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CHAPTER 00

- GENERAL INFORMATION -

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01 - FOREWORD

The Flight Crew Training Manual (FCTM) is the support documentation for Flight Crew trainees and instructors and has three objectives :

- It gives Airbus Industrie's philosophy referring to the FCOM and when necessary supplements the FCOM normal, abnormal/emergency procedures to perform training exercises, ensuring homogeneous insturction and operational use
- It contains teaching advices and key points essential for the correct performance of procedures and exercises.
- It deals with the detrails of the various phases of instruction (briefings, syllabi, RTOLW, ...)

02 - COMMENTS - QUESTIONS - SUGGESTIONS

All manual holders and users are encouraged to forward their questions and suggestions regarding the Flight Crew Training Manual.
Any questions with respect to use of this manual or information contained herein shall be directed to :

AIRBUS INDUSTRIE TRAINING CENTRE
Customer Services Directorate
5 rue Gabriel Clerc
31707 BLAGNAC CEDEX - FRANCE
ATTN. : Training Standards Department
R FAX : 33.(0)5.62.11.07.40

03 - CONTENTS

The FCTM is divided into two volumes :

Volume 1 : Training Support
Volume 2 : Training Syllabi

04 - PAGINATION

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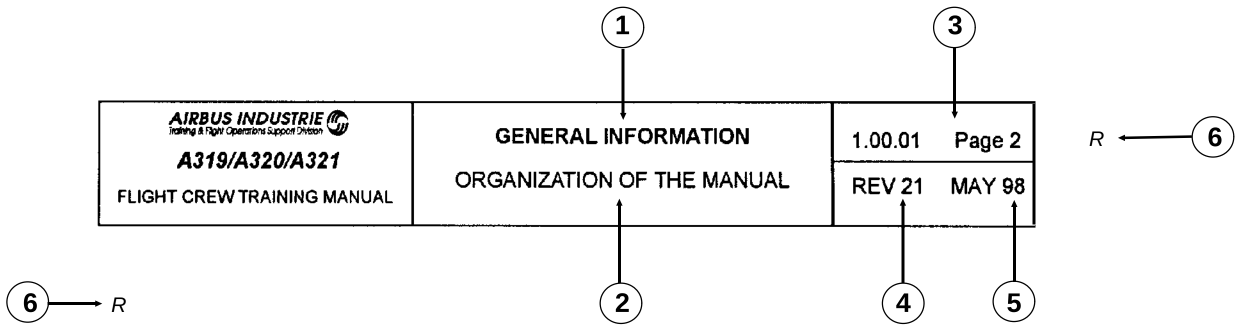

1. Chapter title
2. Section title
3. FCTM volume number - Chapter number - Section number - Page number
4. Revision number
5. Revision date
6. R An "*R*" in front of a line indicates that the line has been revised
   R An "*R*" in front of the page number indicates that the whole page has been revised.

05 - NORMAL REVISIONS

They are issued periodically to cover changes and / or to add new data.
Two documents added to each revision facilitate its incorporation :

- The "Filing Instructions" sheet : it lists the pages to be removed or inserted
- The "List of Effective Pages (LEP)" sheet : it list all the FCTM valid pages

Normal revisions are recorded in the "List of Normal Revisions" section

06 - TEMPORARY REVISIONS

They are printed on yellow paper and are issued when justifying urgent action between normal revisions.
They are recorded in the "List of Temporary Revisions" section.

07 - CUSTOMIZATION

When some items of the Airbus Industrie training philosophy are not adopted by a Customer Airline, they are replaced by those of the Airline. The corresponding header pages bear the name of the Airline and are printed in blue.

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CHAPTER 02

- NORMAL OPERATION BRIEFINGS -

WELCOME BRIEFING
(By simulator instructor)

01 - TRAINING OBJECTIVE

- To familiarize the trainee with course schedule and documentation.
- To familiarize the trainee with the training center facilities.

02 - SCHEDULE

Briefing duration : 1:30

03 - EQUIPMENT

- Document Demonstration Bag
- Introduction to the FCOM booklet
- Aircraft Introduction Video
- Golden Rules Video
- Golden Rules Card
- Blank Trainees' file
- Transparencies

04 - INSTRUCTOR'S ACTIONS

MAIN

- Files correctly filled out by trainees.
- Explanation of course phases and training equipment.
- Presentation and use of documentation - FCOM explanation booklet.
- Aircraft introduction video.
- Golden rules video & golden rules card.
- Training center orientation.
- Discrepancies between VACBI program and VACBI menu.
- Portable computer.
- Performance training manual.
- Reporting time according to phase of course.

Day before briefing

- Check the scheduled room (planning department).
- Check issue of transparencies (trainees office).
- Check availability of course information.
- Check availability of blank training files and syllabi.

Day of the briefing

- Check about items not available the day before.

WELCOME BRIEFING (CONT'D)
(By simulator instructor)

04 - INSTRUCTOR'S ACTIONS (CONT'D)

BRIEFING CONTENTS

Course Presentation

- Introduce yourself to the trainees.
- Explain the role of the course coordinator.
- Ask trainees to complete the file with requested information ; remind them that all files should be signed by the team leader.
- Check that nothing is missing.
- Show and explain course phases and equipment involved, with transparencies
- Explain that a portable computer will be issued on day 3 of the course. It must be returned after the exam, the last day of the VACBI.
- Specify default briefing times according to different course phases and place of rendez-vous with the instructor. Stress that there are 2D trainers available in every briefing room for use during session briefings. Trainees may also use these in their own time, to prepare for FBS or FFS sessions.

Documentation presentation

Use DOC demonstration bag (Trainees' Library) but keep in mind that this documentation is obsolete and used only as an example :

- FCOM Volumes 1,2,3 and 4 & FCOM explanation booklet.
- FCTM Volumes 1 and 2
- Approach charts (this booklet is for the whole Airbus fleet, so some airports are not used for a particular aircraft).
- PTM (Performance Training Manual). Emphasize this book must be used to solve performance course and exam exercises. As the VACBI course can't be continuously updated or customized, FCOM Volume 2 can't be used for VACBI and exam.
- Present and explain the use of headset (VACBI) and earpads (FFS headset).

WELCOME BRIEFING (END)
(By simulator instructor)

04 - INSTRUCTOR'S ACTIONS (END)

BRIEFING CONTENTS (END)

Training Center presentation

- Takes trainees for a center walkaround, emphasizing position of toilets, prayer room if applicable, briefing rooms, FBS, FFS and VACBI room.
- In the VACBI room, show trainees their lockers ; ask them to check their documentation and to sign on the list.
- Before end of walkaround, show the location of the "boutique" where souvenirs are sold.
- Ask hostess at what time she wishes trainees for photography.
- Don't forget to bring back the documentation bag to trainees library and training files to trainees office.

05 - TRAINEES' ACTIONS

- Attendance

06 - COMPLETION STANDARDS

Not applicable

07 - COMMON ERRORS

- Trainees' files incorrect and/or incomplete.
- Course structure not adequately explained.
- Documentation insufficiently explained.

AIRBUS DOCUMENTATION

01 - TRAINING OBJECTIVE

- To use the Airbus documentation, effectively, during the course and in subsequent airline operations.

02 - SCHEDULE

Briefing duration :10 minutes

03 - EQUIPMENT

DOC references :
- FCOM Vol. 1 to 4
- QRH
- MMEL

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- ATA chapters
- FCOM (Flight Crew Operating Manual) Volumes 1 to 4
- QRH
- MMEL & MEL use.

SECONDARY

- FCOM revisions.
- OEBs and FCOM Bulletins

AIRBUS DOCUMENTATION (CONT'D)

05 - TRAINEES' ACTIONS

The FCOM consists of Volumes 1 to 4 and the QRH. The information contained in the FCOM is a compromise between the following two contradictory requests from airlines:

The FCOM should only contain information which is "Need to know" for the operation of the aircraft.

The FCOM should contain a full and in depth description of the aircraft technical systems and associated procedures.

Consequently the information may seem too comprehensive for some operators and too superficial for others. At the beginning of each of the Volumes 1 to 4 there is a contents page followed by a small section which describes the organization of the manual.
Due to the fact that the modification standard of aircraft within an airline's fleet may vary, each page will identify the aircraft to which it is applicable. This is done by printing a registration, or manufacturer serial, number (MSN) at the foot of the page. A decode of MSNs and registrations are included in each FCOM volume. This section also contains some information on revising the manual with temporary and permanent revisions.

The purpose of this briefing note is to give additional information on the use and applicability of each volume. Volume 1 to 4 and the QRH will be described in turn, followed by the MEL.

FCOM VOLUME 1

This manual contains a technical description of the aircraft systems. A list of abbreviations and symbols used in all FCOMs, FCTM and QRH is included at the beginning of the manual. At the beginning of each chapter there is a contents list. Each chapter covers a specific system. The main components, controls and indications are described. The cautions and warnings associated with each system are included in each chapter as is the electric bus distribution.

In volume 1 the chapter numbers correspond to the ATA (Air Transport Association) 100 BREAKDOWN chapter numbers. This represents the official reference for the classification of airplane systems and/or functions. The ATA breakdown consists of six digits, the first two of which refer to a particular aircraft system. The full six digits are used in the MEL and the MMEL. The list below details the ATA chapter numbers used in FCOM Vol. 1.

AIRBUS DOCUMENTATION (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

Chapter	System
21	AIR CONDITIONING, PRESSURIZATION & VENTILATION
22	AUTO FLIGHT
23	COMMUNICATIONS
24	ELECTRICAL
25	EQUIPMENT
26	FIRE PROTECTION
27	FLIGHT CONTROLS
28	FUEL
29	HYDRAULIC
30	ICE AND RAIN PROTECTION
31	INDICATING/ RECORDING SYSTEMS
32	LANDING GEAR
33	LIGHTS
35	OXYGEN
36	PNEUMATIC
38	WATER & WASTE SYSTEM
49	AUXILIARY POWER UNIT
52	DOORS
70	POWER PLANT

The classification of the systems is in alphabetical order apart from the last four systems.

This volume will be of use in the VACBI phase of the course to reinforce and compliment the lessons learnt on VACBI. However the VACBI should be considered the prime source of technical information. Once the VACBI phase is successfully completed and upon completion of training, FCOM Vol. 1 will become the prime source of information on aircraft systems.

<u>FCOM VOLUME 2</u>

This manual contains information on loading, performance and pre-flight planning. Also included is performance information for special operations (contaminated runway, ETOPS, etc.).

This volume is of use during the performance course, and during Line Orientated Flight Training (LOFT) exercises. It will continue to be of use in line operations. This volume is not normally used in flight with the exception of certain specific circumstances.

AIRBUS DOCUMENTATION (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

FCOM VOLUME 3

This volume contains chapters on operating limitations, abnormal/emergency procedures, standard operating procedures (SOPs), supplementary techniques, in-flight performance and single engine operation.

- Operating Limitations - this chapter includes limitations required by the regulating authority and contained in the flight manual. You will not be tested on these limitations unless specified by VACBI or regulatory authorities.
- Abnormal and Emergency Procedures - the contents to this chapter constitute a complete list of all the ECAM failure messages and other failures requiring the use of the QRH. Each section in the main body of this chapter corresponds to the relevant ATA chapter number. In the chapter introduction there is information on ECAM use and task sharing. The section on operating techniques contains information on such topics as rejected take-off, engine failure after V1 etc. Within each ECAM procedure there are notes which amplify and clarify the procedure. These do not appear on ECAM and it is not necessary to consult this volume during ECAM procedures.
- Normal Procedures - this chapter contains all information on SOPs, and techniques required for the conduct of a normal flight.
- Supplementary Techniques - this chapter begins with a definition of operating speeds such as green dot, 'S' speed etc. The rest of the chapter contains valuable information concerning systems and operational situations. Most of the sections conform to the ATA 100 breakdown.
- In Flight Performance - contains information on performance for use in flight.
- Single Engine Operations - this chapter details the three strategies possible following an engine failure in flight. Further information is given to assist in planning and preparing for a single engine landing.
- OEBs - these are used as the fastest way to advise operators of revised or significant new technical information, flight crew procedures or changes to limitations. OEBs are not approved by the airworthiness authorities and will be superseded by a modification or service bulletin. Some OEBs may have an impact on the safe conduct of flight operations and these are reproduced in the QRH.
- FCOM Bulletins - are used to provide supplementary operational information which normally falls outside the content of the FCOM. Each bulletin may deal with one or more subjects. Only bulletins applicable to the aircraft (e.g., IAE or CFM engines) in service with your airline will be issued.

The limitations will be introduced during the VACBI phase. The remainder of the volume is mainly of use from the FBS phase onwards, although there will be an introduction to standard operating procedures (SOPs) during F3D exercises.

AIRBUS DOCUMENTATION (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

FCOM VOLUME 4

This volume provides in depth information about the FMGS principles, procedures and interface. It may sometimes duplicate the information already contained in Volumes 1 and 3, however the aim is to have all the information regarding the FMGS in one book.

FMGS principles and procedures will be introduced during the F3D exercises. As the course progresses, an increasing knowledge of the FMGS is required and the volume will become more useful.

FCOM REVISIONS

There are two types of revision to the FCOM : normal and temporary.

