

ICELANDAIR



B757

**STANDARD
OPERATING
PROCEDURES**

Standard Operating Procedures

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1 Introduction

This Icelandair B757 Standard Operating Procedures Manual was prepared by Icelandair B757 Check Pilots. The manual is based on Boeing B757 Operations Manual, FAA Guidelines for preparing Standard Operating Manual, Icelandair Flight Operations Manual and suggestions from Icelandair B757 Flight Crew. The purpose of the Icelandair Standard Operating Procedures Manual is to:

- Establish standard operating procedures and practices that reflect Icelandair operational philosophy and policy.
- Enhance safety by ensuring all Icelandair B757 flight crew follow the same operating procedures.
- Provide efficient medium for communicating new and revised procedures as may become necessary.

This Icelandair B757 Standard Operating Procedures Manual is approved by the Senior Check Pilot B757 and Chief Pilot. The manual will be revised periodically to incorporate pertinent procedural information and operational policy.

Procedures detailed in this manual should be identical to those in the Boeing 757 Operations Manual and Boeing 757/767 Flight Crew Training Manual. In event of conflict with either B757 Operations Manual or B757/767 Flight Crew Training Manual, the Icelandair Standard Operating Procedures Manual shall supersede.

All B757 flights operated by Icelandair should be conducted according to this manual.

For simplification and brevity the pronoun “he” is used throughout this manual although references in the text apply to both male and female crew members and other operations personnel. Where appropriate, the pronoun “she” should be inferred or assumed.

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2 General

During normal operation each pilot is expected to accomplish the established procedure by recall within his area of responsibility according to the panel scan flow pattern.

Before engine start, lights or indications verify the system's condition or configuration. Review the EICAS status display before engine start to determine if messages are displayed which may affect dispatch and require maintenance action or compliance with the Minimum Equipment List (MEL). After engine start, it is not necessary to check status messages as any message having an adverse effect on safe continuation of the flight, and requiring crew attention, will appear as an EICAS alert message (Warning, Caution, or Advisory).

EICAS alert messages are the primary means of alerting the flight crew to non-normal conditions or improper configuration. During engine start and prior to takeoff, any alert message requires accomplishment of the appropriate non-normal procedure. Upon completion of the procedure and prior to takeoff, the Dispatch Deviations Guide (DDG) should be consulted to determine if MEL relief is available.

Pre/post flight duties are apportioned between the Commander and Co-pilot, while phase-of-flight duties are apportioned between the pilot flying (PF) and pilot not flying (PNF). A normal panel flow is encouraged; however, certain items may be handled in the most logical sequence for existing conditions. Actions outside the crewmember's area of responsibility are initiated at the direction of the Commander.

General phase-of-flight responsibilities are as follows:

Pilot flying:

- flight path and airspeed control
- airplane configuration
- navigation.

Pilot not flying:

- checklist reading
- communications
- tasks requested by PF
- fuel shutoff and fire switches (with PF concurrence).

Phase-of-flight duties, beginning with the takeoff procedure and ending with the landing roll procedure, are presented in table form in the appropriate procedures section.

The Co-pilot, when flying the aeroplane, performs the duties listed under pilot flying and the Commander performs those duties listed under pilot not flying.

Note: Although the mode control panel is designated as the pilot flying responsibility, the pilot not flying should operate the controls on the mode control panel at the direction of the pilot flying when the aeroplane is being flown manually. Heading and altitude changes from ATC clearances and speed selections associated with flap position changes may be made without specific directions. The Commander retains final authority for all actions directed and performed.

When the Autopilot, Flight director, or Autothrottle is in use and a mode change is selected or is scheduled to occur, the annunciation must be verified on the flight mode annunciation display. Aeroplane course, vertical path, and speed must always be monitored. Similarly, when a thrust reference mode change is selected or is scheduled to occur, the annunciation must be verified on the EICAS display. In LNAV and VNAV, all aeroplane course, vertical path, thrust, and speed changes must be verified.

2.1 Checklists

Normal checklists are organised by phase of flight from pre-flight to secure. They are intended to verify that certain critical operational steps have been accomplished. Non-normal checklists are provided to cope with or resolve non-normal situations on the ground or in flight.

The Commander will call for the checklist on the ground. In the air, the pilot flying (PF) will call for the appropriate checklist at the proper time. The pilot assigned to read the checklist will not initiate a checklist but he will remind the PF when he feels the call for the checklist is becoming overdue. On the ground from preflight to take-off, Co-pilot will read all checklists. Each pilot responds to systems and controls in his area of responsibility except BEFORE T/O checklist where both pilots shall verify flaps setting.

After flight the SHUTDOWN and SECURE checklists will be read by the Co-pilot and each pilot shall respond within his area of responsibility

In the air the PNF will read all checklists.

The after take-off checklist shall be responded to by PNF.

Both pilots shall verify altimeter settings to standard.

The approach checklist shall be responded to by PNF. Both pilots shall verify speed bug settings.

The transition level checklist shall be responded to by both pilots for local altimeter setting. The Commander shall respond to recall check.

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The landing checklist shall be responded to by PNF except for landing gear and flaps, which shall be verified by both pilots.

Following completion of each checklist the pilot reading the checklist states “_____CHECKLIST COMPLETE”.

It may be necessary to delay a final item of a procedure e.g. when flying a circling approach with flaps 20 or when speed constraint is present on final approach, making it impossible to select flaps 30 at Glide Slope intercept. In case of deferred final item of a procedure pilot flying will call for the appropriate checklist to the deferred item i.e. at glide slope intercept with gear down and flaps 20. “Landing checklist to flaps,” the PNF will read the checklist to flaps and state:

“LANDING CHECKLIST COMPLETED TO FLAPS”. When flaps are fully down and verified by PF.

PF calls:

“COMPLETE LANDING CHECKLIST”

PNF responds:

“LANDING CHECKLIST COMPLETE.”

2.2 Altimeter Settings

Take-off and Departure

On passing the Transition Altitude(TA) during climb the PNF shall call “Transition” at which time both primary altimeters shall be set to 1013 hPa. The commander may, at his discretion, after clearance to a Flight Level has been received, require both primary altimeters to be set to 1013 hPa before TA has been passed. The standby altimeter should be set to 1013 hPa as a procedure in preparation for the after take-off checklist. Verbal crosschecks in accordance with FOM 8.3.3.2 shall be complied with.

Descent and Approach

During initial descent both pilots’ altimeters will remain at Standard setting. Standby altimeters as installed should normally remain at standard setting but may, at the Commander’s discretion, be referenced to QNH at this stage of flight.

When cleared by ATC to vacate a flight level and descend to an altitude below the Transition Level (TL), and provided no passing FL checks are required, all altimeters shall be set to QNH and crosschecked for agreement.

In US/Canada airspace, when cleared to descent to an altitude below TL (FL180) or to climb to a flight level above TA (18.000’) the standard/local altimeter setting should be retained until just before passing TL/TA.

Altimeter Bug Settings

For departure set bug to field elevation. When changing altimeter to standard (1013.25 hPa) during climb, set bug to zero.

During approach preparation set bug to DH/MDA. If low visibility approach planned, set bug to 500' above touchdown elevation.

2.3 Radio Altimeter Settings

Before take-off the radio altimeter shall be set to 200' RA.

For CAT I / Non-precision 200' RA

For circling approach 400' RA

For CAT II/III approaches the radio altimeter shall be set to the published RA.

2.4 FMC/CDU

Preflight: Either pilot as directed by Commander.

During climb and descent FMC/CDU route and approach modifications should be inserted by the PNF and executed only after confirmation by the PF. During cruise either pilot may insert route modifications which should be executed only after confirmation by the other pilot. When autoflight system fully utilised, PF may insert "DIRECT TO" and Altitude/Flight level changes on his CDU.

2.5 Use of Autobrakes

Use of autobrakes is recommended during landing. Use "2" or greater, which results in a continuous brake application which can increase carbon brake life.

Use "3" or "4" on wet/slippery runway or when landing rollout distance is limited.

Use "3" or "4" in low visibility condition.

Use max auto for minimum stopping distance. When autobrake release is desired, smoothly apply brake pedal force, until the autobrake system disarms. Retain autobrakes to taxi speed if needed.

Deceleration rate can be changed any time during landing roll if needed.

When utilising full runway length for landing roll (i.e. landing on rwy 02 KEF) use of autobrakes is not necessary.

2.6 External Lights

Position Light: Shall be ON at all times.

Red Anti-collision Light: Shall be switched ON when fully ready for push-back/engine start and relevant clearance received. Shall be switched OFF after engine shutdown.

Taxi Light: Shall be switched ON during taxi when aeroplane is moving. Shall be switched OFF during momentary stop on the taxiway. Shall NOT be used to summon the attention of ground crew after pushback. It can cause serious harm to eyes.

Turnoff Lights: Shall only be used when necessary during darkness. Bear in mind possible blinding effect to other traffic.

White Anti-collision Light: Shall be switched to ON just before entering active runway for take-off. Shall be switched OFF when leaving active runway after landing.

Landing Lights: Landing lights may be used momentarily if needed during taxiing with due regard to blinding effect to other traffic. Shall be switched to ON just before applying engine thrust for take-off. Shall be ON at all times below 10.000' *. Shall be switched OFF after landing when no longer required.

