

## A 330 Approach Briefing/Flows Guide

<b>W</b>	<b>Weather – Obtain ATIS</b>		
<b>A</b>	<b>Automation Flows</b>		
	MCDU Reverse "Z"		
	F-PLN	<ul style="list-style-type: none"> <li>Re-do if Return (auto if EOSID) or Divert (2L lateral revision)</li> <li>Select ARRIVAL page and enter RWY, APPR, STAR, TRANS, and APPR VIA (Access by lateral revision at destination)</li> <li>On vectors, clean up flight plan(Direct, radial in),FAF as "TO" Waypoint</li> </ul>	
	RAD NAV	<ul style="list-style-type: none"> <li>VOR: Check for proper NAVAID tuning, either auto or manual.</li> </ul>	
	PROG	<ul style="list-style-type: none"> <li>Insert runway under 4R for situational awareness (technique)</li> <li>Check navigation accuracy</li> <li>If RNAV approach (<u>NOT</u> VOR):                             <ul style="list-style-type: none"> <li>RNP 0.25 NM must be displayed on PROG page</li> <li>GPS PRIMARY or NAV ACCURACY HIGH must be present on both PROG pages (may be confirmed on ND)</li> </ul> </li> </ul>	
	PERF APPR	<ul style="list-style-type: none"> <li>Activate / Confirm Approach (when in SELECTED SPEED Mode, technique - ask other pilot)</li> <li>Enter Landing Data                             <ul style="list-style-type: none"> <li>QNH, Temp, MAG WIND</li> <li>V<sub>APP</sub> (if required)</li> <li>DH/MDA (DH/DA - CAT II/III, DA/DDA - CAT I, RNAV, VOR)</li> <li>LDG CONF</li> </ul> </li> </ul>	
	PERF GO-AROUND	<ul style="list-style-type: none"> <li>Leave default values unchanged</li> </ul>	
	<b>2. ILS pb (if ILS Approach) / PM VOR sel switch to VOR (if VOR Approach)</b>		
	<b>3. Seat Belt Sign – ON (Descending through 18,000' Flow)</b>		
	<b>4. Set AUTO BRK (if desired)</b>		
<b>5. Check ECAM STATUS</b>			
<b>6. Check GW &lt; MLW and landing performance</b>			
<b>R</b>	<b>Report – Brief Approach</b>		
	1. Approach Chart	<ul style="list-style-type: none"> <li>Highest MSA</li> <li>Approach name and runway *</li> <li>Approach chart date *</li> <li>TDZE *</li> <li>Required visibility *</li> </ul>	
	2. PFD	<ul style="list-style-type: none"> <li>Primary navaid Frequency *</li> <li>Final approach course *</li> <li>DA (DH), AH, or DDA/MAP *</li> </ul>	
	3. F-PLN page	<ul style="list-style-type: none"> <li>Final approach verification altitude *</li> <li>Missed approach *</li> </ul>	
	4. All Approaches	<ul style="list-style-type: none"> <li>MEL items</li> <li>Planned runway turnoff and taxi route</li> <li>Landing performance</li> <li>Autobrake setting</li> <li>Landing flap setting</li> <li>Any applicable special considerations such as:                             <ul style="list-style-type: none"> <li>Unique airport advisory approach information</li> <li>Unique noise abatement procedures</li> <li>Unique engine failure during missed approach procedures</li> <li>Significant terrain or obstacles in terminal area relative to approach routing</li> <li>Significant weather conditions (windshear, icing, runway conditions)</li> <li>LASHO</li> <li>ECAM status that may affect approach &amp; landing capabilities</li> <li>Any other known risks and intentions</li> </ul> </li> </ul>	
	<p>* If in night conditions or weather less than 2000/3 <span style="float: right;">Note: Blue colored text required for ALL briefings.</span></p> <p>If in day conditions with weather 2000/3 or greater: State the electronic or visual means to identify the landing runway in the following order of priority:</p> <ul style="list-style-type: none"> <li>ILS or FMS LNAV/VNAV approaches</li> <li>Other non precision approaches</li> <li>VASI/PAPI or visual reference</li> </ul>		
<b>D</b>	<b>Descent - Approach Checklist</b>		

# A330 Callouts

Updated 03-03-2010

Takeoff to Flap Retraction		
Trigger	PF	PM
Commencing takeoff roll	<ul style="list-style-type: none"> <li>Advance thrust levers to approximately 1.1 EPR</li> <li>Advance thrust levers to FLX or TOGA "FLEX" or "TOGA"</li> </ul>	<ul style="list-style-type: none"> <li>Verify takeoff thrust "FLEX SET" or "TOGA SET"</li> </ul>
	<ul style="list-style-type: none"> <li>Captain assumes/maintains control of thrust levers</li> </ul>	
80 kts	"CHECKED"	"80" <ul style="list-style-type: none"> <li>Check STBY airspeed</li> </ul>
V <sub>1</sub> – 5 kts		"V1"
	<ul style="list-style-type: none"> <li>Captain removes hand from thrust levers</li> </ul>	
V <sub>R</sub>	<ul style="list-style-type: none"> <li>Rotate at 3° / sec to 15°</li> </ul>	"ROTATE"
After liftoff	<ul style="list-style-type: none"> <li>Verify positive rate of climb "GEAR UP"</li> <li>Maintain F/D commanded attitude</li> <li>Establish initial climb speed of not less than V<sub>2</sub> + 10 knots</li> </ul>	<ul style="list-style-type: none"> <li>Verify positive rate of climb on VSI "POSITIVE RATE"</li> </ul>
	<ul style="list-style-type: none"> <li>"GEAR UP"</li> <li>Position gear lever UP</li> <li>Monitor speed and altitude</li> </ul>	
Above 100' AFE	"AUTOPILOT 1" or "AUTOPILOT 2", as appropriate	<ul style="list-style-type: none"> <li>Select autopilot ON, if requested</li> </ul>
At or above 400' AFE	<ul style="list-style-type: none"> <li>Select/Request "HEADING ____" if appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Select HDG, if requested</li> </ul>
At the THR RED ALT LVR CLB flashing	<ul style="list-style-type: none"> <li>Move thrust levers to the CL detent "CLIMB"</li> </ul>	
	<ul style="list-style-type: none"> <li>Verify CLB annunciations on FMA</li> </ul>	"CLIMB SET"
At ACCEL ALT (SRS changes to CLB or OP CLB)	<ul style="list-style-type: none"> <li>Follow F/D commands to reduce pitch and accelerate</li> </ul>	
F speed (only displayed when FLAPS 2 or 3 were used for takeoff)	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1", (if appropriate)</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1", if requested</li> <li>Select FLAPS 1, if requested</li> </ul>
S speed	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS UP, AFTER TAKEOFF CHECKLIST"</li> <li>Monitor acceleration to green dot speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS UP"</li> <li>Select FLAPS 0</li> <li>Disarm spoilers</li> <li>Accomplish After Takeoff Flow and Checklist</li> </ul>
At or above 3,000' AFE	<ul style="list-style-type: none"> <li>Select/Request managed or assigned speed</li> </ul>	<ul style="list-style-type: none"> <li>Select managed or assigned speed, if requested</li> </ul>

Loss of Thrust At or Above V <sub>1</sub>		
Trigger	PF	PM
Loss of thrust	<ul style="list-style-type: none"> <li>Pilot first recognizing engine failure "ENGINE FAILURE"</li> </ul>	
	<ul style="list-style-type: none"> <li>"TOGA", if desired</li> <li>Advance thrust levers to TOGA, if desired</li> </ul>	<ul style="list-style-type: none"> <li>Ensure thrust levers at TOGA, if requested</li> <li>"TOGA SET", if requested</li> </ul>
V <sub>R</sub>	<ul style="list-style-type: none"> <li>Rotate at 3° / sec to 12.5°</li> </ul>	"ROTATE"
After liftoff	<ul style="list-style-type: none"> <li>Verify positive rate of climb</li> <li>"GEAR UP"</li> <li>Maintain F/D commanded attitude</li> <li>Trim rudder to maintain a centered β target</li> </ul>	<ul style="list-style-type: none"> <li>Verify positive rate of climb on VSI</li> <li>"POSITIVE RATE"</li> <li>"GEAR UP"</li> <li>Position gear lever UP</li> <li>Monitor speed and altitude</li> </ul>
Above 100' AFE	<ul style="list-style-type: none"> <li>"AUTOPILOT 1" or "AUTOPILOT 2", as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Select autopilot ON, as requested</li> </ul>
At or above 400' AFE (or altitude as specified on applicable route manual "Engine Failure – Takeoff" procedure)	<ul style="list-style-type: none"> <li>Comply with runway specific "Engine Failure - Takeoff" procedure (if published), otherwise, fly runway heading</li> </ul>	
	<ul style="list-style-type: none"> <li>Select/request "HEADING ____" or "NAV" for EOSID, as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Select runway heading, engine failure heading, or NAV, if requested</li> <li>Advise ATC, when able</li> </ul>
Climbing through Engine Out Acceleration Altitude	<ul style="list-style-type: none"> <li>Push ALT pb or request "ALTITUDE HOLD"</li> </ul>	<ul style="list-style-type: none"> <li>Push ALT pb, if altitude hold requested</li> <li>Verify level off</li> </ul>
<b>F</b> speed (only displayed when FLAPS 2 or 3 were used for takeoff)	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 1", if appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 1", if requested</li> <li>Select FLAPS 1, if requested</li> </ul>
<b>S</b> speed	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS UP"</li> <li>Monitor acceleration to green dot speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS UP"</li> <li>Select FLAPS 0</li> <li>Disarm spoilers</li> </ul>
Green dot speed (V <sub>FTO</sub> )	<ul style="list-style-type: none"> <li>Select/request "OPEN CLIMB", if desired</li> <li>Select/request "SPEED ____",</li> <li>Maintain green dot speed</li> <li>Select MCT</li> <li>"MCT"</li> </ul>	<ul style="list-style-type: none"> <li>Select Open Climb, if requested</li> <li>Select green dot speed, if requested</li> <li>Verify thrust levers at MCT</li> <li>"MCT SET"</li> </ul>
	<ul style="list-style-type: none"> <li>Accomplish ECAM and/or QRH procedure(s) as appropriate</li> </ul>	