- The normal revisions are issued periodically by Airbus Industrie and are of a non urgent nature. Normal revisions are accompanied by filing instructions and an updated list of effective pages.
- Temporary revisions cover urgent matters arising between normal revisions, are printed on yellow paper and are accompanied by filing instructions.

The filing instructions accompanying the revisions contain a list of pages to be inserted, removed or replaced. Bear in mind that the manual may contain more than two pages with the same page number as the two pages will refer to aircraft with different modification states.

The MSN or registration of the aircraft, within a fleet, to which a page applies will be clearly marked. Follow the filing instructions carefully in order to avoid removing pages which are still valid. The list of effective pages will allow confirmation that the contents of the FCOM are complete and valid for a particular airline's fleet.

QUICK REFERENCE HANDBOOK (QRH)

Most emergency and abnormal procedures are presented to the crew on ECAM. The QRH contains checklists which cannot be presented on ECAM and additional emergency and abnormal procedures which may be required by ECAM (e.g. SMOKE/TOXIC FUMES REMOVAL). At the front of the QRH there is an important note concerning task sharing and ECAM procedures.

Normal procedures and task sharing are detailed. Also included are in flight performance, operational data and OEBs. The normal checklist is printed on the back of the QRH along with the ON GROUND EMER/ EVACUATION checklist.

The QRH is required for the FBS and FFS.

AIRBUS DOCUMENTATION (END)

05 - TRAINEES' ACTIONS (END)

MASTER MINIMUM EQUIPMENT LIST (MMEL) & MINIMUM EQUIPMENT LIST (MEL)

The main purpose of the MMEL is to permit aircraft dispatch when items of equipment or functions are inoperative, to avoid delays and cancellations.
The MEL is the operators' own version of the MMEL. The MMEL is produced by Airbus Industrie. The MMEL cannot be used as a substitute for the MEL. The MEL is neccessarily more restrictive than the MMEL.

During training at Airbus the MMEL will be used for LOFT exercises. In airline service the MEL produced by the airline will be used as the sole reference.

The MEL should contain the following basic information :

- a list of equipment or functions which may be inoperative for dispatch
- associated operational procedures
- associated maintenance procedures
- list of ECAM warnings, associated with the corresponding dispatch conditions

When a failure is detected or identified, the crew must enter the MEL to determine if dispatch is possible, and limitations or conditions. The MMEL and MEL is organized using the ATA 100 breakdown (as described earlier). The full six figures of this breakdown are used in the MMEL/MEL. For example 21-52-01; the 21 refers to the air conditioning system, 52 to the air cooling system and 01 to the air conditioning pack. Items not listed in this section indicate NO DISPATCH.

If an (O) is associated with an item, then dispatch may be possible following an operational procedure. Operational procedures are contained within the MEL document.

If an (M) is associated, then a maintenance procedure must be applied. Maintenance procedures are generally to be found in maintenance manuals which are not held on the aircraft.

Further guidance on the use of the manuals and the abbreviations therein is contained in the front of the MMEL.

06 - COMPLETION STANDARDS

- Not applicable.

07 - COMMON ERRORS

- Lack of understanding of the FCOM structure.

LOFT BRIEFING

01 - TRAINING OBJECTIVE

The meaning of "L.O.F.T." is Line Oriented Flight Training.
This session has been developed for self evaluation. The objective is to enable the crew, even if unusual (2 Captains or 2 First Officers), to assess their assimilation of the course content and to review items as necessary before the check.The session is also to demonstrate a real time flight with real time problems. It is designed to facilitate the training of two(2) pilots and ensure that each does some flying from their normal crew position.

02 - SCHEDULE

Briefing duration : 1:00
Trip should be approximatively 2:00 to 2:30 to allow remaining time allocation for reviewing.

03 - EQUIPEMENT

Full Flight Simulator

The required documents for the LOFT session are :
- Computerized flight plan (FCTM Vol 2 - LOFT session)
- MET reports (FCTM Vol 2 - LOFT session)
- NOTAMS (FCTM Vol 2 - LOFT session)
- MMEL extracts (FCTM Vol 1 - MMEL chapter)
- RTOLW (FCTM Vol 1 - Performance chapter)

04 - INSTRUCTOR’S ACTION

MAIN

Rules

The instructor will present dispatch release documents to trainees in the briefing room and give a general briefing on the conduct of the loft session. At this stage, he will answer questions and clarify any questions trainees may have regarding documentation.

He will take the role of dispatcher and action the trainee crew’s decisions regarding extra fuel, deferred items, etc... Once the crew has entered the simulator, the instructor will communicate with them as required, in the role of ground mechanic, ATC, cabin crew or company agent.

LOFT BRIEFING (CONT'D)

04 - INSTRUCTOR'S ACTION (END)

Briefing And Preparation

Instructors should be able to effectively convey the purpose of the Line Operational Simulation and how it is representative of line operations. Instructors should also explain the instructor's role during the training, i.e. as an observer and not considered present, unless playing a role in the scenario.

Flight Segment

Instructors should be able to both observe and perform ancillary roles. They should be trained in observing both technical and CRM skills. The instructor should also be trained in proper pacing, proper introduction of abnormal/emergency procedures, and methods of handling unforseen crew actions.

Failures

The failures introduced must not be too excessive. The crew workload should be consistent as to be expected on a very busy flight, not more.

Assessment

The instructor may, with the express consent of the crew, video tape the session and use it for debriefing. Any recording made will be erased immediately after the debriefing and in the presence of the trainees. The debriefing sequence should be initiated by the crew followed by the instructor who will amplify (if necessary) the crew input, and conclude with his general debriefing.

Debriefing And Critique

Instructors should provide both positive and negative feedback during critiques of individual and crew performance. Prior to the instructor's critiques, crewmembers should be encouraged to critique themselves. Instructors will provide feedback to the crew to encourage the changes needed for improved performance. Instructors should also provide specific recommendations to improve individual crewmembers' performance.

LOFT BRIEFING (CONT'D)

05 - TRAINEES' ACTION :

Computerized Flight Plan (CFP) :

CFP should be checked by the crew before the flight, and fuel corrections may be made by the captain. Block fuel may be increased due to weather and NOTAMS.

NOTE : Computed flight plan decode keys are printed on the following pages.

MET Reports :

Weather, wind and temperature at FL to be inserted into MCDU during cockpit preparation should be analysed. The weather data supplied are valid for the intended flight period.

Notams :

Should be analysed and applied.(i/e: inoperative VOR's deselected during cockpit preparation)

MMEL :

The crew should analyse deffered item using the MMEL that should be considered as the company MEL and understand the information given in column nº 4, more particularly the following symbols :

***** : Asterisk requires inoperative equipment component system or function to be placarded in the cockpit to inform crew members of the equipment condition.Unless specified herin, placard wording and location woll be determined by the operator (not simulated here).

(o) : Identifies a crew operational procedure.

(m) : Indicates a requirement for a specific maintenance procedure with must be accomplished nby maintenance personnel or other personnel if qualified and approved by national authorities.

Both symbols (o) and (m) used singularly, or in combination, require the appropriate procedures to be established, published, and compied with, if flight is accomplished with one item inoperative.

Regulatory Take-off and landing Weight (RTOLW) :

Crew should compute T/O configuration, T/O speeds and acceleration altitude.

LOFT BRIEFING (CONT'D)

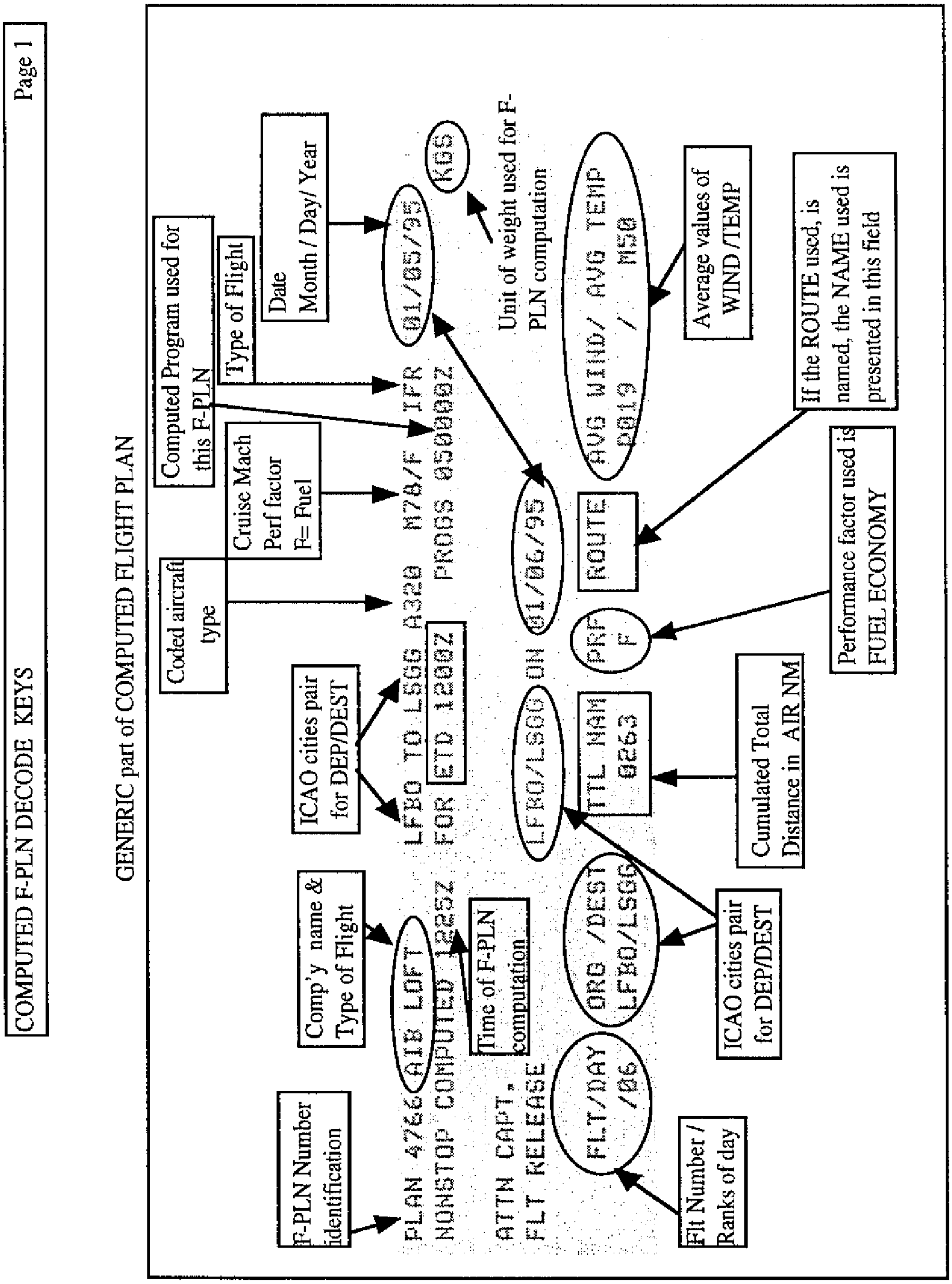
06 - COMPLETION STANDARDS

- Demonstrates correct application of standard procedures.
- Takes safe , correct action in case of failure.
- Solves problem and makes an appropriate decision.
- Ensures good communication and applies CRM skills.

07 COMMON ERRORS

- Insufficient assessment and planning in abnormal situation.
- Incorrect or unappropriate decision.
- Use of back up or alternate system not considered.
- Poor CRM

LOFT BRIEFING (CONT'D)
(Computed flight plan decode keys)



(DCODK1.PCX)

LOFT BRIEFING (CONT'D)
(Computed flight plan decode keys)

```
                E.FUEL  A.FUEL  E.TME   NM    NAM   FL
DEST    LSGG   001701   ... ..  00/40   0274  0263  350
RESV    0.05   000085   ... ..  00/03
ALT     LFLL   000505   ... ..  00/12   0053  0053  240
HOLD           000956   ... ..  00/30
ETOPS RES      000000   ... ..  00/00
ETOPS XPRT     000000   ... ..  00/00
XTR            002553   ... ..  01/20   CAPT.SIGN . . . . . . . . . . .
TOF            005800   ... ..  02/45
TAXI           000200   CORR.   + / -
BLOCK          006000   ... ..  02/45   BLOCK FUEL. . . . . . . . . .

FUEL BURN ADJUSTMENT FOR 4000FT DECREASE IN CRZ ALTITUDE :      KGS

FUEL BURN ADJUSTMENT FOR 1000KGS INCREASE/DECREASE IN TOW :     KGS
```

FL used for CRZ and ALTN

NM	Ground distance in Nm
NAM	Air distance in Nm

FUEL figures as computed by F-PLN versus data inserted at F-PLN request:

DEST XXXX	TRIP FUEL to DESTINATION ICAO DEST code
RES 0.05	ROUTE RESERVE expressed in % of TRIP fuel
ALT XXXX	Fuel from DEST to ALTN, computed in LRC, to ICAO ALTN
HOLD	Fuel to hold 00H30
ETOPS RES	Standard reserve for ETOPS if ETOPS flight
ETOPS XPRT	Fuel carry as extra for ETOPS if ETOPS flight
XTR	Extra fuel = BLOCK FUEL -TAXI - TRIP- RES- ALTN- HOLD
BLOCK	Fuel on BLOCK
E. FUEL	Estimated Fuel figures
A. FUEL	Actualized Fuel figures. Crew may modified certain fuel figures
E.TME	Time figure of ENDURANCE versus each fuel figure

