CHAMBERY AIX-LES-BAINS (CMF/LFLB)

Elevation 779 ft

CATEGORY C

Terrain and circling approach photo briefing available on DocStore.

REGULATION

- RWY 18 departures are **not** authorised for BAV operations - all departures must be conducted using RWY 36 up to the maximum approved tailwind limitation for type and/or performance limitation.
- RNP Z and RNP Y (AR) approaches to RWY 18 are **not** authorised for BAV operations.
- ILS Z and ILS Y approaches to RWY 18 **require** RNAV-1 capability for the initial and missed approach segments.
- Circling approaches to RWY 36 are **only** available during daylight hours for BAV operations.

Dispatch Restrictions

The following must be serviceable at dispatch and in-flight prior to conducting any operations at CMF:

- EGPWS including RA auto-callouts
- Transponder (one)
- TCAS
- GPS (one)
- ILS (one)
- VOR and DME (one)
- ADF (one)
- Autopilot (one)
- Antiskid
- Thrust reversers (both)
- Auto ground spoilers

GENERAL

- The airfield is located 4.5 NM NNW of Chambery / 3.5 NM SSW of Aix-Les-Bains at the S end of Lac du Bourget within a valley in the Jura Mountains. There is significant terrain in all directions reaching 6,047 ft AMSL to the E and 5,112 ft AMSL to the W inside of 5 NM of the RWY 18 THR.
- MSAs are referenced to CBY (15 NM NNW of the airfield):
    - 7200 ft to the N through NE
    - 9700 ft to the NE through SSW (airfield in this segment)
    - 6500 ft inside 14 DME CBY and to the SSW through N.
- CBY is located at an elevation of 5,000 ft AMSL and **must not** be used below this altitude.
- RWY 18/36 is 2,020 m long.
- RWY 36 is the preferred landing RWY by ATC up to a 5 knot TW component, there is no straight-in IAP to RWY 36 and aircraft must circle to the E following an IAP to RWY 18. Ensure the OFP reflects the correct landing RWY to ensure a representative fuel burn - RWY 36 arrival should be planned unless conditions will preclude a circling approach.

THREATS

CFIT

- Terrain rises rapidly to the E and W as described above, outside of 5 NM the mountains to the E reach 6,129 ft AMSL.
- The MSA is **not** referenced to the ARP – see above.
- Masts extend to 1,400 ft AMSL below the RWY 36 prescribed circling track and to 1,821 ft AMSL S of the visual manoeuvring area.
- RWY 18 approach - use type specific guidance to follow the missed approach procedure to ensure terrain clearance.
- The Briefing Video provides a detailed overview of the local terrain.

Runway Excursion

- The RWY is short with displaced THRs: RWY 18 LDA is 1790 m, RWY 36 LDA is 1840 m.

Loss of Control

- RWY 18 IAPs GS and PAPI set at 4.46°.
- RWY 36 VPT manoeuvre must remain inside 5 NM of the RWY 36 THR - PAPI set at 4° (must **not** be used outside 5 NM).
- The valley topology can cause severe turbulence and windshear.

Mid Air Collision

- VFR traffic operates from a parallel grass RWY; the visual circuit is to the E.
- Frequent helicopter and parachuting activity take place, especially during summer months.

ARRIVAL

Diversion Airports

LYON SAINT EXUPERY	LYS/LFLL	34 NM / 275°T	CAT A
GRENOBLE	GNB/LFLS	28 NM / 234°T	CAT A
GENEVA	GVA/LSGG	37 NM / 012°T	CAT B
BASLE MULHOUSE	BSL/LFSB	135 NM / 028°T	CAT B
NICE	NCE/LFMN	131 NM / 159°T	CAT B

Diversion Considerations

- Company preferred alternates are LYS (C1) and GNB (C2).
- Note high MSAs between CMF and potential diversion airfields - Grid MORA for CMF, LYS and GNB is 13,800 ft.
- If a diversion looks likely, confirm with Ops the preferred diversion airfield.

Initial Approach

- Expect a SALEV or FEDZI arrival - compliance with level and speed restrictions is essential to avoid a high-energy approach.
- If routing via SALEV:
    - Geneva ATC may offer a direct to COLLO - anticipate a straight-in approach (ILS Y 18).
    - Expect a late handover to CMF ATC - this can leave you high on the approach.
- Most movements in the valley are one-in, one-out - expect to hold at PIRUV, OSRIM (SALEV arrival) or RIPTU (FEDZI arrival) prior to an approach for both previous arriving traffic and departing traffic.

