in real life ATC may switch to easterly operations early based on the 2000ft wind
- Runway alternation programme for westerly operations can be found at [https://www.heathrow.com/file\\_source/HeathrowNoise/Static/Runway\\_Alternation\\_Programme\\_2018.pdf](https://www.heathrow.com/file_source/HeathrowNoise/Static/Runway_Alternation_Programme_2018.pdf) - note runways change at 1500 **local**.
- No alternation on easterly operations (landings 09L, departures 09R).

## GROUND

- Minimise runway occupancy and expect a frequency change on vacating. In guidance to stand can be provided using a taxiway centreline lighting system; whilst this is obviously not available in FS some VATSIM controllers have been known to use this phraseology.

### A380 Operations

- Reduced 'taxiway centreline to object clearance' of 49m applies on Twy Echo between Bravo and Link 36 and on Twy Whiskey between Twy Sierra and Link 42.
- Reduced clearance of 47.5m to an airside road to the east of Twy Alpha at MORRA
- Pilots are to ensure that aircraft remain on the Twy centreline at all times
- RET N6 on Runway 27L tightens up, and care must be taken to ensure the right wing gear does not clip the grass when vacating on to Twy Alpha

## DEPARTURE

- Be aware pushback from 335 in to G cul-de-sac needs to push abeam Stand 331 to ensure aircraft is straight and start-up does not cause blast safety issues on any stand
- During low visibility procedures, crews to call for start-up ONLY when FULLY ready to start. Aircraft departing via CPT/AWY L9 expect a non-standard departure instruction when using Rwy 09L/09R. Aircraft on this departure will not be issued datalink clearance when using Rwy 09L/09R. This is because the CPT SID track from Rwy 09L/09R conflicts with the arrival stream.
- Advise ATC if not ready for departure by LOKKI/LOMAN or PLUTO/TITAN,
- Conditional clearances in use
- Minimise runway occupancy commensurate with pax comfort and a safe operation

### A319/A320/A321 – Intersection Planning

- FLEX should be maximised whenever possible when deciding on the planned intersection for departure
- BAV Airbus and LHR ATC have agreed a default intersection plan to use A3/N2E/N11/A13. ATC should give a minimum notice of 1 min for default intersection, 3 mins for change of intersection or 5 mins if OET, but this may not always be the case on VATSIM.

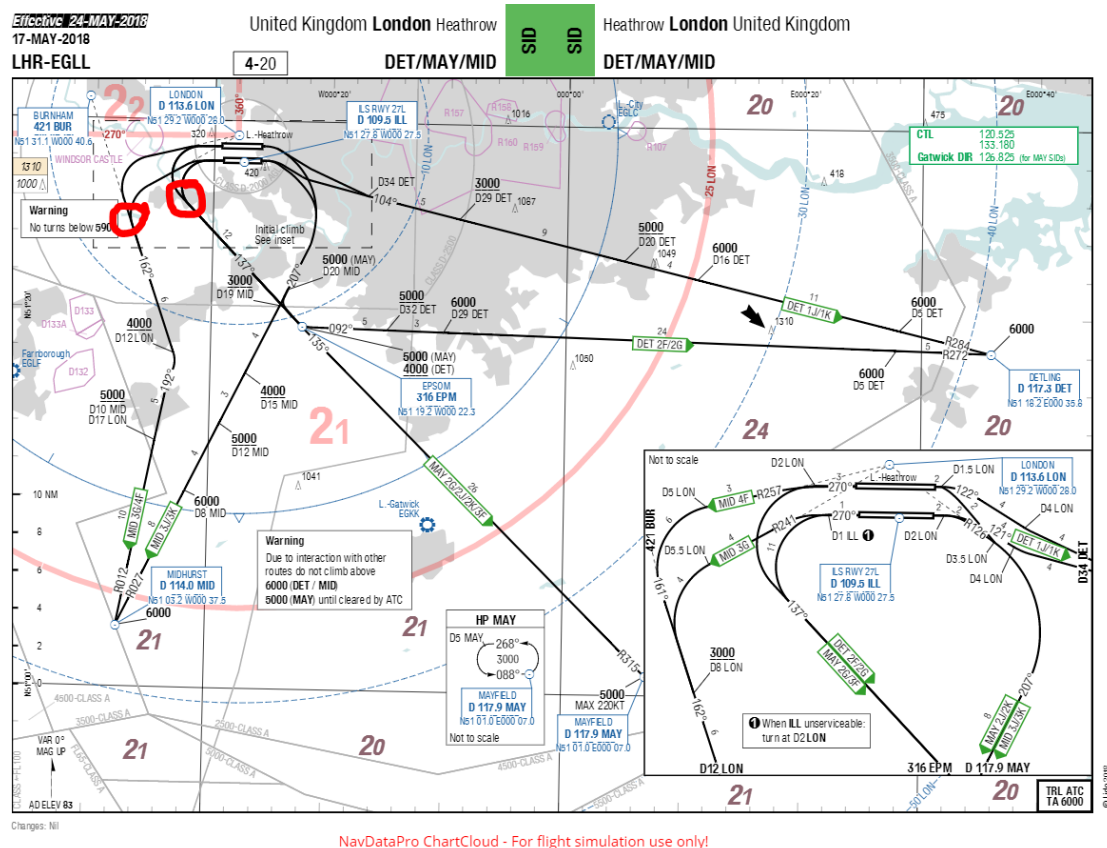
- ATC may offer a reduced notice, shorter intersection in the following cases:
  - When departing northbound
  - First wave departures
  - With a tight slot
  - T3 departures using 09R
- In order to gain this tactical advantage, it may be prudent to plan on a shorter intersection for departure whilst still attempting to maximise FLEX.
- To assist ATC in keeping R/T to a minimum, if requesting ACARS PDC consider adding a line in the free text section for the planned intersection e.g. 'Able NB8'. This could also be inserted in VATSIM FP remarks or mentioned on start request.

### **B747, B767, B777, B787, A380 – 210 kt SID restriction on DET/MAY/MID SIDs at LHR**

In order to achieve accurate track keeping after the LON D2 point and stay within the Noise Preferential Routes, a 210kt speed restriction is introduced for all BAV wide-body aircraft. The B747 will continue to use the FCOM Noise Abatement procedure in addition to the 210kt speed restriction.

This restriction applies until the aircraft is established on course 138° towards EPM (DET/MAY SIDs) or course 162° (MID SID). Additionally, once on a radar vector the speed restriction no longer applies.

The image below shows the point at which it is OK to accelerate, i.e. once the initial large southerly turns on the SIDs are complete:



**Fleet Specific Advice to Improve Track-keeping on Westerly MID/DET/MAY SIDs at LHR**

To ensure that the FMS calculates an accurate LNAV turn, the following fleet-specific advice is offered:

- **B777 and B787** – enter a 210/6000 restriction on the VNAV Climb Page (LSK 4L). Cancel the restriction, if needed, once established on course after the initial turn. Speed intervention will not replot the FMC LNAV profile, so the aircraft will merely reduce the commanded bank angle. Do not introduce speed constraints on the LEGS page, because there is a risk that altitude constraints could be compromised.
- **B747** – Enter a 210/6000 restriction on the VNAV Climb page (LSK 4L). Cancel the restriction, if needed, once established on course after the initial turn. Speed intervention will not replot the FMC LNAV profile, so the aircraft will merely reduce the commanded bank angle and not comply with the noise preferential routing. Do not introduce speed constraints on the LEGS page, because there is a risk that altitude constraints could be compromised. Continue to use the FCOM noise abatement procedure for LHR departures. This is critical as B747 LHR noise performance relies on BOTH correct FMC LNAV plotting and utilisation of FCOM noise abatement procedures.
- **B767** – Enter a 210/6000 restriction on the FMC CLB page. This can be deleted once the aircraft has established on the course 138° towards EPM (DET/MID SIDs) or 162° (MAY SID).
- **A380** – it is recommended to fly 'S'-speed with Flaps 1+F until the initial turn on to a south-easterly track is complete. To pre-program the FMS, check the predicted value of 'S'-speed on the FMS/Perf/T.O. page and then either:
  - Use the PRESEL field on the FMS/PERF/CLB page to fly selected after passing Aa, and return to managed speed once the turn is complete, or:
  - Insert 'S'-speed as a climb speed constraint at an appropriate intercept waypoint via the F-PLAN page.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	British Airways
<b>Handling Agent VHF</b>	131.805 SH 131.905 LH 131.785 HAC
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**LEEDS/BRADFORD (LBA/EGNM)**

Elevation 681ft

**CATEGORY B**

AV brief – not required

**GENERAL**

- Situated in the W Yorkshire industrial complex
- Preferential landing Rwy 14 with takeoff Rwy 32 due noise

**Threat Based Briefing Topics****CFIT**

- Terrain rises towards the Pennine Hills reaching 1,300ft asl at 6 nm NW and 1,700ft asl at 15nm NW
- Approach to Rwy 14 is over the high ground. Ridge 6.5nm out on the approach to Rwy 14 which may give rise to radio altimeter ramping and possibly GPWS activation
- Mast to 262 ft asl at 2nm finals Rwy 14
- G/S soft warnings due to excessive mitigation to land prior to the downslope
- The PAPIs do not follow the ideal ILS G/S. The primary vertical path indication is the ILS G/S – this shall be followed in preference to the PAPIs to avoid GPWS soft warnings
- ILS GP may not give full scale fly-up outside 6° right of LOC centreline
- Possible GPWS operational nuisance activation at 2nm from touchdown
- Do not use GP data in winds above 55kt

**Runway Excursion**

- Rwy 32: the initial approach is over a low plain. On short final, terrain slopes up rapidly toward the landing threshold leading to a very late rad alt call. At 1000ft radio, the height above the landing threshold is approximately 600ft. Consideration should be given to achieving a fully stabilised approach by 1700ft QNH (approximately 3.3d ILF)
- Deep landing due to the downslope in the TDZ
- Short landing due to excessive mitigation to land prior to the downslope and the odd visual perspective due to the displaced THR

**Loss of Control**

- Ground falls away at the Rwy 32 threshold giving WINDSHEAR and downdraughts
- Bird hazard. Aircraft may be delayed until birds cleared

**Mid Air Collision**

- The Vale of York military flying area is 5nm NE
- Crews to exercise caution due to hang gliding and paragliding operations up to 1,500ft QNH to the S, W and NW of the airfield.

**ARRIVAL****Diversion Airports**

MANCHESTER	MAN/EGCC	38 nm/215°T	CAT A
NEWCASTLE	NCL/EGNT	070 nm/359°T	CAT A
BIRMINGHAM	BHX/EGBB	085 nm/182°T	CAT A

- A Radar Vectoring Area chart is available

**Approach**

- ILS 14 – G/P fluctuation may take place between 3.5nm and 1.5nm from the Rwy 14 threshold. Note that the ILS G/S angle is 3.5°
- Terrain on final approach Rwy 32 causes the rad alt to indicate a height change from 200ft to 100ft in a very short time
- The landing thresholds of both Rwy 14 and Rwy 32 are considerably inset
- Rwy 14 NDB approach: Note the higher platform altitude of 3,500ft if radar vectored.

**Missed Approach**

- Many aircrew have commented that the published missed approach procedure is difficult to follow.
- Leeds have introduced the option to go around on runway heading to 4000ft, this being an ATC clearance not a go around instruction. This is either requested by the crew early if they anticipate a go around, or issued by the Leeds Approach Controller on first contact with Leeds.

**Runway Characteristics**

- Pronounced downslope (>0.8%) in the expected area of touchdown on Rwy 14, requires caution. This pronounced downslope from the 14 end of the runway is not visually obvious when operating on Rwy 14/32.
- The touchdown zone on Rwy 32 has a downslope of 0.4%, with the undershoot area having an upslope of 0.7%. This along with the displaced threshold creates a strange visual perspective
- Maximum use of the ILS G/S is necessary to assure the correct vertical path is flown.

## GROUND

### LVPs

- Taxiway A unsuitable for aircraft larger than B739
- There is no longer a need to have a follow me around Twy E as Leeds now have full centreline lighting and stop bars
- To allow simultaneous pushbacks from stands 1 to 5 when Rwy 14 is in use for takeoff, but still allow aircraft to approach Rwy 32 for the CAT 3 ILS, ATC ask that all crews request positive instructions to vacate the runway (regardless of landing Rwy)
- The restriction on backtracking has been changed to: you may backtrack in “exceptional circumstances”, i.e. LVPs. This will allow aircraft to push back and taxi to holding point A1 while an arriving aircraft is landing on Rwy 32. In this conditions, arriving crew will be asked to perform a 180 backtrack and vacate at Twy N.

## WEATHER

- Poor visibility due to industrial haze may occur in settled conditions as well as radiation fog
- Depressions and fronts bring low cloud and strong winds, the latter often giving a substantial CROSSWIND on Rwy 14/32
- Being high up and on the other side of the Pennines to Manchester, Leeds Bradford may be clear while Manchester and Liverpool are in fog.

## OPERATIONAL INFORMATION

<b>Handling Agent</b>	Swissport UK
<b>Handling Agent VHF</b>	130.6
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (ACU equipment not available)

## NEWCASTLE (NCL/EGNT)

Elevation 266ft

### CATEGORY A

AV brief not required.

### GENERAL

#### Threats

##### Runway Excursion

- Rwy 07 early 1000ft RA call

### ARRIVAL

#### Diversion Airports

LEEDS/BRADFORD	LBA/EGNM	070 nm/179°T	CAT B
DURHAM TEES VALLEY	MME/EGNV	033nm /164°T	CAT A
MANCHESTER	MAN/EGCC	104nm /191°T	CAT A
EDINBURGH	EDI/EGPH	080nm /313°T	CAT A

Others that may be used include Prestwick and London Heathrow

## Approach

- Rwy 07 approach terrain: At 1000ft radio the height above the landing threshold is approximately 1400ft (1630ft QNH).

### OPERATIONAL INFORMATION

Handling Agent	Swissport
Handling Agent VHF	122.050
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times



**COPENHAGEN (CPH/EKCH)**

Elevation 17FT

**CATEGORY A**

AV brief not required.

**GENERAL**

- ATC refer to the airfield as 'Kastrup'
- Kastrup airfield is on the eastern coast of Denmark, near the Swedish border
- The airfield is 4nm S of the city of Copenhagen and 13nm W of Malmo across the Oresund bridge.

**Threats****Mid Air Collision**

- Due to airspace structure, uncontrolled VFR traffic may operate only 500ft below the minimum radar cleared altitude in the vicinity of the airport
- TCAS RAs may be generated – remain vigilant

**Runway Incursion**

- All arrivals and departures on Rwy 04 or Rwy 22 demand crossing Rwy 12/30 and a frequency change whilst holding short of 'Z'. Consider briefing the implications of this.

**ARRIVAL****Approach**

- ILS 22L Cat 1: the Rad Alt will ramp up approx. 40ft just prior to the DH due to the nature of the terrain
- Rwy 04 approach – review actions to deal with intercepting glideslope from above.

**DEPARTURE**

- Tall shipping in the vicinity may affect obstacle clearance for Rwy 04, 22L and 30
- CARD provides additional data for use if tall ships are present

**WEATHER**

- Humid, continental climate
- Snow common in winter
- Annual temperature variation between -2°C and 22°C

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Menzies Aviation Denmark
<b>Handling Agent VHF</b>	131.785 'Menzies Copenhagen'
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**OSLO/GARDERMOEN (OSL/ENGM)**

Elevation 681ft

**CATEGORY A**

No AV brief required.

**GENERAL****Threats****CFIT**

- 19 nm NE of the city, Gardermoen has some terrain to the W clockwise through to the N with MSAs rising to 3900ft within 10 nm. It is clearly illustrated on the Lido charts.

**ARRIVAL****Approach**

VOR indication fluctuations have been reported.

**OPERATIONAL INFORMATION**

Handling Agent	MENZIES AVIATION
Handling Agent VHF	131.875
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

**SVALBARD (LYR/ENSB)**

Elevation 94ft

**CATEGORY B**

No AV brief available.

**GENERAL**

- The airport is located 1.6nm north-west of the town of Longyearbyen, on the south side of a large bay, Adventfjorden
- LYR is the northernmost airport in the world with scheduled public flights
- LYR Air Traffic Services consists of a Flight Information Service only. There is no ATC service, and no Radar.

**Threat Based Briefing Topics****CFIT**

- The airfield is surrounded by high ground on all sides, and in particular to the S and E.
- Terrain rises sharply to the S of the airfield, with the 1,000ft asl contour lying less than 1nm S and spot heights up to 3,458ft asl just 4nm S
- To the NE there are peaks of 3,114ft asl ~4nm NE, 3,150ft asl ~8nm NE and 3,540ft ~9nm NE
- A ridge rises up to 3,750ft asl directly under the final approach to Rwy 28 at ~13nm
- Rwy 28 ILS and RNAV approaches considerably offset to fly down a steep, narrow valley
- LOC and RNAV Rwy 28 have 3.6° vertical profiles and reversal procedures take place over very high ground
- Note Rwy 10 missed approach speed restrictions to ensure terrain clearance

**Runway Excursion**

- Short landing Rwy 28 due to disparity between PAPIs (3.4°) and RNAV/LOC vertical profile (3.6°)
- Long landing Rwy 28 due to excessive mitigation/flare following steep approach profile

**Mid Air Collision**

- No Radar available
- Longyear provides a Flight Information Service only. The FISO's instructions are mandatory on the ground, but in the air may be considered advisory only. No ATC separation can be guaranteed and a good lookout is essential
- SID initial climb clearance is to an altitude, but above the TA of 5,000ft. Careful attention to altimeter setting procedures is required

**Loss of Control**

- Risk of 'black hole illusion' during night approaches
- Risk of turbulence and WINDSHEAR on short final to both runways, as well as severe turbulence below FL100 with wind 160° to 270° above 20kt

**ARRIVAL****Approach**

- No Radar. Expect a procedural approach.

- Severe turbulence can be expected below FL100 with S/SW'ly winds above 20kt
- If landing 28, the LOC approach provides the lowest minima. However, if the weather allows it may be preferable to fly the RNAV approach which will provide a vertical path
- Both LOC and RNAV Rwy 28 approaches have 3.6° vertical profiles due to terrain. It is recommended that the aircraft is fully configured before reaching the final descent point to prevent an excessive airspeed increase and possible rushed approach.
- Rwy 28: Do not deviate from the final approach track until visual contact has been established and can be maintained
- The Rwy 28 PAPIs are set at 3.4° and therefore will indicate HIGH when the aircraft is on the correct 3.6° LOC/RNAV profile. This will be exacerbated in the B744 due to the high eye-wheel height. **Do not be tempted to dive for the PAPIs once visual.**
- Rwy 10 has a significant (for the LDA) inset threshold
- Both runways suffer from severe turbulence and WINDSHEAR on short final with strong S/SW'ly winds

## Missed Approach

- Rwy 10: note speed restrictions on the missed approach in order to maintain terrain clearance

### GROUND

- Twy A unsuitable for B744 aircraft
- Very limited parking and ground services available

### DEPARTURE

- IRS High Latitude Alignment procedure required. FCOM SP.11.8 refers. Note that the alignment will take a minimum of 17 minutes, so it is recommended that the alignment process is started at the earliest opportunity after the aircraft is shut down to avoid delaying the next departure.
- ATC clearance will be relayed by the Longyear FISO
- TA is 5,000 ft but initial climb on SIDs is to either 5,100 or 5,500ft altitude. Pay careful attention to altimeter settings and climb clearances
- Vessels in the bay crossing the departure area may penetrate the 3.3% SID climb gradient

### WEATHER

- Temperatures are generally extremely mild for the latitude as a result of the influence of the warm North Atlantic Current

- However, the archipelago is the meeting place for cold polar air from the north and mild, wet sea air from the south. This can lead to low pressure and rapidly changeable conditions with high wind speeds, especially in winter
- Fog common during summer
- Precipitation frequent but generally falls in small quantities
- Average max/min temperatures -20°C/-9°C (Jan) and 3°C/7°C (Jul)

#### OPERATIONAL INFORMATION

Handling Agent	Simfest Ground Services
Handling Agent VHF	
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use APU (no GPU available)
If BOTH electrical power and air conditioning is required:	Use APU for air conditioning (ACU equipment not available)

**TROMSØ/LANGNES (TOS/ENTC)**

Elevation 31ft

**CATEGORY C**

No AV brief available.

**GENERAL**

- The airport is situated on a small island within a fjord system in the high latitudes of Norway
- Tromsø is the largest town in northern Norway and the third largest north of the Arctic Circle anywhere in the world

**Threat Based Briefing Topics****CFIT**

- There is high ground in all quadrants, with particularly notable spot heights of 2,600ft asl 4nm NW, 3,450ft asl 7nm NW, 3,250ft asl 12nm NE and 3,800ft asl 12nm E
- Other significant peaks at 4,100ft asl 6nm SE, 4,550ft asl 16nm SE, and 4,350ft asl 15nm SSE
- Further high ground at 3,150ft 10nm SW and 3,450ft 14nm SW
- On the island itself is a N/S ridge, E of and parallel with the runway which reaches nearly 500ft asl within 1nm
- To the W of the runway are masts to nearly 450ft asl within 0.25nm

**Runway Excursion**

- During spring surface winds often W to NW'ly in excess of 15kt, giving crosswind difficulties

**Loss of Control**

- Both ILSs have a 4° G/P due to terrain, requiring careful handling to avoid GPWS activation
- Windshear may occur on short final Rwy 01 and Rwy 19 with surface wind from 200° to 270° above 20kt

**ARRIVAL****Approach**

- Some published STARs require DME arcs to be flown. A STAR clearance also includes a clearance to make an instrument approach.
- Because of the terrain both ILS Rwy 01 and ILS Rwy 19 have 4° G/Ps. Careful handling is required to avoid GPWS activation, and it is recommended to fully configure the aircraft prior to G/P interception in order to prevent excessive airspeed increase during the approach.
- During approach to Rwy 19 a northerly wind may occur N of OM with WINDSHEAR common at OM and a southerly wind from OM to touchdown
- WINDSHEAR may occur on short final to both runways with surface wind from 200° to 270° above 20kt

- Use of PAPIs is limited to a maximum of 10nm from threshold Rwy 01 and no more than 3.8nm from threshold Rwy 19 due to the terrain. Maximum use should be made of the ILS G/P to ensure the correct vertical path is flown.
- Circling is published as east of the aerodrome only. However, LH circling guidance lights provided for both 01 and 19. Thus those for Rwy 01 provide guidance to an aeroplane turning base leg from west of the aerodrome, over water.
- A base leg from the east (RH) for Rwy 01 brings the aeroplane over the N/S parallel ridge described above

### DEPARTURE

- Use full take-off and full climb power for all departures

### WEATHER

- Surface wind from the SW on 75% of occasions, however during spring surface winds are mainly W to NW'ly and frequently exceed 15kt, giving rise to crosswind difficulties
- Turbulence may be expected during approach, particularly around 5,000ft altitude
- An area particularly prone is 10-16nm S of the aerodrome between 5,000 and 6,000ft
- Sudden severe icing conditions possible during the greater part of the year
- Rapid weather changes predominate
- Fog is rare, but showers with low cloudbase are common
- Temperatures are very mild for the latitude due to the warming influence of the Gulf Stream
- Average min/max temperatures -5.5°C/-0.5°C (Jan) 10°C/15°C (Jun)

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (ACU equipment not available)



**TRONDHEIM (TRD/ENVA)**

Elevation 56ft

**CATEGORY B**

AV brief not required.

**GENERAL**

- The aerodrome is situated at the end of a Fjord, in the village of Værnes, 10nm east of Trondheim city proper
- Joint civil/military airfield

**Threat Based Briefing Topics****CFIT**

- The aerodrome is situated at the end of a Fjord with close high ground to the north, west and south
- Spot heights of 1110ft, 885ft, 814ft, 811ft and 670ft within 3nm of the aerodrome
- 4nm to the north spot heights reach 2,008ft

**Loss of Control**

- Severe turbulence and WINDSHEAR may be experienced on short final to all runways with S/SE'ly winds above 25 kt

**Special Considerations**

- Rwy 27 stable approach criteria: the final approach passes over undulating ground which will lead to an early 1000R call at approx D4.8 as the aircraft passes over a ridge.

**ARRIVAL****Approach**

- Aircraft on the STAR may be cleared direct to the merge point from any position.
- ILS Rwy 27 3.4° glidepath
- Circling prohibited north of the airfield
- Circling guidance lights provided for runway 27
- ILS 27 GS not to be used outside 5° either side of localiser course

**GROUND**

- B744 aircraft idle power only on outboard engines to avoid FOD ingestion
- Twy Y not suitable for B744 operations between A4 and A5

**DEPARTURE**

- Where there are multiple SIDs to the same end point, jet aircraft can expect to be assigned the SID with the longest track mileage
- Direct routing usually available once above 2,500ft amsl
- Strong winds from NE through N to S may cause local moderate turbulence at lower altitudes

**WEATHER**

- Moderate snowfall Nov-Mar
- Spring often sees plenty of sunshine but with chilly nights
- Average min/max temperatures 11°C/19°C (July), -4°C/2°C (December)
- Prevailing wind in November is easterly
- Turbulence and WINDSHEAR may occur on short final to all runways with wind SE to S above 25kt.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (ACU equipment not available)

## KIRUNA (KRN/ESNQ)

Elevation 1,509ft

### CATEGORY A

AV brief not available

### GENERAL

- Airfield located 3NM SE of Kiruna, the most northerly town in Sweden and 90 miles south of the Arctic Circle
- KRN is the most northerly airport in Sweden
- The town centre is currently being moved some miles to the east as the current location suffers from subsidence as a result of the iron ore mine beneath it. The process is expected to last until at least the year 2100
- Kiruna is also home to the Jukkasjärvi Icehotel, constructed each year from snow and ice

### Threats

#### CFIT

- Terrain rises sharply to the W with spot heights of 3,172ft asl 15NM SW and 4,271ft asl 31NM WNW
- Kebnekaise rises to 6,882ft asl 40NM west of the airfield and is the highest point in Sweden

#### Runway Incursion

- Backtrack required for arrival and departure both Rwys

#### Runway Excursion

- Use braking action reports with caution as measurements, while accurate, may not reflect the full width of the runway/taxiway
- Taxi with caution, especially when using the turning pads at the end of Rwy 03/21 as the surface is liable to be slippery

#### Mid Air Collision

- There is no RADAR – procedural control only

### ARRIVAL

#### Diversion Airports

ROVANIEMI	RVN/EFRO	172 nm/118°T	CAT A
KITTILA	KTT/EFKT	119 nm/092°T	CAT B
OULU	OUL/EFOU	244 nm/143°T	CAT A
IVALO	IVL/EFIV	190 nm/070°T	CAT B
HELSINKI	HEL/EFHK	538 nm/163°T	CAT A
STOCKHOLM/ARLANDA	ARN/ESSA	571 nm/189°T	CAT A

## Approach

- Rwy 21 Cat 1 only.
- Rwy 03 has an RNAV approach which is approved for Simfest use.
- Note temperature limits for use of VNAV on the Rwy 03 RNAV
- Only one aircraft at a time is permitted on the movement area in LVPs. This may result in long delays when visibility is poor.

## ILS Rwy 21

- Glideslope fluctuations have been reported during winter as a result of snow
- Note that use of the FD is required for normal Cat 1 minima of 550m RVR. Minimum RVR for FD OFF 750m
- There is no approach control radar and so one can expect to fly the full procedure

### GROUND

- Only one aircraft is permitted on the movement area at a time during LVPs – this may result in long delays in poor visibility conditions
- Very limited apron space
- Backtrack will be required for both departure and arrival

### WEATHER

- Kiruna has a subarctic climate with short, cool summers and long, cold winters
- Snow cover generally late September to the middle of May, though snowfall can occur year round
- The sun does not set between 28 May and 16 July. Between 11 December and 1 January, the sun does not rise.
- Average daily min/max temperatures -18°C/-9°C (Jan), +9°C/+19°C (Jul)

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	SAS Ground Handling Sweden
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (no ACU available). Keep ground power connected to reduce APU fuel burn.

## STOCKHOLM/ARLANDA (ARN/ESSA)

Elevation 137ft

### CATEGORY A

No AV brief available.

### ARRIVAL

#### Diversion Airports

HELSINKI	HEL/EFHK	216 nm/079°T	CAT A
OSLO	OSL/ENGM	209 nm/279°T	CAT A
COPENHAGEN	CPH/EKCH	296 nm/214°T	CAT A
GOTEBORG	GOT/ESGG	213 nm/235°T	CAT A

Others which may be used include Stockholm/Skavsta, Jonkoping and Hamburg.

### GROUND

#### A380

- Runway 01L/19R is approved for A380 arrivals and departures.
- Taxiway Y1, Y2, Y3, Y9 and Y10 are approved to exit/enter runway 01L/19R.
- Rwy 26 can be used for landing only and only exit X2 is approved.
- Taxiway Y, PA and X between Y-ZQ will be used for taxiing and all taxiing will be marshaled.
- Judgemental oversteer shall be used at Y1, Y10, Y-PA-X and X2.
- Idle thrust should be used on outer engines when taxiing.
- A380 parking will be at stand F36 on Pier F.

### OPERATIONAL INFORMATION

Handling Agent	Menzies
Handling Agent VHF	131.45
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

**CAPE TOWN (CPT/FACT)**

Elevation 151ft

**CATEGORY A**

AV brief not required.

**GENERAL**

- Situated approx. 10nm SE of the city.

**Threat Based Briefing Topics****CFIT**

- Terrain 8nm to the W and SW to a peak of 3600ft ask is Table Mountain
- Terrain 9nm to the N to 1700ft is the Tygerberg Nature Reserve
- Terrain 16nm to the E to 5200ft asl in the Stellenbosch region
- Rwy 19 – high ground and obstructions exist along the eastern boundary of the final approach
- Rwy 19 approach: caution when intercepting the glideslope from above with a high rate of descent due to terrain immediately to the East of the approach.

**ARRIVAL****Diversion Airports**

JOHANNESBURG	JNB/FAOR	687 nm/049°T	CAT B
DURBAN King Shaka Intl	DUR/FALE	673 nm/072°T	CAT A
GABARONNE	GBE/FBSK	683 nm/036°T	CAT A
BLOEMFONTEIN	BFN/FABL	491 nm/055°T	CAT A

For consideration in critical circumstances, GEORGE GJR/FAGG is located 188nm/090°T from FACT (LDA 2000m, PCN 49/F/B/Y/U, RFF 7).

**Approach**

- Circling is not permitted between 010°M to 160°M
- Rwy 19 PAPI must not be used beyond 5nm from the threshold

**GROUND**

- Taxiway C has a width of 21m and is therefore unsuitable for B747-400 aircraft
- Crews are advised to vacate at the end if possible when using Rwy 19.

**DEPARTURE**

- Aircraft are not to request pushback until tug is connected.

- Taxiways D3 and D4 are restricted to light/medium aircraft only
- Rwy 16/34 can be used as a taxiway
- Exercise caution whilst on Twy A1 due to fence at Air Chefs
- Do not confuse threshold Rwy 16 for threshold Rwy 19 when taxiing on A1 for takeoff on Rwy 19.
- Do not fly N of VOR CTV 140R below FL85
- Rwy 01/19 Emergency Turn, All Engines procedures and Noise Abatement procedures in CARD
- Rwy 01 departures should avoid overflying Tygerburg Hospital (3nm N of FACT).

## WEATHER

### In Summer (Oct to Mar)

- Generally fair with fresh S'ly winds
- A thundery spell occurs in late summer
- Occasional early morning fog a possibility

### In Winter (May to Aug)

- Winds mainly NW'ly
- Low cloud and rain with passing fronts
- Fog forming during the night may persist until as late as midday.

## OPERATIONAL INFORMATION

<b>Handling Agent</b>	Menzies
<b>Handling Agent VHF</b>	129.975
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU not available). Keep ground power connected when available to reduce APU fuel burn.

**DURBAN (DUR/FALE)**

Elevation 304ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Durban is the primary alternate for JNB. Opened in 2010 DUR is a very well equipped, Code F capable airfield.

**ARRIVAL****Diversion Airports**

JOHANNESBURG	JNB/FAOR	260 nm/323°T	CAT B
HARARE	HRE/FVHA	703 nm/359°T	CAT A

**GROUND**

- Note that the taxiways have very large fillets in the turns and the yellow taxiway centreline is already offset toward the outside of the turn. For this reason the nosewheel will not have to be placed as far beyond the taxiway centreline as at LHR, for example

**Parking**

- Expect to park on stand C5 or C2 in the Charlie Apron
- The Delta Apron may also be available for taxi-in, taxi-out parking however it is occasionally occupied by cargo aircraft

**OPERATIONAL INFORMATION**

Handling Agent	Menzies
Handling Agent VHF	131.0
Potable Water	Uplift Permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use APU (ACU not available). Keep ground power connected when available to reduce APU fuel burn.



**JOHANNESBURG (JNB/FAOR)**

Elevation 5,558ft

**CATEGORY B**

No AV brief required.

**GENERAL****Threat Based Briefing Topics**

- See section on [‘Hot and High’ Operations](#) for information on operations to High Density Altitude airfields.

**Special Considerations**

- During periods of Cb activity, most likely to occur in the South African summer afternoons and evenings (Nov-Mar), it is possible to get the wind blowing in opposite directions and either end of the runway. The predominant drift of Cb activity is from SW to NE, and as the Cbs approach the airfield and move across the runway the wind at surface level will change direction. The prevailing surface wind in the summer evenings is from the NE, but can change rapidly and in a localised manner to the SW. ATC also have instantaneous read-outs of W/V for the thresholds of 03R, 21L and 21R, together with Rwy centre position winds and gust factors. However, this information would appear not to be volunteered to crews, it needs to be specifically requested.
- As mentioned in the previous paragraph, the prevailing surface wind direction in South African summer afternoons and evenings is from the NE. However, the wind direction commonly undergoes a 180° reversal between 1000ft and 2000ft aal. This is particularly marked during periods of Cb activity, but also commonly occurs at other times. This will result in an aircraft taking off in a headwind, encountering a tailwind just after takeoff. The 1500ft wind may be requested from the Met Office/Activesky or ATC (though VATSIM ATC are unlikely to have this info).
- In the early morning during the South African winter months, there is a marked temperature inversion. This affects all South African airports, but is particularly noticeable at Johannesburg. Prevailing wind NW'ly. Extremes of temperature range from Nov 34°C to Jun -7°C.

**ARRIVAL****Diversion Airports**

DURBAN (King Shaka Intl)	DUR/FALE	272 nm/148°T	CAT A
CAPE TOWN	CPT/FACT	688 nm/227°T	CAT A
GABARONNE	GBE/FBSK	158 nm/307°T	CAT A
BLOEMFONTEIN	BFN/FABL	206 nm/210°T	CAT A

**Approach**

- ILS Cat 2 Rwy 03R and 21L: caution radio altimeter on Rwy 03R and Rwy 21L will ramp down approximately 50ft just prior to Cat 2 DH, reducing the time between 50 above call and DH
- Crew report experiencing scalloping of Rwy 03L GP

- In order to maintain the glideslope on short finals, the rate of descent may be slightly higher than normal due to a high TAS. This may need to be allowed for in your landing technique
- Rwy 03R will be usual landing runway
- Ensure ATC are informed whether you are vacating 03R at RS or full length

### GROUND

- Caution is advised when following EOT procedures on taxi-in. If necessary, restart engines to avoid high power settings and blast damage.

**CAUTION:** *Gate numbers inside the terminal do not relate to the stand numbers used by ATC as per Jepp 10-9*

- Parking normally on Apron E. BAW47C parks on Taxiway Mike, just south of intersection with Taxiway Bravo.
- This is uphill from Taxiway A on to D with a significant gradient and due to jet blast in a tight apron **it is not appropriate to shut down engines during taxi-in**
- Take care during the final turn on to stand (uphill then downhill) and caution applying excessive thrust as this can cause blast damage to the remotely parked aircraft, equipment and personnel behind

### DEPARTURE

- The intersection of Taxiway Delta with Taxiway Alpha can be poorly lit at night with reports that only the taxiway centreline lights may be illuminated
- On taxi out there is a downhill gradient and care must be taken when negotiating the turn on to Taxiway Alpha
- A risk of taxiway excursion exists
- As noted on the Jepp 10-9, there are numerous hotspots including the junction of Taxiway Bravo with Taxiway Mike, which can be poorly lit. Taxiway Bravo bends to the east whilst Taxiway Mike continues straight ahead.
- The first cleared level is a Flight Level and usually FL090 which is only 3500ft above the airfield, so a prompt setting of STD is required once past Aa.
- A lot happens at this point of the departure including an automatic frequency change, altimeter setting change, flap movement and level off.
- The handoff to Johannesburg Radar is normally 'silent' and occurs passing 6500ft – i.e. there will be no frequency change instruction from Tower, crews are expected to change frequency and call Johannesburg Radar automatically when passing 6500ft.

**WEATHER**

- Shoulder seasons can include morning fog in JNB. The airfield is CAT II and can operate to CAT II minima even though the runways are E only.
- Predominant wind direction in November overwhelmingly northwesterly.

**OPERATIONAL INFORMATION**

Handling Agent	Menzies
Handling Agent VHF	129.975
Potable Water	Uplift Permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use APU (ACU not available). Keep ground power connected when available to reduce APU fuel burn.

## MAURITIUS (MRU/FIMP)

Elevation 183ft

### CATEGORY B

No AV brief required.

### GENERAL

- Mauritius is a mountainous island with the airport located on a small plain in the SE corner.
- No radar available

### Threat Based Briefing Topics

#### CFIT

- High ground mainly to the N and NW with the highest peak 2,717ft asl 12 nm W of the airfield.
- NW the terrain rises in a continuous 1:30 slope towards the high ground
- High ground immediately to the N which reaches 1,200ft asl within 2.5 nm

#### Runway Excursion – Stable Approach

- Rwy 14 stable criteria – early 1000 auto callout due rising terrain. Callout occurs at 1800ft QNH (4.7d IPL). Refer to the approach guidance below.

#### Runway Excursion - 180° Turns

- To assist 180° turns on rwy at Turning Pad 1 and 2, a guidance system is provided – see Jepps
- Use published SOPs for turns on turning pad 2

### ARRIVAL

#### Diversion Airports

LA REUNION	RUN/FMEE	125 nm/257°T	CAT B
SEYCHELLES	SEZ/FSIA	957 nm/352°T	CAT B
DAR ES SALAAM	DAR/HTDA	1351 nm/307°T	CAT A

Others that can be used include Nairobi and Mombasa

- Landing and takeoff normally Rwy 14 due prevailing easterly trade wind
- Large westerly variation

## Approach

- Expect clearance “direct to FF descend to 4000ft” rather than the GBY arrival
- Rwy 14 Approaches: although the RNAV(GNSS) approach provides a constant 3.5° vertical path for reduced workload, the ILS approach provides a lower decision altitude for use in the event of low cloud or restricted visibility which is not uncommon.

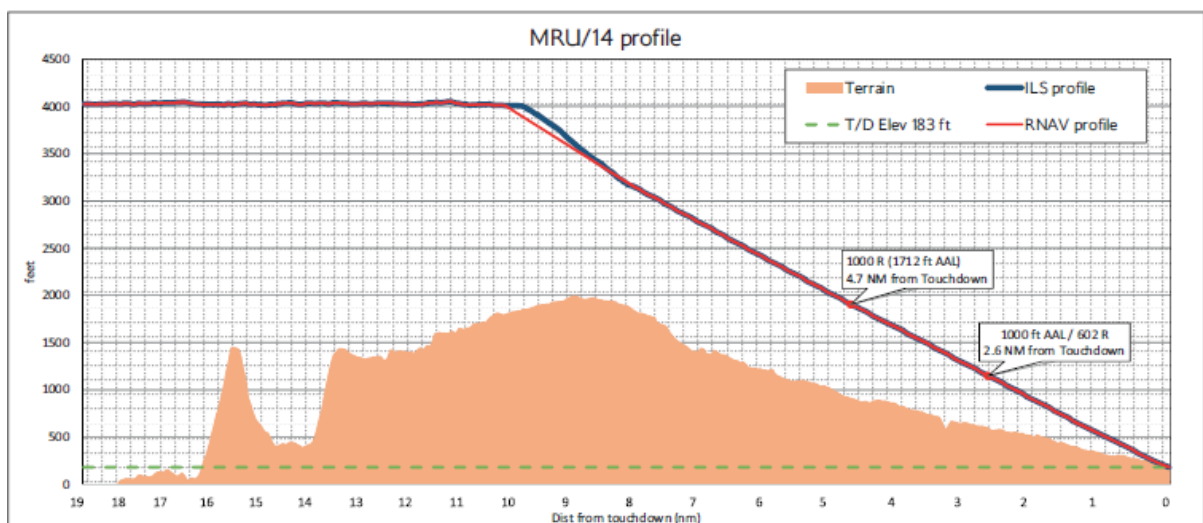
- The ILS approach to Rwy 14 has an unusual vertical profile and steep G/S of 3.5°; review the guidance below when briefing for the ILS approach:
  - It is strongly recommended that the aircraft is fully established in the landing configuration prior to the 10d IPL descent point for energy management during the steep approach and to reduce the CFIT risk
  - Descent below 4000ft is not permitted before 10d IPL in order to ensure separation from the high terrain underlying the approach path just before 10d IPL
  - Between 10d IPL and 8d IPL is the intermediate approach and has a 3.8° profile

**CAUTION: Do not use ILS G/S until 8d IPL to ensure terrain clearance**

- At the 10d IPL descent point commence descent with an appropriate rate of descent such that the 3.5° ILS G/S can be intercepted and captured from above not before 8d IPL

**CAUTION: Do NOT descend below 3200ft before 8d IPL**

- Depicted below are the Rwy 14 RNAV and ILS vertical profiles, as well as the underlying terrain which generates the unexpected rad alt values and the position of the 1000ft auto callout when on profile. Ensure the vertical profile is accurately followed.



- Circling approaches to Rwy 14 are flown RH inside the high ground.

## GROUND

- Refer to the Runway Excursion section for details regarding 180° turns on turning pads

## DEPARTURE

- Emergency Turn Procedures in CARD
- Do not enter Rwy 14 for backtrack until the Final Loadsheet has been received.

**WEATHER**

- A tropical depression within 150 nm of both Mauritius and St Denis Gillot could give bad weather conditions at both airfields simultaneously
- Prevailing wind easterly
- Apr to Aug – referred to locally as winter with strong E-SE winds. Cb develop inland by day.
- Visibility reduced by smoke from fires during sugar cane cutting
- Sep to Nov – occasional showers. Weak fronts giving low cloud and drizzle.
- Dec to Apr – Monsoon rains. Heavy showers and thunderstorms.
- Cyclones very occasionally from Jan to Feb.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Ground 2 Air
<b>Handling Agent VHF</b>	131.7
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**DIEGO GARCIA (FJDG)**

Elevation 14ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- The airfield is located on the western arm of a coral atoll in the mid-Indian Ocean.
- Diego Garcia is the largest landmass in the Chagos Archipelago and the largest continuous dryland rim of all atolls in the world

**ARRIVAL****Threat Based Briefing Topics****CFIT**

- Terrain is not a consideration however there are obstacles up to 254ft in the immediate vicinity of the Rwy 13 final approach path

**Runway Excursion**

- Slightly steeper (3.4°) RNAV approach to Rwy 13
- 61m wide runway with risk of visual illusions

**Mid Air Collision**

- Rwy 13 approaches established outside of controlled airspace

**Approach**

- No STARs published. The ILS for Rwy 31 requires bearing information from the NKW TACAN which is not available to civilian aircraft. As such expect RNAV approaches.
- NKW TACAN will provide DME information only
- ATC at Diego Garcia is provided by the US military. Expect FAA phraseology and procedures. US TERPS minima in use, weather minima given in feet/statute miles rather than metres

**WEATHER**

- Temperatures are generally uniform throughout the year at around 30°C.
- An almost constant breeze keeps conditions comfortable. Winds Oct-Nov are generally light and variable, veering to a westerly direction with the onset of summer in Dec
- Thunderstorm activity generally noticed during the afternoon and evening during summer months and when the ITCZ is in the vicinity of the island.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not available

<b>IF ONLY Electrical Power is required</b>	Use APU
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU



**DZAOUDZI (DZA/FMCZ)**

Elevation 23ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- DZA is located on the southern tip of the island of Petite-Terre. The main island of Mayotte, Grande-Terre, is across the water to the west.
- Although seemingly very small, the airport has regular B777 services and it is the only airport in Mayotte with scheduled services

**ARRIVAL****Threat Based Briefing Topics****CFIT**

- Hill elevation ~430ft asl 300m E of Rwy 16 extended centreline, 0.8nm from threshold not shown on Jeppesen charts
- Other significant high points include 673ft asl 1nm E of the airfield
- High ground to the W on the main island with spot heights up to 2,165ft asl

**Runway Excursion**

- Rwy 16 displaced threshold – LDA 1680m. Check performance-limited MLW before dispatch and with actual expected landing weight in-flight
- Either runway may be very limiting when not dry

**Approach**

- VOR approaches not available to Cat D aircraft
- Expect vectoring to RNAV approach
- Rwy 14 approaches: do not fly east of extended centreline due to CFIT risk.
- Rwy 32 missed approach: avoid flying east of published track due to CFIT risk

**GROUND**

- Parking on A or B ramps
- Expect taxiway G for departure during WF

**WEATHER**

- Risk of heavy rain, Cb build-ups and occasional cyclones during NE monsoon (Nov-May)
- Prevailing north-easterly wind in November but southerly winds still possible early on

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU not available). Keep ground power connected when available to reduce APU fuel burn.