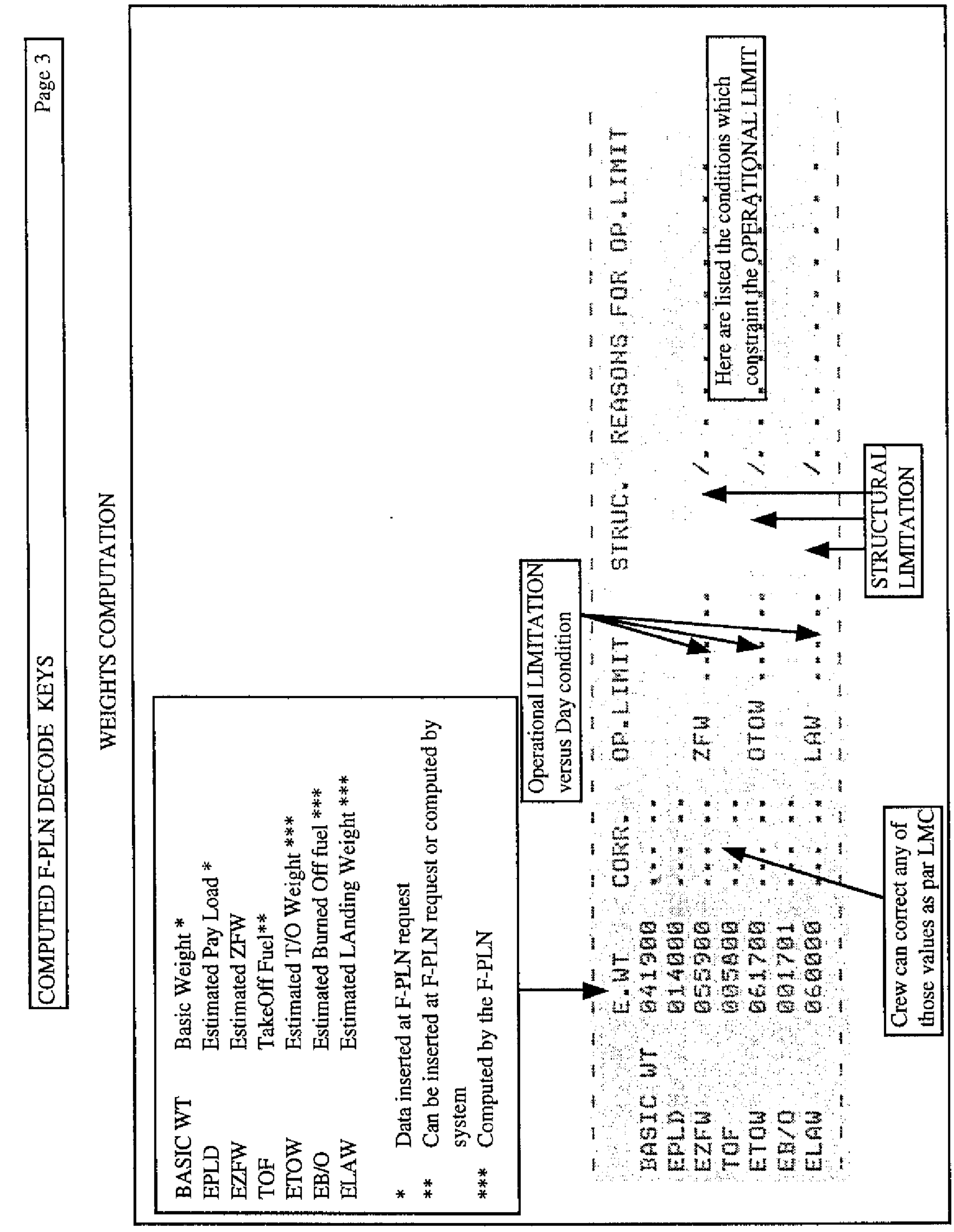
FUEL BURN ADJUSTMENT:

A Δ expressed in KG of burned fuel is presented for each 4000 ft below the computed FL

A Δ expressed in KG of burned fuel is presented for each 1000 kgs versus the COMPUTED takeoff weight

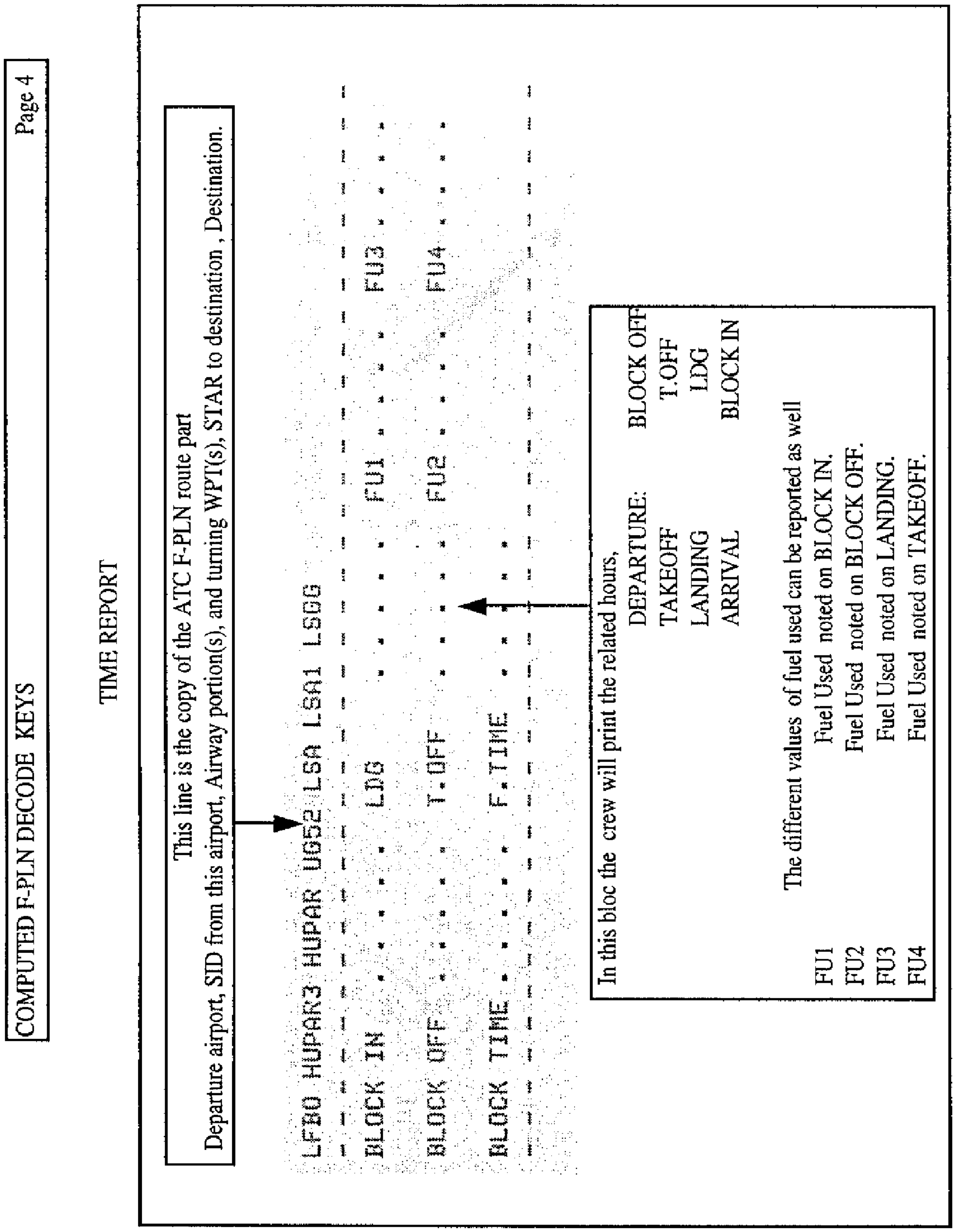
(DCODK2.PCX)

LOFT BRIEFING (CONT'D)
(Computed flight plan decode keys)



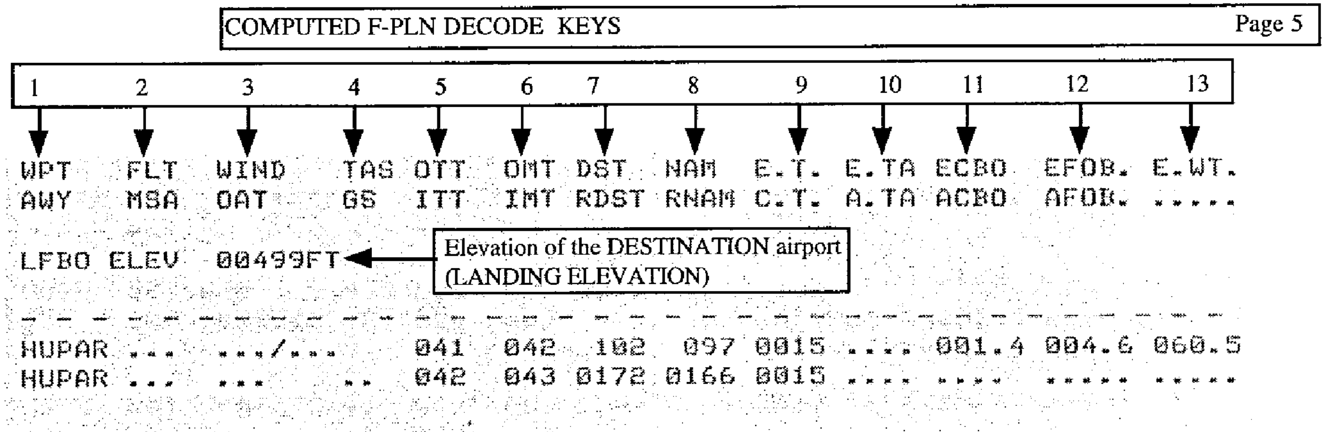
(DCODK3.PCX)

LOFT BRIEFING (CONT'D)
(Computed flight plan decode keys)



(DCODK4.PCX)

LOFT BRIEFING (CONT'D)
(Computed flight plan decode keys)

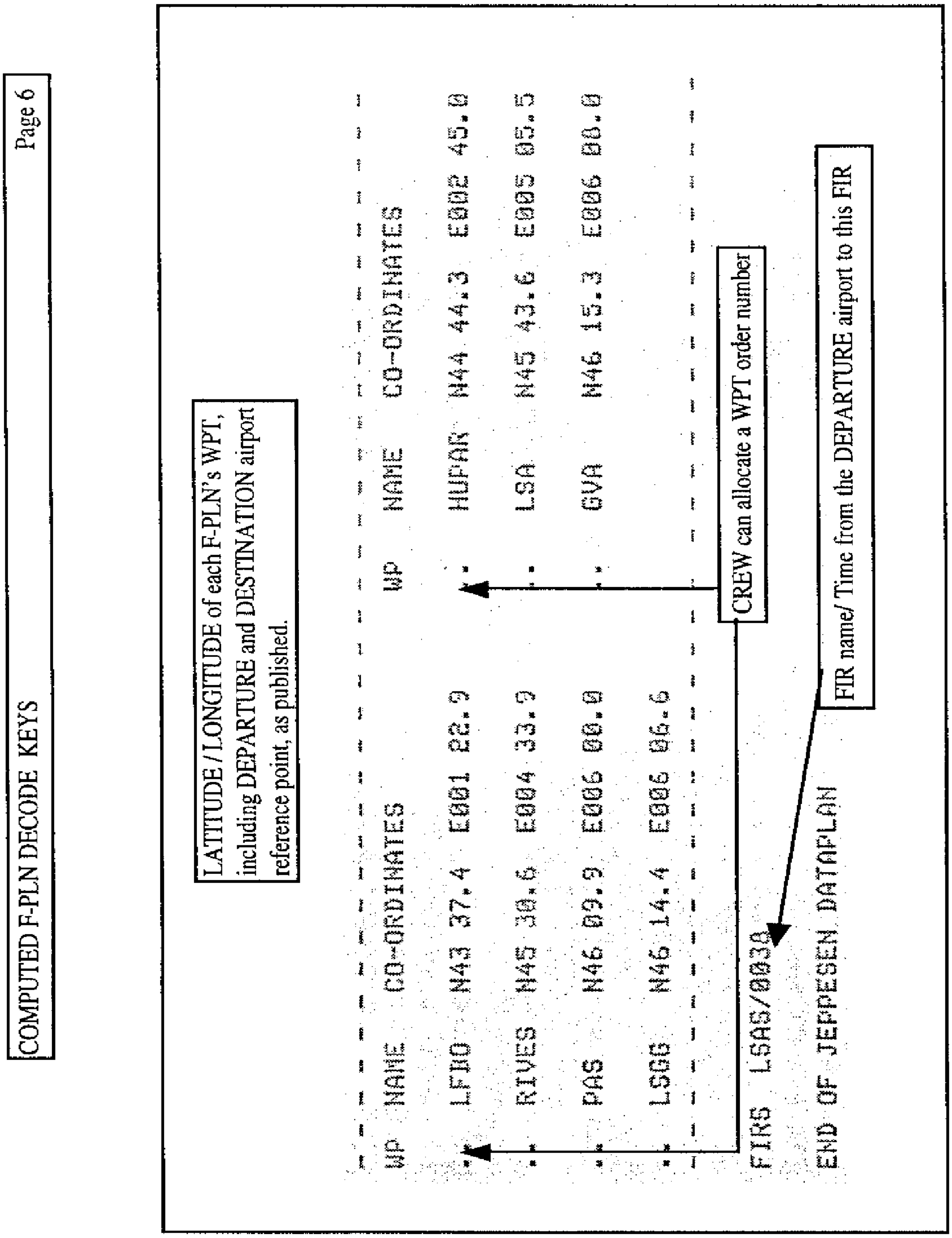


1	WPT AWY name (SID or STAR for DEP/ARR)	7	DIST to the WPT REMAINING distance to DESTINATION	
2	FL at this WPT MSA at this WPT	8	AIR NM to this WPT REMAINING AIR distance to destination.	
3	WIND at this WPT OAT at this WPT	9	ESTIMATED time to this WPT CUMULATED time to this WPT	
4	TAS at this WPT GS at this WPT	10	ESTIMATED time of Arrival at this point ACTUAL time of Arrival at this point	CREW notation CREW correction if needed
5	OUTBOUND TRACK from this WPT INBOUND TRACK to the next WPT	11	ESTIMATED COMPUTED burned fuel ACTUAL burned fuel.	CREW correction if needed
6	OUTBOUND TRACK from this WPT INBOUND TRACK to the next WPT	12	ESTIMATED fuel on board ACTUAL fuel on board	CREW correction if needed
		13	ESTIMATED gross weight ACTUAL gross weight	CREW correction if needed