Approach

- Available IAPs are ILS Z 18 via PIRUV or ILS Y 18 straight-in via COLLO - either ILS approach may be followed by a circle to land manoeuvre to RWY 36.
- Anticipate last minute RWY changes by CMF ATC - always plan to circle RWY 36 if the TW component is less than 5 knots.
- Do not commence an approach unless you can arrive at the MAP with alternate and final reserve fuel on-board - from PIRUV anticipate ~ 200 kg fuel burn to the MAP.
- The glideslope for ILS 18 is set to 4.46° due to terrain - plan for a higher than normal descent rates, especially with a TW component.
- EGPWS “Sink Rate” cautions may occur due to the steeper approach angle, it is permissible to continue if the descent rate is appropriate for the ground speed and the approach is otherwise stable. An immediate terrain escape manoeuvre must be executed for any EGPWS “Pull Up” warning.
- Due to high terrain N of the FAP, do not begin descent on the glideslope until both pilots have confirmed the glideslope against DME cross-check.
- Every effort must be made to be configured in the circling configuration prior to descending on the glideslope.
- The cabin should be secure prior to commencing an approach.

Calculation of Approach Minima

ILS RWY 18

- Approach minima are variable and dependent upon missed approach IAS and OEI missed approach climb gradient.
- Approach minima are calculated in a three-step process:
    - First, calculate the OEI missed approach climb gradient based on the expected landing weight, rounded down to the nearest 0.5%.
    - Second, calculate the missed approach climb speed.
    - Third, using the missed approach climb speed and climb gradient, obtain the appropriate minima for the IAP from the table on the following page.
- Interpolation is not permitted - use the next highest weight and minima values.

MINIMA ILS CAT C

GA climb gradient up to 5000ft	DH-VIS DA	111-120 IAS (KT)	121-130 IAS (KT)	131-140 IAS (KT)	141-150 IAS (KT)	151-160 IAS (KT)
2.5%	ft-m/km	1250-2.4	1710-2.4	1990-2.4	2300-2.4	2550-2.4
	ft	**2020**	**2480**	**2760**	**3070**	**3320**
3%	ft-m/km	1060-2.4	1500-2.4	1750-2.4	2040-2.4	2250-2.4
	ft	**1830**	**2270**	**2520**	**2810**	**3020**
3.5%	ft-m/km	890-2.4	1300-2.4	1530-2.4	1790-2.4	1980-2.4
	ft	**1650**	**2070**	**2300**	**2560**	**2750**
4%	ft-m/km	730-2.4	1110-2.4	1330-2.4	1570-2.4	1740-2.4
	ft	**1500**	**1880**	**2100**	**2340**	**2510**
4.5%	ft-m/km	580-2.2	950-2.4	1150-2.4	1370-2.4	1520-2.4
	ft	**1350**	**1710**	**1920**	**2140**	**2290**
5%	ft-m/km	450-1.7	790-2.4	980-2.4	1180-2.4	1330-2.4
	ft	**1220**	**1560**	**1750**	**1950**	**2100**
5.5%	ft-m/km	380-1.3	650-2.4	820-2.4	1010-2.4	1150-2.4
	ft	**1150**	**1420**	**1590**	**1780**	**1920**
6%	ft-m/km	320-1.0	510-1.9	680-2.4	850-2.4	980-2.4
	ft	**1090**	**1280**	**1450**	**1620**	**1750**
6.5%	ft-m/km	300-900	390-1.4	540-2.0	700-2.4	830-2.4
	ft	**1070**	**1160**	**1310**	**1470**	**1600**
7%	ft-m/km	300-900	300-900	420-1.5	560-2.1	690-2.4
	ft	**1070**	**1070**	**1190**	**1330**	**1460**
7.5%	ft-m/km	300-900	300-900	300-900	430-1.6	550-2.1
	ft	**1070**	**1070**	**1070**	**1200**	**1320**
8%	ft-m/km	300-900	300-900	300-900	310-1.0	430-1.6
	ft	**1070**	**1070**	**1070**	**1080**	**1200**

LOC RWY 18

- Minima for LOC RWY 18 approaches are dependent upon the missed approach OEI climb gradient:

