

Standard Operating Procedures
Preliminary Cockpit Preparation

Items marked by (*) are the only steps to be completed during a transit stop.

The following procedure, performed by the PNF, ensures that required safety checks are made prior to the application of electrical power to avoid inadvertent systems operation and danger to A/C and personnel. Included is APU starting and establishment of electrical and pneumatic power.

IGNITION.....**OFF**
WIPERS.....**OFF**
THROTTLE LEVERS.....**Check Idle**
REVERSE LEVERS.....**Check Stowed position**
FUEL HP VALVES.....**Check OFF**
LANDING GEAR LEVER.....**Check DOWN**
REAR and OVERHEAD C/B PANELS :

- Check all C/B are set. If a C/B is found tripped, coordinate with maintenance for reset.

BATTERIES and EMERGENCY INVERTER :

- **BAT 1,2 and 3**.....**Check OFF**
- **BAT 1,2 and 3 voltage**.....**Check Above 25 V**
 - If one battery is below 25 V connect external power before attempting to start the APU.
- **BAT 1, 2 and 3**.....**AUTO**
 - Check FLOW BARS in line and observe DOME It is illuminated.
- **AC EMER ON INV light**.....**Check ON**
- **DC ESS ON BAT light**.....**Check ON**
- **AC V/FRQ rotary sel.**.....**EMER**
 - Check INV parameters in white range.

CAUTION

In case of emergency inverter malfunction, switch off batteries before any other action to avoid damage to the electronic equipment.

HYDRAULIC :
CAUTION

Do not pressurize the green hydraulic system without ground clearance.

APU FIRE PROTECTION

- **APU FIRE handle**.....**check IN and Latched**
- **LOOP A and B pb.**.....**Check IN**
- **SQUIB TEST pb.**.....**Press**
- **AGENT SQUIB It.**.....**Check Illuminated**
- **LOOP TEST pb.**.....**Press and Hold**

Check

- **LOOP A** It illuminates associated with AUDIO/MASTER CAUTION activation.
- After 3.5 sec **LOOP A** and **LOOP B** illuminate associated with **APU FIRE** warning AUDIO/MASTER WARNING activation and **APU fire handle** illumination.

- **LOOP TEST pb.**.....**Release**
Check

- **LOOP A** warning is cancelled
- **LOOP B** and **APU FIRE** warnings remain activated for 3.5 seconds.

ELEC

EXT PWR (If AVAIL Lt illuminated).....**ON**
AVAIL Lt extinguishes

APU START
• If EXT PWR ON It illuminated :

- **ECAM control panel**.....**Adjust brightness**
- **APU MASTER SW**.....**ON**
 - **APU** page appears on ECAM

- **APU START**.....**ON**

- **ON** It illuminates.
- **Blue ACCEL** light illuminates and indicates that **APU** is accelerating
- On **ECAM APU** page, **N** and **EGT** rise
At 50 % of Speed **Start PB-Switch** is released automatically **ON** white light extinguishes
At 95 % of speed :
- On **ECAM APU** page, **AVAIL** indication appears
- On **APU panel** : **ACCEL** blue light extinguishes
AVAIL It illuminates

- **EXT PWR**.....**As rqrd**

- The **EXT PWR** may be kept **ON** to reduce **APU** load, especially in hot conditions.

• If EXT PWR ON It extinguished :

- **APU MASTER SW**.....**ON**

- **ON** It illuminates

- **APU START**.....**ON**

Blue ACCEL light illuminates and indicates that **APU** is accelerating

At 50 % of speed :

START PB-switch is released automatically **ON** white light extinguishes

At 95 % RPM :

- **AVAIL** It illuminates
- **APU GEN** on line :
- **ECAM APU** page appears after 10 seconds. If required, adjust brightness on **ECAM** control panel.

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STAND BY GENERATOR (if installed)

If required for ETOPS operation, the STBY GEN channel should be tested, as early as possible during the cockpit preparation.

- **ELECTRICAL NETWORK**.....**SUPPLIED**
- **If APU is not running :**
- **APU MASTER SW**.....**Check OFF**
- **BAT FLOW BARS**.....**Check extinguished**
- **GREEN HYD ELEC PUMPS**.....**ON**
- **PTU**.....**Check OFF**
- **FUEL PUMPS**.....**Check OFF**
- **STBY GEN**.....**OVRD**
(STBY GEN OVRD function disengages after 2 minutes)

Checks to be performed :

- **STBY GEN FAULT light**.....**Extinguished**
- **ESS TR current**.....**Approximately 0**
- **DC ESS BUS**.....**22-29 VDC**
- **AC ESS BUS and AC EMER BUS**.....**110-122 VAC**
390-410 Hz
- **DC ESS ON BAT light**.....**Extinguished**
- **AC EMER ON INV light**.....**Extinguished**
- **GREEN HYD ELEC PUMPS**.....**OFF**
- **ELECTRICAL NETWORK SUPPLY**.....**AS REQ**

Note: On ECAM ELEC DC page (SYSTEM Display)

- DC BUS TIE is not displayed
- DC ESS BUS is amber.

*** COCKPIT LIGHTS.....AS REQ**

Set STDBY COMPASS, DOME, STORM and PANEL Its as required. DOME Light should be selected since it is the only lighting source in EMER ELEC configuration. DIM position is recommended for take-off.

ELEC PWR.....Check

- Scan ELEC PWR panel : no amber light illuminated except GEN 1 and GEN 2 FAULT lights.

FUEL :
LEFT INNER PUMP 2.....NORM

- If there is sufficient fuel in the left inner tank, this avoids fuel depletion from the outer tanks which would lead to increased refuelling time.

PROBE/WINDOW HEAT.....Check OFF
VENT

- Check all lights OFF

Note : On ground OVBD green flowbar in line.

ANN LT :

- **AUTO TEST PB****ON**
• Check that all lights are serviceable

The automatic test checks the lights of the overhead panel, instrument panels and pedestal except the following equipment :

**OVERHEAD PANEL INSTRUMENT PANELS
PEDESTAL**

	MASTER CAUTION	
	MASTER WARNING	
MSU's	Altimeters	
ISDU	L/G CTL lever	FMCs
FIRE handles	TRP mode selector	ECAM CTL panel
FQI LO LVL lights	keys	ATC control unit
ENG TRIM (GE only)	SFPI	VHF control unit
	FCU	ADF control unit
	EFIS control panels	
	AUTO LAND lights	

During AUTO TEST operation :

- all the lights not checked by the automatic test are illuminated steady (except a - LOCK, MASTER CAUTION, MASTER WARNING flashing) : check all the corresponding lights are illuminated.
- all digital displays indicate « ...888... » (except FQI during refuelling).
In case of low accuracy of fuel quantity in any tank, FQI display indicates « LA » code for corresponding tank (except during refuelling).

Note : Duration of AUTO TEST is approximately 65 sec.

- If Windshear Warning is installed :
 - WINDSHEAR appears in red on the PFD for approximately 15 seconds (If PFD is on)
 - Audio warning "WINDSHEAR" is announced three times.
 - WINDSHEAR ALERT NOT AVAILABLE message is displayed on ECAM STATUS page.

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AIR BLEED/COMPT TEMP :

- **APU BLEED**.....**ON**
Do not use APU bleed if ground air is connected.
- **PACK VALVES 1 and 2 pb switches**.....**Check ON**
 - Check Flowbars in line
- **COMPT TEMP selectors**.....**AUTO/AS REQ**

PARKING BRAKE.....**ON**

- Check ACCU PRESS and recharge if necessary.
- Check PARKING BRAKE pressure is 1500 PSI or more.

PARKING BRAKE must be applied before performing the Exterior Inspection to allow removal of chocks and to check BRAKE wear indicators.

ALTERNATE BRAKING SYSTEM

Note : The purpose of this check is to verify, before the first flight of the day, the efficiency of the alternate braking (absence of "spongy pedals").

- **CHOCKS**.....**CHECK IN PLACE**
- **BRK/A/SKID**.....**ALTN/ON**
- **PARKING BRAKE**.....**OFF**
- **BRAKE PEDALS**.....**PRESS**
Apply maximum pressure on both pedals.
- **BRAKE PRESSURE**.....**CHECK**
On the brake pressure triple indicator, pressure must build up symmetrically without delay on left and right sides. With full pedal deflection, pressure must be between 2000 and 2700 psi.
- **BRAKE PEDALS**.....**RELEASE**
- **PARKING BRAKE**.....**ON**
- **BRK/A/SKID**.....**NORM/ON**

SPEED BRAKE HANDLE.....**Check in
RETRACT position**
SLATS/FLAPS HANDLE..... **Check**

- If handle position disagrees with slats/flaps position, set handle to corresponding position.

LATERAL PANEL

- Check ANN LT sel in OFF position.
- Check no light illuminated on lateral panel.

MAINTENANCE PANEL AUDIO SELECTOR :

- Select P.A. reception on audio selector of lateral panel, with volume selection in approx 12 o'clock position.

This selection will allow recording of cabin attendants announcements on the cockpit voice recorder.

EMERGENCY EQUIPMENT

- Check:
 - Life jackets stowed
 - Asbestos gloves stowed
 - Axe stowed
 - Flashlights stowed
 - Smoke goggles stowed
 - Portable fire extinguisher lockwired and pressure within the green area
 - Oxygen masks stowed
 - Portable oxygen equipment and full face masks, bottle pressure within the green area and adapters stowed underneath right aft window
 - RH and LH evacuation handles stowed
 - L/G gravity extension handle stowed
 - Smoke hoods (if carried)

RAIN REPELLENT (If installed)

- Pressure and quantity indicators..... Check

CAUTION

The rain repellent should never be used as a windshield washer and should never be sprayed on a dry screen.

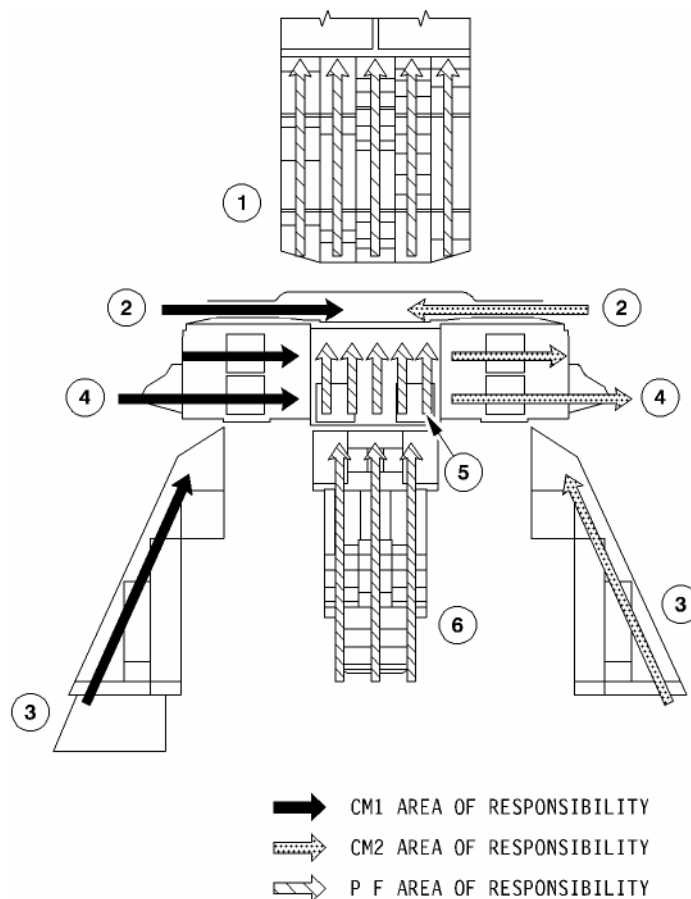
Standard Operating Procedures
Cockpit Preparation
INTRODUCTION

Items marked by (*) are the only steps to be completed during a transit stop.

The cockpit preparation should be performed by the PF and PNF according to panel scan sequence, defined below, and the task sharing defined in the QRH.

DOCUMENTATION AND MAINTENANCE

On entering the aircraft, obtain the technical (maintenance) log, verify the certificate of maintenance and daily inspection (or similar) are up to date and signed. Check the deferred or carried forward defects. If the refuelling has already been performed check the uplift.

PANELS SCAN SEQUENCE


Standard Operating Procedures
Cockpit Preparation

Note 1 : IT IS A GENERAL RULE TO EXTINGUISH ALL WHITE LIGHTS FOR ALL SYSTEMS DURING THE SCAN SEQUENCE. THESE ACTIONS ARE THEREFORE NOT LISTED HERE.

Note 2: FUEL PUMPS MAY BE LEFT OFF UNTIL REFUELLING IS COMPLETED IF REQUIRED.

GEAR PINS and COVERSCheck
- Check three gear pins on board and stowed.

OVERHEAD PANEL

* **IRS MSU 1, MSU 2, MSU 3**

- **Mode**NAV

The IRS MSUs will normally be OFF when entering the cockpit, selecting each MSU to NAV will start the IRS alignment process.

If the MSUs are still in NAV mode, select to OFF for more than 10 seconds, then back to NAV for a complete realignment, which lasts approx 10 minutes.

ALIGN MODE will be illuminated.

Note : 1. The IRS outputs are used by many systems of the aircraft, so it is essential to align the IRS as early as possible to provide data to the related systems.

2. Check IRS ALIGN MEMO on ECAM is no longer displayed before moving the aircraft.

3. Do not initiate a rapid realignment within less than 3 minutes after normal alignment.

4. If an IRS alignment discrepancy occurs (ALIGN light flashes on MSU), check present position is correct and re-enter the present position using the same tuning source (FMS CDU or ISDU) as the one previously used.

- **FMS CDU INIT Key**Press
INIT A page is displayed
LAT/LONGCheck/modify

- **FMS CDU ALIGN IRS prompt**Press
When any of the IRUs are in the align mode the prompt ALIGN IRS will be displayed. Press the ALIGN IRS prompt to align the IRS on the LAT/LONG entered in the CDU, as soon as MSU mode selectors are selected to NAV.

If another page is selected other than INIT A, the message ALIGN IRS remains in the scratchpad.

Note : If IRS had previously been aligned on ground at the same LAT/LONG, then the ALIGN IRS prompt will not be displayed. If the LAT/LONG are changed, the ALIGN IRS prompt is displayed.

- **ISDU** ... Check valid co-ordinates have been sent

* **CABIN SIGNS**

- **NO SMOKING**AUTO/ON
- **SEAT BELTS**SEAT BELTS/ON

* **CALLS**

- Check CALL Its extinguished. Reset as required.
HYD PWR

- **BLUE, GREEN, YELLOW RSVS**within normal range

- Check the 3 fluid level indications are normal.

Note : On ground, system not pressurized, qty ind. needle should be in the outer green sector.

* **FLT RCDR**

GND CTLON
Check DFDR and DFDAU Lts extinguished

ISDUOFF

- Check SYS rotary sel set to OFF.

* **EXT LT**As required

- Check STROBE in AUTO position and BEACON in OFF position.

* **PITCH TRIM/YAW DAMPER/ATS**

PITCH TRIM 1+2ON

YAW DAMPER 1+2ON

ATS 1 (+ 2 If installed)ON

ENG 1 FIRE

- **ENG 1 FIRE handle**check IN and latched.
Engine fire protection test

- **SQUIB TEST pb**Press
Check AGENT 1+2 SQUIB Lts illuminate

- **LOOP TEST pb** Press and Hold

Check: • LOOP Alt illuminates associated with ENG 1 FIRE warning (AUDIO/MASTER CAUTION/ECAM) activation and ENG 1 FIRE HANDLE illumination (and fuel HP valve Lt illumination if HP valve open).

• After 3.5 sec LOOP A and LOOP B Its illuminate associated with ENG 1 FIRE warning (AUDIO/ MASTER WARNING/ECAM) activation and ENG 1 FIRE handle (and fuel HP valve It illumination if HP valve open).

- **LOOP TEST pb** release

Check : • LOOP A warning is cancelled

• LOOP B and ENG 1 FIRE warning remain activated for 3.5 seconds.

EVAC SIGNAL (if installed)As required

- For aircraft with CAPT+PURSER/CAPT switch, the usual position is CAPT.

- For aircraft with ARM/OFF switch, the usual position is OFF.

LDG GEAR ANNUNCIATORCheck
Normal Indications.

- Cross check with center instrument panel.

Standard Operating Procedures
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* **FUEL**

- **X-FEED**.....check X-Line
- **ISOL VALVES/LP VALVES**.....check in line
 - Flow bars in line and steady.

Note : ISOL VALVES check must be done with « PED and OVHD PNL » control knob set to BRIGHT.

- For ETOPS Flights only
- **X-FEED**.....Press
 - Check IN-LINE flow bar illuminated
- **X-FEED**.....Release
 - Check X-LINE flow bar illuminated.

* **COCKPIT VOICE RECORDER**

- **CVR TEST**.....PRESS
 - Check correct operation.

* **CABIN PRESS**

- **AUTO PRESS RATE LIMIT knob**.....NORM
- **RATE LT**.....check extinguished
- Check CAB ALT, DIFF PRESS and CABIN V/S for logical indication.

* **CREW OXYGEN**

- * **SYSTEM HIGH PRESS**.....check indication between 1 400 PSI and 2 000 PSI.

Note : If pressure is below 1 400 PSI, check oxygen duration chart to determine that quantity is sufficient for the scheduled flight.

- **SYSTEM LOW PRESS**.....check in green sector.

ENG 2 FIRE PROTECTION

- Same as for ENG 1.

- * **EMER EXIT LT**.....ARM

- Check that DISARM light extinguishes.

COMPT TEMP

- **ECON FLOW**.....ON/AS REQ
- **MAX COOL**.....AS REQ
- **COMPT TEMP Selectors**.....AUTO/AS REQ
- Select CRT position.

Note : ECON FLOW may be selected ON, if required, for flight with less than 160 pax. Approx 68 % flow is provided.

* **COM**

TUNE VHF COM frequencies use VHF 1 for ATC (only VHF 1 is available in emergency elec config), VHF 2 can be used for ATIS and company frequencies. VHF 3 (if installed) is normally used for ACARS.

* **AIRFIELD DATA**

Obtain necessary data for system initialization and cockpit preparation. This should include RUNWAY IN USE, ALTIMETER SETTING and WEATHER DATA. ATC Tower temperature should be used for all Take-off calculations.