Logo Light: Should be ON below 10.000' during darkness.

Wing Illumination Light: May be used as needed.

* Note: Consider turning off the landing lights and white strobe light in low visibility conditions, during darkness.

2.6 Reverse Thrust

Use idle reverse thrust unless more needed for safety reason.

2.7 Shoulder Harness

Shoulder harness shall be worn from beginning of taxi until aeroplane clean after T/O and from top of descend until taxi speed attained after landing.

2.8 Company Noise Abatement Procedure

RE: FOM 8.1.2.8.3.

For aerodrome requirements refer to route manual terminal pages.

The above procedure should be accomplished as follows:

1. Complete performance page on FMC/CDU.
2. On CDU "CLIMB" page enter V_2+15 / NOISE ABATEMENT PROFILE
FLAP RETRACTION ALTITUDE on dotted speed restriction line
On PEGASUS: enter "FLAP/ACCEL.HT" on "Take-off REF" page
3. After take-off select CLIMB THRUST, VNAV at 1500' AAL.
At 3000' AAL select flaps up on schedule.

2.9 Approach considerations

Greater risk is associated with conducting a non-precision approach (rather than a precision approach) and with conducting an approach in darkness and IMC (rather than in daylight and in VMC). The combined effects of two or more of these risk factors must be considered carefully.

Crews can reduce risk with planning and vigilance. If necessary, plans should be made to hold for better conditions or to divert to an alternate. Plan to abandon the approach if company standards for a stabilised approach are not met.

After commencement of an approach, a missed approach should be conducted when:

- Confusion exists or crew coordination breaks down;
- There is uncertainty about situational awareness;
- Checklists are being conducted late or the crew is task overloaded;
- Any malfunction threatens the successful completion of the approach;
- The approach becomes unstable in altitude, airspeed, glide path, course or configuration;
- Unexpected wind shear is encountered;
- GPWS/EGPWS alert;
- ATC changes will result in a rushed or unstabilised approach; or;
- Adequate visual cues are absent at DH or MDA.

2.10 Stabilised approach

An approach is stabilised when the aeroplane is flown:

- Along the desired flight path in landing configuration;
- With a heading needing only small corrections to maintain the desired flight path;
- At the correct approach speed including relevant and agreed upon corrections; maintaining an acceptable rate of descent; and
- At a thrust setting needing only small corrections to maintain the desired flight path.

In IMC the approach should be stabilised no later than 1000' AAL. In VMC the approach should be stabilised no later than 500' AAL. If not go-around is mandatory.

2.11 Radio Communication

On ground the copilot shall normally handle radio communication.

In the air the PNF shall normally handle radio communication.

As general rule both pilots shall use headphone. On oceanic sector however, when not in direct contact with ATC unit cockpit speakers may be used to monitor radio communication. It is mandatory however that ATC clearances be monitored by both pilots using headphone. Hot mike for intercom can be used if installed.

Monitor guard frequency 121.5 MHz during enroute flying.

Obtain primary and secondary HF frequencies and maintain SELCAL watch at all times. The company might need to pass an important message to a flight. When on ground monitor company/operation frequency.

Monitoring of ATIS/WX broadcast frequencies, and company communication should as a rule be accomplished by PNF following a formal handover of R/T to PF.

Maintain good R/T discipline, i.e.:

Always listen out before transmitting. Use standard phraseology and use full call sign when replying a message. Read back essential instructions. Message from ATC can contain both a clearance and information. Only read back the clearance portion of the message, i.e.:

“ICE123 Turn left heading 070°. Descend to altitude 5000'. Number four in traffic, behind a 747.” Read back: “Turn left heading 070°. Descend to altitude 5000'. ICE123”. Re: FOM 12.4.7.

On first contact after changing frequency, state altitude or flight level. If in climb or descend state flight level or altitude passing and cleared flight level or altitude.

In US and Canada airspace, up to but not including 18.000' MSL, state the separate digits of the thousands plus the hundreds if appropriate

Example:

12.000 One two thousand.

12.500 One two thousand five hundred.

At and above 18.000' MSL (FL 180) state the words flight level followed by the separate digits of the Flight Level

Example:

190 Flight level one niner zero.

275 Flight level two seven five.

Both pilots must be certain that an ATC clearance was correctly understood. If in doubt ask for verification.

If, when receiving an ATC clearance, you are in doubt whether you heard an item correctly; ask for confirmation of the item when reading back the clearance. I.e. “confirm heading”, “confirm flight level”. Do not just read back what you thought was said.

Use air-to-air frequencies only for essential communication. When using HF radios, handmikes installed in the cockpit are more suitable for transmissions than headset boom mikes. Speak clearly with a voice raised slightly.

Both pilots will normally maintain listening watch on the appropriate ATC frequency. If a pilot goes off watch he must inform the other pilot and advise when he is returning on watch. A pilot returning on listening watch shall establish any change in ATC instructions.

2.12 Flight Deck Discipline

Both pilots should be aware of altitude, aeroplane position and situation. If any doubt, investigate.

Avoid casual and non-essential conversation during critical phases of flight, i.e. from start-up until established in climb above transition altitude and from descending through 10.000' until after parking at the gate.

If any cockpit configuration change becomes necessary, no matter how small, it must be accomplished, time permitting, with both pilots monitoring. If one pilot is absent when a configuration change becomes necessary (i.e. switching on anti-ice) he must be briefed on the configuration change upon his return.

Use standard callouts at all times. The pilot not flying should accomplish callouts based on instrument indications or observations for the appropriate condition. The PF should verify the condition/location from his instruments and acknowledge. If the PNF fails to make the required callout the PF should make it.

Do not spend any time or effort on unnecessary activity.

Pilots are expected to give all commands, challenges and responses in a command tone (clearly). When personnel occupy jump seat(s), brief on oxygen mask usage, emergency exits and sterile flight deck policy.

During approach, when visual contact has been established and landing is assured, the Commander may decide to postpone further instruments callouts by stating "VISUAL". It is still required to make the "1000' " and "500' " callouts.

2.13 Weather Radar and Terrain Display Policy

Whenever possibility exists for adverse weather and terrain/obstacles near the intended flight path, one pilot should monitor the weather radar display and the other pilot should monitor the terrain display. The use of the terrain display during night or IMC operations, on departure and approach when in proximity to terrain/obstacles, and at all times in non-radar environments is recommended.

Note: It may be useful to show the terrain display at other times to enhance terrain/situational awareness.

2.14 Autopilot/Manual Flying Policy.

As a rule the autopilot shall be engaged after a F/D pitch mode has been selected and disengaged on final approach. (Re: note on page 4.7 and note 4 on page 7.9) This is especially important during complex departures/arrivals and whenever circumstances create high workload.

It is recommended however that pilots practice manual flying to some extent. This manual flying practice should ideally take place during departures and arrivals at KEF.

Other areas of low traffic density may also be used for that purpose provided weather and traffic situations are considered favourable. Pilot flying shall brief his intentions to practice manual flying. During manual flying the flight directors shall be used and all MCP manipulations shall be accomplished by the monitoring pilot (PNF) as requested by the PF.

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3 Preflight Procedures

3.1 At Dispatch

Both pilots shall participate in the pre-flight dispatch briefing where all factors relevant to the planned flight will be thoroughly checked in order to obtain a clear overview. Items to be checked include but are not limited to:

- Weather for destination.
- Destination alternate(s).
- Enroute alternate(s).
- (T/O alternate, if req.) Enroute flight conditions with special regard to turbulence and possibility of low fuel temperature.
- Altitude selection with regard to estimated weight/expected wind.
- Fuel calculation and extra fuel to be carried.
- Runway status for relevant airports.
- Notams as appropriate.

Commander shall sign Master Document (flight plan) and a copy will be left with dispatch. Copilot shall collect and hold all documents together with the flight envelope, and after flight he shall assure that all documents relevant to the flight, including the loadsheet, are enclosed in the flight envelope before leaving it in a special container in the crew room in REK.

It is appropriate, after the dispatch briefing is completed, that the Commander allocates the task of pre-flight (external) and nominates PF for the next leg.

3.2 Pre-flight inspection

Either pilot, as decided by the Commander will perform the external inspection which includes fuelling supervision if needed. Other pilot will proceed directly to the flight deck and start the flight deck preparation.

3.3 Briefing of Cabin Crew

When on board the aeroplane and prior to passengers boarding, the Commander shall brief the cabin crew of expected flying time, flight condition with special regard to turbulence, also destination weather and other information of interest.

3.4 Entering Flight Deck

The Commander shall check the technical log (AJTL) for discrepancies/deferred items, daily/ETOPS check(s) (Daily exp. in 48 hrs.) check CAT II/III status of aeroplane.

The Copilot shall perform flight deck safety inspection as follows:

- Check circuit breakers, (overhead/side panels).
- Gear pins stowed.
- Fire extinguisher.
- Smoke hood.
- Fire axe.
- Life vests.
- On right side wall check PTU off, flight recorder NORMAL and service interphone OFF.
- Also check aeroplane certificates, manuals, fuel carnets in place.
- Both pilots shall thoroughly check the flight deck for foreign objects.