**LUBANGO (SDD/FNUB)**

Elevation 5772ft

**CATEGORY C**

AV Brief not required

**GENERAL**

- The airfield is located on the eastern outskirts of the city
- Very limited information published in Jepps

**Threat Based Briefing Topics**

Refer to the [‘Hot and High’ Operations](#) section for information on operations to High Density Altitude Airfields

**CFIT**

- Lubango is one of the highest places in Angola and terrain rises sharply to the W, N and S of the airfield
- Significant peaks include ~7,710ft asl 10nm W and a ~7,300ft asl peak almost exactly under the Rwy 10 final approach path at 8 nm
- A ridge and plateau rises to ~6,900ft asl 4nm SW of the airfield
- A ridge ~6,300ft asl rises 12 nm SE of the airfield
- Rwy 28 night approaches carry risk of ‘black hole’ illusion due to featureless terrain under the approach and the lights of the city, which lies on upsloping terrain on the far side of the airfield.
- Rwy 28 RNAV approach terminates at missed approach point 0.8nm prior to the runway threshold

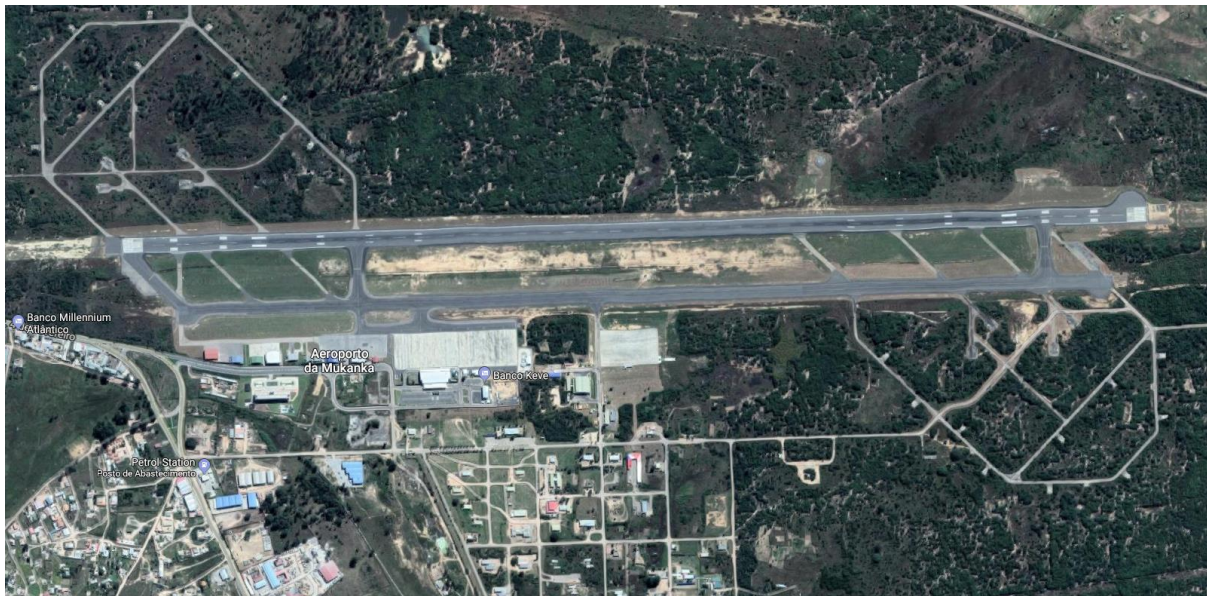
**APPROACH**

- RNAV 28 is the only published instrument approach
- Circling prohibited south of airport
- RNAV Approach Rwy 28: slightly shallower than normal glidepath of 2.87°, though due to the high density altitude this will tend to result in roughly similar rates of descent to a 3° GP at sea level. Note that the approach as coded in the FMS does not terminate at the Rwy 28 threshold, but at the missed approach point, MR28, which is located 0.8nm prior to the threshold.
- The RNAV approach has an unusually high minimum temperature of +15°C associated with it. If reported temperature on the airfield is below +15°C, which is possible at night, use of VNAV is prohibited and the approach must be flown using V/S and LNAV.
- Consider options for flying the missed approach in the event of a navigation accuracy downgrade. Nav aids available include the VUB VOR/DME, frequency 112.3 situated 080°/1.0nm from the airfield, as well as the UB NDB, frequency 335 situated 088°/1.3nm from the airfield

- Officially the airfield is closed during hours of darkness, though World Flight have obtained a special exemption. However, runway lighting is poor with runway edge lighting only and no centreline lighting.
- A risk of 'black hole illusion' exists on night approaches to Rwy 28 due to the dark, featureless terrain under the approach, poor quality airfield lighting and the location of the city on upsloping terrain immediately beyond the airfield.
  - Make maximum use of all available glidepath aids, including the RNAV vertical path and PAPI lights.
  - Although the RNAV approach does **not** terminate in a "RWXX" threshold waypoint, entering "FNUB28" in the FIX page will provide distance to threshold and this should be monitored and used for height vs distance checks on the approach, provided FMS navigation accuracy has been confirmed to be acceptable.
- Night circling approaches to Rwy 10 are prohibited

### GROUND

- Very limited info on Jepp 10-9, but the exits and terminal area are located to the south of Rwy 10/28



- Rwy 28 full length only available via backtrack, but may not be necessary at typical Worldflight weights

### WEATHER

- Generally hot and humid during the day, but cool to cold at night
- Temperature extremes range from 34°C in October to -1°C in June with Sept and Oct the warmest months
- Rain very rare Jun-Aug but very wet Dec-Mar

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Best Fly Flight Support
<b>Handling Agent VHF</b>	130.3
<b>Potable Water</b>	Not permitted

<b>IF ONLY Electrical Power is required</b>	Use APU – do NOT use any ground service
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU - do NOT use any ground service

**LIBREVILLE (LBV/FOOL)**

Elevation 38ft

**CATEGORY A**

AV Brief not required.

**GENERAL**

- Libreville Leon M'ba International Airport is situated on the coast of Gabon
- Joint civil/military airfield, with military aprons either side of the civil apron
- No significant terrain in the vicinity

**GROUND**

- Turns to be completed at the runway ends only
- Use only Twys 1, 2 or 3

**WEATHER**

- There is little seasonal variation in temperature, with averages between 23°C and 31°C and high humidity
- There is a dry season from May to September, with thunderstorms common at other times of the year
- The long rains are from February to April, the short rains from October to November

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use APU – do NOT use any ground service
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU - do NOT use any ground service

## AGADIR (AGA/GMAD)

Elevation 253ft

### CATEGORY A

AV brief not required.

### GENERAL

- AGA is located at the mouth of a wide valley, surrounded by the Atlas mountains to the north, east and south.
- The airfield is located 11 nm southeast of the city itself, just south of the Sous river.

### Threat Based Briefing Topics

#### CFIT

- The Atlas mountains rise N, S and E of the airfield with MSAs of 14,500ft within 45nm

### ARRIVAL

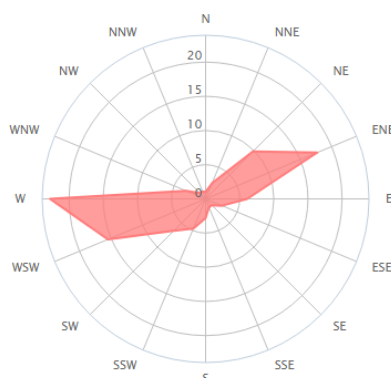
- Arrivals from the south can expect an ARSOL STAR, with radar vectoring to final approach
- The daytime sea breeze will usually favour a Rwy 27 arrival

### GROUND

- Parking on the main apron is nose-out. Note the stand entry instructions published on the Jepp 10-9

### WEATHER

- Summers are warm and winters mild, with daytime temperatures rarely dropping below 20°C
- Rainfall is typically confined to the winter months and is heavily influenced by the North Atlantic Oscillation, with negative NAO indices producing wet winters and positive indices correlating with drought.
- CHERGUI winds from the Sahara may exceptionally bring temperatures in excess of 40°C



**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not permitted

<b>IF ONLY Electrical Power is required</b>	Use GPU
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times



**DAKAR (DSS/GOBD)**

Elevation 290ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- The airfield is located 23 nm east of the city
- DSS is a modern, A380-capable airport opened in late 2017.

**ARRIVAL**

- Prevailing wind usually favours northerly landings
- Rwy 19 non-precision approaches only

**GROUND**

- Ample parking available on Apron N and Apron G

**DEPARTURE**

- No CARD performance data available; use VDC and paper tables provided overleaf

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*****
* GOBD 01          * FLAPS 20   * D-T0          *          BLAISE DIAGNE INTL *
*****
: ELEVATION = 272 (FT) : B747-400/RB211-524H : : :
: SLOPE = -0.20 (%) : DATED 21 AUG 2018 16:20 UTC : ALL WEIGHTS IN :
: T.O.R.A. = 3500 (M) : : : KILOGRAMS (KG) :
: T.O.D.A. = 3500 (M) : AIR COND ON : : :
: A.S.D.A. = 3500 (M) : ANTI ICE ON OR OFF : NOT FOR :
: LENGTH = 3500 (M) : RUNWAY COND 13MM WATER : OPERATIONAL USE :
: WIDTH = 60 (M) : QNH 1013.25 HPA : : :
: : : : : : :
: TEMP : WIND COMP : WIND COMP : WIND COMP : WIND COMP : WIND COMP :
: °C : -15 KTS : +0 KTS : +10 KTS : +20 KTS : +30 KTS :
: : : : : : :
: -10 : NOT AUTH : 385670 FIELD : 424237 FIELD : 430000 BRAKES : 430000 BRAKES :
: : : 130 166 179 : 136 169 180 : 138 169 180 : 138 169 180 :
: : : : : : :
: +0 : NOT AUTH : 362327 FIELD : 369848 FIELD : 377368 FIELD : 377368 FIELD :
: : : 125 159 174 : 128 161 175 : 132 164 177 : 132 164 177 :
: : : : : : :
: +10 : NOT AUTH : 362700 FIELD : 371261 FIELD : 379822 FIELD : 379822 FIELD :
: : : 125 159 174 : 129 162 176 : 133 164 177 : 133 164 177 :
: : : : : : :
: +20 : NOT AUTH : 359055 FIELD : 368657 FIELD : 378259 FIELD : 378259 FIELD :
: : : 125 158 173 : 128 161 175 : 132 164 177 : 132 164 177 :
: : : : : : :
: +30 : NOT AUTH : 355246 FIELD : 365589 FIELD : 375915 FIELD : 375915 FIELD :
: : : 125 157 172 : 128 160 175 : 133 163 177 : 133 163 177 :
: : : : : : :
: +40 : NOT AUTH : 327319 FIELD : 335181 FIELD : 342722 FIELD : 342722 FIELD :
: : : 121 150 165 : 122 153 167 : 126 155 169 : 126 155 169 :
: : : : : : :
: +50 : NOT AUTH : 303706 FIELD : 310005 FIELD : 316303 FIELD : 316303 FIELD :
: : : 115 146 159 : 117 148 161 : 121 150 162 : 121 150 162 :
: : : : : : :
: +60* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
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: : : : : : :
: +70* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
: : : : : : :
: : : : : : :
: +72* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
: : : : : : :
: : : : : : :
: +74* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
: : : : : : :
: : : : : : :
: * = EXCEEDS RWY ENV TEMP LIMIT : RWY ENV TEMP LIMIT = +53°C :
: : RWY ASS TEMP LIMIT = +74°C :
: --PRESSURE CORRECTION-- : : : : :
: +1 HPA : NOT AUTH : +169 KG : +113 KG : +57 KG : +57 KG :
: -1 HPA : NOT AUTH : -486 KG : -530 KG : -579 KG : -579 KG :
: : : : : : :
: MAX BRAKE RELEASE WEIGHT MUST NOT EXCEED MAX CERT TAKEOFF WEIGHT OF 396893 KG :