<b>Rejected Takeoff</b>	
<b>Capt</b>	<b>FO</b>
<p><b>"REJECT, MY AIRCRAFT"</b></p> <ul style="list-style-type: none"> <li>Retard thrust levers to IDLE</li> <li>Use Autobrakes MAX or maximum manual braking</li> <li>Select and maintain maximum reverse thrust until it can be assured the aircraft can stop on the runway<sup>1</sup></li> </ul> <p>Maintain slight forward pressure on sidestick  <i>As soon as aircraft is stopped</i></p> <ul style="list-style-type: none"> <li>After immediately evaluating situation" <ul style="list-style-type: none"> <li>Make a PA announcement" <p><b>"THIS IS THE CAPTAIN, REMAIN SEATED"</b></p> </li> <li>Advise cabin of intentions when able</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Monitor autobrakes</li> <li><b>"NO AUTOBRAKES"</b>, if applicable</li> <li>Monitor deceleration throughout reject</li> <li>Notify tower, when able</li> <li><b>"80"</b></li> </ul>
<p><i>Or</i></p> <ul style="list-style-type: none"> <li>Call for and accomplish QRH Evacuation checklist</li> </ul>	<ul style="list-style-type: none"> <li>Accomplish QRH Evacuation checklist, if directed</li> </ul>
<ul style="list-style-type: none"> <li>Check brake temperature indication</li> </ul>	
<p><sup>1</sup> In case of complete loss of braking, accomplish "Loss of Braking" procedure in PHB Chapter 18</p>	
<p><b>NOTE:</b> Autobrakes will not activate below 72 knots.</p>	

<b>Loss of Braking Procedure</b>
<p><b>IF AUTOBRAKE IS SELECTED:</b></p> <ol style="list-style-type: none"> <li>BRAKE PEDALS ... PRESS</li> </ol> <p><b>IF NO BRAKING AVAILABLE:</b></p> <ol style="list-style-type: none"> <li>REV ... MAX</li> <li>BRAKE PEDALS ... RELEASE <ul style="list-style-type: none"> <li><i>Brake pedals should be released when the A/SKID &amp; N/W STRG selector is switched OFF, since pedal force produces more braking action in alternate mode than in normal mode.</i></li> </ul> </li> <li>A/SKID &amp; N/W STRG ... OFF</li> <li>BRAKE PEDALS ... PRESS <ul style="list-style-type: none"> <li><i>Apply brakes with care since initial pedal force or displacement produces more braking action in alternate mode than in normal mode.</i></li> </ul> </li> <li>MAX BRK PR ... 1000 PSI <ul style="list-style-type: none"> <li><i>Monitor brake pressure on BRAKES PRESS indicator. Limit brake pressure to approximately 1000 psi and at low ground speed adjust brake pressure as required.</i></li> </ul> </li> </ol> <p><b>IF STILL NO BRAKING:</b></p> <ol style="list-style-type: none"> <li>PARKING BRAKE ... SHORT AND SUCCESSIVE APPLICATION <ul style="list-style-type: none"> <li><i>Use short and successive brake applications to stop the aircraft. Brake onset asymmetry may be felt at each parking brake application. If possible delay use of parking brake until low speed to reduce the risk of tire burst and lateral control difficulties.</i></li> </ul> </li> </ol>

ILS CAT I			
Trigger	PF	PM	
<i>Prior to starting the approach</i>	<ul style="list-style-type: none"> <li>Ensure waypoints are sequenced properly</li> <li>Confirm the approach phase has been activated</li> </ul>		
<i>Initial approach</i>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1"</li> <li>Verify <b>S</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1"</li> <li>Select FLAPS 1</li> </ul>	
	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 2"</li> <li>Verify <b>F</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 2"</li> <li>Select FLAPS 2</li> </ul>	
<i>5 mins/15 miles from landing</i>	Captain notifies FAs landing is imminent with 4 bells signal		
<i>Cleared for the approach</i>	<ul style="list-style-type: none"> <li>Select APPR on FCU</li> </ul>		
	<ul style="list-style-type: none"> <li>Verify both AP1 and AP2 engaged, if an autopilot approach</li> <li>Verify <b>GS</b> and <b>LOC</b> annunciate blue on FMA</li> </ul>		
<i>LOC alive</i>	<ul style="list-style-type: none"> <li>Verify LOC deviation display</li> </ul>	"COURSE ALIVE"	
	<ul style="list-style-type: none"> <li>Verify <b>LOC*</b> annunciates green on FMA</li> </ul>		
<i>G/S alive</i>	<ul style="list-style-type: none"> <li>Verify G/S Deviation Display</li> </ul>	"GLIDESLOPE ALIVE"	
<i>1½ dots or 3 nm from FAVA</i>	<ul style="list-style-type: none"> <li>Check airspeed "GEAR DOWN"</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "GEAR DOWN"</li> <li>Position gear lever DOWN</li> <li>Check Triple Indicator</li> </ul>	
	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 3, LANDING CHECKLIST"</li> <li>Spoilers Arm</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 3"</li> <li>Select FLAPS 3</li> <li>Accomplish Landing Checklist</li> </ul>	
<i>On GS Or 1 nm from FAVA</i>	2 E N G	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS FULL", (if desired)</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS FULL", if requested</li> <li>Select FLAPS FULL, if requested</li> <li>Complete Landing Checklist</li> <li>Monitor speed</li> </ul>
		<ul style="list-style-type: none"> <li>Verify <b>GS</b> annunciates green on FMA</li> </ul>	
	1 E N G	"SET MISSED APPROACH ALTITUDE"	<ul style="list-style-type: none"> <li>Set missed approach altitude on FCU</li> </ul>
		<ul style="list-style-type: none"> <li>Verify <b>GS</b> annunciates green on FMA</li> </ul>	
<i>Final Approach Verification Altitude Fix</i>	<ul style="list-style-type: none"> <li>Verify Final Approach Verification Altitude</li> </ul>		
<i>1,000' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude "STABLE"</li> </ul>	"1000" (auto callout)	
	<ul style="list-style-type: none"> <li>Verify autothrust in <b>SPEED</b> mode</li> </ul>		
<i>500' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude, speed, and sink rate</li> </ul>	<ul style="list-style-type: none"> <li>"500" (auto callout)</li> <li>"STABLE, TARGET, SINK ____"</li> <li>or</li> <li>"STABLE, ± ____, SINK ____"</li> </ul>	

ILS CAT I (Cont'd)		
100' above DA(H)	<ul style="list-style-type: none"> <li>Verify altitude</li> </ul> <b>"CONTINUING"</b>	<b>"100 ABOVE"</b> <sup>1</sup> (auto callout) <ul style="list-style-type: none"> <li>Divide time between monitoring instruments and scanning outside for runway environment</li> </ul>
DA(H) Runway NOT in sight	<b>"GO AROUND, TOGA, NAV"</b> <sup>2</sup> <ul style="list-style-type: none"> <li>Execute go around procedure</li> </ul>	<b>"MINIMUMS"</b> (auto callout) <b>"NO CONTACT"</b>
or		
DA(H) Runway in sight	<b>"LANDING"</b> <ul style="list-style-type: none"> <li>Verify A/P disengaged prior to touchdown (no lower than 160' AGL)</li> </ul>	<b>"MINIMUMS"</b> (auto callout) <b>"&lt;VISUAL CUES&gt; IN SIGHT"</b> <sup>1</sup>

<sup>1</sup>Not required if "LANDING" callout has been made by PF.  
<sup>2</sup>NAV should be promptly engaged unless the desired missed approach path cannot be flown in NAV (e.g. visual approach, dual FMGC failure, etc) or ATC assigns a heading. If HDG is used, maintain the current heading until reaching 400' AFE.

