

# Flight Handbook Notes

As of September 2004

## Big Time Disclaimer

The objective in creating these notes was to develop a quick reference study guide for pilots. Printed front-to-back these notes will significantly reduce the quantity of pages while still retaining the Atlas policies, procedures and limitations. The notes are pilot oriented. Many FE duties are not included: emphasizing only on those duties that the Captain should be aware of and impact on crew coordination. Notes are written in the same sequence as the FHB chapter. This allows notes to be used as quick reference to answer those, "I didn't know it said that?" or "Where does it say that?" questions. These notes should only be used for the greater goal of increased standardization and occasional beer bet. Hopefully, it will provide a good review prior to your next simulator.

These notes are **not** an excuse for reading the FHB.

They are **not**, in any way, an approved training document.

They are **not** designed to teach pilots to fly.

(The FHB has diagrams and full color fold outs for this purpose)

Assume these notes are **not** up to date.

Insure notes have **not** been altered by current bulletins.

Question everything.

Print this on both sides and you will end up with about 16 pages: 105 less than FHB Chapter 2. Enjoy.

Want a copy?

Sent an e-mail to [axonjaxn@aol.com](mailto:axonjaxn@aol.com). I'll send you an attached (Word) file.

# Flight Handbook Notes (Sep 2004)

## Chapter 2: Revision 31

### 2.01 Standard Callouts

Review all callouts occasionally to insure standardization: only highlights covered below.

- From the FHB: “No additional calls during takeoff, approach and landing will be made unless an unsafe condition exists”.

Approach:

- PNF: “final approach fix”.
- VOR CDI first movement or ADI pointers within 10 degrees of inbound course: “course alive”.
- “MDA” and “VDP” on non-precision approaches.
- No visual cues at MAP: “missed approach point, no runway”.
- No visual cues at Cat I DH: “decision height, no runway”.
- No visual cues at Cat I (coupled) or Cat II DH: “decision height”.
  - On all above: PF responds with “go around” or “landing” call.
- On Cat II: PNF does not make the “100ft” call.
- No FMA flare green at 53ft: “no flare”.
  - “Flare green” call has been deleted.

Deviations:

- More than 1/3 dot: “localizer”.
- 2 degrees deviation on VOR: “course”.
- “Sink rate”: 2000fpm from 2-1000ft or 1000fpm below 1000ft on approach.

### MCP commands

AP engaged: PF announces the setting and makes the MCP selections.

- PF **may** command PNF to make the selections.

AP not engaged: PF commands the PNF to make **all** selections on the MCP.

Preface change in Command Speed Bug: “Set speed \_\_\_”.

- During approach, Command Speed Bug **shall** be set for the **desired** speed with each change in configuration.
  - “Flaps (1, 5, 10, 20), set speed” (10 knots above minimum speed).
  - “Flaps 25, set target speed”.
  - “Flaps 30” (requires no speed command).

On takeoff: “flaps 5” call, set Command Speed Bug to V2+100 for all engines.

- V2+80 for 3-engine climb out.

Preface Nav Mode Selector commands with: “Nav Mode \_\_\_”.

Preface Speed Mode Selector commands with: “Speed Mode \_\_\_”.

### 2.02 Normal Procedures

The checklist is not a “to do list”, but a confirmation of items previously completed.

PF initiates checklist, “\_\_\_checklist. Crewmember reading will state “\_\_\_checklist”.

- Also, “\_\_\_checklist complete.”

Before takeoff checklist has integrated hold line.

- “Before Takeoff checklist, to the line”. To complete; command “below the line”.

**Checklist accomplishment** (conditions can dictate some deviation).

Before Starting Engines: approximately 15 minutes prior to departure.

- Boxed items: no crew change, no maintenance, normal servicing, 4 hours or less.
- Interruption caused by more than one flight deck duty station being vacated:
  - Re-accomplish the checklist.

Pushback / Engine Start: just prior to pushback or engine start.

After Starting Engines: engines stabilized at idle RPM and prior to brake release.

- When restarting an engine intentionally shut down; re-accomplish the checklist.

Taxi: clear of congested areas, flaps in takeoff setting.

- If engine restart: delay taxi checklist until all engines running and After Starting Engines checklist complete.

Before Takeoff: above the line, at hold line prior to entering runway.

- Below the line, when taxiing onto the runway.

After Takeoff: after flaps are fully retracted and above 10,000ft AFE.

Descent: prior to top of descent.

- PNF responds (**PF also responds to approach brief items**)

Approach: on command of the PF.

Before landing: after configured for landing.

After landing: on command of PF; clear of active; flaps fully retracted.

Secure cockpit: blocked in, all engines shut down.

### **Crew coordination**

Repeat PF commands, indicating understanding and complying.

During critical stages of flight when FO is PF:

- Captain’s feet **will** be on rudder pedals and closely monitor all controls.

Captain states “I have the aircraft”, FO relinquishes with “You have the aircraft”.

After **receipt** and **confirmation** of ATC clearance:

- PF **will** repeat his understanding of altitudes and clearance limit.

Any crewmember shall immediately call attention to any discrepancy noted.

### **Master flight plan documentation**

“Master” in upper right hand corner:

- Record actual weights from the weight and balance on CFP (Bulletin)

Fill in ATIS, clearance and times.

Begin flight plan tracking at first WPT after TOC.

Record ETA and ATA for each WPT (+ if ahead, - if behind).

Cleared direct to fix: draw line to WPT and record the revised ETA.

Record SAT and INS winds at each position.

### **MCP (mode control panel)**

AP engaged: PF makes those selections that have a direct affect on aircraft control.

At cruise: FD pitch bar **will** be biased up.

### **Altimeter Setting**

During climb, at TA; during descent, at TL or when directed by ATC.

State complete altimeter setting and units of measure (“hectopascals / inches”).

In certain countries, ATC may issue altimeter settings in millimeters.

- This is unacceptable; obtain QFE in hectopascals.
- When operating in countries that require use of QFE, you must convert this QFE setting to QNH in millibars (that’s hectopascals) when cleared below TL.
  1. Determine TDZE.
  2. Determine conversion factor for TDZE from the QFE to QNH Conversion Factor chart in Chapter 4.
  3. Conversion factor + QFE millibar setting (from ATC) = QNH setting.
  4. Convert meters to feet (chart in Chapter 4) and add to TDZE.
  5. Descend or climb to altitude in step 4 using QNH from step 3.

PNF and FE independently calculate.

For OPS takeoff and landing data, you **must** enter QNH from step 3.

### **Altimeter Bugs**

Departure: AFE and LOA; RA to below zero.

Approach:

- CAT II: DA and TDZE; RA to DA/RA value.
- All other: DA or MDA and TDZE; RA to DA or MDA for reference.
- No electronic guidance: 1000’ above TDZE and TDZE or AFE; RA to 1000’.
  - Vertical tape: bug to below zero.

**Metric Altimetry:** PNF refers to conversion table, sets altitude alert to nearest 100ft.

**Approach charts:** Altitudes in QNH and QFE (parenthesis)

- Always set QNH minimums on altimeter after converting QFE settings.

### **Altitude Alert**

Set to each altitude assigned by ATC.

Set only those altitudes requiring level off when departing via a departure procedure.

After passing FAF, set missed approach altitude.

### **Weather Radar**

Takeoff: 4 degrees; 5 degrees in mountainous terrain.

Do not use contour mode continuously.

### **Holding**

Time: 14,000’ and below = one minute; above 14,000’ = one and one half minutes.

For maximum fuel economy: hold clean.

20,000ft is a reasonable compromise between high and low altitude holding.

Reduce speed when three minutes from holding fix.

Request expect further clearance time prior to entering holding.

Captain **will** calculate and coordinated with crew a minimum diversion fuel.

Determine drift correction on the inbound leg, **triple** this correction on outbound leg.

Adjust (shorten) pattern to depart at specified time.

Speed:

- USA: 6000' and below = 200k, 6001' – 14,000' = 230k, above = 265k.
- ICAO: 14'000 and below = 230k, 14,001 – 20,000 = 240k, 20,000 – 34,000 = 265k, above = .83m.
- ICAO turbulence = 280k / .80m.

### DME arcs

Use a lead point 1-2 miles; roll out with RMI bearing pointer on wing tip.

Outside: turn toward VOR with pointer 10 degrees ahead of wingtip for each .5m outside.

Inside: VOR pointer 5 degrees behind wingtip for each .5 deviation.

### GPWS

Crew **will immediately** accomplish the following escape maneuver without hesitation.

Exception: under day VMC (positive visual verification that no hazard exists).

- Normal flight profile may be continued.

Maneuver:

- Disengage AP and AT; and disregard FD.
- Firewall thrust, roll wings level, set pitch to 15 degrees initially.
- Smoothly increase pitch in 2-degree increments, respecting stick shaker.
- Maintain gear and flap position until terrain clearance is no longer a factor.
- Accelerate to maneuvering speed, call for climb thrust, and resume normal procedures.
- PNF insures speedbrakes down, callout radio altitudes, VVI and airspeed trends.

### 2.03 Airspeed Bug Settings

Leave the Command Speed Bug at V2 until moving the flap lever to 5: then V2+100k.