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*****
* GOBD 19          * FLAPS 20   * D-TO      *          BLAISE DIAGNE INTL *
*****
: ELEVATION = 251 (FT) : B747-400/RB211-524H : : :
: SLOPE = +0.20 (%) : DATED 21 AUG 2018 16:19 UTC : ALL WEIGHTS IN :
: T.O.R.A. = 3500 (M) : : KILOGRAMS (KG) :
: T.O.D.A. = 3500 (M) : AIR COND ON : :
: A.S.D.A. = 3500 (M) : ANTI ICE ON OR OFF : NOT FOR :
: LENGTH = 3500 (M) : RUNWAY COND 13MM WATER : OPERATIONAL USE :
: WIDTH = 60 (M) : QNH 1013.25 HPA : :
:-----:
: TEMP : WIND COMP : WIND COMP : WIND COMP : WIND COMP : WIND COMP :
: °C : -15 KTS : +0 KTS : +10 KTS : +20 KTS : +30 KTS :
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: -10 : NOT AUTH : 392330 FIELD : 430000 BRAKES : 430000 BRAKES : 430000 BRAKES :
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: +0 : NOT AUTH : 359161 FIELD : 366626 FIELD : 374091 FIELD : 374091 FIELD :
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: +10 : NOT AUTH : 359751 FIELD : 368249 FIELD : 376747 FIELD : 376747 FIELD :
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: +20 : NOT AUTH : 355628 FIELD : 365159 FIELD : 374690 FIELD : 374690 FIELD :
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: +40 : NOT AUTH : 324764 FIELD : 332568 FIELD : 340373 FIELD : 340373 FIELD :
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: +50 : NOT AUTH : 301524 FIELD : 307776 FIELD : 314028 FIELD : 314028 FIELD :
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: +60* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
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: +72* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
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: +74* : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH : NOT AUTH :
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: * = EXCEEDS RWY ENV TEMP LIMIT : RWY ENV TEMP LIMIT = +53°C :
: : RWY ASS TEMP LIMIT = +74°C :
:-----:
:--PRESSURE CORRECTION:-----:
: +1 HPA : NOT AUTH : +192 KG : +137 KG : +82 KG : +82 KG :
: -1 HPA : NOT AUTH : -468 KG : -511 KG : -554 KG : -554 KG :
:-----:
: MAX BRAKE RELEASE WEIGHT MUST NOT EXCEED MAX CERT TAKEOFF WEIGHT OF 396893 KG :

```

**WEATHER**

- Generally warm with a short rainy season (Jul-Sep) and a lengthy dry season (Oct-Jun)
- November sees the highest temperatures, with average daily highs of 31°C and nightly lows around 23°C. However, sea breezes tend to keep temperatures cooler than other inland African cities
- Prevailing wind almost exclusively northerly.

**OPERATIONAL INFORMATION**

Handling Agent	Simfest Ground Services
Handling Agent VHF	
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use GPU
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

**JACKSON HOLE (JAC/KJAC)**

Elevation 6,451ft

**CATEGORY C**

No AV brief available.

**GENERAL**

- JAC is located 7nm north of Jackson town in the Jackson Hole valley, within the Grand Teton National Park
- It is the busiest airport in Wyoming by passenger traffic and the only commercial airport in the United States inside a National Park
- The airport is a mating ground for the rare sage grouse, and the town itself gained significant fame in 2016 when a live stream of the town square went viral on YouTube
- The airport is surrounded on all sides by high terrain with MSAs in excess of 14,000ft within 10nm
- Significant EASTERLY variation (13°E)

**Threat Based Briefing Topics**

See section on [‘Hot and High’ operations](#) for detailed information on operations to high density altitude airfields.

**CFIT**

- The airport lies in a basin between the Teton and Gros Ventre mountain ranges, with steeply rising terrain on all sides.
- In addition to a peak of 13,748ft asl 8nm NW, Blacktail Butte, 7,688ft asl 2.6nm NE is just E of the Rwy 19 final approach course and the Rwy 01 missed approach
- Other notable spot heights 8,344ft asl 16nm SSE, 7,439ft asl 5nm S, 11,241ft asl ~6nm E.
- The terrain is well-depicted on Lido and Jeppesen final approach charts
- No STARs are published: pay close attention to MSAs during transition from enroute to approach phase
- Potential for black hole illusion during night approaches. During winter the area surrounding the airfield is often blanketed with snow, making it difficult to judge height and glidepath.

**Runway Excursion**

- Short landing due to excessive mitigation to land well inside the TDZ
- If the aircraft has not touched down within the marked touchdown zone a go-around must be flown
- Stable approach during rushed visual approaches
- Tailwind during approaches to Rwy 01 with light S'ly wind

**ARRIVAL**

- Rwy 01 preferred for arrivals. ATC may offer a visual approach if weather permits. Expect a right hand downwind for Rwy 01.

- Prevailing wind in November favours Rwy 19. Be wary of any tailwind component if Rwy 01 is in use.
- Pay close attention to step-down altitudes along the procedure and be vigilant about ATC assigned altitudes if under radar vectors
- A risk of black hole illusion exists for night approaches. Similar difficulties in judging height and glidepath may be experienced during daytime in winter due to the blanket of snow which often covers the surrounding area. Maximum use should be made of approach aids including the ILS G/P, PAPIs and RNAV V/DEV indications, as well as height/distance checks to mitigate against this.
- RNP AR procedures only available for temperatures above -27°C. At temperatures below -26°C (unusual but possible), altitudes for the RNAV (GPS) X approach will need to be temperature corrected and flown in LNAV + V/S.
- Note cold temperature corrections may be required to ATC cleared altitudes

### GROUND

- De-icing available if required at the de-icing pads at the north end of Twy A
- Note limited Twy lighting available in the region of the de-icing pad

### WEATHER

- Jackson experiences a unique microclimate which gets considerably more precipitation – mostly snow – than the rest of Wyoming
- The high elevation results in extreme differences between day and night temperatures. Average daily high/low 28°C/5°C (July) to -2°C/-15°C (January)
- Snowfall averages 1.81m per year, almost all falling between November and March

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**NEW YORK (JFK/KJFK)**

Elevation 14ft

**CATEGORY B**

No video brief currently available.

**GENERAL**

- Kennedy International is located on Long Island 10nm SE of the city.
- Apart from Jamaica Bay to the S, the airfield is surrounded by densely-populated, noise sensitive communities on all sides.

**Threats****CFIT**

- Refer to [ARRIVAL](#) section for details on approach platform altitudes, lack of approach lighting and PAPIs/VASIs

**Mid Air Collision**

- Very busy air traffic environment with airports La Guardia 9nm N and Newark 16nm W.
- Numerous light aircraft along the Long Island shoreline and parachute jumping aircraft operate in the vicinity of Calverton (CCC VOR) up to 13,500ft
- Due to the volume and complexity of air traffic it is common for arrival aircraft to be vectored in to New York Class B airspace and then back out again. Areas include:
  - Rwy 4L/R, South of the airport and East of Colt's Neck VOR (COL) at 3,000ft and 4,000ft
  - Rwy 13L/R, South of the airport and East of COL at 3,000ft and 4,000ft
  - Rwy 22L/R, NE of the airport and SE of Deer Park VOR, below Class B at 3,000ft through the Farmingdale cut-out and NE of the airport below Class B at 2,000ft
  - Rwy 31L/R, SE of the airport at 3,000ft and 4,000ft

**Loss of Control - Inflight**

- Bird hazard exists

**Runway Incursion**

- Risk exists during both arrival and departure due to the complex taxiway network and busy traffic environment

**Special Considerations**

- If fuel reserves are low advise ATC in good time. Diversions take about 15 mins to arrange.

## ARRIVAL

### Diversion Airports

NEWARK	EWR/KEWR	018 nm/280°T	CAT A
PHILADELPHIA	PHL/KPHL	081 nm/235°T	CAT A
BALTIMORE	BWI/KBWI	160 nm/236°T	CAT B
BOSTON	BOS/KBOS	162 nm/050°T	CAT B

- Others which may be used include: Washington DC, Montreal, Toronto, Detroit, Charlotte, Windsor Locks and Newburgh Stewart.

## Initial Approach

- The STAR is usually followed by radar vectors to final approach
- ATC often impose speed control during arrival which should be strictly followed
- Crew should be mindful that combinations of Rwy direction configurations may be in use at any one time
- Last minute runway changes and side step requests are frequent.

## Approach

### NW Configuration (31L/R)

- False localiser and glideslope capture have been experienced on ILS 31R
- Most frequently used throughout the winter months with the northerly and northwesterly winds
- Arriving Rwy 31R and departing Rwy 31L
- 1430L to 1730L arrivals may also use 31L due to demand. A **side-step manoeuvre** from Rwy 31R to 31L is sometimes requested by ATC on short finals. Careful consideration should be given to manoeuvring requirements and the Stable Approach Criteria before acceptance.
- Rwy 31L has no approach lighting

### SW Configuration (22L/R)

- Arriving 22L while departing 22R
- Configuration used when required by wind and weather conditions and during the day to comply with Rwy rotation commitments and allow for maintenance on the 13s/31s.
- When making an approach to Rwy 22L it is normal practice to fly the VOR approach. The offset avoids conflict with departing La Guardia traffic, once visual and inside 4 miles it is acceptable to adjust to the centreline.
- Recently resurfaced Rwy 22L is significantly darker in appearance than Rwy 22R. This has caused crews to misidentify the correct runway during VOR approaches. Crews should anticipate and brief the correct visual picture and mitigate the risk of lining up on the incorrect runway centreline



- Occasionally, by either ATC or pilot request, a switch to Rwy 22R may be requested.

***Ensure the following points are fully briefed before beginning an approach to Rwy 22R:***

- Rwy 22R ILS approach – LOC offset which may give an unusual picture on becoming visual with the runway
- LOC may give unhelpful indications on the flight deck but GP should still be used for vertical guidance
- No approach lighting
- Only runway lighting is edge and centreline lighting. Landing threshold is marked by change in edge light colour from red to green. There is no cross bar denoting the landing threshold.

**Note:** The lack of vertical guidance and lighting can lead to crews becoming high on the descent profile. This has led to glidepath deviations and GPWS cautions on a number of occasions.

**NE Configuration (04L/R)**

- Arriving Rwy 04R while departing 04L
- Configuration is typically required during poor weather, when the airport encounters northeasterly winds, sometimes accompanied by significant rain, snow or fog.
- Used during the day to comply with Rwy rotation commitments and to allow for maintenance on the 13s/31s
- Used with strong E and NE winds. Avoids using ILS 13L as long as feasible because of the resulting negative impact to TEB (Teterboro) and LGA airports
- Rwy 04R arrival aircraft are requested to IMMEDIATELY advise ATC in the event of a missed approach as this is critical to separation from 04L departure aircraft
- Rwy 04L has no approach lighting.

**SE Configuration (13L/R)**

- Departures from 1800L are normally 13R and 13L due to demand (most efficient in terms of airport capacity and therefore most frequently used in summer months with the southerly sea breeze)
- No ILS on 13R
- ILS 13L is not an ATC preferred approach option in this configuration, generally used when weather conditions demand – primarily for noise reasons
- When Rwy 13L is used, crews should expect ATC to clear the aircraft for the VOR 13L.
- In strong crosswind conditions it is recommended to disconnect the autopilot earlier than the minimum disconnect height to get a feel for the conditions and minimise corrections closer to the ground. Crews should brief the expected point where the autopilot will be disconnected.
- Ensure Stable Approach Criteria (SAC) is achieved prior to 1000ft aal.
- On the CRI approach a crew may be stabilised laterally only at approximately 500ft aal. It is therefore close to the SOP stabilised lateral parameters and careful monitoring of the bank angle by the PNF turning onto the extended centreline is required. A good appreciation of the

wind direction and its consequence for the final turn is also important in order to achieve less than a 15° bank angle below 500 feet aal.

- ATC will often ask crews to maintain 180kt to CRI (5.2 or 6.2NM to the thresholds), which makes a stabilised approach significantly harder. It is recommended that crews make the request to the approach controller as early as possible (i.e. before turning for ASALT) for a suitable speed at this point, possibly 160kt.
- If weather conditions are good, cross CRI at 1500ft and hold level until intercepting the 3 degree descent path for 13L or R. If the weather is marginal it is important to get down to 850ft by the missed approach point (DMYHL) in order to have a chance of picking up the lead in lights. Having achieved this altitude, hold level flight for the initial stages of the visual segment for 13L although with cloud base at minimum a gradual descent may be required to remain in VMC.
- A continuing descent from DMYHL is required for landing on 13R.
- At DMYHL there is 3.6nm to run for 13L and 2.6nm for 13R. This means that when crossing DMYHL at 850ft, a crew is approximately 230ft low on profile for a 3 degree glide to 13L. Therefore if you keep descending this slope deficit increases and by getting even lower on profile it becomes harder to see the runway environment, PAPIs, etc. For this reason it is easier to hold level from DMYHL for 13L when weather conditions allow, until reaching the 3 degree visual indication, then set up the required rate of descent to keep on the profile.
- From DMYHL follow the curved lead-in lights to the runway. Often this approach will be flown with a south-westerly wind meaning crews must anticipate the turn onto the runway centreline. Data shows that in such conditions the start of the turn is often started too late with a consequent requirement for excessive bank angles to line up with the extended centreline.

### **Additional Briefing Considerations**

- Approaches can often be shortened by ATC increasing the risk of rushed/unstable approaches
- Initial descent is often required well before the FMS calculated descent point. Early and comprehensive briefing is recommended.
- Taxiing and Ground Operations at JFK needs to be thoroughly briefed

## **GROUND**

### **Taxiing**

- If APU is INOP, ground power will be connected via the Jet Bridge. In order to do this, the jet bridge must be connected to the aircraft prior to connecting the cables. For departures, the jet bridge will have to remain attached to the aircraft after doors are closed whilst an engine is started using power from the jet bridge. Once this is completed, the jet bridge will be removed.
- ATC expect aircraft to vacate runways expeditiously without blocked exit taxiway
- Tower will normally give initial taxi instructions before transfer to ground. If they don't, or difficulty is encountered contacting ground then vacate and turn on to the first taxiway - do NOT block the exit. Even if you turn the wrong way, ATC are quite happy that you have kept exits unblocked.

- Landing 31R it is tempting to vacate at Twy V which offers easy access to the Terminal 7 ramp – however, be aware that there could be two frequencies (Ground and Ramp) to talk to before proceeding and any difficulty here could lead to the runway exit being blocked.
- The basic sense of the taxiways is that A (the inner) is used clockwise and B (the outer) is anti-clockwise, but care is required especially at night or in the snow. The apron roadways are frequently better marked than the taxiway centrelines and so crews should use caution about their proximity to other aircraft and lamp standards.
- If landing on rwy 31L crews should exit at either PD or PE onto taxiway P. Also note that twy ZA between C and rwy 22R is much narrower than it appears to be on the chart – use great caution. Taxiway B bridges can be used by the B747-436 without weight restriction although crews should avoid stopping on the bridges due to a lack of escape slide clearance.
- BAV aircraft will normally use Terminal 7, entering by V, VV, VA or W. Parking is likely to be on Stands 2 to 6. A380s park at Terminal 4.
- Note there are taxi route restrictions for the B777-300ER and A380.

## **Parking**

- It is essential you enter the ramp by the correct entry for your gate – it is not possible to taxi from one entry point to another.
- All manoeuvring areas at JFK are restrictive and reduced engine taxi is not recommended

## **DEPARTURE**

- KENNEDY, MERIT, BETTE & HAPIE departures are normally assigned to aircraft returning to Europe via the NAT OTS.
- CARD notes on Noise Abatement procedures
- Certain BAV flights are scheduled to arrive at LHR shortly after 0600L; although JFK taxi times are unpredictable crews should still make every effort to ensure that ETA at LHR is not before that time.
- Long delays on taxi out are common; the flight plan should include extra fuel for this contingency.
- Pushback will usually be “at your discretion” as ramps are not controlled by ATC. However, if pushback is required on to Twy A then clearance MUST be obtained from JFK Ground before pushback is commenced.

### **A318 Departures**

- Crew must advise ATC that 2 minutes wake turbulence separation behind a heavy is required when requesting taxi on the ground control frequency. This will assist ATC as otherwise 5 miles radar separation behind a heavy would routinely be applied.
- Rwy 04L departure aircraft can expect to fly Rwy heading to 1.5 DME, then turn right to 100°. This is to provide separation from possible missed approaches to 04R, who are also required to turn right to 100° so as to avoid LGA airspace
- Controllers may instruct departing aircraft to turn right to 100° prior to 1.5 DME at pilot's discretion when arriving aircraft are not a factor.

**WEATHER**

- Summers warm with occasional heatwaves. Thunderstorms most prevalent May-Sep. Risk of sea fog in Apr and May.
- Winters cold with snow, sleet or rain. Heavy snow falls are a possibility. Slow moving warm fronts just off the coast bring low cloud and poor visibility which can be persistent.
- Washington is often the most reliable alternate during widespread poor weather.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	British Airways
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**MINNEAPOLIS/ST PAUL (MSP/KMSP)**

Elevation 842ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- MSP is located in a heavily built-up area at the confluence of the Mississippi and Minnesota Rivers, less than 10 nm from the centres of both Minneapolis and St Paul.
- It is the largest and busiest airport in the US upper Midwest, and 49<sup>th</sup> busiest in the world

**Threat Based Briefing Topics****CFIT**

- The terrain around MSP is generally flat, but there are various man-made obstacles and high-rise buildings up to 1,748ft asl in Minneapolis and 1,753ft asl in St Paul
- Terrain slopes gently down toward the river in the final approach segments to Rwy 12L/R and 30L/R which may lead to a slightly unusual aspect

**Runway Incursion**

- LAHSO is common on Rwy 30L and Rwy 22 with landing aircraft instructed to hold short of Twy A9/W9 (Rwy 30) or Twy K (Rwy 22) to enable ground traffic to cross the runway. Take care to ensure not to accept either an active or passive LAHSO clearance.
- The taxiway layout is complex in places, particularly at the intersections of Rwy 22 and Rwy 30L/30R and Rwy 04/22 and Rwy 17/35. These areas are highlighted on the Jepp 10-9 and vigilance is required to ensure the correct routing is followed

**Mid Air Collision**

- There are a number of GA airfields located in the Minneapolis-St Paul area and VFR aircraft may be operating outside controlled airspace without reference to ATC in close proximity to the approach and departure flight paths
- Opposite direction operations (take off 12s/land 30s) may be in use at quiet times

**ARRIVAL**

- Preferred runways for arriving traffic are, in order of preference: Rwy 30L/30R; Rwy 35; either Rwy 22 or Rwy 04; Rwy 12L/12R. Aircraft larger than B763 size can expect Rwy 30L or Rwy 12R.
- Rwy 17 never used for arrivals except in an emergency
- Most STARs terminate in a downwind heading from a fix. In the absence of other instructions, ATC expect you to leave the fix on the published heading and await further vectors. Some fixes may have different headings published dependent on the arrival runway: pay close attention to the STAR chart during the approach briefing and ensure the correct heading is flown.

## GROUND

- During World Flight, it is possible that 'Ground Metering' (MSP\_H\_GND 133.575) may be online to regulate the flow of departures
- If this is the case, obtain IFR clearance from MSP\_DEL who will then instruct a frequency change to Ground Metering. On first contact with ground metering give stand number and ATIS information letter.
- Ground Metering will update the clearance as required and instruct you to monitor Ground at the appropriate moment. Take careful note of the ground frequency as there may be several positions open.

## DEPARTURE

- Preferential departure runways, in order of preference, are: Rwy 12L/12R; Rwy 17; Either Rwy 22 or Rwy 04; Rwy 30L/30R.
- Departures from Rwy 22/ Rwy 04 available on request if required for performance reasons but will incur a delays
- Rwy 35 is not used for departures

## WEATHER

- As a result of its northerly latitude and inland location, the Minneapolis-St Paul area experiences the coldest climate of any metropolitan area in the US
- Daily average temperatures range from -5°C in January to 28°C in July
- Prevailing wind in November NW'ly
- The Minneapolis-St Paul area experiences many types of extreme weather with frequent high winds and blizzards. Tornadoes and flash floods have also occurred.

## OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

## SEATTLE (SEA/KSEA)

Elevation 433ft

### CATEGORY A

No AV brief required.

### GENERAL

- Large EASTERLY variation
- No air start unit available – APU should be serviceable ex LHR

### Threats

#### Loss of Control

- Flocks of birds in A/D vicinity

#### Mid-Air Collision

- Risk of TCAS RA events (often 'Descend, Descend') when on approach to inboard Rwy 16L/34R during close-in parallel approach operations in visual conditions. Refer to the 'Approach' section for further guidance.
- Risk of TCAS RA events in the vicinity of Boeing Field (BFI/KBFI) when on approach to Rwy 16L/C/R

### ARRIVAL

#### Diversion Airports

PORTLAND	PDX/KPDX	112 nm/186°T	CAT A
VANCOUVER	YVR/CYVR	111 nm/342°T	CAT B
CALGARY	YYC/CYYC	397 nm/057°T	CAT A
SAN FRANCISCO	SFO/KSFO	591 nm/180°T	CAT B

Others which may be used include Spokane and Edmonton.

### Approach

- TCAS RA events frequently occur on approach to the inboard runway – Rwy 16L/34R – during close-in parallel approach operations in visual conditions. ATC do not maintain 1.5nm spacing, often leading to TCAS 'Descend, Descend' guidance due to following traffic at higher airspeed.

**Note:** Local US carriers can operate with TCAS in TA ONLY during close-in parallel approaches and so will not receive or comply with RA guidance.

- ATC will assign BAV arrivals to the outboard runway – Rwy 16R/34L – whenever possible and exclude BAV arrivals from close-in parallel approach operations. Crews should avoid requesting approach to the inboard Rwy 16L/34R except where absolutely necessary.

- Rwy 16L/34R and 16C/34C – when weather conditions are reported as better than 800/2 the ILS critical areas for these runways will not be protected and crews can expect LOC and G/S fluctuations
- Rwy 16L/C/R and Rwy 34L – approach terrain rises rapidly to threshold causing radalt to ramp up quickly. For Rwy 16L the RA reads 120R when 100ft above the airfield.
- Rwy 16C – caution advised when transferring from instrument approach to visual. Ensure alignment with Rwy 16C as Twy T has been mistaken for Rwy 16C in certain lighting conditions.

## GROUND

### A380 Operations

#### Arrival

- If an A380 arrives on Rwy 16L/34R, ATC shall ensure that all aircraft are clear from Twy B north of Twy S
- When the A380 is taxiing on Twy B north of Twy S, ATC will not authorise Rwy 16L/34R to arrivals and departures
- ATC and Ramp control will coordinate operations on Twy B and taxilane W so that the A380 on Twy B does not pass any aircraft on Twy W (or vice-versa)
- When the A380 is on Twy A, ATC will not allow the wingtips of the A380 on Twy A and another A380 or B747-8 on Twy B to pass each other
- Twy J between Rwy 16C/34C and Twy H not available for A380 operations
- When the A380 is on Twy C, ATC will restrict all operations on Twy D.

#### Departure

- If the aircraft departs on runway 16L/34R, ATC shall ensure that all aircraft are clear from Twy B, north of Twy S, while the A380 is on the runway.
- There are no restrictions if the A380 departs on runways 16C/34C or 16R/34L.

#### Airfield Operations

- A 'follow me' will be provided for all A380 taxi operations
- Note there is no de-icing equipment suitable for A380

#### Parking

- There is no A380 tow bar available at Seattle. If the aircraft is carrying its own tow bar it may be parked on gate S11, Cargo 6 Line 3 or Cargo 2 NL1.
- If the aircraft is not carrying a tow bar or the ground handlers are otherwise unable to move the aircraft, it should **only** be parked on Twy A, Twy B south of Cargo 7, or Twy T.
- Taxiing northbound on Twy A the A380 should park at Pink Spot 2A.



- Taxiing southbound on Twy A the A380 should park south of Pink Spot 4A. Ensure that the entire aircraft is south of Pink Spot 4A and north of future Cargo 5 (the Post Office site).
- On Twy B the aircraft should be parked south of Cargo 7. This is only available when the airport is in south flow.
- On Twy T the aircraft will be parked to avoid the ILS critical areas at the north and south ends of the Twy.

**DEPARTURE**

- Emergency Turn procedures – refer to CARD for further details.

**WEATHER**

- DEC – FEB: Pacific cyclones produce rain with occasional low Stratus, drizzle and fog.
- MAR – MAY: Showery weather with good visibility. Early morning radiation fog usually clearing by 0900 (1700Z).
- JUN – AUG: St moving in from the Pacific up Puget Sound. The incidence of low Stratus increases through the Summer with ceilings down to 300ft.
- SEP – NOV: Radiation fog early morning and gradually increasing rainfall.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Menzies
<b>Handling Agent VHF</b>	130.05
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**BARCELONA (BCN/LEBL)**

Elevation 14ft

**CATEGORY B**

AV brief not required.

**GENERAL**

- The aerodrome is located on a small coastal plain 5.5nm SW of Barcelona city.

**Threat Based Briefing Topics****CFIT**

- Within 10nm from W through N to NE high ground reaching ~2,200ft asl
- 1,000ft asl contour at 5nm range
- Slopes of the Pyrenees start at 18nm. By 22nm peaks rise to 3,500ft asl and further N to over 11,000ft asl
- High ground between 12nm and 4nm on the approach to Rwy 07 just left of centreline
- Ensure descent clearances accepted comply with MSAs

**Loss of Control**

- BCN is subject to a marked diurnal wind variation which can change very rapidly. The airfield position on a coastal plain surrounded on three sides by the sea can exaggerate this effect. This can cause low level wind shear with the land sea breeze effect.

**ARRIVAL****Diversion Airports**

GERONA	GRN/LEGE	047 nm/040°T	CAT B
VALENCIA	VLC/LEVC	156 nm/227°T	CAT B
MADRID	MAD/LEMD	261 nm/259°T	CAT A

Others that may be used include Bilbao, Perpignan and Marseille

**Approach**

- See Jepp 10-1 pages for details of preferential runways and minimum runway occupancy procedures
- A rapid change to the wind direction vertically on the approach can result in multiple runway changes
- Note that when landing on Rwy 02, ATC expect aircraft to vacate by taxiway UB. Exit via M or N is not permitted.
- See noise abatement page for arrival speed control
- Arrivals from the N may have difficulty contacting Barcelona Control at the boundary

- Possible visual descent clearance if VMC
- Expect radar vectors but procedural approaches are not uncommon
- Circling prohibited in sector 255° clockwise to 010°
- Specific 'Comm failure missed approaches' published in Jepps
- Rwy 20 not available for landing
- Crew reports of occasional G/S fluctuation. Please report any occurrences directly to ATC.

### **GROUND**

- Parking at Terminal 1
- There are restrictions on some taxiways and standard taxi routes – see Jepp 10-1 pages
- PC is routinely connected on arrival – check PCA status prior to using APU bleed air
- B747 keep outboard engines at idle to avoid ingestion of gravel and dust during taxi
- If fuel is not required for the return sector advise station staff immediately upon arrival

### **DEPARTURE**

- Some areas are not visible to ATC and therefore crew look-out is essential
- Expect intersection departures Rwy 25R/07L, full length available on request
- Emergency Turn procedures in CARD. Attention to high ground is also necessary while executing the SIDs
- Take note of preferential runways as advised in Jepp 10-1 and justification required for some runway departures
- Crew should note BCN conditional line-up procedure as detailed in Jepp 10-1 for Minimum Runway Occupancy Time (MROT)

### **WEATHER**

- Summer – severe thunderstorms possible over the Pyrenees day and night. Fog may occur at the airfield after midnight.
- Winter and spring – early morning fog. Occasionally fog patches drift over the airfield but clear before fog becomes established.
- S winds produce low stratus. N winds give severe turbulence and downdraughts.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	IBAS – Iberia Airport Services
<b>Handling Agent VHF</b>	131.55
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Airport authority usage restrictions for APU are strictly enforced. Follow guidance in Jepp 10-1 pages.
<b>If BOTH electrical power and air conditioning is required:</b>	Airport authority usage restrictions for APU are strictly enforced. Follow guidance in Jepp 10-1 pages.

**INNSBRUCK (INN/LOWI)**

Elevation 1907FT

**CATEGORY C**Video briefing: [LOC/DME East Circle to Land 08](#)**REGULATION**The following procedures are **not** approved for use:

- RNAV RNP 26 (AR)
- LOC/DME West Special
- LOC/DME East
- RNAV SIDs with an RNP <1

Circling:

- When circle is required for Rwy 08, the BAV procedure is to utilise prescribed tracks, i.e. the "Special" Visual 08

Rwy 08 Take-off Minima:

- Lower Rwy 08 Takeoff Minima (by state permission only) is approved for use.

*Operations to INN require a 'Safety Pilot' as P3. If due to unforeseen circumstances a P3 is not available, the Commander is authorised to operate without a P3, considering the P1/P2 experience and prevailing operational environment.*

**GENERAL**

Guidance regarding operations in to INN are available from the following sources:

- This briefing
- The Innsbruck Aide-Memoire, available on the A320 fleet page, which details specific approach and departure procedures
- The forum thread at <https://forum.bavirtual.co.uk/viewtopic.php?f=15&t=24474>.

The definitive sources of information are the RIM and the Innsbruck Aide-Memoire.

Prior to operating to INN crews must be extremely familiar with all the provided briefing materials.

**The Aide Memoire must be used for approach and departure procedures.****Dispatch Restrictions**

The following must be serviceable for Airbus A319/A320 aircraft:

- One transponder
- TCAS
- EGPWS including automatic voice callouts
- Minimum of one autopilot
- At least one GPS

- ILS1 must be operative
- At least one VOR and ADF
- DMEs may be inoperative provided a serviceable GPS is available. This is in accordance with the MEL.

### Threats

#### CFIT

- The airfield is located 2nm W of the city of Innsbruck in the valley of the River Inn.
- On both sides of the valley the terrain is steep and mountainous
- Typical spot heights (amsl) in the vicinity of the airfield are as follows:

2.5nm NORTH 8,655ft

12nm WEST 9,462ft

16nm EAST 8,288ft

13.nm SOUTHWEST 10,108ft

9nm SOUTHEAST 9,173ft

5nm SOUTH 8,386ft

#### Temperature Deviation from ISA

- When actual OAT differs from ISA by more than -10°C ATC will inform crews of corrections to be added to published altitudes. Refer to the Cold Temperature Corrections section of this manual for additional guidance.

#### Runway Excursion

- The runway is short and combined with the high airfield elevation landing performance can be limiting, especially in contaminated conditions. Careful consideration is required regarding touchdown point and use of retardation devices.

#### Runway Incursion

- Backtrack is required to use the full length of the Rwy. Turning circles are provided.

#### Loss of Control

- Aircraft specific procedures are required in the event of normal and engine-out take-off to assure the required turn radius and climb performance are achieved
- Föhn conditions with associated moderate to severe turbulence, WINDSHEAR and downdraughts especially on finals to Rwy 26. However the conditions on the approach to Rwy 08 can also be quite marked.

#### Mid Air Collision

- Extensive glider activity in spring, summer and autumn (rarely in winter) as well as during Föhn conditions. Generally to the N of the airfield and close to the mountains up to the cloud base
- Crews should be aware that there will be a number of light aircraft operating, possibly without mode C transponders, in the Inn valley. Verify any potential TCAS threats with ATC.

**ARRIVAL**
**Diversion Airports**

MUNICH	MUC/EDDM	068 nm/015°T	CAT A
LINZ	LNZ/LOWL	129 nm/063°T	CAT A
NURNBERG	NUE/EDDN	135 nm/355°T	CAT A
VIENNA	VIE/LOWW	217 nm/076°T	CAT A
ZURICH	ZUE/LSZH	114 nm/276°T	CAT B

- After landing following a diversion, assess the situation at Innsbruck. Weather improvement at Innsbruck is often possible and will allow continued flight after refuelling. If the weather conditions are inclement, road conditions will be bad also and surface transfer times can be 5 to 6 hours.

## Approach

Information is provided in the Lido AOI pages regarding the approach procedure at Innsbruck. Thorough briefing is essential before starting any approach.

- The primary approach is the Special LOC/DME East approach from NDB 'RTT'.
- The LOC/DME West approach from waypoint 'KUDAV' may be used on occasion by ATC.
- Guidance as to the approach, NOT the runway, in use may be obtained from Munich ATC.
- When turning at positions quoted as DME ranges it is **very important to commence the turn at that position and not before**. Reaction time is allowed for in the procedures.
- Be aware of erroneous 'OEJ' LOC indications from D2 before the LOC station until D2 after the LOC station.
- The 'OEV' LOC is offset 4° to the right of the Rwy 26 extended centreline and crosses it 0.2nm from the runway threshold.
- PAPIs to both Rwy 08 and Rwy 26 are set to a slope of 3.5°
- No approach lighting to Rwy 08
- A large block of flats on the eastern side of the city situated on the NORTH bank of the River Inn and close to the extended centreline gives additional guidance to Rwy 26.

Only the A319 and A320 are approved for Innsbruck.

## Planning

The minima for the **LOC/DME East Special** is dependent on the Missed Approach Climb Gradient (MACG) and hence alters the maximum landing weight. The Lido (Aerosoft) approach chart shows the minima relating to the maximum structural landing weight.

Lower minima can be utilised for reduced landing weights as follows:

**A319**

- **Landing weight 60.0T or below WAI 'on':** Rwy 26 DA 2,890ft (996ft) RVR 2400m
- **Landing weight 58.0T or below WAI 'on':** Rwy 26 DA 2,860ft (966ft) RVR 2400m

If WAI is selected 'off' then the published LOC/DME East Special DA can be reduced by 20ft.

**A320**

- **Landing weight 62.0T or below WAI 'on':** Rwy 26 DA 2,750ft (856ft) RVR 2400m
- **Landing weight 60.0T or below WAI 'on':** Rwy 26 DA 2,740ft (846ft) RVR 2400m

There is no allowance for WAI 'off' for the A320.

Note that all minima/landing weights above and on the approach chart are based on 'Packs Off/APU to Packs' performance. This configuration is required from the start of the final approach until the missed approach acceleration altitude of 7,000ft amsl has been achieved.

Careful evaluation is required to balance the minima required against the landing weight. An in-flight landing distance calculation must also be completed prior to the approach to guard against runway excursion. Respect the most limiting of the landing weight limited by MACG and the in-flight landing distance calculation.

**GROUND**

- A follow-me service is provided on the apron.

**DEPARTURE**

- Crew **MUST** refer to the aide-memoire for departure procedures.

**WEATHER**

- Generally good in both winter and summer with good visibility and high cloudbase, although heavy rain showers in summer and snow showers in winter can restrict this visibility and lower the cloudbase.
- During the winter dense fog can form during the early morning hours, especially if snow is present
- In the summer frontal precipitation may occur but most is in the form of brief showers or thunderstorms
- Be prepared for low angle sun dazzle in autumn and winter, and the difficulties of differentiating between terrain and cloud in snow covered conditions
- Winds are usually westerly except when Föhn winds occur (in autumn and winter, surface wind of 100° to 180°, average windspeed of 15kt to 20kt gusting 30kt to 50kt)
- Föhn winds require high pressure over Eastern Europe and low pressure over SW Europe. This situation results in strong southeasterly winds which are channelled through the valley south of Innsbruck (the Brenner Pass) with associated good visibility (50km+) and high ceilings (11,000ft+).



- Anemometers are positioned around the airfield and are known as 'Patscherkofel' (5 nm SE), 'Eigels' (in the vicinity of 'INN') and 'Citynorth' (N abeam of Rwy 26 centreline). The information derived allows ATC to advise the possibility of turbulence and WINDSHEAR.
- Refer to Lido AOI pages for further information on this and other met conditions that may be encountered.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Tiroler Flughafenbetriebsges mbH
<b>Handling Agent VHF</b>	131.475
<b>Potable Water</b>	

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (keep ground power connected to reduce APU fuel burn)

**SALZBURG (SZG/LOWS)**

Elevation 1411ft

**CATEGORY C (CAT B FOR OPERATIONS TO CAT 1 MINIMA)**

AV brief not currently available.

**REGULATION**

- Rwy 15 has a CAT I ILS and 'Special' CAT II/III ILS procedures. Flying the Special ILS CAT II/III requires approval from the Austrian CAA.
- RNAV Visual V Rwy 33 not approved for Simfest aircraft
- Commanders must be qualified to operate to CAT II/III minima

**GENERAL**

- Airfield located on the western outskirts of Salzburg, at the S end of a valley
- Mountainous terrain close to airfield.

**Threats****CFIT**

- Terrain rises to nearly 5,900ft asl within 6nm W, 6,100ft asl 4nm S and 4,600ft asl at 4nm E. To the N and NW the terrain is relatively flat but there are hills to 2,800ft asl 7nm N.
- There is an aerial cableway approximately 800ft agl, 3nm S of the airfield, leading E from a 5,961ft asl peak just W of the runway centreline. The Visual Approach chart shows this detail together with the visual manoeuvring area. Note the SW sector within this area is not to be used for visual manoeuvring.
- Rwy 15 Approach – if forced to go around from close in (e.g. a baulked landing) use type specific guidance to follow the ILS 15 Go Around procedure to ensure terrain clearance.

**Runway Excursion**

- Instrument approaches are made to Rwy 15 only, thus tailwind landings may be necessary.
- Contamination is possible in winter months however snow clearance reported efficient
- Aircraft specific approach procedures may require additional approach speed to assure missed approach climb gradient and turn radius is achieved.

**Mid Air Collision**

- All arrivals and departures are to the NNW of the field because of the terrain. This results in delays due to conflicts.
- Additionally, there is much general aviation traffic
- Hang-, Para-, Glider area NE of the airfield
- Flight within German airspace (state boundaries) may be within Class E with uncoordinated VFR traffic present. Flight within Austrian airspace is within Class D airspace. Caution is advised, use all available situational awareness tools to identify potential conflicts.
- Crew should strictly adhere to all applicable speed limitations and make maximum use of lights to aid conspicuity.

**Ground Collision**

- Busy apron with self-manoeuvring stands and marshalling via hand signals – refer to Ground section for detail

**Special Considerations**

- It is recommended that the Captain is the nominated P1 for flights inbound to SZG and for flights that require a takeoff from Rwy 15
- All procedures include frequent reference to speeds, gradients, bank angles and acceleration altitudes due terrain
- Map shift errors have been reported on non-GPS aircraft

**Operational Considerations**

- Due to the relative differences between operations in to this airfield and more routine operations, Captains are required to ensure all relevant briefing material is covered prior to commencing an approach
- Planning should take in to account forecast landing conditions but with the aim of achieving the highest planned landing weight. The balance between holding potential and achieving a practical landing weight can be a difficult exercise to judge. Automatic tinkering is not recommended, however any return fuel carried to SZG is beneficial and cost efficient
- Maximum use of the autopilot is recommended for all approaches in to SZG
- Planned single-engine, partial flap or other approaches where defects restrict the manoeuvre capabilities of the aircraft in flight are not permitted
- Linz, Munich and Vienna are available as diversions. Weather diversions to Linz have proved very efficient, whilst engineering and spares support at Munich are probably better. Advice from Ops Control should be sought.

**Decision Altitude/Max Landing Weight**

- Landing weight restrictions apply to Rwy 15 dependent on DA. The Special ILS CAT II/III Rwy 15 has the most restrictive landing weight.

**Visual and Circling Minima**

- See Lido chart VAC Visual 33.
- All manoeuvres must be carried out in the area shown. Attention is drawn to the prohibited sector to the SW and the lower circling minima applicable to the circling procedure for Rwy 33 following an ILS approach to Rwy 15.

**Go Arounds**

- Each approach has a different GA profile. Where a turn is described as 'As soon as operationally practicable' it should not be commenced prior to the MAP. For an ILS this is coincident with DA/DH.

**ARRIVAL**
**Diversion Airports**

LINZ	LNZ/LOWL	054 nm/061°T	CAT B
MUNICH	MUC/EDDM	059 nm/304°T	CAT A
NURNBERG	NUE/EDDN	128 nm/323°T	CAT A
VIENNA	VIE/LOWW	145 nm/082°T	CAT A

- Surface wind permitting, expect landing Rwy 15; inbound aircraft may be asked to reduce speed very early to avoid holding closer in.

## ILS Rwy 15



- If Rwy 33 is in use for landing (strong N'ly wind) and the weather is fine, radar vectors are sometimes provided direct in to a right hand downwind for visual approach Rwy 33. This procedure may be accepted after careful consideration of prevailing conditions, however whilst experience is gained during initial operations it may be appropriate to decline and fly the circling procedure.

## Approach

- To land Rwy 33, a circling pattern must be flown from a Rwy 15 approach; the charting contains details including missed approach from the visual segment. The end of the circling downwind leg (i.e. the SI 125° radial at 3.5nm) corresponds to 14.7D from the SBG VOR, this may provide additional situational awareness. Lower circling minima are published for Rwy 33 approaches that follow an initial ILS Approach to Rwy 15.

## AIRCRAFT SPECIFIC PROCEDURES

### A32N

## Regulation

ILS 15 and Special ILS CAT II/III Procedures are approved for the A319 and A320. **The A321 is not approved.**

Commanders must be qualified to operate to CAT 2/3 minima.

## Planning

Operation to Rwy 15 tends to be the most limiting. It is essential that both the RLW MISAP climb gradient and IFLD are always considered to find the most limiting landing weight.

## Which Landing Weight is Likely to Be Limiting?

- In contaminated conditions the IFLD is likely to be the most limiting.
- In other conditions the RLW MISAP climb gradient weight is likely to be most limiting.
- In CAT 2/3 conditions the RLW MISAP climb gradient weight can be very restricting.

## Which Rwy 15 Approach Procedure Should I Use?

To determine which approach procedure is the most relevant for the prevailing conditions answer the following questions:

### 1. Do I need the lowest CAT1 minima or CAT2/3 minima?

If yes use the “ILS 15 CAT1 with turn radii (1780m) and SPECIAL ILS 15 (CAT II/III)” approach procedure.

### 2. Do I need to achieve the best IFLD?

If yes use the “ILS 15 CAT1 – Normal MISAP turn radii” approach procedure if the weather conditions allows. This procedure does not require additional approach speed and produces the shortest IFLD.

The performance manual contains a flow chart and specific MISAP climb gradient tables which takes you through the steps to calculate the RLW limited by MISAP CLG.

## ILS 15

The ILS 15 has the possibility of two different MISAP turn radii. Generally the tighter radii needs a lower climb gradient. In order to achieve the tighter turn radii a unique approach procedure needs to be complied with as detailed below. Crew must carefully consider the MISAP that they are going to fly. The RLW is dependent on the MISAP climb gradient achievable. Refer to Lido Minima tables and the Performance Manual.

Lido provides minima in the following places:

1. ILS CAT 1 Normal MISAP turn radii: On IAC ILS or LOC 15 page and WX Minima OVERFLOW page
2. ILS CAT 1 with 1780 m turn radii: On AOI P2
3. Special CAT II/III: On CCI page

Specific approach techniques are required to assure sufficient bank angle to remain within the required turn radius, these are specific to the approach being flown.

Carefully review the speed/bank angle requirements.

## ILS 15 CAT1 – Normal MISAP Turn Radii

**Note:** Use only the missed approach climb gradient tables for the Normal MISAP turn radii.

### A319

Rwy 15 ILS/DME Missed Approach Climb Gradient

IAC ILS or LOC 15 & WxMinima Overflow				
MISAP CLG	Packs (Note 1)	Anti Ice	Max. Landing Weight	Max. OAT
ILS/DME 5% (Cat C)	ON	ON	52,600 kg	45°C
		OFF	54,000 kg	50°C
ILS/DME 4% (Cat C)	ON	ON	55,600 kg	45°C
		OFF	57,100 kg	50°C
ILS/DME 3% (Cat C)	ON	ON	57,600 kg	45°C
		OFF	59,100 kg	50°C
ILS/DME 2.5% (Cat C)	ON	ON	57,600 kg	45°C
		OFF	59,100 kg	50°C

Rwy 15 LOC/DME Missed Approach Climb Gradient

IAC ILS or LOC 15 & WxMinima Overflow				
MISAP CLG	Packs (Note 1)	Anti Ice	Max. Landing Weight	Max. OAT
LOC/DME 4% (Cat C)	ON	ON	55,600 kg	45°C
		OFF	57,100 kg	50°C
LOC/DME 2.5% (Cat C)	ON	ON	57,600 kg	45°C
		OFF	59,100 kg	50°C

1) The MISAP CLG limited landing weight may be increased by 1000kg for packs off landing.

### A320

Rwy 15 ILS/DME Missed Approach Climb Gradient

IAC ILS or LOC 15 & WxMinima Overflow				
MISAP CLG	Packs (Note 1)	Anti Ice	Max. Landing Weight	Max. OAT (Note 2)
ILS/DME 5% (Cat C)	ON	ON	61,700kg	33°C
		OFF	63,100kg	38°C
ILS/DME 4% (Cat C)	ON	ON	63,100kg	33°C
		OFF	64,500kg	38°C
ILS/DME 3% (Cat C)	ON	ON	64,500kg	33°C
		OFF	64,500kg	38°C
ILS/DME 2.5% (Cat C)	ON	ON	64,500kg	33°C
		OFF	64,500kg	38°C

Rwy 15 LOC/DME Missed Approach Climb Gradient

IAC ILS or LOC 15 & WxMinima Overflow				
MISAP CLG	Packs (Note 1)	Anti Ice	Max. Landing Weight	OAT (Note 2)
LOC/DME 4% (Cat C)	ON	ON	63,100kg	33°C
		OFF	64,500kg	38°C
LOC/DME 2.5% (Cat C)	ON	ON	64,500kg	33°C
		OFF	64,500kg	38°C

1) The MISAP CLG limited landing weight may be increased by 1000kg for packs off landing.

2) If OAT is above 38°C, reduce MISAP CLG limited landing weight by 550kg per 1°C above 38°C. (Applicable to Anti-ice off only).

In the event of MISAP from DA (either Dual or Single Engine) the speed and bank angle requirements have been inspected and will be met by utilising the following procedure:

### Preparation:

- Enter Vapp as a speed constraint at the "SI" NDB in the F-PLN MISAP coding (to stop early acceleration).
- On the PERF GO AROUND Page enter the MISAP stop altitude (6,000ft) as the THR RED/ACC ALT and EO ACC ALT.

### Go Around:

- If, during a GA using NAV, the bank angle reduces below that required, select HDG to increase the bank angle.
- DO NOT accelerate until the turn is complete.

## ILS 15 CAT1 with Turn Radii (1780 m) and SPECIAL ILS 15 (CAT II/III)

**Note:** Use only the missed approach climb gradient tables for the Lower DA MISAP with turn radii (1780 m).

### A319

Rwy 15 ILS/DME Missed Approach Climb Gradient

ILS Rwy 15 Lower DA (LIDO Chart AOI-2)				
MISAP CLG	Packs	Anti Ice	Max. Landing Weight	Max. OAT
ILS/DME 4.7% (Max IAS 165kt)	OFF	ON	55,700 kg	45°C
		OFF	57,100 kg	50°C
ILS/DME 4.2% (Max IAS 165kt)	OFF	ON	57,800 kg	45°C
		OFF	59,200 kg	50°C
ILS/DME 3.8% (Max IAS 165kt)	OFF	ON	59,600 kg	45°C
		OFF	61,000 kg	50°C
ILS/DME 3.2% (Max IAS 165kt)	OFF	ON	61,000 kg	45°C
		OFF	61,000 kg	50°C
ILS/DME 2.7% (Max IAS 165kt)	OFF	ON	61,000 kg	45°C
		OFF	61,000 kg	50°C

### A320

Rwy 15 ILS/DME Missed Approach Climb Gradient

ILS Rwy 15 Lower DA (LIDO Chart AOI-2)				
MISAP CLG	Packs	Anti Ice	Max. Landing Weight	Max. OAT (Note 1)
ILS/DME 4.7% (Max IAS 165kt)	OFF	ON	63,900kg	33°C
		OFF	64,500kg	41°C
ILS/DME 4.2% (Max IAS 165kt)	OFF	ON	64,500kg	36°C
		OFF	64,500kg	45°C
ILS/DME 3.8% (Max IAS 165kt)	OFF	ON	64,500kg	39°C
		OFF	64,500kg	49°C
ILS/DME 3.2% (Max IAS 165kt)	OFF	ON	64,500kg	47°C
		OFF	64,500kg	50°C
ILS/DME 2.7% (Max IAS 165kt)	OFF	ON	64,500kg	50°C
		OFF	64,500kg	50°C

1) If OAT is higher than the value listed above, reduce landing weight by 550kg per 1°C above the listed temperature. (Applicable to Anti-ice off only).

In order to obtain the MISAP climb gradient and tighter turn radius required for these approaches a unique approach procedure is required:

For CAT 2/3 approach Confirm Special ILS available with ATC.

### Preparation:

- The Approach must be flown with PACKS OFF (or APU BLEED ON). Note if WAI is required turn APU BLEED OFF.
- he final approach must be flown in CONF FULL at VLS + 10 kt, ensure this is entered in the FMGC PERF APP page.
- Account for the increased approach speed in the IFLD calculation.
- Enter VLS (Conf FULL) +10 kt as a speed constraint at the "SI" NDB in the F-PLN MISAP coding (to stop early acceleration).
- On the PERF GO AROUND Page enter the MISAP stop altitude (6,000ft) as the THR RED/ACC ALT and EO ACC ALT.

### Approach:

- CONF FULL must be used.
- The final approach speed is VLS + 10 kt.
- Due to the higher approach speed be alert to the tendency to float on landing.

### Go Around:

- Go Around track keeping and turn radius is CRITICAL.
- If, during a GA using NAV, the bank angle reduces below that required, select HDG to increase the bank angle.

- DO NOT accelerate until the turn is complete.

**IFLD**

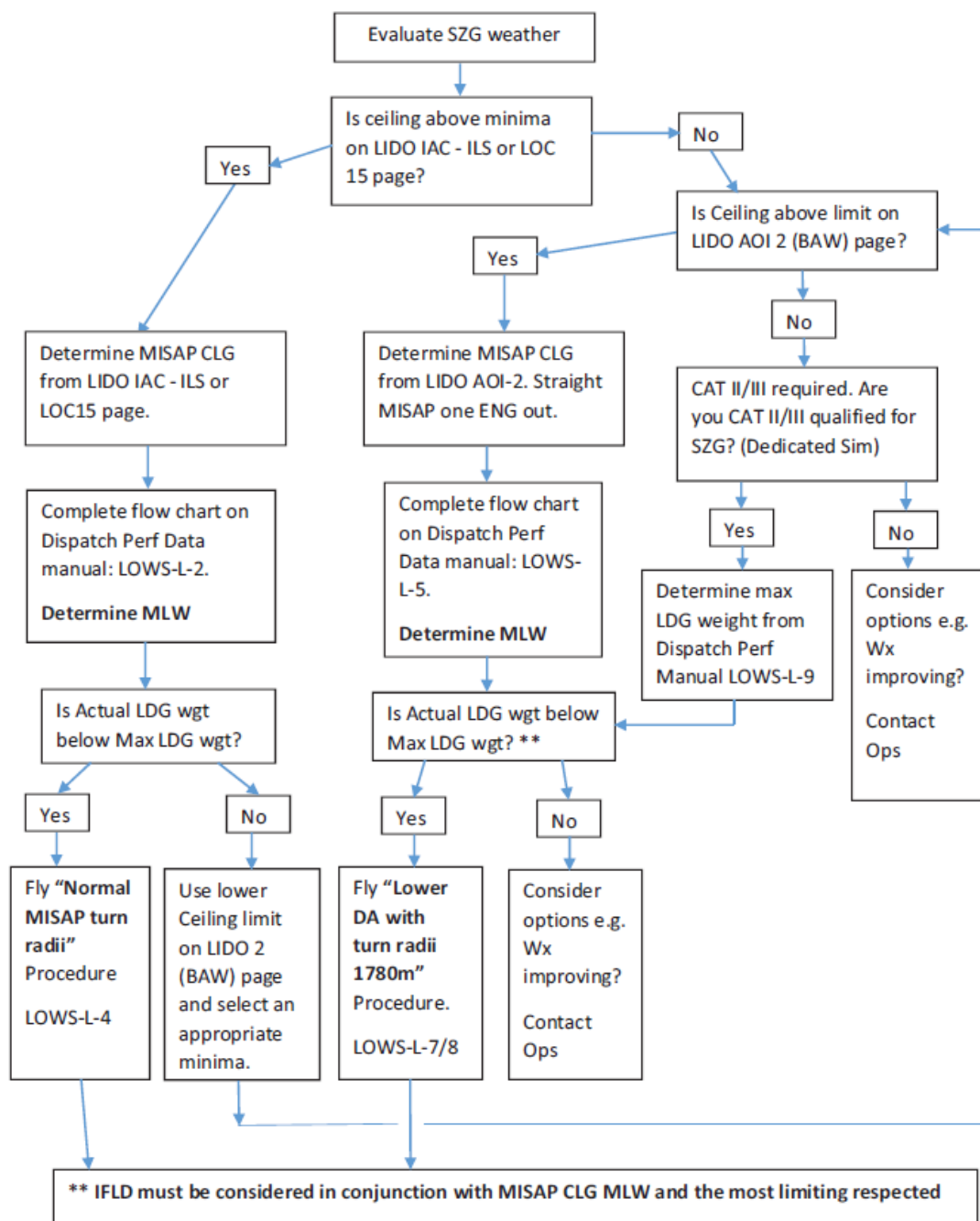
- Add an additional 5 kt SPD correction to the IFLD to account for the approach speed increase.

**CAUTION:** *In the event of a single engine missed approach, the bank angle commanded by the AP/FD is reduced below manoeuvring speed -3 kt. The required radius of turn has been inspected and will be fulfilled using the procedure detailed above. However in the event of doubt about the flight path with NAV, use HDG to provide the greatest angle of bank during the missed approach turn.*



## Flow Chart

The flow chart below is designed to be a rough guide to help with the planning. This briefing, Lido IACs and the relevant aircraft performance manual should be used in conjunction with this chart.



## Circling Rwy 33

- Strict adherence to the published tracks are necessary, do not pass through the extended centreline.
- Use Flap FULL for landing to minimise final turn radius.

**GROUND**

- Boarding can take place on adjacent stands during engine start/self-manoeuving.
- Good look out required when self-manoeuving from stand – ground vehicle infringements have occurred.
- Wing man can be requested if required.
- Push back can be provided if requested by flight crew, however this must be requested via ATC, ideally as soon as the aircraft has arrived in SZG. Request for use of pushback will incur delay and additional cost, so must only be requested when absolutely necessary.

**DEPARTURE**

- Engine start clearance is given by hand signals.
- Rwy 33 is preferential for performance requirements.
- To increase traffic flow (Particularly on Ski charter weekends), ATC favour use of Rwy 15 for arrival and departure. If Met conditions permit, ATC will define 'Rwy 15 only' on ATIS.
- To reduce noise, and if cloud base and visibility permit, ATC may request aircraft to climb on runway heading to 2 nm to the south before starting the visual left turn.
- Rwy 15: Note restrictive take-off weather minima for normal SIDs.
- ATC favour departure from intersection Twy B. If full length is required for take-off inform ATC on clearance request; this will greatly assist with ATC planning and they will co-ordinate the closure of a road crossing the undershoot.
- Standard SIDs require visual initial terrain clearance, however "Special Performance" SIDs are published allowing take off in poor visibility. See charting for details of authorisation; CARD will indicate if these are approved for aircraft types.
- Ground frequency is only in use when promulgated on the ATIS.
- For environmental reasons ATC will avoid situations where delayed outbound aircraft have engines running. To avoid excessive delay at the holding point for Rwy 33, pilots should call for start up when fully ready to allow appropriate sequencing.
- When de-icing is necessary crews may be required to fill in a de-icing request form.

**WEATHER**

- Cb activity in summer.
- Local weather can change very rapidly affecting cloud base and/or visibility and causing wind reversals. The terrain frequently causes turbulence on Rwy 33 approaches.
- Strong W'ly winds give turbulence on short finals Rwy 15 due to the wooded area W of threshold Rwy 15.
- Radiation fog in winter.

- In otherwise good weather conditions, low cloud often persists at 2 nm finals Rwy 15 over an area of river and woodland; if the ATIS reports “cloud base final approach Rwy 15 xxxft” fly the Rwy 15 Special ILS Approach to give the lowest DA.
- Two ceilometers are positioned in the visual manoeuvring area (See Visual Approach chart).

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Salzburg Airport Services. Not dedicated for Simfest only and handling all airlines.
<b>Handling Agent VHF</b>	131.9 ‘Salzburg Services’
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU not available). Keep ground power connected to reduce APU fuel burn.

**FUNCHAL (FNC/LPMA)**

Elevation 191ft

**CATEGORY C**

AV brief – available

**GENERAL**

- Airfield is situated on a plateau engineered out of the side of a hill.
- Single runway 05/23. Parts of the runway are built on manmade culverts over the roads below. The first 1000m of Rwy 23 is effectively a bridge structure.