Standard Operating Procedures
Cockpit Preparation
*** FMS INITIALIZATION**
CAUTION

If the message "PLEASE WAIT" appears : DO NOT PRESS ANY CDU KEY until the message is cleared.

- **FMS data base validity**.....**Check**
Press REF key and display A/C STATUS page
 - Check DATA BASE validity and stored WPT/NAVAID if any review stored data for deletion decision.
 - Check PERF FACTOR agrees with Flight Plan.
- **NAVAID DESELECTION**.....**As req**
If NOTAMs warn of any unreliable DME or VOR/DME, access NAVAID page and DESELECT the related navaid.
- **FLIGHT PLAN INITIALIZATION**
- **INIT key**.....**Press**
INIT A page is displayed.
- **CORTE or city pair code**.....**Insert**
- **INIT PAGE A**.....**Check/complete**
 - Check/modify ALTN/ALTN RTE
 - Enter FLT number, FLT ID (For aircraft with ATC mode S).
 - Enter Cost Index as per airline policy if it was not provided by the data base when a CORTE was inserted.
 - Enter intended CRZ FL or check it if it was already provided by data base. Modify it if necessary taking into account ATC constraints or expected gross weight.
 - Enter Tropopause altitude and/or modify CRZ FL TEMP according to MET forecast.
 - Enter CRZ wind
 - The IRS are usually aligned to the departure airport reference point coordinates, however, if the gate coordinates are published, these may be inserted here.

- F-PLN A page.....**Complete and check**

If CORTE has been inserted, the F-PLN should automatically include the preferential or most probable T/O RWY, approach and landing RWY, associated SIDs, STARs, transition and En Route WPTs. However some data bases will only include departure and arrival airport idents and EN ROUTE WPTs (if appropriate).

The crew must check, modify or insert (as applicable) the F-PLN according to the data given by ATIS, ATC or MET:

- Lateral revision at Departure Airport, Select RWY then SID then TRANS (if appropriate)
- Lateral revision at WPT for ROUTE modification if needed
- Vertical revision : check or enter speed/alt. CONSTRAINTS according to ATC clearance.

- F-PLN.....**Check**

- Check the Flight Plan versus computerized flight plan and navigation charts.
- Check Dist to DEST along the F-PLN indicated on PROGRESS page. Compare with the computerized flight plan.

- F-PLN B page.....**As req**

- Enter wind/temp for waypoints as provided on the computerized Flight plan. It should be remembered that the more points entered, the better the accuracy of the FMS predictions.

- SECONDARY FLIGHT PLAN.....**As req**

This is routinely a copy of the active. However, consideration may be given to the following :

- a) Copy the active F-PLN but modify it at a suitable WPT for an immediate return to the departure airfield in the event of, for example engine failure.
- b) If weather is below landing minimum at the departure airfield the secondary flight plan should be that required for an immediate diversion after take-off.
- c) If there is the possibility of a runway and/or SID change during taxi, this can be prepared for by copying the active and making the necessary modifications.

- PROG.....**As req**

Check VOR tuned by FMS, modify if required.

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FMS DATA INSERTION
*** FMS GROSS WEIGHT INSERTION**

- ZFCG/ZFW.....INSERT
- BLOCK FUEL.....INSERT

- If ZFCG and ZFW are not yet available it is acceptable to enter the expected values in order to obtain predictions. Similarly the expected fuel on board may be entered if refuelling is not already completed at that time.
- If ZFCG and ZFW are inserted, the FMS will provide the minimum fuel required for the trip according to fuel policy (Route Reserves, ALTN, FINAL)
- If ZFCG, ZFW and BLOCK FUEL are inserted, the FMS will provide all predictions, as well as the EXTRA fuel if any.

*** FMS TAKE OFF DATA INSERTION**

- V1, VR.....Insert
- THR RED/ACC.....Set or check
 - Check or modify THR RED/ACC ALT as needed
- TO SHIFT.....As req

GLARESHIELD
*** EFIS**

- PFD and ND brightness.....As req
- FPV/FD.....ON/FD
- VOR/NAV/ILS sw.....As req

Note: .VOR position: manual tune.
 . NAV/ILS positions: auto tune.

- EFIS control box.....As req
- ND mode and range.....As req

. MODE : It is recommended to use MAP mode for take-off unless the SID is not in the data base, then PF should use ARC or ROSE.

. RANGE : It is recommended to set the minimum range to display the first waypoint on departure, or as required for weather radar.

*** FCU**

- Adjust brightness.
- SPD/MACH setting knob.....turn to select V2
- SPD/MACH setting knob.....Push to Activate Preset
- SPD/MACH setting knob.....Turn to Preselect initial climb speed
- ALT Sel.....Initial cleared ALT

LATERAL CONSOLES
RAT

- HYD RAM AIR TURBINE handle.....check OFF

OXYGEN MASK

- Depress INT on audio panel and adjust volume.
- Select interphone transmit.
- Push down and hold RESET/TEST slide control and observe blinker momentarily yellow.
- Notice oxygen flow sounds through loudspeaker.
- Release RESET/TEST slide control.
- Set N/100% manual control to 100%.
- Check system Low Press indication within green band.

GND SERVICE INTPH.....OFF

CM1/CM2 INSTRUMENT PANELS

GPWS.....NORM

- Check no FAULT light illuminated.

Note : GPWS FAULT light will be illuminated whilst IRS 1 is in align mode if a GPWS MK III is fitted.

ND.....Check

- Check for correct display.
- Cross check ND and RMI heading with standby compass.

• If ND/RMI and compass headings disagree :

MSU mode selector.....OFF

• After at least 15 seconds :

MSU mode selector.....NAV

ALIGN MODE annunciator.....Check steady amber

• Upon completion of the 10-minute alignment period :

Cross-check IRS (ND and RMI) and standby compass magnetic heading indications.

- Check radar operation if desired.
- Check ground speed, initial waypoint, VOR indications.

STBY ASI Check

- Check speed pointer 0.

PFD Check

- Check for correct display.
- Check IAS, FMA, initial target ALT, altimeter readings, attitude.

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VSI Check

- Check no flag and pointer 0.

* **ALTIMETER** Check

- Check no flag.
- **QNH/QFE** Set

CLOCK Check/Adjust

- Check time. Adjust if necessary.
Set elapsed time and chrono to zero.

METRIC ALTIMETERS (If installed) Check

- **QNH/QFE** Set

CTR INSTRUMENT PANEL

* **STBY ALTIMETER** Check

- Check no flag.
- **QNH/QFE** Set

STBY HORIZON Check

- Check no flag.
- Erect if necessary.

* **ECAM** RCL

BRK-A/SKID NORM-ON

* **ENG INSTRUMENTS**

- Check:
 - **OIL PRESS** check Zero
 - **OIL QTY** Check
 - MIN OIL quantity before start is 10QT + estimated consumption, (estimated consumption is based on each operator's oil consumption monitoring)
 - **FF ind.** check zero
 - **N2 ind. needles and counter** check zero
No flags, and red max pointers in front of the red limit marks.
 - **EGT ind. needles and counter** check logical temperature
No flags and red max pointers in front of the red limit marks.
 - **N1 ind. needles and counter** check zero
No flags, red max pointers in front of the red limit mark and N1 mode select knobs are pushed and counter for manual setting is masked.
 - **REV and REV UNLK Its.** check extinguished

* **THRUST RATING PANEL**

- **TOGA/FLEX** set
- **TAT** check logical
- **THR LIMIT bugs** check correspond to THR LIMIT display

LANDING GEAR PANEL

- **WARN TEST pb.** Press
Observe down arrow illuminates, continuous repetitive chime sounds and ECAM system activates.
 - **POSITION DET SYS1 or 2** Select
Select SYS1 on odd days, SYS2 on even days
 - * **LANDING ELEVATION** Set
departure field elevation
- Note: If QFE is used set 0 on LANDING ELEVATION counter.**

PEDESTAL

ADF Check

- Check and set as required

RADIOS Check

- **INT knob** check volume
Make sure that the knob is turned up to enable ground crew contact.
- **VHF** Check
- Check VHF transmission and reception.
- **HF** Check
- Check HF transmission and reception if required for flight.

Note : Do not transmit on HF during refuelling.

WEATHER RADAR Check OFF

PARKING BRK OFF/As req

If chocks are in place, release PARKING BRK to increase brake cooling

ATC STBY/OFF

TCAS (if installed) STBY/OFF

VOR/ILS CRS/FREQ As req

FMS DATA CONFIRMATION

- * **IRS ALIGN** Check
- Confirm coordinates
- * **FMS GROSS WEIGHT INSERTION** Check
- The PNF check FMS data
- * **FMS TO DATA** Calculate/Check
- The PNF calculates and check TO data

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* **FMS F-PLN** **Check**

- PNF ensures that inserted F-PLN agrees with planned routes.
- If company policy requires it, thoroughly check the whole F-PLN using the scroll key. Use ND PLAN mode while scrolling the F-PLN on the CDU.

* **AIRFIELD DATA**..... **Confirm**

* **FLT RCDR** **Check**

Recheck that DFDR and DFDAU lights are extinguished.
DFDR internal test may not be completed for up to 7 minutes following GND CTL selected ON.

* **FUEL QUANTITY** **Check**

. After refuelling is completed :

- **FUEL PUMPS**..... **NORM**

- Check fuel quantity corresponds to FLIGHT PLAN fuel, X check with sum of individual tank quantities.
- Check fuel load asymmetry within limits.

TAKE OFF BRIEFING

The purpose of the take off briefing is for the PF to inform the PNF of the planned course of action for both normal and abnormal situations during take off. It is also a recall of standard emergency procedures and is the time for the Captain to give any specific instructions to the First Officer. It should be completed prior to engine start. It is most important that the take off briefing is given at a time when the cockpit workload is low so that both pilots may concentrate on its content and at a time when the take off conditions are likely to be known. The most appropriate time, therefore, is at the end of the Cockpit Preparation, prior to start.

The take off briefing should include the following :

- A review of the emergency procedures relating to the take off.

e.g. for a Captain briefing :

"This will be a left hand seat take off. If any malfunction occurs before V1 I will call STOP or GO (a lack of any response to a malfunction could be considered a subtle incapacitation). If the call is STOP I will apply maximum reverser and bring the aircraft to a stop on the runway bearing in mind the wind direction if there is a fire. You will inform ATC and monitor the deceleration. When the aircraft has come to a stop and parking brake set you will carry out the necessary ECAM actions on my command. If the malfunction occurs after V1 we will continue the take off. No action other than the application of TOGA and silencing any aural warnings will be taken until the aircraft is safely established in the climb and above 400 ft AGL. At that point carry out the ECAM actions on my command up to second agent discharge, if necessary, for an engine fire." Having completed the emergency briefing (which normally needs only be done in full on the first flight of the day for the crew) a review of the variable procedures must be made, making use of the CDU where possible :

- Runway state, weather expected after take-off, use of anti ice.
- Take off configuration, V1, VR, V2, Flex Temp.
- PACKS ON or OFF
- Single engine acceleration altitude, thrust reduction altitude, normal acceleration altitude, transition altitude and first cleared level.
- Terminal area topography and Minimum Safe Altitudes.
- Action in event of immediate return or diversion after take off. (Engine Out SID)
- SID routing and specific RAD/NAV tuning.
- Use of radar.

As already stated, make use of the FMS CDU wherever possible to confirm and emphasise the briefing.

Standard Operating Procedures
Before Pushback or Start
LOADSHEET..... Check

The Captain should thoroughly check the load and trim sheet, particularly for gross errors. If computerised load sheets are used the computations themselves are not normally suspect. Make sure, however, that the entered data is correct, e.g. correct flight, correct aircraft, dry operating index, configuration.

- Check fuel on board and fuel index correction. For aircraft with a trim tank, check the trim tank quantity is as expected on the loadsheet, if not use the actual trim tank quantity to calculate the fuel index correction.

TAKE OFF DATA Prepare and Check/revise
 Once the load sheet is checked :

- Check/modify FMS weights/CG
- PNF checks or recomputes the takeoff speeds and Flex Temperature using the RTOLW charts.
- PF then INDEPENDENTLY calculates the takeoff speeds and Flex Temperature as a crosscheck. Ensure particular care is taken to determine the takeoff configuration.
- Confirm takeoff weight limitation.
- It is recommended to choose the FLAP setting which gives the max Flex Temperature since extension of engine life will be provided by the use of highest flexible temperature. However, a reduction of a few degrees from a high flexible temperature does not cause significant penalty to engines. A higher flap setting will provide lower speeds and more comfort.
- Enter the Flex Temperature and select FLEX on the TRP unless TOGA is required.
- Set V2 and green dot speed on standby ASI (all remaining bugs at 12 o'clock).
- PF enters (or revises) the take off data in the FMS CDU TAKE-OFF and INIT pages.
- Set V2 and Preset initial climb speed on FCU.
- Check CRZ FL is not above MAX FL.

**SEAT, SEAT BELTS, HARNESES, RUDDER
PEDALS..... Adjust**

The seat is correctly adjusted when the pilot's eyes are in line with the red and white balls.

CDU In TAKE OFF Configuration

- It is recommended to display F-PLN on PNF side, TAKE OFF on PF side.

EXT PWR Check OFF

Request external power removal

OIL QTY bugs.....SET

BEFORE START C/L DOWN
TO THE LINE..... Completed
PUSHBACK OR/AND START UP CLEARANCE

- At this stage, the « before start » preparation is stopped to :
 - obtain ground crew clearance (For pushback, chocks removed, nose wheel steering selector and by-pass pin in place, tow truck connected and area clear for start/pushback).
 - obtain ATC pushback and start up clearance.

Engines may be started during pushback.

WINDOWS and DOORS..... Check closed

- Check cockpit windows closed and locked. Check proper locking of sliding windows by pushing the window handle forward into full closed position.
- Check on ECAM DOOR page that all doors are closed.

**BEACON.....ON/AUTO
PARKING BRAKE..... As req**

- If no pushback required, check parking brake is on and check brake pressure indication. Chocks may be removed.

CAUTION

If, during engine start with parking brake on, the aircraft starts to move due to a parking brake failure, immediately release the parking brake and restore braking using the pedals.

- If pushback required, release the parking brake.

CAUTION

Do not use brakes during pushback unless required due to an emergency. Do not use the nose wheel steering during pushback.

- Once pushback is completed apply the parking brake and inform ground crew.

BEFORE START C/L BELOW
THE LINE..... Completed

Standard Operating Procedures
Engine Start

- **THROTTLE LEVERS**.....**IDLE**
be aware of prevailing surface wind, as tail wind may result in starting difficulties.

- **IGNITION**.....**START A/B**
Set IGNITION to START A (odd days) or START B (even days) and check both ARM lights illuminate on START 1 and 2 pushbuttons.

Note : PACK VALVE FAULT It illuminates during closure.

ENG 2 is normally started first.

- **Announce**....." **START ENGINE 2** "
- **START 2(1)**.....**Press**

- Check ARM white light extinguishes
- OPEN blue light illuminates.

- **Announce**....." **VALVE OPEN** "
- **BLEED PRESSURE**.....**check increasing.**

WHEN N2 INCREASES

- **Announce**....." **N2** "
- **OIL PRESSURE**.....**check increasing.**
- **Announce**....." **OIL Pressure** "

AT 15% N2 MINIMUM

- **FUEL LEVER**.....**ON**
Confirm fuel lever ON and locked/seated in notch.
- **CLOCK**.....**Start**
• 25 sec. max from FUEL ON to light up

Notes : 1. As required (quick turn-around, tail wind), set FUEL LEVER to ON at max motoring speed. 2. Max motoring speed is assumed when there is no significant increase in N2.

- **Announce**....." **FUEL ON** "
- **FUEL FLOW**.....**check in normal range**
- **Announce**....." **Fuel Flow** "

EGT INCREASING

- **Announce**....." **EGT** "
- **CLOCK**.....**Stop/reset**

N1 INCREASING

- **Announce**....." **N1** "
- **N2 45 %**

- **Announce**....." **N2 45 %** "

When START 2(1) OEPN light extinguished

- **Announce**....." **VALVE CLOSED** "

Note : Start valve is fully closed when engine reaches ground idle.

AT IDLE

- **N1, N2, EGT and FF**.....**check**
(at ISA, sea level : N1 about 24%, N2 about 65%, EGT about 400 C and FF about 600 kg/h)

- **ECAM**.....**Check Secondary Parameters.**
- **Announce**....." **ALL PARAMETERS CORRECT** "
- **Announce**....." **START ENGINE 1** "

Repeat the start sequence as stated above

Note : Both ARM lights illuminate when ENG 1 N2 reaches 45%.

AFTER SECOND ENGINE START

- **OIL QTY**.....**CHECK BELOW BUG OR**
BELOW 20 QUARTS
(at least 30 seconds after the engine reaches stabilized idle and prior to any thrust application for break-away).

CAUTION

1. Monitor N2, EGT and FF indicators closely during the start for any abnormal indications. Sluggish N2 acceleration is an indication of an impending :

- **HOT START**, if FF is high and EGT rises rapidly.
- **HUNG START**, if FF is low and EGT is proportionally low.

2. The start attempt should be discontinued if :

a) EGT does not rise within 25 seconds after FUEL ON.

Note: When the engines have been cold soaked at OATs below - 30°C, up to 30 seconds will be allowed to obtain an increase in EGT provided an increase in N2 is obtained within 20 seconds from FUEL ON.