Items column 2, 3, and 4, are printed only when aircraft is in CRZ

(DCODK5.PCX)

LOFT BRIEFING (END)
(Computed flight plan decode keys)



(DCODK6.PCX)

BASE TRAINING BRIEFING

01 - TRAINING OBJECTIVE

- Base Training is intended to confirm the "transfer of knowledge" from the Full Flight Simulator to the aircraft. Additionnally, it affords the trainee the opportunity to experience, for the first time, the real aircraft particularly during ground operations and inflight maneuvering using predominantly visual references.
- Trainees should read the the briefing to understand the content and requirements of the session. A full briefing will be given by the training Captain prior to flight
- Training Captain should use the material provided to prepare their own briefing to be given to trainees prior to the base training flight.

02 - SCHEDULE

Pre flight briefing duration : 1:00

03 - EQUIPMENT

AIRCRAFT :

A. GENERAL

Training flights must be conducted in accordance with Airbus Industrie training regulations. Training flights at Toulouse or nearby airports will be conducted under the direct authority of the Airbus Industrie Training Director. In the above case the AI/ST Operations Department will be responsible for the organisation, documentation and coordination of the flight training. Flight training away from Toulouse will be undertaken under the joint authority of the AI/ST Team leader and the Chief Pilot of the customer Airline, using the operational resources of that Airline. Where such training is undertaken, Flight Instructors will observe the Airbus Industrie rules regarding the conduct of the Flight Training.

B. TRAINING IN TOULOUSE

TRAFFIC PATTERNS

The red, green, blue and yellow patterns provided in the Base Training book will form the basis of circuit training patterns at Toulouse, subject to any ATC amendments. Overflight of Francazal Air Base, 5 NM south of Toulouse, is forbidden or subject to special ATC clearance. The crossing of it's approach flight path may be required by ATC owing to traffic conditions at Blagnac when runways 33 L/R are in use. ATC will then order a climb to 3000 ft on an "extended yellow" pattern to clear any inbound Francazal traffic.
In general, overflight of all surrounding densely populated areas is prohibited, especially the communities of Colomiers, Cornebarrieu and Blagnac. Purpan Hospital to the south east and "Clinic des Cedres" to the northwest of Toulouse Blagnac should also be avoided.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

C. CREW REPORTING PROCEDURE

Trainees are normally required to report 2 hours before scheduled departure time to Airbus Training where they will meet their instructor. Whenever a technical delay is known or expected, AI/ST Operations will advise all persons concerned of the delay and the revised reporting time.

D. CARRIAGE OF PASSENGERS

The carriage of passengers is limited to technical observers from Airbus Industrie or the customer Airline, ATC controllers and other specifically approved by the Airbus Industrie Training Director or his Deputy, and with the agreement of the instructor. The number of passengers may not exceed two (2). If the aircraft is under customer foreign registry, approval must also be obtained from the Airline's Representative. Passengers' names will be provided to AI/ST Operations for inclusion in the flight program.

E. CONDUCT OF TRAINING FLIGHTS

a. Seating Policy

Trainees will occupy their respective operating seats under the supervision of their instructor until cockpit preparation is complete. The instructor will then occupy the appropriate non-flying pilot's seat. Normally, Captain trainees will occupy the left seat, First Officer trainees the right seat. However, if a First Officer is being type-rated and the licensing authorities require it, the First Officer trainee will be trained in the left seat. The observers' seat will be occupied by the non-flying trainee Pilot.

b. Flight Training Policy

As a general rule, all the items in the training syllabus should be completed and repeated,if necessary, until proficiency is achieved.

1. Unauthorized Manoeuvres

NO unauthorized manoeuvre which might jeopardize the safety of flight will be allowed. In addition, NO demonstrations of the flight envelope protection systems will be intentionally carried out unless expressly authorized by the Airbus Industrie Training Director or his Deputy.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

2. Engine Failure Simulation

No engine shutdown is allowed for training purposes. Engine failure will be simulated by setting the thrust lever to the forward idle stop (having first checked the correct functioning of the other engine). Engine failure on take off or touch and go should only be simulated after the gear has been selected up and, during go around, only after a steady climb attitude has been achieved. Touch and go after a simulated one engine out landing should only be made in exceptional circumstances, a full stop landing should normaly be performed.

3. Check-lists

Full check-lists will be performed except for touch and go landings and go arounds. The ECAM landing memo may then be used at the instructor's discretion.

4. Accelerate / Stop

No acceleration / stop training will be conducted in the aircraft. The decision to reject a take-off during a Base Training flight is made exclusively by the instructor who will immediately take control of the aircraft. A briefing in this regard will be made prior to flight and reinforced during the take-off briefing.

5. Touch and Go

Touch and go are used to reduce the amount of training time wasted in taxying the aircraft back to the holding point and awaiting take-off clearance. In order to maintain a high level of safety they must be conducted in a properly disciplined manner.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

5. Touch and Go (cont'd)

The following technique is to be used :

- Prior to EVERY touch and go, the instructor will confirm with the trainee that :
  - the spoilers will not be armed
  - reverse thrust will not be used
  - brakes (auto or manual) will not be used
- The trainee will :
  - land the nosewheel after main gear touchdown(which also allows pitch trim reset)
  - track the runway centreline using rudder pedal inputs only
  -
- advance the thrust levers approximately 2" (5 cm) forward (to prevent engines reducing to ground idle).
- The instructor will :
  - call "stand up"
  - move the flap handle to the position two detent and confirm the flaps are running
  - reset the rudder trim if necessary
  - monitor the forward movement of the pitch trim
  - place one hand behind the thrust levers ensuring they are advanced approximately 2" (5 cm)
  - reset the FDs and crossbars as necessary
  - call "GO".
- The trainee will :
  - advance the thrust levers to the TOGA detent
  - maintain the runway centreline.
- The instructor will :
  - monitor engine acceleration
  - check FMA announciation (when appropriate)
  - check GA thrust obtained and call "POWER SET"
  - call "ROTATE" at VAPP
  - maintain his hand behind the thrust levers to ensure no inadvertent reduction of power or unwanted stop
- The trainee will :
  - rotate the aircraft to the pitch attitude commanded by the SRS or 15° if no FD is available.

(See following diagram)

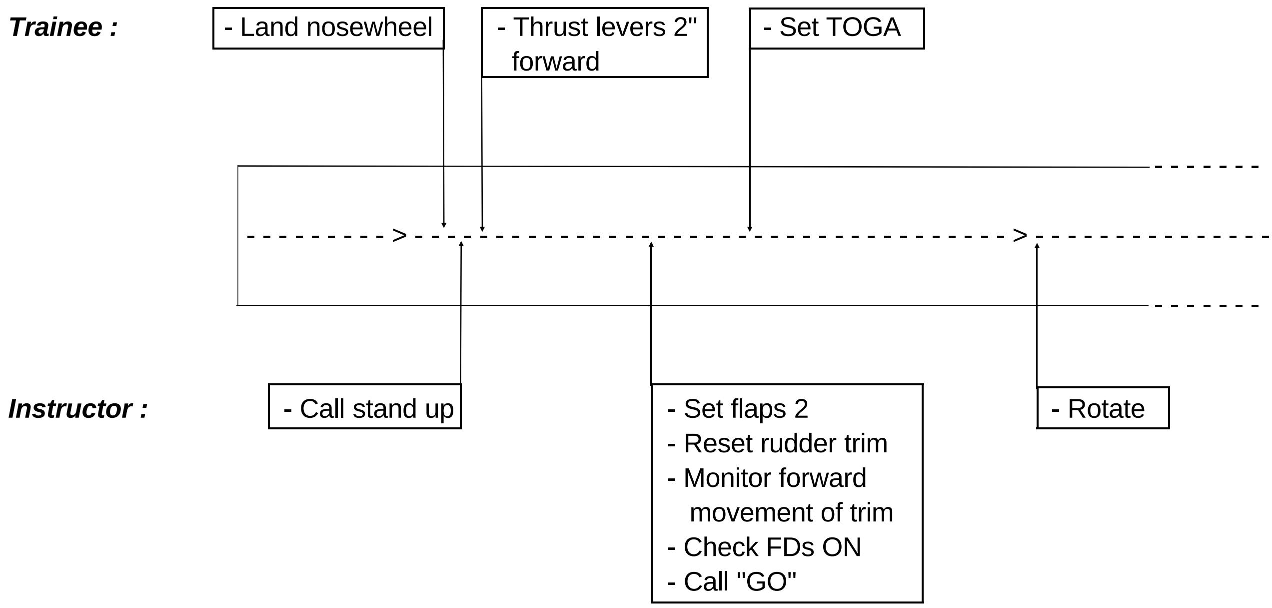
BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

5. Touch and Go (end)



- Following gear retraction the instructor will call for CLB thrust.
- The trainee will move the thrust levers to the CLB detent (the FMA will read CLB SRS GA TRK).

At acceleration altitude or ALT*, which ever occurs first, and F speed : select FLAP 1. Approach may be activated at this stage, or as soon as the required flaps configuration for the following circuit is reached (configuration other than 1).

Emergencies :
If the instructor wishes to abandon the touch and go he will call "STOP" simultaneously taking control of the aircraft and bring it to a halt using maximum braking and reverse. Once the aircraft has stopped he will call for any appropriate ECAM actions. The decision to discontinue a touch and go after the application of TOGA must only be taken if the instructor is certain that the aircraft cannot safely fly. Remember there is no V1 on a touch and go. Note that the take-off configuration warning may sound if the application of TOGA is made while the flaps or pitch trim are resetting but still outside the take-off range.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

6. Radio Communications / External Lookout

The instructor is responsible for all radio communications and maintaining a visual lookout for conflicting air traffic. The trainees (including the observer in the jump seat) should be encouraged to back up the instructor in this regard and to immediately inform him of any potential conflict.

7. Next Exercise

The instructor will inform the trainee of the next exercise to be performed during the downwind leg, and he will confirm the trainees' understanding of this exercise. During each approach, the instructor will remind the trainee whether a full stop, a touch and go, or a go around will be performed.

8. Instructor Take-over

In Flight :
On the A320, there is no intermediate step for corrections between voice recommendations (oral guidance) and total take-over by pressing the push-button on the sidestick. Because of the nature of the "fly by wire" system, additive control inputs by the instructor may be of negative value for instruction purposes and can generate confusion in the handling of the trajectory. This should be emphasized and reviewed with the trainees during the preflight briefing. If take-over becomes necessary during the flight, instructor will clearly call "I HAVE CONTROL" and press sidestick priority pushbutton. The trainee will acknowledge by calling "YOU HAVE CONTROL", release the sidestick and observe the red arrow on the sidestick priority panel on the glareshield. Instructor will keep his side priority pushbutton depressed until the aircraft is under full control and it is safe to return control to the trainee. However there may be cases where it is necessary to apply back stick without warning in case of a very late flare. It must be emphasized that a take-over is a very rare occurence and that if a take-over is necessary the trainee should not regard this as a negative development but the normal take-over method for an A320.

On The Ground :
It should be emphasized that the nosewheel steering tiller should NOT be used at high speeds (GS > 30 kt) because of overcontrolling. Steering inputs from both tillers are additive, and corrective inputs by the instructor can be confusing and potentialy dangerous. Should a take-over be necessary, the instructor will immediately call out
"I HAVE CONTROL", and if necessary, be prepared to use differential braking to regain control or bring the aircraft to a stop.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

9. Fuel Management

For normal Flight Training sessions, 15 tonnes will be the normal fuel load for flights not requiring positioning. If for operational reasons or for training flights requiring positioning, more fuel is loaded, the auto mode of fuel feeding will be used. This means that during circuit training the centre tank fuel will not normally be used and a non-standard fuel loading will result i.e. fuel in the centre tank with inner tank cells not full. The maximum centre tank fuel added to an average aircraft empty weight will never exceed the maximum zero fuel weight. If extended circuit training is required, centre tank fuel may be utilised (if necessary by selecting AUTO/MAN P/B to MAN) at any part of the flight except the take-off or touch and go. The above procedure is to be used until the publication of a Flight Manual derogation allowing the centre tank to feed during training take-offs and touch and go's.