- Island of Porto Santo, 30nm to the NE, provides a good diversion.

**Rwy 23**

### Threat Based Briefing Topics

#### CFIT

- The ground rises rapidly inland to the W and NW reaching over 2500ft asl within 3nm and over 6000ft asl within 9nm. The Jepp MRC and approach charts depict the terrain well.
- The landscape creates turbulence and WINDSHEAR, with a mountainous area on one side and the edge of the plateau on the other.
- ETPs require a turn at the departure end of the runway (DER) which must be adhered to to assure terrain clearance.
- **TOGA must be used for take-off**

#### Runway Excursion

- Due to the nature of the topography any crosswind can vary markedly along the length of the runway
- THR insert and Rwy slope can cause strange visual aspect

#### Runway Incursion

- Backtrack is required for both Rwy

#### Loss of Control

- Steep rising ground, wind variation and turbulence create operating limitations not common at other airfields. These wind limitations must be respected.
- All take-offs and landings require VMC
- At night the hills (Picco do Faccho – lighted) on the right of Rwy 23 may be confused with mist
- Wind reports are transmitted for a point 1nm on final Rwy 05 “Rosario”, the tower itself, and for the touchdown area. Comparison assists in anticipating the level of turbulence on finals. A wind difference of more than 5kt between Rosario and the MID anemometer can indicate TURB on final.
- Wind direction indicators on the S side of the Rwy are useful in showing the varying wind conditions.
- Up/down draughts/variable crosswinds can cause control issues in close proximity to the runway. Be go around minded.
- **Review Jepp 10-1P2 and 10-1P3 for all Turbulence considerations**
- With westerly winds, tail WINDSHEAR may be expected.

## Crew Qualifications

**Note:** Captains Only Takeoff and Landing

### ARRIVAL

#### Diversion Airports

PORTO SANTO	PXO/LPPS	31 nm/044°T	CAT A
TENERIFE SUR	TFS/GCTS	280 nm/178°T	CAT B
GRAN CANARIA	LPA/GCLP	296 nm/166°T	CAT B
LANZAROTE	ACE/GCRR	279 nm/144°T	CAT B
FUERTEVENTURA	FUE/GCFV	297 nm/149°T	CAT B
TENERIFE NORTE	TFN/GCXO	255 nm/175°T	CAT B

## Diversion Strategy

Funchal's relatively remote location and challenging weather conditions mean that diversion planning can be tactically challenging.

Severe windshear can be experienced even in light winds, but the risk of diversion is higher in winter (Nov-Mar). Non-precision approaches only are available with high MDA and Rwy 05 is circling only. Simfest not approved for RNP AR approaches.

- Porto Santo (PXO) is the fuel alternate and is located on another island 45 miles from Madeira.
  - There are limited aircraft stands, handling facilities and hotel availability at PXO. Aircraft steps are in particular short supply during diversions.
  - LIS is the designated commercial alternate but is 90 mins to the north of FNC, with FAO also available. Additional alternates TFS, LPA, FUE and ACE only to be used if PXO, LIS and FAO are unavailable, and then as fuel and go.
- If the cloud base/visibility is forecast to be out of limits for a prolonged period then it is recommended to delay or cancel the flight. However, as the wind is extremely variable there is a chance of landing even if the wind is out of limits on the TAF and therefore cancellation for TAF wind is unlikely.
- If the forecast FNC weather conditions are marginal prior to departure, or degrade whilst enroute, an assessment should be made as to whether to continue to FNC or divert to LIS.
  - If weather allows a good chance of landing at FNC, continue and attempt an approach, if possible.
  - If the approach is unsuccessful then either divert to LIS, or if loitering may result in a successful approach then consider burning any extra fuel loading and LIS fuel, diverting to PXO if subsequently unable to land FNC.
  - In the event of a diversion to PXO, a decision will need to be taken in conjunction with Ops as to whether continue to FNC, operate to LIS or return to base.
- If the FNC weather is below limits and forecast to remain so divert to LIS
  - A decision will then need to be taken as to whether to continue to FNC, nightstop at LIS or return to base.

## Approach

- The main difficulties are crosswinds, turbulence and WINDSHEAR.
- The approach charts contain the differing wind limitations and these are to be treated as maximum limits. The restraining walls bordering the runway have been identified as created vortices.
- Strict adherence to published crosswind limits is essential.
- PAPIs set at 3° for both runways. Maintain the correct approach path and aim to touch down without delay.
- When landing Rwy 05 crews shall use the "recommended" circling altitude on the VOR/DME 05 (Visual) IAC rather than the minimum published circling altitude. This recommended circling altitude (949ft aal), though below the normal ops manual minimum of 1000ft aal, is

specifically approved as the aircraft is more than 1000ft above the terrain under the circling approach.

- Use all available aids, including the points GELO (2nm to run to threshold on a curved approach track and identified by the large white banana packing sheds) and ROSARIO (ROSG in the FMS) in order to facilitate line up and a stable vertical profile.

**Note:** The curved approach light poles between GELO and ROSARIO should be to the left of the aircraft approaching Rwy 05. Do not fly W of these approach lights on final due to high ground.

### GROUND

- Limited apron parking space
- Follow me vehicle used for parking
- Fuelling with passengers on board requires authorisation from 131.850 or 131.875

### DEPARTURE

- Review Jepp 10-1P2, 10-1P3 for all turbulence considerations and 10-1P4 and 10-1P5 for Departure procedures
- Respect the takeoff wind limitations on 10-1P2
- ETPs are in CARD for both runways and require a turn at the DER. This will need to be accomplished in HDG as the EOSID is not coded in the 744 navigation database.

### WEATHER

- The airfield is in the lee of high ground and with the prevailing W'ly winds gives the hazards of crosswinds, downdraughts and turbulence on finals
- Most of the annual rainfall occurs from October to March, averaging 3" per month.

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Portway
<b>Handling Agent VHF</b>	131.875
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power for 45 mins ONLY – then use APU
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (ACU equipment not available)



**ZURICH (ZRH/LSZH)**

Elevation 1417ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- Airfield is in a shallow valley with low hills on all sides. 3nm S is the city of Zurich with the lake beyond.
- 5nm SE is Dubendorf military aerodrome
- Lots of general aviation traffic in the Zurich area.
- All runways are 60m wide

**Threat Based Briefing Topics****CFIT**

- 4nm S the terrain reaches ~2,400ft asl
- 7nm SW there is terrain to ~2,600ft asl
- To the W, in line with the extended centreline of Rwy 28, is a range of hills reaching ~3,000ft asl within 5nm
- Alps are just over 30nm to the S
- Note max speed in turns during missed approach procedures.

**Runway Excursion**

- Frequent tailwind on approach/finals plus speed limits and descent restrictions inbound can lead to being fast and high for a straight-in approach to Rwy 14/16. The final deceleration point needs to take account of the airfield elevation. Be aware that on Rwy 14 there will be two 1000R points, the first when passing over a ridge at 5 mile finals
- Deep landings Rwy 14/16, GPWS sink rate warning Rwy 14/16 and high energy or high approach on all runways are a recurrent problem

**Loss of Control**

- SEVERE TURBULENCE should be expected with strong W winds when positioning for a landing Rwy 28

**Special Considerations**

- During Rwy 14 approach, due to ATC speed restrictions and frequent tailwinds, it is recommended to aim to achieve landing configuration by 3500ft QNH
- The approach to Rwy 14 passes over undulating terrain and at 5nm finals on the Rwy 14 ILS G/P the aircraft is only 800ft above ground level
- Rwy 28 approach terrain: at 1000ft radio, the height above the landing threshold is approximately 1400ft.



## ARRIVAL

### Diversion Airports

BASLE	BSL/LFSB	42 nm/281°T	CAT B
GENEVA	GVA/LSGG	124 nm/234°T	CAT B
STUTTGART	STR/EDDS	079 nm/020°T	CAT B
MUNICH	MUC/EDDM	141 nm/068°T	CAT A

Others that may be used include Frankfurt, Milan and Paris CDG.

## Approach

- Note the changeover times for preferential runway in use, particularly if operating in the evening or early morning (details in Jepp 10-1)
- Expect ILS Rwy 14 during daytime and Rwy 28 for night-stopping aircraft (see Jepp 10-1 for times of runway use)
- Expect radar vectors normally to Rwy 14 (possible Rwy 16); speed and altitude requests by ATC may invite an undesirably steep, fast approach.
- Rws 14 and 16 can be confused: they may both be in use for alternate landings
- ATC use hold short operations Rwy 28 which allow smaller aircraft to land on the first part of Rwy 28 holding short of the intersecting Rwy. Participation in LAHSO, either actively or passively, is not authorised for Simfest.
- Rwy 28 has an ILS but it is 'Uncategorised' and has a high DA
- Both the VOR/DME and ILS Rwy 28 have a 3.3° approach
- ILS or VOR/DME approach to Rwy 28 is preferable to a visual approach for landings Rwy 28
- If a visual approach is required to Rwy 28 after instrument approach to Rwy 14 or 16 break left for a RH base leg to avoid possible GPWS problems
- Circling is prohibited to the SW of the airfield. If the airfield is overflown after the instrument approach Rwy 14 or 16, a left base turn can be made (inside the rising terrain and Dubendorf military AD) without straying to the prohibited SW

**Note:** Use of Rwy 32 for landing widebody aircraft will only be approved in exceptional circumstances in order to meet ATC requirements (for widebody aircraft – to avoid a backtrack on 60m wide Rwy with no turning area, plan to vacate Rwy at Twy G (LDA 2700m).

- Crews report false localiser capture and glide path signal disturbances on ILS 16

**CAUTION:** False glideslope lobe capture has been experienced on intercept HDG to Rwy 34. To avoid upset it is suggested to only arm the approach once the glideslope

*indication on the PFD is correct, relative to the position of the aircraft on the vertical profile.*

## **GROUND**

- Surface Movement Radar and 'Follow Me' vans are available
- SIMFEST use western end of the terminal at E to the North of Rwy 28 and terminal B to the South of Rwy 28
- Contact ground handling agent for expected stand to allow for pre-briefing of potentially complex taxi patterns.

## **DEPARTURE**

- Take-off is normally from Rwy 28
- For start-up procedure see Jepp 10-1 which also contains lengthy notes on noise abatement
- Zurich is very noise sensitive
- See CARD for Emergency Turn Procedures
- Altitude 'gates' must be achieved on the SIDs. Some are ATC requirements.
- High ground on departure
- Transition altitude is 7000ft. Some procedures include '9000ft or above' as conditions at some waypoints.
- There has been a high incidence of fast rotation rates, especially on Rwy 28
- High thrust settings and unusual visual perspective contribute to this event rate
- Refer to FCOM and FCTM guidance on rotation technique.

## **WEATHER**

- Winter – 2 to 3 ins or rain or snow per month
- During high pressure periods persistent fog is a problem
- Summer – 4 to 5 ins of rain per month. Thunderstorms fairly frequent and may continue well in to the night.

**OPERATIONAL INFORMATION**

Handling Agent	Dnata
Handling Agent VHF	130.45
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

**FAIRBANKS (FAI/PAFA)**

Elevation 439ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- The airport is situated 3 nm southwest of the central business district of Fairbanks, at the confluence of the Tanana and Chena rivers
- Fairbanks is the smallest city in the USA with non-stop service to Europe
- The city has a population of 35,252, of which nearly half are military personnel, plus an estimated 500 moose.
- Large EASTERLY variation (18°E)

**Threat Based Briefing Topics****CFIT**

- Terrain rises rapidly to the N and E, with notable peaks at 2,450ft asl 15nm NE and 2,930ft asl 16nm W
- Mt Prindle, 5,286ft asl 52nm NE
- The Alaska Range of mountains runs E-W approximately 70nm to the south, with very high peaks including Mt Deborah 12,339ft asl 72nm SSE and Mt Hayes 13,832ft asl 78nm SE
- Denali (Mt McKinley), 20,320ft asl 134nm SW is the highest peak in North America

**Mid Air Collision**

- Numerous military operating areas in the vicinity with Eielson AFB 21NM SE

**ARRIVAL**

- Rwy 02L preferred
- Note that the ILS DMEs read D2.0 at the runway thresholds
- A seaplane landing area is established at the northern end of the airfield between the two hard runways
- Crew report that compass disruption and radio interference has occurred as a result of high-energy RF transmissions, particularly in the area of R-2206 47nm SW of FAI

**GROUND**

- Parking available at the terminal or the heavy cargo area to the west of Rwy 02L/20R.
- Do not park on the East ramp as access to Rwy 02L/20R for departure is severely restricted from this side of the airport

**WEATHER**

- Fairbanks has a subarctic climate, with short summers and long, cold winters. However, summers are generally very warm for the latitude with temperatures approaching 30°C a fairly common occurrence.
- Daily mean max/min temperatures 22°C/11°C (July) -17°C/-27°C (Jan).
- Snowfall is generally confined to the months between October and March, with October and November the snowiest months.
- Very large temperature inversions are a frequent occurrence due to warm air rising to the tops of the hills to the north whilst cold air drawn in to the Tanana Valley accumulates in and around the city.
- Inversions in winter are associated with the development of thick ice fog.
- Southerly winds bring warm moist air from the Gulf of Alaska, which can lead to sudden and very rapid rises in temperature to well above freezing in winter and a risk of advection fog.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift not permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**JUNEAU INTL (JNU/PAJN)**

Elevation 25ft

**CATEGORY C**<https://www.youtube.com/watch?v=eXGV3k1r2Yo> – Rwy 08 approach terrain overview<https://www.youtube.com/watch?v=2VvAx-XaaLw> – Rwy 26 approach terrain overview**GENERAL**

- The airfield is located 7nm NW of central Juneau
- Large EASTERLY variation (20°E)
- A well-provisioned destination with good facilities
- Significant terrain in all sectors and offset LDA approach

**Threats****CFIT**

- The airport is surrounded by significant terrain on all sides with peaks over 6,700ft asl within 20nm
- MSAs of 10,800ft within 30nm
- Rwy 08 final approach terrain: a ridge of 588ft asl is located on a 1.5nm final which is NOT shown on the charts. The offset approach takes the aircraft to the south of this ridge prior to visual alignment with the extended centreline. See '[Approach](#)' section for more details.
- The ridge immediately prior to the 08 threshold is likely to present an unusual visual aspect, especially at night
- The Rwy 08 missed approach profile requires an immediate turn to avoid terrain. Close adherence to the published procedure is necessary to maintain separation from terrain and the possibility of a go-around after the missed approach point should also be considered.
- Careful handling and strict adherence to published tracks and altitudes necessary to avoid GPWS activations on final approach
- Visual turn required after departure Rwy 08 with terrain in close proximity

**Mid-Air Collision**

- Significant GA and VFR activity on and in the vicinity of the airfield

**Runway Excursion**

- Rushed approaches Rwy 08 due to steep (3.7°) vertical profile
- Late turn (inside 1nm) required to align with the extended centreline

**Loss of Control**

- Rwy 08 stable criteria: LDA track passes over the southern edge of Coghlan Island at 3.3nm. This will cause a sharp reduction in radio altimeter reading and when the aircraft is at 1000ft aal the radalt will indicate ~600ft above terrain.

**Special Considerations**

- LDA Rwy 08 minima are higher than standard VFR minima. The weather conditions and forecast should be checked carefully before departure and appropriate contingency measures planned if the forecast is marginal.

**ARRIVAL****Diversion Airports**

SITKA	SIT/PASI	095 nm/198°T	CAT C
GUSTAVUS	GST/PAGS	041 nm/277°T	CAT C
ANCHORAGE INTL	ANC/PANC	571nm/296°T	CAT A

**Approach**

- The only instrument approach available is the LDA Rwy 08. Note the temperature restriction on the chart for use of VNAV.
- The aircraft should be fully configured prior to reaching the FAF in order to mitigate against rushed approaches and to minimise the likelihood of spurious GPWS activations
- No Category D straight-in minima are published. However, Simfest are authorised to use the Category D circling minima instead. Note that two sets of circling minima are published for day and night operations.
- The LDA 08 takes the aircraft over a 'saddle' between two hills with peaks approximately 590ft asl at around 1.5nm final. The southern peak is slightly lower than the northern peak. After passing over this ridge the aircraft can then be manoeuvred to align with the extended centreline, but not before. This is shown in the video linked above.
- Note that the VASIs are set at 3.5° compared to the LDA vertical path of 3.7°. As such the VASIs will likely indicate high on short final, particularly with the B744 eye-wheel height. Avoid the temptation to dive for the VASIs once visual.

**GROUND**

- Twy B1 unsuitable for wide-body operations

**DEPARTURE**

- Steep climb gradients are required to 10,000ft from both runways
- Use full CLB thrust and climb at Vref +100 to 10,000ft.
- Note Above 10,000ft restriction at CUSHI. If necessary the aircraft can be placed in to a hold at CUSHI whilst climbing above 10,000ft, but this must be requested from ATC in advance. Check the LEGS and VNAV CLB page prior to departure to verify whether the restriction will be met.
- Rwy 26 is preferred for departure wherever possible.
- SIDs from Rwy 08 require a visual climb and right-hand turn to avoid terrain. This will need to be accomplished in the take-off configuration using 25° of bank. Brief how the turn will be flown and consider AFDS modes (e.g. use of SPD INTV to prevent acceleration). Ensure the AFDS bank selector is set to 25°.

- In the event of engine failure from either runway, the safest course of action is likely to be to follow the SID to BARLO then route to EEF NDB and take up the hold (right hand turns, inbound 347°).

### WEATHER

- Temperatures are milder than might be expected for the latitude due to the warming influence of the Pacific Ocean
- Moist, long winters with short but mild summers
- Snowfall mainly Nov-Mar
- Spring (Apr-May) is the driest season, whilst Autumn (Sep-Oct) is the wettest
- Mean daily min/max temperatures -14°C/+7°C (Jan) +6°C/+25°C (Jul)

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Aero Services
<b>Handling Agent VHF</b>	122.950
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.



**SITKA (SIT/PASI)**

Elevation 27ft

**CATEGORY C**

No AV brief available.

**GENERAL**

- Large EASTERLY variation (20°E)
- Sitka Rocky Gutierrez Airport is named after a former mayor of the city and is located west of Sitka's central business district
- The city has no direct road access to the outside world, though there is a car ferry service to Juneau, Ketchikan and other towns in southeast Alaska
- Deceased tuberculosis patients from the nearby hospital were buried on airport grounds and had to be relocated during construction. That section of the airport is still unofficially called The Mausoleum.

**Threat Based Briefing Topics****CFIT**

- The airfield is surrounded by high terrain on all sides except the SW
- Mt Edgecumbe 3,201ft asl 13nm W
- Notable peaks include 3,226ft asl 3nm N and 2,805ft asl 6nm S
- Terrain rises to over 5,300ft asl within 13nm E and N.

**Mid Air Collision**

- No Radar available
- No ATC service available. There is an Aerodrome Flight Information Service only, but the FISO's instructions are advisory only in the air and no ATC separation can be guaranteed. A good lookout is essential.

**Runway Excursion**

- Runway may be slippery when wet
- Offset LDA approach Rwy 11

**Loss of Control**

- Large flocks of birds on and in the vicinity of the airport
- Turbulence and possible WINDSHEAR with strong E/S winds

**ARRIVAL**

- Rwy 11 has an offset LDA plus an RNAV (GPS) approaches. No published instrument procedure for Rwy 29 though a generic VOR let-down is available
- If weather permits the RNAV will likely reduce workload, though the LDA has lower minima
- Both approaches have numerous step-down fixes which must be carefully observed
- Circling not authorised northeast of the airfield

## GROUND

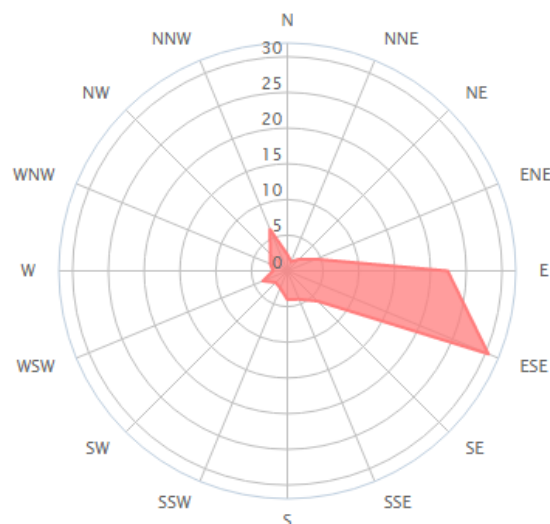
- Limited apron space
- Departing Rwy 29 liable to be problematic as a large lake precludes use of Taxiway G for departure

## DEPARTURE

- Terrain is well-depicted on Lido charts. Close adherence to charted tracks and altitude requirements is essential to ensure terrain clearance
- Emergency turn procedure Rwy 11:
  - As soon as practical and **no later** than 1.5nm from DER, RIGHT turn hdg 223 to intercept R358 BKA to BKA VOR, climbing to 5,000ft
- Emergency turn procedure Rwy 29:
  - LEFT turn dct BKA VOR, climbing to 5,000ft

## WEATHER

- Sitka has an oceanic climate with moderate, but generally cool temperatures and abundant precipitation. Winters are extremely mild compared to inland areas of similar latitude.
- Snowfall averages 84cm per year, almost all falling between November and March
- Average daily high/low temperatures 14°C/9°C (June) 4°C/0°C (January)
- The prevailing wind is easterly and strong, gusty winds may be anticipated Nov-Feb



**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use APU at all times (B744 GPU not available)
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available)

**OSAKA/KANSAI (KIX/RJBB)**

Elevation 17ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Osaka Kansai is located on a man-made island in Osaka Bay
- Some controllers are difficult to understand. Use standard phraseology.

**Threat Based Briefing Topics****CFIT**

- On the mainland S of the airport there is high ground to just over 1,600ft asl at 8nm
- Approaches to Rwy 06 pass the island of Awaji, which has terrain to just under 2,000ft asl 25nm SW

**Mid Air Collision**

- Exercise caution with pressure settings provided by ATC in Japan. Refer to section on [Japanese operations](#) for details
- Departure clearances may include, for example, A110. This is a clearance to an altitude of 11,000ft. This clearance does not, in itself, override the need to comply with the altitude constraints on the SID.

**ARRIVAL****Diversion Airports**

TOKYO Narita	NRT/RJAA	265 nm/072°T	CAT A
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**Approach**

- Osaka is noise sensitive. See Lido AOI.

**GROUND**

- Contact 'Speedbird Tokyo' 131.7

**DEPARTURE**

- Contact Kansai Delivery 5 mins prior to start. See Lido AOI.

**WEATHER**

- Oct-Apr. Occasional light rain or snow.
- Average minimum temperature +2°C

- May-Sep. The wet season with one or two typhoons in Aug or Sep
- Average maximum temperature +26°C

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	JAL
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed.

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**FUKUSHIMA (FKS/RJSF)**

Elevation 1,220ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- FKS is located 19 km southeast of Koriyama
- Traffic declined significantly following the 2011 earthquake and nuclear disaster, but is starting to increase again
- Some controllers are difficult to understand. Use standard phraseology.

**Threat Based Briefing Topics****CFIT**

- High ground to the E and W with spot heights of 3,064ft asl ~6nm E and 3,562ft asl ~15nm NW
- There is also an area of high ground to the S with terrain up to 3,333ft asl inside 20nm
- Mt Nantai, 8,031ft asl, is 50nm SW
- Terrain is well-depicted on Lido charts and a minimum vectoring altitude chart is provided

**Runway Excursion**

- Risk of overshooting due to unusual visual aspect from 60m wide runway

**Mid Air Collision**

- Exercise caution with pressure settings provided by ATC in Japan. Refer to section on [Japanese operations](#) for details
- Departure clearances may include, for example, A110. This is a clearance to an altitude of 11,000ft. This clearance does not, in itself, override the need to comply with the altitude constraints on the SID.

**ARRIVAL**

- RNAV arrivals in use from the north
- The runway is wide and slightly shorter than average for the B744 route network, leading to an unusual visual aspect

**GROUND**

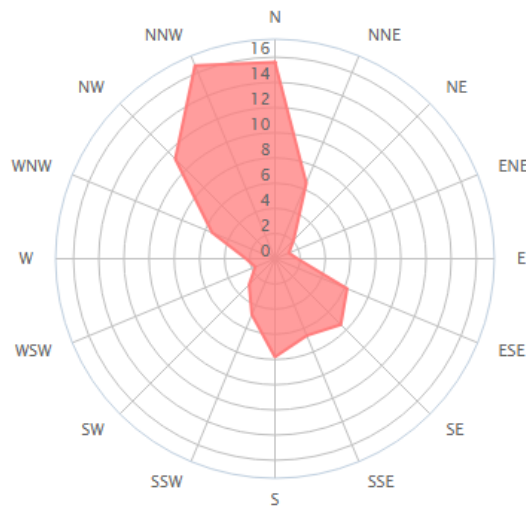
- Runways and taxiways are well-maintained and of good quality
- Very limited apron space

**DEPARTURE**

- Some SIDs require quite steep climb gradients. Consider use of full CLB thrust and Vref+100 if required.

## WEATHER

- The climate is humid continental with mild summers and cold winters with heavy snowfall.
- Rainfall is significant with July, the wettest month, seeing an average of 7.3 inches
- Average daily mean max/min temperatures 29°C/20°C (Aug), 4°C/-3°C (Jan)
- Winds can be high and gusty, particularly in winter
- Prevailing wind N-NW'ly



## OPERATIONAL INFORMATION

<b>Handling Agent</b>	JAL
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**PROVIDENIYA BAY (PVS/UHMD)**

Elevation 71ft

**CATEGORY C**B744 – [NINDA Training Video](#)**GENERAL**

- The airstrip is located 3 km southwest of Provideniya itself, in a narrow valley
- The settlement was established as a port providing a suitable deep-water harbour for Russian ships
- Known as the 'Doorway to the Arctic', tourism has risen significantly since the dissolution of the Soviet Union and there are charter services to Nome and Anchorage.
- PVS is most well-known for being the destination of the 1988 Alaska Airlines 'Friendship Flight' from Nome with around 80 passengers on board
- However a special permit is required for non-Russian nationals to visit the airport and surrounding area

**Threat Based Briefing Topics****CFIT**

- The airport lies in a narrow valley with terrain on both sides rising above 1,500ft asl
- A peak of ~2,000ft asl lies 4nm N. Other notable peaks include 2,361ft asl 4nm W and 2,147ft 2nm SW
- There are no Lido charts available for PVS and the terrain is very poorly depicted on the available Jeppesen charts.
- ATC clearances are very likely to be in metres QFE. QNH is available on request. The Jeppesen charts provide a conversion table and it is this which should be used, not the PFD metres function. Cross-checking of all altitudes is vital.

**Mid Air Collision**

- Complex arrival and departure procedures are published with numerous course reversals required in order to circumnavigate the terrain.

**Runway Excursion**

- The runway is described in Jeppesen as having a grass surface, but is in fact a combination of gravel and sand. Stopping performance is likely to be extremely marginal.
- There are no runway markings and no runway lighting is available.
- The runway and airport itself may be very difficult to pick out, especially at dawn/dusk or if there is snow on the ground.
- Note the runway is 52m wide. Combined with the short length and lack of other visual aids, this is liable to present a highly unusual visual aspect

**ARRIVAL**

- The NDB PAR approach for Rwy 01 is the only available instrument let-down. It is not included in the navigation database and thus will need to be constructed manually. FCTM 5.39 (Non-ILS (Non-Database) Approach) refers, as does the [B744 NINDA training video](#)



produced by Britjet. Note that use of LNAV and VNAV beyond the FAF is not authorised as the final approach track is offset.

- Pay close attention to step-down altitudes published on the Jeppesen STAR charts and take time to carefully verify the procedure is correctly entered in the FMS before top of descent.
- Be mindful of turn radius and modify FMS speeds appropriately in good time. Do not allow the aircraft to get high and/or fast during the approach and take prompt corrective action as required.
- Final approach to both runways is necessarily offset due to terrain
- The 52m wide runway, especially combined with its short length, will give a very unusual visual aspect and a strong sense of being low on final approach and in the flare. This is compounded by the fact that there are no glidepath aids (either visual or electronic) available and no runway lighting. Make maximum use of all in-aircraft aids such as VNAV V/DEV and height/distance checks.
- FOD ingestion is a significant concern due to the sand/gravel runway surface. Although use of full reverse is authorised due to stopping distance concerns, ensure reverse thrust is reduced to idle by 60kt GS unless a safe stop is in doubt. Idle reverse thrust may be used down to taxi speed (~20kt GS).

### **GROUND**

- Note a stream runs E-W under the runway, effectively preventing use of Twy G for 01 departures/19 arrivals
- Very limited parking

### **DEPARTURE**

- The SIDs are not in the navigation database and will need to be manually constructed and flown with reference to raw data
- Emergency turn Rwy 01: Follow GIRLO SID

### **WEATHER**

- Provideniya experiences a polar climate though the coastal location tends to make winters less severe than might be expected for the latitude
- Summers are cool with heavy rainfall
- Average daily max/min temperatures 12°C/6°C (July), -11°C/-16°C (Dec)

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not available

<b>IF ONLY Electrical Power is required</b>	Use APU (GPU equipment not available)
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available)

**SOKOL (GDX/UHMM)**

Elevation 574ft

**CATEGORY B**

AV brief not available.

**GENERAL**

- The airport is located near Sokol, some 43 nm north of Magadan
- GDX gained notoriety in 1991 with the inauguration of Alaska Airlines flights to the US. According to an anecdotal story, the first Alaska Airlines flight required de-icing, which was unavailable, so the flight crew acquired a quantity of vodka and sprayed it on to the wings.

**Threat Based Briefing Topics****CFIT**

- Terrain rises to the north with peaks over 3,800ft within 10nm and a peak of 5,469ft asl ~43nm NE
- The terrain is well-depicted on the Lido charts
- ATC will give clearances in metres QFE. Note that the conversion table on the Lido chart should be used to convert to feet QNH, not the PFD metres option.

**Loss of Control**

- The surrounding terrain can lead to heavy turbulence with downdrafts and WINDSHEAR on final to both Rwys, especially with strong winds

**Runway Excursion**

- Deep landing risk due to unusual visual aspect from 60m wide runway and slightly shallower (2.8°) ILS
- Short landing Rwy 10 due to displaced threshold

**Special Considerations**

- Twy 2 and Twy 3 unsuitable for B744 operations (width 16m). Take care not to confuse Twy 3 with Twy 4 when landing Rwy 10.

**ARRIVAL**

- ILS Rwy 10 has a slightly shallower than normal 2.8° glide path. This, combined with the 60m wide runway, will give an unusual visual aspect
- Note that the first 600m of Rwy 10 is not available for use as it is a closed section of the old runway
- NDB Rwy 28 offset 6°

**GROUND**

- B744 vacate via Twy 4. Twy 3 unsuitable for B744 operations.
- Wingtip and main gear clearance on all taxiways is minimal and taxiing must be conducted slowly and with extreme caution.

### DEPARTURE

- Note all SID turns require minimum 20° bank
- There is an automatic hand-off procedure in place. Pilots are expected to contact APP passing 1,200ft QNH. There will be no formal hand-off from TWR.

### WEATHER

- The Magadan area experiences a subarctic climate. Winters are prolonged and very cold, with up to six months of sub-zero temperatures. Much of the region is covered with permafrost and tundra.
- Daily mean max/min temperatures 15°C/10°C (Aug), -14°C/-19°C (Jan)
- Snowfall is generally light
- Prevailing wind NE'ly. Winds can be gusty and strong particularly in winter months.

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not available

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**KHOMUTOVO/YOUSHNO-SAKHALINSK (UUS/UHSS)**

Elevation 59ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- UUS is the largest airport in Sakhalin Oblast, and is situated on the southern outskirts of the town of Youzhno-Sakhalinsk ('Southern Sakhalin').
- The town was founded by convicts in 1882 but ceded to Japan, along with the southern half of Sakhalin Island, in 1905
- After the end of World War II the Japanese portion of Sakhalin Island was occupied by Soviet troops and ownership of the town was transferred to the USSR

**Threat Based Briefing Topics****CFIT**

- The airfield is located in a narrow valley. There is high ground on both sides with spot heights up to 3,497ft asl ~9nm NE and 2,549ft asl ~20nm NW.
- ATC clearances in metres QFE. Conversion charts to feet QNH provided on Lido charts; these must be used rather than the PFD metres option.

**Runway Excursion**

- Rwy 01 shallow glidepath (2.7°) leading to unusual visual aspect and risk of undershooting

**ARRIVAL**

- Rwy 01 preferred
- Two different missed approach procedures are published dependent on the status of restricted area R1399. Ensure the correct procedure is entered in the FMS.
- Rwy 01 has a 2.7° glidepath which gives a slightly unusual visual aspect
- Numerous restricted areas which may determine the STAR flown. Details on Lido.
- Turning pad 2 not available for aircraft B767 size and above

**GROUND**

- Lido AOI has extensive information on ground movement restrictions.
- Twy 3 not available to civilian aircraft. Route G not suitable for B747.
- B747 – taxi using thrust on inboard engines only. No more than idle thrust permitted on outboard engines due to FOD ingestion concerns.

- Engine start should be accomplished after pushback at one of the marked start-up points. Lido AGC and AOI 4 refer. Note that B744 aircraft are not permitted to start at points 6 or 7.

**DEPARTURE**

- Backtrack will be required for departure. WF ATC may use Twy G.

**WEATHER**

- Yuzhno-Sakhalinsk experiences mild summers and cold winters. Mean daily max/min temperatures 22°C/13°C (Aug), -7°C/-17°C (Jan)
- Fog is a frequent occurrence in summer
- Snowfall is almost entirely between Nov-Mar

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not available

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

## COLOMBO/KATUNAYAKE (CMB/VCBI)

Elevation 29ft

### CATEGORY A

No AV brief required.

### GENERAL

- The airfield is on the W coast of the island 12nm N of Colombo harbour and 15nm N of the city of Colombo.
- The airfield is almost on the coast with a large lagoon on the seaward side.

### Threat Based Briefing Topics

#### CFIT

- It is flat in the vicinity of the airfield, but starts to rise 15nm to the E slowly.
- Mountain range 40nm to the E with peaks to 8300ft asl.
- Mountains 40-75nm in an arc from NE to SE up to 10,000ft.
- The airfield is surrounded by trees up to 80ft agl.

#### Loss of Control

- Concentrations of birds crossing the approach paths of Rwy 22 and 04 at dawn and dusk from Nov to Jan.

#### Runway Excursion

- Colombo (Ratmalana) RML/VCCC is also oriented 04/22 and is only 21nm S of Colombo Intl. It handles domestic services only.

### ARRIVAL

#### Diversion Airports

CHENNAI	MAA/VOMM	350 nm/003°T	CAT A
BANGALORE	BLR/VOBL	385 nm/340°T	CAT A
MALE	MLE/VRMM	421 nm/245°T	CAT A
HYDERABAD	HYD/VOHS	611 nm/352°T	CAT A
COCHIN	COK/VOCI	274 nm/311°T	CAT A
THIRUVANANTHAPURAM	TRV/VOTV	294 nm/193°T	CAT A

## Approach

*On first contact with Colombo Airways once inside SIN or SUPSA (FIR boundary), expect initial descent to FL150 and to report 60 or 70 DME to KAT VOR, where you will be handed over to Colombo Director.*

- Circling is not allowed.

- Expect Radar vectors for an ILS via the KAT VOR.
- Max 250kts below 10,000ft.
- Max 220kts below 10,000ft and within 15nm of KAT VOR.
- Descent clearance is often given to altitudes below MSA; monitoring of the high ground to the E is needed.
- The runway surface is rough.
- Slight airborne delays are possible inbound (4 min hold WF 2016)

### GROUND

- The old Rwy 04/22 is now the parallel taxiway.
- SIMFEST aircraft are NOT to use the taxiway to the Air Lanka Apron or the Air Lanka Apron itself.
- The ramp to the NW of the runway is military.
- Taxi after landing is via the parallel taxiway to Apron A, B or C.
- Use of a marshaller is compulsory for taxi in/out. Nose in parking only.
- There is an isolated stand on the parallel taxiway, 100m from Twy B, to serve Emergency requirements

### DEPARTURE

- Typical WF congestion can be expected but taxi-out time in 2016 was below average (15 min)
- SIDs are published but may not be used
- Take-off clearance will likely be a turn left or right after takeoff and contact Director. This indicates you will make your own turn after takeoff in the direction instructed to establish on the airway. Director will then direct you to the first waypoint. Passing approx. 10,000ft you will be handed over to Colombo Airways.
- Emergency turn procedures in CARD.

### WEATHER

- Typical Tropical Island weather, similar to Male.
- Frequent thunderstorms and heavy rain.
- Little temperature variation throughout the year, staying between 24°C and 30°C.



- Dec to Apr (mid) – Occasional dawn fog, soon clearing. Overcast mid-afternoon, clearing early evening.
- Feb to Sep – Prevailing SW'ly wind.
- Apr (mid) to Jun – Monsoon season. Heavy cloud develops before dawn and lasts all day with heavy rain and frequent thunderstorms generally of short duration. Expect approaches to Rwy 22 during this period.
- Jun to Sep – Generally fine with broken Cu. Very occasional squalls with heavy rain lasting only a short time.
- Oct to Jan – Rain squalls more frequent and more persistent. Thunderstorms especially in the evening. The NE Monsoons blow and an approach to Rwy 04 can be expected.

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Sri Lankan
<b>Handling Agent VHF</b>	131.5
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use APU at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU at all times

**HONG KONG (HKG/VHHH)**

Elevation 28ft

**CATEGORY B**

No AV brief required.

**GENERAL****Threat Based Briefing Topics****CFIT**

- The airport for Hong Kong is built on reclaimed land to the N of Lantau. It is some 11nm W of Hong Kong Island. On Lantau Island there is high ground which begins to rise 1nm S of the airport reaching nearly 3,100ft asl at 3nm S and nearly 2,600ft asl at 3.5nm SE
- The peak on Hong Kong Island reaches nearly 2,000ft asl and is 12nm E
- 12nm NE and only 1.5nm N of the extended centreline to Rwy 25R is a peak to nearly 3,300ft asl
- The airport for Macau is some 20nm SW

**Loss of Control**

- Due to the proximity of the hilly terrain of Lantau Island to the S and E, significant low level windshear and moderate to severe turbulence can be expected when winds blow from E through to S to SW at about 15 kt or more. See [HKG weather section](#) for detailed information.

**ROUTE**

- Driftdown/Depressurisation procedures apply on routes to HKG.

**ARRIVAL****Initial Approach**

- Ensure HKG ATC contacted at appropriate time as detailed on Operational Flight Plan. Contact Hong Kong Radar 3 minutes prior SIERA; ATC should give STAR clearance. SIERA is the boundary and just to the South West of Macau. If there are significant inbound delays a hold may be assigned at CANTO.
- Guangzhou ATC will often require you to descend early, sometimes with direct routings to cross SIERA as low as FL190. Do not delay the descent/arrival briefing based on FMS predicted TOD point.
- Landing on Rwy 07L is preferable when landing Easterly and vacating at RET A8 or A9 will minimise taxi in, however if landing beyond A7 inform approach so they can adjust spacing
- Rwy 25R will be given when landing Westerly (Rwy 25L is used for cargo operators).
- D-ATIS is available for HKG.

**Crew Reports**

- Map shift errors on B747-400 aircraft have been reported

## Approach

- Be alert to the possibility of an ATC descent to a very low platform altitude on the approach to Rwy 07L and plan/brief aircraft configuration appropriately
- Tailwinds on short finals are very common. Pre-brief the latest acceptable touchdown point on the runway.
- There is significant terrain on the approach to Rwy 25 and the missed approach for Rwy 07. The missed approach, following an approach towards Rwy 07R, involves climbing straight ahead initially and then turning right, over the water, between the high ground on Lantau Island and the high ground on Hong Kong Island. Accurate tracking and flying is essential.
- During the winter monsoon, northerly wind of 25kt or more may produce WINDSHEAR and severe turbulence during a missed approach
- Reduced Runway Separation Minima procedures are in place. In favourable meteorological conditions crews may expect to receive clearance to land before the preceding aircraft has vacated or departing aircraft has left the runway.

## Diversion Preference

1. Macau, if approach feasible
2. Shenzhen
3. Guangzhou

### A380 Operations

- Note that Macao and Shenzhen are not available for A380 operations. In this case, Guangzhou (ZGGG), in mainland China about 100nm north of VHHH will be planned as the fuel alternate. Passenger dispersion facilities are limited. If a diversion is likely, plan to load sufficient fuel for Taipei (RCTP) first and then Clark/Angeles City (RPLC) in the Philippines. The OFP will provide the definitive commercial priority of alternates in the normal way (C1, C2 etc).
- From time to time these alternates may not be available for A380 operations
- In the event of a typhoon warning in force at the planned arrival time the flight will be delayed at LHR and operate the following day.

## Alternate and Diversion Airports

- Macau, Shenzhen and Guangzhou are in the local area. Kaohsiung, Taipei or Taiwan provide further alternates along with Manila, which is the most distant.

**Diversion Airports**

MACAU	MFM/MMC	021 nm/242°T	CAT B
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- Macau is very close and has good handling but limited apron space so may become congested fairly rapidly in the event of mass diversions. Fuel approved. Not suitable for A380.
- For northerly arrivals, aircraft are controlled by Hong Kong for the initial approach. Rwy 34 is fully Cat 2 equipped and provides the only AWOPS capability in the area.
- Shenzhen controls intermediate approach to Rwy 16 with cleared altitudes given in metres. Rwy 16 has an offset localiser only approach which is not recommended unless in good weather conditions.

**Diversion Airports**

SHENZHEN	SZX/ZGSZ	021 nm/344°T	CAT A
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- Located 30nm to the NW. Little traffic and reputed to be acceptable from a handling viewpoint. Straightforward approaches to Rwy 15/33. Fuel is approved and more apron capacity than Macau. Not suitable for A380.

**Diversion Airports**

GUANGZHOU	CAN/ZGGG	074 nm/344°T	CAT A
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- New airport opened August 2004. Good surface links to Hong Kong for passenger transfer.

**Diversion Airports**

KAOHSIUNG	KHH/RCKH	359 nm/087°T	CAT A
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- Located on the southern end of Taiwan. Can become congested at times of mass diversion. Immigration difficulties may be experienced.

**Diversion Airports**

TAIPEI	TPE/RCTP	436 nm/068°T	CAT A
ANGELES CITY	CRK/RPLC	572 nm/138°T	CAT A
BEIJING	PEK/ZBAA	1077 nm/007°T	CAT A
SHANGHAI, Pudong	PVG/ZSPD	679 nm/039°T	CAT A

**GROUND**

- B747/B777 parking stands normally used are between E15-E19
- APU ban for aircraft parking at frontal parking stands
  - The APU is to be shut down 5 mins after chocks on and not started in excess of 25 mins (60 mins A380) before STD

- In the event of Red Lightning warnings, refuelling and pushbacks are suspended (see Lido AOI 11)

**A380 Operations**

- A380 stands are N60/62/64, E15 and S25
- If vacating from Rwy 07L at A8 it is possible to be parked at the N gates in less than 5 minutes; this will require running engines on the gate to complete 5 mins at idle thrust
- After disembarking aircraft will be tugged off; complete full shutdown as departure is not for approx. 9hrs
- Stands E15, S23, N60, N62, N64, N66 have provision for A380 FEGP and PCA
- Note only two jetties are available at HKG and these will be attached at M1L and U1L
- Stands N60/N62/N64 reached via a track transit system which takes approx. 10 mins from the main passenger terminal

**DEPARTURE****Starting and Taxi**

- Parking bays generally have two standard pushback procedures, pushback BLUE and pushback RED; the colour defines the direction the aircraft faces after pushback.
- When commencing taxi pilots are requested to use minimum breakaway thrust.

**Departure**

- When departing from Rwy 07L there is a significant risk of aircraft taking off from Twy A instead of Rwy 07L. Beware when turning from Twy B to Rwy 07L so as not to confuse Twy A with Rwy 07L. The risk is promulgated as a Hot Spot in the AERODROME OVERVIEW chart.
- Non-standard acceleration altitudes Rwy 07. Check CARD notes.
- RW07 departures have a right turn over PORPA or ROVER. These must be checked as being coded as FLY-OVER waypoints in the FMS and MUST be flown over. An early turn prior to these waypoints will result in a hard EGPWS warning.
- Any speed restriction on departure such as 220 kt will require Flap 1 to be maintained until acceleration is allowed

**WEATHER**

- Jan-Apr: Low stratus and drizzle, ceiling down to 600ft (300ft over the sea), particularly in the mornings
- May-Sep: SW Monsoon period with Cb and heavy rain. TYPHOONS (3-4 per season).
- Oct-Dec: NE Monsoon. Good weather.

## Windshear and Turbulence

- Due to the proximity of the hilly terrain of Lantau Island to the S and E, significant low level WINDSHEAR and moderate to severe turbulence can be expected when winds blow from E through S to SW at about 15 kt or more. Due to terrain and land-sea breeze effects, the surface winds at the airport are generally not good indications of the prevailing winds. Instead pilots should use the wind conditions at about 2000ft along the approach to assess the likelihood of significant local effects further down the approach. The magnitude of WINDSHEAR and turbulence can be expected to increase towards final.
- Whilst the Hong Kong charts describe significant wind phenomena, they do not go in to detail about the systems that are used and how reports passed by ATC regarding WINDSHEAR should be interpreted by the crew.
- There are two WINDSHEAR detection systems specifically in use at Chek Lap Kok:
  - WINDSHEAR and Turbulence Warning System (WTWS)
  - Terminal Doppler Weather Radar (TDWR)

### WTWS

- This system is the most comprehensive and advanced terminal WINDSHEAR and turbulence detection system in the world. The main goal of WTWS is to provide real-time WINDSHEAR and turbulence alerts to pilots through tower controllers to enhance flight safety in the terminal area.
- The WTWS makes use of a network of anemometers around the airport to detect terrain induced low-level WINDSHEAR. The difference in windspeed and direction measured at adjacent anemometers is used to determine the location and magnitude of the horizontal WINDSHEAR in the arrival and departure corridors.

### TDWR

- This system supplements the WTWS by using an advanced data processing algorithm which is applied to other raw data to detect terrain induced WINDSHEAR and turbulence in clear air.

### Alert Types

- The systems report 3 types of alerts:

Alert Type	Description
Microburst	Only generated by the TDWR and indicates WINDSHEAR events with wind loss of 30kt or more
WINDSHEAR	Can be generated by both the TDWR and WTWS. It indicates a WINDSHEAR event with wind speed loss or gain of 15 kts or greater except for microburst.
Turbulence	Only generated by the WTWS. The minimum threshold setting is for moderate turbulence relative to heavy commercial aircraft.

### ATC Reporting

- An event is analysed and reported when it falls within 3nm of the runway thresholds based on observations made by the weather sensors
- The reports will be in the following format and there will only be one WINDSHEAR/microburst alert for each runway at any time.

**CAUTION: WINDSHEAR plus 15 knots on departure.**

- Unlike some US systems, this means that the aircraft may encounter the WINDSHEAR event with the maximum intensity anywhere along the corridor and there may be more than one event.
- The event will also be shown on the relevant ATIS as:
  - Significant WINDSHEAR forecast 25L and 25R
- In the case of multiple WINDSHEAR occurrences being detected by WTWS and TWDR there is a system of priorities to determine what is reported by ATC. All occurrences are integrated in to one report based on the following table.
- Alert type priorities are:

Priority	Alert Type
Highest	TDWR Microburst
	WTWS WINDSHEAR of minus 30kt or greater
	TDWR WINDSHEAR of minus or plus 15 kts or greater except Microburst
Lowest	WTWS WINDSHEAR of minus or plus 15 kts or greater

- Microbursts are only reported by the TDWR system
- The will be reported in a similar format to WINDSHEAR, e.g. Caution, Microburst minus 30 knots on final approach.
- A turbulence warning may be reported in conjunction with a Microburst or WINDSHEAR alert, e.g. Caution, WINDSHEAR minus 20 knots and moderate turbulence on departure

## Typhoons

- Hong Kong issues warnings of Typhoon activity within the area 10°-30°N and 105°-125°E, commencing 48 hours before expected passage of typhoon through Hong Kong. Simfest Ops will advise all ground stations of typhoon activity. Typhoon information is passed in plain language by the normal Met Broadcast and by Company messages. Advance warning is good, as is strength forecasting. The weather data below is compiled from observations made for the old Kai Tak airport adjacent to Kowloon opposite Hong Kong Island. There is a Simfest Typhoon Conditions Code described below.
- **SIMFEST TYPHOON, HURRICANE OR CYCLONE CONDITIONS**
  - SIMFEST CONDITION I – Winds are forecast to increase to 50 kt within 48 to 24 hours
  - SIMFEST CONDITION II – Winds are forecast to increase to 50kt within 24 to 12 hours. Aircraft are picketed or flown out of the area.
  - SIMFEST CONDITION III – 50 kt winds are forecast within 12 hours, are imminent or are actually being experienced. No aircraft operations except in an emergency.
  - SIMFEST CONDITION IV – Winds reduced to less than 50kt after passage. Aircraft operations resume.

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Jardine Airport Services
<b>Handling Agent VHF</b>	131.8
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use at all times



## MALE (MLE/VRMM)

Elevation 6ft

### CATEGORY A

No AV brief required.

### GENERAL

- MLE is located in a long group of coral islands approximately 400 nm southwest of Colombo

### Threat Based Briefing Topics

#### CFIT

- The runway almost totally dominates a narrow island 1 nm to the northwest of the island of Male. Terrain is not a consideration however there are obstacles up to 200ft in the immediate vicinity located on a nearby island.

#### Runway Excursion

- Backtrack on the runway end turn pads to exit from the runway to the apron. Use the standard FCOM turning pad technique for the 180° turn. Do not follow the yellow turning pan markings as the radius of the circle is smaller than the minimum nosewheel turning radius of a 777/747.

#### Special Considerations

- There is a water aerodrome to the east side of the main runway and seaplanes may operate across the main runway paths. ATC will ensure that seaplanes do not conflict with aircraft on the main runway.

### ARRIVAL

#### Diversion Airports

BANGALORE	BLR/VOBL	596 nm/025°T	CAT A
CHENNAI	MAA/VOMM	660 nm/037°T	CAT A
HYDERABAD	HYD/VOHS	837 nm/020°T	CAT A
THIRUVANANTHAPURAM	TRV/VOTV	329 nm/038°T	CAT A
COCHIN	COK/VOCI	398 nm/026°T	CAT A
COLOMBO (Katunayake)	CMB/VCBI	421 nm/065°T	CAT A

### Approach

- Delays may be encountered on arrival due to the long runway occupancy time of aircraft both arriving and departing.
- Radar vectoring and speed control may be used by ATC to delay arrival time. This may also lead to short notice changes between a Rwy 18 VORDME and a Rwy 36 ILS approach.
- Vectoring to final approaches is generally good.

## GROUND

- There is no taxiway or markings on the apron so exit from runway will be given by tower directly to a marshalled parking position.
- The standard procedure in MLE is that all SIMFEST aircraft will have a main marshaller located on the apron area with two wing walkers to ensure clearance. SIMFEST aircraft are normally parked nose in, with a left or right angle, but please note other aircraft on the apron may be parked at different angles.
- Space on the ground – let alone the apron – is likely to be at a premium during WorldFlight. Expect Taxiway G for departure and consider parking in a position that will not require pushback.
- It has been reported that the GPU can be unreliable.

## DEPARTURE

- Expect delays due to apron and taxiway congestion. In real life aircraft are pushed back from the apron on to the runway for start-up, but during WF this is highly unlikely.
- Departure routing may not be received until very late on. Reports from crew of receiving routing at the runway threshold point.

## WEATHER

- Typical tropical island weather
- Thunderstorms and showers are a frequent occurrence, but generally pass quickly
- A crosswind is often experienced due to runway orientation

## OPERATIONAL INFORMATION

Handling Agent	MACL (Ramp) MLEK (Pax)
Handling Agent VHF	119.7
Potable Water	Uplift permitted

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use APU

**MAKASSAR (UPG/WAAA)**

Elevation 47ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- The airport is located 20 km NE of Makassar's city centre
- It is named after Sultan Hasanuddin, a Sultan of Gowa who fought against the Dutch East India Company in the 1660s.

**Threat Based Briefing Topics****CFIT**

- Significant high ground rises to the east of the airfield. The terrain is well-depicted on Lido charts.
- Mt Moncong Lompobatang, 9,429ft asl, is 30nm SE
- There is also a peak of 5,541ft asl at 24nm less than 2nm to the east of the Rwy 21 extended centreline

**Runway Excursion**

- Sudden extreme rainfall during wet season may very quickly result in significant standing water and flooding.
- The runways are not grooved and water dispersion may be poor with associated reduction in braking action

**ARRIVAL**

- Expect radar vectors to final approach
- Rwy 03/21 preferred

**GROUND**

- Parking is on the new apron to the west of Rwy 03/21

**WEATHER**

- Makassar experiences a tropical monsoon climate, with virtually no seasonal temperature variation but significant differences in rainfall due to the movement of the ITCZ
- Jun-Oct: Dry season with very little rainfall
- Nov-May: Wet season. Rainfall peaks at 28.9 inches in January

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**BRUNEI (BWN/WBSB)**

Elevation 73ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- The airport is situated in a built-up area at the northern tip of Brunei, within the confines of the capital Bandar Seri Begawan