Visual Approach Callouts		
Trigger	PF	PM
1,000' RA	<ul style="list-style-type: none"> <li>Verify altitude</li> </ul> <b>"STABLE"</b>	<b>"1000"</b> (auto callout)
	<ul style="list-style-type: none"> <li>Verify autothrust in <b>SPEED</b> mode</li> </ul>	
500' RA (auto callout)	<ul style="list-style-type: none"> <li>Verify altitude, speed, and sink rate</li> </ul>	<b>"500"</b> (auto callout) <b>"STABLE, TARGET, SINK ____"</b> or <b>"STABLE, ± ____, SINK ____"</b>
If FD is inoperative or not being used, the FPV should be displayed		

Communication During Manual Flight	
Autopilot	<b>"AUTOPILOT OFF"</b> or <b>"AUTOPILOT 1(2)"</b>
Flight Directors	<b>"FLIGHT DIRECTORS OFF"</b> <sup>1</sup> or <b>"FLIGHT DIRECTORS ON"</b> Ensure <b>both</b> F/Ds are OFF or ON
Speed	<b>"SPEED ____"</b> or <b>"MANAGED SPEED"</b>
Heading/Nav	<b>"HEADING ____"</b> or <b>"NAV"</b>
Managed/Open Climb (Descent)	<b>"OPEN CLIMB (DESCENT)"</b> or <b>"MANAGED CLIMB (DESCENT)"</b>
Vertical Speed	<b>"VERTICAL SPEED PLUS (MINUS) ____"</b> or <b>"ALT HOLD"</b>

<sup>1</sup>If the Flight Directors are selected off, the use of the Flight Path Vector (FPV) is recommended.

ILS CAT II/III			
Trigger	Captain (PF)	FO (PM)	
<i>Prior to starting approach</i>	<ul style="list-style-type: none"> <li>Ensure waypoints are sequenced properly</li> <li>Confirm that the approach phase has been activated</li> </ul>		
<i>Initial approach</i>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 1"</li> <li>Verify <b>S</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 1"</li> <li>Select FLAPS 1</li> </ul>	
	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 2"</li> <li>Verify <b>F</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 2"</li> <li>Select FLAPS 2</li> </ul>	
<i>Cleared for the approach</i>	<ul style="list-style-type: none"> <li>Select APPR on FCU</li> <li>Select second autopilot ON</li> <li>"CAT 3 DUAL" or "CAT 3 SINGLE" or "CAT 2"</li> </ul>	<ul style="list-style-type: none"> <li>Verify both AP1 and AP2 engaged</li> <li>Verify approach capability</li> </ul>	
	<ul style="list-style-type: none"> <li>Verify <b>GS</b> and <b>LOC</b> annunciate blue on FMA</li> </ul>		
<i>LOC alive</i>	<ul style="list-style-type: none"> <li>Verify LOC deviation display</li> </ul>	"COURSE ALIVE"	
	<ul style="list-style-type: none"> <li>Verify <b>LOC*</b> annunciates green on FMA</li> </ul>		
<i>G/S alive</i>	<ul style="list-style-type: none"> <li>Verify G/S Deviation Display</li> </ul>	"GLIDESLOPE ALIVE"	
<i>1½ dots or 3 nm from FAVA</i>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"GEAR DOWN"</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"GEAR DOWN"</li> <li>Position gear lever DOWN</li> <li>Check triple Indicator</li> </ul>	
<i>½ dot or 2 nm from FAVA</i>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 3, LANDING CHECKLIST"</li> <li>Spoilers Arm</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS 3"</li> <li>Select FLAPS 3</li> <li>Accomplish Landing Checklist</li> </ul>	
<i>On G/S or 1 nm from FAVA</i>	2 E N G	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS FULL"</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li>"FLAPS FULL"</li> <li>Select FLAPS FULL, if requested</li> <li>Complete Landing Checklist</li> <li>Monitor speed</li> </ul>
		<ul style="list-style-type: none"> <li>Verify <b>GS</b> annunciates green on FMA</li> </ul>	
	1 E N G	<ul style="list-style-type: none"> <li>"SET MISSED APPROACH ALTITUDE"</li> </ul>	<ul style="list-style-type: none"> <li>Set missed approach altitude on FCU</li> </ul>
		<ul style="list-style-type: none"> <li>Verify <b>GS</b> annunciates green on FMA</li> </ul>	
	<ul style="list-style-type: none"> <li>"SET MISSED APPROACH ALTITUDE"</li> </ul>	<ul style="list-style-type: none"> <li>Set missed approach altitude on FCU</li> </ul>	
<i>Final Approach Verification Altitude Fix</i>	<ul style="list-style-type: none"> <li>Verify Final Approach Verification Altitude</li> </ul>		
<i>1,000' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude</li> <li>"STABLE"</li> </ul>	"1000" (auto callout)	
	<ul style="list-style-type: none"> <li>Verify autothrust in <b>SPEED</b> mode</li> </ul>		
<i>500' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude, speed, and sink rate</li> </ul>	<ul style="list-style-type: none"> <li>"500" (auto callout)</li> <li>"STABLE, TARGET, SINK _____"</li> <li>or</li> <li>"STABLE, ± _____, SINK _____"</li> </ul>	

<b>ILS CAT II/III (Cont'd)</b>		
<i>Below 400' RA</i>	<ul style="list-style-type: none"> <li>Verify <b>LAND</b> annunciates green on FMA</li> </ul>	
	<ul style="list-style-type: none"> <li>Monitor the approach</li> </ul>	<b>"LAND GREEN"</b> or <b>"NO LAND GREEN"</b>
<i>100' above minimums</i>	<ul style="list-style-type: none"> <li>Verify altitude</li> <li><b>"CONTINUING"</b></li> <li>Divide time between monitoring auto flight system and scanning outside for runway environment</li> </ul>	<b>"100 ABOVE"</b> (auto callout) <sup>1</sup> <ul style="list-style-type: none"> <li>Verify altitude</li> </ul>
<i>DH Runway <u>not</u> in sight</i>	<b>"GO AROUND, TOGA, NAV<sup>2</sup>"</b> <ul style="list-style-type: none"> <li>Execute go around procedure</li> </ul>	<b>"MINIMUMS"</b> (auto callout) <sup>1</sup> <ul style="list-style-type: none"> <li>Verify altitude</li> </ul>
<i>or ...</i>		
<i>DH Runway in sight</i>	<b>"LANDING"</b>	<b>"MINIMUMS"</b> (auto callout) <sup>1</sup> <ul style="list-style-type: none"> <li>Verify altitude</li> </ul>
<i>AH (Electronically verified aircraft will land in touchdown zone)</i>	<b>"LANDING"</b>	<b>"MINIMUMS"</b> (auto callout) <sup>1</sup> <ul style="list-style-type: none"> <li>Verify altitude</li> </ul>
<i>RETARD (auto callout) 10 ft RA</i>	<ul style="list-style-type: none"> <li>Verify thrust levers at idle</li> </ul>	<ul style="list-style-type: none"> <li>Monitor altitude on PFD</li> <li><b>"PITCH"</b>, if pitch altitude reaches 7.5°</li> <li><b>"BANK"</b>, if bank reaches 7°</li> </ul>
<i>Touchdown</i>	<ul style="list-style-type: none"> <li>Select idle reverse</li> </ul> <p>Select Max Reverse as required</p>	<ul style="list-style-type: none"> <li>Verify spoiler extension and REV green on Ecam</li> <li><b>"SPOILERS"</b> or <b>"NO SPOILERS"</b>, if applicable</li> <li><b>"TWO REVERSE"</b> or <b>"ONE REVERSE"</b> or <b>"NO REVERSE"</b>, as applicable</li> <li><b>"NO ROLLOUT"</b> if applicable</li> </ul>
<i>Nosewheel touchdown</i>	<ul style="list-style-type: none"> <li>Apply brakes, as required</li> </ul>	<ul style="list-style-type: none"> <li>Monitor autobrakes, if selected</li> <li><b>"NO AUTOBRAKES"</b>, if applicable</li> <li>Monitor deceleration</li> </ul>
<i>80 Kts</i>	<ul style="list-style-type: none"> <li>Begin to modulate toward idle reverse</li> </ul>	<b>"80"</b>
<i>60 Kts</i>	<ul style="list-style-type: none"> <li>Ensure idle reverse thrust or less</li> <li>Disconnect autopilot</li> </ul>	
<sup>1</sup> Auto callout will not occur on CAT II RA/NA approaches because minimums are entered into the PERF APPR page MDA field. The PM should make this callout for all aircraft on CAT II RA/NA approaches.		
<sup>2</sup> NAV should be promptly engaged unless the desired missed approach path cannot be flown in NAV (e.g. visual approach, dual FMGC failure, etc) or ATC assigns a heading. If HDG is used, maintain the current heading until reaching 400' AFE.		
NOTE: During ILS CAT II RA/NA approaches, the first officer (PM) calls "Minimums" based on the first indication of: <ul style="list-style-type: none"> <li>Aural tone (crews must select ACP/MKR audio to ON), or</li> <li>AWY displayed in white on PFD displayed on the PFD.</li> </ul>		