10.Automatic Landings

For demonstration purposes, instructors may carry out automatic landings provided the weather and the ILS meet CAT 1 criteria or better. The instructor should be prepared to take manual control immediately if the flight path or roll out deviate. Trainees should be reminded of all the conditions and limitations required prior to conducting an automatic landing during commercial operations.

NOTE : *See FCOM references for limitations on the use of the automatic landing system.*

11.FMGS Use

The FMGS should be initialised for the intended flight either by data base company route e.g. Red or Blue circuit or by waypoint and PBD. Managed lateral navigation may be used for the first ILS assisted approach and when weather makes visual flight impossible. All visual circuits should be flown with FDs off and FPA selected. The fact that the approach and runway will remain displayed is of considerable assistance for positioning the aircraft on final approch.

12.Cockpit Preparation and Engine Start

The trainee crew will occupy the left and right seat for cockpit preparation with the instructor supervising from the jumpseat. Just prior to engine start the instructor will occupy either the right or the left seat. Either engine can be started first, though normally number two engine is the first to be started.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

13.Taxi

Little if any power above idle thrust will be required to get the aircraft moving at training weights. Thrust should be used symmetrically. Avoid high thrust settings at low ground speeds due to the risk of ingestion (FOD). The wing mounted engines are close to the ground, this is particular point to note for ex DC9, BAC1-11 and B727 pilots. Avoid placing engines over unconsolidated or unprepared ground e.g. over the edge of taxyways. Brakes may be checked once the aircraft is moving and thereafter the normal maximum taxy speed should be 20 kt in a straight line, 10 kt for a sharp turn. As pilot eye height at 15 ft is higher than in many other aircraft, monitor ND groundspeed displays to help assess taxy speed. Do not "ride" the brakes, as 20 kt is exceeded, apply brakes smoothly and decelerate to 10 kt, release the brakes and allow the aircraft to accelerate again.

NOTE : *Use of engine anti-ice increases ground idle thrust, care must be taken on slippery surfaces. Nosewheel steering is also fly by wire. The inputs of the nosewheel steering tillers are additive (just like the sidestick). Care is needed to steer the aircraft smoothly with small tiller inputs. Sharp turns particularly need care as the rate of response of the nosewheel to tiller input is not linear.*

14.Take-off

Half forward stick is used at the commencement of the take-off run, this gives full down elevator. For crosswind take-offs into wind aileron is used, care should be taken to avoid using an excessive amount of control to avoid causing unnecessary spoiler deployment. A two stage power application to TOGA or FLEX is made and the aircraft is kept straight by use of the rudder. At 130 kt the connection between the nosewheel steering and the rudder pedals is removed (the nosewheel now centralizes) hence in strong crosswinds more rudder input will be required at this point to prevent the aircraft turning into wind. The down elevator input may be gently removed by 100 kt, rotation at VR is made at the normal rate of 3 °/second to follow the FD SRS pitch commands (in the event of no FD select 15° pitch with 2 engines or 12.5° in the event of an engine failure).

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

15.Initial Climb

Having confirmed a positive rate of climb, the gear is retracted and the aircraft climbs away following the FD commands. Care should be taken to restrict control inputs to those necessary to change or correct the flight path only i.e. avoid overcontrolling.
At thrust Reduction Altitude "CLB" will flash on the upper left portion (ATHR) of the PFD. Move the thrust levers to the CLB detent (two "clicks" from TOGA or one "click" from FLEX). Do not do this too slowly or there is a danger that the ATHR may disconnect. The autothrust is now active. If the acceleration altitude was coincident with the thrust Reduction Altitude, then the speed target will have changed to the ECON climb speed or the climb preset speed. If acceleration altitude is higher than Thrust Reduction Altitude, the speed change will occur when acceleration altitude is reached. Retract the flaps on schedule at F and S speed. When the final configuration for the exercise has been achieved (normally flap 1 for circuit training) activate approach and ensure that managed speed is active, and check VAPP on both PFD's.

16.Circuit Handling

Remember that in pitch the sidestick is demanding "g" and that in roll it is demanding roll rate, take care not to overcontrol. All visual circuits MUST be flown with FDs off and FPV selected, bank angle should be limited to 30°. It is usual to switch FDs off at the begining of the downwind leg. Use of managed speed is normal procedure as well as use of autothrust. The standard timing of 45 seconds (+/- wind) may be used from abeam the end of the runway prior to turning base leg. Flap 2 is selected at this point followed by gear down, and a descent commenced.

The most useful PFD display is the raw FPV symbol to assist in setting the aircraft up on the correct downwind, approach path, to maintain altitude and to avoid gross errors.

NOTE : *With the FDs off the speed target remains magenta VAPP target and the ATHR controls the GS mini.*

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (CONT'D) :

E. CONDUCT OF TRAINING FLIGHTS (CONT'D)

b. Flight Training Policy (cont'd)

17.Final Approach and Landing

ILS guidance may be used, if available, for the first ILS assisted visual approach, after this the use of the ILS should be restricted. Trainees are required to demonstrate their ability to fly a visual approach without ILS or VASI guidance. As has already been stated the FDs are not to be used for visual approaches. The FPV symbol is the most useful aid to establishing the correct approach path. Autothrust is normally used, again however, trainees must demonstrate their ability to fly the approach using both manual and automatic thrust. The speed trend arrow is particularly useful for achieving timely and correct thrust response. Care should be exercised to 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 "stabilised" by 500' AGL, that is on the correct approach path at VAPP (or GS mini) with the appropriate thrust applied ; if stabilisation is not achieved, a go around should be considered. Avoid any tendency to "duck under" in the later stages of the approach. One dot below the glide at 50' is 14' below the ideal glide path, 2 dots is 28'. When the aircraft's glideslope antenna is at 50' the main gear is at 37' AGL and at threshold the main gear is at 34'. In any event, avoid destabilisation of the approach in the last 100' to give the best chance of achieving a good touch down at the required position.

18.Flare and Landings

Standard Landings :
The pilot's view from the cockpit of the A320 during approach and landing is particularly good. The cockpit cut off angle is 20° which gives a superb view of the runway close to the aircraft. Students must make sure that they look well ahead during the flare and landing to enhance their ability to judge the position of the aircraft relative to the ground. At 20' "Retard" will be called. Reduce the thrust levers promptly to idle. Commence a gentle progressive flare and allow the aircraft to touch down without a prolonged floating flare. Do not attempt to "hold the aircraft off" as considerable float may be followed by a hard touchdown.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

AIRCRAFT (END) :

E. CONDUCT OF TRAINING FLIGHTS (END)

b. Flight Training Policy (end)

18.Flare and Landings (end)

Crosswind Landings :
Either the "forward slip" or the "decrab" technique may be used. The preferred technique is the decrab method ; allow the aircraft to point into wind, pushing it straight with gentle use of rudder during the flare. If the decrab is gentle, little, use of into wind aileron will be required if any. For rapid decrab using large or fast rudder inputs, the aircraft will roll conventionally and aileron sidestick inputs will be required (see also FCOM bulletin n° 21). REMEMBER the sidestick demands roll rate, once the wings are level centre the sidestick.

19.Caution

Avoid flaring high and prolonged "hold offs". Tailstrike will occur if the pitch attitude exceeds 13.5° (11.3° with the oleos compressed). Similarly the wing tip will scrape the ground at roll attitudes approaching 18°. It should also be remembered that there is a pitch up tendency with ground spoiler extension. If any doubt exists as to the safety of the flare or landing an immediate go around should be executed (see also FCOM bulletin n° 22).

DOCUMENTATION :

The following documentation will be provided, as appropriate, prior to the commencement of the flight. In particular, the weather folder, notams, ATC flight plan, overflight clearances and computer flight plan (where necessary), will be provided by AI/ST Operations by the time the crew report for briefing

A. AIRCRAFT UNDER AIRLINE REGISTRATION AND F.O. REGISTRATION

a. Aircraft Documentation

- Contract
- Certificate of insurance
- Airworthiness certificate
- Certificate of aircraft registration
- Radio station licence
- Flight Manual
- FCOM
- Quick Reference Handbook
- MEL
- Airline maintenance LOG (if needed)

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (CONT'D)

DOCUMENTATION (CONT'D) :

A. AIRCRAFT UNDER AIRLINE REGISTRATION AND F.O. REGISTRATION (END)

b. Training Documentation

- Weight and balance report *
- RTOLW *
- JEPPESEN documentation *
- Notams *
- Weather folder *
- AI/ST-T flight LOG
- AI/ST-T briefing book
- Airbus maintenance LOG
- Flight syllabus
- Take-off data cards (if needed)

c. ATC Flight Plan

d. Documentation for Flight Outside France

- Certificate of insurance *
- Crew general declaration *
- Manifests for passengers and cargo *
- Overflight and landing permits *

e. Personal Documents

- Flight crew licence
- Individual licence validation or copy of a telex indicating that the instructor is duly authorized by the relevant Authorities to conduct the Flight Training.

NOTE : *Items marked * are under AI/ST - OPS responsibility, but if any other document is missing, AI/ST - OPS will coordinate with the appropriate Office.*

f. Flight Logs and Trainees Files

- AI/ST Flight log must be filled in at AI/ST-OPS counter.
- The daily flight log (blue cover) must be filled in.
- The trainee syllabus must be filled in, signed by the instructor AND the trainee (the orignal must be brought back to AI/ST).
- The type rating certificate and certificate of Course completion must be signed by the instructor : originals to be given to the trainee.

BASE TRAINING BRIEFING (CONT'D)

03 - EQUIPMENT (END)

DOCUMENTATION (END) :

B. AIRCRAFT UNDER AIRBUS REGISTRATION (FWW...)

a. Aircraft Documentation

- Permit to fly : DGAC "LAISSER PASSER EXCEPTIONNEL" **
- Certificate of insurance **
- Flight Manual **
- FCOM **
- Quick Reference Handbook **
- Airbus maintenance LOG **

b. Training Documentation

- Weight and balance report *
- RTOLW *
- JEPPESEN documentation *
- Notams *
- Weather folder *
- AI/ST-T flight LOG
- AI/ST-T briefing book
- Flight syllabus
- Take-off data cards (if needed)

c. ATC Flight Plan *

d. Documents for Flight Outside France

- Certificate of insurance
- Crew general decleration
- Manifests for passengers and cargo
- Overflight and landing permits

e. Personal Documents

- Flight crew licence
- Instructor licence

NOTES :

- *Items marked * are under AI/ST - OPS responsiblity, but if any document is missing contact AI/ST - OPS who will coordinate with the appropriate Office.*

  *Items marked ** are under AI/EV - OPS responsibility.*

- *AIRBUS FLIGHT LOG must be filled in at AI/EV - OPS after the flight.*

04 - INSTRUCTOR'S ACTIONS

Refer to 03 - E. b. "Flight Training Policy"

BASE TRAINING BRIEFING (END)

05 - TRAINEES' ACTIONS

Refer to 03 - E. b. "Flight Training Policy"

06 - COMPLETION STANDARDS

(TBD)

07 - COMMON ERRORS

(TBD)

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01 - TRAINING OBJECTIVE

- To perform a standard exterior inspection.

02 - SCHEDULE

- Briefing duration : 5 minutes

03 - EQUIPMENT

- VACBI Video

DOC references :
- QRH 3.01 (Normal Procedures)
- FCOM 3.03.04 (Preliminary cockpit preparation)
- FCOM 3.03.05 (Exterior inspection)
- FCOM 3.04.91 (Adverse Weather)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Safety exterior inspection.
- Preliminary cockpit preparation items.
- Walk around pattern.
- Tire wear limitations.

<u>SECONDARY</u>

- Brake wear indicators.
- APU fire extinguisher overpressure indicator.
- Crew oxygen overboard discharge indicator.

05 - TRAINEES' ACTIONS

Importance of safety exterior inspection and preliminary cockpit inspection particularly if it is first flight of the day.
Detail brake and tire wear limits and note that the brakes must be on for the brake wear indicators to be checked. This can be confirmed from the parking brake light on the nose leg.

06 - COMPLETION STANDARDS

- Makes a systematic, methodical and complete inspection.

07 - COMMON ERRORS

- Inspection not conducted during transit stop.

- Preliminary cockpit inspection forgotten.

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01 - TRAINING OBJECTIVE

- To perform normal and transit cockpit preparation in accordance with standard procedures.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- QRH 3.01 & 3.02 (Normal procedures)
- FCOM 3.03.01 to 3.03.07 (SOP's)
- FCOM 3.04.91 (Adverse weather - Cold weather)
- FCOM 4.03.20 (FMGS Pilot interface)
- FCOM 4.04.20 (FMGS - How to use)
- FCOM 4.05.10 (FMGS procedures)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Safety check before power connected to aircraft.
- Push button and "lights-out" philosophy.
- Preliminary inspection.
- Exterior inspection.
- Overhead panel scan.
- FMGS initialization.
- Remainder of scan.
- Briefing.

<u>SECONDARY</u>

- Cockpit preparation adapted for special conditions e.g. cold weather.
- Performance calculations take into account actual conditions (weather/aircraft).