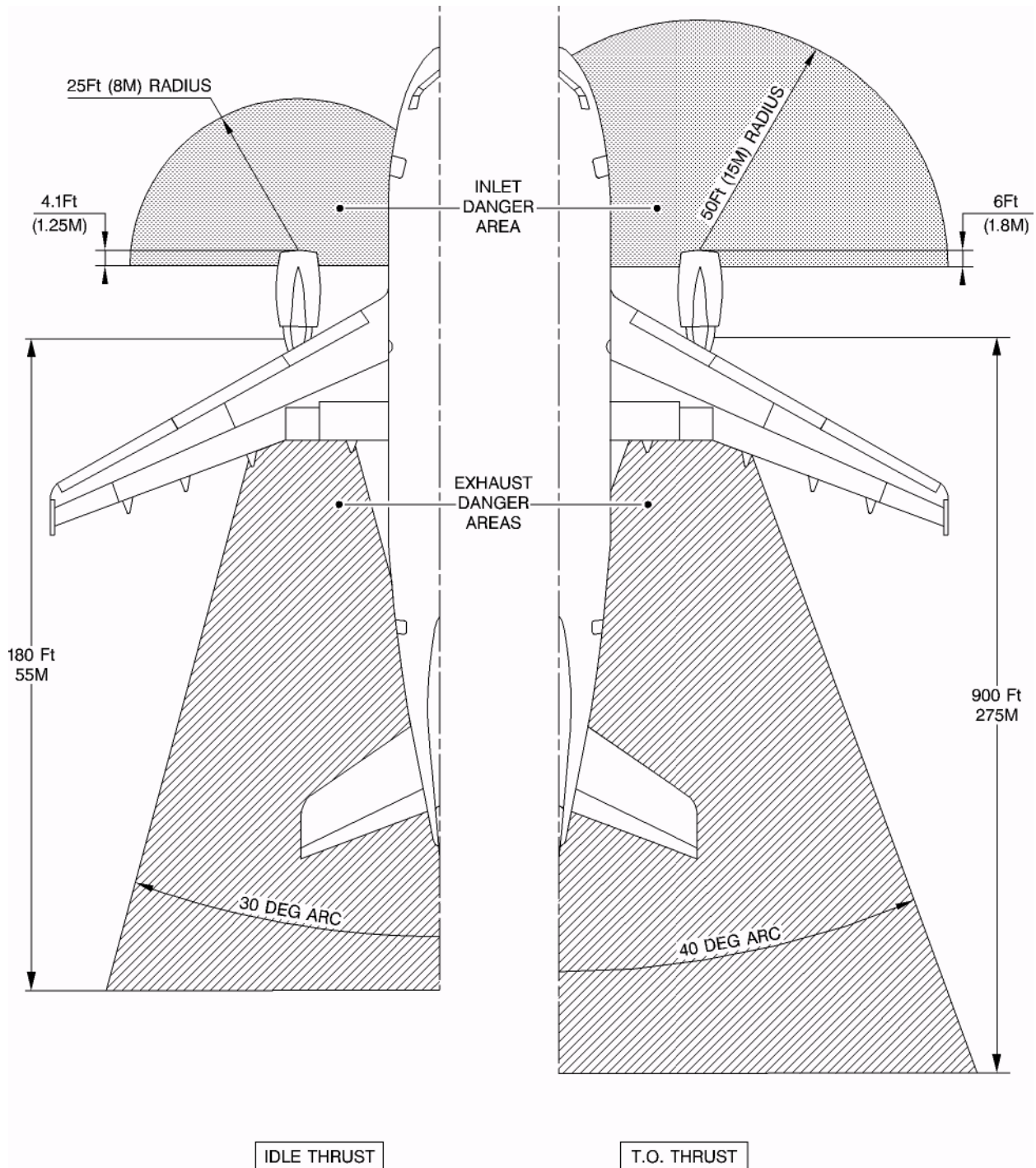
b) Sluggish N2 acceleration accompanied by rapidly increasing EGT or/and tail pipe torching reported by ground crew.

c) N2 stabilizes below ground idle. d) If fuel or ignition is inadvertently interrupted. After placing the FUEL lever to OFF, maintain starter engagement and continue motoring the engine for 30 seconds to ventilate the combustion chambers.

3. The start attempt should be discontinued if an indication of N1 is not obtained within 30 seconds of N2 idle operation.

4. If starter engagement is interrupted, the starter may be reengaged below 20 % N2 (30 % maximum, 0 % recommended).

5. Operational conditions may necessitate the use of starter inlet air pressure below 25PSI. Should these conditions arise, extended time to idle and higher EGT peaks may result. Under these conditions, the start cycle must be closely monitored and appropriate action taken to prevent a hung or hot start.

Standard Operating Procedures
Engine Start
GROUND RUN UP - DANGER AREAS


Standard Operating Procedures
After Start
IGNITION.....OFF

- ARM lights extinguish.
- The PF turning the IGNITION rotary selector to OFF is the signal for the PNF to commence the AFTER START actions.

APU BLEED.....OFF

APU BLEED is selected OFF just after engine start to avoid engine exhaust gas ingestion.

APU

- MASTER sw.....OFF

Note : APU shut down may be delayed if APU BLEED supply is required.

ENGINE WARM-UP :
CAUTION

- After start to ensure engine thermal stabilization, the engine should be operated at idle or near idle for at least 3 minutes prior to advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

ENG ANTI ICE.....AS REQ

Note 1 : Icing conditions may be expected when OAT or TAT is below + 8°C with visible moisture.

Note 2 : . During ground operation in icing conditions, periodic engine run-ups must be performed to shed any possible ice build-up from the spinner, the fan blades or low pressure compressor stators.

- . Periodic engine run-ups must be performed, every 30 minutes, by accelerating the engine to 60 % N1 minimum for 30 seconds (or as practical depending on traffic and airport conditions).
- . Before takeoff a last engine run-up must be performed with observation of all engine parameters to ensure normal engine operation.

WING ANTI ICE.....AS REQ

Note : WING ANTI ICE valves stay closed as long as the aircraft is on the ground.

SLATS and FLAPS.....SET for T/O

- Set SLATS/FLAPS and KRUGER for T/O, and check position on SFPI.
- If the OAT is below - 40° C extend the SLATS/FLAPS step by step.
- If taxiing in slush conditions, keep slats/flaps retracted until reaching the holding point before take off.

GROUND SPOILERS.....ARM
AIL TRIM and RUD TRIM.....ZERO
PITCH TRIM.....Set for T/O

Note : If the OAT is below -40° C, check correct operation of the electrical pitch trim prior to setting the PITCH TRIM for T/O.

ECAM..... check STATUS
ECAM DOOR Page.....Select

- Check all slides armed
- Deselect DOOR page after slide verification.

Clear to disconnect.....Announce

- Ground crew must ensure chocks removed, nose wheel steering by-pass pin removed and area clear for taxi. Interphone is disconnected.
- Check for hand signal display on the left/right side to show all clear for taxi.

AFTER START CHECK-LIST.....Completed

Standard Operating Procedures
Taxi
NOSE Light **TAXI**

Select NOSE Light to TAXI day and night

TAXI CLEARANCE **Obtained**
PARKING BRAKE **OFF**

- Release the parking brake and check brake pressure zero.

ELAPSED TIME **Start**

To record block time

EXTERIOR LTS **As req**
THRUST LEVERS **As req**

. In order to get the aircraft moving, little if any power above idle thrust will be required (max 40% N1). Thrust should normally be used symmetrically. Once aircraft is moving little thrust is required. . The wing mounted engines are close to the ground. Avoid placing engines over unconsolidated or unprepared ground e.g over the edge of taxiways. Avoid high thrust settings at low ground speeds due to the risk of ingestion (FOD).

BRAKES **Check**

. Brakes can be checked once the aircraft is moving, or while stopped. To check the brakes while stopped, depress brake pedals with parking brake ON, select the parking brake OFF and check that the yellow hyd pressure is zero on the brake pressure triple indicator. The main purpose of the brake check is to check that green pressure has taken over and that yellow pressure is at zero on the brake pressure triple indicator.

Note : Any pressure below 130 psi on the brake pressure triple indicator can be considered as zero.

. Thereafter the normal maximum taxi speed should be 30 kt in a straight line, 15 kt for a sharp turn. The ground speed is difficult to assess so monitor ground speed on ND. Do not "ride" the brakes, as 30 kt is exceeded, apply brakes smoothly and decelerate to 10 kt, release the brakes and allow the aircraft to accelerate again.

. Below- 40° C, small braking inputs are required during Taxi. XX will be indicated in place of the brake temperatures while the temperatures are below 0°.

CAUTION

If the brakes fail during ground operations, immediately select the BRK/A/SKID sw to ALTN-OFF and modulate the brakes with pedals. Brake pedals should be released when the A/SKID is switched OFF. Otherwise the pedal braking orders will be taken into account and the aircraft will react strongly. In an extreme emergency and only if pedals are ineffective with the antiskid OFF the aircraft may be stopped with the parking brake (full pressure application will occur).

CAUTION

- If aircraft has been parked in wet conditions for a long period, efficiency of first brakes application at low speed will be reduced.

ECAM **Select F/CTL page**
FLIGHT CONTROLS **Check**

At a convenient stage during taxi :

1. The PNF checks full travel and feel of the elevators and ailerons/spoilers, whilst monitoring on the ECAM F/CTL page.

Note : If PITCH FEEL pushbutton is selected OFF/R then ON, full travel and feel force of the elevators must be checked.

2. The PF holds the nosewheel steering handle to maintain the aircraft direction and checks full travel and feel of the rudder, whilst the PNF monitors the ECAM F/CTL page.

Check all indications return to zero position with respective controls at neutral except the ailerons where droop position is indicated.

3. If the OAT is below - 40° C, the PNF should check full extension of the speedbrakes by setting the speed brake lever notch by notch up to the FULL position whilst monitoring ECAM F/CTL page.

Note 1: HYD SYS LO PR warning may occur if test is performed on more than one axis at a time.

Note 2 : FLIGHT CONTROL check could be done with CWS OFF. If CWS is selected, full travel will not be available.

Note 3 : During aileron check, rudder deflects left or right coordinating with aileron movement (yaw damper input).

ECAM **deselect F/CTL page.**
ATC clearance **obtain/confirm**
TAKE OFF DATA/CONDITIONS **Check/Revise**

- If take off data have become more limiting such as wind change or tower temperature increase, or in case of runway change, prepare updated take off data and as appropriate :

SLAT/FLAP LEVER **takeoff position**

• Select Take off position

V2 **reset on FCU**
Initial climb speed **preset on FCU**
FLX TO temperature **Reinsert in TRP**
FMS
V1, VR **Reinsert**
F-PLN (Runway) **Revise**
F-PLN (SID, TRANS) **Revise or check**

Particular care should be taken to confirm the ATC clearance agrees with the FMS if NAV is to be used.

FCU **As req**

AP cannot be selected in CMD for Take off.

CLEARED ALT **Set on FCU**

IF PROFILE NAV mode is used

PROFILE **Arm**
NAV **Arm**
INITIAL AFTER T.O. HDG **Set on FCU/As req**

If an ATC HDG is required after take off set the heading on the FCU, NAV will be disarmed

FD **Check selected ON**
FMA **Check**

Standard Operating Procedures
Taxi
FLIGHT INSTRUMENTSCheck

- Scan instruments panels observe no abnormal flag on instruments.

RADAR (if required).....ON

- If the radar is required for the flight the following test procedure is recommended :

Adjust the tilt downward until ground returns appear and then slowly adjust it in 1 to 2 degrees steps, up to 15° UP, for weather returns. Select tilt at 4° UP for take off.

ATC code.....Confirm/set
TAKE OFF BRIEFINGConfirm

This briefing should normally be only a brief confirmation of the thorough take-off briefing made at the gate. Any changes in the clearance should be addressed at this time. As extensive use as possible of the displays should be made. eg.

"Take off on RWY 07 (TAKE OFF page), weight 150 t (left ECAM), Slat/Flap 15/15 (SFPI + handle), 50 t fuel (L-ECAM), FLEX 50°, 93% N1 (TRP), LMG2D departure (F-PLN page) V1 151, VR 161, V2 164 (TAKE OFF page + PFD) initial cleared ALT (PFD + FCU)."

FUEL SYSTEM

- If center tank contains fuel :

CTR TK L+R PUMPS.....OFF

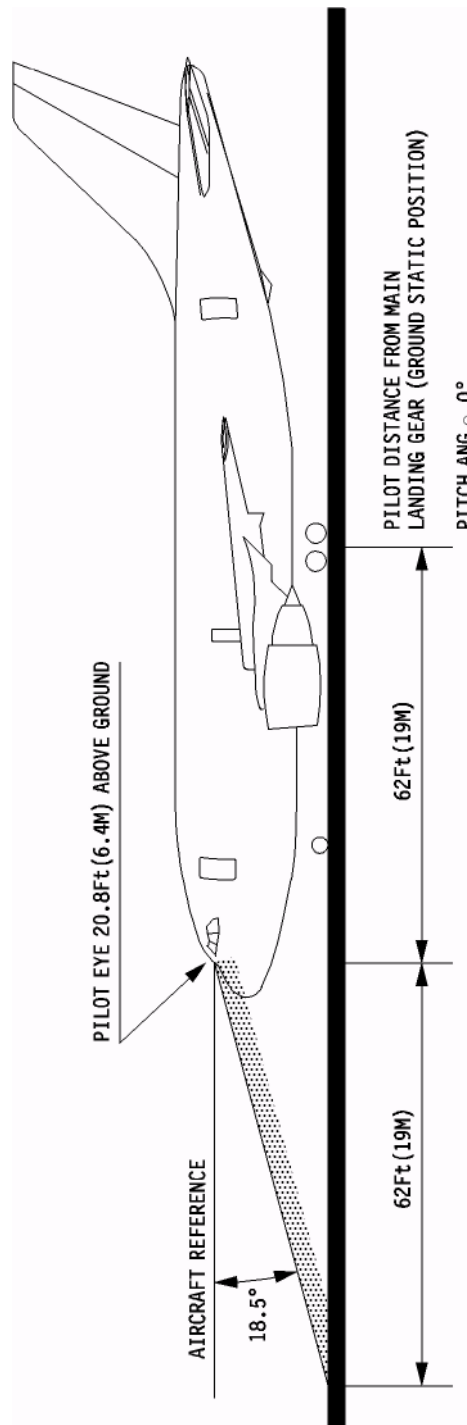
CABIN REPORT.....Received

- Obtain cabin report from purser, as a minimum :
« CABIN SECURED for T.O. »

T/O CONFIG TEST pb.....PRESS

**ECAM.....NORM FOR TO
BEFORE T.O. C/L DOWN TO THE LINE..COMPLETE**

VISUAL GROUND GEOMETRY



Standard Operating Procedures
Taxi
180° TURN ON RUNWAY

A standard runway is 45 meters wide. Considering the turn radius of the aircraft, AIRBUS INDUSTRIE recommends a procedure to make that turn in the most efficient way.

Note : Frequent tight 180 ° turns on the runway have an influence only in fatigue of the landing gear which is subject to high pivoting couples during these turns.

For these calculations of fatigue, it has been assumed that three tight turns would be made at each flight.

PROCEDURE
FOR THE CAPTAIN

- Taxi on the right hand side of the runway up to about 150 m from the end of the runway.
- Turn left, maintaining 25 ° divergence with runway axis.
- When the captain is physically over the runway edge, he applies full deflection as quick as possible on the nose wheel and set about 50 % to 55 % N1 for GE engines or 1.05 EPR for PW engines.

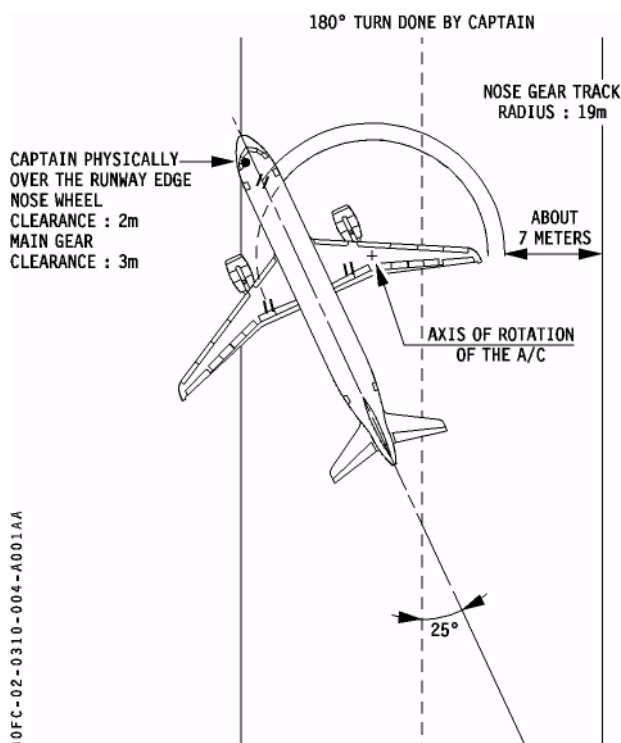
The nose wheel will stay about 2 m from the runway edge and the main gear 3 m from the runway edge. The aircraft will turn around his axis of rotation, with a nose gear track radius of 19 m, leaving a 7 m clearance to the other edge of a 45 m wide runway.

FOR THE COPILOT

The procedure is symmetrical.

The copilot taxis on the left hand side of the runway, turns right (25° with regard of axis) and begins the 180° turn when he is physically over the runway edge.

Note : To avoid the skidding of the nose wheel on a wet runway it is recommended to perform the turn at very low speed, using asymmetrical thrust and differential braking as necessary.



B0FC-02-0310-004-A001AA

Standard Operating Procedures
Before Take Off

TAKE OFF or LINE UP CLEARANCE Obtain
APPROACH PATH CLEAR OF TRAFFIC ...Check
CABIN CREW..... Advise
BRAKE YELLOW HYDRAULIC
PRESSURE.....CHECK

• **If residual pressure is indicated :**

- Depress several times the brake pedals until release of residual pressure
- **If residual pressure remains :**
 - Return to gate
 - Maintenance action is due

Note : Any pressure below 130 psi on the brake pressure triple indicator can be considered as zero.

AUTO BRK.....MAX

- ON It illuminates
- AUTO BRK may be armed with parking brake on.
- Selection of MAX mode before take off will improve safety in the event of an aborted takeoff. If take off must be aborted, the autobrake system will apply the maximum braking (if the ground speed is above 85 kt) as soon as the thrust levers are set to idle which represents a single action done without delay.

IGNITION.....CONT RELIGHT/As req
 CONT RELIGHT is advisable if :

- Runway with standing water
- Heavy rain
- Heavy rain or severe turbulence expected after take off

PACK VALVE..... As req

- If required to increase take-off performance, select pack valves OFF, or use APU bleed to supply the packs.
- If APU bleed supply is used and wing anti-ice is required one pack must be selected off.

ATC..... ON/As req

ALT REPORTING..... ON/As req

TCAS (if installed).....Set to TA/RA

TA ONLY mode should be selected in the following cases :

- known nearby traffic which is in visual contact
- at particular airports and during particular procedures identified by an operator as having a significant potential for unwanted or inappropriate RAs (closely spaced parallel or converging runways...)

EXT LTS..... Set

- Use *NOSE TO*, *RUNWAY TURN OFF* and *LANDING LT* to minimize bird strike hazard during T/O and set NAV and LOGO as required.

BEFORE TAKE OFF

CHECK LIST BELOW THE LINE...COMPLETED

Standard Operating Procedures
Take Off

Take off with PMC and A/THR engaged is the normal procedure.