3.5 Use of APU

1. Check local restrictions for APU operations.
2. No APU start or shutdown during fuelling operation.
3. When ground pneumatics sources in use, APU can be started any time.

3.6 Pilots in Seats

COMMANDER	COPILOT
<i>Either pilot may operate FMC as decided by commander</i>	
Perform panel scan as AOM VOL 1	Perform panel scan as AOM VOL 1
<u>Note:</u> <i>IRS alignment must be completed before VSI, ADI, HSI and RMI checks.</i>	
Load FMC check present position (LAT/LONG)	
<u>Note:</u> <i>When inserting present position into FMC/CDU both pilots must cross check and verify correct LAT/LONG <u>before</u> entry into CDU</i>	
Set NAV AIDS for expected departure	Obtain ATIS and enter on Bug Card Set NAV AIDS for expected departure
Tune VOR frequency and set radials for departure track/distance monitoring, in order to be prepared for conventional VOR tracking should FMC fail or map shift be experienced. Use ADF #2 if needed for departure routing. <u>Note:</u> <i>It is recommended to tune ADF #1 to a locator for landing runway at point of departure in case a return suddenly becomes necessary. The ILS inbound course for same runway can also be selected.</i>	
Monitor ATC clearance	Obtain ATC clearance
<u>Note:</u> <i>Copilot shall obtain ATC clearance timely if possible. Remember to give stand number. ATIS designator, Aeroplane type as appropriate. When receiving the ATC clearance it should be checked against the flight plan route and cleared waypoints underlined on the master document and all other clearance items clearly written down.</i>	
Check FMC flight plan against current flight plan, insert changes, if any, and execute.	Copilot read aloud current flight plan route from master document

3.7 Departure Briefing

Departure briefing shall be accomplished at the gate when departure has been set up. PF will brief with special emphasis on following items:

- Departure chart number and date;
- Departure designator and runway;
- Tracking and distances;
- Altitude/Flight Level crossings;
- Set final altitude/Flight Level on MCP;
- Climb requirements/flap retraction altitude;
- Minimum altitudes;
- Sector altitudes;
- Transition altitude;
- R/T frequency change;
- Engine fail procedure and level-off altitude, if different than SID (Airport Analysis).
- Noise abatement if required;

These items to be crosschecked and verified by PNF.
On Commanders decision review ground emergency/engine out profile.

COMMANDER	COPILOT
Call for Pre-flight Checklist	Read Pre-flight Checklist
Verify Fuel Check	Perform Fuel Check

3.8 Fuel Check

When fuel receipt is received in the cockpit Copilot will perform fuel check as follows.

1. Enter uplifted fuel in the correct measure (LTR/USG) into the AJTL.
2. Convert uplifted fuel to kg.
3. Enter the uplifted fuel into the AJTL in kg.
4. Enter “Totaliser” fuel in the “AFTER FUELLING” column in AJTL
5. Compare before fuelling + uplifted fuel with totaliser fuel and sign in the CKD column.

SEQ	PRE-FLIGHT	FUEL UPLIFT	BEFORE	UPLIFT	AFTER	CKD	ARRIVAL	SUPPLIER	RECEIPT NO.	OIL ADDED (QUARTS)
		AMOUNT	FUELLING	(KGS)	FUELLING		FUEL			ENG. 1
1	TDH	3 910	USG	6 400	11 839	18 300	GHG			ENG. 2
2										APU
3										
4										
5										
6										

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Any considerable difference is worth investigating.

The Commander shall check that the total fuel on board is in accordance with flightplan fuel calculations and there is no difference between totaliser on overhead panel and calculated/Totaliser on CDU progress page 2.

3.9 Loadsheet Onboard

COMMANDER	COPILOT
<u>Check:</u> Correct date. Aeroplane registration. Number of crew/passengers. ZFW, TOW. T/O Fuel. % MAC. Other information as necessary. Then sign the Loadsheet	Insert ZFW (flap setting and %MAC as appropriate) into CDU
Consider assumed temperature thrust reduction for T/O based on prevailing weather/runway condition. Normally maximum reduction should be used unless circumstances dictate otherwise.	Check airport analysis for thrust reduction based on assumed temperature. Select the lower of runway/performance limit corrected for QNH and wind.
Insert V-speeds into CDU. On Pegasus enter flaps setting and thrust reduction before insertion of V-speeds.	Calculate V-speeds, flaps manoeuvring speeds and stab trim setting and enter on bug card.
Set V_2 on MCP Command bug	
Set airspeed external bugs on V_1 , V_R , $V_{ref\ 30} +40$ and $V_{ref\ 30} +80$	Set airspeed external bugs on V_1 , V_R , $V_{ref\ 30} +40$ and $V_{ref\ 30} +80$
On CDU approach page check $V_{ref\ 30}$ and compare with the figure derived from QRH.	

When “preflight complete”, on CDU, PF selects CDU to CLIMB, PNF selects CDU to DIR INT (Legs on Pegasus).

Requesting ZFW from load control as soon as available (KEF) will make it possible to calculate V-speeds and thrust reduction at an earlier stage.

Both pilots must make sure that the V-speeds have been correctly calculated and finally they must compare and cross check bug settings on airspeed indicators.

CALLOUTS: **BOLD TEXT**

ACTIONS: In plain text

3.10 Before Pushback

COMMANDER	COPILOT
Request hydraulic clearance from ground crew. “PRESSURISE HYDRAULICS”.	Upon command select electric hydraulic pumps and fuel pumps for tanks containing fuel to ON.
When hydraulic system pressure status page is normal, perform flight control check and set stab trim.	
Monitor Pushback/Startup clearance.	Obtain Pushback/Startup clearance from Ground/Tower. When clearance received switch on anti-collision light and lock flight deck door.
“ BEFORE START CHECKLIST”	Read Before Start Checklist.

4 Taxi/Take-off Procedures

4.1 Pushback

Commander shall communicate with ground crew as follows:

COMMANDER	GROUND
"GROUND FROM COCKPIT"	
PUSH BACK	
"READY FOR PUSH BACK" "BRAKES ARE RELEASED"	"CONFIRM BRAKES RELEASED"

Note: At first movement of aeroplane Commander will select his clock to run. Consult with ground crew for engine start.

4.2 Engine Start

COMMANDER	COPILOT
Announce start sequence. Normal start sequence is right then left.	
“START _____ ENGINE”	Position START selector to GROUND Start timing of start cycle. Monitor Valve in Transit Light momentarily ON, then OFF. Announce “START VALVE OPEN”
Observe oil pressure increase, N1 rotation and N2 rotation.	
Position _____ FUEL CONTROL switch to RUN when: • EGT between 1 degree C and 100 degrees C, and • N3 reaches 25%, (if 25% N3 is not achievable; at maximum motoring and a minimum of 15% N3) • N2 reaches 10%, or its maximum whichever is reached first. Position _____ FUEL CONTROL switch to RICH when: • EGT 0 degree C, and • N3 reaches 25%, (if 25% N3 is not achievable; at maximum motoring and a minimum of 15% N3) • N2 reaches 10%, or its maximum whichever is reached first. When engine stabilized Position _____ FUEL CONTROL switch to RUN.	When N3 reaches 50% start selector will automatically return to AUTO. Monitor Valve in Transit Light momentarily ON, then OFF Announce “START VALVE CLOSED”

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Observe EGT rise and EGT within limits. Abort start if EGT fails to rise within 20 seconds of selecting RICH/RUN or if EGT exceeds limits.

Repeat procedure to start remaining engine

Commander will start timing when fuel control to Rich/Run position.

The Commander shall, during engine start, verbally confirm parameter indications i.e. N3, oil pressure, N2, N1, fuel flow, lightup.

AFTER PUSH BACK	
COMMANDER	GROUND
"PARKING BRAKES SET"	"PUSHBACK COMPLETED CONFIRM PARKING BRAKES SET"

COMMANDER	COPILOT
"AFTER START PROCEDURE"	
Check recall. Secondary engine display off. Autobrake RTO	APU ON/OFF (consult with commander) Engine Anti Ice on if required. Isolation valve off Pack controls auto

4.3 After Start

COMMANDER	GROUND
"DISCONNECT"	"DISCONNECTING, STANDBY FOR VISUAL SIGN AT YOUR LEFT"
"ROGER"	

Note: Check and verify normal running of all systems before releasing ground crew.

4.4 When Clear Signal is Received

COMMANDER	COPILOT
“AFTER START CHECKLIST”	Read After Start Checklist
Monitor Taxi Clearance When Taxi Clearance is received switch on Taxi Light.	Call for Taxi Clearance

Note: It is an important safety measure to delay the after start checklist and obtaining of taxi clearance until the taxi signal has been received from the groundcrew.

4.5 Taxying Out for Take-off

The Commander shall taxi the aircraft and both pilots shall have their ground/taxi charts readily available for reference during taxi.

The Copilot shall check that the area to the right of aircraft is clear before movement starts and then assist the Commander as necessary during taxiing. To begin taxi, release brakes, smoothly increase thrust to minimum required for the airplane to roll forward, then reduce thrust to idle. A turn should not be started until sufficient forward speed has been attained to carry the aeroplane through the turn at idle thrust.