Managed Non-precision Approach		
Trigger	PF	PM
<i>Prior to starting approach</i>	<ul style="list-style-type: none"> <li>Ensure waypoints are sequenced properly</li> <li>Confirm that the approach phase has been activated</li> </ul>	
<i>Initial approach</i>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1"</li> <li>Verify <b>S</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 1"</li> <li>Select FLAPS 1</li> </ul>
	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 2"</li> <li>Verify <b>F</b> speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 2"</li> <li>Select FLAPS 2</li> </ul>
<i>Cleared for the approach</i>	<ul style="list-style-type: none"> <li>Select APPR on FCU</li> <li>Verify <b>FINAL</b> and <b>APP NAV</b> annunciate blue on FMA</li> </ul>	
<i>Final approach course intercept</i>	<ul style="list-style-type: none"> <li>Verify <b>APP NAV</b> annunciates green on FMA</li> </ul>	
<i>Approx 3 miles prior to FAF</i>	<ul style="list-style-type: none"> <li>Check airspeed "GEAR DOWN,"</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "GEAR DOWN"</li> <li>Position gear lever DOWN</li> <li>Check Triple Indicator</li> </ul>
<i>Approx 2 miles prior to FAF</i>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 3, LANDING CHECKLIST"</li> <li>Spoilers Arm</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS 3"</li> <li>Select FLAPS 3</li> <li>Accomplish Landing Flow and Checklist</li> </ul>
<i>Approx 1 mile prior to FAF</i>	<b>2 E N G</b>	<ul style="list-style-type: none"> <li>Check airspeed "FLAPS FULL", (if desired)</li> </ul>
	<b>1 E N G</b>	No actions – maintain Flap 3 configuration & airspeed
<i>Glidepath intercept/capture (FINAL APP)</i>	<ul style="list-style-type: none"> <li>Verify <b>FINAL APP</b> annunciates green on FMA</li> </ul>	
<i>1,000' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude "STABLE"</li> </ul>	<ul style="list-style-type: none"> <li>Set missed approach altitude on FCU "1000" (auto callout)</li> </ul>
<i>500' RA</i>	<ul style="list-style-type: none"> <li>Verify altitude, speed, and sink rate</li> </ul>	<ul style="list-style-type: none"> <li>"500"<sup>1</sup> (auto callout)</li> <li>"STABLE, TARGET, SINK ____"</li> <li>or</li> <li>"STABLE, ± ____, SINK ____"</li> </ul>
<i>100' above DA or DDA</i>	<ul style="list-style-type: none"> <li>Verify altitude "CONTINUING"</li> </ul>	<ul style="list-style-type: none"> <li>"100 ABOVE"<sup>2</sup></li> <li>Divide time between monitoring instruments and scanning outside for runway environment</li> </ul>
<i>DA or DDA (Runway environment <u>not</u> in sight)</i>	<ul style="list-style-type: none"> <li>"GO AROUND, TOGA, NAV"</li> <li>Execute go around procedure</li> </ul>	<ul style="list-style-type: none"> <li>"MINIMUMS" (auto callout), "NO CONTACT"</li> </ul>
or		
<i>DA or DDA (Runway environment <u>is</u> in sight)</i>	<ul style="list-style-type: none"> <li>"LANDING"</li> </ul>	<ul style="list-style-type: none"> <li>"MINIMUMS" (auto callout), "&lt;VISUAL CUES&gt; IN SIGHT"<sup>2</sup></li> </ul>
<ul style="list-style-type: none"> <li>Verify A/P disengaged no later than DA/DDA</li> </ul>		
<p>The "500" callout is not required on a non-precision approach.  <sup>2</sup>Not required if "LANDING" callout has been made by PF.  <sup>3</sup>NAV should be promptly engaged unless the desired missed approach path cannot be flown in NAV (e.g. visual approach, dual FMGC failure, etc) or ATC assigns a heading. If HDG is used, maintain the current heading until reaching 400' AFE.</p>		

## RNAV (RNP) AR/SAAAR Approach Notes

RNAV (RNP) AR/SAAAR approach plate identifiers include:

- (RNP) in the title
- SPECIAL AIRCRAFT & AIRCREW AUTHORIZATION REQUIRED in notes section
- Another possible feature is the curved segment, called an RF (radius to fix) leg.

The MCDU FLT PLAN page will have "\_\_\_ ARC" displayed between the defining waypoints of an RF leg, where the number is the radius of the arc.

Airbus aircraft have uncompensated BARO-VNAV systems. Temperature limits must be respected.

To determine approach category use VAPP on MCDU PERF page. Use approach category to determine maximum speed when on an RF leg segment (consult QRH table).

Do not accept any clearance direct to a fix unless it is outside the FAF/GP intercept and does not immediately precede an RF leg.

Do not modify waypoints. Modifying waypoints may remove an RF leg, compromising obstacle clearance.

Once inside the FAF/GP Intercept, the PM must callout deviations that equal or exceeds 1/2 dot on the V/DEV scale. If V/DEC increases to  $\geq 3/4$  dot deviation, execute a missed approach.

### MISSED APPROACH

ESTIMATED is the measure of position accuracy. If ESTIMATED value exceeds the REQUIRED value, NAV ACCUR DOWNGRAD is displayed. FM position is reliable but not sufficient to continue. Continue use of NAV but execute a missed approach.

GPS PRIMARY and HIGH accuracy must be present on both MCDU PROG pages. If GPS PRIMARY is lost, ESTIMATED position will increase with time. FM position is reliable but not sufficient to continue. Continue use of NAV but execute Missed Approach. Monitor FMA to ensure NAV is engaged.

If a missed approach is executed above 1000 ft AGL with NAV available, either

- Stop the descent and monitor FMA to ensure NAV is engaged, or
- Accomplish the go-around maneuver and monitor the FMA to ensure NAV is engaged.

If a missed approach is executed below 1000 ft AGL, utilize the go-around procedure. Monitor FMA to ensure NAV is engaged.

Always monitor FMA to ensure NAV is engaged. GA TRK may cause the aircraft to rapidly depart a curved RF course.

### IF MISSED APPROACH ...

#### *Missed Approach is required for:*

- GPS PRIMARY LOST or NAV ACCUR DOWNGRADE is displayed
- Vertical deviation  $\geq 3/4$  dot (After FAF/GP Intercept)
- Any failure or degradation of FMS, GPS, Autopilot, or Flight Director
- At MAP and visual landing cues not in sight

#### *Missed Approach Execution:*

- Stop descent (below 1000' RA use Go-Around procedure), maintain or climb to (whichever is higher):
  - Approach segment altitude, or
  - Missed approach altitude
- Remain in NAV:
  - Reengage, if required
  - Follow the lateral approach path or missed approach path

### ESCAPE MANEUVER

If the aircraft strays off course or its position cannot be determined, an ESCAPE to the MSA may be required. Escape Maneuver Execution is based on Reliable or Unreliable FM position.

**Reliable FM Position:** Cross-track error must be monitored during the approach. A deviation indicates autopilot inability to maintain the FMGC generated course. PM must callout values that equal or exceed 0.2 NM. If the cross-track error reaches or exceeds 0.3, execute the Escape Maneuver.

Note: The position and course are reliable but the autopilot is unable to track the course. Disconnect autopilot and use heading to maintain course while climbing to the MSA.

**Unreliable FM Position** is indicated with specific messages:

- NAV FM/GPS POS DISAGREE
- FMS1/FMS2 POS DIFF
- "MAP NOT AVAILABLE" on both NDs

With unreliable position information, execute the escape maneuver. With position error messages, the course depiction on the ND is not accurate and must NOT be used during the escape maneuver. Select TOGA and climb to the MSA. Utilize HDG and ground-based nav aids to avoid known obstacles. Selecting GPWS TERR - OFF prevents erroneous terrain alerts.

An ESCAPE is required only if position cannot be determined OR the autopilot cannot maintain NAV course.