MINIMA LOC CAT A, B, C

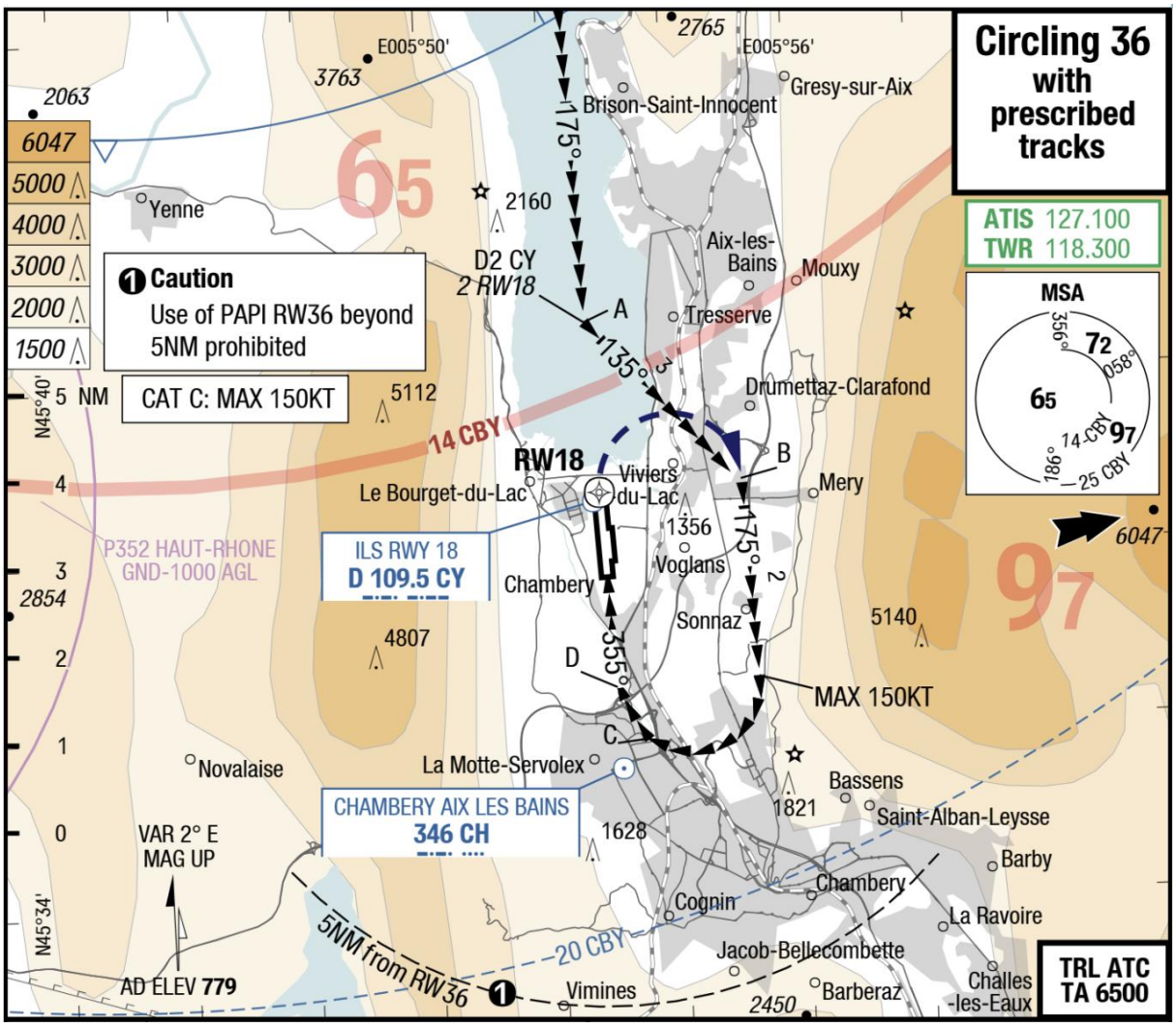
GA climb gradient up to 5000ft	CAT	MDH-VIS MDA		GA climb gradient up to 5000ft	CAT	MDH-VIS MDA	
2.5% < 3%	A	ft-m/km ft	1360 - 5.0 **2130**	4% < 5%	A	ft-m/km ft	1360 - 5.0 **2130**
	B	ft-m/km ft	2420 - 5.0 **3190**		B	ft-m/km ft	1550 - 5.0 **2320**
	C	ft-m/km ft	2790 - 5.0 **3560**		C	ft-m/km ft	1850 - 5.0 **2620**
3% < 4%	A	ft-m/km ft	1360 - 5.0 **2130**	≥ 5%	A	ft-m/km ft	1360 - 5.0 **2130**
	B	ft-m/km ft	2130 - 5.0 **2900**		B	ft-m/km ft	1360 - 5.0 **2130**
	C	ft-m/km ft	2470 - 5.0 **3240**		C	ft-m/km ft	1380 - 5.0 **2150**

Circling Approach RWY 36

- Circling MDA for RWY 36 is the higher of the relevant IAP minima or 1,880 ft AMSL.