To the pilot, the aeroplane appears to be moving slower than it actually is due to the flight deck height above the ground. Consequently, the tendency is to taxi faster than desired. This is especially true during runway turnoff after landing. The ground speed display on the flight instruments may be used to determine actual taxi speed. The appropriate taxi speed will depend on turn radius and surface condition.

Taxi speed should be closely monitored during taxi out, particularly when the active runway is some distance from the departure gate. Avoid "riding" the brakes to control taxi speed as this causes high brake temperatures and increased wear of brakes. Normal taxi speed is approximately 20 knots, adjusted for conditions. On long straight taxi routes, speeds up to 30 knots are acceptable, however at speeds greater than 20 knots use rudder pedal steering only. When approaching a turn, speed should be slowed to an appropriate speed for conditions. On a dry surface, use approximately 10 knots.

Note: High taxi speed combined with heavy gross weight and a long taxi distance can result in tire sidewall overheating.

COMMANDER	COPILOT
Call for flaps to T/O setting	Set T/O flaps
<i>Note: Flaps can be selected to T/O setting at any time on the taxiway when clear of parking area. (Except for contaminated taxiway; see cold weather operation)</i>	

4.6 Take-off Briefing

COMMANDER	COPILOT
Review: Last minute ATC clearance, flaps setting thrust setting, runway condition and any other factors affecting the take-off not previously briefed.	Confirm briefing items

4.7 Cabin Secure Signal Received from C/C 1

COMMANDER	COPILOT
	Give appropriate cabin signal when takeoff expected in less than three minutes.
“BEFORE TAKE-OFF CHECKLIST”	Read before take-off checklist

4.8 Cleared for Lineup

COMMANDER	COPILOT
Align aeroplane with runway centreline	Select TCAS to TA/RA or T/A only as appropriate
	Turn white strobe light on when entering runway

If the Copilot is the to be the flying pilot the Commander hands over the controls after lining up by calling: **“YOUR CONTROLS”** (which includes brakes if applicable).

At the same time he takes over the radio communication. If static T/O is required the handover shall take place as soon as the aeroplane has been stopped in take-off position.

4.9 Cleared for Take-off

PILOT FLYING	PILOT NOT FLYING
	Switch landing lights ON
If any weather is reported/expected in the T/O sector switch on weather radar	

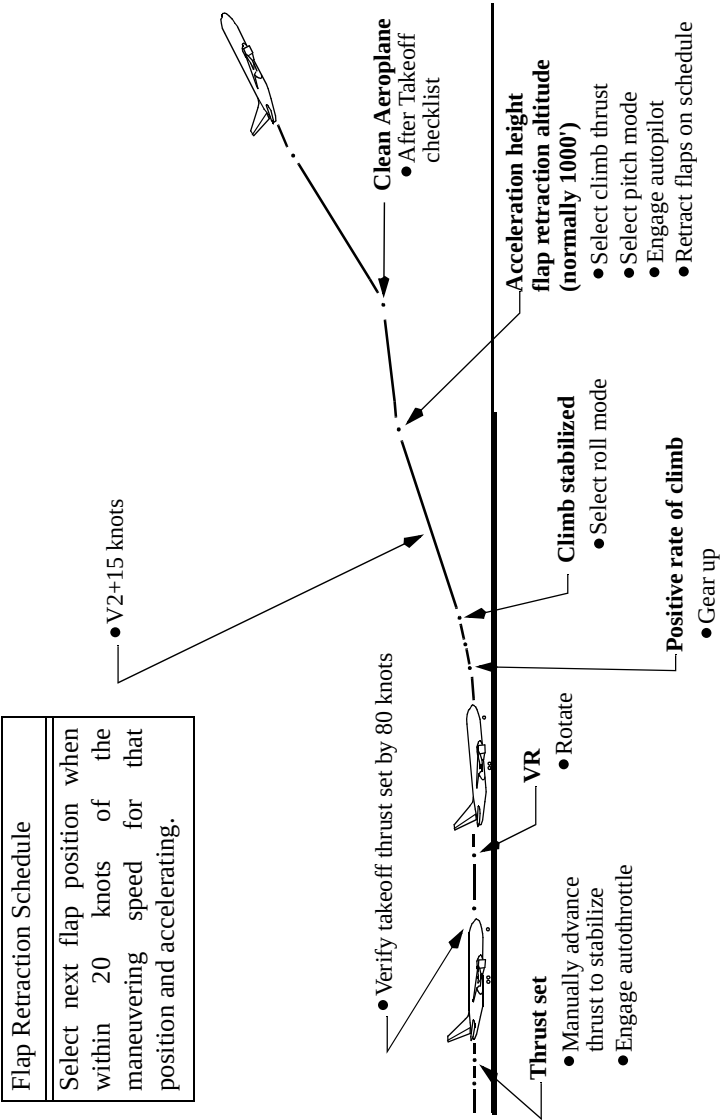
4.10 Take-off procedure

PILOT FLYING	PILOT NOT FLYING
Advance thrust levers to approximately 1.10 EPR. When both engines stabilized push EPR switch and make a callout to confirm anticipated take-off EPR i.e. “SET TAKE-OFF THRUST ONE POINT SIX FIVE”	Verify correct takeoff thrust set. ”THRUST SET”
	Adjust takeoff thrust prior to 80 knots, if required. Monitor engine instruments throughout takeoff.
<i>Note: After takeoff thrust is set, the commander must keep his hand on the thrust levers until V_1</i>	
Check airspeed indicator Verify 80 knots by responding: “CHECKED”	Accelerating through 80kts. “EIGHTY” Check autothrottle revert to THR HOLD on flight mode display.
Monitor airspeed noting V_1 Rotate at V_R Establish a positive climb	“VEE ONE” At V_R “ROTATE” Monitor airspeed, vertical speed and pressure altimeter. “POSITIVE CLIMB” when indicated on pressure altimeter.

PILOT FLYING	PILOT NOT FLYING
“GEAR UP” when positive climb is established.	Position landing gear lever UP.
“LNAV” or “HDG” select. when established in climb.	Push LNAV/HDG selection switch.
At flap retraction altitude. “CLIMB THRUST, VNAV” ” ____AUTOPILOT” * Push A/P engage command switch.	Select CLB thrust Push VNAV switch
Verify climb thrust set and autopilot engaged in CMD	
“FLAPS FIVE-ONE-UP” according to flap retraction schedule.	Position flap lever as directed.
	When flaps are up, landing gear and door lights extinguished position landing gear lever to off “CLEAN AEROPLANE”
	“TRANSITION”
At transition altitude set altimeter to 1013 hPa and external bug to ZERO. If initially levelling of at a flight level both primary altimeters may at commanders discretion be set at 1013 hPa before passing TA.	
When time permits “AFTER TAKEOFF CHECKLIST”	Accomplish after takeoff checklist.

- * As soon as pitch mode has been selected (VNAV/FLCH/VS) autopilot can be selected to CMD, normally use centre A/P. Early use of autopilot is strongly recommended especially in busy areas/complex departures/bad weather. When conditions are favourable however autopilot selection can be delayed if pilots wish to exercise manual flying. PF should brief his intentions on A/P usage before T/O.

NORMAL TAKE-OFF PROFILE



5 Climb Procedure

PILOT FLYING	PILOT NOT FLYING
	Above 10.000' position LANDING and LOGO light switches to OFF. Check APU OFF if not required Seatbelt switch to AUTO * Departure message *

- * On Commanders decision, when established at normal climb speed and no turbulence expected, seat belts may be switched to AUTO
If necessary leave seatbelts on and brief crew/passengers of possible turbulence.
When time permits and not interfering with other duties, transmit departure message to company.

5.1 Economy Climb

The normal economy climb speed schedule of the FMC minimises trip cost. It is influenced by gross weight and cost index.

The FMC generates a speed schedule which is normally utilised by selecting VNAV (VNAV SPEED)

If FMC data not available use 290 kts/ Mach 0.78 above 10.000'.

If ATC permits use of higher than 250 kts below 10.000', the use of ECON speed may provide additional fuel savings.

5.2 Maximum Rate of Climb

Maximum Rate of Climb can be obtained by flying at flaps up manoeuvring speed + 50 kts until intercepting MAC 0.75. Use speed intervention. (Ref FCTM 3.4)

5.3 Maximum Angle of Climb

Maximum angle of climb is approximately the minimum clean manoeuvring speed for the weight. The FMC provides Maximum Angle of Climb Speed.

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6 Cruise

6.1 Master Document

One copy of the flight plan shall be used as the “Master Document” on the flight deck during each flight. The Master Document shall in all cases contain the fuel calculation and total fuel carried for the flight and shall be signed by the Commander.

When other duties permit, preferably after reaching initial cruising altitude, the ETA calculation shall be carried out and the relevant ETA entered for each waypoint.

As the flight progresses the following should be entered on the Master Document in addition to ATA from plotting chart:

- Mid-position
- Mid-position, temperature and w/v (from FMC PROG II)
- Waypoint; temperature and w/v (from FMC PROG II)
- Waypoint; fuel consumed TBO (from FMC PROG II)
- Waypoint; fuel remaining REM (from FMC PROG II)
- Waypoint; actual flight level.