- Joint civil/military airfield also serving as the headquarters of the Royal Brunei Air Force.
- No significant terrain within the immediate vicinity of the airfield but there is high ground to the SE

**Threat Based Briefing Topics****CFIT**

- Terrain rises to the SE of the airfield up to 2,700ft asl within 27nm
- The 30nm MSA is 6,200ft and the 50nm MSA 8,100ft

**Loss of Control**

- A powerplant at under the Rwy 03 approach path at 1.2nm is reported to generate turbulence and low stratus cloud

**Special Considerations**

- The nav aids at the airfield, including the VOR, DME and ILS for both runways, undergo weekly scheduled maintenance and are unavailable at these times. See Lido AOI for details.

**ARRIVAL**

- Rwy 03 has a slightly steep (3.2°) glidepath
- Rwy 21 – the localiser signal has been reported unreliable outside 18nm beyond 10° L/R of centreline, and at more than 15° left of centreline at 17nm

**DEPARTURE**

- No SIDs published. Expect radar vectors after departure.

**WEATHER**

- Hot, wet tropical rainforest climate with heavy precipitation throughout the course of the year.
- Jun-Oct: SW Monsoon associated with Cb and heavy rain.
- Dec-Mar: NE Monsoon, with generally good weather.
- Very little seasonal variation in temperature with daily mean high/low temperatures of 32°C/23°C almost year-round

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use at all times

**JAKARTA (CGK/WIII)**

Elevation 34ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Located 20km northwest of central Jakarta
- CGK is the busiest and largest airport in South East Asia and one of the busiest airports in the world
- Terrain rises rapidly S and E of the airfield, with MSAs of 12000ft within 40 NM
- Local ATC may be difficult to understand. Use standard phraseology.

**Threat Based Briefing Topics****CFIT**

- Mt Pangrango 39NM SE rises to 9,905ft asl
- Gunung Karang 37NM W rises to 5,833ft asl
- Other notable peaks are: 20NM S ~4000ft asl, 30NM SE ~7000ft asl, 67NM SE ~7000ft asl
- 120NM MSA 15000ft

**Runway Excursion**

- Wider than standard runways leading to potential for misjudgement of height
- Runways may be slippery when wet

**ARRIVAL**

- Note stepped descent profile on STARs
- Expect radar vectors to final. Jakarta Approach also handles traffic to/from Hakim Perdanakusuma (WIHH)
- Both runways are 60m wide – beware visual illusions
- Ground and Tower positions may be split – North frequencies for landing 07L/25R and parking T2/T3, South for T1 and 07R/25L

**GROUND**

- Potential long taxi times dependent on parking position

**DEPARTURE**

- Expect TULIP or DOLTA SID

- Note stepped climb profiles

### WEATHER

- Prevailing wind direction south westerly in November
- Wet season runs Oct-May with frequent heavy rainfall
- November average daily max/min temperatures 30°/23°C

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest
<b>Potable Water</b>	Not Assessed

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (Keep ground power connected to reduce APU fuel burn)



**BANDA ACEH (BTJ/WITT)**

Elevation 65ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- BTJ is located approx. 13km SE of Banda Aceh city (pronounced: BAN-dah ATCH-ay) in the far north-west of the island of Sumatra.
- The airport was rebuilt and upgraded to its current specification after the Boxing Day tsunami of 2004
- The airport is situated in a wide valley with steeply rising terrain to the E, S and W

**Threat Based Briefing Topics****CFIT**

- Mt Seulawah Agam, 5,940ft asl 14nm SE
- Other notable peaks ~5,800ft asl 9nm SW, ~6,900ft asl 18nm S, ~2,000ft 18nm N, 1,702ft 5NM NE, 2,018ft 10nm W

**Loss of Control**

- Turbulence and/or windshear likely on approach with strong E wind

**Runway Excursion**

- Tailwind approaches Rwy 17

**ARRIVAL**

- No instrument approaches available for Rwy 32. If tailwind out of limits for landing 17 it is possible to perform a circling approach but be aware of very high MDAs (2300 ft) and proximity of high terrain to the E
- DME arc procedures in use but radar vectoring to final is highly likely during WF
- Note max 220 kt speed restriction in go-around due to terrain

**GROUND**

- Very limited apron space
- Rwy 17 departures will require backtrack or Taxiway G

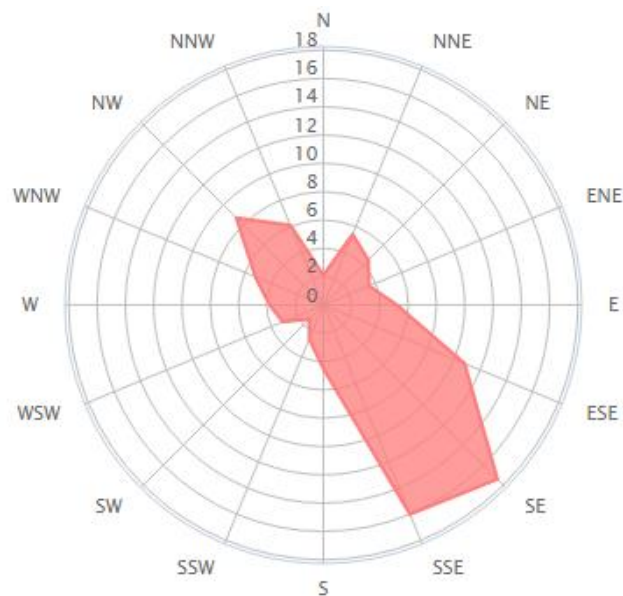
**DEPARTURE**

- Note departure speed and climb gradient requirements
- Emergency turn procedures rwy 17:

- All SIDs: engine failure below 1500ft QNH: turn RIGHT to BAC
- Above 1500ft QNH: no restrictions provided SID tracks and climb profile achieved

### WEATHER

- Banda Aceh has a tropical rainforest climate, with the driest months being Jun-Aug but frequent heavy rainfall can be expected throughout the year
- Average temperatures consistent throughout the year at around 27°C
- Prevailing south-easterly wind in November
- Average wind distribution in November:



### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Jetway: Use GPU (remote: use APU)
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (Keep ground power connected if available to reduce APU fuel burn)

**SINGAPORE (SIN/WSSS)**

Elevation 22ft

**CATEGORY A**

AV brief not required.

**GENERAL**

- Runway 02R/20L military only

**ARRIVAL****Diversion Airports**

KUALA LUMPUR	KUL/WMKK	238 nm/301°T	CAT A
PENANG	PEN/WMKP	350 nm/317°T	CAT B
JAKARTA	CGK/WIII	550 nm/160°T	CAT A
BANGKOK	BKK/VTBD	842 nm/345°T	CAT A

- Paya Lebar (QPG/WSAP) is a military airbase and is not suitable for commercial operations. There is no ground handling and no customs & immigration facilities. Permission to land would only be granted if it is an absolute emergency.
- Ground handling equipment would have to be moved from SIN if an aircraft was to divert to Paya Lebar.

**Approach**

- Local VATSIM ATC generally of a good standard but lengthy vectors can be expected if arriving in the middle of the pack and air delays of up to 20 min can be expected (WF 2016: 20 min, WF 2017: 14 min)
- Review approach speed requirements in the Jepp Airport Briefing pages as early selection of flap and landing gear may be required
- ATC expect arriving aircraft to vacate at the first available taxiway so as to minimise runway occupancy times. Jepp 10-1P1 refers.
- Parking is normally along the C pier of T1 and may be any of the stands C1, C20, C22-25

**Parking**

- Rwy 02L exit W4 works well for parking on stand C23 but be mindful of engine cooldown requirements before shutdown

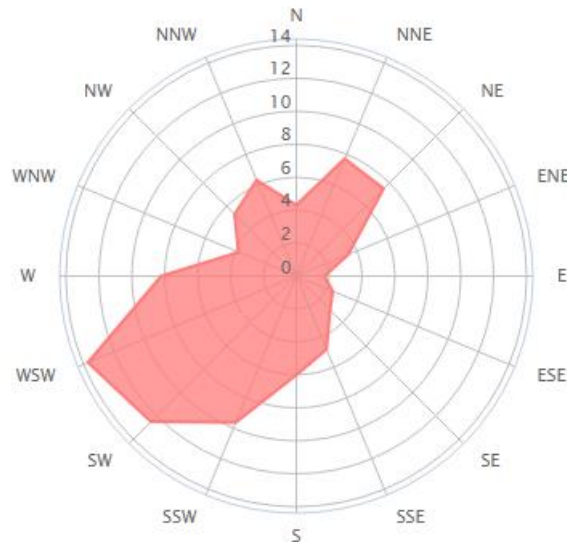
**DEPARTURE**

- Above average taxi-out times (WF 2016: 27 min, WF 2017: 24 min)

- Expect AROSO 2A SID off rwy 02C
- If the SID vertical profile cannot be achieved inform ATC prior to departure and expect radar vectoring if necessary

### WEATHER

- Heavy rain during Cb activity rarely results in a cloudbase below 500ft or visibility less than 1000m
- WorldFlight takes place at the start of the NE monsoon season (Nov to Jan). During this period frequent heavy rainfall can be expected with Cb build-ups during the afternoon and evening.
- Average daily high/low in November 31°C/24°C
- Average wind distribution November:



### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Singapore Air Terminal Services (SATS)
<b>Handling Agent VHF</b>	Speedbird Singapore 131.225
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU for air conditioning (Keep ground power connected to reduce APU fuel burn)

**BRISBANE (BNE/YBBN)**

Elevation 13ft

**CATEGORY A**

AV Brief not required.

**ARRIVAL****Approach**

- Rwy 19 – most approaches to this runway are flown visually from a 90° intercept to a 5nm final
- Cutting the corner when visual with the runway and thus reducing the track miles to touchdown has resulted in some unstable approaches

**WEATHER**

- Dec to Apr – risk of tropical cyclones tracking S to SE, however the frequency is around 5 in 30 years
- Fog may occur in any month but the frequency is highest from May to Sep with July being the worst month
- Strong gusty W'ly winds can occur for periods lasting up to 48 hrs from Jun to Aug
- Surface winds are mainly:
  - SW'ly Mar to Sep
  - NE'ly Oct to Dec
  - E to SE'ly Jan to Feb

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Menzies
<b>Handling Agent VHF</b>	131.9
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**CAIRNS (CNS/YBCS)**

Elevation 10ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- Cairns is situated on the E coast of Queensland in latitude 17°S
- The city is immediately S of the airport and overlooks Cairns Harbour
- Preferred runways are 15 for landing and 33 for take-off.

**Threat Based Briefing Topics****CFIT**

- W of the airfield is Mt Whitefield, rising to 1,250ft asl within 1 nm of the runway.
- Further high ground from NW through S to E.
- Notable peaks/obstructions, are: 12 nm NW ~2,700ft asl, 7 nm NW ~2,250ft asl.
- 5 nm E ~2,200ft asl, 7 nm E ~2,750ft asl, 14 nm SE ~3,350ft asl, 23 nm SE ~5,400ft asl.
- 6 nm SW ~3,500ft asl, 10 nm SW ~4,350ft asl.
- There is a steep sided valley to the S of the city which narrows as it extends S.

**Runway Incursion**

- There is a short runway (925 m) orientated 12/30. Clearance is required to taxi across Rwy12 threshold.

**Loss of Control**

- Low level turbulence on final approach to both runways with SE to W winds; WINDSHEAR on short finals.
- If taking off with a tailwind on Rwy 33, expect an increasing tailwind component during early climb-out.
- Birds are a hazard, especially Pelicans.

**ARRIVAL**

- DME arc procedures are used but aircraft may be radar vectored to final approach.
- Maximum speeds are published for some procedures due terrain.
- Landings Rwy 33 rare, most likely during the afternoons July, August and September.
- The visual circling approach Rwy 33 is flown right hand and must not extend beyond 4.4 DME to the S. Consider accepting a tailwind landing on Rwy 15.

**GROUND**

- 4 engined aircraft are required to use low power on outboard engines whilst taxiing

- If the exit at B2/B5 are missed a backtrack may be required (though WF procedures may implement Taxiway G)
- Expect ATC and ramp congestion.

### DEPARTURE

- High traffic levels can be expected with resulting ATC frequency congestion.
- Long taxi out times can be expected (2017: 34 mins and 21 mins). Plan taxi fuel and start-up time accordingly.
- Backtrack possible, but Taxiway G to runway end more likely

### WEATHER

- Apr to Nov Cairns generally fine weather with prevailing SE wind
- High terrain surrounding Cairns has a significant orographic effect on the weather from Nov through to Mar. The onset of the wet season is signalled by a shift in the winds to the NE in Nov.
- Poor conditions can be expected to persist for lengthy periods throughout the wet season
- Cyclones can be expected to affect the area during the wet season
- Mean max/min temperatures: 32°/24°C in summer; 26°/17°C in winter.

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Simfest Ground Services
<b>Potable Water</b>	Not Assessed

<b>IF ONLY Electrical Power is required</b>	Use APU (GPU/FEGP not available)
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU not available)

**BROOME (BME/YBRM)**

Elevation 57ft

**CATEGORY B**

No AV brief required.

**GENERAL**

- Located on the NW coast of Australia, Broome is a class D airfield
- There is no radar.
- Cable Beach on the western side of the town is the site where an undersea telegraph cable to Java and on thence to the UK makes landfall in Australia, as well as being one of Australia's most famous nudist beaches
- A colony of over 50,000 megabats lives in the mangroves nearby
- Broome is also a site of palaeontological significance with what are thought to be the world's largest fossilised dinosaur tracks a short distance out to sea at Gantheaume Point

**ARRIVAL**

- RNAV and NDB approaches only
- Expect RNAV (GNSS) approach runway 28
- Note PAPIs set for 54ft MEHT – B744 aircraft consider flying 3w/1r

**GROUND**

- B777-200ER and B747-400 aircraft not authorised to use taxiways north of Rwy 10/28
- Simfest aim to park on the RPT apron south of the runway

**DEPARTURE**

- The published SIDs are for helicopters, so expect radar vectors
- No backtrack required for departures from 28 but the apron and taxiway areas are very tight

**WEATHER**

- Generally settled in November but thunderstorms and torrential rain build up during the rainy season (Dec-Mar)
- Average high/low temperatures in November 33°/22°C respectively



- Prevailing wind in November almost exclusively westerly

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Potable Water</b>	Not Assessed

<b>IF ONLY Electrical Power is required</b>	Use APU (GPU/FEGP not available)
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU not available)

**DARWIN (DRW/YPDN)**

Elevation 103ft

**CATEGORY A**

No AV brief required.

**GENERAL****Threat Based Briefing Topics****Loss of Control**

- Arrestor cables are located at the Rwy 11 and Rwy 29 TDZ.

**Runway Incursion**

- It is not permitted to vacate directly on to or cross Rwy 18/36 without explicit ATC approval

**ARRIVAL**

- Rwy 11 preferred for arrivals from sector SW clockwise to NE
- Rwy 29 preferred for arrivals from sector NE clockwise to SE

**GROUND**

- Consider parking at S apron during WorldFlight to avoid backtrack
- Note that ATC approval is required to cross or vacate on to Rwy 18/36

**OPERATIONAL INFORMATION**

<b>Handling Agent</b>	Simfest Ground Services
<b>Handling Agent VHF</b>	
<b>Potable Water</b>	Not assessed

<b>IF ONLY Electrical Power is required</b>	Use at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use APU (ACU equipment not available). Keep ground power connected to reduce APU fuel burn.

**SYDNEY (SYD/YSSY)**

Elevation 21ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Sydney Airport is very noise sensitive. Extensive noise abatement notes in the charts.
- High traffic levels can be expected with accompanying ramp and ATC congestion. Previous years have seen in excess of 200 aircraft taking part in the first and final legs.
- Official sims can generally expect some measure of priority handling but be prepared for long delays outbound and load taxi fuel accordingly.

**ARRIVAL****Diversion Airports**

MELBOURNE	MEL/YMML	381 nm/234°T	CAT A
BRISBANE	BNE/YBBN	407 nm/014°T	CAT A
ADELAIDE	ADL/YPAD	629 nm/264°T	CAT A

- Official sims will be issued with special arrival procedures prior to the final leg
- Simultaneous close parallel ILS approaches and independent visual approaches to parallel runways may be in use. In the latter case, remember it is the pilot's responsibility to maintain the necessary separation from adjacent aircraft and that traffic information WILL NOT be given about aircraft on adjacent approaches.

**GROUND**

- Only taxiway T6 is wide enough for exit from 16L.
- Exercise caution with regard to jet blast when taxiing within the vicinity of the international ramp/terminal area.
- If aircraft, ground equipment or personnel are present on stands 11 and 12, crews should anticipate the potential for jet blast when parking on opposing stands (8, 9, 10, 24, 25)

**DEPARTURE**

- Be prepared for ground and ATC congestion and long taxi delays. Simfest taxi out time at SYD in 2017 was 27 minutes.
- ATC may elect to issue pre-departure clearance instead of a normal airways clearance. When pre-departure clearances are in use, pilots will be notified by ATIS, for example:

"PDC AVBL. ACFT IN RECEIPT OF PDC TO MNTN 5000FT"

- In order to reduce radio congestion, pilots of eligible aircraft shall contact Clearance Delivery by text only on frequency chat and request "PDC REQ" with the ATIS identifier. For Example: "PDC REQ with INFO A".
- ATC will require readback of the SID (Including runway and/or transition if issued) and transponder code as received from your PDC message. Your clearance read back should also include any other requirements and must state your current parking position/bay. You should read back on the Clearance Delivery Frequency prior to pushback.
- Once you have completed this process, you can contact the appropriate ground frequency for further requests.

### WEATHER

- In moist SE winds behind a cold front and within 3 hours of its passage, broken scud with base 400-800ft drifts in from the sea. It is followed later by showers and further scud of up to 8/8 cover. The "black north-easter" which develops ahead of a trough also brings low cloud, but conditions are less severe than those with SE winds.
- Most thunderstorms occur at cold fronts, which if active are of the line squall type (southerly buster) and may persist for periods of up to 3 hours. Dust with NW winds may reduce visibility.
- Prevailing wind Oct to Apr is easterly

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	QANTAS (Pax), MENZIES (Ramp)
<b>Potable Water</b>	Uplift Permitted

<b>IF ONLY Electrical Power is required</b>	Use ground power at all times
<b>If BOTH electrical power and air conditioning is required:</b>	Use both ground services at all times

**SHANGHAI/HONGQIAO (SHA/ZSSS)**

Elevation 10ft

**CATEGORY A**

No AV brief required.

**GENERAL**

- Airfield is located on the westernmost edge of the city, 7nm from its centre
- No significant terrain within the vicinity

**Threat Based Briefing Topics****Special Considerations**

- Aircraft are prohibited from flying in to area R559 E of airfield
- All altimeter clearances are given in metres QNH. China uses RVSM at cruising altitudes. Check correct feet setting in MCP versus cleared metric flight levels (see Lido conversion charts). See Lido>RSI>Middle East/Asia>RAR>2.11 Altitude Regulations for RVSM flight level information and transitions to other FIRs
- Lido CRAR contains details of border crossing and turn back together with flight rules and special procedures peculiar to China.

**ARRIVAL****Diversion Airports**

SHANGHAI, Pudong

PVG/ZSPD

024 nm/098°T

CAT A

**Initial Approach**

- Aircraft will normally be radar vectored and sequenced from Andong, Wuxi and Hegsha VOR to appropriate final approach track
- Circling W of airfield only

**WEATHER**

- Due to their proximity, Hongqiao's weather is very similar to Shanghai Pudong's
- Winter Oct-Mar temps can drop below freezing with frequent fog periods generally clearing by mid-morning
- Spring, Apr-Jun is characterised by low cloud and rain with occasional sea fog
- Summer, Jun-Aug is monsoon season with the highest period of rainfall
- Typhoons can occur at any time from May-Nov

**OPERATIONAL INFORMATION**

Handling Agent	China Eastern
Handling Agent VHF	131.5
Potable Water	Not assessed.

IF ONLY Electrical Power is required	Use ground power at all times
If BOTH electrical power and air conditioning is required:	Use both ground services at all times

## AFRICA AREA

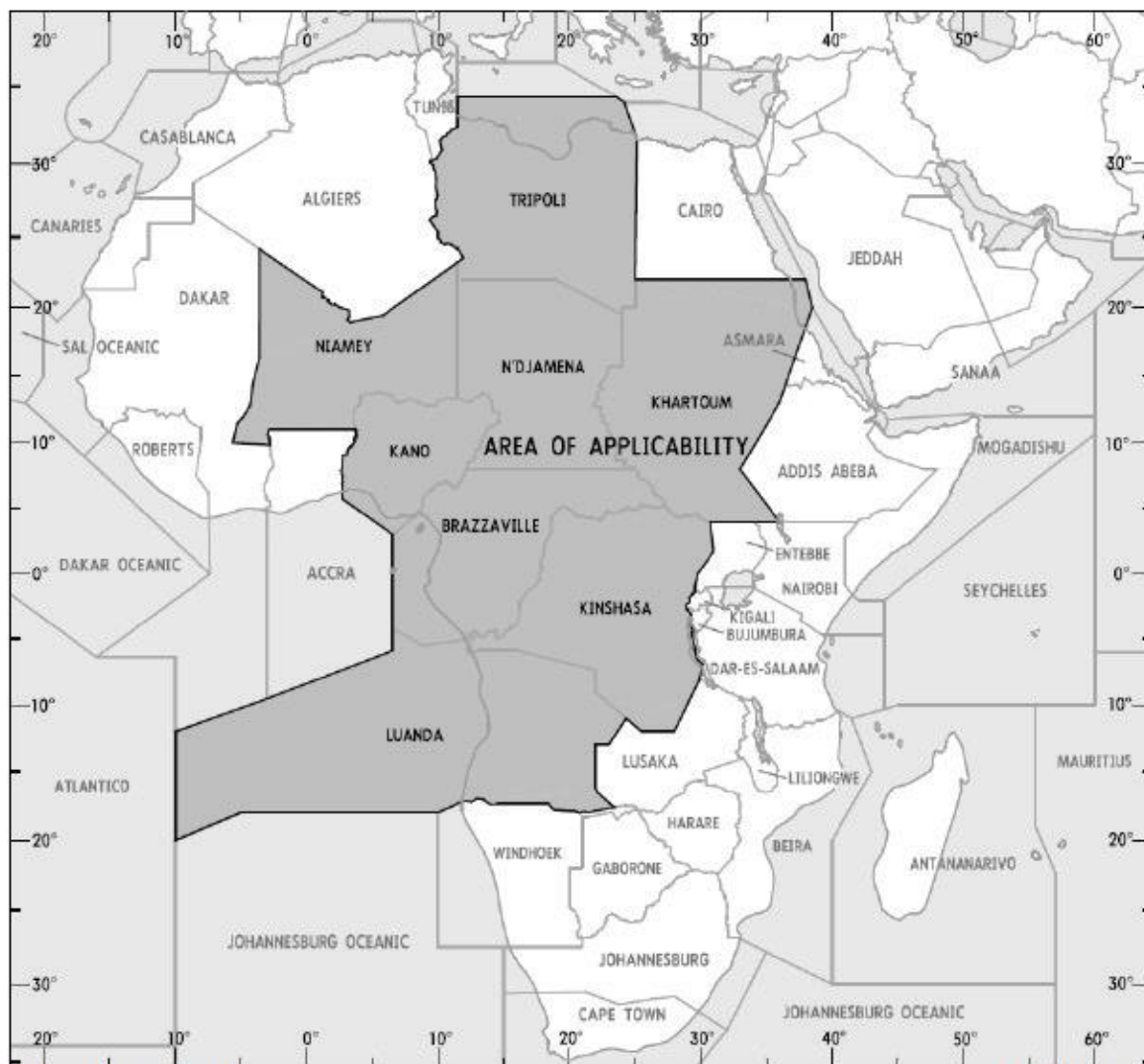
This briefing sheet is not intended to supersede information provided in the relevant Operations Manuals and NOTAMS.

For Hot and High Operations see [‘Hot and High’ Operations briefing](#).

For weather information see separate “Weather Notes” briefing.

### IATA IN-FLIGHT BROADCAST PROCEDURE

This procedure is mandatory and applies to the following FIRs within the AFI region: Tripoli, Niamey, N'Djamena, Khartoum, Asmara, Kano, Brazzaville, Kinshasa, Luanda and Mogadishu.



Source: IATA SO&I AFI

7 March 2013

The standard IATA procedure is as follows:

1. Crews will maintain a listening watch on 126.9 MHz from 10 mins before entering the defined area until leaving the area.
2. Ensure transponder is operating for TCAS purposes; squawk A2000 if no specific code is assigned.
3. When using accurate navigation systems aircraft should fly 1 nm right of track.

**Note:** This is an IATA recommendation only and one that SIMFEST has decided to adopt. Many other operators in the region do not follow this policy.

4. In addition to normal ATS reporting procedures for the route being flown, flight crews will broadcast position data as follows:
  - a. 10 mins before entering or crossing an FIR within the IFBP region or as soon as appropriate after taking-off from an airfield within the IFBP region.
  - b. 10 mins prior to reporting points.
  - c. 10 mins prior to crossing or joining an ATS route.
  - d. At 20 min intervals between distant reporting points.
  - e. 2-5 mins where possible, before a change in flight level.
  - f. At the time of a change in flight level.
  - g. At any other time considered necessary by the crew.
  - h. In the interests of reducing congestion on the IFBP frequency, pilot may exercise discretion to omit closely spaced repetitive IFBP reports.

**Example:** “All stations, this is Speedbird 054, in the Khartoum FIR, Flight Level 310, Northbound on UB612, estimate SOGIN at 0523 UTC, Speedbird 054, Flight Level 310, in the Khartoum FIR”.

It is a very good idea, particularly in W Africa, to plot the blind position reports of other aircraft. Any conflicts that cannot be resolved through ATC, perhaps because of communication difficulties, must be resolved between the individual aircraft.

### GENERAL ADVICE

Note that many routes are in Advisory Airspace, and hence only an advisory service and not a control service will be offered. This means that separation will only be provided from known traffic; 10 min longitudinal separation is not unusual. As communications are notoriously bad throughout Africa (with the exception of South Africa), both between ATC Units and R/T between ATC and aircraft, flight plans may not have been received and aircraft may not have been able to contact ATC. This also applies to a lesser extent in controlled airspace. The use of SATCOM may be a possible solution to comms problems. As Radar coverage is negligible except in South Africa, there is likely to be unknown traffic. Hence:

1. Keep a good look-out and listening watch. Even with aircraft operating at the correct cruising levels conflicts have occurred between traffic converging almost head on, as semi-circular rules are generally used and traffic is mainly N-S.
2. Do not accept non-standard clearances (e.g. levels). As most of the routes are N-S and semi-circular rules are used, a small change of track may necessitate a level change. However, note that some N-S airways/advisory routes use the mean direction to determine the appropriate FL – see charts.



3. Direct routings may be offered, however, some countries prohibit foreign registered aircraft from operating outside controlled or advisory airspace. See AIS Briefing for current information.
4. Use the IATA In-Flight Broadcast Procedure (see IATA In-Flight Broadcast Procedure) when appropriate. But do not assume that all aircraft will use the facility. If it is apparent that there is a conflict with another aircraft, inform ATC as soon as possible and insist that they resolve the situation. Apparent conflict situations should be voyage reported.
5. When approaching an FIR boundary attempt to contact the onward ATC Unit well in advance, as co-ordination will probably not have been carried out, remembering, after this ctc has been established, to pass on any changes (e.g. FL) to the next unit.

### RVSM

RVSM applies to all of Africa between FL290-410 and follows standard RVSM procedures.

### WEST AFRICA

Radio aids, airfield lighting, VASIs/PAPIs etc are frequently unreliable or unserviceable at W African terminals. HF communications are often difficult, particularly with Lagos, Kano and Accra. Maximum use should be made of VHF relays. Maintain a SELCAL watch with Stockholm Radio passing operational details as appropriate.

All W African stations require total persons on board and endurance on arrival and departure.

Many MSAs on charts are unreliable due to incomplete surveying.

Aircraft water tanks should be full ex UK as drinking water uplift is often not available.

Aircraft APU should be serviceable ex UK as air starts are often unavailable.

Accurate weather information may not be available at London before departure. Obtaining Wx information en-route is extremely difficult due poor communications.

IT IS IMPORTANT TO TAKE ANTI MALARIAL PRECAUTIONS.

DRINKING WATER is suspect at all W African destinations.

### EN ROUTE AIRFIELDS

UK	- NIGERIA - GHANA - IVORY COAST	GHARDAIA (Algeria) TAMANRASSET (Algeria) – although promulgated as H24 it has been reported impossible to make radio contact while overflying nearby at night  OUAGADOUGOU (Burkina Faso) NIAMEY (Niger)
LAGOS	- ACCRA	COTOUNOU (Benin) LOME (Togo)
UK	- GAMBIA	LAS PALMAS (Canarias) NOUADHIBOU (Mauritania) NOUAKCHOTT (Mauritania)

**ALGERIA**

Difficulty contacting Algiers on HF occurs. Aircraft unable to maintain direct contact with Algiers ACC may be able to pass messages via Tamanrasset.

**GHANA/IVORY COAST**

See under Nigeria for operations between Accra and Lagos.

**NIAMEY**

There have been reports of flight level conflicts, some serious, with other aircraft while in Niamey FIR.

**NIGERIA**

For aircraft routing between Lagos and Accra it is usual to establish radio contact with Accra before being released by Lagos and vice versa.

There have been a number of airprox incidents involving Lagos and Accra due to comms problems and lack of co-ordination.

**TCHAD**

Difficulty has been experienced contacting N'Djamena before their FIR Boundary for onward clearance.

N'Djamena shares some AFI 2 HF frequencies with Algiers.

There have been a number of reports of flight level conflicts, some serious, with other aircraft while in the N'Djamena FIR. Once again IFBP has been instrumental in resolving these conflicts.

A North/South route just to the West of N'Djamena takes the aircraft into the Kano FIR; contact Maiduguri TWR on VHF before the Kano FIR Boundary.

**EAST AFRICA**

Terrain information is incomplete over some of the area.

**ETHIOPIA (ADDIS ABABA FIR)**

MSAs in the Addis Ababa FIR are high, the highest being over 17,000 feet.

**LIBYA (TRIPOLI FIR)**

Difficulty contacting Tripoli on HF occurs.

Foreign registered aircraft must not fly outside ATS routes and controlled airspace. Overflight of oil installations is prohibited.

**SUDAN (KHARTOUM FIR)**

A SIMFEST crew report conflicting opposite direction traffic of which Khartoum ATC were totally unaware. The situation was resolved with the aid of TCAS although the conflicting traffic was not TCAS equipped.

Poor comms reported along UB612F between ORNAT and ALVOR.

Caution during Haj season due to high East – West traffic density. Haj traffic from Khartoum FIR to Jeddah routes Port Sudan – BOGUM – Jeddah and traffic from Jeddah to Khartoum FIR routes Jeddah – DUNGU – Port Sudan. Traffic departing Jeddah should attempt to contact Khartoum on HF immediately after departure, but remain in contact with Jeddah until released.

Prohibited Area P10A (to the NW of VOR KTM) – Any aircraft infringing this airspace may be subject to interception by the Sudan Air Force and indefinitely detained. Flights cleared along UA727/UR611D must be at FL280 or above. Do not deviate from the airway centre line.

### **SOUTHERN AFRICA**

Mt Kenya 17,058ft is 50 nm E of Lodwar – Nakuru – Nairobi track.

Mt Meru 14,978ft is 38 nm E of LOSIN (121 nm SW of Nairobi along A405).

Mt Kilimanjaro 19,340ft is 20 nm SW of GABSO (100 nm SE of Nairobi along UB533).

Many Safety Altitudes on Charts are unreliable due to incomplete surveying.

### **ANGOLA**

There have been reports of flight level conflicts with other aircraft while under Luanda Control, but few in recent years. HF Comms problems between TERBA and ILDIR have been reported with a SIMFEST crew (2004) passing through the sector without any direct contact with Luanda.

### **DEMOCRATIC REPUBLIC OF THE CONGO (DRC)**

Conflicting crossing traffic, not advised by ATC between Bangui and Lubumbashi; the situation was resolved each time by the two aircraft crews using the In-flight Broadcast frequency 126.9. Major re-development project is ongoing within DRC to re-build ATC infrastructure.

### **MADAGASCAR (ANTANANARIVO FIR)**

The following IFR levels are available in Antananarivo FIR/UIR.

Mogadishu – Mahajanga Odds to 290,330,370 etc.

Mahajanqa – Mogadishu Evens to 280,310,350,390 etc.

Seychelles – St Denis Evens to 280,310,350,390 etc.

St Denis – Seychelles Odds to 290,330,370 etc.

### **MAURITIUS**

In order to facilitate the issue of descent clearances to aircraft approaching Mauritius from Antananarivo FIR above FL250 the following procedures are used:

1. Aircraft approaching from the SW shall call Mauritius over St Denis VOR.
2. Aircraft approaching from the W shall call Mauritius when abeam St Denis VOR.
3. Aircraft approaching from the NW shall call Mauritius at the FIR boundary.

Aircraft proceeding to Antananarivo FIR from Mauritius are requested to contact Antananarivo FIC as soon as convenient after take-off, but shall remain in contact with Mauritius until the FIR boundary or until released by Mauritius, whichever is later.

#### **NAMIBIA**

Strategic Lateral Offset Procedure (SLOP) is not authorised in FYWH due to adequate ATS surveillance coverage between FL290 and FL410.

#### **REPUBLIC OF SOUTH AFRICA**

Speed Control – Within a CTR, ATZ or aerodrome traffic area, 200 kt maximum unless authorised by ATC. If unable to comply advise ATC.

Aircraft operating off the West coast of South Africa, outside controlled airspace, are to broadcast position reports blind on the FIC frequency if two way contact cannot be established. Good communications reported with Johannesburg Oceanic on HF.

South Africa uses 124.8 as the Unicom frequency as 122.8 clashes with a number of ATC facilities. It is recommended to monitor 122.8 on box 2 as non-local pilots may not be aware.

#### **ZAMBIA/MOZAMBIQUE**

Aircraft using A405 between Harare and Mbeya need to monitor for conflicting traffic on A400 between Chileka and Lusaka. This traffic should be at FL320 or below.

There may be restrictions on entry/exit points to the South – see AIS Briefing for latest.

## **AUSTRALASIA INCLUDING NEW ZEALAND AND PACIFIC**

### **AUSTRALIA**

Australian ATC is empowered to prohibit an approach to land (except in an emergency) or a take-off when the weather conditions are worse than the published State minima. ATC may use the term "THE AERODROME IS CLOSED TO TAKE-OFF (OR LANDING)." The use of the terms relates solely to prohibition of the aircraft to carry out its desired manoeuvre; all services and facilities at the airport continue in full operation. BA minima are the more restrictive of State minima and minima calculated according to BA criteria.

There are specific Australian regulations with regard to alternates and fuel requirements which, for instance, allow a flight to proceed without a nominated alternate in good weather conditions. However BA fuel policy, which meets the requirements of EASA OPS and is approved by the UK CAA, is more restrictive than that required by the Australian AIP, therefore detailed knowledge of the Australian requirements is not necessary.

### **ROUTINGS AND POSITION REPORTS**

Radar coverage is good, within Brisbane, Melbourne and Sydney CTA's. Therefore, unless otherwise instructed position reports are not required, but it is required to transmit level information at frequency change points.

RNAV routes are widely used.

Direct routings are now commonplace and INS separation as low as 30 nm may be given.

Heavy Aircraft – Pilots of heavy aircraft should always suffix their callsign with the word "HEAVY" in the initial radiotelephony contact with aerodrome control tower or approach unit.

### **REDUCED VERTICAL SEPARATION MINIMUM (RVSM)**

RVSM is used throughout all Australian FIRs, vertical separation may be reduced from 2,000ft to 1,000ft. There is a minimum equipment requirement and an associated altimeter check before flight into RVSM airspace – see relevant manual for aircraft type.

If failure results in the aircraft having less than the minimum equipment required to enter RVSM airspace, ATC must be informed immediately.

### **RVSM CONTINGENCY PROCEDURES**

Crew procedures are generally in accordance with global RVSM procedures, however crews should be aware that in the event of being unable to maintain assigned altitude and in the absence of a revised ATC clearance, then an aircraft should leave its assigned track by turning 90° right or left whenever this is possible. Additionally when flying in Australian Oceanic Airspace and unable to maintain RVSM compliance and/or unable to maintain assigned altitude, then crews should adopt an off-set of 25.0 nm from assigned track until a revised ATC clearance is obtained. (See In Flight Contingencies).

If WAKE VORTEX problems are encountered with adjacent RVSM aircraft (Oceanic Airspace), consider obtaining a revised ATC clearance. If not possible or practicable, establish contact (if possible) with the other aircraft on 123.45; one or both aircraft should initiate a lateral offset of up to 2 nm. Advise ATC and return to track as soon as the offset is no longer required.

There are Designated Routes in the Oceanic Control Areas with named reporting points.

Position Reporting on Designated Routes:

- |                               |   |  |
|-------------------------------|---|--|
| a. Over Nav Aid or over water | ) | Report if overhead; or                 |
| within 150nm of Terminal      | ) | True Bearing/Dist when abeam, or if    |
|                               | ) | a Terminal VOR DME can be used,        |
|                               | ) | the DME distance and radial flown      |
|                               |   |  |
| b. More than 150nm from       | ) | Report as "at" the R/Pt if within 20nm |
| Terminal and over water       | ) | of it. If more than 20nm give True     |
|                               | ) | Bearing/Dist when abeam                |

#### **AUSTRALIAN ORGANISED TRACK STRUCTURE (AUSOTS)**

AUSOTS tracks may be established within the Melbourne and Brisbane FIRs for traffic operating between Singapore and Australian Intl airports Brisbane, Sydney and Melbourne.

#### **LATERAL OFFSETS IN OCEANIC AIRSPACE**

Aircraft operating in oceanic airspace in the Brisbane and Melbourne FIRs are authorised to use lateral offsets in accordance with the requirements detailed below:

- a. The offset shall only be applied by aircraft with automatic offset tracking capability.
- b. When an offset is applied, the offset must be established at a distance of 1 nm or 2 nm to the RIGHT of track relative to the direction of flight.
- c. The offset must only be applied during the en route phase of flight.
- d. The offset must not be used in addition to diversions or other offsets; e.g. weather or wake turbulence.
- e. The offset must not be applied at levels where obstacle clearance would be affected.
- f. Identified aircraft:
  - i. May continue an offset; and
  - ii. Must advise ATC prior to initiating or changing an offset.

The decision to apply a lateral offset is the responsibility of the pilot in command. Other than when an identified aircraft initiates or changes a lateral offset, pilots are not required to notify ATC that a lateral offset is being applied.

#### **WEATHER DEVIATION PROCEDURES**

The following procedures are intended to provide guidance for deviations around thunderstorms. All possible circumstances cannot be covered and therefore the pilot's judgment shall ultimately determine the sequence of actions taken.

If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air traffic control clearance shall be obtained at the earliest possible time.

When the pilot initiates communications with ATC, rapid response may be obtained by stating “WEATHER DEVIATION REQUIRED” to indicate that priority is desired on the frequency and for ATC response.

If a revised air traffic control clearance cannot be obtained and deviation from track is required to avoid weather, the pilot should take the following actions:

1. If possible, deviate away from an organized track or route system.
2. Establish communication with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions (including the magnitude of the deviation expected) on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45).
3. Watch for conflicting traffic both visually and by reference to TCAS.
4. Turn on all aircraft exterior lights (commensurate with appropriate operating limitations).
5. For deviations of less than 10 nm, aircraft should remain at the level assigned by ATC.
6. For deviations of greater than 10 nm, when the aircraft is approximately 10 nm from track, initiate a level change based on the following criteria:

Route Centreline Track	Deviations >10nm	Level Change
East (000-179 magnetic)	Left	<i>Descend 300ft</i>
	Right	<i>Climb 300ft</i>
West (180-359 magnetic)	Left	<i>Climb 300ft</i>
	Right	<i>Descend 300ft</i>

7. If contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.
8. When returning to track, be at its assigned flight level, when the aircraft is within approximately 10 nm of center line.

**Note:** 2 and 3 above call for the pilot to: broadcast aircraft position and pilot’s intentions, identify conflicting traffic and communicate air-to-air with near-by aircraft. If the pilot determines that there is another aircraft at or near the same FL with which his aircraft might conflict, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

#### IN FLIGHT CONTINGENCIES

The following procedures are intended for aircraft unable to maintain assigned level due to:

- a) Weather (for example severe turbulence);
- b) Aircraft performance problems; or
- c) Pressurisation failure.

They are applicable primarily when rapid descent, turn-back, or diversion to an alternate aerodrome is required. The pilot's judgement will determine the specific sequence of actions taken, having regard to the prevailing circumstances.

An aircraft unable to continue flight in accordance with ATC clearance should obtain a revised clearance prior to initiating any action USING THE DISTRESS (MAYDAY) OR URGENCY (PAN) PREFIX as appropriate.

If unable to comply with the above, leave assigned track by turning 90° right or left, climb or descend 1,000ft if above FL410, 500ft if below FL410 or if at FL410 climbing 1000ft or descending 500ft, while acquiring a track laterally offset by 25 nm from assigned track. Direction of turn to be determined by the position of aircraft relative to any organised tracks, levels allocated, direction to alternate and terrain.

If unable to maintain assigned FL minimise descent while turning to acquire the 25 nm offset. A subsequent FL should be selected which, differs by 1,000ft from those normally used if above FL410 or by 500ft if below FL410.

Obtain ATC clearance soonest USING THE DISTRESS (MAYDAY) OR URGENCY (PAN) PREFIX as appropriate and broadcast position (including Track code, if appropriate) and intentions on 121.5 (with 123.45 as back up) until ATC clearance received. Put all aircraft lights on, maintain the look-out assisted by TCAS.

Before diverting across the flow of adjacent traffic expedite climb or descent to a FL not used by majority of Oceanic traffic (i.e. above FL410 or below FL285).

TWIN-ENGINE AIRCRAFT – Using these procedures as a result of engine shutdown or primary system failure should advise ATC as soon as possible giving aircraft type and requesting expeditious handling.

#### **LAND AND HOLD SHORT OPERATIONS (LAHSO)**

Landing and holding short of an intersecting runway, taxiway or designated point on a runway. **BA (along with other international operators) policy is NOT TO PARTICIPATE in LAHSO for landing or departure, neither actively (cleared to land and hold short), nor passively (other aircraft cleared to land and hold short).** BA aircraft should not be offered (or accept) a landing or departure clearance with other traffic operating LAHSO on an intersecting runway. Pilots will be alerted that LAHSO are in progress via the ATIS.

#### **SIMULTANEOUS OPPOSITE DIRECTION OPERATIONS**

Used where arriving aircraft approach and land on one Rwy at the same time as departures in the opposite direction from the parallel Rwy. The use of these operations will be broadcast on ATIS and are subject to the following conditions:

1. Visual conditions.
2. Departure course diverges by 15° from approach course.
3. Traffic information is passed on conflicting aircraft, e.g. "Traffic (MD11) departing on opposite direction parallel Rwy, turning East".



### **SIMULTANEOUS PARALLEL ILS APPROACHES**

Airports having parallel runways separated by at least 4,300ft may operate a system of simultaneous ILS approaches to both runways. The 4,300ft limit may be reduced with increased ATC monitoring of aircraft on final approach; the term ILS Precision Runway Monitor (ILS PRM) may be used. SIMULTANEOUS CLOSE PARALLEL APPROACH is the term used to describe this reduced separation.

### **INDEPENDENT VISUAL APPROACHES**

These are simultaneous visual approaches to parallel Rwys, used where normal radar or vertical separation standards are not applied. The ATIS will advise if independent visual approaches are in operation.

The following should be borne in mind:

1. When cleared for an Independent Visual Approach, the pilot is responsible for maintaining the necessary separation from the aircraft on the adjacent approach if it deviates from its flight path.
2. Fly accurate headings when being radar vectored onto final.
3. Ensure Rwy centreline is not crossed during intercept.
4. Monitor the other approach.
5. Accurately track your Rwy centreline.

**Note:** Traffic information WILL NOT be given about aircraft on adjacent approaches.

### **"AUSEP"**

A term used by Australian ATC to identify airlines and aircraft which have been approved by the Australian CAA to operate on RNAV Routes within Australian airspace. All BA 747 aircraft are AUSEP approved.

Transponder – A serviceable transponder is mandatory for all IFR flights, although ATC may give a dispensation for individual flights.

### **ADS-B**

B744 and B777 fleets have Air Service Australia approval for ADS-B Out operations. This uses the transponder signal to give ATC a pseudo radar picture, allowing closer separation, reducing ATC delays and allowing improved climb or descent opportunities. If ATC see a loss in signal they may ask you to switch transponder.

### **CRUISING LEVELS**

Inside controlled airspace – Semi-circular.

Outside controlled airspace – Quadrantal.

### **SPEED CONTROL**

Where Radar is employed speed control may be implemented. Normally this will be advised in advance to facilitate planning of the descent. It will not be attempted when known turbulence exists.

### **CUSTOMS**

Do not import fruit or meat into Australia.

### **AERODROMES**

Many aerodromes have restricted hours of operation. Should an aircraft divert to an airfield with a “jet-ban” in force, having landed, it will not be allowed to take-off until the period of the “jet ban” is over.

Pilots will normally be instructed, in advance, to change to tower frequency when established on final approach. If due to congestion on the frequency this instruction is not issued the pilot should change automatically at 4 nm from the threshold.

### **‘T’ BAR VASI**

‘T’ Bar VASI installations are used.

Long bodied aircraft may use ‘T’ type VASIs by flying two lights high, i.e. using the two light fly down indication; this gives a 747 wheel height over the threshold of about 27ft.

### **PRATIQUE REPORTING**

Routine calls confirming disinfection of aircraft are not required.

### **RFF**

Throughout Australia a common RFF frequency, 131.0, is used by the Emergency services to enable direct contact with flight crew. It is managed through the tower as the rescue services do not continually monitor the frequency.

## **NEW ZEALAND**

Only Auckland and Christchurch aerodromes are available to large aircraft, radar is available at both and facilities are good.

### **FLIGHT PLANNING**

With only Christchurch available as an alternate within New Zealand, there can be problems when the weather is poor.

It may be necessary to flight plan with Christchurch as destination and Auckland as alternate and subsequently divert to Auckland.

If only one of the airfields is open this should be flight planned as destination with Sydney or Melbourne as alternate.

If either airfield is below destination limits but there is a prospect of improvement, use of a PNR should be considered to facilitate a departure.

### **DESIGNATED ROUTES**

There are Designated Routes in the Oceanic Control Areas and requirements for position reports are the same as for Australia.

### **121.5 MHZ**

121.5 MHz should be guarded on all ocean crossings.

### **SPEED CONTROL**

Not above 250 kts below 10,000ft within 30 nm of destination.

### **CRUISING LEVELS**

Oceanic FIRs and Control Areas use ICAO Basic rules for allocation for IFR traffic. Domestic FIRs use an unusual allocation system.

### **CLEARANCE DELIVERY PROCEDURE**

Applicable to Auckland and Christchurch. Not later than 5 mins prior to start advise Ground Control with the following:

1. Pre-flight radio check.
2. ATIS received.
3. Level requested.
4. Alternate.
5. Take-off time.
6. Runway required if other than that notified on ATIS.
7. Number of persons on board.

**CHRISTCHURCH**

Extensive military and civil training occurs in VFR and “VFR on top”, a good look-out is needed.

**PACIFIC****AIRSPACE DESCRIPTION**

The Oceanic Control Areas covering the Pacific are:

1. Tokyo and Anchorage CTAs to the North.
2. Oakland CTA covering the central Pacific, including the area South of the Tokyo CTA.
3. Brisbane, Auckland, Nadi and Tahiti CTAs to the South.

Reduced Vertical Separation Minimum (RVSM) is used.

**NORTH PACIFIC (NOPAC) ROUTES**

These are described in the Polar Area Briefing.

**HAWAII AND US MAINLAND COMPOSITE ROUTE SYSTEM**

This route system organises the considerable flow of traffic between the islands and the mainland.

**IN FLIGHT CONTINGENCIES ICAO PAC REGION**

Guidelines are published in the Flight Guide Supplement. Basically if unable to maintain assigned FL or a turnback is required:

1. Attempt to obtain re-clearance from ATC.
2. Keep ATC and other aircraft (using 121.5 MHz) advised of intentions.
3. Leave assigned track at 90° (turning in direction most suitable to keep clear of adjacent routes) to establish a track laterally separated by 25 nm from original and select a level 500ft separated from those normally used.

**USAF RADAR ADVISORY SERVICE**

This service is available over a large area of the central Pacific. The callsign is STARGAZER and initial contact is on 121.5.

**COMMUNICATIONS**

Families of HF frequencies are used, e.g. CEP 1-2-3 for the Hawaii/US Mainland routes.

121.5            should            be            monitored            during            ocean            crossings.

## SHORTHAUL OPERATIONS TO THE CIS

### COMMONWEALTH OF INDEPENDENT STATES (C.I.S.)

Members include: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

### ATC GENERAL

Communication may take place through an interpreter causing delays to clearances.

Arriving aircraft usually stepped down gradually with numerous level checks. PAR control may be poor; information may be given as deviation from C/L and G/P in metres, corrective action being left to the pilot. Almost all markers are modulated at 3,000 Hz – airways lamp activates.

Departure may consist of short stepped climbs with several requests for passing levels.

ATC may ask: "Request your flying conditions", which means information as to whether you are flying over/in/below cloud, wind and ground speed in km/hr.

### METRIC UNITS

See conversion tables in relevant charting documentation.

Ht, elevation, FL: metres.      Surface wind: metres per sec.

Speed and Upper wind: kph.      Cloud: tenths or octas.

Distance: km and metres.      QFE: (mmHg) mb to foreign operators.

Aprox conversions:	SPEED (km/hr)	/2	= knots
	WIND (m/sec)	x2	= knots
	ROC/ROD (m/sec)	x200	=ft/min

**Note:** Conversions should be crosschecked by all pilots.

### ALTIMETRY

C.I.S (excluding member countries listed below)

- At or above TL: RVSM FL
- At or below Trans Ht in the aerodrome area: Ht in metres (i.e. QFE).
- At or below Trans Ht outside the aerodrome area: Altitude in metres (i.e. QNH).
- QNH available on request. It may be included on the ATIS (e.g. Moscow) and on HF broadcasts.

**Ukraine** – FL290-410 ICAO RVSM FL System will be used and at crews request expressed in meters or as a FL.

### RVSM

ATC will apply 1,000ft separation between "Approved" aircraft. Item 10 of the ICAO flight plan should contain "W" indicate RVSM approved aircraft.

### STRATEGIC LATERAL OFFSETS PROCEDURES (SLOP)

In non radar environments it is the pilots decision whether to offset 1 or 2 nautical miles to the RIGHT of the centreline.

Within radar airspace lateral offsets, of 1 mile to the RIGHT of centreline, require approval from ATC.

### SUSPENSION OF RVSM

ATC will consider suspending RVSM procedures when there are pilot reports of greater than moderate turbulence. Vertical separation will then be 600 m (2,000ft).

### WAKE TURBULENCE

Pilots encountering wake turbulence should contact ATC as soon as possible and request either a) Flight Level change, b) a vector if possible, or c) a lateral offset.

### CRUISING LEVELS

#### CIS

Vertical separation is based on semi-circular rules using TRUE track and are as follows:

000° to 179° TRUE		180° to 359° TRUE	
FL	Metres	FL	Metres
030	900	040	1,200
050	1,500	060	1,850
070	2,150	080	2,450
090	2,750	100	3,050
110	3,350	120	3,650
130	3,950	140	4,250
150	4,550	160	4,900
170	5,200	180	5,500
190	5,800	200	6,100
210	6,400	200	6,700
230	7,000	240	7,300
250	7,600	260	7,900
270	8,250	280	8,550
290	8,850	300	9,150
310	9,450	320	9,750
330	10,050	340	10,350
350	10,650	360	10,950
370	11,300	380	11,600
390	11,900	400	12,200
410	12,500		

Subject to traffic, ATC may occasionally vary these levels if so requested.

**AIR TRAFFIC CONTROL****SPEED CONTROL**

There is a 270 kts speed restriction below FL100 down to transition level.

Max rate of descent = 3,000 fpm below FL100.

**DEPARTURES AND ARRIVALS**

Arriving aircraft usually stepped down with numerous level changes.

PAR control may be poor; information may be given as deviation from C/L and G/P in metres, corrective action being left to the pilot.

Departure may consist of short stepped climbs with several requests for passing levels.

**ILS GLIDE SLOPE**

Many provincial airfields have glideslope angles which are shallower than the standard 3°.



## EAST EUROPE – SIBERIA AREA

This brief covers the various routes to Eastern Europe and Russia. It also covers the routes across Russia to India, China and Japan.

### METRIC UNITS

Ht, elevation, FL: metres.	Surface wind: metres per sec.
Speed and Upper wind: kph.	Cloud: tenths or octas.
Distance: km and metres.	QFE: (mmHg) mb to foreign operators.
Approx conversions:	SPEED (km/hr) /2 = knots
	WIND (m/sec) ×2 = knots
	ROC/ROD (m/sec) ×200 = ft/min

See conversion tables in relevant charting documentation.

Note: Conversions should be crosschecked by all pilots.

### ALTIMETRY

C.I.S (excluding member countries listed below)

At or above TL: RVSM FL

At or below Trans Ht in the aerodrome area: Ht in metres (i.e. QFE).

At or below Trans Ht outside the aerodrome area: Altitude in metres (i.e. QNH).

QNH available on request. It may be included on the ATIS (e.g. Moscow) and on HF broadcasts.

Lido charts give:

1. Ht inft and metres (QFE).
2. Equivalent altitude inft (QNH).
3. FL in feet and metres (1013.2).
4. Trans Ht and a derived Trans Alt.

### AFGHANISTAN

RVSM only available between FL340-410 due Military Ops.

### BALTIC STATES (ESTONIA, LATVIA, LITHUANIA) –

As Western Europe.

### BELARUS

FL290-410 ICAO RVSM FL System will be used and at crews request expressed in meters or as a FL.

**BULGARIA**

At or above Transition Level, Flight Levels in feet. At or below Transition Height, height (QFE) in metres. However ATC now often give clearances below Transition in feet on QNH as opposed to metres on QFE.

**CZECH AND SLOVAK REPUBLICS**

As Western Europe.

**GEORGIA**

As Western Europe.

**HUNGARY**

As Western Europe.

**MOLDOVA**

As Western Europe.

**MONGOLIA**

At or above Transition Level, Flight Levels in Metres (Using China's Metric FLAS RVSM – FL290-FL410). Vertical separation is based on semi-circular rules using MAG track. Plan to move to Russian RVSM levels in 2013.

**POLAND**

As Western Europe.

**ROMANIA**

As Western Europe but metres may be used below Transition Altitude.

**UKRAINE**

FL290-410 ICAO RVSM FL System will be used and at crews request expressed in meters or as a FL.

**RVSM**

ATC will apply 1,000ft separation between "Approved" aircraft. Item 10 of the ICAO flight plan should contain "W" to indicate RVSM approved aircraft.

**STRATEGIC LATERAL OFFSETS PROCEDURES (SLOP)**

In non radar environments it is the pilots decision whether to offset 1 or 2 nautical miles to the RIGHT of the centreline.

Within radar airspace lateral offsets, of 1 mile to the RIGHT of centreline, require approval from ATC.

### **SUSPENSION OF RVSM**

ATC will consider suspending RVSM procedures when there are pilot reports of greater than moderate turbulence. Vertical separation will then be 600 m (2,000ft).

### **WAKE TURBULENCE**

Pilots encountering wake turbulence should contact ATC as soon as possible and request either:

1. Flight Level change,
2. A vector if possible, or
3. A lateral offset.

### **DEVIATION ACTIONS TAKEN BY THE PILOT**

When deviating for any reason by 90 m (300ft) or more from cleared flight level by ATC in RVSM airspace, report to the relevant ATS unit concerned via radio or data link as soon as practicable.

### **RVSM TRANSITION PROCEDURES**

Russia-Mongolia (LHR-PEK/LHR-HKG):

- Expect climb from FLft to FLm 5 mins after boundary (GINOM/NIGOR).

Mongolia-Russia (PEK-LHR):

- Expect descent from FLm to FLft to be level 5 mins before boundary (AMUTA).

Russia-Mongolia (LHR-PVG):

- Expect climb from FLft to FLm to be level 5 mins before boundary (DARNO).

Mongolia-Russia (PVG-LHR/HKG-LHR):

- Expect climb from FLft to FLm 5 mins after boundary (DARNO).

### **CONTINGENCY**

In case of no communication with ATC/ATS at the switch over time the following contingency procedure as per Doc 4444 chapter 15.3 shall be followed:

- Make a call on the emergency frequency 121.5 MHz to announce your intentions then:
- In airspace where procedural separation is being applied, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan.

### **MINIMUM SAFE ALTITUDES**

C.I.S determined MSAs are as follows:

- In the take-off and landing area at least 1,000ft (300 m).

- In the approach area and along airways:
  - Over relatively flat terrain at least 2,000ft (600 m).
  - In mountainous areas at least 3,000ft (900 m) above the highest obstacle located within 13.5 nm (25 km) of the airway centre line.

## **BORDER CROSSING**

### **CHINA**

Border crossing only allowed within a specified air corridor or over a specified entry/exit point. ATC must be contacted 15-20 mins prior to the border giving call sign, ETA for border and FL. Border crossing clearance should then be issued.

The border must not be crossed without ATC permission. A position report must be made when crossing the border and the change to metric cruising levels for China co-ordinated.

### **INDIA**

Call 10 mins prior to the FIR boundary.

### **PAKISTAN**

Call 15 mins prior to the FIR boundary.

### **UZBEKISTAN**

Call 10 mins prior to FIR boundary.

### **TOKYO/C.I.S**

N-Bound      Call KHABAROVSK CONTROL on HF requesting clearance to cross the C.I.S border and enter KHABAROVSK FIR, also the requested FL.