Cruise: set high speed buffet, airspeed to be maintained (command), low speed buffet.

Climb and descent: airspeed to be maintained.

Approach and landing:

- Vref: minimum speed at 50ft; 1.3 times stall speed in flaps 30 configuration.
- **Landing Bug: determined by adding the following to Vref.**
  - Flaps 30 = 0 knots; Flaps 25 = 5 knots.
  - TE flap asymmetry or split flaps = 25 knots.
  - One or more leading edge flaps not extended, dual hydraulic failure, jammed stab, engine in reverse = 20 knots.
  - Ice on LE flaps for landing = 10 knots.
  - If landing with 25 flaps due to abnormal situation: use abnormal additive.
  - The 5-knot flap 25 additive is inclusive: does not need to be added again.
- **Final approach speed = Target Speed** and is set with **Command Speed Bug**.
  - **Determined by adding wind corrections to Landing Bug.**
  - ½ steady state headwind component + full gust (not to exceed 20 knots).
  - Always add a minimum of 5 knots.
  - Wind correction is bled off in the flare.
    - Gust additive **should** be retained until touchdown.

If planned landing flap setting is changed: change only the Target Speed.

## 2.04 Preflight Procedures

Before each flight, the flight crew will conduct a preflight inspection.

- Preflight **should** be conducted in the prescribed manner from memory.
- Preflight guides **will** be used to aid in the completion of the preflight.
- Preflight guide **should** be used to verify accomplishment.
- When tolerances are specified, final resolution is delegated to maintenance.
- Warning: do not operate any system until both the exterior and interior (FE) safety checks are complete.
- Don't operate flight controls without specific indication from observer, it is safe.

**Preflight security inspection:** physical search for suspicious items.

- Insure loose items secure.
- Prevent the carriage of dangerous objects and secure loose items.
- Captain: seat pocket, cushion, smoke goggle stowage, forward rudder pedals.
- FO: upper deck.

**Flight engineer preflight duties:**

- Begin preflight as soon as possible, NLT 1 hour prior to departure.
- Plan to be complete 15 minutes prior to departure.
- Primary determination of aircraft condition and airworthiness is observations and notations in logbook.

**FE will:**

- Review logbook with Captain: status and incomplete items.
  - Check RVSM items and airworthiness release block.
- Airworthiness release required only after a Transit check or higher accomplished.
- Completion of individual items signed by a properly certified individual employed by or entity hired by Atlas Air.
- Review autoland: if not accomplished within 15 days, advise Captain.
  - **Must** be performed and annotated in logbook.
- Confirm fuel load with Captain, insure vendor is aware of total and distribution.
- Verify fuel load; fuel added agrees with voucher and retain voucher for envelope.
- Conduct safety check, preflight, main cargo deck and security inspection.
- Review NOTOC with Captain: one copy in envelope.
- Ensure weight and balance on board and signed by Captain.
  - Check names of operating crew and ACMs listed.
  - The operating crew **may** correct a manually generated W & Balance.
    - Crewmember making the change **will** initial next to changed data.
    - Copy of change left with station.
  - A computer generated W & Balance **must** be re-accomplished.
- Review takeoff performance and data card.
  - Compare takeoff weight and CG with W & Balance.
  - Check all information on card matches OPS screen.
- Confirm block out fuel agrees with master flight plan.
  - Record block out fuel using quantity gauges (logbook).
- Complete logbook in blue / black ballpoint pen.
  - Discrepancies **will** be **approved and reviewed** by Captain **prior** to entry.

FE transit preflight: at thru stations (in lieu of complete preflight) if:

- No maintenance, normal fuel / fluid service, on ground less than 4 hours.

**Safety Check (Interior):** remember this from initial training?

Only when electrical and / or pneumatic power is not applied to aircraft.

- Alternate LE/TE flap switches – Off
- Gear lever – Down
- Flap lever and gauges – Check in agreement
- Radar – Off / Standby
- Electric hydraulic pump – Off
- Air driven pumps – Off
- Jettison panel switches – Off / close

The remaining part of the FE preflight is outside the scope of this pilot study guide.

The following are some limitations for review from this section.

- Main battery voltage: 22-24 power off, 25-32 power on.
- APU battery voltage: 25-36 (the battery must be on to check the APU battery).
- APU oil quantity: above 2 ¼ quarts for start.
- APU start: EGT below 990c, RPM continuously accelerates.
- Starter cutout: volts increase at 50% RPM.
- APU shutdown: EGT exceed 990c, acceleration stops 4-5secs, starter engaged above 50% RPM, no EGT in 20secs.
- APU oil: above 1 quart after stabilized.
- Volts: 115 $\pm$ 5v, 400 $\pm$ 5hz.
- APU generator 2 or EXT PWR 2 to power main deck cargo handling bus.
- TR volts: 25-32 for each bus.
- Bleed air duct: 40-45psi.
- Two packs may be used on ground if duct pressure can be maintained above 14psi and APU EGT 657c or less.
- Oxygen pressure: crew 1200psi (ocean); crew 950psi (land); passenger 1200psi.

**Cargo:**

Ensure all cargo pallet locks are locked, including empty pallet positions.

- 16 and 20 foot pallets secured by side locks only.
- Check fixed end stops at A, CL, TR and SL.
- AMC pallets require only forward and aft end locks.

Cargo nets serviceable: see ALM.

- Questionable net or pallet: FE notifies Atlas ground rep, who **will** confer with Captain to correct condition.
  - If situation cannot be resolved: contact GCC and confer with Duty Manager or Chief Pilot on Duty.

Prior to flight: crew **will** ascertain cargo door handles and indicator lights give positive indication closed / locked.

**Pilots' preflight duties (General):**

Start no later than 1 hour prior to departure, plan to finish by 15 minutes prior.

### **The Captain will:**

Sign two dispatch releases: label one CFP "Master".

Ensure flight plan filed with ATC agrees with navigation charts and CFP.

Brief the crew on INTAMS, NOTAMS and aircraft differences: copy to aircraft.

Confirm NAT message, even if filed on random track.

Review estimated weights.

Verify total number of crew, ACM, occupants: coordinate changes with dispatch.

- FOM Bulletin 80: Captain will initial names of occupants.
- Confirm list of names on release: Amendment required (fax or verbal) if different.

Review all weather: including departure alternate, ETP airports and all destinations.

Verify required fuel equal to or greater than minimum dispatch release.

- Notify dispatch of any fuel load change.

If in RVSM airspace: verify alternate (non-RVSM) fuel summary.

- Equipment failure alternate plan.

Confirm final fuel load with FE.

Review logbook with FE: conditions of dispatch / DDPG.

**Preflight, insert present position and align INSs.** (Yep, it says the Captain will)

Review and sign NOTOC and Weight and Balance.

Check takeoff performance:

- Verify departure station, runway, TOGW, ATIS, Burn on OPS screen.
- Correct NOTAM or MEL/CDL entered by cycling to appropriate input screens.

### **The FO will:**

Check aircraft manuals against INTAMS for current revisions.

- If not current: check CFP to see if dispatch must be contacted for updated charts.

Ensure names of operating crew and ACMs are listed on master CFP.

Check correct present position loaded in INSs.

Any discrepancy between CFP and Jeppesen charts: use CFP.

Compute takeoff performance and complete Data card:

- Input data to dispatch landing performance module.
- Input data to takeoff performance module.
- Copy info to data card.

### **Pilot flying preflight:**

Align Litton 92: switch to NAV (ten minute alignment).

- If longer than 10 minute alignment desired: STBY, then ALIGN.

### **Random notes from Pilot Flying preflight:**

Need brake pressure of 1000psi and parking brake set to check autobrakes.

Compasses: use SET HDG knob to align HSI compass card and RMI.

- Servicing equipment near wingtips may cause errors.

Do not operate wipers on dry windows.

Window 1 OVHT light may illuminate: place L1 and R1 switches OFF, then back ON.

FD switches: set pitch for takeoff or biased down.

- One FD **shall** be used for takeoff.

Heading selector: set heading to departure runway heading.

Altitude alert system: set initial clearance altitude. (**must** be operational for RVSM).

GPWS: set VHF NAV 1 radio to ILS frequency to ops check.

Penny and Giles:

- No BIT errors.
- No exceedance indication displayed.
- Left or Right screen: select.
  - Recall exceedance = RCL push button.
  - Review snapshots = RCL + S/S push button.
  - Erase any snapshots = RST + S/S push buttons.
  - Notify maintenance of any BIT or exceedance.

Do not move reverser levers with pneumatic system pressure: LE flaps will move.

Do not operate HF transmitters while refueling.

Check INS: check coordinates of each WPT on steering CDU using Jeppesen charts.

- Circle WPT numbers on CFP.

### **PNF preflight:**

Load INS waypoints from master CFP.

Check distances against master CFP.

Enable DME update on Litton 92.

### **Both pilots:**

Set DH bugs below zero and check DH light out for takeoff.

Set one altimeter bug to AFE: other to 800ft above AFE or engine failure LOA (highest).

Compare altimeter to field elevation from Jeppesen airport page.

Captain and FO altimeters:

- Within 50 ft of each other at SL and 75ft of field elevation prior to entering RVSM.