- **Announce**....."TAKE OFF"
- **CLOCK**.....**START**
- Slightly advance throttles and monitor spool-up, until both engine are above idle (approx. 40% N1).
- **BRAKES** **RELEASE**
Rolling takeoff is recommended when possible
- **GO-LEVERS**.....**TRIGGER**

Note 1 : CM1 keeps his hand on throttles until V1 is reached without interfering with throttles movement.

Note 2 : In case of asymmetrical throttles movement, CM1 is ready to override or to disconnect the A/THR.

DIRECTIONAL CONTROL.....**USE RUDDER PEDALS**

Note 1 : Keep control column forward of neutral and release progressively to achieve the neutral position by 100 kt.

Note 2: In case of vibrations or shimmy of the nose wheels, release forward pressure and apply a slight back pressure on the control column as necessary. Vibrations will probably disappear as the weight on the nose wheel is reduced.

- **PFD/ND**.....**SCAN**
- Check FMA on PFD THR, SRS, RWY (or HDG or HDG/S), FD1 (2)
- **Announce**.....**FMA indication**
- Check FMS position update (A/C symbol on runway threshold)
- **TAKE-OFF N1**.....**CHECK**
- Check take-off N1 is set prior to reaching 80 Kt.
- **Announce**.....« **POWER SET** »

AIRSPEED and

ENGINE INSTRUMENTS.....**SCAN**

- Scan the airspeed and engine instruments throughout the take off roll When speed is 100 kt on PFD
- **PNF Announce**.....« **ONE HUNDRED KNOTS** »
- PF Crosscheck speed reading on own PFD.
- **Announce**....."Check"

Below 100 kt the decision to abort the T.O., may be taken at the discretion of the captain. Above 100 kt rejecting the T.O. is a more serious matter and becomes more critical as V1 speed approaches.

Note : THR mode changes to blue indication (A TS declutch by 100 kts)

V SPEEDS

- At V1
Announce....."V1"
- At VR
Announce....."ROTATE"

AIRCRAFT HANDLING

- **ROTATION**.....**PERFORM**

- At VR rotate the aircraft smoothly using continuous rotation to establish the required pitch attitude (not to exceed 18°) as directed by SRS pitch command bar.
- The pitch bar is commanded to maintain V2 + 10 kt or a max pitch of 18°. In case of engine failure pitch bar will maintain V2 or the existing speed whichever greater.
- If SRS is not available, rotate to 12.5° pitch attitude.
- If into-wind aileron has been applied on the ground start to centralize the control column during rotation so that the aircraft gets airborne with wings level.

LANDING GEAR

- **Announce**.....« **POSITIVE CLIMB** »
Announce positive climb when the vertical speed indication is positive

- **Order**.....« **GEAR UP** »

- **L/G lever**.....**UP**

GROUND SPOILERS.....**DISARM**

EXTERIOR LTS.....**SET**

- **NOSE AND RWY**

TURN OFF lights.....**OFF**

Landing lights may be left ON according to the airline policy/local regulations

AP.....**AS REQ**

AP 1 or AP 2 may be engaged. If AP is already engaged in CWS ; press CWS/CMD pushbutton to engage CMD.

AT THRUST REDUCTION ALTITUDE

- **THROTTLES**...Check symmetrical retard movement

- **ENGINES THRUST** Check CL setting

TRP.....Check LIM MODE

Indication "CL" and "AUTO"

Note : In case of either asymmetrical thrust reduction or thrust reduction below CL, A/THR must be disconnected and thrust manually set.

Announce.....**FMA indication**
Check P.THR and P.CLB engagement

LANDING GEAR lever.....**Neutral**

- When L/G lights are extinguished, set the L/G lever to neutral.

- **Announce**.....« **GEAR UP** »

PACK VALVE**Select one pack**

Check flow bar in-line.

Note 1 : Selecting both packs simultaneously may affect passenger comfort.

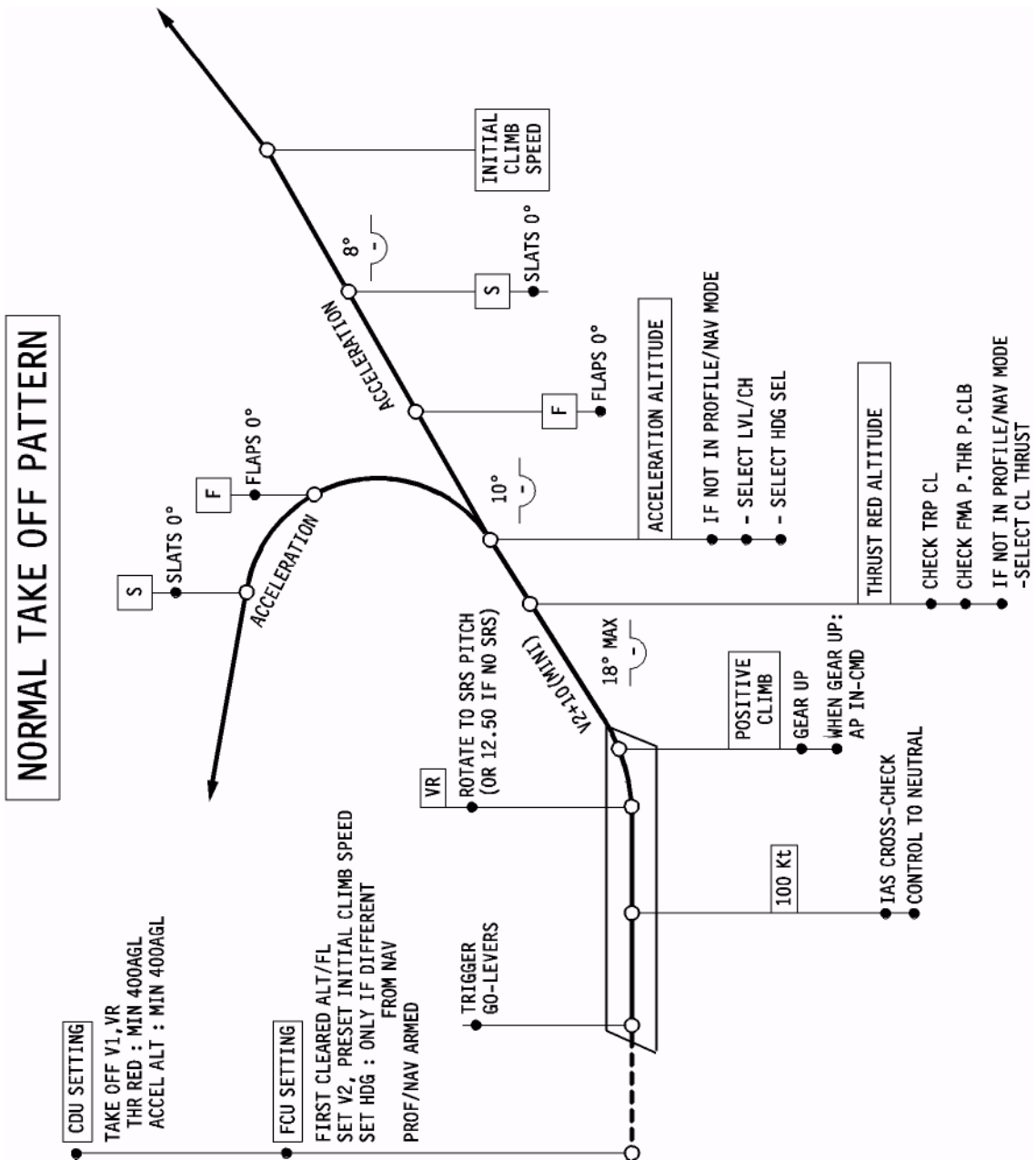
Note 2 : Selecting a pack before reducing T/O thrust may lead to an engine overboost.

Standard Operating Procedures
Take Off
SLATS/FLAPS (and KRUGER)

Retract FLAPS once above acceleration altitude (or once in CLB phase). This ensures that the aircraft is effectively accelerating towards CLB speed.

- **At F speed minimum (F on PFD)**
order.....« **FLAPS ZERO** »
- **SLATS/FLAPS** **FLAPS 0**
When SFPI shows FLAPS ZERO
- **Announce** "**FLAPS ZERO**"
- **At S speed minimum (S on PFD)**
order..... « **SLATS RETRACT** »
- **SLATS/FLAPS handle**..... **SLATS 0**
When SFPI shows SLATS ZERO.
- **Announce**..... "**SLATS RETRACTED**"

PACK VALVE.....**Set second to ON**
Check flow bar in-line

Standard Operating Procedures
Take Off


Standard Operating Procedures
After Take Off
APU BLEEDAs req

If the APU has been used to supply air conditioning during take off, select APU BLEED to OFF. Use of APU BLEED is limited to 20000 ft.

APU.....As req
IGNITION.....As req

- Set CONT RELIGHT only if severe turbulence, heavy icing conditions or heavy rain is encountered.

FUEL SYSTEM

- If L and R CTR TANK PUMPS have been selected to OFF during taxi
L and R CTR TANK PUMPS..... ON

ICE PROTECTION.....As req

- ENG ANTI ICE must be ON when icing conditions exist with TAT below + 8 °.

SIGNS.....As req

- Set SEAT BELTS sw as required.

TCAS (If installed).....Set to TA/RA

Action required only if the take off has been performed with TA only.

AFTER TAKE OFF/CLIMB
CHECKLIST DOWN TO THE LINE Completed

Standard Operating Procedures
Climb
ENGINE MONITORING

A difference in EPR between the two engines may be observed during climb up to 14200 ft. This difference has a negligible effect on the aircraft handling.

The EPR difference may be corrected by advancing both throttles levers by at least 2 degrees and then releasing them, returning the thrust control to the A/THR.

This action is sufficient to ensure that both FADEC have switched over from the takeoff phase to the flight phase and, thus, provide consistent EPR CMD computations.

LANDING LTS.....OFF/RETRACT

When reaching the appropriate altitude according to airline policy/local regulations turn off RWY TURN OFF LTS and turn off and retract LANDING LTS.

FMA

The normal climb mode is P. THR/P.CLB in profile mode.

When selecting a new cleared FL

- FMA indication.....Check/Announce
- Cleared ALT on PFD.....Check

Monitor the progress in climb, particularly when approaching the cleared altitude.

When 1000 ft below the cleared altitude

- Announce....."Altitude for cleared altitude"
- Monitor reduction in V/S as the cleared altitude is reached. In V/S or LVL/CH mode, monitor ALT* engagement, then ALT at cleared altitude.

At level off

- FMA indication.....Check/Announce

PF CDU.....PROG

- PF CDU should be preferably set on PROG page but other pages such as F-PLN may be selected as necessary.

With the AP engaged the PF should make any required F-PLN revisions.

PNF CDU.....F-PLN

- PNF CDU should be preferably set on F-PLN page (allowing to carry out any ATC long term lateral or vertical revisions).

CLIMB SPEEDS MODIFICATIONS :

If a speed change is required by ATC, for turbulence or operational reasons (e.g. increase climb rate), select new speed using FMS TACT MODE.

ALTIMETERS.....Set

- At transition altitude set standard on all altimeters.
- Cross check baro settings and altitude readings.

CRZ FL.....Check/Set as req

- If ATC clears the aircraft to intended CRZ FL or above, there is no need to modify the CRZ FL inserted in the INIT A page during cockpit prep. Higher CRZ FL will be taken automatically into account by FCU ALT knob selection.
- If ATC limits CRZ FL to a lower level than the one inserted in the INIT A page (or present on PROG page) it is necessary to insert this lower CRZ FL in the PROG page. Otherwise there is no transition into CRZ phase : consequently the speed targets and Mach are not modified.

The MAX FL displayed on the PROG page gives at least 0.2g buffet margin. It is not recommended to fly above this level. If a level higher than MAX FL is entered as the CRZ FL, then the message "CRZ FL above MAX FL" will appear on the CDU. The OPT FL displayed is a function of the Cost Index and aircraft weight.

AFTER T.O./CLIMB C/L
BELOW THE LINE.....Completed
RADAR.....As req

Adjust tilt angle depending on aircraft attitude and the selected range of the ND. A slightly negative tilt is required to avoid over-scanning and to provide some ground returns at the top edge of the ND.

FMS

When time permits

- Recopy the active flight plan in the secondary if an immediate return flight plan has been constructed.
- Check optimum and maximum altitude capability.

Standard Operating Procedures
Climb
LANDING LTS.....OFF/RETRACT

When reaching the appropriate altitude according to airline policy/local regulations turn off RWY TURN OFF LTS and turn off and retract LANDING LTS.

FMA

The normal climb mode is P. THR/P.CLB in profile mode.

When selecting a new cleared FL

- FMA indication.....**Check/Announce**
- Cleared ALT on PFD.....**Check**

Monitor the progress in climb, particularly when approaching the cleared altitude.

When 1000 ft below the cleared altitude

- Announce.....**"Altitude for cleared altitude"**

Monitor reduction in V/S as the cleared altitude is reached. In V/S or LVL/CH mode, monitor ALT* engagement, then ALT at cleared altitude.

At level off

- FMA indication.....**Check/Announce**

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- PF CDU should be preferably set on PROG page but other pages such as F-PLN may be selected as necessary. With the AP engaged the PF should make any required F-PLN revisions.

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AFTER T.O./CLIMB C/L
BELOW THE LINE.....Completed
RADAR.....As req

Adjust tilt angle depending on aircraft attitude and the selected range of the ND. A slightly negative tilt is required to avoid over-scanning and to provide some ground returns at the top edge of the ND.

FMS

When time permits

- Recopy the active flight plan in the secondary if an immediate return flight plan has been constructed.
- Check optimum and maximum altitude capability.

AFTER TOP OF CLIMB

OIL QTY bugs.....**RESET**

Standard Operating Procedures
Cruise
THRUST RATING PANEL Check

- Check LIM MODE indication CL (Set CR if not in PROFILE).

ECAM MEMO/STATUS Review
ECAM SYS PAGES Review

Periodically review system pages and in particular :

- ENG :Oil Press and temperature
- HYD :Fluid quantities. Green sys is lower than on ground following L/G retraction
- AC :GEN parameters, IDG OIL temp
- DC :Battery charging status
- BLEED :BLEED parameters
- COND :Check duct temperature compared with zone temperature. Avoid large difference to improve pax comfort.

PRESS : Check Cabin ALT and V/S.

FUEL : Check distribution

F/CTL : Note any unusual surface position.

OIL QTY.....MONITOR

FLIGHT PROGRESS Check

Flight progress should be monitored in the conventional way, when overflying a waypoint, check the track and distance to the next waypoint.

- Check Fuel : check FOB, Fuel PRED (FMS) and compare with computed Flight Plan.
- Every 30 min., check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure. If the sum is unusually smaller than the fuel on board at departure, suspect a fuel leak.

CAUTION

This check must also be performed each time a fuel imbalance procedure is necessary. Perform the check before applying the fuel imbalance procedure. If fuel leak is confirmed, apply the fuel leak procedure.

OPT FL..... Check

Periodically check the OPT and MAX FL to ensure that the aircraft flies as close to the OPT FL as practical. Allowing the CRZ FL to become significantly below the OPT FL may result in a large increase in fuel burn. Check the CRZ FL against that expected in the flight plan, on which the fuel requirements were based.

AIRCRAFT TRIMMING

The minimum drag for cruise flight is obtained when the control wheel is neutral. This condition is obtained by the following procedure :

- Ensure symmetrical fuel loading.

- Ensure accurate symmetrical thrust, autothrottle disengaged,
- Engage the autopilot, if not already engaged, in HDG SEL mode and in ALT mode in CMD,
- Adjust the rudder trim in order to get a zero control wheel position (aileron deflection scale on the wheel), between 1.5°L and 1.5° R is a typical normal range
- Verify that the bank angle is not too large for passenger comfort (1.5° appears to be a reasonable value),
- Check again the lateral trim conditions and retrim if necessary when there is a noticeable change in flight conditions.
- Revert to PROF/NAV mode, as required once trimming is completed.

Note : The same procedure applies to the low speed range of the aircraft including single engine climbout.

NAVIGATION ACCURACY Check

Navigation accuracy must be monitored, particularly when "I" (IRS only) or "LOW" is displayed on the PROG page. Insert a VOR/DME ident in the FMS BRG/DIST TO function, check the bearing and distance compared to the same VOR/DME remotely tuned on the PROG page and displayed on the DDRMI.

The check is satisfactory if the difference in the distance is

<= 3 NM en route

<= 2 NM in TMA

<= 1 NM on approach

If the check is satisfactory : FMS position is reliable.

- ND ARC or MAP and FMS NAV MODE may be used.

If the check is unsatisfactory : FMS position is not reliable.

- Refer to raw data for navigation and monitor.

- If a gross mismatch between display and real position is detected : disengage NAV mode and use raw data navigation (possibly switch to ROSE MODE so as not to be misled by FMS data).

RADAR TILT.....Adjust

A near zero degree tilt setting should be used upto around 20, 000 ft. If two different ranges are selected on the two NDs, it is recommended to set a downward tilt with the shorter ND range in order to monitor and detect nearby weather activity. A near zero tilt is recommended for the longer range ND in order to identify weather requiring a possible change of course.

At higher altitudes above 20, 000 ft, a slightly downward tilt is recommended for both NDs.

Standard Operating Procedures**Cruise****CABIN TEMPMonitor**

Regular attention should be paid to the ECAM CRUISE page so that passenger cabin temperatures may be monitored and adjusted as necessary.

Note 1: It will take upto 20 minutes for the cabin temperature to stabilize after the adjustment of the COMPT TEMP selectors, so do not chase the ECAM cabin temperature indications. Make one change to the COMPT TEMP selectors then wait for the temperature to stabilize prior to any further adjustments.

Note 2 : If the aft galley area temperature becomes too low, the most efficient way to increase the temperature, without making it too hot in the passenger cabin, is to increase the bulk cargo heating (if installed) as long as this is compatible with the load carried.

Standard Operating Procedures
Descent Preparation

Descent preparation and approach briefing take approx 10 minutes. So they should be initiated approx 80-100 miles before top of descent.

ECAM MEMO PAGE **Check**

- Check STATUS on MEMO page. Review if required. Take particular note of any landing capability downgrade or any other aspect affecting the approach and landing.

WEATHER AND LANDING

INFORMATION **Obtain**

- Check weather at alternate and destination, including runway in use.