Circling Approaches

- Circling approaches to RWY 36 follow a visual prescribed track (VPT) to the E of the airfield - the procedure is only available during daylight hours for BAV operations.
- A ridge of high ground runs parallel to the downwind leg and will be between the aircraft and the airport when established downwind.
- A 150 knot speed restriction applies to the VPT.
- If conditions permit, fly the visual circuit at 2200 ft AMSL.
- The visual manoeuvre shall be backed-up by timing from the tables on the following page.
- Review visual landmarks in the photo briefing - on the downwind leg, do not fly closer to the airfield than the parallel road (A43); on the base leg do not overfly the hospital complex.
- The downwind leg should not extend beyond 2.5 DME CY.
- The circling manoeuvre must remain inside of 5 NM of the RWY 36 THR.
- The base leg should be flown as a continuous turn to final with a 500-600 fpm descent commenced at the end of the downwind leg.
- The RWY 36 PAPI is set to 4° - do not descend below the PAPI.



Segment	Distance	Ground Speed				
		80 knots	120 knots	150 knots	180 knots	210 knots
A – B	2.6 NM	1:57	1:18	1:02	0:52	0:45
B – End Downwind	2.2 NM	1:39	1:06	0:53	0:44	0:38

Missed Approach

- The missed approach procedure depends on a minimum bank angle of 20° and a maximum IAS of 160 knots to ensure terrain clearance during the L 80/260° procedure turn S of CH.
- If LNAV reduces the bank angle below select HDG mode to increase the bank angle - E190: Ensure the HDG bug is appropriate for the direction of turn BEFORE selecting HDG mode.
- Do not accelerate until the aircraft is N of CH and above 4,100 ft AMSL.
- If a go-around is conducted during the RWY 36 VPT:
    - If visual contact is lost between Point A and Point B – climb initially on track 135° until Point B then continue a climbing right turn to intercept CY LOC backcourse then continue per the ILS 18 missed approach procedure.
    - If visual contact is lost after Point B – perform a climbing right turn to intercept CY LOC backcourse then continue per the ILS 18 missed approach procedure.
    - If a baulked landing is required, re-entering the visual circuit is not authorised.

Landing

- Because both RWYs have steeper approach gradients, the visual picture on final will be abnormal when compared to routine operations and the rate of descent greater.
- If an EGPWS “Sink Rate” caution occurs below 100 ft RA there must be an immediate response to reduce the rate of descent - if the rate of descent remains excessive then a go-around must be executed.

GROUND

- Taxiway N is only authorised for E190 operations - A32N landing RWY 36 shall backtrack and vacate at C.
- Taxiways are relatively narrow - exercise caution when taxiing, especially if they are slippery or contaminated.
- Both RWY 36 and 18 require backtrack to utilise full RWY length - there are turning circles at both RWY ends.
- If vacating RWY 36 via Taxiway N, use caution as the taxiway is narrow and requires a 90° turn.
- Due to limited apron space and the nature of the airport environment, expect delays after engine start.

DEPARTURE

- RWY 36 departure only – RWY 18 departure is not authorised.
- If a TW component is likely to be performance limiting, check departure performance prior to refueling and consider if a fuel stop at LYS if this will permit departure will the full payload for the sector.
- Expect a BUSIL 2C departure:
    - 8.8% climb gradient required to 4,100 ft for terrain
    - 9.3% climb gradient required FL110 for ATC – advise ATC if unable.
- BELUS 2C is available on request from ATC if performance is limiting and requires a 6.5% climb gradient to 4,200 ft for terrain.
- Note the 200 knot (until LB624) and 220 knot (until BELUS) speed restrictions.
- Minimum acceleration altitude is 4,100 ft (4,200 ft for BELUS 2C).
- RWY 36 Emergency Turn Procedure:
    - Climb and backtrack CY to 5.5 DME CY, then
    - Turn left on to track 311° until crossing CBY radial 165°, then
    - Turn left on to track 200° to intercept CBY radial 192° outbound, then
    - Intercept LTP radial 047° inbound and continue to LTP to hold.