### **2.05 Servicing Procedures** FE ensures:

Fuel load from Captain.

Fuel record is properly completed.

Fuel on board is correct and has correct distribution.

Captain is informed of servicing delays.

If necessary, instruct and monitor servicing personnel.

An inoperative servicing indicator requires maintenance verification of correct quantity.

### **Fuel load verification:**

Confirm fueling record is completed.

- Individual gauge within 450kg of value on the record.
- Sum of all gauges equal to but not more than 900kg of total fuel on record.
  - Sum of metered fuel added + gauge sum on board before fueling = not less than 450kg or more than 1400kg of the total fuel on the record.
- Discrepancy: check arrival fuel, APU burn and fuel density.
- Cannot resolve: check measuring stick (contact maintenance).
- Gauge inoperative: confirm tank fuel with measuring stick.

Tolerances are not considered absolute or limiting.

## 2.06 Fuel Management

Boost pump pressure is required during flight.

Fuel sampling: use takeoff fuel configuration for four minutes.

Balance procedures may be delayed until 450kg imbalance.

- Maintain balance by use of boost pumps.
- Do not use less than 3 pumps to feed all engines.

Takeoff with reserve tanks empty authorized if:

- Center wing tank empty, any main tank not to exceed 12.6kg, TOGW 318.875kg.

Landing with reserve tanks full: permissible.

Fuel temperature: maintain 3c above freezing point:

- Change altitude or divert to warmer air; increase Mach number.
- TAT increases .5 to .7c for each .01mach increase.
  - In extreme cases, descend to FL250.

Atlas Air minimum planned landing fuels:

- Destination: 10.5kg (domestic and international).
- Alternate: 7.0kg mandatory.
  - Flight to destination, MAP, divert, immediate landing at alternate.
  - Once a flight has departed, if 7.0kg cannot be met: Captain and dispatcher **should** discuss alternate measures to meet this requirement.
    - Closer alternate, LRC, no alternate (weather requirements).
- Minimum fuel for landing: 5.5kg.
  - Touchdown = 1.1kg, go around = 2.6kg, indicator error = 1.8kg.
  - Pull up at runway threshold to 1000ft, fly pattern, 3 degree GS from 2.5nm

Fuel feed table:

Takeoff: all boost pumps on, 1 and 4 crossfeed open, 2 and 3 crossfeed closed.

- If more than 4.5kg in center: override / jettison pumps on.

Climb and cruise with center tank fuel:

- When override / jettison pump low pressure lights on: pump off, scavenge on.
  - Scavenge pump low pressure light: pump off.
- Quantity in main tank 2 and 3 = 1 and 4 plus reserves:
  - All boost pumps on, 1 and 4 crossfeed open, 2 and 3 crossfeed closed.

Descent: start of descent (or 1 and 4 mains equal 2.3kg):

- 1 and 4 reserve transfer valves open for remainder of flight.
- Limitations: 1 and 4 (each) less than 10,205kg and GW less than 318,875kg.

## 2.07 Before Starting Engines Checklist

Just prior to calling for the checklist: set the parking brake.

Takeoff briefing: share common plan of action.

- Complete prior to engine start to the maximum extent possible.

Flight deck / ACM's shall have seat belt and shoulder harness on prior to engine start.

- FE may delay shoulder harness until before takeoff.

Do not move rudder pedals until ground crew clear.

FE shall have seat within 30 degrees of facing forward for takeoff.

## **Pushback / Engine Start**

Captain **must** be in interphone contact with ground crew for a pushback.

- If hand signals used: ground crew clearly visible.

PNF **will** obtain clearance for pushback and/or engine start **and** ATC clearance.

Both pilots **will** monitor receipt of all clearances:

- Received and recorded on CFP by PNF.
- PNF **will** set clearance altitude on MCP and set transponder code.
- PF **will** visually and verbally verify these settings.

Aircraft shall not be moved until all occupants are seated with seat belts fastened.

- Captain **will** confirm: Doors closed and lights out, electric pump and ADP1 (for push), ATC clearance received and beacon-ON prior to push or start.

## **2.08 Pushback / Engine Start Checklist**

Checklist includes eleven documents to check.

FE **will** retain required copies of General Decs.

INS: checked and NAV.

- NAV status 1; observe TRUE and INS displayed and no flags.

Set HSI switches as required for departure.

After pressurizing brake system: check pressure 2000psi or above.

## **Pushback and Engine Start**

Crossbleed starts are prohibited during pushback.

“Ready for pushback”, “Release brakes”, “Brakes released, cleared for pushback”.

If start on No.4 discontinued: return hydraulic system 4 electric pump switch to ON.

Do not operate NWS with tiller or rudder pedals until ground crew is clear.

- During towing: keep feet off rudder pedals / brakes.

“Set brakes”, “Brakes are set”.

Any start sequence can be used: normally 1,2,3,4.

“Ready to start engines”, turn beacon light – ON.

Good start: N1 (20-25), N2 (60-65), EGT (345-485), FF (600-700), oil pressure light out.

Amber LE flap light may illuminate during power change.

- Light should extinguish when flaps extended.

“Remove the ground air”, “Remove the ground power”.

## **2.09 After Starting Engines Checklist**

PNF verifies actual weight against estimated weight; crosschecks Data Card V1,Vr,V2.

Check TOD mode window, N1 limit and bugs agree.

- If FFRAT inoperative: set N1 bugs manually.
- Altimeter bugs set to AFE and LOA, RA bugs below zero.

Trim:

- Check brake release lights illuminate.
- Green band and stab trim green band lights extinguished.
- If trim setting is in mid-band boundary on table: select adjacent green band.
  - If causes stab trim green light: recheck trim setting; then wgt. and balance.

“Cleared to disconnect, standing by for hand signals on right/left side”.

Acknowledge: momentary flash of landing **or** runway turnoff light **once**.

- To re-establish communications: flash light several times.

Do not taxi until personnel are confirmed clear and indicate it is clear to taxi.

## 2.10 Taxi Checklist

Aircraft moving:

- One pilot maintains control, the other accomplishes checks requiring an inside indicator check.

Slowly and smoothly control column full travel fore and aft.

**After** flaps are extended for takeoff: rotate control wheel full travel both directions.

Move rudder pedals smoothly and slowly: min. time for complete cycle is 8 seconds.

Yaw damper: turn with tiller and observe rudder position indicators opposite movement.

- HSI, RMI, turn needles indicate turn in same direction.
- All ADIs indicate level.

PNF **will** obtain clearance from ground control to taxi and ATC flight plan clearance.

“Clear left”, “Clear right”.

If possible, keep nose wheel centered until rolling.

- Use **equal thrust** (as low as possible) on **all engines** to start rolling.

Taxi speed **should not** exceed 20 knots.

For sharp turns: use **maximum** of 10 knots at start of turn.

PF commands, “flaps 10 / 20”: after leaving the ramp.

- Delay if taxiway contaminated with snow / slush.

Tire temperature:

- **Heavy** weight operations: avoid use brakes by slowing well below taxi speed and let speed rebuild to 20 knots.

Reverse thrust for backing or taxing is **prohibited**.

180 degree turns on runways less than 153ft **will not** be attempted.

## 2.11 Before Takeoff Checklist

Altimeters within **75ft of runway end elevation** or not authorized for RVSM flight.

Lights:

- Strobe and wing: taxiing on to the runway.
- Landing and turnoff: cleared for takeoff.

Prior to advancing thrust levers: check gear not centered and then DISARM.

### Autothrottle takeoff:

- Will not be used for max thrust T/O, or normal thrust setting greater than RTG I.
- Ensure less than RTG I with performance handbook chart or select RTG I on FFRATS (read TAT display).
- Captain holds brakes, advances thrust levers to approx 70% N1:
  - Check stable and **symmetrical**.
- As brakes released: engage AT and call, “set takeoff thrust”.
- FE responds “set takeoff thrust”:
  - Makes final trim when **THR HLD is displayed**.
  - When final thrust is set: FE **will** state, “Takeoff thrust is set”.

**Manual Takeoff:**

- Captain calls, “set takeoff thrust”.
- FE responds, “ set takeoff thrust”:
  - Follows through and makes final thrust setting by 80 knots.
  - “Takeoff thrust is set”.
- Engage AT after CLB and N1 has been selected.

**Crosswind Takeoff:**

- Prevent spoiler drag early in T/O roll: **do not** preposition aileron into wind until wing roll is noted.

**Takeoff Warning:** after brake release: **Do not attempt to assess problem.**

- **Prior to 80kts, discontinue T/O** and clear runway.
- Gear not centered, LE and TE flaps, SB down, stab trim in green, parking brake.