LANDING ELEVATION **Set**

Note 1: If QFE is used set **O** on **LANDING ELEVATION** counter.

Note 2: In case the destination field elevation is higher than the actual cruise CAB ALT, combined with low aircraft cruise FL, set the **LANDING ELEVATION** counter to landing field elevation before initiating the descent, in order to permit CAB ALT to reach the landing field elevation before landing.

FUEL **Check**

- If flight has been performed below FL 200, check on ECAM FUEL page that there is less than 2000 kg (4400 lbs) of fuel in trim tank. If there is more than 2000 kg (4400 lbs) of fuel in trim tank, check TRIM TK PUMPS are selected **ON** and select TRIM TK MODE push-button to FWD position.

FMS

LANDING DATA **Prepare**

- Set speed bugs on STBY ASI, VAPP and Green Dot.

On FMS APPR page

- **LANDING CONFIG** **Check**
If landing in 20/20 config, select 20/20 on FMS APPR page.

- **MDA** **Insert**

DESCENT WIND PROFILE **Insert**

This insertion, on the DES FORECAST page should be made early to ensure optimum Top of Descent point can be re-computed and ensure that it is ahead of the present position. If no wind is inserted, wind is computed by interpolation between CRZ wind and no wind at destination.

For CAT II or CAT III approach :

- **DH** **Set on FCU F-PLN** **Check/Modify STAR/APPROACH** **Insert**

The FMS computes VAPP based on the predicted landing weight, it is equal to VREF + WIND CORR (entered by crew) + 5 kts (This assumes A/THR is engaged for landing). The DECEL point, where the aircraft should start to decelerate is computed based on the inserted flight plan route and wind profile.

NAVAIDS **Check**

Set Navaids as required and check ident. If a VOR/DME exists close to the airfield, it should be selected systematically and its ident should be set on PROG page BRG/DIST TO field for navigation accuracy monitoring during descent.

GO AROUND page **Check/Modify**

Check/modify the THR RED ALT and ACC ALT.

SEC F-PLN page **As req**

If weather is OK, SEC F-PLN can be used for setting another possible approach and/or RWY as a backup at destination airfield.

If there is a last minute RWY change, it is then only necessary to activate SEC F-PLN not forgetting to set new MDA/DH and navaids.

APPROACH BRIEFING

It is recommended to use FMS pages and ND as a guide for descent and approach briefing. Main points to be covered are :

- | | |
|------------|---|
| Navaid | - ILS, VOR selection procedures and crossing altitudes. |
| F-PLN page | - STAR, APPR, TRANS, MISSED APPROACH |
| APPR page | - Landing Config, speeds, MDA, |
| FUEL PRED | - Fuel needed for diversion, holding fuel available. |
| | - Runway conditions, lighting and dimensions |
| | - Ground Spoiler, reverse operation and autobrake selection |
| | - Terminal area topography, transition level and minimum safe altitudes to ensure a proper terrain awareness. |
| | - Weather at destination |
| | - Go Around : |

- Standard call/task sharing
- Diversion decision

Note : If AP disengaged, it is recommended to descend at Mach 0.8 or below to avoid alpha-trim activation.

DESCENT CLEARANCE **Obtain WHEN DESCENT CLEARANCE IS GIVEN BY ATC**

- **FCU ALT KNOB** **TURN** to select cleared altitude
- **FCU ALT KNOB** **Pull**
- **P. THR/P. DES armed** **Check FMA**
 - IMM DES prompt is displayed on FMS CDU

ANTI ICE **As req**

During descent ENG ANTI ICE should be ON when icing conditions are met, or when moderate to severe precipitation is encountered.

IGNITION **As req**

Ignition should be selected to CONT RELIGHT prior to ENG ANTI ICE selection.

Standard Operating Procedures
Descent
DESCENT INITIATION

Descent will be initiated automatically in profile mode at the Top of Descent (T/D) point, provided a lower altitude has been preset on the FCU. The FMS will hold the CRZ FL until the top of descent. 30 seconds before reaching the T/D, P. DES will flash to indicate that the descent will be initiated without any further pilot action.

- If ATC requires an early descent.

The descent may be initiated immediately (before reaching T/D) by pressing IMM DES prompt on CDU. In this case the descent will be performed at 1 000 ft/min (this value can be changed on CDU) until the precomputed path is reached.

- If the descent is delayed by ATC

When passing the T/D the aircraft stays at the CRZ ALT as no lower altitude has been selected on the FCU. DECEL prompt is displayed in line 1R. Pressing this prompt reduces speed to green dot (highest of PFD and FMS values if they are different). As soon as clearance is given by ATC, select the cleared ALT on the FCU, select desired descent speed on the FCU, then pull the FCU speed/Mach knob. The descent will now be initiated in LVL/CH mode.

DESCENT MONITORING

PF CDU.....PROG

- PF CDU should preferably be set to PROG page in order to see the VDEV and DIST TO DEST information. Other pages such as F-PLN may be selected as necessary. With AP engaged PF should make any required F-PLN revisions.

PNF CDU.....F-PLN

- Descent monitoring can be achieved as follows :

- When flying in NAV mode, PROFILE mode is most probably used. P.DES indicated on the FMA. The aircraft descends along the descent flight path : VDEV is provided on PROG page, and may be thus monitored. All constraints of the FPLN will be taken in to account by the FMS.
- When flying in HDG (TRK) mode out of the lateral F.PLN, PROFILE DESCENT should not be used. PROG page displays flight plan distance to DESTINATION and can display BRG/DIST to DESTINATION if selected. The comparison of this data is useful to monitor the descent. The level  symbol, on ND may be used to monitor the descent as well. The predictions on CDU assume a return to the FPLN path.

- From time to time, during stabilised descent select FPA on PFD and check that remaining distance to destination is approximately the FL change

$$FPA (^{\circ}) = \frac{\Delta FL}{DIST (NM)}$$

When each new descent clearance is given by ATC

Cleared level.....Set on FCU

FMA indication.....Check/Announce

Cleared ALT on PFD.....Check

Check MSA and ensure that the aircraft does not descend below MSA. Monitor progress in the descent, particularly when approaching the cleared altitude.

When 1000 Ft above the cleared altitude.

Announce....."Altitude for cleared altitude"

Monitor reduction in V/S as the cleared altitude is reached. In V/S or LVL/CH mode, monitor ALT* engagement, then ALT at the cleared altitude.

At level off

FMA indication.....Check/Announce

Note : In PROFILE mode, the descent is performed at idle thrust, maintaining the required descent path by pitch control. Thus the aircraft speed will vary with the pitch and is not directly controlled. However, if the speed varies by more than 20 kt from the FMS target speed (most probably due to lack of sufficient, or accurate descent wind inputs) the following will occur :

If the Speed is 20 kt above the target, or reaches VMAX-2Kt, "MORE DRAG" flashes on the PFD. The SPD BRK should be extended. The message will flash until the speed is within 5 kt of the target.

If the speed is 20 kt below the target or 10 kt below Green Dot, and the SPD BRK is extended, the message "LESS DRAG" is displayed on the CDU. The SPD BRK should be retracted. If the SPD BRK is not extended, the aircraft reverts to P. SPD mode, power is increased and the target speed re-captured.

Standard Operating Procedures
Descent
DESCENT ADJUSTMENT

If an increased rate of descent is desired :

- Increase descent speed (by use of LVL/CH and selected speed) if comfort and ATC permit. This is economically better (Time / Fuel).
- Maintain high speed as long as possible (SPD LIM may be cleared, subject to ATC clearance).
- If aircraft is high with high speed, it is more efficient to keep high speed until level off and then decelerate rather than to mix descent and deceleration.

If the aircraft goes below the desired profile, use SPD V / S mode to adjust rate of descent.

- SPEED BRAKEAs req

In descent speed brake may be used to increase the rate of descent. Half speedbrake extension may be used to maintain the required rate of descent when engine anti ice is used. In Profile descent (P.DES) if the aircraft is on or below the flight path and ATC requires an increased rate of descent, do not use speed brake on its own since rate of descent is dictated by planned flight path. In this case select MAX DES mode on TACT page with speed brake.

- Note:**
1. Use of full speedbrake above 0.78 M is uncomfortable for passengers.
 2. With ANTI-ICE ON engine thrust is increased which will reduce the descent path angle at idle. This can be compensated for by an increase of descent speed, or by extending half speed brake.
 3. Do not use speedbrake in 30/40 config.
 4. Do not change speedbrake position during configuration changes.

RADAR TILTAdjust

Every 10 000 ft during descent down to around 15 000 ft, adjust the tilt angle slightly upwards to eliminate excessive ground clutter on the upper part of the ND.

From 15 000 ft, adjust the tilt angle by one degree upwards per 5 000 ft descent, in order to keep the ND relatively free of ground clutter.

ALTIMETERSSet

- . Set QNH (QFE if required) on all altimeters when approaching the transition altitude and when cleared for an altitude.
- . Crosscheck baro settings and altitude readings.

Navigation accuracyCheck

Standard Operating Procedures
Standard Approach

The following approach procedure assumes AP engaged in PROFILE mode and A/THR engaged, which is the recommended procedure.

INITIAL APPROACH

IGNITION.....As req

- Select IGNITION rotary sel to CONT RELIGHT if required. It is recommended to select CONT RELIGHT if the landing runway is covered with standing water, in heavy rain, or if severe turbulence is expected in the approach or Go around area.

SIGNS

- SEAT BELTS sw.....ON/AUTO

EXTERIOR LTS..... As req

- Set RWY TURN OFF It ON at FL 100 Use LAND Its as per company policy/regulatory recommendation

POSITIONING

Check aircraft positioning for a smooth transition to the approach. Rule of thumb : 9000 ft at 250 Kt - 30 NM to touchdown

NAV/COM FREQ Check/Set

- Set VHF as required
- Set ILS frequency and course
- Set VOR/NAV/ILS switch to ILS as required

APPROACH SPEED

If ATC requires a particular speed to be flown then use selected speed. When ATC speed constraint no longer applies, return to profile mode.

NAVIGATION ACCURACY..... Check

Monitor navigation accuracy and be prepared to change approach strategy. If IRS ONLY NAVIGATION is displayed crosscheck nav accuracy.

If navigation accuracy is greater than 1 NM

- ND must be used in ROSE or ARC mode by PF.
- NAV mode should not be used, use HDG SEL.

RADAR TILT..... Adjust

Increase tilt as required to keep the ND clear of ground clutter.

ND.....Set/Check
PF ND MODE.....MAP for ILS approach
PNF ND MODE.....MAP may be kept
 otherwise depending on the FMS accuracy
ND RANGE.....Select 15 NM

DH..... Check

- Both CM1 and CM2 confirm DH setting on EFIS control box in accordance with company policy.
- For CAT 1 precision approaches, or non-precision approaches, set the CAT 1 DH or MDA using the altimeter amber index and set a DH = - 5 on the EFIS control panel to cancel the "MINIMUM" auto call-out.
- For CAT 2 or CAT 3 approaches, set DH on the EFIS control panel to provide "MINIMUM" auto call-out based on radio altimeter height.

APPROACH CHECK LIST..... Complete

Standard Operating Procedures
Standard Approach
FINAL APPROACH

The following procedure assumes an ILS approach with one AP engaged in CMD and A/THR engaged which is the recommended procedure. Conducting a stabilized approach is recommended. The objective is to be stabilized at 500 ft AGL minimum in VMC (1000 ft AGL in IMC) after continuous deceleration on the glideslope. To be stabilized, all the following conditions must be achieved before or when reaching this stabilization height :

- the aircraft is on the correct lateral and vertical flight path,
 - the aircraft is in the desired landing configuration,
 - the power is stabilized and the aircraft is trimmed to maintain VAPP on the desired glide path,
 - no excessive flight parameter deviation.
- The advantages are :
- Lower fuel consumption
 - Lower noise levels
 - Time saving
 - Flexibility and ability to vary speed to suit ATC.

If not stabilized when reaching 500 ft AGL minimum in VMC (1000 ft AGL in IMC), a Go Around must be initiated.

FCU **Green dot speed**
HDG SEL **As req**
Airspeed **Check below VFE**
Order **"SLATS extend"**
Announce **"Speed checked"**
SLATS 15 **Select**
Slats 15 should be extended not later than 3NM prior to the FAF (Final Approach Fix) When SLATS 15 on SFPI
Announce **"SLATS extended"**

FCU **S Speed**
 Check deceleration towards S speed. The aircraft should be established on the glide slope with Slats 15 at S Speed at or above 2 000 ft AGL.

- In the event that a/c speed is significantly higher than S on the G/S, or the a/c does not decelerate on the G/S, extend the L/G in order to slow the a/c down.

GPWS

If landing is planned to be performed in S 20°/F 20° landing configuration select GPWS LANDING SLATS/FLAPS switch to 20/20.

Landing with Flaps 20 is recommended in windshear conditions or if approach climb requirements cannot be met with Flaps 40.

WHEN CLEARED FOR FINAL APPROACH

LAND pb on FCU **Press**
 This enables LOC and G/S capture.

Note : Arm the LAND mode only when ATC gives clearance for the ILS approach (clearance for both LOC and G/S capture). If only LOC capture required, use V/L mode until clearance for full ILS received.

2ND AP **As req**
AUTOLAND lights **Test**

For CAT 2 or 3 autolands only, check the AUTOLAND lights illuminate. This test checks the flight warning computer monitoring of autoland functions.

FMA **Check/announce**
TCAS (If installed) **Set TA/As req**
 TA only mode should be selected in the following cases :

- known nearby traffic which is in visual contact
- at particular airports and during particular procedures identified by an operator as having a significant potential for unwanted or inappropriate RAs (closely spaced parallel runways, converging runways, operation in airport with low terrain along the final approach...)

LOC CAPTURE **Monitor**
Announce **"LOC*"**

At LOC capture, NAV or HDG is disengaged automatically. Check correct ILS course set.

RWY HDG **Set**

G/S CAPTURE **Monitor**

- If above the glideslope
 V/S mode **Select**
 FCU altitude **Set above A/C altitude**
 Note : Do not reach VMAX to avoid reversion to LVL CH mode.

Announce **"GS*"**

GO AROUND ALT **Set**

CAUTION

Ensure Go Around altitude is not set before GS*, otherwise if AP/FD is in V/S mode, any exceedance of VFE will lead to LVL/CH engagement and climb at TOGA power to Go around alt. If for any reason LVL/CH is engaged with a higher altitude selected on the FCU than the current altitude, then disconnect the A/THR and AP and revert to basic manual flying.

Between 2500 ft and 2000 ft AGL

RAD ALT **CHECK**
Announce **"RAD ALT ALIVE"**
Note : Crew should now keep RA in scan to landing.

At 2000 ft AGL Minimum

Final deceleration sequence from SLATS 15/S speed to FLAPS 40/VAPP

SPD BRK **Check retracted**
Airspeed **Check below VFE**
Order **"FLAPS 20"**
Announce **"Speed checked"**
FLAPS 20 **Select**
FCU **VAPP**
 If A/THR is OFF **Idle**
THROTTLES **Idle**
When FLAPS 20 on SFPI
Announce **"FLAPS 20"**
Order **GEAR DOWN**
L/G LEVER **DOWN**

Standard Operating Procedures
Standard Approach
BRAKE YELLOW HYDRAULIC PRESSURE....CHECK

- If residual pressure is indicated :
 - Depress several times the brake pedals until release of residual pressure
- If residual pressure remains :
 - Select preferably the AUTOBRAKE system or apply brakes at touchdown.
 - A slight brake deflection (3°) will supersede any previous yellow pressure.

Note : If antiskid is inoperative maintain a symmetrical braking as soon as aircraft touchdown.

Note : Any pressure below 130 psi on the brake pressure triple indicator can be considered as zero.

GND SPOILERS.....ARM
AUTO BRK.....As req

- The use of autobrake is recommended. Select the appropriate pushbutton according to the runway length and conditions and check related ON light illuminated. The use of MAX is not recommended at landing.
- When landing on short or contaminated runway or when operating in low visibility weather conditions use MED mode.
- On a normal length dry runway LO mode is recommended. It is recommended to use max reverse thrust until 80 kt. Then idle reverse and brakes, as necessary, according to the remaining distance.

Note : If, on very long runways, the pilot anticipates that braking will not be needed, use of the autobrake is unnecessary.

When L/G down

Announce....."GEAR DOWN"

Check "3 green" on landing gear main indication panel.

SPD BRK.....Check retracted Order.....FLAPS 40

FLAPS 40.....Select

BRK/A-SKID.....Check NORM/ON position

ECAM wheel page.....Check

- Check 8 brake release indications

When Flaps 40 on SFPI

Announce....."FLAPS 40"

Check speed approaching VAPP

The approach must be stabilized with FLAP 40/VAPP by 500ft min. in VMC, 1000 ft min in IMC, otherwise a Go around must be initiated.

If A/THR is not engaged :

THROTTLES.....Adjust

WING ANTI-ICE.....OFF

Only use WING ANTI ICE in case of severe icing conditions

EXT LTS.....ON

Set NOSE sw to TAXI

LANDING LT to ON

Selecting lights on even in daylight will minimize bird strike hazard.

CABIN REPORT.....Received

Obtain cabin report and advise cabin crew of landing.

LANDING CHECKLIST.....Completed

FLIGHT PARAMETERS.....Check

PF announces any FMA modification PNF calls out :

- Pitch attitude becomes lower than 0° or greater than 10° nose up
- Bank angle becomes greater than 7°
- V/S greater than 1 000 ft/min
- Airspeed deviations of more than + 10 kt or - 5 kt
- LOC or G/S deviation greater than 1 dot.
- Any significant changes in ground speed that might indicate windshear.

If a call out occurs during the final approach, a go around must be initiated.

At 400 ft AGL

Check/Announce....."LAND Green"

At DA + 100 ft

Announce....."ONE HUNDRED ABOVE"

At DA

Monitor or announce....."MINIMUM"

Announce."LANDING" or "GO AROUND FLAPS"

Do not "duck under" the G/S. Maintain a stabilized flight path down to the flare.