AIRCRAFT SPECIFIC PROCEDURES

E190

Calculation of Approach Minima

- To obtain the OEI missed approach climb gradient use the tables overleaf – do not interpolate:

Chambery RWY 18 Approach Climb Gradient – Non-Icing Conditions

	LANDING FLAP 5 (GO-AROUND FLAP 3)							
AIRCRAFT WEIGHT	**43 T**	**42 T**	**41 T**	**40 T**	**39 T**	**38 T**	**37 T**	**36 T**
OAT °C								
-5	4.96	5.36	5.80	6.26	6.74	7.24	7.78	8.35
0	4.94	5.34	5.77	6.23	6.71	7.21	7.75	8.32
5	4.91	5.31	5.75	6.20	6.68	7.18	7.72	8.29
10	4.87	5.28	5.71	6.16	6.64	7.14	7.68	8.25
15	4.84	5.24	5.67	6.12	6.60	7.10	7.63	8.20
20	4.80	5.20	5.63	6.08	6.56	7.05	7.59	8.16
25	4.76	5.16	5.59	6.04	6.52	7.01	7.54	8.11

	LANDING FLAP FULL (GO-AROUND FLAP 4)							
AIRCRAFT WEIGHT	**43 T**	**42 T**	**41 T**	**40 T**	**39 T**	**38 T**	**37 T**	**36 T**
OAT °C								
-5	4.44	4.86	5.29	5.75	6.24	6.74	7.28	7.86
0	4.42	4.84	5.27	5.73	6.21	6.71	7.25	7.83
5	4.40	4.81	5.24	5.70	6.18	6.68	7.22	7.79
10	4.36	4.77	5.20	5.66	6.14	6.64	7.18	7.75
15	4.32	4.74	5.16	5.62	6.10	6.60	7.14	7.71
20	4.28	4.70	5.13	5.58	6.06	6.55	7.09	7.66
25	4.25	4.66	5.09	5.54	6.02	6.51	7.05	7.62

Chambery RWY 18 Approach Climb Gradient – Icing Conditions

	LANDING FLAP 5 (GO-AROUND FLAP 3)							
AIRCRAFT WEIGHT	**43 T**	**42 T**	**41 T**	**40 T**	**39 T**	**38 T**	**37 T**	**36 T**
OAT °C								
-5	3.57	3.97	4.39	4.83	5.30	5.79	6.32	6.88
0	3.54	3.94	4.36	4.80	5.27	5.76	6.29	6.85
5	3.51	3.91	4.33	4.77	5.24	5.73	6.25	6.81
10	3.47	3.87	4.29	4.73	5.19	5.68	6.21	6.76

	LANDING FLAP FULL (GO-AROUND FLAP 4)							
AIRCRAFT WEIGHT	**43 T**	**42 T**	**41 T**	**40 T**	**39 T**	**38 T**	**37 T**	**36 T**
OAT °C								
-5	3.01	3.42	3.85	4.30	4.78	5.28	5.82	6.38
0	2.98	3.39	3.82	4.27	4.75	5.25	5.79	6.35
5	2.95	3.36	3.79	4.24	4.72	5.21	5.75	6.32
10	2.91	3.32	3.74	4.19	4.67	5.17	5.70	6.27