When receiving an ATC clearance it must be clearly written down on the Master Document. In case of a track change the Master Document must be updated accordingly. When cleared “Direct to” a downtrack waypoint bypassing other waypoint, draw a line down, pointing at the new active waypoint.

It is recommended to use the FIX/ABEAM function to carry out time and fuel checks passing the offset waypoints.

The calculations and entries into the Master Document shall normally be carried out by PNF.

6.2 Position Reporting

Refer to FOM 8.3.2.9.5

6.3 Fuel Monitoring

As the flight progresses fuel consumption shall be closely monitored and total burn-off at each waypoint shall be entered on the Master Document and compared with the calculated burn-off. The totaliser fuel shall also be entered on Master Document (PNF). Any discrepancy is worth investigating.

6.4 Position Plotting and Track Monitoring

The plotting chart is only intended to provide a visual presentation of the intended route, which otherwise is defined only in terms of coordinates.

It must be assured that the intended track is correctly drawn on the plotting chart. The FMC position shall be entered on the plotting chart approximately 10 minutes after passing each waypoint, and a mid position (between waypoints) should also be entered. Instead of 10 minutes after waypoint passage, two degrees of longitude after that waypoint can be used as a checkpoint (i.e. after passing 63N 30W, check latitude and enter positions passing 32W and 35W). These positions should fall precisely on track. If not, investigate immediately.

The position plotting can be carried out by either pilot as decided by Commander.

6.5 RVSM Procedures and Contingencies

Prior to entry into RVSM airspace, crosscheck the primary altimeters of which at least two must agree within plus or minus 200', record the readings on the plotting chart to be available for use in possible contingency situations.

Within RVSM airspace, crosscheck periodically (approx. every hour) the primary altimeter which should agree within 200'. If not, advise ATC immediately. If/when advised by ATC of an assigned altitude deviation exceeding 300', return as soon as possible to the cleared FL or follow the Contingency Procedures (refer to Jeppesen chart AT(H/L) 2, panel 2). Report immediately leaving or reaching any new cruising level, whether it will be following a re-clearance, step-climb etc..

When climbing or descending within RVSM airspace limit climb/descent to 1000 fpm or less when within 1000 feet of cleared FL. Use v/s if necessary.

In event of wake turbulence encounter:

- Notify ATC as soon as possible
- Contact the other aircraft on 123.45 MHz if possible.
- Consider a lateral offset NOT TO EXCEED 2 NM (ATC will not normally respond).
- Return to assigned route or track as soon as offset is no longer required
- Notify ATC when re-established on route or track.

Note that ATC will not issue a clearance for lateral offset

6.6 Transponder Operation

30 minutes after entering the NAT region operate the transponder at C 2000, all directions. If entering Bermuda TMA operate transponder at C 2100. If operating in the Western Atlantic Route System retain last assigned code until new code is assigned. When operating in the south and east part of Reykjavik OCA, the last assigned transponder code must be retained until otherwise advised.

6.7 Altitude Selection

Plan to conduct the cruise portion of the flight as close as possible to the optimum altitude.

For a long flight where altitude changes are difficult to obtain, request flight level approximately 2000' above optimum altitude. (Typically for ICELAND-USA FLIGHTS). Before requesting/accepting an altitude above optimum, determine whether it will be acceptable with regard to expected/reported turbulence conditions ahead.

Optimum altitude increases by approximately 800' per hour as fuel is burned off.

Cruise fuel penalties include:

ISA + 10°C = 1% increase in trip fuel

2000' above/below optimum altitude = 1-2% increase in trip fuel

4000' below optimum altitude = 3-5% increase in trip fuel

8000' below optimum altitude = 8-14% increase in trip fuel

6.8 Revised Estimate

It is essential to monitor estimated time over next position as the flight progresses. Any deviation in excess of 2 minutes from previously given estimate must be revised and transmitted to ATC accordingly.

6.9 Minimum Enroute Altitude

The crew should at all times be aware of the minimum safe altitude in the area where the flight is operating should a sudden descent become necessary.

6.10 Fuel Temperature

During extended operation at high cruise altitudes, fuel temperature tends to lower towards total air temperature. Fuel temperature must be kept at least 3° C above freezing point of the fuel specification. This can be of concern of flights from US destinations when JET A fuel with a freezing point of - 40° C is used. The rate of cooling is approximately 3°C per hour, with a maximum of 12°C per hour under most extreme condition. Total air temperature can be raised by descending to warmer air mass and/or increasing mach number.

In most cases the required descent would be 3000' to 5000' below optimum altitude.

An increase of 0.01 mach will result in an increase of 0.5° to 0.7° total air temperature.

6.11 Operation in ETOPS Area

Normal procedures on ETOPS flight do not differ from standard operation. However, during the last hour of cruise before descent for approach, the ICAA currently requires that a fuel crossfeed valve check be performed on single crossfeed valve aeroplanes.

Approaching the ETOPS Area

Procedures:

- Check fuel remaining commensurate with the CFP fuel.
- Check that ERA weather satisfies requirements.
- Check accuracy of navigation and navigation equipment by reference to radio aids.
- Plot position and time on the ETOPS plotting chart.
- Commander to verify the coordinates and waypoint sequence for intended route.
- Check requirement for APU operation.
- Check crossfeed valve.

For further ETOPS operational information refer to FOM 8.5.3.

7 Descent/Approach Procedures

7.1 Descent Preparation

In order to determine the T/D point be sure to insert proposed landing Rwy, approach and transition together with any altitude constraint into the arrival/legs page of the CDU. If necessary also add wind forecast and expected altitude for engine anti-ice selection on the descend forecast page.

Obtain destination ATIS and enter on BUG card, set NAV radios and airspeed/altimeters bugs and radio altimeters as required.

Set double bug on V_{REF} , for landing flaps and single bug at $V_{REF 30} + 40$ and $V_{REF 30} + 80$ for flaps five and clean manoeuvring speeds respectively.

Set altimeter bug to applicable approach minima (500' HAT for low visibility).

Copilot will fill out BUG card.

Plan use of autobrakes consistent with Rwy length/status (Use of autobrakes recommended).

PF will accomplish arrival and approach briefing prior to start of descent. Brief passengers of destination weather, anticipated delays, and give estimated time of landing. Brief cabin crew of flying time remaining.

When time permits transmit arrival message to company.

If destination weather/runway status is marginal and diversion is possible or likely, check weather for alternate airport(s) decide minimum fuel for diversion and insert into RES FUEL on CDU performance page.

In case of holding, this gives "HOLD AVAILABLE TIME" on CDU holding page.

Load alternate route into ROUTE II in FMC, if possible.

7.2 Arrival/Approach Briefing

Arrival/approach briefing is to be conducted by PF before top of descent.
Special emphasis on following items:
Arrival/approach chart number and date
Tracking and distances
Flight level/altitude crossings
Navigation radio setups
LOM (or equivalent) crossing altitude
Decision altitude/height. Minimum descent altitude
Runway elevation
Stabilised approach altitude
Sector altitude
Glideslope intercept/final approach fix crossing altitude
Missed approach procedure/routing
Runway turn off .

If a flight is cleared to descent to lower flight level before reaching anticipated top of descent insert the new cleared level into CDU cruise page. Readjust MCP altitude and descend in VNAV mode. Autothrottle will turn to TRH HLD and thrust can be controlled manually to obtain desired vertical speed. DO NOT USE V/S MODE (as speed protection may be lost).

When the new flight level is reached autothrottle will return so SPD and a new T/D point will appear.

7.3 Descent

PILOT FLYING	PILOT NOT FLYING
Readjust MCP ALT to cleared FL/ALT. Descend will start automatically at T/D point provided VNAV engaged. FLCH is optional (NOT V/S)	 Report leaving FL_____

If desired, a smooth transition into descend profile can be obtained by using “descend now” function on CDU DES page when within 10 NM of T/D point.

Standard Operating Procedures

PILOT FLYING	PILOT NOT FLYING
	Turn seatbelts ON at commanders decision no later than 20 min. before anticipated landing.
“APPROACH CHECKLIST”	Read Approach Checklist

During descent, use VNAV as much as practicable. If VNAV not feasible, use FLCH (not V/S).

Monitor TAT for engine anti-ice. When in clouds during descend use eng. anti-ice even with SAT lower than -40 °C.

As soon as cleared to Altitude reset altimeter to local setting and Commander shall check RECALL.

Passing FL 100/10.000' turn landing lights to ON (Logo light if in darkness). When landing estimated in 10 minutes announce to cabin (“10 minutes to landing”, this will be close to 10.000' altitude). No further CDU manipulations unless necessary (i.e. change of runway/approach) except for extension of runway centerline, when LNAV is no longer required. Use VNAV or FLCH. Speed brakes can be used to adjust vertical profile as necessary.

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
When cleared to altitude and no further reference to FL is required	Set altimeter to QNH	Set altimeter to QNH
	“TRANSITION LEVEL CHECKLIST”	Read Ttransition Level Checklist.
Passing FL 100/10.000' When landing EST in 10 min.	Announce to cabin 10 min to landing	Turn on landing/logo lights.

7.4 Initial Approach

PF shall keep hands on controls and thrust levers at all times during automatic approach and landing.