05 - TRAINEES' ACTIONS

On ECAM a check of hydraulic fluid and engine oil levels should be made. Additionally press RCL pb in order to check any defects and refer to MMEL if necessary.
Check of technical log with reference to MMEL if necessary. An useful order for cockpit preparation is :

- Scan (Overhead panel scan and area of responsibility)
- Program (Program the FMGS with data)
- Instruments (Check flight instruments)
- Take off briefing (Done before engine start)

Pattern of scan depends on whether the pilot is PF, PNF, CM1 or CM2, with differing areas of responsibility (FCOM 3.03.06 [SOPs - Cockpit Preparation]).

It may be useful to programme the FMGS in the following order. Remember to fill in all the amber boxes. Enter other information as time allows.

- INIT A page
- F-PLN page A & B
- SEC F-PLN
- RAD NAV page
- INIT B page
- PERF page

Consider using the secondary flight plan to have available ; an alternate runway, departure routing, return to the departure airfield or routing to take off alternate.

- PNF should cross check all data entries in FMGS.
- Once the completed load sheet has been received, the FMGS INIT B page may be filled in with relevant information.
- Take-off briefing to be accomplished prior to engine start.
- Once scan is complete there should be no white lights on the overhead panel, making it easy to verify that all items have been done.
- Completion of Before Start checklist above and below the line.

06 - COMPLETION STANDARDS

- Completes all actions in correct sequence in a timely manner (30 minutes normal preparation, 20 minutes for transit preparation).
- Respects task sharing and areas of responsibility.
- Ensures good crew communication and mutual cross-checking.

07 - COMMON ERRORS

- Correct sequence and areas of responsibility not respected.
- MCDU preparation incomplete or in wrong sequence.
- Take-off briefing not completed before push back / engine start.

01 - TRAINING OBJECTIVE

- To conduct an effective and comprehensive take-off briefing.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 3.02 (Normal procedures)
- FCOM 3.03.06 (Cockpit preparation)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Take-off briefing conducted at the right time (prior to before start checklist).
- EFIS and MCDU used as main reference during briefing.
- Applicable NOTAMs mentioned.
- All items covered in a logical sequence.
- Re-briefs in case of late changes.

SECONDARY

- Importance of ensuring that the briefing is fully understood by PNF.

05 - TRAINEES' ACTIONS

The take-off brief should be a clear and comprehensive statement of intended courses of action, covering the normal and abnormal cases. It should be given at a time when the workload is low, so that both pilots may concentrate on its content. Due regard should be taken of the actual weather conditions. It should occur at the end of the cockpit preparation, prior to the engine start.

Maximum use should be made of the FMGS MCDU and EFIS as the prime reference for the departure briefing.

All items should be covered in a logical manner, and a check of the PNF's understanding done at an appropriate stage.
If items such as runway changes, last minute passengers are anticipated, then the brief should be updated accordingly e.g. V speeds.
For typical brief contents see FCOM 3.03.06 (SOPs - Cockpit Preparation).

Special attention should be paid to actual conditions affecting the take-off (runway condition, difficult SID, weather etc.) rather than merely giving a generalised take-off briefing.

06 - COMPLETION STANDARDS

- Performs a briefing that is clear and covers all required items, according to actual circumstances.
- Confirms that the briefing is fully understood by all crew members.

07 - COMMON ERRORS

- Take-off briefing not carried out before engine start.
- Real weather conditions not taken into account.
- PF does not confirm that all aspects are fully understood by PNF.
- Logical briefing sequence not respected.
- Briefing excessive in length and/or contents.
- EFIS, ECAM, MCDU, FCU not used to confirm briefing data.

01 - TRAINING OBJECTIVE

- To perform normal engine start.
- To recognize the need to use manual engine start procedure.
- To carry out manual engine start procedure.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :

- QRH 3.03 (Engine Start)
- FCOM 1.70.80 (Ignition and starting)
- FCOM 3.03.08 (Engine Start Auto)
- FCOM 3.04.70 (Engine Start Manual)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- FADEC power check complete before setting ENG MASTER sw ON.
- Check of bleed pressure on lower ECAM.
- Correct monitoring of parameters during starting sequence (for manual start).
- Hand on Master switch (for manual start).
- Use of CHRONO during manual start.

<u>SECONDARY</u>

- Significance of maximum motoring speed (manual start).
- Abort of manual start

05 - TRAINEES' ACTIONS

Automatic start is normally used, although at hot or high airfields, bleed duct pressure may be low, necessitating a manual start. Furthermore, low air pressure from an external source may require a manual start.

Auto starting

- Check thrust levers at idle before selecting IGN/START switch to START.
- Check ECAM amber crosses disappear from screen before selecting master switch to "on" (V2500, amber crosses remain on N1 and N2 until 3.5% and 6% respectively).
- Check bleed pressure sufficient.
- Monitor parameters in order :
  - Bleed valve opens
  - N2 increases
  - Igniter displayed
  - Fuel flow
  - Light up
  - Starter cut-out
  - Bleed valve closure
  - EGT peaks then decreases
- Repeat for second engine start.
- Engine mode selector to NORM.

Manual starting

- Check thrust levers at idle before selecting ENG MODE SELECTOR.
- Remember use of stopwatch.
- Check ECAM amber crosses disappear from screen before selecting MAN START pb to "on" (V2500, amber crosses remain on N1 and N2 until 3.5% and 6% respectively).
- Delay selecting MASTER switch to "on" until max motoring speed (minimum 20% for CFM and 15% for IAE, also for IAE MASTER switch must be set to on 50 sec after setting MAN START pb to ON). If unable to achieve these figures, load shedding may be required . (See FCOM 3.04.70 [Supplementary Techniques - Power Plant] for definition of max motoring and load shedding)
- Monitor parameters with regard to time limits.
- At N2 = 50 % (43% for V2500), check start valve cross line.
- MAN START pb to "off".
- Engine mode selector to NORM.

The action of putting the engine mode selector switch to NORM will trigger the after start scan (FCOM 3.03.09 [SOPs - After Start]). This is followed by the after start checklist.

06 - COMPLETION STANDARDS

- Determines and applies appropriate engine start procedure (Auto or manual).
- Monitors engine parameters on ECAM during the starting sequence.

07 - COMMON ERRORS

- Thrust lever(s) not at idle.
- IGN/START not selected before ENG MASTER sw ON.
- Bleed pressure not checked.
- APU Bleed not on.
- Hand not on the ENG MASTER sw (manual start).
- Stopwatch not used or not started at ENG MASTER sw ON (manual start).
- ENG MASTER sw ON below maximum motoring speed (manual start).
- ENG START sel left at IGN/START after start completion.

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01 - TRAINING OBJECTIVE

- To taxi safely using correct nose wheel steering and braking techniques.
- To perform the required procedures during taxi.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 3.03 & 3.04 (Taxi and before take off)
- FCOM 1.32.20 (Nose wheel steering)
- FCOM 3.03.10 (SOPs)
- FCOM 3.04.27 (Supplementary Techniques)
- FCOM 4.05.20 (FMGS procedures - Taxi)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Technique for use of "Taxi by Wire" nose wheel steering.
- Control of ground speed.
- Task sharing during flight controls check and final briefing.
- Confirmation of final data using EFIS, ECAM and MCDU.

<u>SECONDARY</u>

- Location of related items :
- Antiskid and nose wheel steering switch.
- Brake and ACCU PRESS Indicator.
- Brake temperature.
- Ground speed.
- Packs off policy and procedure.

05 - TRAINEES' ACTIONS

On receipt of taxi clearance, set nose light "on". While maintaining pressure on pedals, release the parking brake. Check brake pressure reads zero, indicating a successful hydraulic power changeover. At light weights no power is needed for the airplane to start moving. At heavy weights apply minimum power smoothly to get the aircraft moving, thereafter little power is required to maintain motion.

05 - TRAINEES' ACTIONS (END)

Avoid high power settings due to the risk of FOD (Foreign Object Damage). Maintain suitable ground speed with reference to the ND. Do not ride the brakes. Allow aircraft to accelerate, brake, then accelerate again. This reduces brake wear. On carbon brakes, brake wear is a function of number of brake applications not the pressure applied nor the duration of the braking. Brake wear is greatest when the brakes are cold. Carbon brakes do not "fade" at high brake temperatures.

If brakes fail during taxi, select A/SKID & N/W STRG sw to "off ". Pedals should be released when switching A/SKID to "off ". Steering is then achieved through differential braking. Only in extreme emergency should the aircraft be stopped with parking brake, as full pressure is immediately applied.

Nose wheel steering is "fly by wire" with no mechanical connection between tiller and nose wheel. The relationship between tiller deflection and nosewheel angle is not linear. Forces are light and care is necessary to make gentle movements on the tiller to avoid unnecessary high rate turns. Very tight turns may be made, but over controlling may be noticeable. When turning at low speed, maintain chosen tiller position and if necessary, accept a tighter turn radius than intended to achieve a smooth turn. The sensitivity of nosewheel steering responses to inputs from rudder pedals or hand wheels reduces as speed increases (FCOM 1.32.20 [Landing Gear - Nosewheel Steering]). Nosewheel steering will not be effective above 130 kts.

When clear of apron, flight control checks may be made. The F/CTL page is automatically displayed on movement of the controls.

ATC clearance may then be received or confirmed, the FMGS and briefing should be modified if there are any changes. When a packs off take-off is planned, the packs should be switched off just prior to completing the before take off checklist.

Complete the Before take off checklist.

06 - COMPLETION STANDARDS

- Monitors and controls ground speed using correct technique.
- Does not exceed maximum taxi speed of 30 kts in a straight line or 10 kts in a sharp turn.
- Makes smooth, progressive use of nose wheel steering.
- Strict application of task-sharing requirements.

07 - COMMON ERRORS

- Excessive thrust application after break release.
- Taxiing too fast.
- Riding the brakes.
- PF distracted by F/CTL page during flight control check.
- Overcontrolling on the tiller leading to scuffing of nose wheel tire.

01 - TRAINING OBJECTIVE

- To perform a take-off and initial climb to acceleration altitude in accordance with standard procedures.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :

- QRH 3.04 (Normal procedures)
- FCOM 3.02.70 (Thrust lever faults)
- FCOM 3.03.12 (SOP's)
- FCOM 3.04.27 (Flight controls)
- FCOM 4.05.30 (FMGS - Take-off)
- FCOM Bulletin 22 (Tailstrike)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Stabilize engine before setting take-off power
- PNF : check of take-off power.
- Rotate to initial pitch attitude and maintain until SRS established.

SECONDARY

- Rolling take-off recommended.
- No flap retraction until acceleration altitude, speed trend positive and speed target above current airspeed.
- Pack operation

05 - TRAINEES' ACTIONS

While turning onto the runway, it is important not to waste any runway available, and a rolling take-off is recommended. In normal conditions i.e. no strong crosswind or very aft CG, apply half forward stick. This should be progressively reduced to neutral between 80 kts and 100 kts. Start the CHRONO as the take-off roll is commenced.

Set the power in two stages, allowing engines to stabilize at approximately 50% N1/1.05 EPR, before setting FLEX or TOGA power. The engine page will be automatically displayed on the SD. A thrust disagree warning will be triggered if the two FADECs select a different thrust take-off mode on the ground.

05 - TRAINEES' ACTIONS (END)

Ensure FMA annunciation's are called and a check of the FM position is performed (on ND, airplane symbol is centered on runway). FLEX or TOGA thrust must be achieved before reaching 80 kt. Remember to check power is set correctly and to call "Power Set".

Maintain runway centeline with rudder pedals, the stick remaining neutral (unless very strong crosswinds or very aft CG). This is because any sidestick displacement will cause the spoilers to deploy. By 130 kt, the connection between nosewheel steering and rudder pedals is removed, and more rudder input will gradually be required to prevent the aircraft turning into wind.

At VR, rotate the aircraft smoothly to 5° nose up, thereafter follow SRS. During this time the control laws will change to flight mode. Above 30 ft auto pilot is available.

A positive rate of climb should be confirmed on altimeter, VSI and RA before requesting retraction of the undercarriage.

Good technique is required in order to avoid tail strike, particularly on the A321. Early rotation, over-rotation and excessive pitch rate (or any combination) may all cause a tailstrike on take-off (refer to FCOM bulletin 22). In the event of a tail strike, flight at high altitude is not recommended and an immediate return should be considered.

At thrust reduction altitude, reduce aircraft pitch attitude, and with a positive speed trend, reduce thrust to the climb gate. Check FMA annunciation's and retract flaps on schedule. The F and S speeds are minimum speeds for flap retraction and not speeds at which retraction is essential. Ensure a positive speed trend before flap retraction. When accelerating through 210 kts with CONF 1 + F selected, the flaps will automatically retract to CONF 1, well before VFE of 215 kts. Flaps will not automatically re-extend if speed drops below 210 kts (FCOM 1.27.50 [Flight Controls - Flaps and Slats]). Complete after take-off items and then the after take-off checklist.

If a packs off take-off was carried out, PACK 1 should be selected on at thrust reduction and PACK 2 when the flaps have been retracted.