## Surveillance Approach (ASR)

### During an ASR approach

**The controller will issue:**

- Headings and relative position of the aircraft
- The published MDA
- Lost communications procedures (if IFR conditions are likely)
- Missed approach instructions  
(if IFR conditions exist on final approach segment)
- Recommended altitudes on final upon request
- When to descend to the MDA
- The missed approach point

**The pilot may request:**

- Desired distances from start descent point and
- Recommended altitudes on final approach

**If the Radar/ASR page is not available:**

- Provide controller with aircraft approach category and
- Request visibility minimums for approach

### Procedure Notes

- Select appropriate approach or runway of intended landing from FMC database
- Provide controller with aircraft approach category  
(if no ASR page) Note: Cat C, D if 141-165kts, E  $\geq$  166kts
- Request (technique):
  - Visibility minimums for approach (if no ASR page)
  - Published MDA, missed approach instructions
  - Desired distances from start descent point (10,5,3,2,1)
  - Recommended altitudes on final approach
- When the published MDA is not a multiple of 100, round it up to the next 100'
- When established at initial approach altitude with ALT on FMA, set the MDA in FCU window
- 3 mi – GEAR DOWN, 2 mi – FLAPS 3, 1 mi – FLAPS FULL
- At top of descent point initialize descent utilizing V/S (technique)  
(no greater than 1000 FPM below 1000 AGL ... crosscheck G/S or Vertical Deviation if available)
- Once level at the MDA with ALT on FMA, set missed approach altitude in FCU window
- Autopilot and F/D OFF to descend below MDA

<b>Stabilized Approach Callouts</b>		
<i>If ...</i>	<i>and...</i>	<i>then ...</i>
At 1,000 ft RA	Stabilized	The PF calls <b>"STABLE"</b>
	Unstabilized in IMC	The PF calls <b>"UNSTABLE"</b> and performs a go-around. <sup>1</sup>
	Unstabilized in VMC	Compliance with the flight parameters shown below (not rate of descent) may be delayed until 500 ft RA as long as "unstable" is called out along with the deviation is verbalized (e.g., "Unstable, slightly high – correcting", etc.), otherwise the PF calls out "UNSTABLE" and performs a go-around <sup>1</sup> .
At 500 ft RA <sup>2</sup>	Stabilized	The PM calls <b>"STABLE, Target or ± _____, SINK _____"</b>
	Unstabilized	The PM calls <b>"UNSTABLE"</b> and the PF performs a go-around. <sup>1</sup>
<sup>1</sup> If non-normal conditions require deviation and are briefed the approach can be continued.		
<sup>2</sup> Callout not required during non-precision approach unless "Landing" callout is made about 500 feet.		
<b>Stabilized Approach Notes</b>		
<b>Policy:</b> Pilots will plan to be stabilized on all approaches by 1,000 ft RA in both IMC and VMC.		
<b>Rate of Descent:</b> By 1,000 ft RA, the descent rate is transitioning to no greater than 1000 FPM.		
<b>Flight Parameters:</b> Below 1,000 ft AFE, the aircraft is:		
<ul style="list-style-type: none"> <li>On a proper flight path (visual or electronic) with only small changes in pitch and heading required to maintain that path,</li> <li>At a speed above V<sub>LS</sub>, no less than Target – 5 kts and not greater than Target + 10 kts allowing for transitory conditions, with engines spooled up,</li> <li>In trim, and in an approved landing configuration</li> </ul>		

<b>Landing</b>		
<i>Trigger</i>	<b>PF</b>	<b>PM</b>
<i>If Autoland: (RETARD auto callout) 10' RA or If Manual landing: 20-30 feet RA</i>	<ul style="list-style-type: none"> <li>Verify thrust levers at idle</li> </ul>	<ul style="list-style-type: none"> <li>Monitor attitude on PFD</li> <li><b>"PITCH"</b>, if pitch attitude reaches 7.5°</li> <li><b>"BANK"</b>, if bank reaches 7°</li> </ul>
<i>Touchdown</i>	<ul style="list-style-type: none"> <li>Select Idle Reverse</li> <li>Select Max Reverse, as required</li> </ul>	<ul style="list-style-type: none"> <li>Verify spoiler extension and <b>REV</b> green</li> <li><b>"SPOILERS"</b> or <b>"NO SPOILERS"</b> as applicable</li> <li><b>"TWO REVERSE"</b>, <b>"ONE REVERSE"</b> or <b>"NO REVERSE"</b> as applicable</li> <li><b>"NO ROLLOUT"</b> If applicable</li> </ul>
<i>Nose wheel touchdown</i>	<ul style="list-style-type: none"> <li>Apply brakes, as required</li> </ul>	<ul style="list-style-type: none"> <li>Monitor autobrakes if selected</li> <li><b>"NO AUTOBRAKES"</b>, if applicable</li> <li>Monitor deceleration</li> </ul>
<i>80 kts</i>	<ul style="list-style-type: none"> <li>Begin to modulate toward idle reverse</li> </ul>	<b>"80"</b>
<i>60 kts</i>	<ul style="list-style-type: none"> <li>Ensure idle reverse thrust or less</li> <li>If Autoland, disconnect autopilot</li> </ul>	

Go-Around		
Trigger	PF	PM
<i>Go-around</i>	<p><b>"GO-AROUND, TOGA"</b>, <b>"NAV"</b></p> <ul style="list-style-type: none"> <li>Advance thrust levers to TOGA</li> <li>Simultaneously rotate to F/D commanded attitude</li> <li>Engage/Ensure NAV<sup>1</sup></li> </ul> <p><b>"GO-AROUND FLAPS"</b></p>	<ul style="list-style-type: none"> <li>Verify TOGA Thrust on E/WD</li> <li><b>"TOGA SET"</b></li> <li>Engage/Ensure NAV<sup>1</sup></li> <li><b>"NAV"</b></li> <li><b>"FLAPS ____"</b></li> <li>Retract Flaps to the go-around setting (e.g. Flaps <b>3</b>)</li> </ul>
	<ul style="list-style-type: none"> <li>Verify <b>MAN TOGA</b>   <b>SRS</b>   annunciated on FMA</li> </ul>	
<i>Positive rate of climb</i>	<ul style="list-style-type: none"> <li>Verify positive rate of climb</li> <li><b>"GEAR UP"</b></li> <li>Execute published missed approach or proceed as instructed by ATC</li> </ul>	<ul style="list-style-type: none"> <li>Verify positive rate of climb on VSI</li> <li><b>"POSITIVE RATE"</b></li> <li><b>"GEAR UP"</b></li> <li>Position gear lever UP</li> <li>Advise ATC</li> </ul>
<i>Above 100' AFE</i>	<b>"AUTOPILOT 1"</b> , or <b>"AUTOPILOT 2"</b> , if appropriate	<ul style="list-style-type: none"> <li>Select autopilot on, if requested</li> </ul>
<i>At or above 400' AFE</i>	<ul style="list-style-type: none"> <li>Select/request <b>"HEADING ____"</b> if appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Select/adjust HDG, if requested</li> </ul>
<i>At the THR RED ALT</i> <b>LVR CLB</b> flashing	<ul style="list-style-type: none"> <li>Move thrust levers to the CL detent</li> <li><b>"CLIMB"</b></li> </ul>	
	<ul style="list-style-type: none"> <li>Verify <b>CLB</b> annunciations on FMA</li> </ul>	<b>"CLIMB SET"</b>
	<ul style="list-style-type: none"> <li>Follow F/D commands to reduce pitch and accelerate</li> </ul>	
<b>F</b> speed	<ul style="list-style-type: none"> <li>Check airspeed</li> <li><b>"FLAPS 1"</b></li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li><b>"FLAPS 1"</b></li> <li>Select FLAPS 1</li> </ul>
<b>S</b> speed	<ul style="list-style-type: none"> <li>Check airspeed</li> <li><b>"FLAPS UP, AFTER TAKEOFF CHECKLIST"</b></li> <li>Monitor acceleration to green dot speed</li> </ul>	<ul style="list-style-type: none"> <li>Check airspeed</li> <li><b>"FLAPS UP"</b></li> <li>Select FLAPS 0</li> <li>Disarm Spoilers</li> <li>Accomplish After Takeoff Flow and Checklist</li> </ul>
<p><sup>1</sup>NAV should be promptly engaged unless the desired missed approach path cannot be flown in NAV (e.g. visual approach, dual FMGC failure, etc) or ATC assigns a heading. If HDG is used, maintain the current heading until reaching 400' AFE.</p> <p>Above 1000 feet RA, thrust usage and configuration requirements are at the pilot's discretion. Normally, however, the best course of action is to initially move the thrust levers to the TOGA detent and then return them to the CL detent when TOGA thrust is not required</p>		