On baseleg, in level flight, start to reduce speed for flap extension approximately 5 NM from the final course. Intercept final approach course with flaps five, flaps five manoeuvring speed or as directed by ATC. Always intercept ILS LOC in HDG mode. NAV AIDS used for approach shall be identified aurally. If making an NDB approach aurally monitor radio beacon(s) throughout the approach and missed approach. For monitoring of NAV aids refer to FOM 8.4.1.4.

7.5 Holding

If holding required enter the holding pattern and modify as necessary on the CDU holding page. Check max holding speeds for altitude (on normal checklist). Start reducing to holding speed 3 min before arrival time at the holding fix. Use LNAV and FLCH. When max issued holding speed lower than minimum clean speed use flaps 1. If holding above FL 250 use $V_{REF 30} + 100$ as a buffet margin.

7.6 ILS Approach

Normally a standard ILS approach profile (Ref. page 7.5) shall be used unless circumstances dictate otherwise.

Low drag ILS approaches (Ref. page 7.6) are feasible and sometimes necessary (German airports) if the altitude for glideslope follow or capture is relatively high above runway elevation and ceiling and visibility above specified limits.

An altitude deviation CAUTION message will be activated when descending 300' below selected MCP altitude.

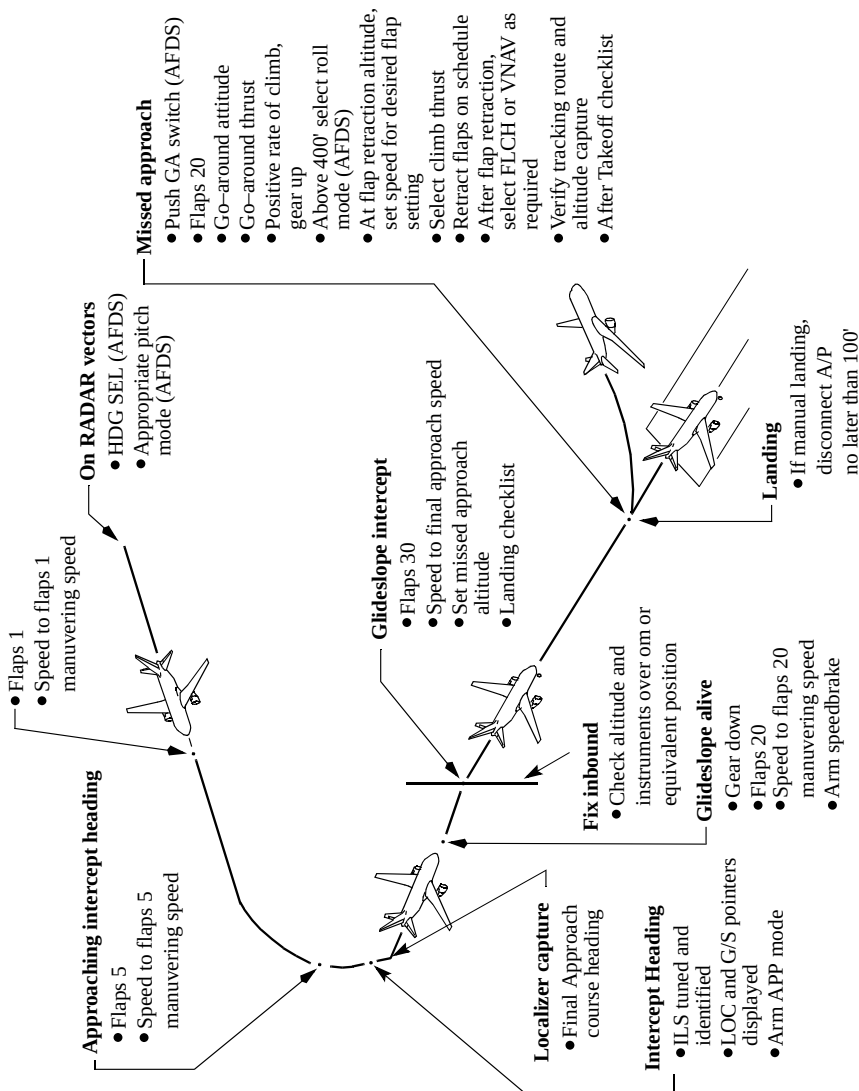
A low drag approach should not be planned or performed if the G/S capture altitude is less than 2500 feet above runway elevation and/or ceiling and visibility less than 1000'/5000m.

Decelerating ILS approaches (Ref. page 7.7) are necessary when final approach speed constraint is present (i.e. 160 kts to four miles out).

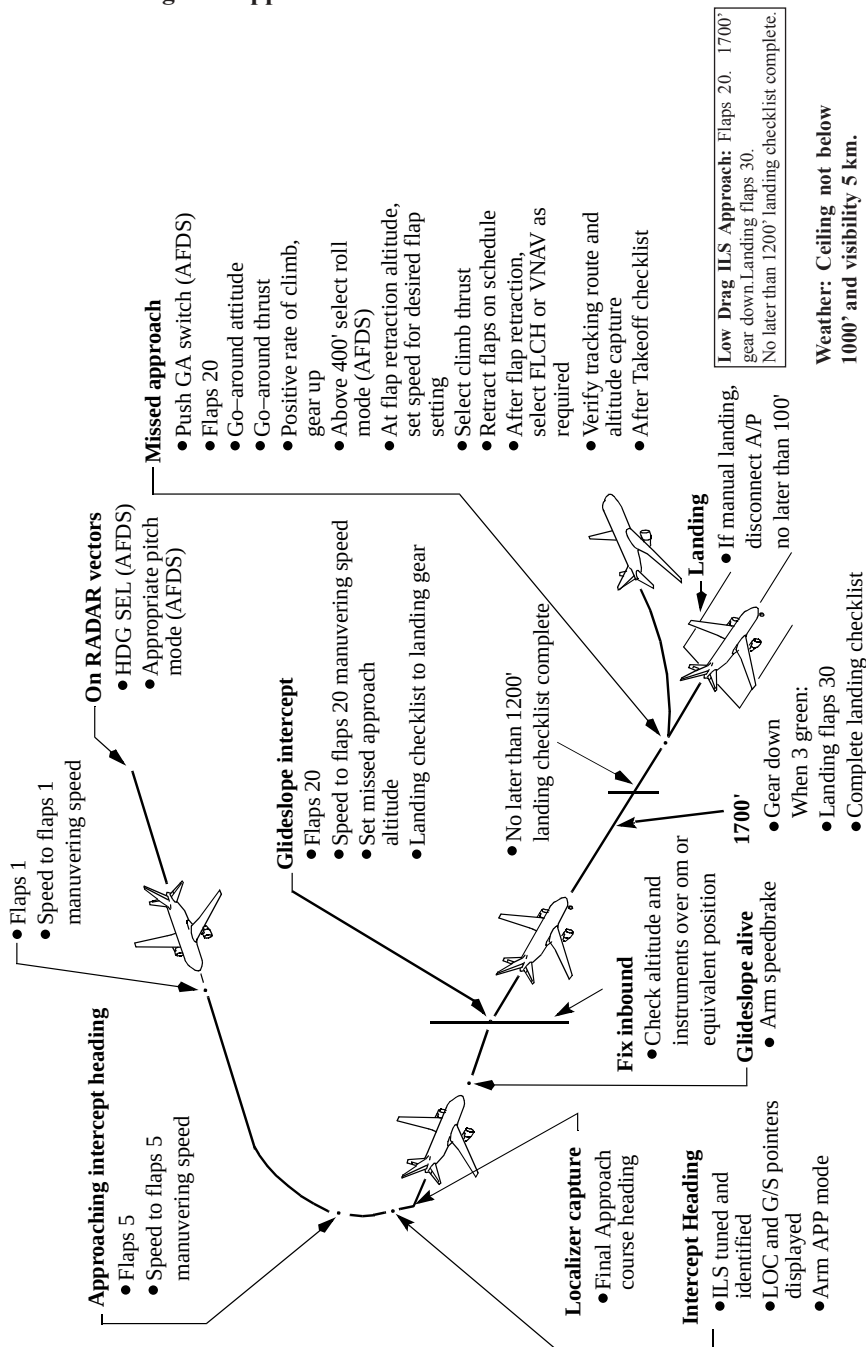
In all cases the planned approach profile shall be included in the approach briefing.