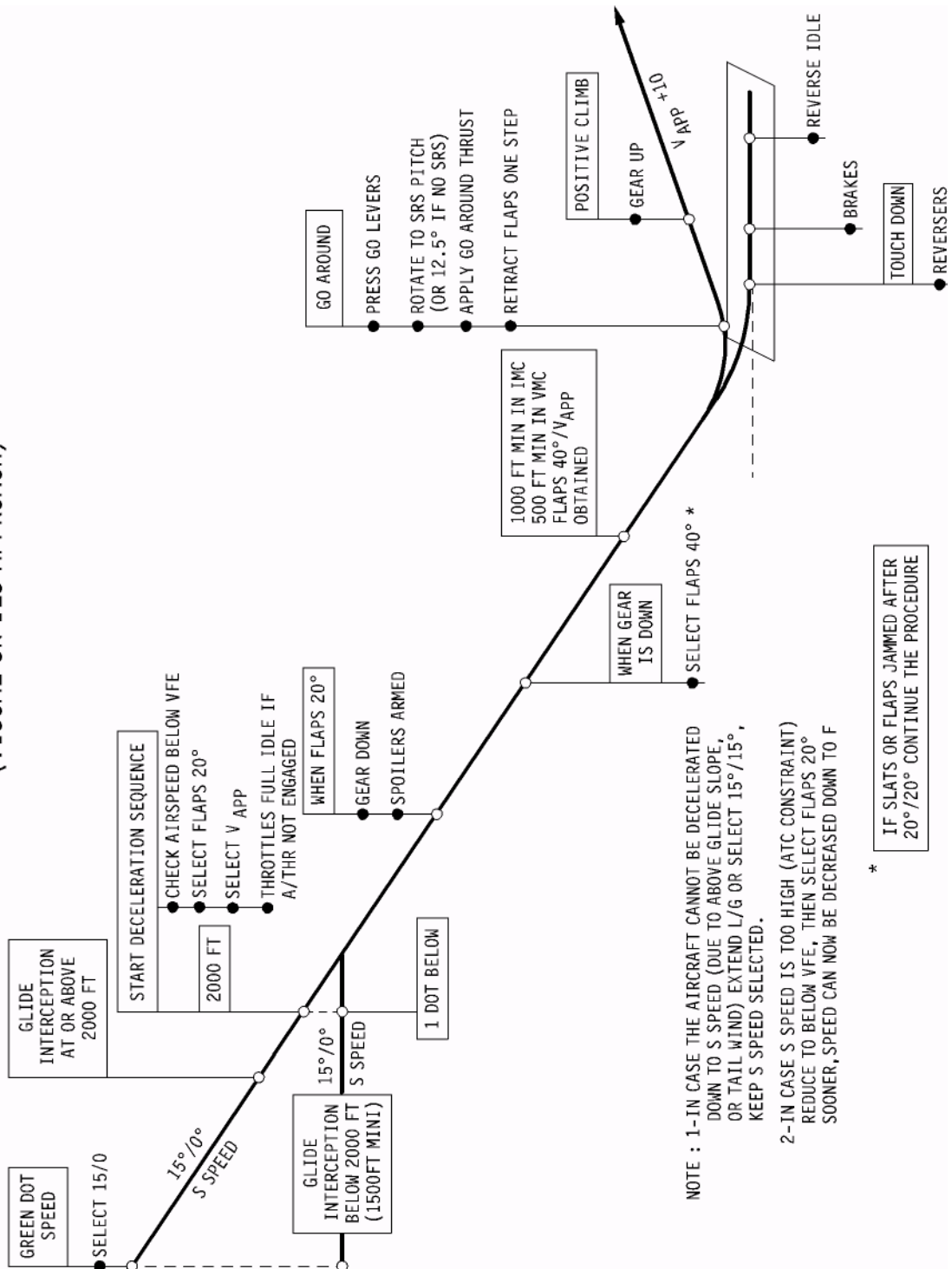
AUTO CALL-OUT.....Monitor

or announce appropriate heights as per company policy

At 50 ft, aircraft one dot below G/S is 14 ft too low.

Standard Operating Procedures
Standard Approach
STANDARD APPROACH

PERFORMED MANUALLY OR WITH AP ENGAGED ON A STABILIZED FINAL SLOPE OF ABOUT 3°
(VISUAL OR ILS APPROACH)



Standard Operating Procedures**Visual Approach****INTRODUCTION**

This procedure provides general guidelines to perform a visual approach. In every case, if a visual approach has been published for the landing runway, it must be applied.

Note : Keep in mind the possible risk of optical illusions due to night vision.

OBJECTIVE

The objective is to approach using visual references on a nominal 3 degree glideslope and to be stabilized by 500 ft AGL. To be stabilized, all the following conditions must be achieved before or when reaching this stabilization height :

- the aircraft is on the correct lateral and vertical flight path,
- the aircraft is in the desired landing configuration,
- the power is stabilized and the aircraft is trimmed to maintain VAPP on the desired glide path,
- no excessive flight parameter deviation.

If not stabilized when reaching 500ft AGL minimum, a Go Around must be initiated.

METHOD FOR VISUAL APPROACH

- The autopilot should be disconnected.
- The use of the FPV is recommended.

Note : If the forecasted tail wind at landing is greater than 10 knots, decelerated approach is not allowed, and the speed should be stabilized around VREF + 5 knots in final.

VISUAL CIRCUIT**INITIAL/INTERMEDIATE APPROACH**

The flight plan selected on the CDU should include the selection of the LANDING RWY. The down wind leg might be also part of the F PLN. This may be a useful indication of the aircraft positioning in the circuit, on the ND. However visual references must be used.

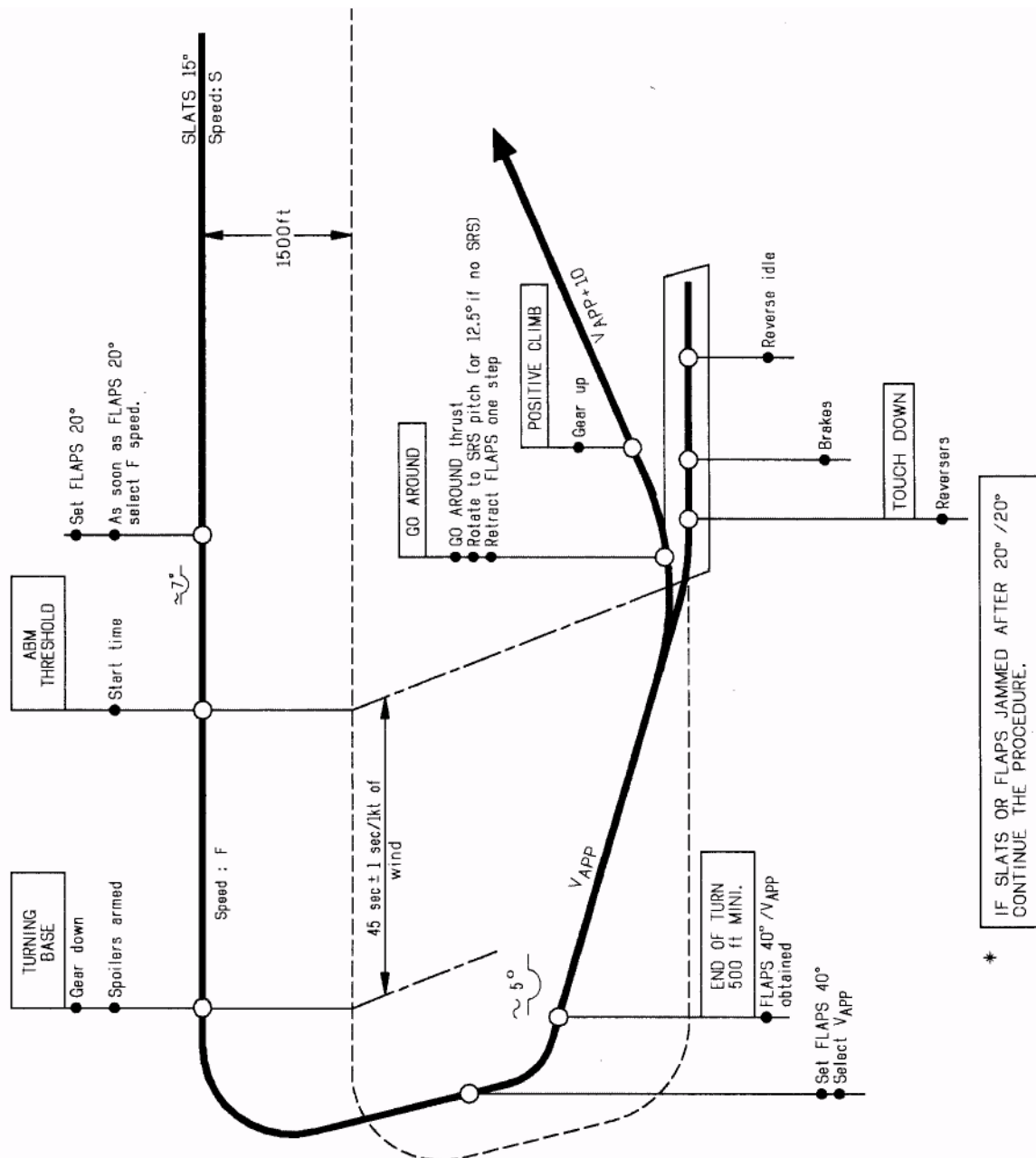
Therefore, at beginning of down wind leg :

- Select FPV ON
- The use of A/THR is at pilot's discretion.
- Apply the flight pattern Down wind leg extension 45 seconds ($\pm$ wind correction) Turn into base leg - Bank 30° max.

FINAL APPROACH

- The speed trend arrow and FPV are useful for achieving timely and correct thrust (if in manual thrust) and approach path corrections. Avoid descent through the correct approach path with idle thrust. (Late recognition of this situation without prompt thrust increase may lead to considerable speed decay and altitude loss).
- Endeavour to have the aircraft "stabilized" by 500 ft AGL, on the correct approach path at VAPP (or GS mini) with the appropriate thrust applied. If not stabilized a go around must be initiated.
- Avoid any tendency to "duck under" in the latter stages of the approach.
- Avoid destabilization of the approach in the last 100 ft to give the best chance of achieving a good touch down at the desired position.

STABILIZED VISUAL APPROACH (1 or 2 ENGINES)



Standard Operating Procedures
Non Precision Approach
INTRODUCTION

This procedure contains recommendations that are specific to Non Precision Approaches. The standard approach procedure steps have not been repeated. They must be completed before the Final Approach Fix. This procedure provides general guidelines which may be adapted according to the airline policy and/or the actual flight conditions.

APPLICABILITY

This procedure applies to all non-ILS approaches, e.g. NDB, VOR, VOR-DME, LOC ONLY, LOC-DME, LOC BACK CRS.

APPROACH GUIDANCE

Non Precision Approaches can be performed using two different AP/FD guidances :

- FMS guidance :
 - NAV mode down to the MDA or until LOC interception (lateral)
 - PROFILE mode until FAF then V/S mode down to the MDA (vertical).
- Selected guidance :
 - HDG SEL mode down to the MDA (lateral) or until LOC interception
 - V/S mode after leaving the FAF down to the MDA (vertical)

When the approach is stored in the NAV database and the NAV ACCURACY check is positive, the FMS guidance is recommended. Otherwise, the selected guidance must be used.

In both cases, the recommended flight reference display for a Non Precision Approach is the FPV/FPR.

APPROACH SPEED TECHNIQUE

The standard speed technique is a stabilized approach using AP engaged in CMD mode and A/THR engaged in SPD mode. This enables the aircraft to intercept the final descent path in the landing configuration and at VAPP, thrust above idle.

INITIAL APPROACH

NAVIGATION ACCURACY.....CHECK

Check navigation accuracy using nav aids raw data to determine approach strategy.

REFERENCE NAVAIDS.....TUNED/CHECKED

For VOR approach, tune frequency and course on VOR control panel and check VOR is also tuned on CDU.

MDA (MDH).....CHECK/SET

Set MDA (MDH) using the altimeter amber index and set a DH = - 5 on the EFIS control panel to cancel the "MINIMUM" auto call out.

- **If accuracy check is positive :**

ND.....both in MAP
FMS GUIDANCE.....USE
VOR/NAV/ILS switches.....BOTH IN NAV

For a LOC approach, revert to ILS position prior to LOC interception.

- **If accuracy check is negative :**

PF ND.....ROSE or ARC
PNF ND.....MAP or ROSE or ARC
SELECTED GUIDANCE.....USE
PF VOR/NAV/ILS switch.....VOR or ILS
PNF VOR/NAV/ILS switch.....AS RQRD

FPA/CRS target.....SET

For NDB approach, set final approach course on ILS control panel.

APPROACH CHECKLIST.....COMPLETE

INTERMEDIATE APPROACH

The STANDARD APPROACH steps to prepare the aircraft for landing (L/G down, spoilers armed. Flaps 40, speed Vapp) should be performed before reaching the FAF. The objective is to be stabilized at 500 ft AGL minimum in VMC (1000 ft AGL in IMC) by ensuring that :

- the aircraft is on the correct lateral and vertical flight path,
- the power is stabilized and the aircraft is trimmed to maintain VAPP on the desired approach path,
- no excessive flight parameter deviation.

If not stabilized when reaching 500 ft AGL minimum in VMC (1000 ft AGL in IMC), a Go Around must be initiated.

FINAL APPROACH

FD/FPV switch.....SELECT FPV

Select FPV just before FAF at the latest.

- **At FAF :**

V/S.....SELECT
 Set pre-calculated V/S required to obtain desired FPA.

- **If ND is in MAP mode :**

VOR/NAV/ILS switch.....ILS
 ILS must be selected to cancel V/DEV scale.

GA ALTITUDE.....SET
 Set when below the go around altitude.

Standard Operating Procedures
Non Precision Approach

- **During final approach :**
POSITION and FLIGHT PATH CHECK/ADJUST
 - Monitor reference navaid raw data.
 - Monitor altitude in relation with the published descent profile and the distance to the runway.
 - Adjust HDG SEL and V/S accordingly.
 - If FMS NAV is not satisfactory, revert to HDG/SEL.

LANDING CHECKLISTCOMPLETE

FLIGHT PARAMETERSCHECK

PF announces any FMA modification. PNF calls out if :

- Speed becomes lower than VAPP - 5 kt or greater than speed target + 10 kt.
- Pitch attitude becomes lower than - 2.5° or greater than 10° nose up.
- Bank angle becomes greater than 7°.
- Descent rate becomes greater than 1000 ft/min.
- Any significant changes in ground speed that might indicate windshear.

If a call out occurs during the final approach, a go around must be initiated.

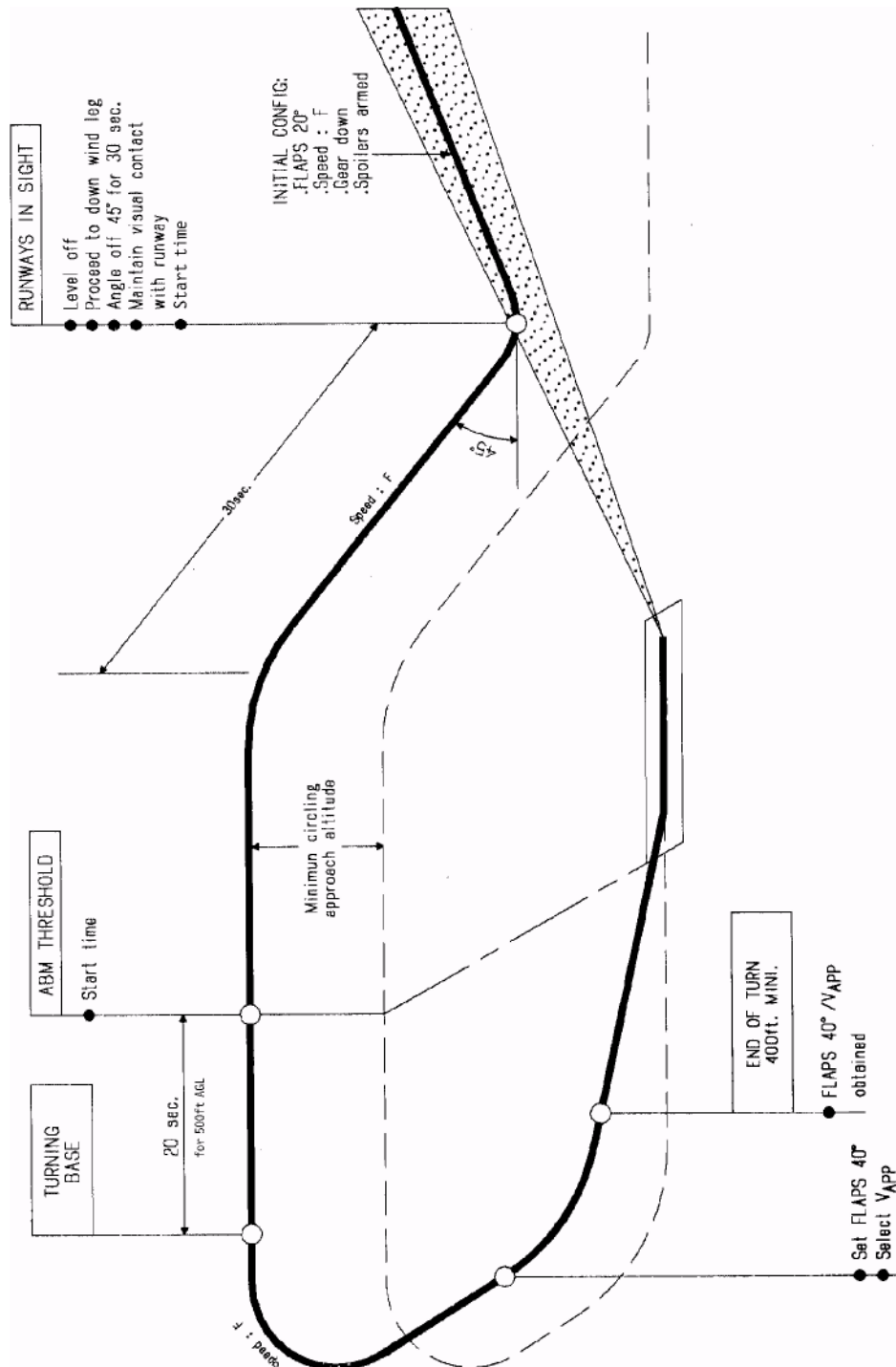
- **At MDA (MDH) + 100 ft :**
HUNDRED ABOVEANNOUNCE
- **Reaching MDA (MDH) :**
 - **When visual references are acquired and confirmed by both PF/PNF :**
LANDINGANNOUNCE
Continue as visual approach with the standard call outs.
APOFF
 - **If no visual references are acquired :**
 - **At MDA (MDH) and VDP :**
GO AROUND/FLAPSANNOUNCE
Initiate go around.