<b>Engine-out Go-Around</b>		
<i>Trigger</i>	<b>PF</b>	<b>PM</b>
<i>Go-around</i>	<p><b>"GO-AROUND, TOGA"</b>, <b>"NAV"</b></p> <ul style="list-style-type: none"> <li>• Advance thrust lever to TOGA</li> <li>• Rotate to F/D commanded attitude</li> <li>• Engage/Ensure NAV<sup>1</sup></li> </ul> <p><b>"GO-AROUND FLAPS"</b></p> <ul style="list-style-type: none"> <li>• Verify <b>MAN TOGA   SRS   GA TRK</b> annunciated on FMA</li> </ul>	<ul style="list-style-type: none"> <li>• Verify TOGA Thrust on E/WD</li> </ul> <p><b>"TOGA SET"</b></p> <ul style="list-style-type: none"> <li>• Engage/Ensure NAV<sup>1</sup></li> </ul> <p><b>"NAV"</b></p> <p><b>"FLAPS ____"</b></p> <ul style="list-style-type: none"> <li>• Retract Flaps to the go-around setting (e.g. Flaps 2)</li> </ul>
<i>Positive rate of climb</i>	<ul style="list-style-type: none"> <li>• Verify positive rate of climb</li> </ul> <p><b>"GEAR UP"</b></p> <ul style="list-style-type: none"> <li>• Maintain F/D commanded attitude</li> </ul>	<ul style="list-style-type: none"> <li>• Verify positive rate of climb on VSI</li> </ul> <p><b>"POSITIVE RATE"</b></p> <p><b>"GEAR UP"</b></p> <ul style="list-style-type: none"> <li>• Position gear lever UP</li> <li>• Advise ATC</li> <li>• Monitor speed and altitude</li> </ul>
<i>Above 100' AFE</i>	<p><b>"AUTOPILOT 1"</b>, or <b>"AUTOPILOT 2"</b>, if appropriate</p> <ul style="list-style-type: none"> <li>• Comply with runway specific "Engine Failure – Missed Approach" procedure (if published); otherwise, fly runway heading</li> </ul>	<ul style="list-style-type: none"> <li>• Select autopilot on, if requested</li> </ul>
<i>At or above 400' AFE (or altitude as specified on published "Engine Failure – Missed Approach")</i>	<ul style="list-style-type: none"> <li>• Select/request</li> </ul> <p><b>"HEADING ____"</b></p>	<ul style="list-style-type: none"> <li>• Select runway heading, engine failure heading, if requested</li> <li>• Monitor missed approach procedure</li> </ul>
<i>At or above 1000' AFE (or altitude as specified on published "Engine Failure – Missed Approach")</i>	<ul style="list-style-type: none"> <li>• Push V/S knob or request</li> </ul> <p><b>"ALTITUDE HOLD"</b></p>	<ul style="list-style-type: none"> <li>• Push ALT pb, if altitude hold requested</li> <li>• Verify ALT annunciates green on FMA</li> </ul>
<b>F</b> speed	<ul style="list-style-type: none"> <li>• Check airspeed</li> </ul> <p><b>"FLAPS 1"</b></p>	<ul style="list-style-type: none"> <li>• Check airspeed</li> </ul> <p><b>"FLAPS 1"</b></p> <ul style="list-style-type: none"> <li>• Select FLAPS 1</li> </ul>
<b>S</b> speed	<ul style="list-style-type: none"> <li>• Check airspeed</li> </ul> <p><b>"FLAPS UP,"</b> <b>"AFTER TAKEOFF CHECKLIST"</b></p> <ul style="list-style-type: none"> <li>• Monitor acceleration to green dot speed</li> </ul>	<ul style="list-style-type: none"> <li>• Check airspeed</li> </ul> <p><b>"FLAPS UP"</b></p> <ul style="list-style-type: none"> <li>• Select FLAPS 0</li> <li>• Disarm Spoilers</li> <li>• Accomplish After Takeoff Flow and Checklist</li> </ul>
<i>Green dot speed</i>	<ul style="list-style-type: none"> <li>• Select/request</li> </ul> <p><b>"OPEN CLIMB"</b> if desired</p> <ul style="list-style-type: none"> <li>• Select/request</li> </ul> <p><b>"SPEED ____"</b></p> <ul style="list-style-type: none"> <li>• Maintain green dot speed</li> <li>• Select MCT</li> </ul> <p><b>"MCT"</b></p> <ul style="list-style-type: none"> <li>• If necessary, accomplish ECAM and/or QRH procedure(s) as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Select Open Climb, if requested</li> <li>• Select green dot speed, if requested</li> <li>• Verify thrust levers at MCT</li> </ul> <p><b>"MCT SET"</b></p>

<sup>1</sup>NAV should be promptly engaged unless the desired MAP path cannot be flown in NAV (e.g. visual approach, dual FMGC failure, etc) or ATC assigns a heading. If HDG is used, maintain the current heading until reaching 400' AFE.

<b>Windshear Recovery Maneuver</b>	
In some cases, barometric instruments (altimeter/VSI) can indicate a climb even though the aircraft is descending toward the terrain or the terrain is rising. In all cases it is critical to call out the trend (i.e. "Descending", "Climbing") as determined from the Radio Altimeter. The Barometric Altimeter and VSI are supporting instruments.	
PF	PM
<b>Recovery</b>	
<p><b>"WINDSHEAR TOGA"</b></p> <p><i>Simultaneously:</i></p> <p><b>THRUST</b></p> <ul style="list-style-type: none"> <li>• <b>THRUST - TOGA</b></li> </ul> <p><b>ROLL</b></p> <ul style="list-style-type: none"> <li>• <b>Roll wings level, unless terrain is a factor</b>, in order to maximize aircraft performance</li> </ul> <p><b>PITCH</b></p> <ul style="list-style-type: none"> <li>• If on takeoff roll, rotate no later than 2,000 feet of runway remaining</li> <li>• Rotate at a normal takeoff rotation rate (2-3°/sec) to SRS commanded attitude (including full back sidestick), or ...</li> <li>• <b>If SRS not available, use 17.5° with full back sidestick, if required</b></li> <li>• Utilize autopilot if engaged, but be aware that automatic disengagement may occur if alpha &gt; alpha prot</li> </ul>	<ul style="list-style-type: none"> <li>• Verify all actions have been completed and coordinate with PF to accomplish omitted items</li> <li>• ATTITUDE/AIRSPED/ALTITUDE – MONITOR</li> <li>• RADIO ALTITUDE – MONITOR</li> <li>• Call out information on flight path (e.g., <b>"300 FEET DESCENDING, 400 FEET CLIMBING"</b>)</li> </ul>
<b>Configuration</b>	
<ul style="list-style-type: none"> <li>• Verify speedbrakes retracted</li> <li>• Do not alter gear/flap configuration until terrain clearance is assured</li> </ul>	<ul style="list-style-type: none"> <li>• Verify all actions have been completed and coordinated with PF to accomplish omitted items</li> </ul>
<b>After Windshear Recovery</b>	
<ul style="list-style-type: none"> <li>• Resume normal flight</li> <li>• Retract gear/flaps as required</li> </ul>	<ul style="list-style-type: none"> <li>• Issue PIREP to ATC</li> </ul>

<b>EGPWS Warning Escape Maneuver</b>		
If a "PULL UP" or TERRAIN, TERRAIN PULL UP" alert occurs at night or in IMC, use this Maneuver		
<b>Step</b>	<b>PF</b>	<b>PM</b>
<b>1 Accomplished Simultaneously</b>	<p><b>THRUST</b></p> <p><b>"TOGA"</b></p> <ul style="list-style-type: none"> <li>• Set TOGA thrust</li> </ul>	<ul style="list-style-type: none"> <li>• Verify all actions have been completed and call out any omissions</li> <li>• Monitor <i>radio altimeter</i> and call out information on flight path<sup>1</sup> (e.g., <b>"300 FEET DESCENDING, 400 FEET CLIMBING"</b>)</li> <li>• Monitor attitude, airspeed, and altitude</li> <li>• Call out the safe altitude (e.g., <b>"MSA IS 3,400 FEET"</b>)</li> <li>• Advise ATC</li> </ul>
	<p><b>PITCH</b></p> <ul style="list-style-type: none"> <li>• Autopilot – disconnect</li> <li>• Roll wings level</li> <li>• Rotate to full back sidestick</li> </ul>	
<b>2</b>	<p><b>CONFIGURATION</b></p> <ul style="list-style-type: none"> <li>• Speedbrakes - retract</li> <li>• Do <u>not</u> alter gear/flap configuration until terrain clearance is assured</li> </ul>	
<b>3</b>	<ul style="list-style-type: none"> <li>• Climb to safe altitude</li> </ul>	
<b>4</b>	<p><b>AFTER RECOVERY</b></p> <ul style="list-style-type: none"> <li>• Resume normal flight</li> <li>• Retract gear/flaps as required</li> </ul>	
<p><sup>1</sup> Radio altimeter is primary flight path indicator. In some cases barometric instruments (altimeter/VSI) can indicate a climb even though terrain elevation may be increasing faster than the climb rate of the airplane. In these cases it is critical to call out the trend "Descending" as determined from the radio altimeter.</p>		