There may be difficulty establishing contact with KHABAROVSK CONTROL on both HF and VHF when N-bound over the SEA OF JAPAN. SAPPORO CONTROL may be able to relay entry clearance.

S-Bound      Call KHABAROVSK CONTROL and request relay to SAPPORO of estimate for the FIR boundary and requested FL. If unsuccessful call TOKYO CONTROL on HF.

## **AIR TRAFFIC CONTROL**

### **C.I.S**

Almost all airfield marker beacons are modulated to 3,000 Hz – airways lamp activates.

### **Communications**

In the C.I.S care should be taken to adhere to standard phraseology as understanding of English is limited. Communications sometimes take place through an interpreter rather than direct with the controller, thus requests for further descent etc, should be made early. There is often an apparent lack of awareness among the controllers of deteriorating situations.

ATC may ask: "Request your flying conditions", which means information as to whether you are flying over/in/below cloud, wind and ground speed in km/hr. A conversion table is given in the Flight Guide Supplement.

VHF is satisfactory and is used over practically the whole of the C.I.S except for part of KHABAROVSK FIR and on the Oceanic portion of the ARCTICA route, where HF is required. On W-bound flights there is sometimes difficulty establishing contact with KHABAROVSK ATC on both VHF and HF when over the SEA of JAPAN. In such case SAPPORO CONTROL may be able to relay entry clearance.

The standard ICAO phonetic alphabet is used throughout the C.I.S. However, reporting points are sometimes given using their Russian name instead of the phonetic callsign.

SELCAL is not usually available.

The control frequency in use must be closely monitored. In case of no direct contact with the appropriate control/centre, try a sub-centre/relay.

Direct routings are not normally available, but deviations due to weather may be permitted with ATC permission and will probably be with Radar assistance.

121.5 is available at all ACCs.

Transponders are used as normal, including emergency codes. A discrete code should be given by ATC, otherwise squawk A2000.

### **Flight Plan**

A Flight Plan must be filed and clearance received for all flights. In the Flight Plan indicate:

Cruising levels, on standard setting, in tens of metres with 4 digits and prefixed with S, e.g. 8,850 m = S0885.

Speed in km/hr as 4 figures with the prefix K, e.g. 600 km/hr = K0600.

### **Speed Control**

There is a 270 kts speed restriction below FL100 down to transition level.

Max rate of descent = 3,000 fpm below FL100.

### **Departures and Arrivals**

Arriving aircraft usually stepped down with numerous level changes.

PAR control may be poor; information may be given as deviation from C/L and G/P in metres, corrective action being left to the pilot.

Departure may consist of short stepped climbs with several requests for passing levels.

### **ILS Glide Slope**

Many provincial airfields have glideslope angles which are shallower than the standard 3°.

## **TCAS**

Not all aircraft operating in the C.I.S have standard transponders, so nearby traffic may not show as TCAS targets. The ability of TCAS to resolve a conflict with some C.I.S aircraft is limited, even when targets are shown on the display – so an RA generated on our aircraft may not have a co-ordinated manoeuvre on the other aircraft.

## **DIVERSION**

If an emergency landing becomes necessary, ATC will provide Radar assistance for an approach and landing at a suitable aerodrome. The approach details will be given by the Approach Control Unit concerned and the approach itself will, if possible, be assisted by PAR. Information may be given as deviation from the centre line and glide path in m, corrective action being left to the crew.

An SAS 767 from Tokyo to Stockholm was forced to seek a diversion following an engine shut down. A Mayday call was made and ATC efficiently vectored the aircraft for an ILS at Syktyvkar, 61 38N 50 50E. Using standard phrases there were no language problems. The landing QFE was at first given in mm but on request both QFE and QNH were given in mb. The time from the Mayday call to touch down was some 50 minutes.

In the case of a normal diversion to a civil aerodrome, the diversion should be requested from ATC in the usual way.

## **ALTERNATES**

Over Siberia the number of adequate civil en-route alternates is limited. See Siberia Flight Progress chart for information relating to routes and alternates.

The route SE over Afghanistan is rather better served.

It should be emphasised that ground handling facilities at en-route alternate airfields may be severely limited and diversion to such airfields should be for emergency only.

Any Guidance on ground manoeuvring, found within the airfield brief for those airfields, is given to ensure that the aircraft does not become disabled by departing the paved surface as some of the taxiways are not suitable for use. Crews should consider the use of differential braking and asymmetric power when executing 180 degree turns on the runway.

Information from the AIP and Boeing airfield surveys has been used to determine the suitability of taxiways, however, crews should request marshalling assistance if there is any doubt about wheel clearance on the paved surface.

Parking should be restricted to 'taxi out' stands as the availability of a suitable towbar and tug cannot be assured.

Fuel grade TS-1 (written TC-1) is the Russian equivalent of Jet-A1 and available at all the airfields.

De-icing is not generally an issue, however anti-icing can be problematic as there may be no published hold-over times available for the fluid used.

## **ARCTICA 1 ROUTE**

This northerly route takes the aircraft over Norway and above the Arctic Circle to 7730N6600E and down over Siberia.

From LATEN,7230N3205E to NARKI,7527N8726E on B483 is classified as an Oceanic leg and all normal Oceanic procedures should be followed. Clearance for this leg will be passed by BODO Oceanic Eastbound and by Khatanga Control Westbound.

MET reports at En-Route reporting points may be requested during the Oceanic leg.

## **FUEL – LOW EN ROUTE TEMPERATURES**

At the flight planning stage consideration should be given to the forecast en-route temperatures and the freeze point of fuel in tanks. Consult the FCOM for your aircraft type bearing in mind that extra fuel may be required to carry out the recommended procedures to keep fuel temperatures above limits.

## **COMPASS UNRELIABLE**

Between reporting point's Narki,7527N8726E and Agada,7012N10811E, on the Arctica 1 Route, flights enter the Compass Unreliable area. Details on procedures to be adopted in case of Navigational Equipment failures can be found within the relevant FCOM.

## **TERRAIN**

Note the high Safety Altitudes in the area of Almaty (24,000ft) and Kabul (over 19,000ft). This is of significance in case of a pressurisation failure.

Across Siberia, the terrain is rather lower. The Urals reach 6,300ft asl but there are further mountains to the E. On the Arctica route the terrain on the island of Novaya Zemlya is believed to not exceed a maximum of 6,700ft asl with a lower range of mountains on the mainland to 2,600ft asl just beyond the coast in point Narki of B483. At about 118E there are mountains to 10,200ft asl S of R22 and nearer the coast there is much high ground up to 8,800ft asl.

## **MID/FAR EAST AREA**

This briefing sheet is not intended to supersede information provided in the relevant Operations Manual and NOTAMS.

For weather information see separate “Weather Notes” briefing.

### **GENERAL**

#### **RVSM**

RVSM is now in force across many FIRs within the Middle East region and is being implemented in stages throughout the Asia region.

### **HAJJ PILGRIMAGE – JEDDAH, KINGDOM OF SAUDI ARABIA**

#### **HAJJ BACKGROUND INFORMATION**

The Hajj is a pilgrimage to Makkah in Saudi Arabia. It is the largest annual pilgrimage in the world, and is the fifth pillar of Islam, an obligation that must be carried out at least once in their lifetime, by every able-bodied Muslim who can afford to do so. For many the journey starts with the flight to Jeddah. Because the Islamic calendar is a lunar calendar, 11 days shorter than the Gregorian calendar used in the western world, the apparent date of the Hajj changes from year to year. The Hajj pilgrimage lasts for approximately 10 days, but the Saudi Arabian Authorities publish official Pilgrimage travel dates that last for approximately one month outbound to Jeddah. BAVirtual must comply with these travel dates and are not permitted to carry pilgrims outside of these dates. For a defined period outside of the Hajj dates, Muslims can travel to Makkah to perform the pilgrimage known as Umrah (al-Umrat al mufradah), providing they are holding a specific Umrah visa.

About two million Muslims from more than 70 countries journey to the holy city of Makkah each year to make the spiritual pilgrimage. Over the course of the Hajj, pilgrims travel the nine miles from Makkah to the Plain of Arafat and back, stopping at the sacred sites of Mina and Muzdalifa to perform prayerful rituals.

The close of the Hajj is marked by a festival, the Eid al-Adha, which is celebrated with prayers and the exchange of gifts in Muslim communities everywhere. This, and the Eid al-Fitr, a day of celebration commemorating the end of Ramadan, are the main festivals of the Muslim calendar. Pilgrims generally travel to the Hajj in groups as an expression of unity.

During the Hajj, male pilgrims are required to dress only in the ihram, a garment consisting of two sheets of white un-hemmed cloth, with the top draped over the torso and the bottom secured by a white sash; plus a pair of sandals. Women are simply required to maintain their hijab – normal modest dress, which does not cover the hands or face. The majority of customers will have already changed into the ihram before boarding the aircraft.

#### **OPERATIONAL**

The Hajj generates an enormous amount of traffic into and out of Jeddah, including widebody charter aircraft from all over the world. The number of flights, particularly East/West traffic in the North and central part of the AFI region increases dramatically, and special attention is required to reduce the risk of Mid Air Collision. IATA IFBP procedures should be rigorously applied.



The airport is well versed in handling this volume of traffic, however, many of the crews involved are not used to the ATC situation and procedures in Africa. To ease traffic flows many of the temporary ATS routes created for HAJ are now becoming permanent and will therefore see traffic year round. It is hoped that this will lessen the impact of HAJ as crews will become familiar during the year to these cross routes.

**OFP** will use **Riyadh** as the first Commercial Alternate. Riyadh is by far the preferred destination alternate with Hajj passengers onboard. OFP should plan 15 minutes contingency.

Hajj traffic will have the word 'Hajj' in their callsign.

#### **PRE-FLIGHT**

Please ensure potable water levels are loaded to full prior to departure.

#### **DURING THE FLIGHT**

Throughout the flight there may be a high demand for the toilets as cleanliness is of great importance during prayer. Clothes, the body and the place of prayer must be clean. Pilgrims will want to perform "Wu'du" (ablution) where they will wash their hands, arms, face and feet before praying. There will be extra demand for water during this period therefore potable water levels will be loaded to full.

Flight crew should be aware of two communication requirements that we would be grateful for your assistance with; exact timings should be sought from ATC.

- **Approximately one hour before landing the flight crew should announce over the PA system that the aircraft is entering the "ihram" zone (pronounced "ee-ramm"). Those on pilgrimage will commence some rituals involving cleansing and changing attire, and the recitation of their "intention" prayer.**

**These rituals place the pilgrim into the ihram sacred state, which is required before they cross the pilgrimage boundary of "Miqat" (pronounced "Mee-kaht").**

- **Please confirm with ATC the time at which you pass the Miqat boundary, and make a further PA to the passengers informing them of this. This PA would likely be concurrent with the "20 minutes to landing" PA.**

#### **THE MIDDLE EAST**

There are pre-planned routes across the Middle East towards the Persian Gulf which are used as the political situation dictates. They are a Southern route via Egypt and Saudi Arabia, a Mid route across Syria and a Northern route via Iraq or Iran.

#### **FIR BOUNDARIES**

Some ATC units require contact to be made at least 10 minutes before arrival at their boundary. This is highlighted on OFP plans and charts. At times it is difficult to make such contact and use of relays by other aircraft or through other ATC units may be necessary.

#### **HAJJ PILGRIMAGE SEASON**

During the HAJJ Pilgrimage Season, the timing of which is variable, the number of flights and particularly E-W flights entering Saudi airspace from North and Central Africa increases dramatically and with it the risk of ATS incidents.

**TURKEY**

Airway closures for missile firing occur; check Operational Flight Plan against AIS information.

**EASTERN MED**

In the Eastern Med ATC co-ordination is poor and several VHF frequencies need to be monitored at one time. It is strongly recommended that all/both crewmembers be on the flight deck for this portion of the flight.

The area carries much Europe to MID/FAR EAST traffic and is extremely busy. Along the route between Nicosia and Bahrain changes in flight level are extremely difficult to obtain.

When routing through Turkey (via MUT-VESAR-NIKAS), at MUT, control will be passed to ERCAN freq 126.7 (another Turkish unit pronounced "ERJAN") who will require position reports at VESAR and NIKAS even though these points are in Nicosia FIR.

However this portion of the airway is in fact controlled by Nicosia and conflicting clearances may be given. In such cases it is important to check any clearance from ERCAN with Nicosia before it is followed.

Nicosia have long-range VHF and should be contacted as early as possible to ensure optimum levels and co-ordination through their airspace.

Damascus should be contacted (via Latakia Radio for relay if necessary) 10 minutes prior to NIKAS, although co-ordination between Nicosia and Damascus is good.

The same procedure in reverse will be required when flying westbound.

**JORDAN**

There is a mandatory speed restriction of 250 kts max below 10,000ft.

**RED SEA**

A listening watch must be maintained on 121.5. Information requests made on 121.5 must be replied to with:

1. Aircraft callsign.
2. Transponder code.
3. Heading.
4. Altitude.
5. Ground speed.

Deviations from an ATC clearance must be advised to ATC. Company comms must not interfere with the above.

**SAUDI ARABIA**

Usually there are route and flight level restrictions over Saudi Arabia, see AIS for current situation.

VHF contact with Jeddah ATC, while en-route to airports in the Gulf area, is sometimes at extreme range; loss of VHF communication does occur.

Aircraft bound to/from Israeli aerodromes are not permitted to operate in Saudi Arabian airspace.

There is a mandatory speed restriction of 250 kts max below 10,000ft.

There are large flights of migratory birds (up to 1 metre wing-span) in the periods March to May and September to November Jeddah shows a statistically high likelihood of a bird strike.

## **IRAN**

Diversion to airfields in Iran should be avoided if at all possible.

Extensive high terrain requires requires the use of decompression profiles on routes into Iran.

Due to the geological configuration in the Tabriz area, considerable differences in the local atmospheric pressure may occur in the winter, leading to discrepancies in terrain clearance when operating at Flight Levels. Pilots should be aware that the difference could potentially be over 1,000ft.

### **Speed Control**

Aircraft inbound to Tehran should maintain 280 kts IAS or less when at or below FL200 and a maximum of 220 kts IAS within 25 nm of airports, when at or below FL140.

### **ADIZ Procedures**

All aircraft entering Iranian airspace shall be at FL150 or above; if unable to comply, prior permission is required. Crews should ensure that FIR estimates are to within a tolerance of five minutes. All foreign aircraft must use established ATC routes; failure to comply could lead to interception.

Before entering Tehran FIR all flights are required to contact either TABRIZ Radar or MASHHAD Radar, on 127.800 or 135.100 Mhz, 10 minutes prior to entry for the purpose of military identification. In addition, the appropriate Tehran ACC must be contacted. Where range prevents two-way communication with air defence Tehran ACC will relay.

RVSM procdures adopted.

Prohibited area P10 (60 nm north of Esfahan VOR) centred on a highly sensitive nuclear enrichment plant. Vertical extent of area must be considered without upper limit.

Caution advised particularly on airway UT211. Avoidance of P10 is assured on airway – any ATC vectors or weather avoidance off airway in vicinity of P10 must be considered carefully and challenged if necessary.

## **ISRAELI AIRSPACE**

Tel Aviv Air Defence Radar must be contacted (box2/3) not later than BGN180d. when arriving from the West Nicosia FIR, or 10 minutes before passing Sharm El-Sheikh when arriving from the South Cairo FIR (freq 124.3 or 132.05). This is stated on Lido AOI pages for Tel Aviv (TLV/LLBG).

If entering via SOLIN contact Tel Aviv no later than 180 nm from BGN, Com 123.05 or 124.3.

From Amman FIR (TALMI) contact Tel Aviv CTRL 121.4 or 132.05 as soon as practical after take-off from Amman and no later than 10 nm East of position TALMI.

Overflight Israeli Airspace into Amman expect early descent for crossing at 11,000ft. Departing Amman maintain 12,000ft on departure.

**FLIGHTS OVERFLYING OR ARRIVING TO ISRAEL FIR****Advance Cabin Landing Preparation**

All passengers must be seated and belts fastened, at least 30 minutes before landing in Israel and until landing.

**Overflights**

**Flights to Jordan:** All passengers must be seated and belts fastened, at least 30 minutes before landing in Jordan and until landing.

**Flights from Jordan:** All passengers must be seated and belts fastened, at least 15 minutes after takeoff from Jordan.

**BAHRAIN**

Aircraft bound to/from Israeli aerodromes are prohibited from Bahrain airspace.

**GULF OF OMAN – INDIA****GENERAL**

The area contains its share of politically sensitive borders. This gives rise to restrictions near the India/Pakistan borders which are under military control. Air Defence Clearance Numbers may be allocated. Adherence to promulgated routes and procedures (e.g. obtaining onward clearance) is essential. Failure to do so will risk interception by military aircraft. There are a number of advisory routes and ATC co-ordination over India and Pakistan is poor. Lack of radar coverage means only procedural service is offered in many areas, with its accompanying limitations. Aircraft are frequently held down and occasionally en-route holding is necessary.

Communications are a mix of VHF and HF. Reports are often passed to ATC via en-route airport VHF installations as highlighted on OFP plans and charts. HF is often extremely difficult due to inadequate equipment and poor RT standards; frequencies are very cluttered. This has the effect of making SELCAL less useful than normal.

**FIR BOUNDARIES**

Contact 10 minutes before arrival at FIR boundaries is usually required (15 minutes before Karachi and Lahore FIRs) and is highlighted on OFP plans and charts.

**LISTENING WATCH**

A listening watch on 121.5 Mhz should be maintained.

**BLIND BROADCAST PROCEDURE**

This procedure is detailed in the Africa Area brief and should be used over the Indian Ocean in FIRs Antananarivo, Beira, Dar es Salaam, Mauritius, Mogadishu and Nairobi.

**INDIA**

Cruising Levels Up to: FL140 – QUADRANTAL RULES APPLY.

FL150 AND ABOVE – SEMI-CIRCULAR RULES APPLY.

**PAKISTAN**

Flights operating into or over Pakistan must contact Karachi ACC 15 mins prior OPRK FIR to request Air Defence clearance number. Flights departing Pakistan must obtain Air defence clearance number before departure. There is significant mountainous terrain towards the western and northern borders of Pakistan.

**Areas of High MSAs**

Airways and airway segments affected by Driftdown and De-pressurisation procedures are contained below.

Note the high Safety Altitudes in the area of Almaty (24,000ft) and Kabul (over 19,000ft). This is of significance in case of a pressurisation failure.

**AFGHANISTAN**

Overflight of Afghanistan may be restricted due to hostilities.

When Westbound from Lahore FIR in to Kabul, at least 10 mins prior to FIR BDY, contact Kabul on VHF 128.5 or HF 10018, 5658 and 3467.

Failing contact on VHF or HF, attempt relay with other aircraft. In the event that contact cannot be established with Kabul, continue on Flt Plan route as Lahore will have provided Kabul with an estimate for the FIR crossing point and Kabul will be expecting you. Continue to try and establish two-way contact with Kabul.

MSAs – for navigationally well equipped aircraft (e.g. 747-400/777/787) the MSA calculation may sometimes be based on 10 nm either side of track as opposed to 20 nm. This is to allow operation at FL280 and will have been approved by the CAA. (The 10 nm dimension is the basic EASA OPS requirement).

All flights at or above FL210 operate under IFR. En-route procedural service is provided by Kabul ACC, upper and lower airways network.

An advisory service is provided within 75 nm of Kabul.

For ATC reasons changes of flight level over Afghanistan should, if possible, be avoided.

Over Afghanistan communication is carried out on HF, but VHF frequencies for terminal areas are available and can be used en-route when flying within their range. Communication problems are common in the Afghanistan area, especially with Kabul. There is often sufficient traffic to make relays on VHF feasible. In case of difficulty try HF Lahore, Karachi, or Delhi and relay.

In Kabul and Lahore FIRs maintain a listening watch on Kabul and Lahore ACC control VHF frequencies for intercept of other traffic.

Kabul ACC 128.5, backup 126.325.

**BOBCAT Trial – Slot Requirements**

There is to be a operational trial of ATFM (air traffic flow management) from Asia to Europe for flights via Afghanistan.

This starts on 20 July 2006; no end date for this trial has been given.

It applies to all westbound flights transiting the Kabul FIR between 2000-2359 UTC on Afghan airways A466, N644, L750 and G792.

**Pilots Responsibility**

Pilots should be aware of the Allocated Wheels Up Time (slot), route and gateways and their estimated time and flight level at these points.

The Allocated Wheels Up Time (slot) shall be included in the initial ATC clearance request.

There is a 5 minute buffer to the slot, if unable to meet this time please request a new slot from ATC, or via the dispatcher if a long delay is anticipated.

Afghan airways and associated gateways as follows:

A466 – SITAX

N644 – PAVLO

L750 – ROSIE

G792 – ASLUM.

**DRIFTDOWN AND DEPRESSURISATION PROCEDURES****Driftdown/Oxygen Procedures for routes from India to LHR via N636 (Westbound)****B777-200ER GE90-85B****India to LHR via N636 Westbound****Minimum Flight Level for Crossing**

Flight plans will be issued with minimum recommended flight levels of FL310.

FL310 is the minimum acceptable level. Should levels below FL310 be offered, all efforts must be made to negotiate higher to avoid a turn back. Delaying, en-route holding, negotiating with other aircraft in the vicinity are options. A re-route is required if clearance to FL310 or above is not obtained.

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

BURTA (N32 37.5 E064 26.5)

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **Before BURTA:** turn back and initially proceed 6 nm offset along the airway and divert to suitable airfield. Return to airway centre line when cleared by ATC.
2. **After BURTA:** continue with an initial 6 nm offset along the airway toward MASHHAD and divert to suitable airfield. Return to airway centre line when cleared by ATC.

**Actions Following Depressurisation**

No action required – continue on route as planned.

**MSAs and Turns**

Turns are permitted in either direction.

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

## Driftdown/Oxygen Procedures for routes from India to LHR via N644 (Westbound)

**B777-200ER GE90-85B****India to LHR via N644 Westbound****Minimum Flight Level for Crossing**

Flight plans will be issued with minimum recommended flight levels of FL310.

However FL280 is the minimum acceptable level to meet driftdown criteria. Should levels below FL280 be offered, all efforts must be made to negotiate higher to avoid a turn back. Delaying, en-route holding, negotiating with other aircraft in the vicinity are options. A re-route is required if clearance to FL280 or above is not obtained.

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

VUVEN (N34.328 E066.558)

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **Before VUVEN:** turn back and initially proceed 6 nm offset right along the airway toward Delhi. Return to airway centreline when cleared by ATC.
2. **After VUVEN:** continue with an initial 6 nm left offset along the airway toward suitable diversion airfield (e.g. OIMM/UTAA/UBBB). Return to airway centre line when cleared by ATC.

**Actions Following Depressurisation**

No action required – continue on route as planned.

**MSAs and Turns**

The above turns will take the aircraft to the west side of the airway.

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.



**Driftdown/Oxygen Procedures for routes on Airway M875 (East/Westbound)**
**B777-200ER GE90-85B**
**Route KHOLM M875 SITAX / SITAX M875 KHOLM**
**Minimum Flight Level for Crossing**

Flight plans will be issued with minimum recommended flight levels of FL330.

FL330 is the minimum acceptable level to meet driftdown criteria. Should levels below FL330 be offered, all efforts must be made to negotiate higher to avoid a turn back. Delaying, en-route holding, negotiating with other aircraft in the vicinity are options. A re-route is required if clearance to FL330 or above is not obtained.

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

TAPIS

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **East of TAPIS:** 6nm offset to North along OFP route towards Delhi (DEL).
2. **West of TAPIS:** 6nm offset to South along OFP route towards Termez (TRZ).

**Actions Following Depressurisation**

No action required – continue on route as planned.

**MSAs and Turns**

No restrictions

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

**Driftdown/Oxygen Procedures for routes on Airway M875-L509 (East/Westbound)**
**B777-200ER GE90-85B**
**Route KHOLM M875 TAPIS L509 HANGU /  
HANGU L509 TAPIS M875 KHOLM**
**Minimum Flight Level for Crossing**

Flight plans will be issued with minimum recommended flight levels of FL330.

FL330 is the minimum acceptable level to meet driftdown criteria. Should levels below FL330 be offered, all efforts must be made to negotiate higher to avoid a turn back. Delaying, en-route holding, negotiating with other aircraft in the vicinity are options. A re-route is required if clearance to FL330 or above is not obtained.

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

TAPIS

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **East of TAPIS:** 6nm offset to North along OFP route towards Delhi (DEL).
2. **West of TAPIS:** 6nm offset to South along OFP route towards Termez (TRZ).

**Actions Following Depressurisation**

No action required – continue on route as planned.

**MSAs and Turns**

No restrictions

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

**Driftdown/Oxygen Procedures for routes on Airway UL125/R660/UW704 (Westbound)****B777-200ER GE90-85B****Route IKA-CRM****Minimum Flight Level for Crossing**

N/A

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

DASIS

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **Before DASIS:** Turn back DCT previous waypoint. To OITT, OIIE or other suitable diversion airfield.
2. **After DASIS:** Continue on planned route. Divert as per fuel state.

**Actions Following Depressurisation**

Initial descent to 16,000ft then per MTCA.

**MSAs and Turns**

No restrictions

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

**Driftdown/Oxygen Procedures for routes on Airway R659 through Iran (Northbound)**
**B777-200ER GE90-85B  
B777-200 GE90-76B**
**AUH/BAH/DXB – LHR via UL123 (R659)  
northbound (SHIRAZ)**
**Minimum Flight Level for Crossing**

Flight plans will be issued with minimum recommended flight levels of FL260.

FL260 is the minimum acceptable level to meet driftdown criteria. Should levels below FL260 be offered, all efforts must be made to negotiate higher to avoid a turn back. Delaying, en-route holding, negotiating with other aircraft in the vicinity are options. A re-route is required if clearance to FL260 or above is not obtained.

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**
**CP123 (N31.459 E052.039)**

Insert in FMS at a time of low workload. This critical point is coincident with waypoint GESIP (Route R659 only).

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **Before CP123:** turn back (right) and initially proceed L6 offset along the airway toward the South. Return to airway centre line when cleared by ATC.
2. **After CP123:** continue with an initial R6 offset along the airway toward the North. Return to airway centre line when cleared by ATC.

**Actions Following Depressurisation**

The same routings, including the published escape route, will apply in the event of a depressurisation. The initial level off height will be 15,600 ft. Further descent as permitted by MSA.

**MSAs and Turns**

The above turns will take the aircraft to the East side of the airway.

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

**Driftdown/Oxygen Procedures for routes on Airway UP975/UT36/G208/R661 (Eastbound)**
**B777-200ER GE90-85B**
**Route UNVUS-OIIE**
**Minimum Flight Level for Crossing**

N/A

If the FMC engine out performance indicates that the aircraft would have sufficient terrain clearance, no critical point and escape route are required.

**Critical Points**

ULTED

**Actions Following In Flight Shutdown**

Dependent on position as follows:

1. **Before ULTED:** Turn back direct previous waypoint and route to suitable diversion airfield.
2. **After ULTED:** Continue on planned route. Divert as per fuel state.

**Actions Following Depressurisation**

Initial descent to 15,300ft then per MTCA

**MSAs and Turns**

No restrictions

**Fuel Jettison**

The analysis has shown that the terrain will be cleared without using fuel jettison. However, it is recommended that fuel jettison is selected as soon as workload permits. 30,000 kg fuel remaining will be sufficient fuel for diversion to all likely alternates. Further fuel jettison may be necessary to reduce weight below MLW.

**Driftdown/Oxygen Procedures for routes from Kuala Lumpur via REGET (Westbound)**
**B787-9 Trent J**
**KUL-LHR via Route REGET N644 LEMOD**
**Critical Points**

NEVIV (N33 5.84 E067 47.0) for engine failure

**Actions Following In Flight Shutdown**

1. **Before NEVIV:** Turn back with 3nm offset and divert to Lahore (OPLA) or Delhi (DEL) or nearest suitable alternate advising ATC as early as possible.
2. **After NEVIV:** Divert to Mashhad (OIMM) or Ashgabat (UTAA) or nearest suitable alternate advising ATC as early as possible.

**Actions Following Depressurisation**

Initial descent altitude: 19,000ft

**Note:** Operations from UK to KUL on N644 via LEMOD are unrestricted for decompression and driftdown considerations due to the reversal of the terrain profile and lower gross weight over the high terrain.

**INDIA – HONG KONG**

Routes to Malaysia, Indonesia, Bangkok, Hong Kong, China and The Philippines.

**GENERAL**

Generally en-route communications are good, using VHF with HF back-up.

Over Large areas of Eastern Russia and China VHF frequencies for Datalink are locked out (more expensive than Satcom) and datalink services are routed via Satcom. If Satcom datalink fails then Company Comms and D-ATIS are unavailable until approaching HKG.

Part of Calcutta FIR lies E of Dhaka and just N of Chittagong. If this is entered without permission from Calcutta ATC, due weather avoidance etc, a violation may be filed.

Hong Kong Control on 127.1 MHz has an extended range of 350 nm beamed to the SW (with SELCAL).

When communicating with Chinese controllers it is essential that standard phraseology is strictly adhered to. They have a very pronounced accent but otherwise communications are good. Initial contact is on HF well before the border.

Reporting points are normally referred to by the navaid ident. e.g. KILO MIKE GOLF for Kunming.

When routing to Hong Kong across China, Hong Kong ATC should be contacted as soon as possible on HF and the forward estimate monitored.

On the route via Kunming (KMG) they can normally be reached by Lashio (LSO) over Myanmar (formerly Burma). See Central Asia or Far East Flight Progress Chart.

En-route Radar coverage is sparse.

Approaching Hong Kong, communications will be transferred to VHF and Hong Kong will provide Radar monitoring and issue an onward clearance.

**VOLCANIC ACTIVITY**

GALUNGGUNG, 90 nm SE of Jakarta. A BA 747, flying downwind of this volcano, at normal cruising levels, suffered failure of all 4 engines.

PINATUBO, 50 nm NW of Manila. Volcanic ash was reported to 45,000ft and Manila Airport was closed.

MAYON, 170 nm SE of Manila. Significant eruption Feb 2000.

**DRIFTDOWN AND DEPRESSURISATION PROCEDURES**

Driftdown/Oxygen Procedures for Operation on Airways A368/B215 through China en-route to Hong Kong (Eastbound)

**B747-400****LHR-HKG via A368/B215****Critical Points**

**YABRAI (YBL) (N39 25.7 E102 46.3)** for engine failure.

**OXY1 (N43 38.1 E090 25.1)** 152 nm North of HMI, 110 nm South of FKG for decompression.

**OXY2 (N34 30.3 E104 13.4)** 69 nm North of OMBON, 162 nm South of JTA for decompression.

**Actions Following In Flight Shutdown**

Dependent on position as follows:

Once established at driftdown altitude, establish Two engine inoperative level-off height. Compare with MSAs on route ahead, and if adequate clearance is not available, divert as appropriate.

1. **Before YABRAI (YBL):** Proceed to YBL and route via A596 or B330 to ZBAA or ZBHH dependant on fuel.
2. **After YABRAI (YBL):** Proceed to destination.

**Actions Following Depressurisation**

1. **Before OXY1 (after Fukang):** Return to Urumqi area. Either land at Urumqi or divert back to CIS on A368 via SARIN.
2. **Between OXY1 (after Fukang) and OXY 2 (after JTA):** Proceed/return to Yabrai (YBL) as appropriate and route A596 to Beijing or destination dependant on fuel.
3. **After OXY 2 (after JTA):** Proceed to destination.

**Note:** Sufficient oxygen capacity is available to cover a decompression at OXY1 and divert to Urumqi or if this is not available, diversion by A368 via SARIN to the CIS. If routing via A368 – SARIN no special oxygen handling procedures are required. (MSAs to the West of SARIN are low enough that oxygen is not required.)

**Escape Route**

Escape route available via A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.

**MSAs and Turns**

Turns are permitted in either direction.

**Driftdown/Oxygen Procedure for Operation on Airways B215/A368 through China en-route from Hong Kong (Westbound)**
**B747-400**
**HKG-LHR via B215/A368**
**Critical Points**

**OXY1 (N43 38.1 E090 25.1)** 152 nm North of HMI, 110 nm South of FKG for decompression.

**Actions Following In Flight Shutdown**

Dependent on position as follows:

Once established at driftdown altitude, establish Two engine inoperative level off height. Compare with MSAs on route ahead, and if adequate clearance is not available, divert as appropriate.

**Actions Following Depressurisation**

1. **Before OXY1 (between Hami HMI and Fukang FKG):** Proceed/return to Yabrai (YBL) as appropriate and route A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.
2. **After OXY1:** Route to CIS or divert to Urumqi.

**Note:** Sufficient oxygen capacity is available to cover a decompression at OXY1 and divert to Urumqi or if this is not available, diversion by A368 via SARIN to the CIS. If routing via A368 – SARIN no special oxygen handling procedures are required. (MSAs to the West of SARIN are low enough that oxygen is not required.)

**Escape Route**

Escape route available via A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.

**MSAs and Turns**

Turns are permitted in either direction.

**Driftdown/Oxygen Procedure for Operation on Airway B330 through China en-route to HKG (Eastbound)**
**B747-400**
**LHR-HKG via B330 MORIT**
**Critical Points**

**OXY2 (N34 30.3 E104 13.4)** 69 nm North of OMBON, 162 nm South of JTA for decompression.

**Actions Following In Flight Shutdown**

Dependent on position as follows:

Once established at driftdown altitude, establish Two engine inoperative level off height. Compare with MSAs on route ahead, and if adequate clearance is not available, divert as appropriate.

**Actions Following Depressurisation**

1. **Before OXY2:** Proceed on airway A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel or turnback and proceed to Novosibirsk (UNNT/ OVB) on airway B330.  
Continuation past OXY2 on routing or a return to Urumqi/Kazakhstan past OXY1 is not permitted due to terrain critical oxygen requirements.
2. **After OXY2:** Continue to HKG.

**Escape Route**

Escape route available via A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.

**MSAs and Turns**

Turns are permitted in either direction.



**B787-8 Trent AE**
**LHR-CTU via B330 MORIT**
**Critical Points**

**TEKOR (N45 4.36 E099 16.31)** for decompression

**OMBON (N33 21.24 E104 16.18)** for decompression

**Actions Following In Flight Shutdown**

Dependent on position as follows:

Once established at driftdown altitude, establish Two engine inoperative level off height. Compare with MSAs on route ahead, and if adequate clearance is not available, divert as appropriate.

**Actions Following Depressurisation**

**Initial descent altitude:** 20,000ft

1. **Before TEKOR:** Turn back with 3 nm offset and divert to nearest suitable alternate advising ATC as early as possible.
2. **Between TEKOR and OMBON:** Divert to Lanzhou (ZLLL) or nearest suitable alternate.
3. **After OMBON:** Continuation to CTU is permitted or nearest suitable alternate.

**MSAs and Turns**

Turnbacks are not permitted in West bound direction due to significant terrain.

Restricted airspace up to FL 270 exists 10 nm to the East and for a distance of 70 nm North from DOREX.

**Driftdown/Oxygen Procedure for Operation on Airway B330 through China en-route from Hong Kong (Westbound)**
**B747-400**
**HKG-LHR via B330 MORIT**
**Critical Points**

**OXY2 (N34 30.3 E104 13.4)** 69 nm North of OMBON, 162 nm South of JTA for decompression.

**Actions Following In Flight Shutdown**

Dependent on position as follows:

Once established at driftdown altitude, establish Two engine inoperative level off height. Compare with MSAs on route ahead, and if adequate clearance is not available, divert as appropriate.

**Actions Following Depressurisation**

1. **Before OXY2:** Turn back and return to HKG
2. **After OXY2:** Continue to Novosibirsk (UNNT/OVB) on airway B330 or proceed on airway A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.

**Escape Route**

Escape route available via A596 towards Beijing ZBAA or Hohhot ZBHH dependant on fuel.

**MSAs and Turns**

Turns are permitted in either direction.

**B787-8 Trent AE**
**CTU-LHR via B330 MORIT**
**Critical Points**

**DOREX (N31 8.48 E104 22.5)** for engine failure

**OMBON (N33 21.24 E104 16.18)** for engine failure

**OMBON (N33 21.24 E104 16.18)** for decompression

**TEKOR (N45 4.36 E099 16.31)** for decompression

**Actions Following In Flight Shutdown**

1. **Before DOREX:** Turn back and return to CTU
2. **Between DOREX and OMBON:** Turn back to CTU must be made to the East. Restricted airspace exists 10 nm East of the airway between DOREX and 70 nm North from DOREX. In the event of an airborne return advise ATC immediately. ATC have indicated that the restricted area can be entered during the turn. However, every effort should be made to reduce the time within it and regain a 3 nm West offset of the airway centreline expeditiously.
3. **After OMBON:** Continue or turn back with 3 nm offset on airway B330 to Lanzhou ZLLL or nearest suitable alternate and advise ATC as early as possible.

**Actions Following Depressurisation**

**Initial descent altitude:** 20,000ft

1. **Before OMBON:** Turn back to CTU must be made to the East. Restricted airspace exists 10 nm East of the airway between DOREX and 70 nm North from DOREX. In the event of an airborne return advise ATC immediately. ATC have indicated that the restricted area can be entered during the turn. However, every effort should be made to reduce the time within it and regain a 3 nm West offset of the airway centreline expeditiously.
2. **Between OMBON and TEKOR:** Continue or turn back to Lanzhou ZLLL with 3 nm offset or to nearest suitable alternate advising ATC as early as possible.
3. **After TEKOR:** Continue with 3 nm offset and divert to nearest suitable alternate advising ATC as early as possible.

**MSAs and Turns**

Turnbacks are not permitted in West bound direction due to significant terrain.

Restricted airspace up to FL 270 exists 10 nm to the East and for a distance of 70 nm North from DOREX.

The following MSAs can be used instead of CIRRU MSAs for this portion of the flight:

From	To	MSA
DOREX	OMBON	15,600
OMBON	JTA	16,500
JTA	YBL	11,300
YBL	MORIT	8,100
MORIT	TEKOR	11,000
TEKOR	DILAT	11,900

**CHINA**

Within China, air-routes vary in width between 8-20 km. Deviation from the specified air routes is prohibited. Crews should note that the civil controllers only have responsibility for aircraft within the 20 km width of the airway. Airspace outside of the airway is controlled by the military. Crews requiring

deviation for weather should only request vectors within the airway width. Crews having to deviate outside the airway will be under military control and may be instructed to land at a nearby military airfield. In such cases consideration of returning to airport of origin or diversion must be considered. If necessary a PAN call should be made.

### **Diversion**

Provided that the original destination is Chinese, the CAAC (who are responsible for all aircraft handling in China) additionally consider themselves responsible for handling at the alternate. Thus ground handling and fuel will be available on diversion to a mainland Chinese alternate.

### **Border Crossing**

This is only allowed within a specified air corridor or over a specified entry/exit point. ATC must be contacted 15-20 mins prior to the border giving call sign, ETA for border and FL.

Border crossing clearance should then be issued. The border must not be crossed without ATC permission. A position report must be made when crossing the border. These rules apply for both entry and exit.

### **Forced to Return**

If it becomes necessary, an aircraft is permitted to return by its original route, air corridor or entry/exit point. ATC should be informed of the following:

1. Call sign.
2. Reason for forced return.
3. Time when beginning return.
4. Altitude.
5. Aerodrome of intended landing.

If no instructions are received from ATC, the return flight over China shall be at a Flight Level immediately below that originally flown. If this is below the MSA then the Flight Level above that originally flown shall be used.

### **Altimetry**

All altimeter clearances are given in metres, QNH.

China uses RVSM at cruising altitudes. Check correct feet setting in MCP versus cleared metric flight levels.

### **Dimensional Units**

Horizontal distances in km. Speeds and Upper Wind km per hr. Surface winds metres per sec.

Approx conversions:  $(\text{km/hr})/2 = \text{knots}$

$(\text{m/sec}) \times 2 = \text{knots}$

### **Routes from C.I.S across China**

MSAs are high over much of northern China; over 21,000ft at Urumqi and over 22,000ft N of Chengdu. This necessitates careful planning for engine failure and decompression.

## **HONG KONG**

### **Routing from LHR to HKG:**

Routing does not vary significantly and is to the south of Helsinki then via the Baltic states to the North of Moscow across Siberia where it turns south east over Mongolia and into China.

There is high terrain in Sichuan province in China along airway B330 (Lanzhou and Kunming FIRs) which is subject to decompression escape routes provided above. Escape routes **MUST** be programmed in the FMS prior to transit.

Russian and Chinese airspace is RVSM. Russia operates to ICAO FL rules. China/Mongolia operates in metric levels and the equivalent semi-circular cruising levels are subtly different, so FL330 becomes FL10100 m which is flown as 33,100 feet. This requires a small altitude change at the boundary which must be flown otherwise Chinese controllers will challenge your level.

Hong Kong is standard ICAO levels.

CPDLC is not yet available in Russia in the FIRs we fly through.

Mongolia (Ulanbaatar) has a trial CPDLC service with ADS-B.

The Chinese will often assign offsets for significant distances through their airspace which you are required to fly. Some crews apply their own offset in Russian airspace, ATC may query any such offset especially if more than 1 nm.

### **Hong Kong – Notification of Arrival Delay**

Effective from August 2013 – A delay notification message will be included in the arrival ATIS when an arrival delay is expected to exceed 30 mins. ATC will supplement this information as required on first contact. **UNLESS** informed by pilots ATC will consider flights that decide to continue inbound to HKG will have the required holding fuel to absorb the notified delay. If further delay develops pilots will be informed accordingly.

## **VIETNAM**

Aircraft operating over Vietnam may require an over flight Clearance Number.

## **HONG KONG – TOKYO**

In this area there is good ATC and co-ordination.

## **TAIWAN**

Aircraft must contact Taipei Control prior to crossing the FIR boundary for clearance. BAV services to TAIPEI – to satisfy political sensitivities, at no time should the aircraft be landed in MAINLAND CHINA.

## **JAPAN**

Japanese controllers have a pronounced accent and a tendency to talk quickly making it difficult at times to understand clearances. It pays to be prepared in advance for clearances, listening out to other aircraft going the same way can be very useful.

Be prepared for a full clearance as far as the first major airway. Only after this will the term “flight planned route” be given. Beacons will usually be referred to by their “name” rather than callsign.

Pressure settings provided by ATC are usually in ‘inches of Hg’ but may be provided in ‘Hpa’. Exercise caution as a combination of these two settings may also be used at the same time.

Transition Altitude 14,000ft.

250 kts Max at or below 10,000ft within approach control areas.

Volcanic activity is a continuing hazard over Japan.

All Japanese airfields have markings on the runway indicating its midpoint. The markings consist of 3 parallel white stripes running across the runway.

Airfields which are likely to see heavy snow fall in the winter months have orange runway markings instead of white ones to improve recognition.

#### **Minimum Fuel Advisory**

Advise ATC when fuel has reached a state where any undue delay at destination is unacceptable. This call does not declare an emergency and does not imply a need for traffic priority. On initial contact the term "MINIMUM FUEL ADVISORY" should be used after your callsign. IF TRAFFIC PRIORITY IS REQUIRED YOU MUST DECLARE AN EMERGENCY, reporting fuel remaining in minutes.

#### **Radar Advisory Service**

This network exists primarily for air defence around Japan but will provide assistance on request. This assistance may be withdrawn without prior notice.

When using the service it is the pilots responsibility for obtaining changes in ATC clearances prior to contact with radar stations, but ground stations will assist in obtaining clearances if necessary.

#### **Departure Clearances**

Departure clearances from Japan ATC may include, for example, A110. This is a clearance to an altitude of 11,000ft. This clearance does not, in itself, override the need to comply with the altitude constraints on the SID.

### **FAR EAST – AUSTRALIA**

Communications and ATC are good with a mixture of VHF and HF.

OFP highlights the requirement for the sending of Met reports which is quite extensive.

REFER TO AUSTRALASIA AREA BRIEFING for details of Australian operations.

### **INDONESIA**

250 kts Max at or below FL100 in Jakarta, Palembang, Surabaya or Bali controlled airspace.

### **SINGAPORE – JAKARTA**

There are special level assignments for aircraft flying between these FIRs.

### **PHILIPPINES**

Aircraft entering Manila FIR from the south are to report at 2°N giving FL and estimate for 4°N.

Speed Control – 250 kts Max within 30 nm of Manila below FL100.

### **YANGON FIR**

IFBP should be followed in the Yangon FIR. See details in the Africa Area brief.

## NORTH AMERICA AREA

### NORTH ATLANTIC

### OCEANIC CONTROL AREA

Gander, Shanwick, New York, Santa Maria, Reykjavik. FL55 – Unlimited.

#### Minimum Navigation Performance Specification – North Atlantic

The MNPS airspace over the North Atlantic is that airspace:

- FL285 – FL420.
- The Southern portion of the Santa Maria Oceanic, thence from 27°N – The North Pole.
- Bounded in the E by the E boundaries of CTAs Santa Maria Oceanic, Shanwick Oceanic and Reykjavik.
- Bounded in the W by the W boundaries of CTAs Reykjavik, Gander Oceanic, New York Oceanic and Santa Maria Oceanic, excluding the area W of 60°W and S of 38° 30'N within New York Oceanic.

The area N of 54°N NW of Ireland is designated the NORTHERN OCEANIC TRANSITION AREA (NOTA) and is part of the MNPS airspace.

Control in this area is provided by Shannon ATC centre.

The area S of 51°N to the SW of Ireland is designated as the SHANNON OCEANIC TRANSITION AREA (SOTA) and is part of the MNPS airspace. Control in this area is provided by Shannon ATC Centre along standard published routes.

South of this area between 08°W and 08°45'W is the BREST OCEANIC TRANSITION AREA (BOTA) which is also part of MNPS airspace. Control is provided by Brest ACC, callsign 'Brest Control'.

Aircraft operating within the MNPS airspace are required to have a minimum navigation performance capability. This requirement is in principle two navigation systems in Nav mode – but see relevant manual for aircraft type.

Aircraft with reduced navigational capability may utilise special routes between NE Canada and Europe via Greenland and Iceland (Blue Spruce Route), and between the Azores and the Portuguese mainland.

#### Reduced Vertical Separation Minimum (RVSM)

Within MNPS airspace Reduced Vertical Separation Minimum (RVSM) is used. There is a minimum equipment requirement and an associated altimeter check before flight into RVSM airspace – see relevant manual for aircraft type. "W" is entered in Item 10 of the Flight Plan to indicate an aircraft is equipped and approved to operate in RVSM airspace.

**If failure results in the aircraft having less than the minimum equipment required to enter RVSM airspace, ATC must be informed immediately. Loss of all autopilots means non-compliance with RVSM equipment minima.**

The New York Oceanic FIR (WATRS area) West of 60W and South of 38°30'N FL 290 and 410 (inclusive) is designated as RVSM airspace.

**Strategic Lateral Offset Procedure**

The Strategic Lateral Offset Procedure is now implemented within North Atlantic Region Airspace including the New York Oceanic FIR (WATRS area) West of 60W and South of 3830N.

The procedure provides for the application of lateral offsets within the following guidelines:

- Strategic lateral offsets and those executed to avoid wake turbulence are to be made to the right of a route or track, never to the left;
- In relation to a route or track, there are three positions that an aircraft may fly: centreline, one or 2 NM right; and,
- Offsets are not to exceed 2 NM right of centreline.

The intent of this procedure is to reduce risk (increase the safety margin) by distributing aircraft laterally and equally across the three available positions. In this connection, pilots must take account of the following:

- Aircraft without automatic offset programming capability must fly the centreline;
- Aircraft capable of being programmed with automatic offsets may fly the centreline or offset one or 2 NM right of centreline to obtain lateral spacing from nearby aircraft;
- Pilots should use whatever means are available (e.g. TCAS, communications, visual acquisition, GPWS) to determine the best flight path to fly;
- Any aircraft overtaking another aircraft is to offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken;
- For wake turbulence purposes, pilots are also to fly one of the three positions at 2 above and never offset to the left of centreline nor offset more than 2 NM right of centreline;

**Note:** It is recognized that the pilot will use his/her judgement to determine the action most appropriate to any given situation and has the final authority and responsibility for the safe operation of the aeroplane. The air-to-air channel, 123.45 may be used to co-ordinate the best wake turbulence offset option.

- Pilots may apply an offset outbound at the oceanic entry point but must return to centreline at the oceanic exit point;
- Aircraft transiting radar-controlled airspace, e.g. Bermuda, are to remain on their established offset positions;
- Pilots should use a random method to decide whether to offset 1 NM right, 2 NM right or fly the centreline, taking in to account the circumstances above;
- There is no ATC clearance required for this procedure and it is not necessary that ATC be advised; and,
- Position reports are to be based on the current ATC clearance and not the exact co-ordinates of the offset position. An example of a report when passing 54N 20W while being offset from track is *"Shanwick, Speedbird 175, position 54N 020W, 1222, estimate...etc"*.



**Standard Lateral Separation**

120 nm but with the following exceptions:

- 60 nm between aircraft complying with the requirements of MNPS in MNPS airspace.
- 90 nm between aircraft operating outside MNPS airspace.
  - Between the USA or Canada and Bermuda.
  - Between the USA, Canada or Bermuda and the Caribbean.
  - Between the Iberian Peninsula and the Azores.
  - Between Iceland and Scandinavia or the UK.

**Standard Longitudinal Separation**

Basically 10 mins for jet aircraft, provided the aircraft meet MNPS requirements, operate wholly or partly in MNPS airspace, use the Mach No Technique and have reported over the same entry point into the OCA and follow the same track or diverging tracks, or the required separation may be assured using ATC Radar. The separation may be reduced to 5 minutes if the preceding aircraft arriving at the OCEANIC entry point is flying at speed of Mach .06 greater than following aircraft.

Requirements when using the Mach No Technique:

- i. The planned True Mach Number for each portion of the route within the NAT shall be specified in item 15 of the Flight Plan.