Note : In selected guidance, if ground references are not visible when the aircraft reaches MDA, an immediate go around must be initiated.

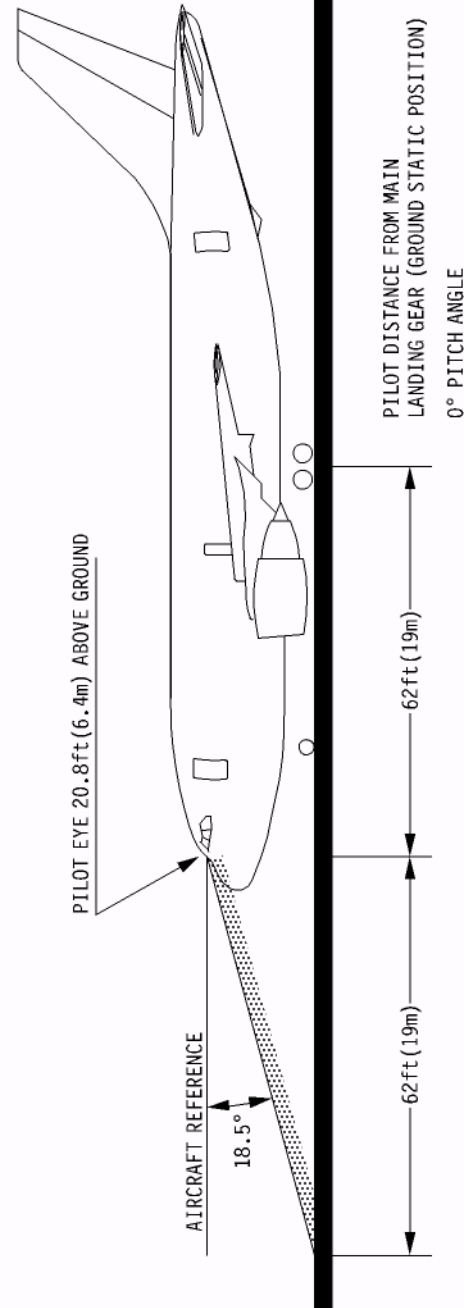
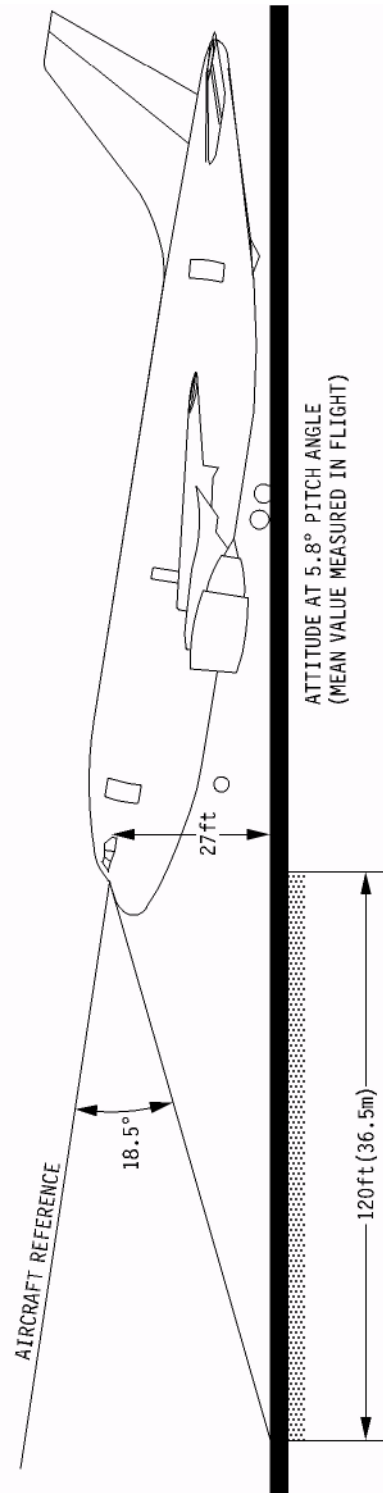
However, if the distance to the runway is not properly assessed, a step descent approach may be considered and a level off at MDA may be performed, using ALT HOLD to level off not lower than MDA, while searching for visual references. If the pilot has no visual reference at MAPt at the latest, he must begin a go around.

Standard Operating Procedures
**Non Precision Approach,
Low Visibility Circling Approach**

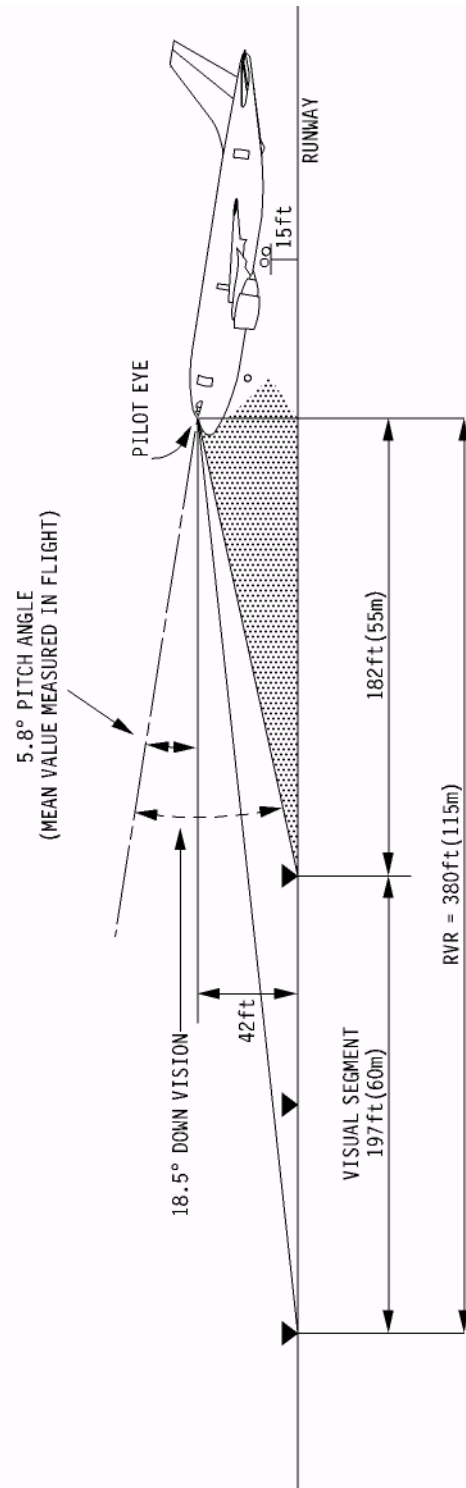
Note : This pattern illustrates a low visibility circling approach and does not refer to a non precision approach.



PILOT EYE ORIENTATION WITH GROUND

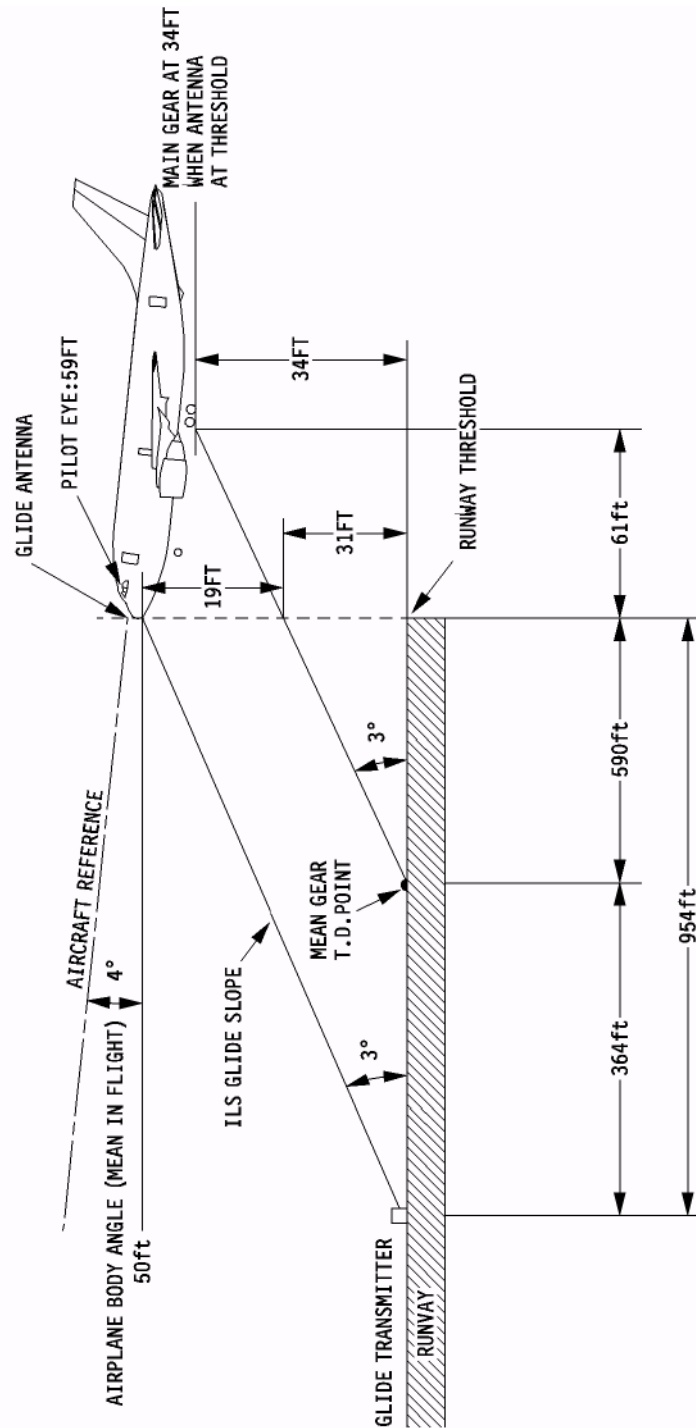


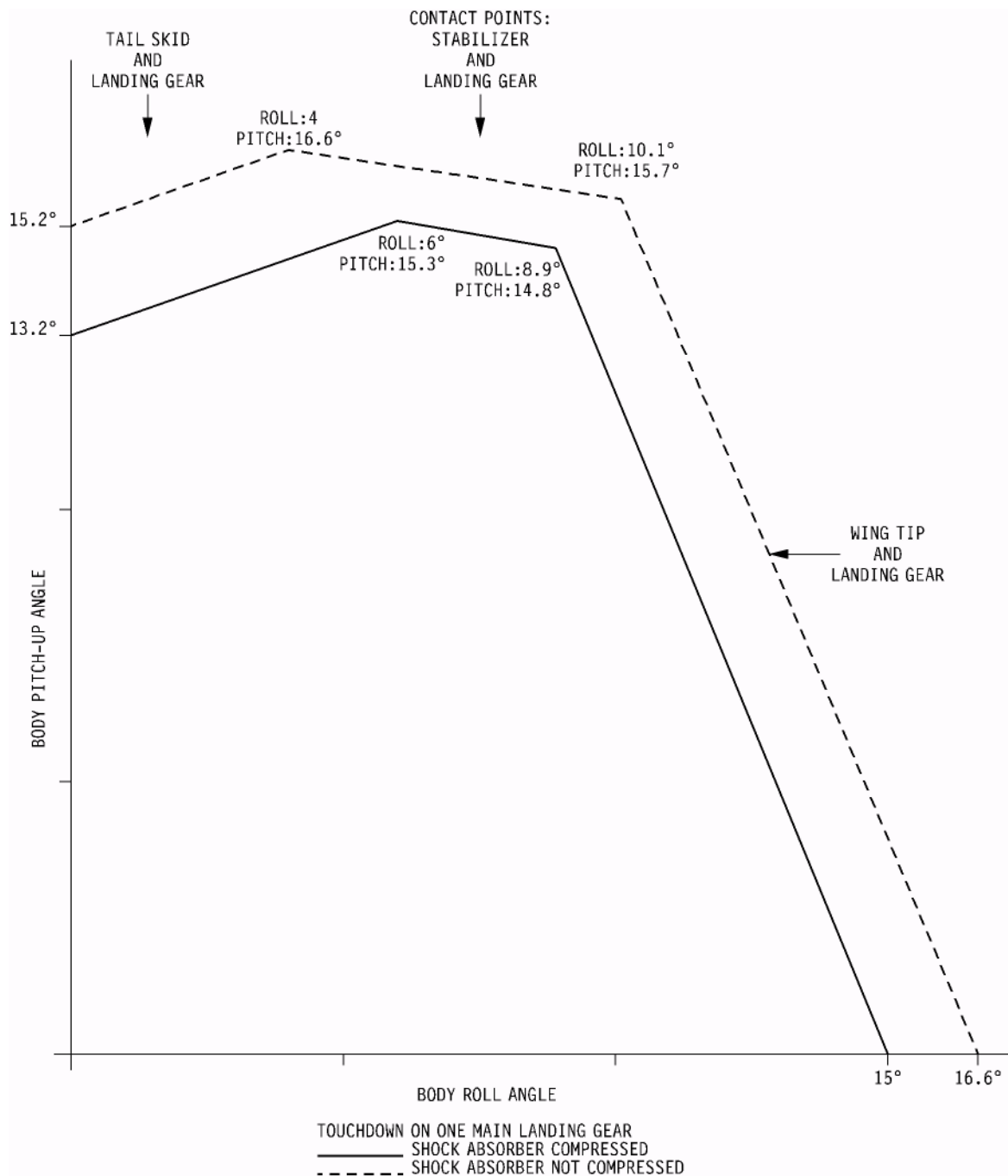
**VISUAL GROUND SEGMENTS
LANDING APPROACH
H=15FT**



ESTIMATED ILS APPROACH

AIRPLANE FOLLOWING STRAIGHT LINE EXTENSION OF GLIDE AT THRESHOLD



GROUND CLEARANCE DIAGRAM


Standard Operating Procedures
Landing
AT 20-30 FT

FLARE.....**Perform**

Note : Do not flare too high or with too high pitch attitude. Tail strike will occur at + 13° pitch.

THROTTLES **Monitor idle**

- Monitor throttles reduction to idle at 30 ft. If A/THR not engaged retard throttles to idle.

AT TOUCHDOWN

REVERSE LEVERS.....**Pull**

- Immediately after touch down of main landing gear, pull reverse levers to the idle mechanical stop.
- After reverse thrust is initiated, a full-stop landing must be performed.

Note 1 : Maximum efficiency of the reverse is obtained at high speed.

Note 2 : Maintain a slight backward pressure on reverse levers in order to identify the release of the idle mechanical stop. Do not move reverse levers towards stow position while reversers are in transit; such action may cause system damage.

Note 3 : If one or both REV UNLK It remains on, apply reverse normally.

Note 4: If the use of max reverse is restricted due to noise consideration, maintain reverse idle until taxi speed is reached.

Note 5 : If directional control problems are encountered, reduce thrust to reverse idle until directional control is satisfactory.

- **MAX. REVERSE THRUST**.....**Apply**
- **N1, EGT and IAS**.....**Monitor**

CAUTION

The use of high levels of reverse thrust at low airspeed should be avoided since the distortion of the air flow caused by gases re-entering the compressor can cause engine stalls which may result in excessive EGT.

GROUND SPOILERS**check extension**

- Check ground spoilers extension after touch down on ECAM system display.

Note : If ground spoilers are not armed they will extend when reverse is selected.

DIRECTIONAL CONTROL.....**Rudder pedals**

- Do not use NWS Control handle before taxi speed is reached

BRAKES **As req**

- Apply brakes as required or monitor autobrake When autobrake is used the PF should be ready to take over and apply manual braking as required.

CAUTION

If brakes are found inoperative, switch immediately BRK-A/SKID to ALTN/OFF and modulate brake pressure as required at or below 1000 PSI. Brake pedals should be released when the A/SKID is switched OFF. Otherwise the pedal braking orders will be taken into account and the aircraft will react strongly.

AT 80 KTS or IAS FLUCTUATIONS.....**Announce REVERSE**.....**Idle**

AT TAXI SPEED :

REVERSE.....**STOW**

- Stow the reverse when taxi speed is reached and before leaving the runway.

CAUTION

Do not recycle if reverse fails to stow. Engine shut down is recommended.

CAUTION

On taxiways, the use of reverse, even restricted to idle thrust, may have the following effects :

- Fine sand and debris may be ingested which might be detrimental to both the engine and airframe systems.
- On snow covered areas, snow will be recirculated into the air inlet, which may result in engine flame out or roll back.

Except in an emergency, reverse thrust should not be used to control aircraft speed while taxiing.

Standard Operating Procedures
Go Around
To initiate Go Around, simultaneously :

Announce....."GO AROUND-FLAPS..."
Announce GO AROUND and the required FLAP setting

GO LEVERS.....Trigger

Note : Triggering one GO LEVER is sufficient to initiate GO AROUND.

THROTTLE LEVERS.....GO AROUND thrust

Follow through on THROTTLE LEVERS if ATS is armed or manually set GO AROUND thrust if ATS is not armed.

CAUTION

PF should be ready to override or disconnect the autothrottle function in case of thrust asymmetry and to counteract aircraft yaw.

ROTATION.....Perform

Rotate the aircraft at a rate of typically 3 degrees per seconds.

Set a 18 degrees pitch attitude then follow the SRS orders if available (not exceeding 18 degrees) or maintain 18 degrees.

As thrust increases, be prepared to counteract the thrust pitch-up moment.

Trim the aircraft nose down as required. The pitch attitude should not be allowed to develop beyond 25 degrees, as such a pitch attitude would result in a significant speed loss.

An immediate and firm elevator nose down command (together with a nose down pitch trim order) would allow to recover the target pitch attitude.

FMA indication.....Announce

Check THR, GO AROUND

Note: FMS CDU automatically switches to GO AROUND page.

FLAPS.....Retract one step

Announce new FLAP position when indicated.

THRUST.....Check/Adjust

Announce....."Positive climb"

Order....."GEAR UP"

L/G.....UP

FLIGHT PARAMETERS.....MONITOR

Monitor :

. the airspeed and speed trend, . the pitch attitude and bank angle . the thrust increase (GA thrust on the TRP and on N1/EPR indicators).

A call out must be made in case of excessive deviation :

. speed dropping below VLS - 5 KT

. speed trend negative

. pitch attitude in excess of 20 degrees

. bank angle in excess of 15 degrees (30 degrees if the missed approach procedure requires a turn) . significant thrust loss.