06 - COMPLETION STANDARDS

- Lines up on and maintains centerline.
- Confirms FMA modes and FMGS position update.
- Makes standard call-outs on schedule.
- Rotates at correct rate to initial pitch target (15°).
- Accurately follows flight director commands.
- Maintains speed between V2 and V2+20 kt during initial climb.
- Ensures landing gear and flap retraction according to standard procedures.
- Follows published SID or ATC clearance.
- Respects task sharing requirements.

07 - COMMON ERRORS

- Runway wasted during line-up and initial power setting.
- Use of nosewheel steering tiller during take-off roll.
- Not starting CHRONO.
- FMA callouts late or missed.
- FMA callouts not acknowledged.
- "Power set" call missed or made before parameters stabilized and checked.
- Half forward stick not applied.

CROSSWIND OR TAILWIND

01 - TRAINING OBJECTIVE

- To apply correct technique for take-off when crosswind exceeds 20 kts.

02 - SCHEDULE

Briefing duration : 5 minutes

03 - EQUIPMENT

DOC references :
- FCOM 3.03.12 (Procedure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Stick / Thrust lever procedure.
- Use of into wind aileron.

05 - TRAINEES' ACTIONS

In cases of strong crosswind and or tailwind, the following technique is recommended :

- At commencement of the take-off roll, apply full forward stick. Move the thrust levers progressively to reach FLEX/TOGA power by 40 kts. Small inputs on the sidestick laterally may be made, although too large an input will cause spoiler deployment. During rotation, the stick should be centralized so that the aircraft gets airborne with zero roll rate demand.

06 - COMPLETION STANDARDS

- Knows and applies correct technique.

07 - COMMON ERRORS

- Stick not fully forward.
- Too much into wind aileron causing spoiler activation.
- Aircraft deviation from centerline.
- "Positive climb" call made without confirmation on altimeter, VSI and RA.

01 - TRAINING OBJECTIVE

- To perform a climb to cruising altitude in accordance with standard operating procedures and techniques.

02 - SCHEDULE

Briefing duration : 5 minutes

03 - EQUIPMENT

- FMS Freeplay Trainer

DOC references :
- QRH 3.04 & 3.05 (Normal procedures)
- FCOM 1.22.30 (Auto Flight)
- FCOM 3.03.13 & 3.03.14 (SOPs)
- FCOM 3.04.27 (Flight controls)
- FCOM 3.04.91 (Adverse Weather)
- FCOM 4.05.40 (FMGS - Climb)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Use of managed speed for normal climb with CLB or OP CLB.
- Use of V/S, EXP CLB or selected speed for improved climb rates.
- Correct setting of altimeters at transition altitude.
- FMGS procedures.

SECONDARY

- Turbulence speeds in the climb.
- Presetting climb speed (MCDU PERF CLB page) and cancelling.
- Climb predictions (MCDU PROG page).

05 - TRAINEES' ACTIONS

At an appropriate time in the climb the following actions should be accomplished :

- above transition altitude, check all altimeters set to standard setting.
- copy active flight plan into secondary, to ensure that secondary sequences with primary.
- clear RAD NAV page to allow auto tuning.
- carry out a check of navigation accuracy (may be left until in cruise).
- switch off seat belt signs (according to airline policy).

The best speed for economy climb is FMGS managed speed. If however a greater rate of climb is required there are several options.

- Best rate of climb is achieved by selecting green dot speed (or EXP CLB which gives a target of green dot, on the A320), however at high altitude it will take a long time to accelerate from green dot to cruise speed.
- For long term maximization of climb rate, use a selected speed between green dot and ECON speed.
- Use of V/S is possible but A/THR mode becomes SPEED when V/S is selected. Care should be taken to monitor speed trend. If speed decays into VLS, a mode reversion will occur. (FCOM 1.22.30 [Vertical Modes] and Briefing Note - Flight Director Mode Reversions.)

If turbulence is forecast, or experienced, in the climb use turbulence speeds of 250 kt below 20,000 ft, and 275 kt /0.76 Mach above.

06 - COMPLETION STANDARDS

- Demonstrate the ability to use the various climb techniques available.
- Maintains speed within +/-10 kts of target.
- Follows SOP's.

07 - COMMON ERRORS

- Omitting to set BARO REF to STD.
- Not monitoring FMA when using V/S.

01 - TRAINING OBJECTIVE

- To efficiently manage the cruise phase.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

- FMS Freeplay Trainer

DOC references :
- QRH 3.05 & 4.08 to 4.10 (OPS data)
- FCOM 1.22.20 & 30 (Auto Flight)
- FCOM 3.03.15 (SOP's)
- FCOM 3.05.15 (Cruise)
- FCOM 3.05.20 (In cruise check)
- FCOM 4.05.50 (FMGS Procedure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Maximum flight level.
- Optimum flight level.

SECONDARY

- Long range cruise.
- Atmospheric influence.
- Step climb.
- Insertion of forecast winds in F-PLN page if not done during preflight preparation.

05 - TRAINEES' ACTIONS

At the top of climb, and periodically throughout the cruise, conduct a check of the ECAM system pages. Navigation accuracy should be checked regularly and monitored using raw data as required. If FMGS navigation performance is unsatisfactory, use selected guidance and navigate using raw data. See also Briefing Notes - Global Positioning System (if fitted) and FMGS Position Updating.

Selection of cruise altitude and speed will depend on several factors including the overall sector length, cost index and aircraft weight.

Cost index is a number which takes account of fuel costs and aircraft operating costs to allow the FMGS to compute an optimum cruise speed taking into consideration headwind, or tailwind, component. For example, low fuel costs and high operating costs will lead to a high cost index and fast cruise speed. Cost index will also affect climb and descent speeds.
In order for the FMGS to enter the cruise phase and the F-PLN page predictions of fuel on arrival (destination and alternate) to be correct, it is necessary to ensure that the cruise altitude entered in the PROG page and the actual cruise altitude are the same. Forecast winds and temperatures should also be entered in the F-PLN at appropriate points along the route so that accurate predictions will be calculated. Additionally any step climbs should be included in the F-PLN.

Should these predictions indicate that the aircraft will arrive below minimum fuel or late, then manipulation of the cost index may allow the target to be achieved. Selection of CI 0 will select maximum range and CI 999 will select minimum time in the FMGS predictions and managed speeds.

If actual cruise altitude is less than that entered in PROG page the FMA will indicate ALT. To enable engagement of ALT CRZ (soft altitude mode) the actual altitude must be entered in the PROG page. Selection of a higher altitude on the FCU than that entered in PROG will automatically update PROG page with a new cruise altitude.

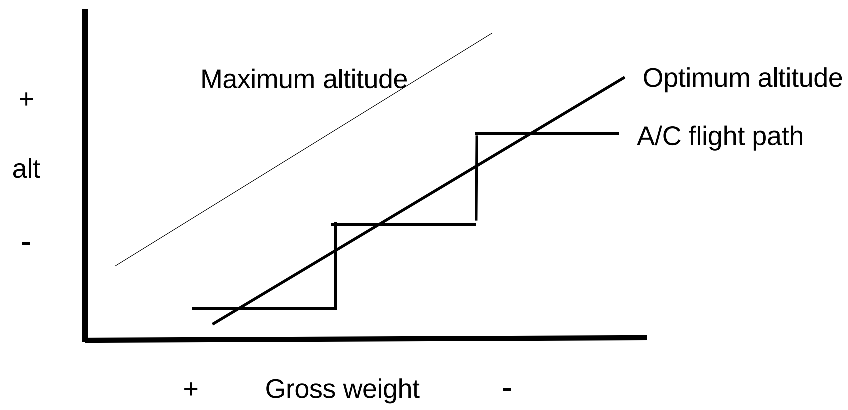
For short sector lengths the most economic cruise altitude is not necessarily the maximum which can be achieved. See FCOM 3.05.15 (In Flight Performance - Cruise) for a graph which enables selection of the best cruise altitude on short sectors.

Optimum altitude (OPT) is the altitude at which the aircraft covers the maximum distance per kilogram of fuel. It is computed from aircraft current GW, CI, deviation from ISA and a minimum of 5 minutes in the cruise. Recommended Maximum (REC MAX) altitude ensures a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust and level flight at MAX CRZ thrust, limited to FL 390. (FCOM 2.05.20 [Flight Planning - Cruise Level])

In order to fly at maximum range, an aircraft must operate continuously at optimum altitude. This would mean that the aircraft would have to climb continuously in order to remain at optimum altitude (cruise climb). Usually this is not possible so the most fuel efficient way is to step climb to an altitude that is slightly above optimum. As gross weight decreases the optimum altitude will increase and another step climb is required.

05 - TRAINEES' ACTIONS (END)

The diagram overleaf demonstrates the ideal flight path given the constraint of maintaining given cruising altitudes :



The FMGS PROG page gives an optimum altitude and a recommended maximum altitude. Recommended maximum altitude is limited to FL 390. Selecting a cruise altitude not more than 2000 ft above optimum will maintain fuel efficiency and a sensible maneuver margin.

QRH 4.08 provides graphs for use in flight to determine maximum altitudes.

06 - COMPLETION STANDARDS

- Correctly determines optimum cruising altitude.
- Maintains cruise altitude +/-100 ft and speed +/-10 kts or +/-0.01Mach.
- Adjusts cruise parameters according to flight circumstances.

07 - COMMON ERRORS

- Atmospheric influence not taken into account.
- Speed/Mach change not considered to improve fuel economy.
- Wrong cruise altitude in PROG page

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01 - TRAINING OBJECTIVE

- To carry out a complete and comprehensive preparation for descent and approach.
- To carry out a crew briefing, in a timely manner, covering all aspects of the descent and approach.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH 3.05 (Task sharing)
- QRH 4.10 (Descent Data)
- FCOM 3.03.16 (Standard Procedures)
- FCOM 4.05.60 (FMGS Procedures)
- Briefing note - Performance (Climb and descent)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Descent and approach preparation carried out in good time before top of descent.
- Procedure for data entry into MCDU must be methodical.
- All data entries cross-checked by other crew member.
- Briefing conducted with maximum use of EFIS and MCDU displayed data.

SECONDARY

- Navigation accuracy and Minimum Enroute Altitude (MEA) check before beginning descent.

05 - TRAINEES' ACTIONS

At a suitable time prior to descent, the PNF should obtain the latest destination airport weather. Other pertinent information such as runway in use, its condition, and airport NOTAMS should be obtained at this time.

The FMGS should then be programmed using the most up to date information, following the FPRS format :

F - Flight plan modifications (check that TOD is at a reasonable position)
P - Performance descent winds, destination airfield weather and landing flap selection
R - Radio aid selection, tuning, and course selection
S - Secondary flight plan to cover contingencies e.g. runway change

The fuel predictions (fuel at destination, alternate and extra fuel) on the FUEL PRED page will only be accurate if the F-PLN is constructed correctly in terms of arrival routing, go-around routing and route to alternate.

The descent and approach briefing should be given at a time of low workload so that both pilots may concentrate on its content. Approximately ten minutes before the start of descent point, the brief should be begun, allowing time to complete a thorough brief. Use the EFIS and MCDU to brief routes and procedures. (Items to be covered are listed in FCOM 3.03.16 [SOPs - Descent Preparation]). As for the before take-off briefing, it is important that actual conditions are briefed rather than merely repeating a standard brief.

Emphasis must be placed on Minimum Enroute Altitudes (MEA), and safe altitudes near destination airport. Other items, such as special requirements (anti-ice, failure cases), descent strategy or other constraints should be mentioned.

All data entries must be cross-checked by both pilots and any ambiguities resolved.

Prior to commencing the descent, a navigational accuracy check should be carried out. Throughout the descent, only one "head down " at any time.

06 - COMPLETION STANDARDS

- Obtains valid information for the destination airport.
- Carries out all items required to prepare the aircraft for the descent and arrival procedure.
- Conducts a comprehensive descent and approach briefing as detailed in FCOM 3.03.16 (SOPs) and includes any special requirements.

07 - COMMON ERRORS

- Late, and therefore, rushed descent and approach preparation and briefing leading to important items being omitted.
- Data entries not checked by both crew members.
- Distraction, leading to "two heads down" situations.

01 - TRAINING OBJECTIVE

- To understand and implement the correct descent entry according to aircraft position and required descent path.
- To use all information and symbols available from MCDU and EFIS to properly monitor descent progress.
- To use the appropriate method to adjust descent rate as necessary to regain required path.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH 3.05 (Task sharing)
- QRH 4.10 (OPS Data)
- FCOM 3.03.17 (Standard Procedures)
- FCOM 4.02.30 (Flight guidance)
- FCOM 4.05.60 (Procedures)
- FCOM Bulletin nº 09 (Open descent)
- FCOM Bulletin nº 16 (Mode reversions)
- FCOM Bulletin nº 41 (VMO/MMO Exceedance)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Techniques for initiating descent.
- FMA/AP and A/THR descent modes.
- MCDU and EFIS descent information and symbols.
- Techniques for adjusting descent rate.
- Controlled Flight Into Terrain (CFIT)
- GPWS warnings and required reactions.

<u>SECONDARY</u>

- Descent planning "rules of thumb"
- Engine Anti-ice requirements.
- Radar tilt angles.
- Level-off techniques.

05 - TRAINEES' ACTIONS

The calculated top of descent point is only valid for the routing entered in the F-PLN page. Ensure that the F-PLN page contains the routing you expect to fly.