**Takeoff:** performance calculations presume use of all available runway.

- Check compass heading against runway heading.
- **Do not use tiller** after application of takeoff thrust:
- After 100knts, the yoke should be neutral or slightly forward.
- Ensure brake release is accomplished smoothly and takeoff thrust is set in a slow and smooth manner.
- PNF / FE call “engine failure” if loss of thrust or mechanical failure.
  - Confirmed by two or more abnormal indications.
- PNF calls “80 knots”: PF responds “check”.
- Captain removes his hand from thrust levers at V1.
- At Vr smooth and continuous rotation to initial climb attitude: max 17 degrees.
  - Normal rotation rate: 3 degrees per second.
- **When airborne:** PNF calls “positive climb”.
- PF calls “gear up”: PNF responds “gear up”, retracts gear and presses S/S button.
- If flight director used: pitch set at initial climb attitude. If not: biased down.
- Engine limit exceeded during takeoff: FE **should** notify the Captain.
  - **Once takeoff thrust has been set, no further thrust lever adjustments should be made until reaching 800 feet.**
  - After reaching 800 feet, retard lever until engine parameters within limits.
  - Parameters cannot be maintained within limits: shutdown is required.

**FO takeoff:**

- Captain **will** control brakes and thrust levers until V1.
- Captain retains responsibility to initiate reject.
- At V1, Captain **will** remove hand from thrust levers signifying commitment to takeoff.

**Rejected takeoff procedure:**

- Decision rests solely with the Captain.
- Decision **must** be made so stopping action can begin by V1.
- Captain clearly announce: **“Reject, I have the aircraft.”**

- FO does not abandon control until Captain makes a positive input.
- **Prior to 80 knots:**
  - Reject for system failures, unusual noise or vibration, tire failure, abnormally slow acceleration, engine failure/fire, unsafe configuration warning or unsafe or unable to fly.
- **Above 80 knots:**
  - Reject for engine failure/fire, or unsafe or unable to fly.
- Rapidly and simultaneously:
  - Maximum manual braking.
  - Close thrust levers.
  - AT disengage.
  - Max allowable reverse thrust on symmetrical engines.
  - Check speedbrake lever up.
  - Maintain directional control: rudders and brakes.
  - Taxi clear of the runway if possible.
  - After landing or evacuation checklist.
- **Reject for takeoff warning or mechanical must be entered in logbook.**
  - **Must be cleared by maintenance prior to takeoff (FAA reportable).**

#### **Engine failure after V1:**

- Fly the aircraft: maintain directional control.
- Rotate at Vr using normal rotation rate.
- Positive rate of climb, V2 or greater: “Gear up”.
- Climb at V2, not exceed 15 degrees bank until LOA and V2+10.
  - If failure after V2: maintain that speed.
- At LOA, maintain level flight, retract flaps to 1 while accelerating to V2+80.
  - At high gross weights, initiate climb to prevent exceeding flaps 5 speed prior to flaps 1, green light.
- Establish climb at V2+80, while retracting flaps to zero (15 degrees of bank).
- Set max continuous thrust.
- Command initiation of appropriate checklist:
  - Engine failure / shutdown **or** Engine fire, sever damage or separation.

#### **2.12Climb / Departures**

Adjustments to climb thrust: 5000ft intervals, 5c TAT.

Crew responsible to see and avoid: traffic, obstacles.

#### **Departure procedures:**

- Review location of obstacles and minimum climb gradients by comparing with approach charts and 10-1 page.
- When issued clearance to “climb and maintain” or “maintain” an altitude: disregard departure procedure altitude restrictions.

Track: actual flight path over the ground: heading corrected for drift.

#### **To fly a track:**

- PF: CDU to Drift Angle; turn to track heading.
- PNF: note drift; turn HDG Selector opposite the drift (as commanded by PF).
  - Zero the drift over the ground.

### **RNAV departure:**

- Litton 92 is authorized for RNAV departures.
  - Must be preloaded with fixes and enable updating.
- Read latest bulletins and INTAMs regarding fly over fixes and current data base capabilities.

### **Back course localizer departures:**

- Set published front course in course selector window.
  - CDI is directional with front course in CSW.
  - Command bars of FD are directional when Back Beam switch is selected.
- When using FD for course guidance:
  - Tune and identify front course localizer frequency.
  - HSI to VOL/ILS, ILS or Radio (as installed).
  - Set inbound front course in CSW: CDI is now directional.
  - NAV mode selector: VOR/LOC or LOC.
  - Set Back Beam switch to B/B: verify light on (FD is now directional).
  - Verify FD FMA: NAV armed.
- Localizer capture:
  - Verify FD FMA: NAV green.
  - FD commands turn to back course.
  - Check wind and drift angle on INS.
- FD may not be used on aircraft without back beam switch.
  - Turn FD off.
  - NAV mode selector to HDG.
  - HSI switch to ILS.
  - PNF monitors HSI localizer progress and makes HDG selector inputs to direct PF to center CDI.

### **Turn after takeoff:**

- Airport analysis data provides obstacle clearance based on runway heading or special engine-out procedures.
- If obstacle clearance in turn after takeoff is consideration:
  - Maintain takeoff flaps: climb V<sub>2</sub>+10.
  - Maximum 30-degree bank above 400ft AFE and V<sub>2</sub>+10.

### **Close-in noise abatement (ICAO A): Flaps 10**

Noise relief during part of takeoff procedure closest to the airport.

- **Will** be used: airport specified on Jeppesen airport page, departure procedure, or when close-in obstacle exists.
- V<sub>2</sub>+10 to a maximum of 17 degrees pitch.
- If FD is used: PF **should** call, “speed mode, indicated airspeed”.
  - PNF **should** pause momentarily at V/S position prior to selecting IAS.
  - Delay in logic of FD prevents optimum airspeed commands for 20secs from off position.
- Do not exceed 15 degrees bank below V<sub>2</sub>+10 and/or V<sub>2</sub>+80 to V<sub>2</sub>+100.
- Minimum maneuvering speeds must be attained prior to flap retraction.

- At 1500' AFE: PF will command, "set climb thrust".
  - FE responds, "set climb thrust": when set, "climb thrust set".
- At 3000' AFE (or other altitude in DP): PF will reduce pitch to 8-10 degrees.
  - Minimum rate of 500fpm.
- V2+40: PF, "flaps 5".
  - PNF selects flap lever 5, gear lever off, command bug V2+100.
- V2+60: PF, "Flaps 1".
  - Do not exceed flaps 5 placard speed until flaps 1, LE green (high GW).
  - If FD used: PF **should** call, "speed mode IAS".
  - PNF calls: "flaps 1, green light".
- PF continues to V2+80: commands "flaps up" while accelerating to V2+100.
  - If FD used: PF **may** call, "speed mode, VS\_\_\_". (not less than 500fpm).
  - Do not exceed 15 degrees bank from V2+80 to V2+100.
- If FD is used, PF **may** call "speed mode IAS" and maintain V2+100.
  - Climb at V2+100 until above 10,000 AFE.
  - Transition to enroute climb.

Advise ATC if climb speed exceeds 250K below 10,000AFE.

#### **"Close in" noise abatement (ICAO A) Flaps 20.**

- Only covering the differences here.

At 1000 ft AFE: reduce pitch and accelerate to V2+20.

Command flaps 10: adjust pitch to maintain V2+20.

If FD is used: PF **should** call, "speed mode, IAS".

At 1500 ft AFE: PF commands, "set climb thrust".

- FE responds, "set climb thrust" and "climb thrust set".

#### **"Distant" noise abatement (ICAO B) Flaps 10.**

- Noise relief farther away from the airport.
- Normal profile used unless otherwise specified by Jeppesen airport pages or departure procedure.

At 1000ft AFE: PF will reduce pitch to 8-10 degrees (min 500fpm).

If FD is used: PF **should** call, "speed mode, VS\_\_\_".

At V2+40: command, "flaps 5, set climb thrust".

- PNF: select flaps 5, gear lever off, reset command bug to V2+100.
- FE: respond "Set Climb Thrust" and Climb thrust set."
- Clean up: standard.

#### **"Distant" noise abatement (ICAO B) Flaps 20.**

- At a 1000ft: pitch 8-10 degrees, and then clean it up.

#### **Area departure and Climb speeds.**

Four engine:

- Turn after takeoff (above 400AFE): 30 degree bank, V2+10, take off flaps.
- Best Angle: Vref+100, Vref+110 at FL200.
- Best Rate: Vref+130-150, Mach .82 -.83.
- Best Economy: Vref+160-170, Mach .83 -.84.

- Turbulence: 290-310k, Mach .82 - .85.
- 260K below 15,000 ft and below max landing weight.

Three engine:

- Take off climb: best angle at V<sub>2</sub>, (max 15 degrees bank).
- Turn after takeoff (above LOA): V<sub>2</sub>+10, flaps up, 30 degree bank.
- Max 15 degree bank between V<sub>2</sub>+80 and V<sub>2</sub>+100 during departure.
- Enroute: best angle and rate, flaps up, V<sub>2</sub>+100.

Two engine: best angle and rate, flaps up, V<sub>2</sub>+100.

### 2.13 After Takeoff

No smoking sign **will** remain ON for duration of flight (unless I'm sleeping in the bunk!).

Landing/wing lights: Off above 10,000ft AFE recommended.

At transition altitude: 29.92 inches / 10.13 Hp.

After 10,000ft: FE **will** transmit departure message to station **and** to Atlas GCC.

If an engine limit has been exceeded: logbook entry required.