Standard Operating Procedures

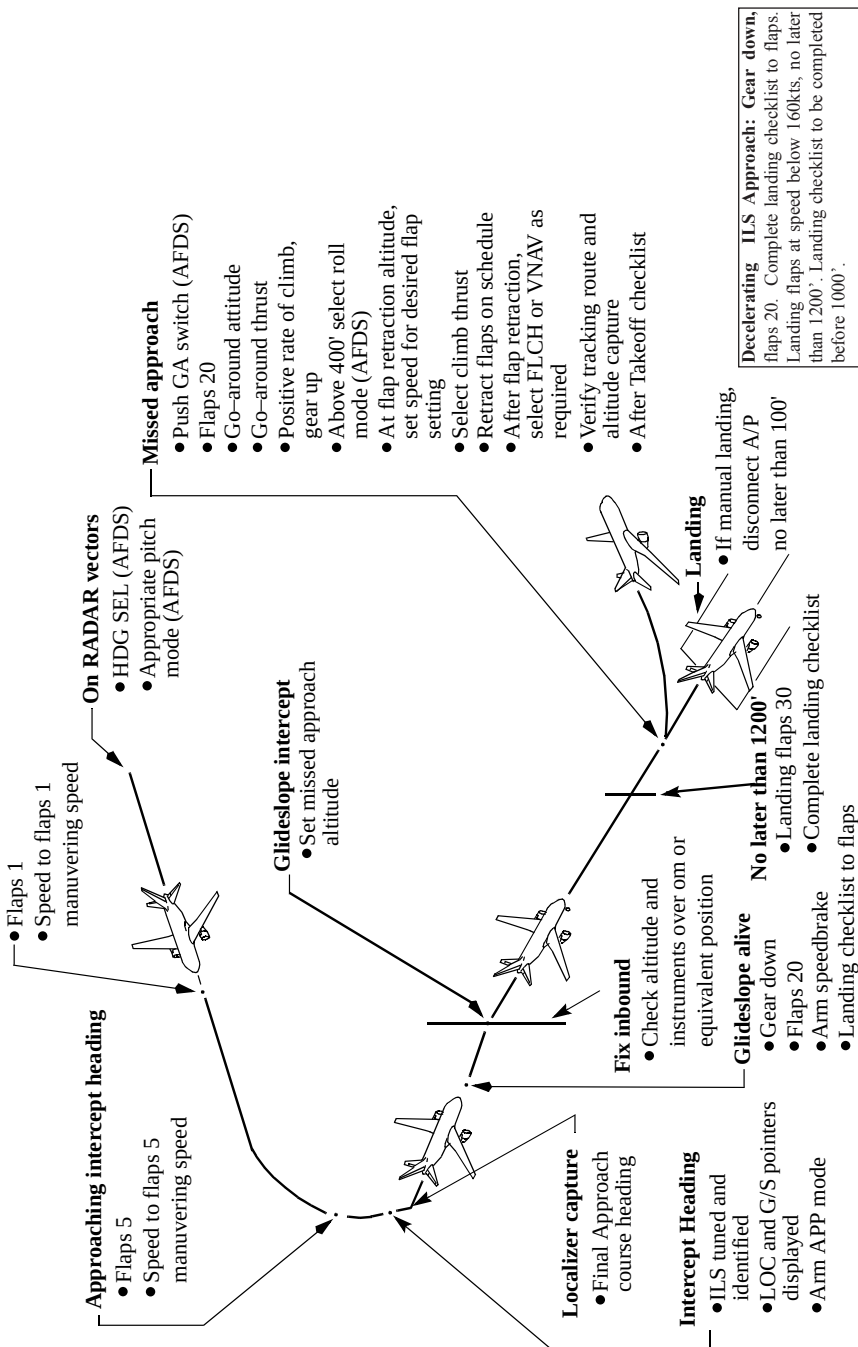
Standard ILS Approach



Low Drag ILS Approach



Decelerating ILS Approach



CONDITIONS	PILOT FLYING	PILOT NOT FLYING
On radar vectors. When appropriate. If a procedural approach is being flown, cross the fix outbound at flaps 5, manoeuvring speed	“FLAPS ONE” Adjust speed to flaps 1 manoeuvring speed.	Select flaps to 1.
	“FLAPS FIVE” Adjust speed to flaps 5 manoeuvring speed.	Select flaps to 5.
On intercept heading and cleared for approach.	Look for LOC and G/S pointers properly displayed on ADI Arm APP mode. Monitor flight mode annunciation on ADI. “G/S ARMED LOC ARMED”	Monitor proper flight mode annunciation. “CHECKED”
Localizer alive.	“CHECKED”	“LOCALIZER ALIVE”
Glide slope alive. *1)	“CHECKED” “GEAR DOWN FLAPS TWENTY” Adjust speed to flaps 20 manoeuvring speed or ATC speed. Arm speedbrake. <i>Note: Commander shall arm Speedbrake.</i>	“GLIDE SLOPE ALIVE” Select gear down and flaps to 20.
Glide slope captured	“FLAPS THIRTY” *2) “LANDING CHECKLIST” Adjust speed to final approach speed.	Select flaps to 30. Read landing checklist. Set missed approach altitude on MCP altitude.
Fix inbound	Check altitude and instruments over OM or equivalent position.	
	“CHECKED NO FLAGS.”	Call: (Example) “OUTER MARKER 1470' NO FLAGS”.

Standard Operating Procedures

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
1000' AAL (QNH)	“CHECKED”	“ONE THOUSAND” Callout significant deviations from programmed airspeed descend and instrument indications.
500' AAL (QNH)	“CHECKED”	“FIVE HUNDRED”
100' Above DH	“CHECKED”	“HUNDRED ABOVE”
Reaching DH	“LANDING/GO AROUND” *³⁾ For manual landing disconnect A/P no later than 100' * ⁴⁾	“MINIMUM”

*1) Intercepting glideslope from above. Autoflight system engaged, landing gear down and localiser captured. Glideslope armed. Use V/S 1500 fpm down.

*2) During final approach, if ATC speed constraint is present i.e. “maintain 160 kts to 4 miles out” leave flaps at 20 until free of speed constraint. Accomplish "landing checklist to flaps at glide slope intercept. When landing flaps are set complete landing checklist. In some cases landing gear must be lowered late on final (i.e. FRA, approaching or over outer marker). Accomplish LANDING CHECKLIST TO GEAR AT G/S INTERCEPT. When gear is down and landing flaps are set, complete landing checklist. Ensure to be in landing configuration no lower than 1200' AAL. If necessary, partial speed brake may be used to control vertical path during low drag approach. Refer to approach profiles, pages 7.7 to 7.9.

*3) Commander shall announce go around.

*4) On final approach in strong gusty winds an early disconnect of autopilot is recommended to allow for manual trimming of aircraft. Preferably through 500' AAL.

If the automatic callout of “Fifty” is not heard, the PNF should call every 10' below 50' radio height, i.e. “Forty”, “Thirty”, “Twenty”, “Ten”.

For automatic landing adjust speed command bug to $V_{REF} + 5$, regardless of wind. For manual landing add $\frac{1}{2}$ head wind component + gust to V_{REF} , maximum 20 kts.

Standard Operating Procedures

7.7 Missed Approach Procedure. ILS Approach

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
At DH/MDA with no visual contact. Commander shall announce go-around.	Push G/A switch “FLAPS TWENTY”	Position flap lever to 20.
Verify rotation to go-around attitude and thrust increase and verify flight mode annunciation on ADI for proper mode.		
After positive rate of climb established (by altimeter).	“GEAR UP”	Verify go-around thrust, adjust if necessary. “POSITIVE CLIMB” Position gear lever to UP.
Above 400` R/A.	Select LNAV or HDG.	
Flap retract Altitude.	Position airspeed command bug to $V_{REF} + 80$. “CLIMB THRUST” “FLAPS FIVE-ONE-UP” According to flap retraction schedule.	Select climb thrust Position flap lever as directed.
Aeroplane clean.	FLCH/VNAV as required.	
	Verify missed approach route being tracked and M/A altitude captured.	
		“CLEAN AEROPLANE”
	“AFTER T/O CHECKLIST”	Accomplish after T/O checklist.

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8 Landing

For landing technic refer to FCTM chapter 4.

8.1 Rollout

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
After touch down	Maintain runway centreline and fly the nose wheel smoothly onto the runway. Avoid increasing pitch after touchdown. Use idle reverse unless necessary for safety reasons. Reverse off by 60 kts.	Monitor speed brake and when extended “SPEEDBRAKE UP” If no extension “SPEEDBRAKE NOT UP” Decelerating through 60 kts. “SIXTY KNOTS”
If the Copilot was the PF the commander shall take over control of the aeroplane at this point by stating: “MY CONTROLS”		

8.2 Clean Up Procedure

CONDITIONS	COMMANDER	COPILOT
Leaving active runway or at normal taxi speed.	Disconnect A/P prior to runway turnoff. Speed brake lever down. • Auto brakes selector OFF.	When commander has selected speed brake down, start the after landing procedure as follows: • Select clock to HLD. • Select flap lever to UP • Start APU • White strobe light OFF • Landing lights as required by commander • Select flight directors OFF • Select status page on secondary EICAS display (to monitor APU start). • Stab trim to 4 units. • Weather radar OFF • Select TCAS OFF. Set 0000 on display. • Select ILS FRQ off scale.
Taxi.	Both pilots shall have their ground/taxi charts readily available for reference during taxi.	
Prior to entering gate	“TAXI LIGHT OFF” <i>To avoid blinding effect.</i>	Select taxi light OFF

8.3 Shutdown Procedure

CONDITIONS	COMMANDER	COPILOT
When aeroplane stop at the gate.	Park brake set. Verify park brake light illuminated.	Engine anti-ice switches OFF (prior to engine shutdown)
Shut down procedure.	Shut down engine right then left. Select clock to HOLD. If APU not available shut down left engine when external power on buses. “SEAT BELTS OFF”	If APU not available select external power on when external power available light is illuminated. Select seat belt selector to OFF. Red anticollision light switch OFF Flight deck door lock OFF.
	Complete the shutdown scan according to AOM.	
Shutdown scan completed.	“SHUT DOWN CHECKLIST”	Read shut down checklist.
Chocks in place.	Release the parking brake.	
Shut down checklist completed.	Sign AJTL. If any technical discrepancy, enter into AJTL. If no defect “NIL” should be written.	Complete paper work.