Stall Recovery		
Step	PF	PM
1 Accomplished Simultaneously	<b>THRUST</b> <b>"TOGA"</b> <ul style="list-style-type: none"> <li>Set TOGA thrust</li> </ul>	<ul style="list-style-type: none"> <li>Verify all actions have been completed and call out any omissions</li> <li>Monitor attitude, airspeed, and altitude</li> <li>Monitor <i>radio altimeter</i> and call out information on flight path<sup>1</sup> (e.g., <b>"300 FEET DESCENDING, 400 FEET CLIMBING"</b>)</li> </ul>
	<b>ROLL</b> <ul style="list-style-type: none"> <li>Autopilot – disconnect</li> <li>Reduce pitch attitude</li> <li>Roll wings level</li> </ul>	
	<b>PITCH</b> <ul style="list-style-type: none"> <li>Adjust pitch as required to minimize altitude loss</li> <li>Respect stall warning/buffet</li> </ul>	
2	<b>CONFIGURATION</b> <ul style="list-style-type: none"> <li>Speedbrakes - retract</li> <li>If below 20,000' and in clean configuration, Select FLAPS 1</li> <li>If above 20,000' or <u>not</u> in clean configuration, do <u>not</u> alter gear/flap configuration until terrain clearance is assured</li> </ul>	
3	<b>AFTER STALL RECOVERY</b> <ul style="list-style-type: none"> <li>Resume normal flight</li> <li>Retract gear/flaps as required</li> </ul>	

ILS/LDA PRM <i>Climbing Breakout</i>		
Trigger	Capt (PF)	FO (PM)
<i>Alert</i>	Simultaneously: <b>"BREAKOUT, TOGA"</b> <ul style="list-style-type: none"> <li>Disconnect Autopilot</li> <li>Advance thrust levers to TOGA</li> <li>Turn to heading</li> <li>Establish climb (follow RA, if received)</li> <li>Select thrust levers to CL when able</li> </ul> <b>"CLIMB"</b>	<ul style="list-style-type: none"> <li>If RA procedure, turn both FDs OFF <b>"TOGA SET"</b></li> <li>Set and select heading on FCU</li> <li>Set (do <u>not</u> select) altitude on FCU</li> <li>Verify CL limit on E/WD <b>"CLIMB SET"</b></li> <li>Monitor flight path and speed; call out deviations</li> </ul>
<i>Established on heading</i>	<ul style="list-style-type: none"> <li>Reestablish automation</li> <li>Reconfigure aircraft, as desired</li> </ul>	<ul style="list-style-type: none"> <li>Reconfigure aircraft, as desired</li> </ul>
ILS/LDA PRM <i>Descending Breakout</i>		
Trigger	Capt (PF)	FO (PM)
<i>Alert</i>	Simultaneously: <b>"BREAKOUT"</b> <ul style="list-style-type: none"> <li>Verify thrust levers remain in CL detent</li> <li>Disconnect autopilot</li> <li>Turn to heading</li> <li>Establish descent (follow RA, if received), not exceed 1,000 FPM (unless directed by RA)</li> </ul>	<ul style="list-style-type: none"> <li>If RA procedure, turn both FDs OFF</li> <li>Set and select heading on FCU</li> <li>Set (do <u>not</u> SELECT) altitude on FCU</li> <li>Monitor flight path and speed; call out deviations</li> </ul>
<i>Leveled off and established on heading</i>	<ul style="list-style-type: none"> <li>Reestablish automation</li> <li>Reconfigure aircraft, as desired<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Reconfigure aircraft, as desired</li> </ul>

<sup>1</sup>After a descending breakout, the GA phase will not have been automatically sequenced. Unless TOGA is subsequently selected, it will be necessary to re-insert the anticipated approach into the flight plan.

<b>TCAS WARNINGS</b>		
Initial TCAS guidance is based on crew action with 5 seconds. Increase or reversal TCAS guidance is based on crew reaction with 2.5 seconds. Avoid excessive maneuvers while aiming to keep the vertical speed outside the red area of the VSI and within the green area (if applicable). If necessary, use the full speed range between Alpha max and Vmax. Resolution Advisories are inhibited below 900 ft.		
<b>Trigger</b>	<b>PF</b>	<b>PM</b>
<b>Traffic Advisory - All</b>		
<b>"TRAFFIC, TRAFFIC"</b> <i>Announcement</i>	<ul style="list-style-type: none"> <li>Do <u>not</u> maneuver based on TA alone.</li> <li>Attempt to see the reported traffic<sup>1</sup></li> </ul>	
<b>Preventative Resolution Advisory - All</b>		
<b>"MONITOR VERTICAL SPEED"</b> <i>Announcement</i>	<ul style="list-style-type: none"> <li><b>"AUTOPILOT – OFF"</b></li> <li><b>"FLIGHT DIRECTORS – OFF"</b></li> <li>Maintain or adjust the vertical speed as required to avoid the red area of the vertical speed scale</li> <li>Attempt to see reported traffic.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Select both FDs OFF</li> <li>Verify all actions have been completed and coordinate with PF to accomplish omitted items.</li> </ul>
<b>Corrective Resolution Advisory - All</b>		
<b>RA</b> <i>(See Announcement list below)</i>	<ul style="list-style-type: none"> <li>Respond promptly and smoothly to an RA.</li> <li><b>"AUTOPILOT – OFF"</b></li> <li><b>"FLIGHT DIRECTORS – OFF"</b></li> <li>Adjust the vertical speed as required to remain within the green area of the vertical speed scale.</li> <li>Respect the stall, GPWS, or Windshear warning.</li> <li>Attempt to see reported traffic.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Select both FDs OFF</li> <li>Notify ATC</li> <li>Verify all actions have been completed and coordinate with PF to accomplish omitted items.</li> </ul>
<b>Corrective Resolution Advisory - Approach</b>		
<b>"CLIMB" or "INCREASE CLIMB"</b> <i>Announcement</i>	<ul style="list-style-type: none"> <li>Go Around - Execute</li> </ul>	<ul style="list-style-type: none"> <li>Notify ATC</li> </ul>
<b>Clear of Conflict Advisory - All</b>		
<b>"CLEAR OF CONFLICT"</b>	<ul style="list-style-type: none"> <li>Expediently return to the previously assigned ATC clearance when the traffic conflict is resolved and resume normal navigation.</li> <li>AP and/or FD can be reengaged as desired.</li> <li>Attempt to see the reported traffic.</li> </ul>	
Note 1: The traffic acquired visually may not be the same traffic causing the RA. When an RA occurs, the PF should respond immediately to RA displays and maneuver as indicated, unless doing so would jeopardize the safe operation of the flight or the flight crew can assure separation with help of definitive visual acquisition of the aircraft causing the RA.		
<b>Corrective Resolution Advisories Announcements (RAs)</b>		
<b>RA Category</b>	<b>TCAS II Version 7</b>	
Climb	<b>"CLIMB, CLIMB"</b>	
Descend	<b>"DESCEND, DESCEND"</b>	
Altitude Crossing Climb	<b>"CLIMB, CROSSING CLIMB"</b> (twice)	
Altitude Crossing Descend	<b>"DESCEND, CROSSING DESCEND"</b> (twice)	
Reduce Climb	<b>"ADJUST VERTICAL SPEED, ADJUST"</b>	
Reduce Decent	<b>"ADJUST VERTICAL SPEED, ADJUST"</b>	
RA Reversal to a Descend RA	<b>"CLIMB, CLIMB NOW"</b> (twice)	
Increase Climb	<b>"INCREASE CLIMB"</b> (twice)	
Increase Descent	<b>"INCREASE DESCENT"</b> (twice)	
Maintain Rate	<b>"MAINTAIN VERTICAL SPEED, MAINTAIN"</b>	
Altitude Crossing, Maintain Rate (Climb and Descend)	<b>"MAINTAIN VERTICAL SPEED, CROSSING MAINTAIN"</b>	
Weakening of Initial RA	<b>"ADJUST VERTICAL SPEED, ADJUST"</b>	
Note: If an initial RA is changed to a less aggressive advisory, pilots should respond to the changed RA and adjust the airplane's vertical speed accordingly, while keeping the pitch guidance symbol in the green arc, and/or out of the red arc.		

## Non-Normal Procedures

### 1. PF – Maintain Aircraft Control

The PF will devote total awareness to the control and navigation of the airplane and use automation as appropriate to help reduce workload.

### 2. Identify the Non-Normal

The first crewmember recognizing the non-normal situation will clearly announce it (e.g., "Engine Fire"). Do not identify which engine has malfunctioned at this time. If not immediately obvious which procedure to use, additional analysis may be necessary. The captain will determine which procedure is appropriate.