### 2.14 Cruise

**Cruise thrust:** .84m (-200), .85m (-300).

- When outside (not within 2000ft) of optimum altitude consult LRC data to establish optimum specific range speed equal to or less than flight plan mach.
- Flight plan based on highest altitude that includes 1.3g buffet protection.
- Do not accept altitude if more than max cruise thrust will be required to cruise (GW / OAT) in altitude capability chart, or above the 1.3g buffet capability chart.
- After level off: select SPEED, adjust thrust levers to balance N1 within 1%.
  - After 10 minutes: select MACH.
  - After cruise Mach is stabilized: select CRZ.
- Set high and low speed 1.3g buffet speed bugs.

**Aircraft trim:** after TOC and stable at cruise mach.

- Do not rush; balance fuel and thrust.
- Disengage AP, rudder and aileron trim to zero.
- Hold wings level; use rudder trim to stop turning tendency.
- Hold wings level; use aileron trim to remove any wings level wheel force.
  - The control wheel may not be centered.
  - More than one unit of aileron trim causes spoiler extension.

**Cruise inflight performance:** greater than 2-hour flight.

- Normally done within one hour of TOC.
- Steady state cruise, AT off, N1's aligned, along track acceleration = 3 or less.
  - Litton 92: Data, slew up once.
- Align N1's, set target speed, and stabilize for 3 minutes.
- Penny and Giles: record from snapshot.

Fuel computations: 1+15hr apart.

Cruise card: TOC, altitude change, each cruise chart bracket change.

Main cargo deck inspection: when duties permit **and** after encountering turbulence.

Step climb: 1000ft in RVSM, 2000 / 4000ft in non-RVSM to stay close to optimum.

- Climb thrust at cruise mach.

**Do not** reduce to one pack unless dictated by a non-normal situation.

## 2.15 RVSM Procedures

Confirm altimeters set and within 200ft of each other.

Must have: two primary altimeters, AP hold, altitude alert, transponder with alt reporting.

Altitude changes: 1000fpm limit, 150ft over / undershoot limit.

Check altimeters once each hour: within 200ft (reportable to ATC if not).

Record two primary and standby on plotting chart:

- At coast out, coast in, oceanic checkpoints and each hour.

Report to ATC: weather or equipment failures:

- Failure of altitude hold, altimeter redundancy, loss of thrust, greater than moderate turbulence.

*From FOM 6.3*

*Aircraft should not overshoot or undershoot altitudes by more than 150ft.*

*Intervals of approximately 1 hour, crosscheck between primary altimeters:*

- *Must agree within 200ft. or report to ATC.*

*In non-radar environment, report reaching any assigned altitude in RVSM.*

*Notify ATC:*

- *Failure of altitude hold, loss of altimetry redundancy, loss of thrust requiring descent, greater than moderate turbulence.*

*If altitude change in RVSM using greater than 1500fpm, within 2nm of another aircraft:*

- *Possible TA or even RA, limit climbs to 1000fpm when close to other aircraft.*
- *RA requires written report (see Chpt13) if a change in existing vertical speed was required in RVSM or Transition Area.*

## 2.16 INS Procedures

**Class I airspace operation:** nav radios are primary nav reference for airway operations.

- INS only used to supplement: required to know position with respect to airway.
- PF INS: CRS (slew up once); PNF INS: FPL (ETA); INS 3: DATA.

**Class II airspace operations:** INS is the only navigation reference.

- Plotting chart required: route segment between operational service volume of ICAS standard navaid exceeds 725nm.
- Record time to NAV on CFP.
- When DME is available: updating **should** be accomplished.
  - INS accuracy status of 2 or less in RNP 5, RNAV departures, STARS.
- PF: POS; PNF: CRS (slew up once); INS 3: DATA.

**Gross error check:** will be performed within 10 minutes of beginning the Class II portion of flight prior to loss of navaid reception.

- Fix will be plotted on chart or CFP.
- When VOR information no longer available, HSI switches to INS / NAV.

**Accuracy check:**

- Prior to entry, compare triple mix position of steering CDU and pure inertial positions of all three units with a known geographic point.
- Provide error rates for each of the four values.
- Not required if departing from BRNAV or RPN-5 airspace.
- Overhead: track inbound to insure accurately overhead station.
- Display POS on each CDU; HOLD simultaneously; note and record time.
- Record triple mix position of steering INS and pure inertial position on all 3.

- Check H in upper left hand corner; pure inertial on lines 4 and 5; triple mix on line 2 and data entry line.
- Calculate latitude and longitude errors for all four recorded values.
  - Longitude error **must** be computed by multiplying the position error by correction factor from table.
- Drift rate **must** be calculated prior to entry into RNP-10 or BRNAV (RPN-5) airspace.
  - Divide triple mix latitude and longitude error by time INS in NAV.
  - Max allowable drift rate: 1.6nm/hr (RNP 10); 2.5nm/hr BRNAV (RNP-5); if greater advise ATC.
- North / South accuracy check differences: preferred method (2.16.5).
  - Set magnetic variation in course selector window (E is least / W is best).
  - Press HOLD and note time **and DME**.
  - Convert DME to degrees and minutes (60nm = one degree).
- Record: time, DME, variation, radial, station ident. and coordinates, coordinates for all INS's and triple mix, Lat/ Long error, and drift rate (if entering BRNAV or RNP-10 airspace).
- Other information to plot:
  - Time and altimeter readings of both primary altimeter and standby at coast-out, each compulsory and coast-in.
  - ETP and ETP ICAO identifiers.
  - Two degree (coordinates and time) past each compulsory waypoint.
    - Plot the position; compare XTK, DIST / TIME on all INS's.
    - Ten minutes past waypoints on N-S route.
    - On Pacific tracks: after each loaded waypoint.
    - When passing Non-compulsory reporting points not loaded as waypoints, PF verify steering CDU displays proper coordinates.
  - Gross error check within 10 minutes of beginning Class II navigation portion of flight: include time, radial / DME of station.

*From the FOM 5.1 Navigation*

**RNP10:**

- *Nav standard requiring 95% XTK and 95% along track error of less than 10nm.*
- *Will be able to operate for no longer than 13hr (Litton 92).*
- *This equates to a maximum INS deviation rate of:*
  - *.77nm/hr Litton 92 (10nm divided by 13).*
  - *The “nav clock” starts when INS placed in NAV mode and continues:*
    - *Until aircraft begins using (VOR/DME/NDB) and/or comes under radar surveillance.*
    - *Or time which INSs are updated.*
- *Upon completion of a DME update, the “nav clock” resets to zero.*

**RNP5 (BRNAV):**

- *Track accuracy equal to or less than 5nm for 95% of the flight time.*
- *Automatic DME must be utilized.*
  - *Litton 92 meets RNP5 accuracy for 2.5 hours unaided.*
  - *Unlimited when continuously updating.*

## 2.17 Descent Checklist

To the maximum extent possible, the briefing will be completed prior to descent.

- PF will complete the briefing **and respond**.
- Re-brief applicable approach plate items for runway change.

Pilots respond by calling out Vref and Lng Bug airspeeds and go-around N1 setting.

PF determines target speed: PNF completes target speed portion of landing card.

Wing lights: On, during hours of darkness.

*There are currently six restrictions to FO landings, in addition to “Captain only” fields and high minimums Captains: Short Field (less than 8000ft), Cat II, PAR, crosswind greater than 20k, visibility less than  $\frac{3}{4}$  (RVR40), braking action less than good.*

### Autobrakes:

- The primary means of braking and **will normally be used** for all landings.
- MIN: normal setting; reverser operation results in modulation of brake pressure.
- MED: **will be used** when positive braking is imperative and when rollout distance is limited (Limits pressure to 1800psi).
  - Provides a wet and slippery runway deceleration with optimum anti-skid performance.
  - Thrust reverser operation results in modulation of brake pressure.
  - **Will be used:** wet and slippery; sever crosswind; engine out; low visibility (3/4sm or RVR4000/1200m); 8000ft or less; landing distance affected by aircraft configuration.
  - Slight aft pressure on control column after main gear touchdown as braking commences.
- MAX: only when minimum stop distance is mandatory (pressure = 3000psi).
  - Reverse thrust operation does not modulate autobrake pressure, but improves deceleration level.
  - Braking limited to MED until nose gear touchdown.

*From FOM 5.3*

*Takeoff and landing with braking action report of NIL or unreliable is **prohibited**.*

- *ICAO weather code 1, RCR factor 2-5, NOTAM contraction BRAN, Tapley 6-17.*

Descent: normally at idle thrust at .84m or 290-310k, whichever is slower (FL350).

- Average descent rate: 3000fpm to FL200, 2000fpm below.
- With speedbrakes fully extended: 3500fpm.
- Calculate: altitude X 3, plus 10 mile slowdown to 250k for straight-in.
  - Nacelle anti-ice: 1 mile for each 1000ft of anticipated use.
  - Target descent rates calculation: GS / 2 (add a zero) for 3 degrees.

## 2.18 Arrivals

STAR: if initial ATC clearance clears you for entire flight planned route; includes STAR.

- This is not clearance for the approach or altitude associated with it.

RNAV arrival profile:

- Litton 92 is authorized for RNAV arrivals.