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9 Non-Precision Approach

9.1 VOR Approach

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
On radar vectors. When appropriate. If a procedural approach is being flown, cross the fix outbound at flaps five, manoeuvring speed	"FLAPS ONE" Adjust speed to flaps 1 manoeuvring speed.	Select flaps to 1.
	"FLAPS FIVE" Adjust speed to flaps 5 manoeuvring speed.	Select flaps to 5.
On intercept heading and cleared for approach	Arm LNAV "LNAV ARMED"	Monitor proper flight mode annunciation. "CHECKED" Select VOR Raw data on HSI for track/distance monitoring through out the approach.
VOR radial alive.	"CHECKED"	"VOR ALIVE"
1,5 NM or 30 sek. before descend point.	"CHECKED" "GEAR DOWN FLAPS TWENTY" Adjust speed to flaps 20 manoeuvring speed or ATC speed. Reset MCP altitude selector to next lower altitude. Arm speed brake. <i>Note: Commander shall arm speedbrake</i> Arm V/S.	"APPROACHING DESCEND POINT" Select gear down and flaps to 20.

VOR Approach continued...

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
At descend point	“FLAPS THIRTY” “LANDING CHECKLIST” Adjust speed to final approach speed. Adjust V/S to initiate descend. Adjust descend rate until green arc on HSI is over the next altitude constraint on the inbound leg. When the descend rate has stabilized reset MCP altitude to next lower altitude constrain or to the nearest 100’ below MDA.	Select flap to 30. Read landing checklist. Continue to monitor track/altitude crossings.
Fix inbound	Check altitude and instruments passing fix inbound (DME or NDB)	
	“CHECKED”	(Example) “SEVEN DME 2000’ NEXT 6 DME AT 1680’ ”.
1000’ AAL QNH	“CHECKED” Vertical speed should be less than 1000 FPM below 1000’ AAL. Reduce further as appropriate approaching MDA.	“ONE THOUSAND” Call out significant deviations from programmed airspeed, descend and instrument indications.
500’ AAL QNH	“CHECKED”	“FIVE HUNDRED”
100’ above MDA	“CHECKED” Check and adjust V/S as necessary Just before, or at MDA. Push altitude hold.	“HUNDRED ABOVE”

VOR Approach continued...

At MDA when ALT hold displayed.	“SET MISSED APPROACH ALTITUDE”	“MINIMUM” Set MA ALT on MCP
Visual contact	“LANDING”	Pending on conditions: “APPROACH/ STROBE/ CENTERLINE- LIGHTS” or “RUNWAY IN SIGHT”
When established on VASIS (or other slope reference) and leaving MDA.	Switch off F/D. Disconnect autopilot/ auto throttle and manually land the aeroplane	Switch off flight director monitor airspeed and sink rate and call out significant deviations. I.e. “BUG MINUS FIVE” “SINK 900”

9.2 NDB Approach

NDB approach is conducted in the same way as VOR approach. Raw data information must be monitored. NDB must be aurally monitored all the time. LNAV may be used for tracking as long as no disagreement is noted on raw data. Both pilots may be in MAP mode. (Ref. FOM 8.4.1.4)

9.3 LOC Backcourse Approach

For localizer backcourse approach select front course on course selector. For LOC backcourse tracking select LOC and B/CRS on MCP when on intercept heading.

9.4 Missed Approach. Non-Precision

The missed approach procedure for a non-precision approach is the same as for a precision approach. Keep autopilot/autothrottle engaged.

If a missed approach is required following a manual approach or after the autopilot is disconnected during the final visual approach segment, push either GA switch, call for flaps twenty, ensure/set go-around thrust, and rotate smoothly to 15 degrees pitch attitude. Then follow flight director commands and retract the landing gear after a positive climb is indicated on the altimeter. If the flight directors have been turned off during the final visual approach segment, ensure that they are turned on after gear retraction and prior to any roll/pitch mode selection.

Note: If the flight director switches are off and flight director guidance is in the pop-up mode after initiation of the go-around, flight director guidance will disappear with the first selection of a roll/pitch mode. At this point restoration of flight director guidance requires turning both switches on and pushing either GA switch and selecting LNAV or HDG SEL.

9.5 Circling approach

Circling approach is conducted in the same way as a straight-in non-precision approach, except for selection of landing flaps, which is delayed until just prior to intercepting final approach profile for the landing runway. Set radio altimeter to 400'. Use the minima associated with anticipated circling speed.

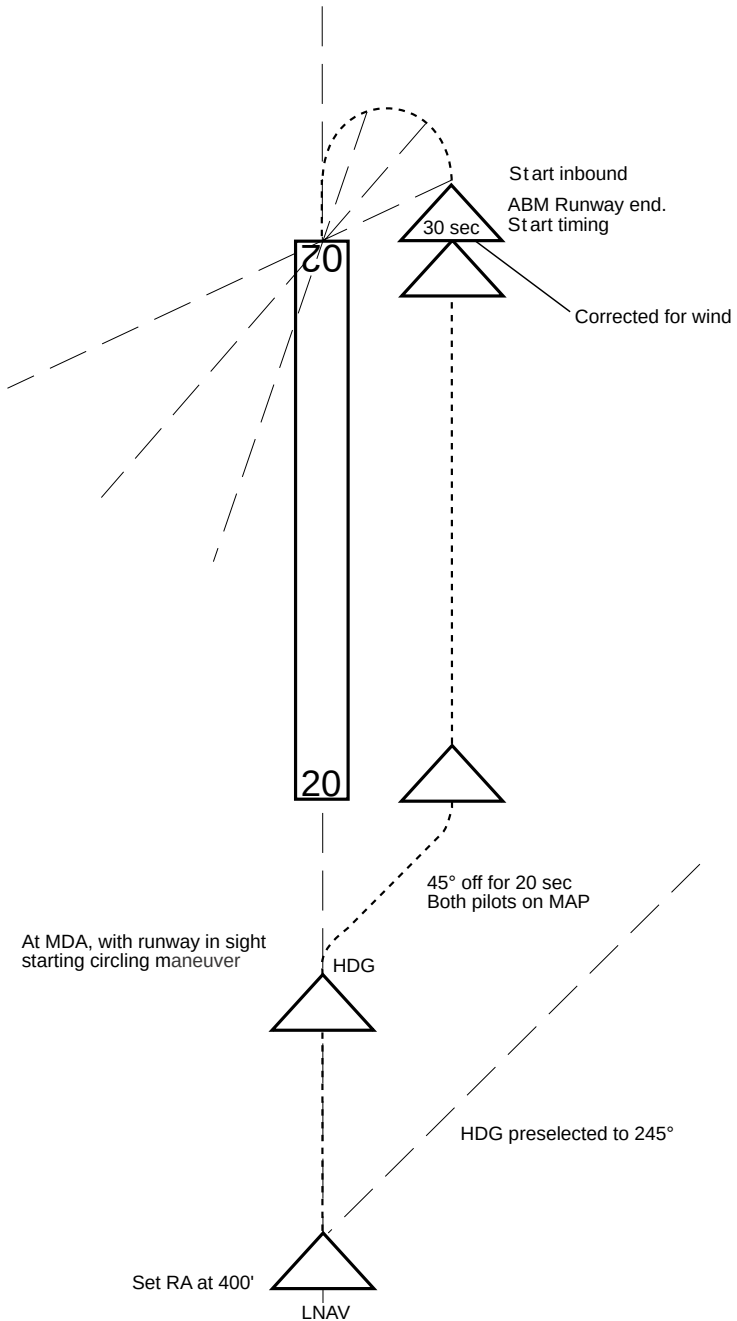
Passing FAF select gear down, flaps twenty and descend to circling MDA. Accomplish landing checklist to flaps during descent to MDA. Heading bug should be preselected to break off heading (45° off the inbound course). When at MDA with runway in sight and ready to commence visual circling push HDG on MCP (PF). Fly 45° offset heading for 20 seconds before turning down wind. If visual contact with runway is lost go-around is mandatory. Extend downwind leg 30 seconds (corrected for wind) beyond end of landing runway before commencing inbound turn. Use HDG sel and place heading line over runway end on map while turning inbound. Prior to intercepting final approach profile, select landing flaps and decelerate to the approach speed. Complete the landing checklist. Do not descend below MDA until intercepting the visual profile.

Leaving MDA disengage autopilot and disconnect the autothrottle. After intercepting the visual profile cycle both F/D to OFF (PNF) and select the PNF F/D to ON when established on final approach. This eliminates unwanted commands for the PF and allows F/D guidances in the event of go-around. Complete the landing.

9.4 Missed Approach from Circling

If visual reference is lost while circling to land from an instrument approach, the missed approach specified for that particular instrument approach must be followed. It is expected that the pilot will make an initial climbing turn toward the landing runway and overhead the aerodrome where he will establish the aeroplane in a climb on the missed approach track.

Circling Approach



Intentionally
Blank