- ii. The Mach number approved by ATC shall be adhered to as accurately as possible and approval shall be requested before making any change. If immediate temporary change is essential (e.g. due to turbulence), notify ATC as soon as possible and advise adjacent aircraft using 121.5. Clearance for a prolonged reduction in Mach number may not be possible if the 10 minute separation is compromised.
- iii. Advise ATC of any change in Mach number after leaving Oceanic airspace.

**ATC Use of 5 Minutes GNSS Climb/Descent Through Procedure**

Some NAT ATC units utilise a procedure which permits ATC to clear an aircraft to climb or descend through the level of another aircraft, with as little as 5 minutes longitudinal separation, provided that both aircraft are using GNSS (GPS) for position determination and reporting. The rule allowing ATC to use this procedure includes a caveat that the climb or descent needs to be undertaken within 10 minutes of the time that the second aircraft in the pair has passed a common reporting point.

**Importance of Accurate Time**

Preflight procedures for any NAT MNPS flight must include a UTC time check of the aircraft master clock(s).

**Organised Track System (OTS)**

As a result of passenger demands, time zone differences and airport noise restrictions, much of the North Atlantic air traffic contributes to one of two flows; a W-bound flow departing Europe in the morning, and an E-bound flow departing North America in the evening.

In order to provide the best service to the bulk of traffic, a system of organised tracks is constructed every 12 hours to accommodate as many aircraft as possible on or close to their minimum cost path.



The Oceanic Centre supervisor obtains from the principal operators, the “best time” routes for the day. For peak traffic periods, ATC select a primary, and three or more other tracks which parallel the primary at not less than 60 nm separation.

Shanwick is responsible for nominating tracks for the period 1130 - 1900Z when they are predominantly W-bound and these will be alphabetically identified ‘A’, ‘B’, ‘C’, etc from N to S. ATC will only publish those flight levels required to meet anticipated demand. However, other levels can be made available if requested. From 0100 - 0800Z when most of the traffic flow is E-bound the responsibility for track nomination lies with Gander who will identify tracks as ‘Z’, ‘Y’, ‘X’, etc from S to N. The time periods are times at 30°W and are those normally used. In all cases the hours of validity will be specified on the NAT Track Message.

These tracks are then notified to all main operators in the form of a Track Message. Since the Track structure changes daily, it is important to ensure that the Track Message relates to the correct date. Track Messages should be taken on all flights operating in Oceanic airspace during the relevant periods. The fact that a specific FL is not published for a particular Track does not necessarily mean that it cannot be made available on request. The Track Message is supplied on Simbrief and PFPX CIRRUS OFPs and can be separately obtained via <https://www.notams.faa.gov/common/nat.html>.

Prior to the organised track system coming into operation, E’ly and W’ly traffic can operate in RVSM; thus opposite direction traffic at only 1,000ft separation is a possibility.

Outside the organised track periods random routes are planned.

### **Organised Track System (OTS) Transition Periods**

It is recommended that random flights, planning to cross 30°W E-bound within the hour preceding the onset of the day track system or planning to cross 30°W W-bound within the hour preceding the onset of the night track system, flight plan to join a track of the OTS at or beyond 30°W in accordance with the flight levels published in the NAT Track Message, or flight plan to remain clear of the OTS.

### **Flight Planning**

During the period of OTS operation flights will normally be planned to follow a NAT. Note that this is not mandatory, a random track may still be filed, but ATC may reclear the flight along a NAT.

Flights South of 70°N, and predominantly East/West should normally flight plan so that specific ten° of longitude (20°W, 30°W, etc.) are crossed at whole° of latitude, and generally N-bound or S-bound aircraft should normally flight plan so that specific parallels of latitude spaced at five degree intervals (65°N, 60°N, etc.) are crossed at whole° of longitude.

If the flight is planned to operate along the whole length of one of the organised tracks, the intended organised track should be defined in Item 15 of the flight plan using the abbreviation “NAT” followed by the relevant code letter. The accumulated estimated elapsed time (EET) from take-off to either the OCA entry point for W-bound flights, or the commencement point of the Track for E-bound flights will be given in Item 18 of the Flight Plan.

For flights wishing to join or leave an organised track at some intermediate point, full track details are specified in the Flight Plan. (A route constructed using only part of a N Atlantic Track is a random route. “Abbreviated Read-back of Clearances”, described below, does not apply).

For flights conducted wholly or partly outside the OTS, accumulated estimated elapsed times from take-off to significant points on route should be specified in Item 18 of the flight plan.

For all flights intending to operate within MNPS airspace for any portion of their flight, the letter “X” should be inserted immediately after the letter “S” in Item 10 of the flight plan, indicating that the flight is certified as being in compliance with the MNPS.

For turbojet aircraft, the Mach No planned to be used for each portion of the flight in the NAT region should be specified in Item 15 of the flight plan.

### **UK – N America**

BAV's North American services to/from the eastern seaboard and mid-west are usually planned to operate within the organised track structure. Routes will be analysed and determined on a best time/cost basis.

West Coast Operations follow a best time track, which may or may not encompass part or whole of the N. Atlantic Organised Track System.

### **Bermuda**

Bermuda is in the New York OCA.

New York provides ATC for Bermuda Approach; VHF and Radar cover are by remote facilities. Squawk 2100 while transiting the BDA TCA.

### **Clearances**

Initial clearance will be domestic only to the Oceanic entry point.

Pilots should request Oceanic clearances from the ATS unit responsible for the first Oceanic area within which they wish to operate not more than 90 mins and not less than 30 mins flying time from the Oceanic boundary when flying Westbound. Such clearances are applicable only from the Oceanic boundary/entry point. A full readback of an oceanic clearance, including track co-ordinates, is the standard requirement and is always required if the clearance is received on HF.

Note that on VATSIM it is normal practice during routine (non-event) operations for a single controller to cover both Shanwick and Gander OCAs. This controller may be logged on as either EGGX\_FSS or CZQX\_FSS and will normally handle Oceanic clearances from both sides of the Atlantic.

The clearance may give an expected FL (e.g. EXPECT F350) for the oceanic crossing; climb to this level will be subject to clearance to climb by the domestic controller. If the received clearance necessitates a revised domestic routing this too must be negotiated with the domestic controller.

### **Westbound Clearances**

Early information of ETA and flight level at the Oceanic boundary is of extreme importance to ATC for planning purposes. Therefore UK departures not using an ACARS clearance request should call for Clearance from Shanwick on VHF as soon as possible after take-off, keeping in mind the 90-30 minute rule mentioned earlier. If unable to contact Shanwick on VHF, clearance should be requested on HF.

It sometimes happens that aircraft are routed from LHR/LGW over France for their N Atlantic crossing. To obtain the Oceanic Clearance from Shanwick on VHF it is necessary to make the call as soon as possible, once again keeping in mind the 90-30 minute rule. Any delay will take the aircraft out of VHF range and HF will need to be used.

Westbound Oceanic Clearance through Shanwick and Gander to New York ACC – this does NOT apply to flts through Santa Maria ACC to New York ACC.

Shanwick will clear flights to the first NAMED fix in the New York ACC then say VIA FLIGHT PLANNED ROUTE TO DESTINATION. If the flight-planned route goes South and East of 20N60W Shanwick will clear the acft to the last set of coordinates filed that are North and East of 20N60W and then say VIA FLIGHT PLANNED ROUTE TO DESTINATION. If ATC change the original planned route they will issue a routing to put the acft back on the original planned route then say VIA FLIGHT PLANNED ROUTE TO DESTINATION. The named fixes or coordinates that Shanwick clear acft to

are NOT clearance limits. After those points the acft should proceed VIA FLIGHT PLANNED ROUTE TO DESTINATION.

### **Eastbound Clearances**

Gander clearance delivery procedures between 2330 and 0730 (DST 2230Z – 0630Z) require flights (in addition to monitoring the appropriate control sector frequency) to contact “Gander Clearance Delivery” not more than 90 mins and not less than 30 mins flying time from the Oceanic boundary for their Oceanic clearance.

Clearance delivery frequencies and locations are published daily in the eastbound Track Message. To reduce VHF radio transmissions during these hours the domestic control sector will not normally issue instructions for pilots to contact oceanic clearance delivery (nor is there a requirement for pilots to notify the domestic control sector that oceanic clearance has been received).

As in Westbound clearances above, remember that during routine operations a single controller logged on as EGGX or CZQX is likely to be covering the combined Shanwick/Gander OCA and will normally issue clearances for flights on both sides of the Atlantic.

### **Santa Maria Oceanic**

Ensure that the request for oceanic clearance is made at least 40mins prior to estimated arrival at the Santa Maria Oceanic boundary.

### **New York Oceanic**

The procedures used to issue Oceanic Clearances to eastbound traffic entering the New York Oceanic FIR from a FAA facility (eg Miami FIR) were modified effective January 2013. The last assigned route clearance, or that received at the departure aerodrome if not updated, is considered to be the route portion of the oceanic clearance with assignment of Altitude and Speed only occurring once airborne prior to entry into the New York Oceanic FIR.

### **Oceanic Clearance Request**

- i. Callsign.
- ii. Co-ordinates of OCA entry point (or first point of an organised track).
- iii. Most accurate possible estimate for OCA entry point.
- iv. Desired FL for Oceanic crossing.
- v. Desired Mach. No. for Oceanic crossing.
- vi. OCA entry point max possible Flight Level.
- vii. Next best Track and Flight Level.
- viii. Any change to flight plan affecting OCA.

E.g.: “Shanwick, Speedbird 175, request JFK via NAT BRAVO, estimate PIKIL time 1227Z, FL340 Mach .85. Maximum at PIKIL FL360, next best NAT CHARLIE FL350.”

To minimise R/T, initially GIVE ONLY THE CALLSIGN WHEN CALLING SHANWICK ON VHF WESTBOUND; they will tell you the information they require. Note that “entry points” occur at Longitudes 10W, 15W exiting Scottish and Shannon, named points on the Brest Oceanic Transition Area (BOTA) boundary at 0845W, named points on the Shanwick Oceanic boundary, e.g. MASIT and named points on the Shannon Oceanic Transition Area (SOTA) boundary, e.g. OMOKO.

After receiving the clearance, the forward estimate for the Oceanic entry point must be monitored, and any revised ETA passed to ATC. This is very important as longitudinal spacing is based on these estimates. Advise ATC if the ETA changes by 3 minutes or more.

If the aircraft is cleared on a North Atlantic Track not as flight planned the easiest way to provide the Oceanic Boundary ETA that will be immediately called for by ATC is to request, from the Domestic Controller, a direct routing to the new Oceanic Boundary point.

### **Non-receipt of Clearance**

If pilots have not received their Oceanic Clearance prior to reaching the Shanwick OCA boundary, they must contact Domestic ATC and request instructions to enable them to remain clear of Oceanic Airspace whilst awaiting such Clearance. This is not the case for other NAT OCAs into any of which flights may enter whilst pilots are awaiting receipt of a delayed Oceanic Clearance. Pilots should always endeavour to obtain Oceanic Clearance prior to entering these other NAT OCAs; however, if any difficulty is encountered the pilot should not hold while awaiting Clearance unless so directed by ATC.

### **Core NAT Tracks**

Changes are in effect for aircraft operating on selected NAT tracks at selected levels. This is known as ADS C and CPDLC mandated OTS. The remarks section of the track message will include ADS C and CPDLC tracks and levels. These NAT tracks require all acft to be carrying serviceable FANS/CPDLC equipment. In trail spacing will be correspondingly reduced.

Refuse incompatible clearances if you are not FANS/CPDLC equipped. All BAV aircraft currently operating on the North Atlantic can be assumed to be suitably equipped if fully serviceable.

### **“When Able Higher” (WAH) Reports**

Must be provided by all flights entering New York (MNPSA) and Santa Maria OCAs,

e.g. *“Global Air 543, 40N 40W 1010, FL350, 40N 50W 110, 40N 60W next, able FL360 at 1035, able FL370 at 1145, able FL390 at 1300”.*

ATC will interpret this message as an *ability* to climb, not a request.

### **Reykjavik Control Area (BIRD)**

Oceanic Clearance, when required, should be requested from Iceland Radio VHF 127.85 (BICC\_FSS) not more than 30 mins and not less than 10 mins prior to the Oceanic boundary. If crews are unable to get their clearance prior to entry they are expected to enter Reykjavik OCA at the flight level cleared by Scottish and contact Reykjavik Control on assigned frequency.

### **Abbreviated Read-back of Clearances**

A full co-ordinate read back is required unless a Track Message, complete with Track Message Identification (TMI) number, is held on the Flight Deck. In which case, if following the whole of a N Atlantic Track (NAT), read-back should only include TRACK LETTER, FL, MACH NO. and TRACK MESSAGE IDENTIFICATION.

*“Speedbird 175, cleared to JFK via NAT BRAVO, FL340 Mach .85, TMI is 273.”*

IF NOT FOLLOWING THE WHOLE LENGTH OF A NAT, FULL READ-BACK OF THE TRACK CO-ORDINATES IS REQUIRED INSTEAD OF THE TRACK MESSAGE IDENTIFICATION. The Track Message Identification number will have a suffix letter if the Track Message has been revised (e.g. 365A); this letter forms part of the identification number and must be quoted.

### **Automatic Climb Clearances**

These may be issued by Gander, Moncton or Montreal. The instruction will specify a time to leave the initial flight level and a time to reach the final level. No further clearance is required to commence the climb. If a possibility exists that the aircraft will be unable to comply then the clearance must be rejected.

### **Track Changes**

It often happens that the Oceanic Clearance will be for a Track other than that flight planned. For instance a westbound aircraft may have been flight planned to use Track A but when the clearance is received it is for Track B. This track change will necessitate loading the co-ordinates of Track B into the on-board navigation systems.

### **North American Domestic Routes (NAR)**

The NAR system comprises a series of pre-planned routes over existing airway/route systems from/to coastal fixes serving North Atlantic traffic.

Most routes are divided into two portions:

- i. Common Portion – That portion of the route between the coastal fix and a specified Inland Navigation Facility.
- ii. Non-Common Portion – That portion of the route between the specified Inland Navigation Facility and the relevant system airfield.

The routes are numbered and prefixed by “N”. Odd route numbers have E-bound applications, and even route numbers have W-bound applications. The NAR numbers have letter suffixes to indicate revisions to the route, e.g. NAR N102A becomes N102B with the first change and N102C with the second change and so on.

All aircraft that enter/exit the North Atlantic via the identified coastal fixes should use the NAR system if their domestic route requirements are compatible – those relevant to the particular entry/exit point are given on the Track Message.

Westbound traffic entering Canadian domestic airspace will not routinely receive onward en route clearance if proceeding as per flight plan. Flights that have been re-routed and enter Canadian domestic airspace within 120 nm of the flight planned Oceanic Exit Point can expect to be re-cleared to regain their flight planned route by the Inland Navigation Fix.

Other re-routed flights will be tactically re-routed by ATC. Re-clearance may be a specified route in full or expressed as a North American Route (NAR) comprising Common and Non Common Portions.

### **Met Reports**

Occasionally aircraft may be nominated by ATC to make met reports. This is done by ATC when delivering clearance, adding the phrase “send met reports”. Met reports should also be sent by any aircraft which encounters abnormal weather conditions or not following one of the organised tracks.

If you are asked to send met reports, add the temperature and spot wind for both the current position **and** the mid-point of the leg just flown to the end of a position report. For example:

*“Speedbird 175, position 57N 20W time 1228Z, FL350 Mach .85. Estimate 57N 30W time 1341Z, next 56N 40W. Minus 56 220/55, Minus 60 270/80 5630N 15W.”*

### **Adherence to Track and ETA**

It is essential to check that the aircraft is setting off towards the correct next way point at each turning point. Ten minutes after each turning point check that the aircraft is on track. Waypoints uplinked may

be interrogated by line selecting the waypoint and checking the co-ordinates in the Scratchpad, or on the Nav Data page of the FMS.

### **Reclearance**

A change in your filed clearance (i.e. different from the oceanic route requested with the flight plan) is the most probable cause of Gross Navigation Error. Crews must be particularly cautious when receiving a reclearance. Strict adherence to fleet SOPs in this situation will mitigate the risk of GNE and concomitant risk of mid-air collision.

### **Step Climbs in North Atlantic MNPS Airspace**

#### **Planned Step Climbs**

Due to current ATC restrictions, flights operating on North Atlantic Organised Track Structure cannot file flight plans containing step climbs within the NAT segment. This restriction is also contained in the Lido Flight planning system and as a result, OFPs will not display step climbs within the NAT segment even if it is economic to do so.

#### **En-route Step Climbs**

Within the NAT system, the OCA controller will endeavour to allow flight climbs on a tactical basis. To make the most of this service crews should review FMC performance predictions to determine optimum cruise levels. Climb requests should then be made via HF radio or CPDLC to the appropriate OCA.

### **Communications**

As HF is not simulated in MSFS/P3D etc, VATSIM uses VHF frequencies in the Oceanic Control Area.

In normal operations, the positions covering the MNPS area are:

<b>Position Designation</b>	<b>RTF Callsign</b>	<b>Frequency</b>
EGGX_FSS	SHANWICK RADIO	131.800
CZQX_FSS	GANDER RADIO	131.700
NY_JBC_FSS	NEW YORK RADIO	125.925
LPPO_FSS	SANTA MARIA RADIO	127.900
BICC_FSS	ICELAND RADIO	127.850

During large events such as Cross The Pond additional frequencies will be opened, often split via NAT Track and/or level.

121.5 should be monitored continuously on long over-water flights.

Although Shanwick is responsible for the area west of 30W and Gander is responsible for the area east of 30W, it is routine for one controller to cover the whole combined Shanwick/Gander area during normal operations. The controller may be logged on as EGGX\_FSS or CZQX\_FSS and should be contacted for Oceanic clearance in the usual way (i.e. prior to the Oceanic Entry Point) whether you are heading westbound or eastbound.

When approaching the Canadian coast, the Oceanic Controller, on HF or VHF will give a frequency on which to call the appropriate centre, for onward airways clearance. Remember that on HF you are talking to a radio operator so there may be a delay for requests to be actioned. The aircraft SELCAL code is included in Item 18 of the Flight Plan and can be found for each aircraft in the fleet in the Flight Operations section of the BAV Forums.



### Transponders

While in the North Atlantic/NAT/Flight Information Region, and unless otherwise directed by ATC, select A2000. However, the last assigned code should be retained for a period of **30 mins** after entry into NAT Airspace. However, for all SSR equipped aircraft operating on routes T9 and T213 the last assigned code shall be retained for a maximum of **ten minutes** after entry into NAT Airspace.

### Flight Planning Minima for Alternate Aerodromes

When flight planning certain aerodromes as the nominated alternate, the forecast weather at the alternate must be above specified limits which are much higher than those for use of the aerodrome as a destination.

### En Route Diversion Aerodromes

- KEFLAVIK (Iceland) H24.
  - If a KEF SNOWTAM is reporting 40 m wide cleared runway, a wider width can be provided within a short time period (10–20 mins) if reqd. Contact KEF tower as soon as possible to request 45 m cleared width.
- IQALUIT (Baffin Is) H24.
- GANDER (Newfoundland) H24.
- SANTA MARIA (Azores) H24.
- SHANNON (Ireland) H24.
- THULE (Greenland) Limited Hours.
- KANGERLUSSUAQ (Greenland) Limited Hours.
  - However Kangerlussuaq will be available within 60 mins (usually less) in an emergency and may be used H24 for Non ETOPS planning purposes, e.g. ferry flights of two engined aircraft.
- GOOSE BAY (Labrador) H24.
- HALIFAX (Nova Scotia) H24.
- LAJES (Azores) H24.

### Weather Deviation Procedures

The following procedures are intended to provide guidance for deviations around thunderstorms. All possible circumstances cannot be covered and therefore the pilot's judgment shall ultimately determine the sequence of actions taken.

If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air traffic control clearance shall be obtained at the earliest possible time.

When the pilot initiates communications with ATC, rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response.

If a revised air traffic control clearance cannot be obtained and deviation from track is required to avoid weather, the pilot should take the following actions:

1. If possible, deviate away from an organized track or route system.
2. Establish communication with and alert nearby aircraft by broadcasting, at suitable intervals: identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions (including the magnitude of the deviation expected) on the frequency in use, as well as on UNICOM frequency 122.800 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45).
3. Watch for conflicting traffic both visually and by reference to TCAS.
4. Turn on all aircraft exterior lights (commensurate with appropriate operating limitations).
5. For deviations of less than 10 nm, aircraft should remain at the level assigned by ATC.
6. For deviations of greater than 10 nm, when the aircraft is approximately 10 nm from track, initiate a level change based on the following criteria:

Route Centreline Track	Deviation >10M	Level Change
EAST (000-179 magnetic)	LEFT	DESCEND 300ft
	RIGHT	CLIMB 300ft
WEST (180-359 magnetic)	LEFT	CLIMB 300ft
	RIGHT	DESCEND 300ft

*Simple rule of thumb: if deviating North of Track Descend 300ft, South of Track Climb 300ft.*

7. If contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.
8. When returning to track, be at its assigned flight level, when the aircraft is within approximately 10 nm of centre line.

**Note:** 2 and 3 above call for the pilot to: broadcast aircraft position and pilot's intentions, identify conflicting traffic and communicate air-to-air with near-by aircraft. If the pilot determines that there is another aircraft at or near the same FL with which his aircraft might conflict, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

#### IN-FLIGHT CONTINGENCIES

The following procedures are intended for aircraft unable to maintain assigned level due to:

- a) Weather (for example severe turbulence);
- b) Aircraft performance problems; or
- c) Pressurisation failure.

They are applicable primarily when rapid descent, turn-back, or diversion to an alternate aerodrome is required. The pilot's judgement will determine the specific sequence of actions taken, having regard to the prevailing circumstances.

An aircraft unable to continue flight in accordance with ATC clearance



should obtain a revised clearance prior to initiating any action USING THE DISTRESS (MAYDAY) OR URGENCY (PAN) PREFIX as appropriate.

### **General Procedures**

If prior clearance cannot be obtained, an ATC clearance should be obtained at the earliest possible time and, in the meantime, the aircraft should broadcast its position (including the ATS Route designator or the Track Code as appropriate) and its intentions, at frequent intervals on 122.8 MHz (with 123.45 MHz as a back-up frequency). It must be recognised that due to the types of communications used in North Atlantic operations (e.g. CPDLC, station-to-station SATCOM Voice and SELCAL with HF), pilots' situation awareness, of other potentially conflicting traffic, may be non-existent or incomplete. If, however, the aircraft is in an area where ATC communications are being conducted on VHF, pending receipt of any re-clearance, the position and intentions should be broadcast on the current control frequency, rather than 122.8 or 123.45 MHz.

In general terms, the aircraft should be flown at a flight level and/or on a track where other aircraft are least likely to be encountered. Maximum use of aircraft lighting should be made and a good lookout maintained. If ACAS/TCAS is carried, the displayed information should be used to assist in sighting proximate traffic.

### **Specific Procedures**

The general concept of these Oceanic in-flight contingency procedures is, whenever operationally feasible, to offset from the assigned route by 15 NM and climb or descend to a level which differs from those normally used by 500ft if below FL410 or by 1000ft if above FL410.

The aircraft should leave its assigned route or track by initially turning at least 45° to the right or left whenever this is feasible. The direction of the turn should, where appropriate, be determined by the position of the aircraft relative to any organised route or track system (e.g. whether the aircraft is outside, at the edge of, or within the system). Other factors which may affect the direction of turn are: direction to an alternate airport, terrain clearance, levels allocated on adjacent routes or tracks and any known SLOP offsets adopted by other nearby traffic.

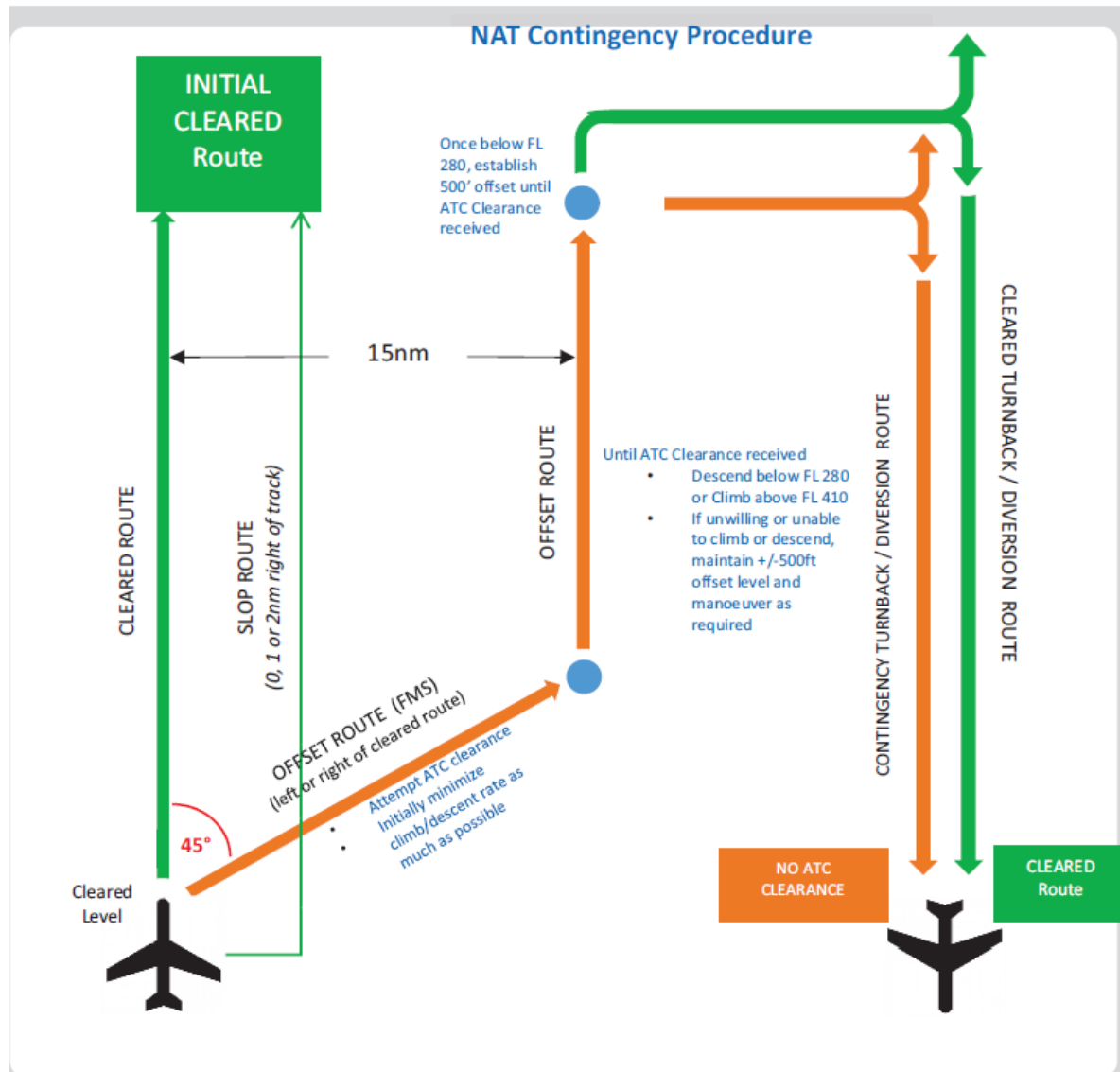
An aircraft that is unable to maintain its assigned flight level (e.g. due to power loss, pressurization problems, freezing fuel, etc.) should, whenever possible, initially minimise its rate of descent when leaving its original track centreline and then when expected to be clear of any possible traffic following the same track at lower levels and while subsequently maintaining a same direction 15 NM offset track, descend to an operationally feasible flight level, which differs from those normally used by 500ft if below FL410 (or by 1000ft if above FL410).

Before commencing any diversion across the flow of adjacent traffic, or before initiating any turn-back (180°), aircraft should, whilst subsequently maintaining a same direction 15 NM offset track, expedite climb above or descent below the vast majority of NAT traffic (i.e. to a level above FL410 or below FL280), and then maintain a flight level which differs from those normally used: by 1000ft if above FL410, or by 500ft if below FL410.

However, if the pilot is unable or unwilling to carry out a major climb or descent, then any diversion or turn-back manoeuvre should be carried out at a level 500ft different from those in use within the NAT HLA, until a new ATC clearance is obtained.

**TWIN-ENGINE AIRCRAFT** – Using these procedures as a result of engine shutdown or primary system failure should advise ATC as soon as possible giving aircraft type and requesting expeditious handling.

The graphic overleaf illustrates the procedure:



### Navigation Equipment Failure

A minimum number of navigation systems depending on aircraft type (e.g. 2 INS) must be serviceable to enter MNPS airspace. If failure reduces the number below the minimum ATC must be informed. If total navigation system failure occurs, ATC must be informed. If no instructions from ATC consider climbing/descending 500ft, broadcast action on frequency/121.5, and advise ATC as soon as possible.

### NORTHERN ORGANISED TRACK SYSTEM (NOROTS)

NOR OTS consists of a number of daily flexi tracks from the Reykjavik/Edmonton boundary at 60° West to the West coast of Canada/Northern USA.

Valid from 1300–2300 UTC at 60° West.

Affects westbound traffic from Europe to Western Canada/USA.

Tracks will be designated NOR1 through to NOR9.

Like the North Atlantic OTS, the TDM (track definition message) will have a TMI (track message identifier) number, which is to be included in any abbreviated route clearance readback to ATC.

The TDM and associated TMI number will be included in the briefing given by Network Operations Flight Planning (NOFP).

Tracks will be described using named fixes, Navaids and whole° of latitude and longitude, which should be used in position reports when required.

#### **REDUCED LATERAL SEPARATION MINIMA (RLATSM)**

Commencing in November 2015, Reduced Lateral Separation (RLatSM) will be offered in the NAT OTS between FL350 and FL390 inclusive (co-incident with airspace subject to the NAT Region Datalink Mandate).

All aircraft operating on the published RLatSM tracks will be subject to the trial, other published OTS flight levels and tracks are not part of the trial.

There are no additional crew requirements associated with trial participation.

For further information, pilots should view the NATS briefing video about RLatSM available at <https://www.nats.aero/rlat/>

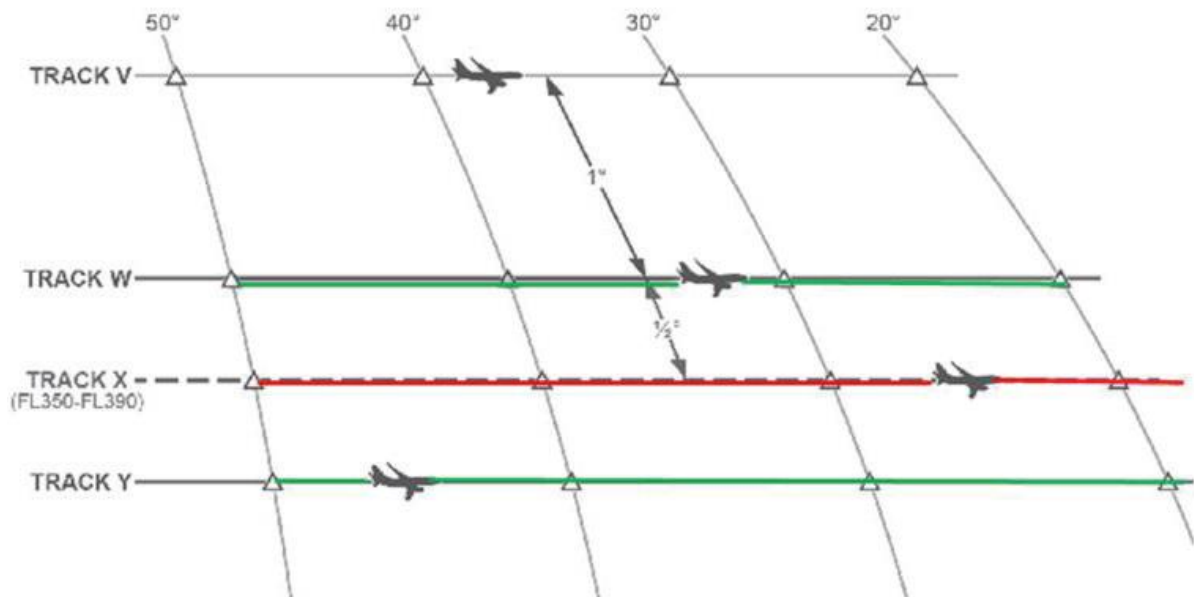
#### **Eligibility**

BAVirtual aircraft are eligible to operate on RLatSM tracks providing they are:

- Approved for RNP 4; and
- Equipped with Automatic Dependent Surveillance-Contract (ADS-C); and
- Equipped with Controller-Pilot Data Link Communications (CPDLC).

The required Communications, Navigation and Surveillance (CNS) systems must be operational, and flight crew must report any failure or malfunction of GPS, ADS-C, or CPDLC equipment to Air Traffic Control as soon as it becomes apparent.

In order to be able to utilise a track defined by half-degree waypoints, the flight crew must have uplinked the relevant route into the FMS, either via CPDLC (when the Oceanic Control Centres are appropriately equipped) or from Simbrief/PFPX etc as part of flight preparation. **Manual entry into the FMS of a track defined by half-degree waypoints is not permitted.**

**Flight Planning**


Only those operators/aircraft eligible for RLatSM operations will be allowed to operate on designated RLatSM tracks between FL 350-390 (inclusive). All RLatSM tracks will be underlined in the OTS Track Message, with RLatSM tracks and FLs uniquely identified in Remark 3. In the above graphic, tracks W, X and Y are all RLatSM tracks.

The following ICAO Flight Plan annotations in Items 10 and 18 indicate that required RLatSM CNS systems are operational for the flight.

- Item 10a (Radio communication, navigation and approach-aid equipment and capabilities): 'J5' indicates Inmarsat CPDLC SATCOM and 'J7' indicates CPDLC Iridium SATCOM data link equipage and operation;
- Item 10b (Surveillance equipment and capabilities): 'D1' indicates ADS-C equipage and operation;
- Item 18 (Other information): 'PBN/' followed by 'L1' indicates RNP 4 authorisation.

**Clearance onto an RLatSM Track**

Initially, aircraft will only be issued a clearance onto the RLatSM track which uses half-degree latitude waypoints if that track has been requested in the flight plan, and uplinked direct in to the FMS via Company Route request/ACARS etc.

If a flight is planned on a half-degree track, but the flight crew are unable to uplink the route during flight preparation, they should request a re-route onto a whole-degree track, or a non-RLatSM track.

**Manual entry into the FMS of a track defined by half-degree waypoints is not permitted.**

In the graphic example above:

- Only flights which had been flight-planned onto Track X would be given a clearance onto that track; however, they could be re-routed onto Tracks W or Y
- A flight which had been flight-planned onto Track W could not be re-routed onto Track X, but could be re-routed onto Track Y

When CPDLC uplink of routes (in the appropriate ARINC format) is available to ATC, aircraft may be cleared onto an RLatSM track, defined by half-degree waypoints, other than that which was flight-planned. As a precaution against possible waypoint-insertion errors, rerouting of flights onto RLatSM identified tracks containing half-degree coordinates will only be permitted via CPDLC route-uplink from the relevant Oceanic Control Centre.

Aircraft will not be cleared to join an RLatSM track after the OCA boundary, but may be cleared to leave such a track before OCA exit.

### **Waypoints and Navigation Errors**

Existing navigation displays truncate waypoints consisting of latitude/longitude to a maximum of seven characters; minutes of latitude are not displayed. To mitigate the possibility of gross navigational errors resulting from incorrect waypoint insertion, it is imperative that established procedures are followed for route insertion and checking.

Flight crew are further advised that, should they be notified by ATC that systems indicate the aircraft is not flying the cleared route, they should immediately display the full° and minutes loaded in to the FMC for the NEXT and NEXT+1 waypoints, and verify against the cleared route before responding.

ATC Notifications of possible track deviation will be in the following format:

Voice message example: 'SHANWICK CONFIRMS YOUR POSITION REPORT INDICATES INCORRECT ROUTING. CHECK FULL° AND MINUTES LOADED INTO FMC. YOUR CLEARED ROUTE IS [route]'

CPDLC message example: 'YOUR POSITION REPORT INDICATES INCORRECT ROUTING. CHECK FULL° AND MINUTES LOADED INTO FMC. YOUR CLEARED ROUTE IS [route]'

### **TCAS**

Operative TCAS is required at dispatch for flight in RLatSM airspace. If the TCAS fails after dispatch, the flight can continue as planned.

### **Failure of Communication, Navigation or Surveillance Systems**

If a flight experiences a failure of a CNS system required for RLatSM PRIOR TO DEPARTURE, the flight should be planned so as to remain clear of NAT RLatSM tracks between FL 350-390 (inclusive).

If a flight experiences a failure of a CNS system required for RLatSM AFTER DEPARTURE BUT PRIOR TO ENTERING RLATSM AIRSPACE, the flight crew should contact ATC and request a revised clearance which will keep the flight clear of NAT RLatSM tracks between FL 350- 390 (inclusive).

If a flight experiences a failure of a CNS system required for RLatSM WHILE OPERATING IN RLATSM AIRSPACE, ATC must be advised immediately. Such flights may be re-cleared to exit RLatSM airspace, but consideration will be given to allowing the flight to remain in the airspace, based on tactical considerations.

### **Contingency Procedures**

Contingency procedures for NAT operations (see [In Flight Contingencies](#) above), including procedures for SLOP and weather deviation, are unchanged during operations in RLatSM airspace. However, flight crew should be particularly vigilant if flying 15 nm offset, because of the potential proximity of other traffic.

If a flight experiences an Urgency situation or an Emergency whilst flying in datalink airspace, it is recommended that flight crew set the CPDLC to Emergency mode. Doing so will alert the controller to the flight's situation in the shortest time.

Moreover, if the Commander determines that a diversion across the Organised Track System, or a turn-back, is required, it is highly advisable to contact ATC first (if practicable) to determine a suitable level at which to fly. If it is not possible to contact ATC, it is strongly recommended to exit the OTS by climbing above FL410 or descending below FL285 before crossing the OTS or turning back.

**CANADA****AIRSPACE DESCRIPTION****High Level Airspace**

- Within Southern Control Area Controlled Airspace – At and above 18,000ft.
- Within Northern Control Area Controlled Airspace – At and above FL230.
- Within Arctic Control Area Controlled Airspace – At and above FL270.

Airways referred to as Jet Routes.

**Low Level Airspace**

- Low Level Airways up to but not including 18,000ft.

Airways referred to as Victor Routes.

**RVSM (Reduced Vertical Separation Minimum)**

Canadian Airspace between FL290–410 is now designated as RVSM; vertical separation is reduced from 2,000ft to 1,000ft. There is a minimum equipment requirement and an associated altimeter check before flight into RVSM airspace – see relevant manual for aircraft type.

**Northern Track System**

A Northern Track System in the Northern Control Area interacts with the established Airway System in the Southern Control Area. This system consists of Primary Tracks and a number of secondary Laterals. For flights operating within the NCA Track System, position reports are to be indicated by the compulsory reporting point designator. In cases where these points have not been named, pilots should use the published coordinates for that point.

Example: For a flight on NCA Track BRAVO where it crosses 80°W—“*SIX SEVEN THREE ZERO NORTH, ZERO EIGHT ZERO WEST AT (time)*”.

**Southern Control Area Track System – Winnipeg/Montreal FIRs**

To expedite traffic flow, a system of commonly used routes has been designated from 18,000ft asl and above, for use by traffic between the Mid-West/Western USA and Europe. Each route has been assigned a code letter.

**VORs in Northern Canada**

Many VORs are orientated on True North. These are generally in the magnetic compass unusable or erratic areas. The charts are marked to indicate this.

**PROCEDURES****Altimeter Setting Procedures**

Canadian airspace is divided into two regions for altimeter settings:

1. Altimeter Setting Region – QNH up to 18,000ft. Aircraft use the altimeter setting of the nearest station along the route of flight.

Above 18,000ft altimeter is set to 29.92 inches (1013.2 mbs).

2. **Standard Pressure Region** - Aircraft in **uncontrolled** airspace within the Standard Pressure Region set Standard Pressure, except for take-off and landing. The Standard Pressure

Region is the sparsely-populated area of Canada where pressure data is generally not available.

Altimeter settings are given in inches.

### **Runway Heading**

When cleared to “fly or maintain runway heading”, pilots are expected to FLY THE RUNWAY HEADING WITH NO DRIFT CORRECTION applied.

### **Cruising Levels**

Pilots may request flight levels not appropriate to the airway or direction of flight but should make the reason for the request known to ATC, e.g. icing, turbulence or fuel considerations.

### **Mach No**

Advising ATC prior to any change of Mach No is particularly important in Canadian Domestic Airspace; this includes the change to economy Mach No after a N Atlantic crossing at a fixed Mach No.

### **Cruising Levels in the Northern Control Area**

In this airspace, TRUE track is used to determine cruising altitude for direction of flight.

### **Temperature Correction to Minimum Operating Altitude**

See [Cold Temperature Corrections](#) section of this manual.

The AIPs of Canada and the USA suggest that in cold conditions pilots should operate at least 1000ft above the published minimum en-route altitude.

### **Heavy Aircraft**

Pilots of heavy aircraft are required to use the word “HEAVY” on initial contact with each ATC unit. After communication has been established and when there is no likelihood of confusion, the word “HEAVY” may be omitted in Canada.

**Note:** There is no such alleviation in the USA, although custom and practice is similar.

### **Reduced Position Reporting**

In areas of Radar coverage, position reports may be discontinued when authorised by ATC. Pilots will be informed when to resume normal reporting procedures.

### **Flight Planning**

For flights planning to operate on a Northern Track or Lateral, the route is defined in the Flight Plan by the abbreviation NCA followed by the letter(s) and/or number(s) of the Tracks requested, e.g.:

Lateral 3 = NCA3

Northern Track Bravo = NCAB

For flights planning to operate on a “Southern Control Area Track” in the Winnipeg/Montreal FIRs, the route should be defined in the Flight Plan by the abbreviation SCA followed by the letter of the Track requested, e.g:

Southern Track Juliet = SCAJ



**Aerodrome Operating Minima (AOM) in Canada and the USA**

Special rules apply. See table below.

Canada Takeoff Minima	
Facilities	Ceiling/Visibility/RVR
High Intensity Runway Lights or Runway Centreline lights or Runway Centreline Markings	Nil/0.25SM or RVR 1200ft
High Intensity Runway lights and Runway Centreline lights and Runway Centreline Markings and Touchdown and Mid-point RVR reporting systems (both of which are required and controlling)	Nil/RVR 600ft

**Denial of ATC Clearance in Canada**

In Canada, ATC may deny take-off or landing clearance to crew if arrivals and departures on the active runway are suspended or restricted following implementation of a Reduced or Low Visibility Operating Plan.

Example phraseology:

“ATC: XYZ123, LVOP in effect, state your intentions.”

If the pilot persists with the intention to land or take-off, ATC will inform the pilot that a landing/take-off clearance cannot be issued and provide required information, which may include traffic, hazards, obstructions, runway exit or wind.

Example phraseology:

“ATC: Since landing/take-off clearance cannot be issued, you are landing/taking off on your own responsibility.”

Pilots should clarify any ambiguity with ATC.

**Communications**

Over Canada monitor 121.5 without Selcal.

VHF is used whenever possible supplemented by HF facilities.

**Arctic Radio/Baffin Radio**

Arctic Radio, centred near Cambridge Bay and Baffin Radio, centred near Iqaluit, are VHF networks supplementing the international HF network.

They accept IFR position reports and relay ATC clearances. They also provide weather and NOTAM information.

Initial contact is on 126.7.

**Holding**

Right hand turns are standard, adjusted to achieve 1 min at or below 14,000ft or 1½ min above 14,000ft inbound to the fix. Speeds are:

Up to 14,000ft	230 kt or less
Above 14,000ft	265 kt or less

**Speed Control**

Aircraft flying in controlled airspace and below 10,000ft asl are limited to maximum speed of 250 kts. Below 3,000ft agl and within 10 nm of an airport speed is limited to 200 kts for jets. Aircraft unable to manoeuvre safely at these speeds should operate at minimum safe speed.

Aircraft may operate at more than 250 kts below 10,000ft on departure.

**Other Traffic Information**

Radar Control advise aircraft of unidentified traffic in the near vicinity; they will also, on request, provide vectors to avoid this traffic.

**Visual Approach**

A "visual approach" is an approach by an IFR flight in which all or part of the instrument approach is not completed. Whenever the cloud ceiling is at least 500ft above the maximum radar vectoring altitude and the visibility at least 5 statute miles, IFR aircraft may be vectored to the airport traffic circuit and asked to complete a visual approach provided:

- The pilot has the airport in sight.
- The pilot reports sighting preceding IFR or VFR traffic.

Radar service is terminated when the pilot is told to contact Tower.

**LAHSO**

BAV are not authorised to operate LAHSO in Canada, see under USA for Land and Hold Short Operations (LAHSO) details.

**Weather Reports**

In N America/Canada visibility and RVR are recorded using statute miles and feet.

**Flight Service Station (FSS)**

A network of Flight Service Stations exists in Canada to provide weather and NOTAM information. It is particularly useful after a North Atlantic crossing for updates to weather information. Relay of IFR position reports and ATC clearances is also available. Initial contact is on 126.7 VHF, 5680 HF; the request can then be directed to the station coming in with the greatest clarity. The call should be something like:

"Any Flight Service Station this is Speedbird 185" and then in the case of Stephenville FSS responding first and with greatest clarity, the subsequent transmission would be:

"Stephenville Flight Service, Speedbird 185 requesting....."

FSSs usually operate H24 but may be difficult to raise during the 10 mins before each hour – at this time the operator is probably outside taking weather observations and then typing them into the network computer.

**ATIS**

Wind direction, as usual, will be °M.

Note: Magnetic variation in Canada can be in excess of 30°.

**Canadian Runway Friction Index (CRFI)**

Canadian aerodromes may report a Canadian Runway Friction Index (CRFI) value when reporting the state of contaminated runways.

The CRFI does not reflect the stopping performance of BAVirtual aircraft and therefore should not be used to compute take-off/landing performance. The Runway Condition Code (RWYCC), contaminant type and depth, and/or braking action should be provided alongside the CRFI and used instead for the computation of take-off/landing performance.

**En Route Diversion Aerodromes in N Canada**

The following are well equipped airfields N of about 50°N:

YYR	Goose	53 19N 60 25W
YFB	Iqaluit	63 45N 68 33W
YYQ	Churchill	58 44N 94 04W
YWG	Winnipeg	49 55N 97 14W
YZF	Yellowknife (Limited Hrs)	62 28N 114 27W
YXE	Saskatoon	52 10N 106 42W
YEG	Edmonton	53 19N 113 35W
YYC	Calgary	51 06N 114 01W

**USA****AIRSPACE DESCRIPTION****Aeronautical Information Manual (AIM)**

Published by the FAA; it is a pilot's guide to procedures in the USA. AIM references below are paragraph numbers or pilot/controller glossary (PCG) page numbers. Available here:

[http://www.faa.gov/air\\_traffic/publications](http://www.faa.gov/air_traffic/publications)

**Airways/Route Systems**

US airspace is divided into a two-level structure:

- a) Federal Airways – (Victor Routes) up to, but not including 18,000ft.
- b) Jet Route – From 18,000ft to FL450 inclusive.

Clearances are often given direct from present position over long distances.

National Route Program (NRP) enables more flexible use of US airspace. At the flight planning stage, the number of reporting points is reduced to a minimum over long distances using published guidelines; the abbreviation NRP is added to Item 18 of the ATC Flight Plan.

Uncontrolled VFR Traffic operating below 18,000ft is a problem for IFR flights in US airspace. The aircraft are not necessarily Transponder equipped and traffic information from ATC may be very late.  
**AIM 4-4-11.**

(Transponders are not mandatory below 10,000ft outside TMAs).

**RVSM (Reduced Vertical Separation Minimum)**

US airspace, including Alaska, Houston and Miami Oceanic and San Juan FIR between FL290–410 is now designated as RVSM. There is the standard minimum equipment requirement and an associated altimeter check before flight into RVSM airspace – see relevant manual for aircraft type. "W" is entered in Item 10 of the Flight Plan to indicate an aircraft is equipped to operate in RVSM airspace.

**ATCAA – ATC Assigned Airspace**

Is temporarily reserved airspace for military activity, which is not published internationally by NOTAM but is controlled by ATC. As these temporary areas are not published, flight planning cannot take account of them so 'on the day tactical' re-routes may be required, which will be managed by the ARTCC controlling the area. Deviations should be minor with some level capping or vectors provided.

**VATSIM 'Contact Me' Notifications**

Many VATSIM ATC units in the USA will **not** automatically send 'Contact Me' requests to aircraft entering their airspace or to aircraft in their airspace when they log in. Instead the pilot is expected to monitor regularly for ATC presence or be aware of when they are crossing a boundary from UNICOM in to a controlled sector and contact the controller on their own initiative. **VATSIM CoC B3.**

**PROCEDURES****VFR Traffic in TMAs**

Expect such traffic to be separated from your aircraft by as little as 500ft vertically and 1½ miles laterally (and, as a result, expect relatively frequent TCAS warnings). **AIM 3-2-3.**

Traffic Advisories – below 18,000ft and outside TMAs ATC will give information on VFR traffic but will not necessarily give radar vectors around the traffic unless requested. **AIM 5-5-10.**

During an arrival an aircraft may be vectored outside the TMA for spacing. ATC should (but might not) advise the aircraft that it is leaving Class B airspace; the inference is that vectors should probably be requested following a Traffic Advisory.

### **Altimeter Setting Procedures**

Altimeter settings are given in inches mercury.

- a) For cruise below 18,000ft – Altimeter to be set according to the reported altimeter setting of a station along the route (QNH). **ENSURE DESTINATION QNH IS SET ONCE IN CONTACT WITH APPROACH CONTROL**; they may not issue a specific instruction to do so.
- b) For cruise at or above 18,000ft – Altimeter to be set to 29.92 ins/1013.2 mbs.

### **Vacating Altitudes/FLs**

Vacating any previously assigned altitude/FL for a newly assigned altitude/FL must be reported to ATC. Reaching an assigned altitude/FL is not subject to a report. **AIM 5-3-3.**

### **Speed Control**

In accordance with Federal Aviation regulations:

- a) Aircraft speed shall not exceed 250 kts IAS during flight below 10,000ft asl, unless otherwise authorised.

**Note:** That maintaining a speed above 250 kts, level at 10,000ft, is acceptable. The practice of (a) maintaining high speed on arrival or (b) increasing speed above 250 kts on departure, while the aircraft is below 10,000ft and more than 12 nm off the coast (e.g. JFK) **MUST** be co-ordinated with ATC.

- b) Airport Traffic Area (4.34 nm radius of an airport, ground level to, but not including 3,000ft). Aircraft speed shall not exceed 200 kts.
- c) If the minimum airspeed for safe manoeuvrability is greater than the above, the aircraft may be operated at that speed (controllers advise that this should be co-ordinated with ATC). Notify ATC if flying more than 10 kts LESS than planned speed.

## **CLEARANCES**

“MAINTAIN” – The altitude/FL instructions in an ATC clearance will normally require that a pilot “MAINTAIN” an altitude/FL. When ATC has not used the term “AT PILOT’S DISCRETION” nor imposed any climb or descent restrictions, pilots should initiate climb or descent promptly on acknowledgement of the clearance.

Descend or climb at an optimum rate consistent with the operating characteristics of the aircraft to 1,000 feet above or below the assigned altitude, and then attempt to descend or climb at a rate of between 500 and 1,500 fpm until the assigned altitude is reached. Optimum rate can be interpreted as the best rate commensurate with a fuel efficiency. If ATC require a different rate, they will tell you. If you cannot achieve a rate of at least 500 feet a minute, advise ATC.

If it is necessary to level off at an intermediate altitude during climb or descent, advise ATC, except when leveling off at 10,000 feet MSL on descent, or 2,500 feet above airport elevation (prior to entering a Class C or Class D surface area), when required for speed reduction. **AIM 4-4-10**

“DESCEND VIA” Clearance – Authorises pilots to vertically and laterally navigate in accordance with a depicted procedure, e.g. “Descend via the Civit One Arrival.” **AIM 5-4-1.**

**“CRUISE”** Clearance – The term CRUISE may be used for a cruise climb or descent. The pilot may level off at any intermediate level between the minimum IFR level and the altitude specified in the clearance. Climb/descent within the block is to be made at the discretion of the pilot. However, once the pilot starts descent and verbally reports leaving an altitude in the block, he may not return to that altitude without additional ATC clearance. **AIM 4-4-3.**

At times controllers will ask pilots to verify that they are at a particular altitude. The phraseology used will be: “VERIFY AT (altitude).” In climbing or descending situations, controllers may ask pilots to “VERIFY ASSIGNED ALTITUDE AS (altitude).” Pilots should confirm that they are at the altitude stated by the controller or that the assigned altitude is correct as stated. If this is not the case, they should inform the controller of the actual altitude being maintained or the different assigned altitude. **AIM 5-3-1.**

### **Heavy Aircraft**

Pilots of heavy aircraft in the USA should always suffix their callsign with the word “HEAVY”. Note that there is no alleviation to limiting this to first contact. **AIM 7-3-8.**

### **Callsigns**

Are spoken using group form for the numbers:

BAW05	Heavy is transmitted as SPEEDBIRD FIVE HEAVY (not Zero Five)
BAW11	Heavy is transmitted as SPEEDBIRD ELEVEN HEAVY (not One One)
BAW178	Heavy is transmitted as SPEEDBIRD ONE SEVENTY EIGHT HEAVY (not One Seven Eight)
BAW1423	Heavy is transmitted as SPEEDBIRD FOURTEEN TWENTY THREE HEAVY (not One Four Two Three). <b>AIM 4-2-4.</b>

### **Reduced Position Reports**

When informed by ATC that their aircraft is in “RADAR CONTACT”, pilots will discontinue position reports over compulsory reporting points. Pilots must report when vacating any previously assigned altitude/flight level for a newly assigned altitude/flight level.

Pilots must resume normal position reporting when ATC advise “RADAR CONTACT LOST” or “RADAR SERVICE TERMINATED”. **AIM 5-3-2.**

### **Holding**

Right hand turns standard, adjusted to achieve 1 min at or below 14,000ft or 1½ min above 14,000ft inbound to the fix. Speeds are:

Above 6,001ft to 14,000ft	230kt or less 210kt or less when published as an exception
Above 14,000ft	265kt or less

An ATC clearance requiring an aircraft to hold at a fix where the pattern is not charted will include the following information:

1. Direction of holding from the fix in terms of the eight cardinal compass points (i.e., N, NE, E, SE, etc.).
2. Holding fix (the fix may be omitted if included at the beginning of the transmission as the clearance limit).

3. Radial, course, bearing, airway or route on which the aircraft is to hold.
4. Leg length in miles if DME or RNAV is to be used (leg length will be specified in minutes on pilot request or if the controller considers it necessary).
5. Direction of turn if left turns are to be made, the pilot requests, or the controller considers it necessary.
6. Time to expect further clearance and any pertinent additional delay information. **AIM 5-3-8.**