- Fixes must be preloaded.
- Load fixes: feeder, intermediate, FAF, runway fix, missed approach fix.
  - A waypoint is needed after the FAF that is aligned with the approach.
  - If MAP is not aligned with the runway, the far end of the runway should be plotted and entered as a waypoint to assist in alignment with final.
- Transitioning:
  - One pilot should monitor VOR (if aligned with final course).
  - Other pilot: tune, identify and set course for approach.
  - INS will remain coupled to AP and start turn to final.
    - Monitor on CDU with XTR.
  - As turn to final is made, monitor VOR/ILS.
  - As course guidance becomes active select VOR/ILS/LAND to capture.
  - RNAV approaches are not authorized.

*From FOM 6.5 Simultaneous Intersecting Runway Operation*

*In the interest of safety, Atlas crews **should not** accept SIRO clearance.*

*Arriving aircraft **will advise**:*

- *“Unable SIRO” or “cannot accept land and hold short clearance”.*

*From FOM 6.5 Uncontrolled Airports*

*Part 121 ops are **prohibited**: unless approved by Director of Operations*

*Part 91 ops (ferry or position for maintenance) into uncontrolled airports are allowed:*

- *Restricted to day/VFR only.*
- *Night departures must be approved by Director of Operations.*

## **2.19 Approach**

At transition level or as directed by ATC: set local altimeter setting and RA bugs.

Cleared for approach; both pilots respond to HSI switches.

- Position: as required by arrival clearance.

### **Scan Policy:**

- Cat II and coupled: when approaching DH (300 ft above) PF will include outside visual cues.
  - PNF remains on instruments until touchdown.
  - PF evaluates position on ILS, crab angle, headwind/tailwind effect, AP performance.
  - If PF anticipated view is not achieved, GA **must** be initiated.
  - All other approaches: PF will remain on instruments and PNF scans.
- All crew will call out any warning flags or significant deviations.

### **Stabilized approach:**

- Landing configuration, checklist complete, on speed, engines spooled up, proper flight path.
- Go around required: if not stabilized by 500ft visual or 1000ft IMC.

### **Descent below minimums:**

May not continue below DA or MDA unless:

- Descent to landing within TDZE.
- Normal rate of descent using normal maneuvers.
- Visibility not less than visibility required for the approach.
- One of the following visual references:
  - Threshold (markings or lights), TDZ markings or lights, REIL, Runway (markings or lights), VASI.
    - Only VASI designed for use by 747 is three-bar.
    - Two-bar used only initially (not below 500 ft) to establish GS.

### **General Approach Duties:**

Preparation: no flaps or warning lights, instrument lighting reduced.

- Landing light use at night/low visibility not recommended.

PF: confirm frequencies and course, monitor everything.

- Lightly hold controls and thrust levers.
- Note drift angle.
- Command, “set missed approach altitude” at FAF.
- State “landing” or “go around”.
  - Delay “landing” call to preclude confusion until DH.
  - In visual conditions and PF states runway insight, the “one hundred above” callout is not required.

PNF:

- Timing, set MAP altitude at FAF, and at DH check:
- Localize 1/3 dot, GS 1dot, VOR 2 / ADF 5 degrees and stabilized at target speed.
- Advise PF of visual cues.

FE: monitor and backup.

- Approaching FAF: check radios and navigation aids set as briefed.
- Altimeters set local, no warning flaps.

### **Visual Approach.**

Use all available aids: GS, VASI, PAPI.

After being cleared for visual approach:

- Remain VMC and proceed to airport most direct and safe manner.
- Acceptance of traffic information and instructions to follow.
  - Acknowledge you see the other aircraft and will maneuver as necessary to avoid or maintain in trail separation.
  - Accept responsibility for wake separation.

### **Approach.**

Abeam: flaps 10, landing bug+20 (+10).

Base turn: flaps 20, landing bug+10 (+10), gear down, descend.

Intercept final: flaps 25, target speed set, flaps 30.

Engine inoperative: keep control wheel level with the rudder / trim.

- Prior to touchdown: zero rudder trim.

## Precision Approaches:

### Manual ILS.

#### Preparation:

- Set HSI switches and pitch bars biased up (if FD used).
- Tune and identify: check RMI paddle positions.
- Marker beacon light brightness, audio switch on, sensitivity low.

#### PF:

- Execute MAP for any instrument warning or flag below 800 ft AFE in IMC.
- Maintain balanced thrust.

#### PNF: advise PF of deviations.

- Target: +10/-0 knots.
- Descent rate: 2000fpm at or below 2000ft AFE; 1000fpm at or below 1000ft AFE.
- Localizer 1/3 dot, GS 1 dot (1/2 dot at 100 ft for landing gear clearance).

#### Flying:

- Calls: “nav mode ILS”, “course alive”, “heading to course”, “set missed approach altitude”, “GS alive”.
- At GS capture: FMA GS green, FD pitch to 750 FPM, start tracking after 10secs.
- 1000 ft: stabilized on GS, landing flaps, target airspeed.

#### Configure: GS first positive movement; flaps 20.

- One dot below GS: gear down.
- After gear down: flaps 25 (target airspeed).
- GS capture: flaps 30.

### Coupled / Autoland ILS (differences from manual ILS only).

#### PF:

- Use maximum level of automation available.
- Adjust scan outside approximately 300 ft above DA/H.
- Disconnect AP and land if FMA does not change to green at 53 ft RA.
- Disconnect AP and AT after touchdown.
- **Missed approach** for any instrument warning or flag **below 800ft AFE in IMC.**

#### PNF:

- Remain on instruments approaching DH.
- Call out “no flare” if the FMA FLARE does not change to green at 53 ft RA.

#### Flying:

- Cleared for approach: PF will announce and place Nav Mode Selector to LAND.
- Wings level: PF announce and place second AP to Command.
  - Steer with heading select knob.
  - FMA should display NAV and GS armed.
- Localizer capture: PF will announce and set heading selector to inbound course.
- Prior to FAF: PF will announce and set missed approach altitude.
- Glide Slope capture: GS FMA green, pitch mode off, 750fpm descent, 10secs AP/FD tracking.
  - 1000ft on RA: PF will check FMA FLARE armed.
- PF must integrate raw data indications.

- Approaching DA: PF checks localizer 1/3dot, GS 1/2 dot, target speed.
- At 53ft: FMA FLARE green (if PNF calls “no flare”: disconnect AP and land).
- At 30ft: FMA RETARD green.
  - If slow to retard or inoperative; insure thrust levers idle at or just after TD.
- After touchdown: PF disconnects AP and AT.

Restrictions:

- Autoland not used for overweight landings.
- Autoland not used if note on approach chart restricting use of GS or AP below specific altitude.
- Single AP operation: ILS must be disconnected by 50ft above TDZE.
- One engine may be inoperative for autoland.
  - Keep control wheel approximately level by use of rudder pedals and trim.
  - Prior to touchdown: zero rudder trim, allow rudder to neutral as thrust retarded.
- Minimum TCH of 47 feet.
- Crews shall advise the tower that a coupled approach is being conducted.
- During go-around: aircraft may make momentary contact with runway.
  - Continue go-around: once initiate it **will** be continued.

**Category II coupled / autoland ILS** (differences from previous notes only).

Captain will:

- Brief using the CatII briefing guide.
- Use maximum level of automation.
- Execute missed approach for instrument warning or flag below 800ft AFE in IMC
- Execute missed approach if autoland status annunciator does not display proper indications below 800ft RA.
- Call “landing” or “go-around”.
- Disconnect AP if FMA FLARE does not change to green at 53ft RA.

Flying and restrictions as previously noted.

**PAR: Captain only** / DH as published (no lower than 200ft HAT).

Select back up approach: lost communication, you are cleared any published approach.

Attempt contact if no transmissions are received:

- 1 minute while being vectored to final, 5 seconds on final (15secs for ASR)

The controller will issue missed approach instructions.

Repeat all headings, altitudes and altimeter settings until advised not to.

Transition to final: bank standard rate, not to exceed 30 degrees.

Controller issues ceiling and visibility only when below 1500/3.

Final approach radar / controller normally at 8 miles.

10-30 seconds prior to final descent, controller advises “approaching glide path”.

- Configuration established prior to final descent.
- “Begin descent” with predetermined rate: approximately GS / 2.

Turns not to exceed half standard rate on final.

## Non-Precision Approaches

- Plan to be established on course, configured for landing, Before Landing Checklist complete, prior to FAF.
- Course may vary up to 30 degrees and still be published as a straight-in.

Without recommended altitudes: plan to reach MDA before MAP.

- Initiate descent to MDA without delay.

PNF: monitor descent and distance / time to MAP.

CDA approach: crosscheck normal rate of descent (approximately 600-900fpm).

- Execute missed: upon reaching MDA and runway environment not in sight.

**Visual descent point:** normal descent from MDA to touchdown point (V)

- Plan to reach MDA at or before VDP.
- If runway acquired prior to VDP: descent should **not** be initiated until VDP.
- If runway not acquired by VDP: missed approach is **probable**.
- Compute a PDP (preplanned descent point): HAT divided by 300 = nm
  - Published time to MAP – 10% of HAT converted to seconds.