NAV or HDG mode.....Select

Announce....."GEAR UP"

L/G.....Neutral

At thrust reduction altitude

Set CL on TRP.

THROTTLES..Check symmetrical retard movement

Note : In case of asymmetrical throttle retard movement, A/THR should be disconnected and thrust manually set.

At GA acceleration altitude

SPD/MACH.....Select 250 Kt

LVL/CH.....Select

- Retract slats/flaps on schedule

MISSED APPROACH PROCEDURE.....Follow

Standard Operating Procedures
After Landing

The following steps should be done once the aircraft has cleared the runway.

BRAKE FANS (if installed)..... **As req**

LAND LTS.....**RETRACT**
Unless otherwise necessary.

ICE PROTECTION

ENG ANTI ICE.....**As req**

WING ANTI ICE SUPPLY.....**OFF**

IGNITION.....**OFF**

APU..... **Start**

APU start may be delayed until just prior to engine shutdown.

GROUND SPOILERS..... **Disarm**

ATC.....**STBY/OFF**

TCAS.....**STBY/OFF**

RADAR.....**OFF**

Turn off RADAR to prevent RADAR emissions

TEST (if installed) **Select**

Then in case of inadvertant switching of the RADAR to ON, no RADAR emission will occur.

PITCH TRIM **1° NOSE UP**

SLATS/FLAPS..... **0/0**

It is recommended to retract FLAPS step by step to minimise the possibility of jamming (mainly on bumpy taxiways).

If the approach was made in icing conditions, or, if the runway was contaminated with slush or snow, do not retract the slats/flaps until after engine shutdown once the ground crew has confirmed them clear of obstructing ice.

BRAKE TEMPERATURE..... **Check**

Check brake temperature on ECAM wheel page for discrepancy or high temperature.

A report for maintenance action must be made when :

1. temperature difference between two brakes on the same gear is greater than 150°C

AND

temperature of one brake is below 60°C (Loss of braking capability on this wheel) or temperature of one brake is above 600°C (brake binding on this wheel).

OR

2. difference between average temperature of LH and RH main landing gear brakes is greater or equal to 200°C (no significant crosswind, or differential braking).

AFTER LANDING

CHECK LIST **Completed**

Standard Operating Procedures
Parking

NOSE LIGHT..... OFF/As req

Turn nose light OFF before turning towards ground marshaller approaching stand.

PARKING BRAKE ACCU PRESS..... Check

- The ACCU PRESS indication must be in the green band. In case of low accumulator pressure, chocks are required before engines shutdown.

PARKING BRAKE.....ON

Note: It is recommended not to leave PARKING BRAKE ON if "BRAKES HOT" ECAM message is displayed. Ensure chocks are in place as soon as possible so PARKING BRAKE can be released.

APU BLEED.....ON

- Check APU bleed established

Note : Selection of APU BLEED before engine shut down avoids cycling of the packs. However delay as late as possible to avoid engine exhaust fumes entering the air cond. If APU is not available, set EXT PWR to ON before shutting down engines.

ENGINES FUEL LEVERS.....OFF

- Check engine parameters decrease

Note : 1) For thermal stabilization before shutdown the engines should be operated at idle or required taxi thrust until gate arrival. Refer to Single Engine Taxi procedure, as required.

- 2) If N2 does not decrease upon FUEL LEVER selection to OFF (HP VALVE light illuminated) select hydraulic pumps OFF and pull fire handle. Engine will shut down after 70 to 90 sec.

ELAPSED TIME.....Stop

EXT LTS..... As req

- Set all lights as required. Switch off BEACON once all engines have spooled down.

SLIDE DISARMED..... Check

Check on ECAM DOOR page. Warn cabin crew if a slide is not disarmed.

CABIN PRESS..... Check

Check differential pressure is zero and inform cabin and ground crew that cabin and cargo doors can be opened.

SEAT BELTS.....OFF

GROUND CONTACTEstablish

PARKING BRAKE..... OFF/As req

- Check chocks in place and release parking brake to improve cooling

It is recommended not to use the parking brake for prolonged periods when brake temperatures are above 200°C to avoid hydraulic fluid degradation.

RUD TRAVEL

Note: Do not select RUD TRAVEL pushbutton switches to OFF.

FUEL PUMPS.....OFF

- Set all fuel pumps to OFF except L INNER TANK Pump 2 if fuel remains in INNER TK and APU is used.
- TRIM TK MODE push button.....Check AUTO

WINDOW HEAT.....OFF

Note : Window Heat can be selected ON during the turn-around time to avoid ice build-up on the frontal windshield and the lateral windows.

PROBE HEAT.....OFF

- Select CAPT, STBY and F/O pushbutton switches to OFF

IRS..... Check

Record IRS 1, 2, 3 position, position error. Ground speed or drift rate as required for maintenance monitoring.

Note : GS is set to zero 2 minutes after aircraft has stopped moving. Thus GS must be recorded before this time.

IRS MSU 1, 2, 3..... OFF/As req

IRS ISDU..... OFF/As req

BRAKE TEMP..... Check

BRAKE FAN (If installed)..... OFF/As req

Select brake fans OFF when brake temperature is below 100°C.

CRT's : (FMS, ECAM, EFIS).....Dim

- Dim the CRTs to increase their life, do not switch OFF.
- If aircraft is not flying again within 2 hours, switch EFIS CRTs to OFF.

PARKING CHECK LIST..... Completed

Standard Operating Procedures
Securing The Aircraft

This procedure should be accomplished when required by airline policy.

IRS MSU 1, 2, 3OFF

- After switching the IRS OFF, wait at least 10 seconds before switching off the electrical supply to ensure that the IRS memorize the last position data.

CREW OXYGENOFF

EXTERIOR LTSOFF

CRT'SOFF

APU AIR BLEED OFF/R

EXT PWRAS REQUIRED

APUAS REQUIRED

- Set master switch to OFF after the passengers have disembarked.
- Set L INR TK PUMP 2 to OFF.

CAUTION

If APU is running when leaving the aircraft do not switch off the BATTERIES.

EMERG EXIT LT DISARM

BATTERIESOFF

Standard Operating Procedures
Standard Calls
COMMUNICATIONS AND STANDARD TERMS

Standard phraseology is essential to ensure effective crew communication. The phraseology should be concise and exact. The following chapter lists calls that should be used as standard. They supplement the call outs identified in the SOP.

These Airbus standard call outs are also designed to promote situational awareness, and to ensure crew understanding of systems and their use in line operation.

CHECK LIST CALL OUTS

- "CHECK" : a command for the other pilot to check an item.
- "CHECKED" : a response that an item has been checked.
- "CROSS CHECKED" : a call verifying information from both pilot stations.

If a check list needs to be interrupted, announce "HOLD CHECK LIST AT_" and "RESUME CHECK LIST AT_" for continuation. At the completion of a check list announce "_CHECKLIST COMPLETE".

ACTIONS COMMANDED BY PF

The following commands do not necessarily initiate a change in a guidance mode. The intent is to ensure clear, consistent, standard communication between crew members.

All actions made on the FCU must be verified on the PFD/ND.

SET

The command "SET" means to use a knob (ex : on FCU) to set a value, but not to change a mode. SET is accomplished by only rotating the appropriate selection knob :

ex : "SET GO AROUND ALTITUDE_"
ex : "SETQNH_"
ex : "SET ALT_"

ENGAGE

The command "ENGAGE" means to PUSH the specified FCU button or set the specified lever or switch to "ON" that causes an immediate FMA change.

ex : "ENGAGE A/THR"
ex : "ENGAGE NAV"
ex : "ENGAGE PROFILE"
ex : "ENGAGE ALT HOLD"

ARM

The command "ARM _" means to arm a system, such as by pushing the specified FCU button.

e.g. : "ARM LAND"
e.g. : "ARM LOC."

PULL

The call out PULL is self-explanatory. The word PULL means to use a FCU knob to engage a mode.

ex : "ALT 8000 PULL"
ex : "V/S SET - 1000^{FT}/_{MN} AND PULL"

PUSH

The call out PUSH is self-explanatory. The word PUSH means to use a FCU knob to synchronize or preset a value.

ex : "HDG PUSH"
ex : "SPEED PUSH PRESET 250"

Note 1: Whenever there is no requirement for PULL/PUSH, and if a new setting is required, simply command SET the specific selector knob followed by the required value.

ex : existing mode is lateral mode Hdg of 140 degrees and a new hdg of 100 degrees is required; command is "SET HDG 100" (refer to SET paragraph above).

Note 2 : all actions made on the FCU and CDU must be verified on the PFD and ND as follows :

- a. First, ensure that the correct FCU knob is used, then verify indications on the PFD/ND.
- b. Mode changes should be confirmed by calling the colour when appropriate - e.g. BLUE, GREEN.

FMA

Except when listed otherwise (eg CAT II & III task sharing), all FMA changes will be normally called by PF, otherwise by PNF.

ALTITUDE

PNF calls passing 1000ft before the cleared altitude or FL, and is acknowledged by the PF calling "CHECKED".

e.g. : "3000 for 4000"
e.g. : "290 for 280"

Standard Operating Procedures
Standard Calls
SLATS/FLAPS OR GEAR CONFIGURATION
EXTENSION

SLATS/FLAPS CONFIGURATION	CALLS/RESPONSES
SLAT 0-> SLATS 15	PF : SLATS EXTEND PNF : SPEED CHECKED... SLATS EXTENDED
SLATS 15 -> FLAPS 15 (if required)	PF : FLAPS 15 PNF : SPEED CHECKED... FLAPS 15
SLATS 15/FLAPS 15 -> SLATS 20/FLAPS 20	PF : FLAPS 20 PNF : SPEED CHECKED... FLAPS 20
SLATS 20/FLAPS 20 -> SLATS 30/FLAPS 40	PF : FLAPS 40 PNF : SPEED CHECKED... FLAPS 40

RETRACTION

SLATS/FLAPS CONFIGURATION	CALLS/RESPONSES
SLATS/FLAPS 20/20 passing "F" speed	PF : FLAPS 0 PNF : SPEED CHECKED... FLAPS 0
SLATS 15 passing "S" speed	PF : SLATS RETRACT PNF : SPEED CHECKED... SLATS RETRACTED

FLIGHT PARAMETERS

PNF will make call-outs for the following conditions during final approach. Attitude callouts are also to be made through to landing.

- "SPEED" when speed becomes less than Vapp - 5 or more than speed target + 10.
- "SINK RATE" when V/S is greater than - 1000 ft/min.
- "BANK" when bank angle becomes greater than 7°.
- "PITCH" when pitch attitude becomes lower than 0° or higher than + 10°.
- "LOC" or "GLIDE" when either localizer or glide slope deviation is one dot.
- "COURSE" when greater than 1/2 dot (VOR) or 5 degrees (ADF).

Standard Operating Procedures**Standard Calls****PF/PNF DUTIES TRANSFER**

Transfer of control is initiated by a command and followed by an acknowledgment.

- "I HAVE CONTROL" is either the command that the other pilot is to pass control and assume PNF duties ; or the acknowledgment by the other pilot that he has assumed PF duties.
- "YOU HAVE CONTROL" is either the command that the other pilot is to take control and assume PF duties ; or the acknowledgment by the other pilot that he has assumed PNF duties.

ABNORMAL AND EMERGENCY CALL OUTS**ECAM Procedures**

1. "ECAM ACTION" is commanded by PF when required.
2. "CLEAR_(title of the system)" is asked by the PNF for confirmation by the PF, that all actions have been taken/reviewed on the present ECAM WARNING/CAUTION or SYSTEM PAGE. ex : CLEAR HYDRAULIC
3. "CLEAR_(title of the system)" is the command by the PF that the action and review is confirmed.
4. "ECAM ACTIONS COMPLETED" is the announcement by the PNF that all APPLICABLE ACTIONS have been completed and sys pages have been reviewed.
5. Should the PF require an action from the PNF during ECAM procedures, the order "STOP ECAM" will be used. When ready to resume the ECAM the order/statement "CONTINUE ECAM" will be used.

Standard Operating Procedures
Standard Calls
SUMMARY FOR EACH PHASE

EXTERNAL POWER DISCONNECTION		
EVENT	PF	GND Mech
Initial ground contact	GROUND (from) COCKPIT	COCKPIT (from) GROUND
External... disconnection	REMOVE EXTERNAL...	EXTERNAL.. REMOVED
BEFORE ENGINE START		
EVENT	PF	PNF
Before start up clearance received	BEFORE START C/L TO THE LINE	BEFORE START C/L COMPLETED TO THE LINE
After start up clearance received	BELOW THE LINE	BEFORE START C/L COMPLETED
PUSH BACK		
EVENT	PF	GND Mech
When ready for push back and push back clearance received from ATC	GROUND, (from) COCKPIT READY TO PUSH	COCKPIT, (from) GROUND RELEASE PARKING BRAKE
Start of push	BRAKE RELEASED CLEAR TO PUSH	
When push back completed	BRAKE SET	SET PARKING BRAKE
When ready to disconnect (engine parameters are stabilized)	CLEAR TO DISCONNECT	DISCONNECT HAND SIGNALS ON LEFT/RIGHT

Standard Operating Procedures
Standard Calls

ENGINE START			
EVENT	PF	PNF	GND
When start up clearance obtained When fan starts to rotate	CLEAR TO START?		CLEAR TO START ROTATION

AFTER ENGINE START		
EVENT	PF	PNF
All engines started and stabilized and GND is disconnected	AFTER START C/L	AFTER START C/L COMPLETED

TAXI		
EVENT	PF	PNF
When taxi clearance obtained	CLEAR LEFT (RIGHT) SIDE	CLEAR RIGHT (LEFT) SIDE
Checking Brakes	BRAKE CHECK	PRESSURE ZERO (0)
Checking flight controls in following sequence (could be done before start of taxi also)	FLIGHT CONTROL CHECK	
1. Elevators		FULL UP FULL DOWN NEUTRAL
2. Ailerons		FULL LEFT FULL RIGHT NEUTRAL
3. Rudder	FULL LEFT FULL RIGHT NEUTRAL	CHECKED
<i>Note : the PNF should follow pedal movement with feet</i>		
During taxi	BEFORE TAKE-OFF CHECK LIST TO THE LINE	BEFORE TAKE-OFF C/L COMPLETED TO THE LINE
Lining up on the runway	BELOW THE LINE	BEFORE TAKE-OFF C/L COMPLETED

Standard Operating Procedures
Standard Calls

TAKE-OFF		
EVENT	PF	PNF
TRIGGERING GO LEVERS	TAKE-OFF ANNOUNCE FMA	CHECKED
Before passing 80 kts		POWER SET
At 100 kts	CHECKED	ONE HUNDRED
At V1		V1
At VR		ROTATE
When positively clear of the ground (+ V/S and RAD ALT increase)	GEAR UP	POSITIVE CLIMB
If AP is required	ENGAGE AP. Followed by confirmation on FMA	AP... ENGAGED
When gear retracted		GEAR UP/NEUTRAL
When F Speed and accelerating	FLAPS 0	SPEED CHECKED FLAPS 0
When S Speed and accelerating	SLATS RETRACT	SPEED CHECKED SLATS RETRACTED
AFTER T/O check	AFTER TAKE-OFF C/L	AFTER TAKE-OFF C/L COMPLETED TO THE LINE Note: This C/L will be announced COMPLETED when the altimeters are set and cross-checked to STANDARD.

Standard Operating Procedures
Standard Calls
CLIMB, CRUISE, DESCENT PHASES

During climb, cruise and descent phases communication should be standardized as mentioned in paragraph COMMUNICATIONS AND STANDARD TERMS of this section STANDARD CALLS

ALTIMETER SETTING CHANGES TO/FROM QNH/QFE-STD

EVENT	PF	PNF
Barometric setting change and subsequent altimeter cross-check	PULL STANDARD	STANDARD CROSS-CHECKED PASSING FL...NOW
	CHECKED or SET QNH/QFE...	
	CHECKED	QNH/QFE... CROSS-CHECKED PASSING... FT NOW

Standard Operating Procedures
Standard Calls

APPROACH AND LANDING STABILIZED		
EVENT	PF	PNF
When cleared below transition level or as appropriate.	APPROACH CHECK LIST	APPROACH CHECK LIST COMPLETED
Initial Approach	SET GREEN DOT SPEED	GREEN DOT SPEED SET
Beginning of Radio Altimeter indication	CHECKED	RADIO ALTIMETER ALIVE
At Green Dot Speed (or below VFE)	SLATS EXTEND SET "S" SPEED	SPEED CHECKED SLATS EXTENDED
AT "S" SPEED (or below VFE)	FLAPS 20 SET "F" SPEED	SPEED CHECKED FLAPS 20
INTERCEPTION HEADING	ARM LAND	LAND ARMED
LOCALIZER CAPTURE	LOC* SET RWY HEADING	...°SET
2 DOTS (1 DOT) SINGLE ENGINE	GEAR DOWN	GS ALIVE GEAR IS DOWN
WHEN GEAR IS DOWN	FLAPS 40 SET VAPP	SPEED CHECKED FLAPS 40 VAPP SET
GS CAPTURE	GS* SET GO AROUND ALTITUDE	... ^{FT} SET
FAF OR OM if applicable	PASSING (Fix name) OR OM... ^{FT} /TIMING	CHECKED (TIMING)
When FLAPS 40	LANDING CHECK LIST	LANDING C/L COMPLETED
1000 ^{FT} AGL	CHECKED	ONE THOUSAND
700 ^{FT} AGL Each pilot checks the ILS selected course on his ND.		COURSE SET
400 ^{FT}	LAND GREEN	CHECKED
100 ^{FT} above MDA	CHECKED	ONE HUNDRED ABOVE
MDA visual reference	LANDING	MINIMUM
MDA no visual reference	GO-AROUND FLAPS	MINIMUM

Standard Operating Procedures
Standard Calls

APPROACH AND LANDING STABILIZED ILS APPROACH		
EVENT	PF	PNF
PNF monitors pin-programmed auto call out or announces if auto call out inoperative (as often as practical - CAT 1 and lower only)		ONE HUNDRED FIFTY
After touch down		SPOILERS REVERSE GREEN (See the note 1 below)
When autobrake armed		See note 2 below
At 80 kts ground speed		EIGHTY
Note 1: if reverse deployment is not as expected, call NO REVERSE ENGINE... or NO REVERSE, as appropriate. Note 2: if Autobrake is armed and NO flow BAR green light observed, call NO AUTOBRAKE		