**Minimum Fuel Advisory**

Advise ATC when fuel has reached a state where any undue delay at destination is unacceptable. This call does not declare an emergency and does not imply a need for traffic priority. On initial contact the term "MINIMUM FUEL" should be used after your callsign, e.g. "*Philadelphia Approach, Speedbird 219, Minimum Fuel, ----.*" IF TRAFFIC PRIORITY IS REQUIRED YOU MUST DECLARE AN EMERGENCY, reporting fuel remaining in minutes. **AIM 5-5-15.**

**Speed Control**

Aircraft operating between F280 and 10,000 feet must maintain a minimum of 250 Kts. Arriving turbojet aircraft operating below 10,000 feet must maintain:

- a) A speed not less than 210 knots, except;
- b) Within 20 flying miles of the airport of intended landing, a speed not less than 170 knots. **AIM 4-4-12.**

**ILS Critical Area Protection**

At or above ceiling 800ft and/or visibility 2 sm:

1. No critical area protective action is provided under these conditions.
2. A flight crew under these conditions should advise the tower that it will conduct an AUTOLAND or COUPLED approach to ensure that the ILS critical areas are protected when the aircraft is inside the ILS MM. **AIM 1-1-9.**

Pilots are cautioned that vehicular traffic not subject to ATC may cause momentary deviation to ILS course or glide slope signals. **AIM 1-1-9.**

Crews should be cautious of localiser and glidepath signals during an ILS approach in weather conditions of ceiling 800ft and/or 2 sm or better. In conditions below this, the localiser is protected inside the middle marker.

**Parallel ILS Approaches**

Airports having parallel runways separated by at least 2,500ft may operate parallel ILS approaches to both runways. Aircraft will be given staggered separation from aircraft on the adjacent localiser. **AIM 5-4-13.**

**Simultaneous Parallel ILS Approaches**

Airports having parallel runways separated by at least 4,300ft may operate a system of simultaneous ILS approaches to both runways. The 4,300ft limit may be reduced with increased ATC monitoring of aircraft on final approach; the term ILS Precision Runway Monitor (ILS PRM) may be used. SIMULTANEOUS CLOSE PARALLEL APPROACH is the term used to describe this reduced separation. **AIM 5-4-15.**

**ILS PRM – Simultaneous Converging Approaches**



When the ATIS broadcast advises ILS PRM approaches are in progress (or ILS PRM and LDA PRM approaches in the case of SOIA), pilots should brief to fly the ILS PRM. Pilots will be informed on initial contact or via the ATIS. It is worth briefing the communications and breakout procedures associated with these approaches. **AIM 5-4-16.**

### **Radar Vectors**

Be aware that the Airport Surveillance Radar can be referred to as 'ASR'. By implication an 'ASR to ILS' would be radar vectors to ILS.

### **DME ARC Procedures**

The procedure is to fly at the DME range as specified on the chart or as given by ATC to intercept the relevant approach, e.g. "*SPEEDBIRD 175 Arc 10 to Rwy 07R*". The requirement is to fly a constant DME range of 10 nm until intercepting the final approach to Rwy 07R.

### **Side-step Manoeuvre**

ATC may authorise an approach procedure which serves either one of parallel runways that are separated by 1,200ft or less followed by a straight-in landing on the adjacent runway, e.g. "Cleared for ILS runway 07 left approach, side-step to runway 07 right". Pilots are expected to commence the side-step manoeuvre as soon as possible after visual contact. **AIM 5-4-19.**

### **Land and Hold Short Operations (LAHSO)**

Landing and holding short of an intersecting runway, taxiway or designated point on a runway. Yellow, parallel hold-short lines will be painted across the runway and in-pavement lighting may be included. **AIM 4-3-11.**

**BAV (along with other international operators) policy is NOT TO PARTICIPATE in LAHSO for landing or departure, neither actively (cleared to land and hold short), nor passively (other aircraft cleared to land and hold short). If ATIS advises LAHSO in use, advise ATC "UNABLE TO PARTICIPATE" on first contact. Crews should refuse any LAHSO offered by ATC.**

**If in doubt confirm with ATC that other aircraft will not carry out LAHSO on any intersecting runway that may be in use for your arrival or departure.**

It should be born in mind that if LAHSO are underway at an airport, an aircraft landing on another runway may fail to 'hold short'.

Even though not taking part in LAHSO lighting for such operations, white strobes at intersecting runways, may be left on during your approach.

### **Visual Separation**

Acceptance of instructions to follow another aircraft or to maintain visual separation from it is an acknowledgement that the pilot will avoid the other aircraft or maintain in-trail separation and accept responsibility for wake turbulence separation. **AIM 5-5-12.** (Visual separation instructions are used at night. During a climb out from Phoenix at night a BA aircraft was given visual separation instructions; a TCAS incident resulted).

### **Visual Reference Lost while Circling from an Instrument Approach**

Same as the rest of the world. The missed approach for the instrument let down just flown should be carried out. To establish on the missed approach course, make a climbing turn towards the landing runway and then continue the turn until established on the missed approach course. This ensures that the aircraft remains within the circling area while climbing to a safe altitude. **AIM 5-4-21.**

### **Visual Approach**



May be conducted on an IFR Flight Plan and authorises a pilot to proceed visually to the airport, often reducing track miles to landing. The pilot must have either the airport or the preceding aircraft in sight. If the pilot has the airport in sight but cannot see the aircraft to be followed, declare this.

ATC may clear your aircraft for a visual approach; however, ATC retains both separation and wake vortex separation responsibility. When visually following a preceding aircraft, acceptance of the visual approach clearance constitutes pilot acceptance of separation and wake vortex separation responsibility. Be aware that if radar service is being received, it may be automatically terminated when told to contact the tower. **AIM 5-5-3.**

If not familiar with an airfield, be certain the correct airfield is identified before accepting a visual clearance, and be aware of the consequences of doing so.

### **Visual Approach Go Around**

A visual approach has no missed approach segment. If a Go Around is necessary, instructions from ATC should be given. However, IF ATC FAIL TO GIVE INSTRUCTIONS THEN THEY MUST BE IMMEDIATELY REQUESTED.

### **Go Arounds**

A clearance for an instrument approach procedure includes a clearance to fly the published missed approach procedure, unless otherwise instructed by ATC. The published missed approach procedure provides obstacle clearance only when the missed approach is conducted on the missed approach segment from or above the missed approach point, and assumes a climb rate of 200 feet/NM or higher.

In the event a balked (rejected) landing occurs at a position other than the published missed approach point, the pilot should contact ATC as soon as possible to obtain an amended clearance. If unable to contact ATC for any reason, the pilot should attempt to re-intercept a published segment of the missed approach and comply with route and altitude instructions. If unable to contact ATC, and in the pilot's judgment it is no longer appropriate to fly the published missed approach procedure, then consider maintaining visual conditions. **AIM 5-4-21.**

### **Landing Clearance**

Expect to receive landing clearances with one or more aircraft still ahead of your aircraft. The clearance you are receiving is to land in sequence if it is safe to do so. This sort of landing clearance requires special vigilance at night.

### **Gate Number**

Obtain parking gate number on the company frequency before landing.

### **Taxiing after Landing**

Taxi clear of the runway unless otherwise directed by ATC. An aircraft is considered clear of the runway when all parts of the aircraft are past the runway edge and there are no restrictions to its continued movement beyond the runway holding position markings. In the absence of ATC instructions, the pilot is expected to taxi clear of the landing runway by taxiing beyond the runway holding position markings associated with the landing runway, even if that requires the aircraft to protrude into or cross another taxiway or ramp area. Once all parts of the aircraft have crossed the runway holding position markings, the pilot must hold unless further instructions have been issued by ATC. **AIM 4-3-20.**

### **Ground Movement**

#### **Taxi Clearances**

After an incident involving a BAV aircraft, the UK CAA, prompted by the FAA, give the following warning:

Crews are reminded of the importance of strictly adhering to all taxi clearances at US airports. All runway hold short instructions should be read back to ATC when requested. The FAA will levy substantial fines on pilots violating taxi clearances especially any runway incursion. Extra care must be taken during periods of reduced visibility such as fog, heavy rain or snow. If in doubt about any taxi clearance stop and request clarification from ATC.

**IFR Clearances**

If using R/T, call clearance delivery or ground control not more than 10 minutes before proposed taxi time. **AIM 5-2-1.**

**Expect Departure Clearance Time (EDCT).**

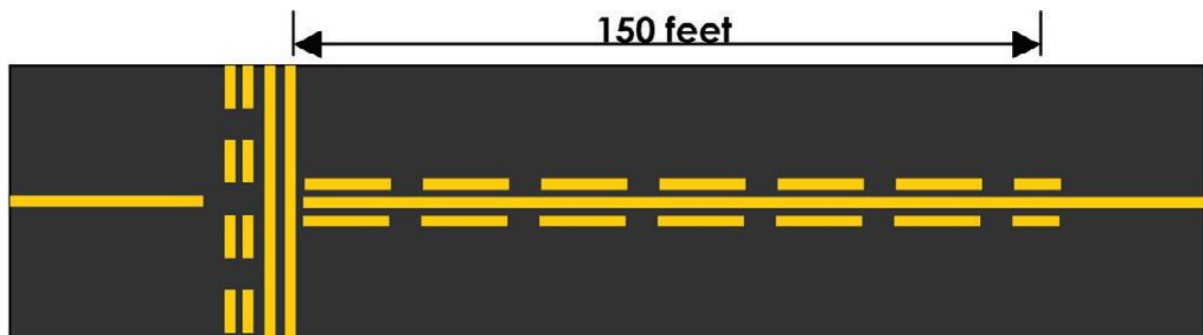
The EDCT is the runway release time assigned to an aircraft included in traffic management programs. Aircraft are expected to depart no earlier than 5 minutes before, and no later than 5 minutes after the EDCT. Similar to TSAT in Europe. **AIM 5-2-6.**

**TAXI TO Clearance**

When issuing taxi instructions to any point other than an assigned take-off runway, ATC will specify the point to taxi to, issue taxi instructions, and state any hold short instructions or runway crossing clearances if the taxi route will cross a runway. **AIM 4-3-18.**

**Taxiway Centreline Markings**

Standard Taxiway centreline markings are being progressively changed at US airports to provide a visual clue to pilots that they are approaching a runway holding position. Dashed yellow lines are placed on both sides of the taxiway centreline starting 150ft prior to the holding point.

**ILS Critical Area Holding Signs**

'ILS' in white on a red sign confirms the hold markings on the taxiway, indicating the proximity of the ILS critical area. **AIM 2-3-28.**

**Runway Centreline Lighting System (RCLS)**

Installed on some precision approach runways. Lights are spaced at 50ft (15.24 m) intervals. **AIM 2-1-5.**

**Changing to Tower Frequency before Take-off**

Unless otherwise instructed, remain on ground control frequency until ready to request take-off, then change to tower frequency. Pilots are encouraged to monitor the local tower frequency as soon as practical consistent with other ATC requirements. **AIM 4-3-14.**

**Use of Landing Lights Prior to and for Take-off**

Pilots are encouraged to turn on their landing lights when taxiing on, across, or holding in position on any runway and either after take-off clearance has been received or when beginning the take-off roll. **AIM 4-3-23.**

**Wake Turbulence Separation**

Timed OR radar distance separation is applied between departing aircraft. **AIM 7-3-9.**

If a timed separation is to be insisted upon rather than accepting radar distance separation, ATC must be informed before the aircraft enters the runway for take-off.

**Departure Control**

When cleared to “fly or maintain runway heading”, pilots are expected to FLY THE RUNWAY HEADING WITH NO DRIFT CORRECTION applied. When a departure is to be vectored immediately following take-off, the pilot will be advised prior to take-off of the initial heading to be flown but may not be advised of the purpose of the heading. **AIM 5-2-7.**

**Omission of Departure Control Frequency**

Controllers may (and normally do) omit the departure control frequency if an assigned departure procedure has a published frequency. **AIM 5-2-7.**

**Runway Distance Remaining Signs**

A white numeral on a black sign indicates the number of thousands of FEET remaining to the end of the runway, e.g. 3 indicates 3,000ft remaining. These signs may be installed along one or both sides of the runway. **AIM 2-3-13.**

**Abbreviation of Frequencies**

Ground frequencies may be abbreviated to the decimal number, e.g. 121.7 becomes “point seven”. **AIM 4-3-14.**

**Delay/ATC Flight Plan**

To ensure that a flight plan remains active pilots, whose actual departure time will be delayed by more than 1 hour, should inform ATC of the new ETD. **AIM 5-1-11.**

**Airways Clearance Read-back**

At most USA airfields it is not necessary to read back the full airways clearance IF the route is as flight planned. Read back only the assigned transponder code.

**EFC (Expect Further Clearance) Time**

The time a pilot can expect to receive clearance beyond a clearance limit.

At an approach holding point this is equivalent to an EAT.

**Departure Clearance**

Clearances may be given without a transition being assigned from ATC. ATC assume you will fly to the transition given as the first point on the flight plan (e.g. MERIT out of JFK). If the SID has changed from what was expected on the OFP then the crew may miss this and join the legs to a point further down route.

**Departure Procedure**

There are two types of DP: Obstacle Departure Procedures (ODPs), printed either textually or graphically, and Standard Instrument Departures (SIDs), always printed graphically. All DPs, either textual or graphic, may be designed using either conventional or RNAV criteria.

ODPs are only used for obstruction clearance and do not include ATC related climb requirements. SIDs may contain ATC climb requirements and are either pilot nav or vector SIDs. Pilot nav SIDs may be either RNAV-based or using conventional navigation aids. **AIM 5-2-8.**

**Transition**

A point at which a DP (Departure Procedure) is left and a STAR joined.

**Aerodrome Operating Minima (AOM) in the USA and Canada**

Special rules apply. See table below.

<b>USA Takeoff Minima</b>	
<b>Facilities</b>	<b>Ceiling/Visibility/RVR</b>
High Intensity Runway lights or Runway Centreline lights or Runway Centreline Markings or (if daylight) the runway is marked such that the pilot can maintain adequate visual reference throughout the take-off run	Nil/Visibility 0.25SM or 1600ft RVR (Note 1)
Runway Centreline lights and two RVR reporting systems (both are required and are controlling)	Nil/RVR1200ft (Stop-end RVR1000M) (Note 2)
Runway Centreline lights and Runway Centreline markings and two or three RVR reporting systems (all are required and are controlling)	Nil/Touchdown Zone 600ft, Mid Point and Stop-end RVR 600ft (Note 3)

**Note 1:** The Touchdown zone RVR Report if available is controlling

**Note 2:** Mid-point RVR may be substituted for Touchdown Zone RVR or Stop-end RVR if either is available

**Note 3:** Where only 2 RVR systems are installed the touchdown zone and rollout RVRs are required and controlling.

**Diversions from New York**

ATC advise that it takes 10–15 minutes to process a diversion clearance.

Aircraft should therefore make their request early so that clearance is readily available should it be required.

**Windsor Locks (Bradley Intl) KBDL**

A well-equipped airfield situated midway between New York and Boston. Useful to know about during periods of wide spread poor weather along the eastern seaboard.

**Wind Shear**

Pilots are requested to volunteer reports to controllers of WINDSHEAR conditions they encounter. Avoid the use of “negative” or “positive” WINDSHEAR. Report loss/gain of airspeed and the altitude(s) at which it was encountered, e.g. *“Kennedy Tower, Speedbird 193 Heavy encountered WINDSHEAR, loss of 20 kts at 400ft”*. **AIM 7-1-21.**

**Weather**

ATC are mandated to vector you clear of severe weather. PIREPs contribute to the effectiveness of the US “Flight Watch” service. This service is designed to provide aircraft with timely weather advisories pertinent to the type of flight intended, route of flight, and altitude.

**Automated Weather Observing**

The onset of automation in N America has added new groups to forecasts and actuals. The important data remains in the recognisable format. **AIM 7-1-10.**

**LLWS (Low Level Wind Shear Alert System)**

Through ATC, provides pilots with details of hazardous WINDSHEAR and microburst activity near the airport. **AIM 7-1-23.**

Experience has shown that it may be necessary to ask ATC for information they have available on Cb and microburst activity, for instance while assessing conditions for a take-off.

**SCATANA**

See under Canada.

**Braking Action Advisories**

BA ADVYS on ATIS is abbreviation for BRAKING ACTION ADVISORIES and is associated with degraded braking action or runway surface contamination. Crew must contact the TWR for confirmation of actual braking action or runway surface contamination when ATIS includes BA ADVYS.

**NEAR MID-AIR COLLISION (NMAC)**

An NMAC in the USA is defined as an incident associated with the operation of an aircraft in which a possibility of a collision occurs as a result of proximity of less than 500ft to another aircraft or the crew member feels that a collision hazard existed between two or more aircraft (e.g. ~IFR/VFR conflict).

Crews should report such incidents immediately on the frequency in use, using the term “near mid-air collision”. **AIM 7-6-3.**

**SWAP (SEVERE WEATHER AVOIDANCE PLAN)**

These are formalised plans in areas that are particularly susceptible to severe weather. They are developed, co-ordinated and implemented to reduce ATC restrictions associated with rerouting aircraft around areas of severe weather.

If SWAP is annotated on the METAR delays can be expected on arrival into the TMA due to extended track miles and/or reroutes. On departure ground delays may be experienced.

**CONSTRUCTION ATIS RECORDINGS**

For runways that are undergoing construction or have recently completed construction, operators and pilots can expect to hear the following messages via the ATIS recording. In situations where the runway has been shortened, operators will hear “WARNING” and “SHORTENED”.

- For example: “WARNING, RUNWAY (number) has been SHORTENED, (length in feet) FEET AVAILABLE.”

In addition, it states that, “SHORTENED” will be used as part of the take-off (or line up and wait) and landing clearance...’

- For example: “RUNWAY (number) SHORTENED, CLEARED FOR TAKE-OFF.”

**Note:** These procedures will apply for the duration of works or until a permanent shortening of the runway is reflected accordingly in aeronautical publications. **FAA Info notice 11015.**

## POLAR AREA INCLUDING NORTH PACIFIC

### UK-ALASKA

### ROUTING

The western routes from UK to Japan typically take the aircraft N of Iceland, over the N of Greenland and into the latitudes N of Anchorage, Alaska.

### AIRSPACE DESCRIPTION

#### Atlantic Oceanic Control Area

From FL 55 – Unlimited, except the Domestic Sector of Reykjavik Oceanic CTA.

**Note:** That Sondrestrom only exercises control in the Greenland area in their FIR below FL195. Above this level is Reykjavik CTA to the N and Gander CTA to the S.

#### Canada

Canadian airspace is divided into 3 basic areas:

- **Arctic Control Area** – From FL 270 upwards.
- **Northern Control Area** – From FL 230 upwards.
- **Southern Control Area** – From 18,000ft upwards.

### MINIMUM NAVIGATION PERFORMANCE SPECIFICATION AIRSPACE

Aircraft operating within MNPS Airspace are required to have a minimum navigational performance capability to allow reduced separation between aircraft.

Exact equipment requirements are detailed in the fleet specific MEL.

#### Atlantic

The MNPS airspace over the North Atlantic is that airspace:

- a) FL 285 – FL 420.
- b) The Southern Portion of the Santa Maria Oceanic, thence from 27°N – North Pole.
- c) Bounded in the E by the E boundaries of CTAs Santa Maria Oceanic, Shanwick Oceanic and Reykjavik.
- d) Bounded in the W by the W boundaries of CTAs Reykjavik, Gander Oceanic, New York Oceanic and Santa Maria Oceanic, excluding the area W of 60°W and S of 38° 30'N within New York Oceanic.

#### Canada

Canada has implemented RVSM/MNPS Airspace.

**AIR TRAFFIC CONTROL****Atlantic**

Aircraft Crossing 61°N at 10°W or East of 10°W – This is the boundary between Scottish and Reykjavik. Hand over is under radar. Oceanic Clearance should be requested from Scottish not more than 30 mins and not less than 10 mins prior to the Oceanic boundary.

**Iceland**

All flights routing through Reykjavik airspace onto North Canadian Arctic tracks (NCA) A, B or C shall make position reports and estimates for 60°W in latitude and longitude. All flights routing along the Polar Track Structure whilst in Reykjavik airspace shall make FULL position reports indicating both latitude and longitude. (For any 'named' points use associated name).

**Polar Tracks**

In order to facilitate the flow of traffic between Europe and Alaska a Polar Track structure has been established. These Polar Tracks are fixed tracks; they are located N of the airspace used by the Atlantic Organised Track System.

Note that the tracks may be defined as Magnetic or True.

**Flight Plan** – Flights operating on the Polar Tracks define their tracks by the appropriate Polar Track number or letter prefixed by PTS.

**ATC Clearance** – When the whole of a Polar Track is being followed, an abbreviated clearance may be issued which will include:

- i. Track specified by the track code.
- ii. FL.
- iii. Mach No.

On receipt of an abbreviated clearance, the pilot shall read back the contents of the clearance message, and in addition, the full details of the Track if the clearance has been received from Reykjavik.

When W-bound a clearance along a Polar Track will normally be received through Scottish ATCC while still in Scottish airspace, and the abbreviated clearance should be read back as given.

**Position Reports** – Unless otherwise requested, position reports should be made at the significant points depicted on the relevant Polar Track.

When operating on a Polar Track position reports may be abbreviated, except in Reykjavik FIR, by replacing the normal latitude co-ordinate with the Track identifier, e.g.: "Speedbird 005, Polar Q 20W 1537, FL 310, Polar Q 40W 1620, "Alert" next".

**Track and ETA** – As with other North Atlantic routes, separation is procedural and based on Mach No Technique. Hence maintaining the cleared Track and Mach No is important.

**Canada****Altimeter Setting Procedure**

Canadian Airspace is divided into two regions:

- i. Standard Pressure Region – Use standard pressure setting (29.92") except in controlled airspace below 18,000ft asl.



- ii. Altimeter Setting Region – Use QNH below 18,000ft asl. Altimeter settings given in inches.

**Northern Track System** – This System consists of primary Tracks and a number of secondary Laterals. TRUE track is used as opposed to magnetic track.

**ATC Clearances** – When aircraft are cleared via a Northern Track the ATC clearance and pilots read back will be in the following format:

“ATC CLEARS (Identification) TO (Destination) VIA NORTHERN TRACK (Code); (flight plan route or route details); TO MAINTAIN (flight level); MACH NO.; (Mach No.); (other instructions or information)”.

#### **Position Reports**

- i. Identification.
- ii. Reporting Point and Time.
- iii. Altitude/FL.
- iv. Next Reporting Point and Time (GMT).
- v. Subsequent Reporting Point.

When operating along a Northern Track and making a position report, the position will be expressed by the code name of the Track and the reporting line meridian; e.g. “Speedbird 005, Bravo 80W 1700, FL 310, Bravo 90W 1740, Bravo 100W next”.

**Adherence to Mach No, Track and ETA** – In the N of Canada, as in Oceanic Airspace, ATC is procedural. Hence adherence to track, ETA and Mach No is essential.

#### **Flight Planning**

For flights planning to operate on one of the established Tracks, the route should be defined in the Flight Plan by the abbreviation NCA followed by the letter(s) and/or number(s) of the Tracks requested, e.g.:

Lateral 3 (i.e. lateral track within the Northern Track system) – NCA3.

Northern Track Bravo – NCAB.

#### **Alaska**

The route across Alaska is controlled entirely through remote VHF from Anchorage. There is complete Radar coverage.

There is good coordination between Canadian and Alaskan ATC. On approaching Alaska from the E, flights are given a detailed clearance by Anchorage followed by direct routings once in their FIR.

In the Anchorage area there is much low level light traffic, a significant proportion of which ignores ATC.

Within the Anchorage FIR use the MNPS position report format including ‘NEXT’ position.

#### **ABNORMALLY HIGH BAROMETRIC PRESSURE**

Extremely high pressures over Alaska during Winter 88/89 resulted in off scale altimeter settings. At Anchorage the maximum reached was 31.53 inches and at Fairbanks 31.85 inches.

FAA regulations require that when the Barometric Pressure exceeds 31.00 inches all aircraft set 31.00 inches for en route operations below 18,000ft altitude until beyond the affected area.



At the beginning of the final approach segment the current altimeter setting will be set if possible. If not possible 31.00 inches will remain set throughout the approach. Aircraft on departure or missed approach will set 31.00 inches prior to reaching any mandatory/crossing altitude or 1,500ft agl whichever is lower.

For aircraft with the capability of setting the current altimeter setting no additional procedures apply.

For aircraft operating IFR and unable to set the current altimeter setting the following procedures apply:

1. To determine the suitability of destination and alternate airports increase the ceiling requirements by 100ft and visibility requirements by  $\frac{1}{4}$  sm for each 1/10 inch (or portion thereof) of Hg over 31.00 inches.
2. On approach 31.00 inches will remain set. Decision Ht/Alt shall be deemed to have been reached when the published minimum height/altitude is displayed on the altimeter (the aircraft will be higher than displayed).
3. These procedures do not apply to CAT II or CAT III ILS operations (i.e. using radio altimeters) nor do they apply to QFE altimetry systems.

#### **ALTIMETERS – LOW TEMPERATURE ERRORS**

Very low temperature causes an altimeter to over-read.

The AIPs of Canada and Alaska suggest that in cold conditions pilots should operate at least 1,000ft above the published minimum en-route altitude.

See also the [Cold Temperature Corrections](#) section of this manual.

#### **FUEL – LOW EN ROUTE TEMPERATURES**

At the flight planning stage consideration should be given to the forecast en route temperatures and the freeze point of fuel in tanks. Consult the FCOM for your aircraft type bearing in mind that extra fuel may be required to carry out the recommended procedures to keep fuel temperatures above limits.

#### **COMMUNICATIONS**

Generally straight forward with onward clearance being given in good time, or a frequency change to get clearance automatically given.

Rekjavik CTA is controlled through Iceland Radio.

##### **Polar Track Structure**

**Clearance W bound** – This should be obtained from Reykjavik by Scottish ATC, while the aircraft is still in the Scottish FIR/UIR, and relayed to the aircraft. About 100 nm before Stornaway, Scottish will ask for an estimate for the Reykjavik OCA Entry Point and the requested level and some time later will call back with the clearance.

If routeing via 61N 10W there is no need to contact Shanwick OCA even though the position 61N 10W is on the boundary between Shanwick and Reykjavik OCAs.

**Clearance E bound** – Either before the Reykjavik CTA boundary or on first contact, obtain clearance for the Polar Track, reading back the full coordinates. Flights will normally be handed over from Cambridge Bay to obtain clearance, or it will have been coordinated beforehand.

Maintain a listening watch at all times on 121.5 MHz, and, if necessary, transmit blind on this frequency.

**Canada**

Monitor 121.5 MHz.

**Canadian Domestic Clearance W bound** – The Polar Tracks enter Canadian airspace via Edmonton FIR. When making the 40°W position report with Iceland it is common for Cambridge Bay to acknowledge and give the onward clearance.

**Arctic Radio/Baffin Radio**

Arctic Radio, centred near Cambridge Bay and Baffin Radio, centred near Iqaluit are VHF networks supplementing the international HF network.

They accept IFR position reports and relay ATC clearances. They also provide weather and NOTAM information.

Initial contact is on 126.7.

**Alaska**

Normal ATC, as USA. There is good coordination between Edmonton ACC and Anchorage ACC.

**NAVIGATION**

The B747 FCOM contains POLAR FMS/IRS/CDU FAILURE PROCEDURES which define two Decision Points.

DECISION PT 1 is where the track crosses into the Magnetic Compass Unreliable Area.

DECISION PT 2 is where the track crosses into the Magnetic Compass Useless Area.

The procedures define minimum navigational equipment which must be serviceable at each Decision Point. If the minimum cannot be satisfied the aircraft may be required to return to departure point or re-route to within reception range of radio aids capable of fixing the aircraft's position at intervals not exceeding one hour. Re-routing detail is included in the FCOM procedures.

**Canada General Navigation Information**

The enroute MF beacons provide 24 hour coverage. Most, such as Eureka and Mould Bay, may be received at ranges in excess of 250 nm.

ADF needles will always indicate the correct relative bearing and are the simplest form of navigation in case of compass failure.

No VORs are expected to be received in the "Compass Unuseable" area, but for information, VOR needles always read correctly against the compass card to show the QDM/radial, while the relative bearing will only be correct if the compass is aligned to the Magnetic meridian – or True meridian depending on the alignment of the VOR station.

Ground Radar coverage along the route is good. It is mainly military, and stations can be contacted routinely on 126.7 and in emergency on 121.5.

Thule, an enroute diversion aerodrome, is in the Magnetic Compass Unreliable Area.

**En Route Diversion Aerodromes**

The only en-route diversionary aerodromes available and suitable for large jets are:

KEFLAVIK  
THULE  
KANGERLUSSUAQ  
IQALUIT  
FAIRBANKS

There are also other, smaller aerodromes in the Arctic region which serve the needs of isolated weather or military stations, they have limited facilities. The one exception is RESOLUTE which has a Rwy 17(T)/35(T), VOR/DME, ILS and NDB but is unpaved.

**Note:** Thule publishes headings in °T and °G with Kangerlussuaq publishing both °T and °M. RESOLUTE VOR radiates True bearings.

**Radar**

Over Canada military Radar coverage is good especially in the ADIZ area. To obtain assistance call "Radar Assistance" on 122.2, 121.5 or 126.7.

Over Alaska aircraft receive a Radar service from Anchorage.

The USAF Radar Advisory Service will give assistance to civil aircraft in distress or emergency. Aircraft should establish contact on 121.5 calling "Radar Advisory Service".

**ALASKA – JAPAN****ROUTEING**

The route lies along the North Pacific Composite Route System. This is a system of routes linking North America with Japan. See below. Southern Alaska and the Aleutian Islands have numerous active volcanoes. Eruptions have seen volcanic dust clouds well over 30,000ft.

**AIRSPACE DESCRIPTION**

The route across the Pacific lies in:

- Anchorage OCA FL 55 – UNLTD.
- Tokyo OCA FL 55 – UNLTD.

The changeover point is approximately half-way across.

**AIR TRAFFIC CONTROL****North Pacific (NOPAC) Routes – Composite Route System**

To facilitate the movement of traffic, there is an organised route system between Anchorage and Tokyo, on which composite lateral/vertical separation is authorised at and above FL 280.

**Oceanic Transition Routes (OTRs)**

These routes are used to transition aircraft to/from the Composite Route System. OTRs are used in/out of Japan.

**Separation**

In the Composite Route System, separation is a combination of 50 nm laterally and 1,000ft vertically between aircraft on immediately adjacent routes. Aircraft at the same altitude will be laterally separated by at least 100 nm. Aircraft on the same route will be separated by 2,000ft vertically or 15 mins longitudinally.

Note that separation is procedural. Hence adherence to cleared track and Mach No. is essential.

**Flight Plan**

The Composite Route will be depicted in the following order: entry point, route designator, exit point. e.g. COMFE G344 CURVS. The planned Mach No shall be specified in Item 15 of the Flight Plan, and the TAS equivalent in the Remarks Section of Item 18.

**Clearance**

To effect more efficient use of airspace ATC may assign a Mach No as the last item of the clearance issued on departure or before entering the ATS route. In which case the Mach number should be included in Position Reports.

Clearances should be read back as given. A full read back of the coordinates of the route is not required.

Direct routings are often possible. Variation of Mach No may well be available if needed for economy or time keeping.

There are considerable coordination problems over the ocean, as aircraft join the NOPAC routes mid-ocean having been airborne for many hours. Thus the situation may have changed considerably since they received their clearance. This may cause departure delays.

At the Anchorage/Tokyo OCA boundary control will be transferred. Coordination between the ATCCs is good.

**Cruise Climbs**

Cruise climbs are often available in the Anchorage OCA; a block of airspace from your present level to another level – usually 2,000ft higher – will be assigned with a request for an estimate of when you expect to be level.

**Communications**

E from Shemya communication with Anchorage is by remote VHF stations situated on the Aleutian Islands. Aircraft on R220 will be out of VHF range around 180° E/W for a short while, but an HF frequency is not normally assigned.

When W-bound abeam Shemya (Eareckson AS) control is transferred to Anchorage Oceanic who should be contacted through Honolulu Radio on HF. Anchorage may not assign an HF frequency to call Honolulu. On being released by Anchorage on VHF crews should immediately call Honolulu Radio and establish a SELCAL or listening watch on HF.

On making the position report at the Anchorage/Tokyo OCA boundary, control will be transferred and the onward primary and secondary HF frequencies given.

**HF** – As over the Atlantic, communication with Oceanic ATC is on HF via a “communicator” with no air traffic control authority. Hence there will be delays in the handling of routine aircraft requests. This should be taken into account when requesting stepped climbs, re-routes, or other requests requiring ATC action.

121.5 MHz should be monitored.

**Position Reports**

Position reports should be made at all designated reporting points, as this is the basis for separation. Use the MNPS position report format including "NEXT" position.

The prefix POSITION should be used for position reports.

**Additional Reports** – When reporting abeam Shemya (Eareckson AS) on the N.Pacific Routes, give DME distance and radial from Shemya VORTAC.

**Radar** – FAA Radar is available up to 150 nm W of Anchorage. A small portion of the track system is under FAA Radar cover from a site on St Pauls Island.

**EN ROUTE AERODROMES**

There are no diversion aerodromes W of Eareckson AS (Shemya) until Chitose in Japan.

<b>Eareckson AS (Shemya)</b>	Well equipped military aerodrome, 1,200nm from Anchorage. Radar, ILS etc.
<b>Cold Bay</b>	600 nm from Anchorage and S of the Composite Route Structure. Civil aerodrome with ILS.
<b>Chitose</b>	Civil aerodrome with Radar and ILS.

## SOUTH AMERICA AND CARIBBEAN AREA

The basic North Atlantic procedures are given in the N. America Area Briefing.

### EUROPE – CARIBBEAN

#### ROUTING

S-bound, the first Oceanic CTA entered is Shanwick, followed by Santa Maria at 45°N and New York at 40°W. Minimum Navigation Performance Specification (MNPS) airspace is left at 27°N.

Alternatively aircraft are routed via Brest, Madrid and Lisbon FIRs with Oceanic Clearance from Santa Maria.

#### ATC PROCEDURES

SW bound – Oceanic clearance is requested from Shanwick Oceanic on VHF soon after take-off. A full read-back of an oceanic clearance, including track co-ordinates, is the standard requirement and is always required if the clearance is received on HF.

Some of the tracks used to the Caribbean cross up to three Oceanic CTA boundaries in quick succession.

**Note:** That Adams Radar on Barbados provide a Radar service and should be contacted.

**NE bound** – Oceanic clearance is normally given on the ground. However, there will often be level restrictions until Piarco is contacted.

The Oceanic clearance may differ from that given on OFP when the routing is likely to conflict with the OTS for that day. Sometimes level restrictions will be given to enable the flight to pass under the OTS.

#### COMMUNICATIONS

Communications can sometimes be difficult in Piarco CTA and San Juan Oceanic CTA, even though the latter is an ARINC (USA) manned Unit.

**Met Reports** – These are required on all routes to the Caribbean. It is basically adding temperature and spot wind to the end of each position report.

**Transponders** – Standard Oceanic procedure. Squawk A2000 30 mins after entry into an Oceanic CTA.

**Cuban Airspace** – Caribbean arrivals from the N will involve over-flying Cuba. If needed HF communication with Havana is through “BOYEROS RADIO”, CAR HF/RT NETWORK.

#### VOLCANOES

Mexico – (Popocatepetl) 35 nm SE of Mexico City – See AIS for any cautions on ash emissions.

Montserrat – (16°44'N 62°11'W). See AIS for any cautions on ash emissions.

**BRIEFING CONSIDERATIONS FOR CARIBBEAN APPROACHES**

SESMA data and ASRs confirm the experience of, and ongoing threat from, high energy and unstable approaches during operation into Caribbean airfields.

To enable appropriate threat identification in the Descent Brief, use the Flight Ops Safety Plan and review the following guidance, to ensure that compliance with the Safe Landing Policy, including the Stable Approach Criteria is achieved.

**Avoid**

At the briefing stage consider:

- What are you going to fly?

Expect change – develop a strategy for a change of runway or approach type; particularly when changing to a visual approach or to reduced track miles.

Agree the profile to be monitored in order to achieve the Stable Approach Criteria (SAC) by 1000ft auto callout and, of particular importance, how compliance with the profile will be confirmed.

Set gates and bottom lines to ensure SAC are achieved by 1000ft auto callout and maintained to touchdown.

- How you are going to fly it?

Use of AFDS modes for non-ILS and visual approaches.

Monitor the gates you have set and brief what you will do if gates are not met with a plan for early intervention.

Although the 1000ft auto callout is the bottom line for achieving the SAC, success relies on achieving the planned profile throughout the approach to touchdown.

- Brief and plan the go-around.

**Trap**

- Identify the threats associated with any changes to your plan; verbalise and resolve the threats.
- Review the agreed profile, monitor the profile and intervene if the profile is not being flown.

**Mitigate**

- Effective intervention is difficult during high workload due to runway or approach changes in unfamiliar environments.
- Anticipate the 1000ft auto callout with a review of the vertical profile, aircraft configuration and approach speed.
- If SAC not achieved by 1000ft auto callout and maintained to touchdown, flight crew must initiate go-around.

**High Energy approaches can lead to runway end excursions and Controlled Flight into Terrain.**

**EUROPE – RECIFE (BRAZIL)****ROUTING**

The route to Rio de Janeiro and the E coast of South America lies across Portugal, then out over Madeira or the Canary Islands making landfall on South America near Recife.

**REDUCED VERTICAL SEPARATION MINIMUM (RVSM)**

RVSM airspace is now established between Europe and South America in the EUR/SAM Corridor.

Vertical separation will be reduced to 1,000ft between flight levels 290 and 410 inclusive. "W" will be entered in item 10 of flight plans to indicate an aircraft is equipped to operate in RVSM airspace. In addition entry and exit points and requested flight level within the corridor are to be included in item 15 of the flight plan.

**Longitudinal Separation** – The application of 10 minutes longitudinal separation using the Mach No Technique will be applied to aircraft operating at or above FL250 within the Canaries, Dakar Oceanic, Recife and SAL Oceanic FIRS (EUR/SAM Corridor). This may be reduced to 5 minutes if the preceding aircraft arriving at the OCEANIC entry point is flying at speed of Mach.06 greater than following aircraft.

Requirements when using the Mach No Technique:

- i. The planned True Mach Number for each portion of the route shall be specified in item 15 of the Flight Plan.
- ii. The Mach number approved by ATC shall be adhered to and approval shall be requested before making any change. If immediate temporary change essential (e.g. due to turbulence), notify ATC as soon as possible and advise adjacent aircraft using 121.5. Clearance for a prolonged reduction in Mach number may not be possible if the 10 minute separation is compromised.

**ATC PROCEDURES**

When crossing FIR/Oceanic CTA boundaries S of 30°N, except those between domestic FIRs, contact the onward ATC Unit 15-20 mins before entry into their airspace and request onward clearance.

Canaries Control has extended range VHF and Radar with a range of 300-400 nm from Las Palmas.

Sal should be contacted 15 mins prior to entry, normally on VHF, but this is not always possible. Sometimes Flight Plan details will not have been received.

After Sal FIR, Dakar Control should be contacted, normally on HF. Recife Radio and Dakar Control share the same family of frequencies, SAT. On approaching the South American coast, the flight will be handed over to Recife Centre on VHF.



**SOUTH AMERICA****OPERATIONAL**

The South American continent covers a vast area. For example, Brazil is bigger than Australia. Study of an elementary atlas of this area is useful.

**Aids**

The facilities at major aerodromes are quite good, although Radar assistance is somewhat hampered by the language problem.

Serviceability of navaids may not be correctly NOTAMed.

**Safety Altitudes**

The safety altitude in the area of most of the BAVirtual destinations is high.

Any departure from the designated holding areas, or specified procedures can lead to a rapid degradation of terrain clearance. Safety altitudes need to be carefully monitored when diverting, especially in the event of an engine failure.

There have been numerous instances of flights being cleared by ATC to an altitude below the MSA. In a non Radar environment, the controllers assume that the crew know their position, and when they can descend. Hence, prior to descent, check the MSA, and keep track of position.

When Radar is not available, a published or assigned altitude will be given which must be reached before continuing past a specified fix. It may be necessary to enter a hold to climb or descend as necessary to achieve this.

**AIR TRAFFIC CONTROL**

South American ATC controllers in general understand the term "direct" to mean to proceed without delay along the flight planned route. Pilots receiving a "direct" clearance in S.America should verify the intended meaning checking MSA if necessary.

A call to ground control prior to start is expected at most aerodromes. ATC clearance is not normally given until the aircraft is taxiing.

Due to traffic and terrain, many SIDs involve multiple turns and altitude requirements. Do not rely on Radar monitoring to pick up any errors.

ATC coordination is not always efficient, so re-confirm clearances when given a frequency change.

VFR traffic will be controlled in local language and traffic information may be poor; a good look out is required. Such traffic may be encountered at fairly high altitude (10,000ft) due to the high terrain. Most Latin American airlines turn their landing lights on in the aerodrome area.

**COMMUNICATIONS**

Language is a major problem in South America; English comes a very poor second to Portuguese or Spanish. Hence do not be surprised if you cannot understand a controller, or him you. Allow plenty of time to negotiate, use standard phraseology, speak slowly and distinctly and be patient and alert at all times.

Do not use slang or such terms as "Boundary" or "FIR", use the correct phonetic designator. Use the word "decimal" rather than "point" for frequencies, etc.

Listen carefully; transmissions are sometimes weak and garbled. If a controllers response to a message is a simple “Roger”, be careful as he may not have understood.

Blanking of signals by high ground is a problem.

Use the correct name for the ATC unit especially when calling an aerodrome. The latter may not be the same as the aerodrome name.

### TAKE-OFF

Due to terrain, and numerous crossing restrictions, SIDs must be followed carefully. Basically the most prudent philosophy is to climb as quickly as possible.

### PUBLIC ADDRESS ANNOUNCEMENTS

- The term “Latin America” is preferred to “South America”.
- Use the name of the destination aerodrome, and not just the city name, e.g. “El Dorado International Airport, Bogota”.
- Generally:      Temperature – Centigrade.  
                         Altitude – Metres.  
                         Speed – Km/hr.

### BRAZIL

Air traffic control in the upper airspace is by Recife and Brasilia centres, and is generally good. Brasilia will identify the flight on initial contact and then pass the message “under Radar surveillance”. This indicates that position reports may be omitted.

ATC will occasionally confirm that the flight is passing a reporting point to indicate that surveillance is maintained.

Most of the population live along the coast, and hence most aerodromes and air traffic is in this area. Brazilian territory extends 200 nm from the coast.

Large BALLOONS, balloon type objects and Kites may be encountered over Brazil. They are a religious tradition; the activity reaches a peak from mid Jun to Aug. Aircraft have, in the past, been forced to take avoiding action; ATC are unlikely to warn the aircraft.

### UNICOM

Brazil uses a non-standard Unicom frequency of 123.45 as 122.8 clashes with a number of ATC facilities. It is recommended that 122.8 is monitored on Box 2 as non-local pilots may not be aware.

### DESCENT

The Brazil AIP warns that ATC may clear aircraft to set the QNH and descend to an altitude which is above the Transition Level. This procedure is used when a continuous approach is anticipated without long periods of level flight following initial descent from cruising level. This procedure is used at Rio.

Magnetic variation in N and E Brazil is in excess of 20°W.

**EMERGENCY**

When an aircraft is in an emergency condition within the Brazilian FIR ATC shall be informed using the following classifications:

**WHITE ALERT** – Possibility of an accident are remote but there are signs of danger that may require a warning to ATC. **Example:** Aircraft in emergency due to low fuel status.

**YELLOW ALERT** – There is a good chance of an aeronautical accident, and the rescue services are required to attend.

**RED ALERT** – An aeronautical accident is unavoidable or it has already happened.

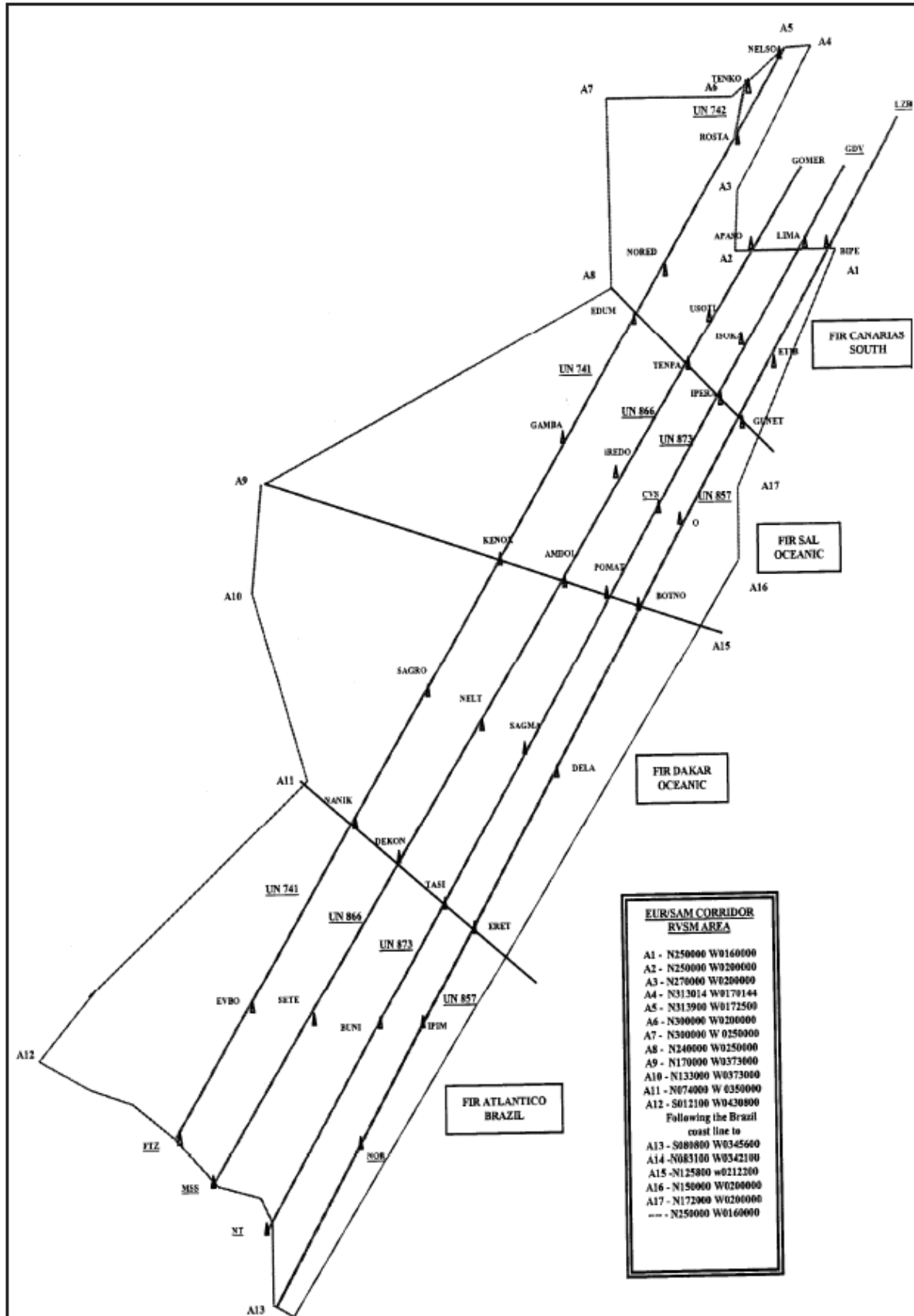
All emergency messages will be preceded by MAYDAY, MAYDAY, MAYDAY or PAN, PAN, PAN in case of urgency.

**VENEZUELA**

Apart from Caracas, few aerodromes have good facilities.

Traffic between Maiquetia ACC and Piarco ACC is co-ordinated.

## EUR/SAM CORRIDOR RVSM AIRSPACE



## COLD TEMPERATURE CORRECTIONS

Pressure altimeters are calibrated to indicate true altitude under ISA conditions. Any deviation from ISA will result in an erroneous reading on the altimeter. In a case when the temperature is higher than the ISA, the true altitude will be higher than the figure indicated by the altimeter, and the true altitude will be lower when the temperature is lower than the ISA. The altimeter error may be significant, and becomes extremely important when considering obstacle clearances in very cold temperatures.

In conditions of extreme cold weather, PSX users with the appropriate option selected should add the values derived from the Altitude Correction Chart to the published procedure altitudes, including minimum sector altitudes and DME arcs, to ensure adequate obstacle clearance. Unless otherwise specified, the destination aerodrome elevation is used as the elevation of the altimeter source.

**For aerodromes up to 1,000ft use aerodrome temperature and for aerodromes above 1,000ft use ISA deviation for altitude corrections.** (The temperature at ISA is +15°C minus 2°C per 1,000ft above sea level. The ISA deviation is the ambient temperature minus the temperature at ISA. E.g. an airfield 2,500ft above sea level at -30°C has an ISA deviation of  $-30-10 = -40$ .)

With respect to altitude corrections, the following procedures apply:

- IFR assigned altitudes may be either accepted or refused. Refusal in this case is based upon the pilot's assessment of temperature effect on obstruction clearance.
- IFR assigned altitudes accepted by a pilot shall not be adjusted to compensate for cold temperatures, i.e. If a pilot accepts "maintain 3,000", and altitude correction shall not be applied to 3,000 feet.
- Radar vectoring altitudes assigned by ATC are temperature compensated and require no corrective action by pilots.
- When altitude corrections are applied to a published final approach fix crossing altitude, procedure turn or missed approach altitude, pilots should advise ATC how much of a correction is to be applied.

**Note that the effect of temperature on altitude is not modelled in MSFS based sims and therefore no correction is required by users on these platforms.**

### ALTITUDE CORRECTION CHART

Height Above the Elevation of the Altimeter Source (feet)

Aero-drome Temp °C	Aero-drome ISA deviation °C	200	300	400	500	600	700	800	900	1000	1500	2000	3000	4000	5000
0°	-15	20	20	30	30	40	40	50	50	60	90	120	170	230	290
-10°	-25	20	30	40	50	60	70	80	90	100	150	200	290	390	490
-20°	-35	30	50	60	70	90	100	120	130	140	210	280	430	570	710
-30°	-45	40	60	80	100	120	140	150	170	190	280	380	570	760	950
-40°	-55	50	80	100	120	150	170	190	220	240	360	480	720	970	1210
-50°	-65	60	90	120	150	180	210	240	270	300	450	600	890	1190	1500

**Note:** Values should be added to published altitudes.

## **'HOT AND HIGH' OPERATIONS**

### **INTRODUCTION**

Air density is a fundamental variable when considering aircraft performance. Air density is a function of temperature and pressure. There is no flight deck instrument indicating density, but temperature and pressure (from sea level pressure and altitude) are readily available. It is therefore more natural for the pilot to think of performance using these variables, hence the term 'hot and high'. Density altitude makes the concept easier to visualise.

To calculate the density altitude the rule of thumb is:

Density Altitude = Airfield Pressure Altitude + 1000ft per 8°C above ISA.

e.g. Johannesburg, elevation 5500ft amsl. With an OAT of 32°C (ISA + 28) and standard pressure the density altitude is 9000ft.

### **AWARENESS OF THE DENSITY ALTITUDE**

'Hot and high' conditions can be anticipated and therefore covered in the approach briefing. Most of the problems arise because the TAS increases with increasing density altitude (refer to appendix). Therefore a comparison of IAS and TAS will give a good indication of the problems ahead.

### **HORIZONTAL PROFILE**

The turning radius will increase as the TAS increases. It may be necessary to reduce speed by the increment in TAS (due to high density altitude) to achieve the horizontal profile. Using the Johannesburg example, an initial approach speed of 220 kt IAS at 3000ft aal will give a TAS of 260 kt. Modifying the FMC speed to 180 kt, for example, will produce a TAS of 215 kt and will restore the aircraft's turning radius to the sea level equivalent.

### **VERTICAL PROFILE**

When flying a 3° profile the rule of thumb is:

Rate of descent = 5 × groundspeed.

Therefore if the TAS is higher it follows that the V/S will be higher by an equivalent amount. In the above example, 220 kt IAS gives 260 kt TAS and (in still air) a V/S of 1300ft/min. This should be anticipated, especially for a non precision approach.

### **ENERGY MANAGEMENT**

An aircraft will glide equally well at sea level or at altitude, and therefore density altitude has no effect on the ability of the aircraft to follow a 3° profile. This is despite the increased vertical speed and therefore, perhaps, contrary to initial expectations. The descent profile will be achievable with normal configurations and thrust settings.

This is a potential trap, because everything appears normal it may be (incorrectly) assumed that slowing up will be equally straightforward. This will not be the case. Again the high TAS is the clue, and it has two effects.

- Acceleration (and deceleration) is a rate of change of speed. That is to say it takes a certain time to slow up. However, our approaches are normally based on 'gates' that are a fixed distance (or height, it amounts to the same thing) from touchdown. With a higher TAS this distance will be covered a lot more quickly, leaving less time to slow up. Using the Johannesburg example, 180 kt IAS equates to 215 kt TAS, which is 20% faster.
- Reducing speed from 180 kt IAS to 140 kt IAS appears to be a reduction of 40 kt. In our example this would equate to 215 kt TAS and 167 kt TAS respectively. In other words this is actually a reduction of 48 kt – again a 20% difference.

These factors are compounded, and the increase in distance required to slow down may be considerable. In the Johannesburg example  $1.2 \times 1.2 = 1.44$ , so it will take 44% longer to decelerate. Therefore the deceleration 'gate' must be moved to a more appropriate position earlier in the approach. Allowing a minimum of 50% extra distance would seem to be a good rule of thumb, however it could be more for very high density altitudes. This should be increased further if other factors (e.g. tailwind, non-normal configuration, high approach speeds due to weight, etc.) are also present.

### **BRAKING**

The kinetic energy will be higher on touchdown and this has to be dissipated by the brakes. The use of reverse thrust and an appropriate runway turn-off will keep brake temperatures down.

### **SUMMARY**

- 'Hot and high' conditions should be anticipated and briefed. Comparing IAS to TAS will give a good indication of likely problems.
- Turning radius will increase. A speed reduction may be necessary to achieve the horizontal profile.
- The ability of the aircraft to follow a descent profile is not necessarily an indication of how well it will slow down.
- It could take up to 50% further to decelerate (more if the density altitude is very high or if other factors are present). The 'gates' should be moved back to a more appropriate position to allow more time and distance to slow up.
- Touchdown speeds will be higher. Choose appropriate braking.