Landing:

- Intercept the centerline and glide path before runway threshold.
  - Aligned and stabilized NLT 500ft above TDZE.
  - Not stabilized below 1000ft (IMC) or 500ft (VMC): execute MAP.

Flying non-precision approaches:

- Prior to FAF: fully configured, target a/s, pitch 4.5 degrees, checklist complete.
- Descent: 1000-1500fpm, target pitch is 0.
- Visual aim point 1500ft, touchdown 1000-2000ft.

## Localizer:

If approach is based on timing: fully configured and target speed prior to FAF.

HSI switch to VOR/ILS, ILS or Radio; heading to intercept.

Nav mode selector to VOR/LOC or LOC: FMA NAV armed.

LOC capture: FMA NAV green, heading to course, Wind / DA on INS.

## Backcourse:

Set front course in CSW: CDI is directional.

Nav mode selector: VOR/LOC or LOC.

Back beam switch ON (light on): FD course guidance is directional.

LOC capture: FMA NAV green, heading to course, Wind / DA on INS.

**No back beam switch:** flight director may **not** be used.

- Turn flight director OFF.
- Nav mode selector: HDG.
- **HSI switch to ILS.**
- PNF: make heading bug inputs to direct PF to keep CDI centered.

## Localizer directional aid (LDA):

Comparable accuracy and use to localizer; not part of complete ILS system.

Not aligned with runway: offset more than 3 degrees.

May see listed as instrument guidance system (IGS) in ICAO.

**SDF:** essentially same as localizer procedures.  
SDF course may not be aligned with the runway.

- Normally wider course; less precise.

**VOR (and VOR/DME):**

Mode selector to VOR/LOC: FMA NAV armed.

Course capture: FMA NAV green, heading to course, Wind / DA on INS.

Aircraft with no VOR/LOC position on Nav mode selector:

- Approach may be flown with no FD information.

**NDB:**

- Lateral guidance referenced to the ADF RMI (paddle switches).
- One crew must monitor station identifier throughout approach.
- Set heading bug to inbound course or heading corrected for drift.
- Check wind and drift angle on INS.

**ASR:**

- Upon request, controller will provide recommended altitudes on final to the last whole mile above the published MDA.
- Select backup approach compatible with existing weather.
- If lost communications: cleared to fly any published approach.
  - Attempt contact if no transmissions:
    - 1 minute being vectored, 15 seconds on final.
  - If unable to contact or maintain VMC: transition to backup.
- Repeat heading, altitudes, and altimeter settings until advised not to on final.
- Turn at standard rate: initiate turns and descents immediately after instructed.
- Controller will inform pilot of runway and MDA, MAP location, advance notice of descent to MDA.
- If runway is not reported in sight, missed approach instructions will be given.

**Go Around:**

Simultaneously rotate to GA pitch (14/ 12 degrees) and apply GA thrust.

Command “flaps 20, set go around thrust”.

- Be alert for asymmetric engine spool up.

Positive rate of climb and target speed or above: “gear up”.

Command “nav mode heading, altitude select”.

Climb to 1000ft AFE at **target +10**.

- 15 degrees of bank: target to target +10.
- 30 degrees of bank maximum at target +10 (above 400ft AFE).

1000ft AFE: continue climb (pitch 8-10 degrees), accelerate, and retract flaps as desired.

- Target +20, flaps 10.
- PNF: flaps 20, “positive climb” (gear up), speed brake down, nav mode HDG.

## 2.20 Before Landing

Unless weather conditions cause lights to degrade visibility, turn on all landing lights.

- TL or 10,000ft, whichever is higher.

Normal approach:

- Opposite approach end of runway; time for 60 seconds and flaps 10.
- Turning base: flaps 20 and gear down.
- Turning final: flaps 30 and target speed.
- Stabilized on GP and airspeed, sink rate, trimmed, engines spooled at 500ft.
- Body attitude at TD is about 5 degrees: if exceeds 8 degrees PNF calls “pitch”.

Reduced visibility, wet and slippery runways:

- Include in briefing: GP intercept and runway remaining.
- If marginal braking: consider holding or diverting.
- Braking action **NIL**: landing **prohibited**.

Crosswind:

- Dry = 30 knots / Wet = 25 knots / icy, slush, autoland or CAT II = 10 knots.
- Downwind rudder and compensating aileron **may** be applied, but not necessary on wet / icy runways.
- Very slippery: crab angle **should** be maintained through TD.
- If reverse thrust and crosswind cause drift to downwind side of runway; reduce reverse thrust to idle and release brakes to correct back.

Touchdown and landing:

- If speedbrake lever fails: immediately actuate it manually.
- Simultaneously with autospeedbrake: pull all reverse thrust levers to interlock, hold light pressure, after locks release, pull symmetrical levers to **full reverse** position.
  - If exceed 95%: logbook entry.
- Lower nose while speedbrakes and thrust reversers are being actuated.
- Aerodynamic braking is **prohibited**
- 80 knots: initiate to **reach** reverse thrust by 60 knots.
- Position full down after engines decelerate to reverse idle.
- If stop on runway is in question: max reverse thrust may be used to complete stop.

**Autobrakes:**

- Slippery, reduced visibility (3/4 Or RVR 4000) or limited length: autobrakes **should** be left engaged until **safe taxi speed**.
  - Safe taxi speed = 20 knots on high speed or 10 knots for 90 degree turn.
- Dry runway: manual brake below 80kts coincident with return to forward thrust.
  - Autobrakes **may** be left engaged on dry runway until safe taxi speed.

When manual braking: do not pump the brakes.

Rudder control is effective down to 50-60 knots.

Do not use tiller until safe taxi speed.

Engine stall or uncontrollable EGT increase:

- FE calls out and awaits Captain command to move start lever to cutoff.
- N2 below 30%: motor engine for 30 seconds.

Turnoff; taxi-in:

- PF commands FE to arm body gear steering at **safe taxi speed** and prior to turning off the runway.
  - Autobrake switch not turned off until clear of the runway.
- Taxi speed of 20 knots **should not** be exceeded.
- After clearing runway: check brake pressure, accomplish after landing checklist items, Captain stows speedbrake, PF calls for after landing checklist.

## 2.21 After Landing

Radar and transponder to standby on this checklist.

Slush / snow or hard landing: leave flaps extended.

Three engine taxi: checklist done, 3 minutes, clean and **dry**, visibility greater than ¾.

- PNF places the start lever to cutoff after FE calls “clear to shutdown”.

Two engine taxi: less than 250,000kg, number two (after securing number three).

Parking: PNF checks brake pressure.

Tow-in: avoid using brakes, don't hold tiller, advise ground if brakes are hot.

Shutdown: 3 minutes at idle.

Overnight: OPS, INS, emergency exit lights, standby power, and battery: OFF.

- DC meters pushbutton: deselected.

## 2.22 Secure Cockpit

Radar to OFF: ground time three hours or more or APU / ground power not available.

INS to OFF: ground time three hours or more or APU / ground power not available.

Check drift rates and residual GS: will zero after stationary for 3 minutes.

- Mode switch OFF: after drift and GS checked.
- INS drift exceeds **1.0nm**: logbook entry.
- RESID GS exceeds **15 knots** on two consecutive flights or **21 knots** on single flight: logbook entry.

Ensure OPS computer – OFF, using the shutdown window to exit program.

**FO** pass arrival message to station **and** Atlas GCC as soon as operational duties permit.

- Do not use HF radio if refueling.

Logbook entries will be approved and reviewed by the Captain prior to entry.

Fuel remaining in center tank: logbook entry required.

Flight termination:

- Turn off all unnecessary cockpit lights.
- No outbound crew, maintenance rep., Atlas rep: shutdown APU.
- Special load notification form in HAZMAT / NOTOC container.
- FE **will** brief maintenance on condition of aircraft and logbook entries.

## 2.23 Adverse Weather

Do not use reduced thrust:

- Contaminated runway or wind shear conditions suspected.

Takeoffs on slippery runways not allowed:

- Crosswind exceeds 15k, slush or wet snow greater than ½ inch (13mm).

**Captain Only Operations:** will perform as PF if:

- Braking action less than Good
- Visibility less than ¾ mile or RVR less than 4000/1200m.
- Crosswind component exceeds 20 knots.

### **Cold Weather**

Icing conditions:

- OAT on ground / TAT in flight is 10c or below with visible moisture.
  - Visible moisture includes fog with visibility of one mile or less.
- 10c or below and temperature / dew point spread less than 3 degrees.
- OAT on ground 10c or below and surfaces have moisture that may be ingested.

Exterior Safety:

- Takeoff is permitted with light covering of frost, up to 1/8 inch thick on bottom of wing, due to cold fuel.
- Thin hoar frost is acceptable on upper surface of fuselage provided all vents and ports are clean.
- When operating APU in icing conditions, bleed air should be open.
  - Anti-icing is supplied downstream of APU bleed valve.

### **Airframe De-icing:**

Type I relatively thin; shorter holdover times.

- Expect only Type I fluid be applied below -25c.

Type II and IV fluid shear off wing as aircraft accelerates; wing clean at rotation.

- Usually applied as the second step of a two step process.
- Can not be touched up.