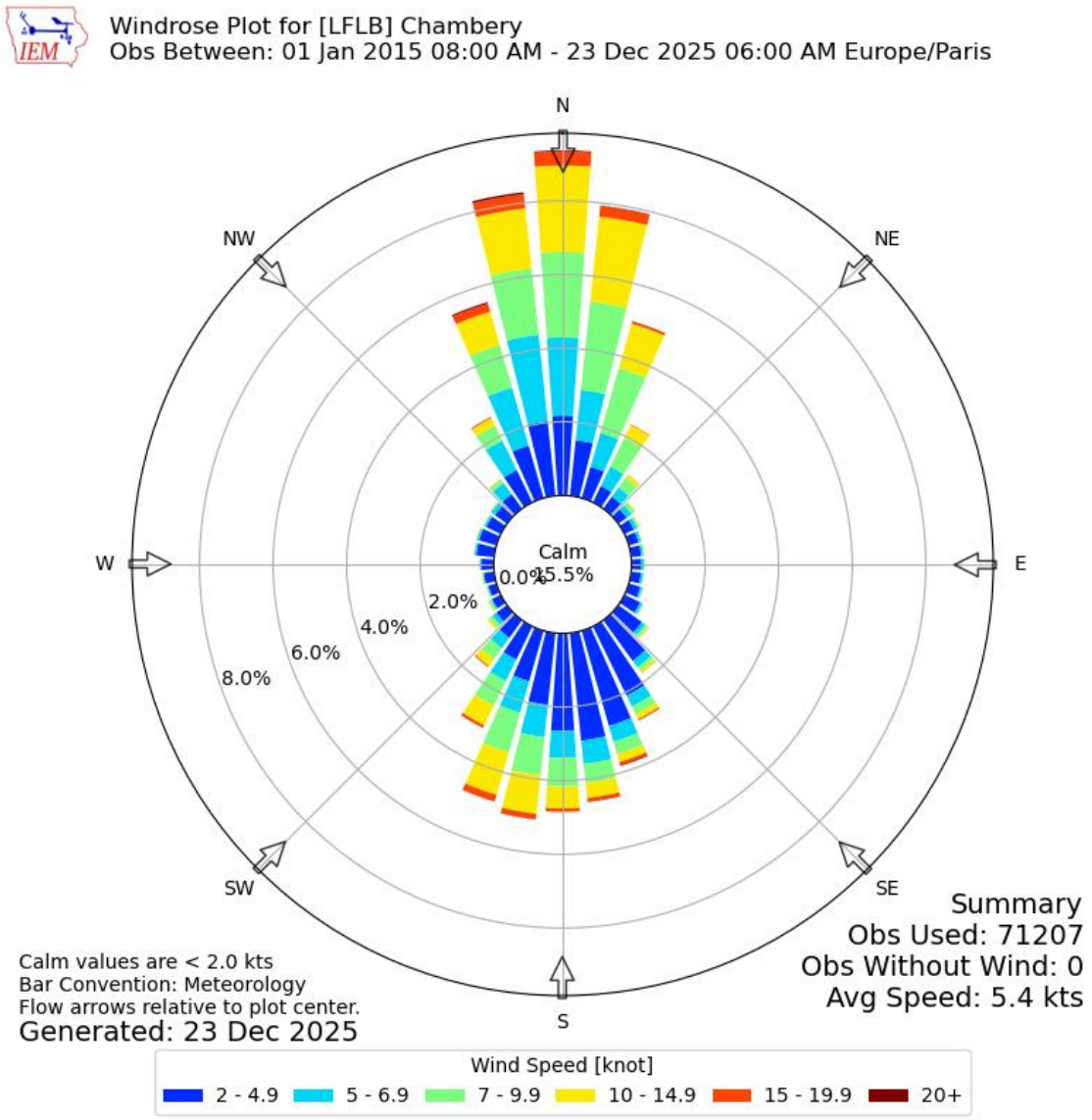
- To obtain the missed approach climb speed, extract the appropriate V_{REF}/V_{AC} from the Operational Aide Memoire and add 20 knots (FD targets V_{REF} + 20 knots all engines operating).

Circling Approach Technique

- Review E190 FCOM 2.22 – Circling Approaches prior to the approach.
- The ILS may be flown initially at 160 knots, Flap 3, and Gear Down.
- To ensure ALT SEL capture at circling minima, fly the approach using LOC and FPA or VS modes (see FCOM 2.19.3 – Approach Guidance Table).
- The aircraft must achieve 140 knots and Flap 5 prior to the start of the circling manoeuvre.
- Once level at circling minima in ALT mode, reset the ALT SEL to the missed approach altitude.

WEATHER

- METARs and TAFs may not be available for early morning departures - carefully check the OFP weather and RWY selection.
- Local weather is generally good but prone to mist/fog in the valley during the morning/evening.
- Cloud base is usually above 2000 ft AAL for the majority of the year.
- Wind is generally light and aligned with the RWY and valley, however in conditions in excess of 5-10 knots the local topology can cause severe turbulence and windshear.



- With N and NW winds:
    - Expect moderate to severe turbulence and/or windshear during approaches to RWY 18 inside 5 NM
    - Severe downdrafts can be experienced on short final to RWY 36
- With S and SW winds in excess of 15 knots, severe turbulence can be expected around and to the S of the CH locator. Turbulence is typically most severe overhead the city and above 3,000 ft AMSL.
- If CBs are established over the mountains to the W of the airfield, 20 to 50 knot crosswind gusts may occur - do not attempt an approach or departure in these conditions until CBs have cleared.

OPERATIONAL INFORMATION

- The airport has very strict arrival and departure slot requirements - liaise with handling agents and operations to ensure you are ready to depart on schedule for both inbound and outbound sectors.

Handling Agent	SEACA
Handling Agent VHF	130.50
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 EQPT not available).