### 3. PM - Determine if Immediate Action or ECAM Exception

Once:

- the airplane flight path and configuration are properly established, and
- the airplane is not in a critical phase of flight (e.g., takeoff, landing) ...

the PM determines and verbalizes whether the non-normal is an Immediate Action Item or an ECAM Exception. The Immediate Action Index and ECAM Exception Index are available on the back of the QRH.

### 4. PM - Accomplish Immediate Action Items, if applicable.

Accomplish any red items from memory, and then use the QRH to complete Immediate Action items without delay as follows:

PF	PM
Accomplish each non-normal checklist item using "Challenge-Response-Response Concept"	
Maintain aircraft control	Read aloud the appropriate QRH or electronic checklist items: <ul style="list-style-type: none"> <li>• checklist title</li> <li>• challenge and response for all numbered items (left margin items on an electronic checklist)</li> <li>• indented items, if necessary, and</li> <li>• notes, cautions, and warnings</li> </ul>
Perform/request all items directly related to flying the aircraft (e.g., flight path control, autopilot, thrust management, etc.)	Position controls <u>not</u> directly related to flying the aircraft and items requested by the PF

Note: Refined guidance has been created in an effort to putting the most standardized methodology into practice when handling non-normal procedures. In review, it is now preferred to consult the index on the back of the QRH to determine whether a non-normal situation is an Immediate Action or an ECAM Exception prior to the captain assigning PF duties. If the non-normal is an Immediate Action item, its associated checklist should be conducted prior to any transfer of control. If the non-normal is an ECAM Exception, transfer of control should occur prior to conducting its associated checklist.

### 5. Captain - Assigns PF

In-flight, the captain should normally assign the flying duties to the first officer while non-normal checklists are completed unless conditions dictate otherwise. This allows the captain to direct full attention to the accomplishment of non-normal procedures and conduct communications with external resources. The captain should verbalize who will assume ATC communications.

### 6. Accomplish Non-normal procedure

The PF calls for the QRH or ECAM non-normal procedure once Immediate Action items (if any) have been completed. Reference the table under step four (4) when completing the following steps:

- **6A. PM - Accomplish QRH non-normal procedure, if directed to by immediate actions items or ...**
- **6B. PM - Accomplish ECAM Exception Items, if directed to by QRH ECAM Exceptions Index.** ECAM Exceptions are QRH procedures that must be accomplished in lieu of ECAM actions or ...
- **6C. PM - Accomplish ECAM, if applicable.**

### 7. PM - Accomplish ECAM Follow-Up procedures, if applicable

ECAM cautions and warnings requiring QRH follow up are contained in a QRH index on yellow pages following the Immediate Action Items. After completing the ECAM checklist, complete the associated QRH Follow-Up checklist if the ECAM caution or warning is listed in this index. If the ECAM checklist returns the system to normal, the associated Follow-Up procedures are not accomplished.

**Additional Resources:** The crew should refer to the ECAM Non-Normal Supplemental Manual, if time permits.

**Crew Awareness ECAMs:** In the event of a Crew Awareness ECAM (e.g., COND AFT CRG ISO VALVE) on the ground, dispatch may not be permitted or an MEL/CDL may apply. Comply with Pilot Handbook "Discrepancies-After Dispatch Before Takeoff" procedure.

## ECAM Procedures

When performing ECAM Actions always start in <b>Box 1</b> , then 2,3,4. Complete <u>ALL</u> items before proceeding to the next box	
<b>UPPER ECAM</b> (Warning Display)	
Primary Failures <b>Box 1</b>	Secondary Failures <b>Box 2</b>
<b>LOWER ECAM</b> (Status Display)	
Procedures <b>Box 3</b>	Inop Systems <b>Box 4</b>

Example ECAM Procedures			
ECAM SCREEN		PROCEDURES / CALLOUTS	
WARNING DISPLAY (Upper)		PF	PM
<b>Box 1</b>	<b>Box 2</b>		
<b>HYD B RSVR OVHT</b> <b>BLUE ELEC PUMP ...</b> <b>OFF</b>		Pilot first noting non-normal read ECAM action (e.g., <b>"HYDRAULIC B RESERVOIR OVERHEAT"</b> ) Captain Assigns PF	
		<b>"ECAM ACTION"<sup>1</sup></b>	<ul style="list-style-type: none"> <li>Confirm fault on SD</li> <li>Read full line of ECAM action (e.g., <b>"BLUE ELECTRIC PUMP OFF"</b>) <b>Box 1</b></li> <li>Perform ECAM action(s)<sup>2</sup> or request execution by the PF</li> <li>Repeat the response (e.g. <b>"OFF"</b>)</li> <li>Review all affected equipment shown in amber on <b>HYD</b> page.</li> </ul>
<b>HYD B RSVR OVHT</b> <b>B SYS LO PR</b>	* F/CTL	<ul style="list-style-type: none"> <li>Check ECAM action(s) completed</li> <li><b>"CLEAR ECAM"</b></li> </ul>	<b>"CLEAR ECAM?"</b>
<b>SEAT BELTS</b>	* F/CTL	<b>"CLEAR FLIGHT CONTROL"</b>	<ul style="list-style-type: none"> <li>Review all affected equipment shown in amber on <b>F/CTL</b> page <b>Box 2</b></li> </ul> <b>"CLEAR FLIGHT CONTROL?"</b>
STATUS DISPLAY (Lower)			
<b>Box 3</b>	<b>Box 4</b>		
<u>STATUS</u> <b>APPR PROC</b> IF BLUE OVHT OUT: <b>BLUE ELEC PUMP ...</b> <b>ON</b>  <b>CAT 2 ONLY</b> <b>SLATS SLOW</b>	<u>INOP SYS</u> <b>CAT 3</b> <b>BLUE HYD</b> <b>SPLR 3</b>	<b>"CLEAR STATUS"</b>	<ul style="list-style-type: none"> <li>Read STATUS line by line <b>Box 3</b> then <b>Box 4</b></li> </ul> <b>"CLEAR STATUS?"</b>

## ECAM Procedure Notes

1. Unless conditions dictate otherwise, the captain should assign the flying duties to the F/O in accordance with the FOM.
2. Confirm correct thrust lever, engine master, engine fire pb, cargo smoke DISCH pb, IR pbs/selectors, and/or IDGs before performing ECAM action.
Procedures will be initiated on command of PF.
No action will be taken (except cancelling the audio warning through MASTER WARN light until: <ul style="list-style-type: none"> <li>• Flight path is stabilized</li> <li>• The airplane is not in a critical phase of flight (e.g., takeoff, landing).</li> </ul>
If an emergency or abnormal procedure calls for <b>LAND ASAP</b> written in red or amber on ECAM, comply with FOM procedures and land at nearest suitable airport.
Primary Failure – Failure of an item of equipment or system causing loss of others in the airplane. On the ECAM their title is boxed: <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 5px;"><b>B SYS LO PR</b></div>
Crew Coordination – When carrying out a procedure displayed on the ECAM, it is essential that both pilots are aware of the present display. Before any CLEAR action, crosscheck that no blue message remains (except in case of no action feedback), that can be eliminated by a direct action. <p style="text-align: center;"><b>*** NO CLEAR ACTION BEFORE CROSS EXAMINATION ***</b></p>
Should it be necessary to stop ECAM actions for any reason, the PF will state: <b>"HOLD ECAM"</b> . ECAM actions will continue when the PF states <b>"CONTINUE ECAM"</b> .
ECAM Procedures, STATUS information, and a check of PFD/ND are sufficient for handling the fault. However, when ECAM actions have been performed, and ECAM STATUS has been reviewed, if time permits, the crew may refer to the ECAM Non-Normal Supplemental manual.
Common sense must be applied when using ECAM. For example, if the last remaining hydraulic system overheats, ECAM will indicate shutting the system OFF. For obvious reasons, don't.

## ECAM Challenge-Response-Response Concept

ECAM Confirm Example:

<b>THR LEVER 1 .....IDLE</b>	
PF	PM
Fly the aircraft	Read aloud <b>"THRUST LEVER 1 IDLE"</b>
Guard thrust lever 2 and state <b>"CONFIRMED"</b> when ready for action	Select thrust lever 1
	Position thrust lever 1 to IDLE
	Repeat aloud <b>"IDLE"</b>
<b>Non-normal checklist notes:</b>	
<b>Standard:</b> PM reads aloud the checklist challenge and response, selects the proper control, accomplishes the action, then repeats the response aloud.	
<b>Confirm:</b> Accomplished the same as standard non-normal checklist items except the action will <u>not</u> be accomplished until the PF guards the non-affected control and states "Confirmed".	
<b>Verify:</b> Accomplished the same as standard non-normal checklist items except the response is repeated by the PF.	

Send corrections/comments to Bob Sanford, Email: [busdriver@hky.com](mailto:busdriver@hky.com)  
 Unofficial Airbus Study Site: [www.airbusdriver.net](http://www.airbusdriver.net)