### **When to De-ice:**

OAT below 10c and difference between dew point and OAT is less than 3c

- Or visible moisture is present.

Taxiways are slush, snow, sleet or water covered with temperatures near freezing.

Forecast indicates conditions will exist at departure time.

Takeoffs in light freezing rain or drizzle should only be attempted after tactile check.

- Or anti-iced with Type II or IV and takeoff accomplished within holdover time.

### **Holdover Times:**

**Estimated** length of protective time; varies with weather conditions

- **Begins when fluid application commences;** expires when loses effectiveness.

Contractor must communicate at start and completion of anti-icing.

- Type, procedure (deice or anti-ice), mixture ratio, time application started, contractor name, confirm free of contaminants.
- Record data on form 02-AA-08, add to trip envelope.

Military Type I and II do not have FAA approved holdover times.

- A pre-takeoff contamination check must be accomplished.

Holdover times should not be considered minimums or maximums.

**Takeoff is prohibited if any surface contamination is detected.**

**The captain must determine that anti-icing fluid is still providing protection.  
Holdover time has expired: a pre-takeoff contamination check must be performed.**

**Practices:**

Qualified personnel shall accomplish and maintain communication during procedure.  
Fluid type and mix must be in accordance with SAE Holdover Tables.  
No Type II or IV forward of static ports and all traces removed from windows.  
Keep out of all openings, engine intakes / exhausts, hot brakes.  
Light frost (1/8inch) on wing lower surface due to cold fuel, high humidity is permissible.

**Procedure: At the gate**

Electric Pump Hydraulic System 4 – On  
Flight Deck Fan – On  
Pack Valve Switches – Close  
AP Bleed Air Valve Switch – Close  
Pressurization Mode Selector Switch – Man  
Both Outflow Valves – Manually close  
Establish communication with ground personnel  
After completion: fill in data on 02-AA-08

**Before pushback:**

Pressurization Mode Selector – Auto  
Outflow Valves – Open  
APU/Engine Bleed Valves – Open  
Pack Valve Switches, Nacelle Anti-ice, Flight Deck Fan, ADPs - As Required.

**Engine Start:**

If start valve does not open or no duct pressure drop: Start valve solenoid may need heat.  
Oil pressure may be slow in rising, Oil pressure lights on, Filter Bypass light on.  
If anti-ice required: turn on as soon as practical, after each engine is started.

- OAT on ground is 10c or below and visible moisture is present.
- Fog with visibility less than one mile, rain, snow, sleet or standing water, slush, ice, snow on ramps, taxiways, runways, or temp dew point spread less than 3 degrees.

Monitor wing flap position indicators for positive movement.

- If flaps stop, place flap lever to same position as indicated.

**Taxi Out:**

Exercise NWS in both directions.  
If slush and ice are present on taxiways, taxi with flaps retracted: hold Taxi Checklist.  
Avoid using large tiller inputs for sideslip correction: BGS may aggravate a skid.  
Maintain greater distance than normal between aircraft: may blow off Type II or IV fluid.

**Remote De-ice/Anti-ice Procedure:**

Set parking brake.

Flash runway turnoff lights twice to indicate brakes are set.

Thrust levers close.

Nacelle anti-ice – On, if icing conditions exist.

Flight deck fan – On.

Pack valves and bleed air valves – Close

Press mode selector – Manual and close both outflow valves.

Air driven pumps and APU – Off

Communicate with ground staff.

Accomplish with flaps up to prevent slush from accumulating in flap cavities.

After complete: fill out 02-AA-08 and determine holdover times.

Pressurization mode selector – Auto and open outflow valves.

APU and engine bleeds open.

Pack valves, nacelle anti-ice, flight deck fan, ADPs – As required.

Set stab trim for takeoff.

**Threshold De-icing/Anti-icing:** Use remote procedures above.

If necessary to spray fluid into intakes, takeoff with all packs off to prevent smoke.

- Ingestion of fluid will not degrade performance.

Contamination recognition: anti-ice fluid has lost its effectiveness.

- Type I: Change from smooth wet clean to snow or ice covered (rapidly)
- Type II/IV: Change from a smooth gel-like to snow or ice covered (slow)

Check methods:

- From flight deck: windshield wipers, spray nozzles, outboard engine/ wing.
- From main deck: wing leading edges and control surfaces.
  - **Brakes set** until crewmember returns to seat.

Takeoff is prohibited if **any** surface contamination is detected.

**Pre-takeoff check:** must be made **if icing conditions exist.**

- Even if holdover time has not been exceeded.
- May be made from cockpit.

**Pre-takeoff contamination check:** when holdover time is exceeded.

- Required within five minutes of takeoff.
- LE and TE surfaces and visible flight control surfaces free of contaminants.

Ground run-up: clear area in rear of aircraft; 60% N1 or as high as practical (30secs).

**If OAT less than -39c** and reduced thrust selected: prior to engaging AT, advance No.3 thrust lever full forward and retard (2-3secs) to obtain takeoff warning check.

Takeoff on slippery runway not allowed if crosswind exceeds 15k or when slush or wet snow is more than ½ inch (13mm).

- Consider wing anti-ice after flap retraction to melt any accumulation of slush.

Light forward pressure on control column for maximum NWS effectiveness.

70% N1, symmetrical spool up, set takeoff thrust slowly and smoothly.

Use rudder pedal steering and/or rudder input to correct deviations.

- Limit rudder input ½ full travel.

Rudder effectiveness is less than rudder pedal steering effectiveness below 50k.

Reject on slick runway, above 50k, rudder should be used as primary means of directional control.

- If skid develops, reduce reverse thrust to idle.
- Use rudder pedal steering augmented by differential braking for control.

Climb: when icing conditions are anticipated (+10c TAT and -40c SAT), turn on ignition and nacelle anti-ice before penetration.

- When engines stable, turn off ignition.

After flaps up: wing anti-ice should be turned on to melt accumulation of slush.

Fuel freeze point +3c, decrease altitude or divert to warmer air, or increase Mach.

#### **Descent:** anti-ice

- Visible moisture, +10c and below, N1 50% above 10,000ft, 45% below.
- Prolonged flight in icing conditions with flaps extended: **prohibited**.

**Taxi-in and Parking:** anti-ice on when conditions exist.

- Do not start APU until just prior to engine shutdown when bleed air may be used for APU inlet anti-icing.
- Do not retract flaps beyond 25 when taxi through water or slush.
  - Visually inspect the jackscrews prior to retraction.

Over night securing of aircraft: refer to manual.

#### **Hot weather**

Excessive riding of brakes should be avoided.

Use intermittent brake usage:

- Allow aircraft to accelerate to 20k, then brake to a very slow taxi speed.

Landing on long, dry runways:

- Reverse thrust may be used as the primary method of slowing the aircraft.
- Manual braking used in preference to the autobrake system.

#### **Severe turbulence**

Diversion is the **best policy** if severe turbulence persists in the area.

Flap extension in areas of known turbulence should be delayed as long as possible.

Ignition on as soon as turbulence is encountered.

- FE informs captain if selected without command.

#### **Cruise and climb**

Autoflight is recommended for flight through turbulence.

The most important objective:

- Obtain an initial thrust setting reasonably close to the correct one.

- Undesirable to make thrust changes during severe turbulence.

Autoflight in severe turbulence: speed mode to TURB

- Provides pitch hold and wings level.
- Maintain altitude and heading by manual AP controls.

AT switch: OFF.

Severe turbulence below 15,000ft, aircraft may be lowed to 250k clean.

### **Heavy precipitation**

With extremely heavy rain, N1 may fluctuate up to 6%.

When precipitation anticipated or expected: AT OFF, anti-ice ON.

### **Windshear**

Change of wind speed and/or direction over a short distance of flight.

- Severe: airspeed greater than  $\pm 15k$ , pitch  $\pm 5$  degrees, VVI  $\pm 500ft$ .

If severe windshear is indicated, delay takeoff or discontinue approach.

- Thunderstorms, virga, LLWAS warning, frontal passage, temperature inversion, temp / dew point spread of 15-30 degrees, strong winds.

Precautionary actions:

- Maximum thrust, longest suitable runway, Vr equal to Vr for runway performance takeoff weight, do not use FD, flaps 20, know climb attitude, develop awareness.
- OPS:
  - Select WINDSHEAR on OPS takeoff ATIS input page.
  - Will revert to maximum thrust and flaps 20.
- Stick shaker must be respected at all times.
- Encountered near Vr with insufficient runway to stop:
  - Firewall thrust and initiate normal rotation at least 2,000ft before end.

Approach and landing:

- Add airspeed correction up to maximum of 20k.
- Do not use AT.
- Avoid large thrust reductions.

### **Recovery:**

- Disengage AT and AP, firewall thrust, wings level, rotate to 15 degrees initially, no flight director, (up to 20 degrees ay be required to silence “pull up”), increase pitch in small (2 degree) increments until acceptable flight path has been achieved.
- Maintain gear and flap configuration.
- Accelerate to maneuvering speed, call for climb thrust.
- FE insures speedbrakes are down.

### **Stall recovery:**

- Disengage AP and AT, firewall thrust; simultaneously roll wings level and adjust pitch to minimize altitude loss.
- Clean up as above.