MANAGED DESCENT

The normal method of initiating a descent is to select DES mode at the FMGS calculated top of descent point. However, if an early descent is required by ATC, engaging descent mode will give 1000 fpm rate of descent until regaining the computed profile. If descent is delayed, a DECELERATE message appears in amber. To regain the optimum descent profile, a decrease in speed may be permitted towards green dot. Thereafter, managed descent mode is used to "catch up" with the ideal profile, when cleared for descent.

In DES mode, there is a target speed with high and low speed brackets. Speed will vary between these brackets to maintain the airplane on the required descent path. The speed will vary because the actual conditions (wind, temperature, use of anti-ice etc.) will differ from the assumptions made by the FMGS. If the speed decays towards the lower bracket, power will be applied to maintain the programmed path and MACH (SPEED) is annunciated in the FMA. Should the speed rise to the upper bracket, and it is computed that the required profile will not be regained, a white MORE DRAG message is displayed. The PROG page and on the ND, the level symbol should be used to monitor progress in the descent.

Under normal circumstances, thrust will be at idle. However, if a slow descent is required, or the speed has decayed then the thrust mode changes to speed. Similarly, if a speed increase is required (maybe due to ATC) then using a selected speed in excess of optimum will command the autothrust to speed mode, as the aircraft applies power to keep on profile.

If an increased rate of descent is required, OPEN DES must be selected and speedbrake used as appropriate. Selecting only speedbrake in DES mode will not achieve an increase in rate of descent, as power will be applied to maintain the airplane on profile and at target speed.

OPEN DESCENT

An alternative to the managed descent is the OPEN DES mode. This will give a descent with thrust at idle, and retains the option of using a managed speed or a pilot selected speed. Speedbrake is very effective in increasing descent rate. If the aircraft is not in managed navigation, i.e. in HDG mode, then managed descent mode is not available. The aircraft will not follow a descent path but will merely descend at an idle thrust setting, and a set speed. By monitoring the ND, the level off point can be found and the PROG page gives a deviation from planned profile. If in HDG mode, then the PROG page displays required miles to touchdown and actual miles.

05 - TRAINEES' ACTIONS (END)

RECOVERING IDEAL PROFILE

If the airplane is below profile in the OPEN DES case, the simplest way of regaining the profile is to use V/S. Once on the profile again, adjust rate of descent accordingly, with speed, V/S changes or OPEN DES.

If high on profile in the OPEN DES case, speed may be increased (with the permission of ATC), or drag used. Note that in DES mode, if drag is used when attempting to steepen profile, the airplane will apply power to offset the drag and maintain the ideal profile. Thus, to increase descent rate, OPEN DES must be selected and drag used, ensuring that thrust remains at idle.

EXPEDITE DESCENT (A320 only)

Another option is to use the EXPED pb which will command target speed close to MMO/VMO. This will give a very high rate of descent and its use must be closely monitored.

OVERVIEW

In all modes the ideal profile is tracked by the VDEV indicator on the PFD. It is important at all times to bear in mind terrain and MEA considerations. The procedure for terrain checking is especially important with thrust at idle. Bear in mind the drill for recovery from GPWS warnings QRH 1.08 (GPWS Warning).A rule of thumb calculation for descent is that track miles to run should equal three times your height in thousands of feet. Exact figures are given in QRH 4.10.

The effects of engine and wing anti-ice on descent profile can be marked, as the idle N1/EPR is increased, thus giving a shallower descent profile. If already in the descent, and anti-ice is used, it is usual to see an increase in speed in DES mode. If speed increases to the upper bracket, speedbrake can be used. If in OPEN DES mode a higher selected speed is advisable. Alternately, in OPEN DES mode, half speedbrake will counteract the effects of anti-ice. Conditions requiring the use of anti-ice are listed in FCOM 3.04.30 (Supplementary Techniques - Ice and Rain Protection).

It is vital to know the operating mode of the thrust system, particularly with regard to CFIT.

Weather radar use in the descent is covered in FCOM 3.03.17(SOPs - Descent).

06 - COMPLETION STANDARDS

- Uses the correct method to initiate descent.
- Monitors descent according to expected navigation.
- Maintains heading +/-5 and speed +/-10 kts.
- Adjusts descent rate using appropriate methods bearing in mind aircraft limitations and passenger comfort.
- Complies with all ATC clearances and minimum safe altitudes.

07 - COMMON ERRORS

- ND not used effectively to monitor descent progress.
- Inappropriate methods used to adjust descent rate (Power used against speedbrake).
- Vmo/Mmo exceedance due to high cost index descent speed range.
- Inaccurate descent routing, thereby invalidating descent predictions.

STANDARD APPROACH

01 - TRAINING OBJECTIVE

- To perform an ILS approach safely and accurately in accordance with standard procedures.

02 - SCHEDULE

Briefing duration : 30 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH 3.06 (Normal procedures)
- FCOM 1.22.30 (Flight guidance)
- FCOM 3.03.18 (SOP's)
- FCOM 4.02.30 (Flight guidance principles)
- FCOM 4.05.70 (ILS approach)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Correct FMGS approach preparation.
- Approach phase activation.
- Aircraft configuration planning.
- Landing gear extension before CONF 2, if deceleration is slow.
- Procedure at Decision Altitude.

SECONDARY

- Starting of the deceleration sequence according to glide-slope capture altitude (above or below 2000 ft AGL).

STANDARD APPROACH (CONT'D)

05 - TRAINEES' ACTIONS

Correct FMGS preparation prior to descent will ease the workload during the approach phase. Should a runway change or expeditious routing be anticipated then programming the secondary flight plan accordingly will allow changes to be made quickly and easily. It is recommended that the active F-PLN be programmed with the anticipated arrival routing and runway (radar pattern or a particular procedure) and the secondary F-PLN be programmed with an alternative (full procedural pattern or an alternative runway). Program the FMGS with the routing you expect.

Both ILS pb's should be pressed prior to the intermediate approach phase and all navigation aids should be identified, and displayed as necessary. The use of the ND in nav modes and relevant range scales, with the ILS displayed on the PFD, will aid situational awareness. As always the FMGS position should be checked against raw data.

Two useful guides in descent are 250 kt at 9000 ft AAL 30 nm from touch down and 250 kt at 3000 ft AAL 15 NM from touchdown. From 250 kt in level flight deceleration to S speed with extension of CONF 1 will take approximately 5 nm.

Activation of the approach phase will allow the use of managed speed during the approach. Automatic activation will occur at the deceleration point. If an early deceleration is required then approach phase can be activated on the PERF page. When flying the intermediate approach in selected speed, don't forget to check that the approach has been activated before resuming managed speed, otherwise target speed will be descent speed. At very light weights the use of managed speed may produce speeds slower than desirable in a radar or procedural pattern in which case the use of selected speed is recommended.

When cleared for the ILS the APPR pushbutton should be pressed and G/S and LOC modes will be armed. Engagement of LOC* and LOC modes should always be monitored carefully by the crew and that the inbound course is correct.

After glide slope capture, set missed approach altitude, and check that a blue go-around procedure is displayed on the ND. If there is no go-around procedure displayed, or an incorrect procedure displayed, the F-PLN may be incorrectly sequenced or the go-around will have to be flown using selected modes. A check of the TO waypoint will indicate that the F-PLN is correctly sequenced.

The normal approach is a decelerated approach with glideslope interception occurring at S speed and flight continuing to 2000 ft AAL (minimum) at this speed, at which point the aircraft will be configured for landing in accordance with SOP's (FCOM 3.03.18 (SOPs - ILS Approach). In certain circumstances (e. g. tail wind, steep glide slope, or high weights) the aircraft may accelerate to faster than S speed in which case the landing gear should be lowered before selection of CONF 2. Speed brake can be used in certain circumstances (inhibited in CONF FULL) but be careful of VLS and high sink rates.

STANDARD APPROACH (END)

05 - TRAINEES' ACTIONS (END)

During flap extension it is important that PNF monitors aircraft IAS and VFE for the flap setting called for. If flaps are selected above VFE NEXT the control surfaces will move but the aircraft will give an overspeed warning. If the IAS is great enough, high speed protections will be activated resulting in a pitch up.

Should the glideslope be intercepted in level flight below 2000 ft AAL (1500 ft minimum) then CONF 2 should be selected at one dot below the glideslope and thereafter standard approach procedures followed.

PNF should monitor closely the aircraft flight path during the final approach phase and be ready to call out V/S greater than 1000 fpm, airspeed deviation of +10 kts or -5 kts, or LOC/GS deviation of more than 1 dot.

The final approach phase is one in which pilot incapacitation is both more likely and more critical, therefore PNF should closely monitor the performance of PF and be ready to take control if necessary.
The aircraft should be stabilized in the approach configuration by 1000 ft AAL (500 ft AAL in VMC) or a go around should be carried out.

When the autopilot is disconnected avoid the temptation to make inputs on the sidestick. The aircraft will be stabilized and tracking towards the runway. Avoid the tendency to turn towards the runway in a crosswind or to "duck under" the glideslope.

06 - COMPLETION STANDARDS

- Initiates deceleration at appropriate moment.
- Configures aircraft in accordance with standard procedures.
- Maintains aircraft within one dot deflection on localiser and glideslope.
- Maintains airplane speed within +10 kts/-5 kts of VAPP.
- Makes correct decision at Decision Altitude to land or go around and executes decision correctly.
- Ensures visual segment flown smoothly and landing made within touch-down zone.
- Ensures task sharing requirements and good crew communications.

07 - COMMON ERRORS

- Misuse of flight plan.
- Approach phase not activated or speed not managed.
- Go around altitude not set.
- Centerline and/or glide slope not maintained during visual segment
- Confusion between memo display and landing memo.
- Landing configuration not stabilized by 1000 ft AGL.
- Calling for flap at VFE NEXT.

GLIDE SLOPE INTERCEPTION FROM ABOVE

01 - TRAINING OBJECTIVE

- To intercept the ILS glide slope from above.
- To correctly manage aircraft speed and configuration.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- FCOM 1.22.30 (Flight Guidance)
- FCOM 3.03.18 (SOPs)
- FCOM 4.05.70 (Approach procedures)

04 - ISTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- How to achieve desired descent rate (Speed / Drag).
- Importance of PF intentions being clearly understood by PNF.

SECONDARY

- Envelope protection.

GLIDE SLOPE INTERCEPTION FROM ABOVE (END)

05 - TRAINEES' ACTIONS

To intercept the glideslope from above the following method should be used :

V/S. .... set 1500 fpm down
APP pb.. depress
(LOC arms then engages if not already done)
FCU altitude... set above aircraft altitude
When G/S engages .... set go around altitude

It is vital to use V/S rather than OPEN DES in order that the ATHR is in SPEED mode not IDLE mode. (See also FCOM BULLETIN No 9)

Maximum descent path is obtained with CONF FULL, gear down at VMAX. Nevertheless, the rate of descent should be carefully monitored to avoid exceedance of speed limits and with respect to CFIT precautions.

Like a standard approach, the aircraft must be stabilized by 1000 ft AGL, which means it is necessary to be established on the glide path by the FAF or outer marker.

06 - COMPLETION STANDARDS

- Recognizes degree of vertical deviation and determines appropriate method to achieve interception.
- Achieves glide slope capture by FAF and ensures stabilization in landing configuration by 1000 ft AAL.

07 - COMMON ERRORS

- Lack of situational awareness.
- Using OPEN DES.
- Alt set below current altitude.
- Use of managed speed when selected speed is more appropriate.
- Exceedance of speed limitations (Vmax).
- Go around altitude not selected.
- Go around not immediately initiated if not stabilized at 1000 ft AAL.

RAW DATA APPROACH

01 - TRAINING OBJECTIVE

- To smoothly and accurately carry out a manually flown ILS approach without FD.
- To apply correct task sharing procedures for manual flight.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :
- QRH 3.06 (Task sharing)
- FCOM 1.22.30 (A/THR)
- FCOM 3.03.18 (SOP's)
- FCOM 3.03.23 (Go Around)
- FCOM 3.04.31 (Use of FPV)
- Briefing Note - Use of FPV

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Pitch attitude and power settings.
- Significance of specific indications on the PFD (FPV, Speed trend, selected track index, ILS deviation scales...).
- Early preparation for the approach and anticipation of LOC interception.
- Small, smooth corrections in pitch and bank to maintain FPV in desired position.
- Autothrust disconnection if go around below 100 ft (RA).

SECONDARY

- FDs must be selected off to view blue track index on PFD.
- ILS pb must be selected early to display deviation scales in order to allow interception of LOC.

RAW DATA APPROACH (END)

05 - TRAINEES' ACTIONS

The track bug should be set to the inbound course and remain there for the entire approach. The datum position for the FPV will always be the same whatever the prevailing conditions, i.e. at -3° (for a 3 glideslope angle) centrally below the blue line (set to ILS inbound course) on the PFD horizon. The FPV should be kept in this position so long as the aircraft is on the GS and LOC.

If the LOC index shows the aircraft is not on the centerline, adjust track to re-establish. Once on the centerline place the FPV in the datum position beneath the blue line and the aircraft will maintain the centerline.

If the GS index shows the aircraft to be high, a correction should be made by lowering the FPV to a value below -3°. Once the aircraft is re-established on the glideslope return the FPV to the datum position

Raw data must be monitored throughout the approach.

Emphasis should be placed on the advantages of this presentation. There is no guesswork involved in establishing the correct initial pitch attitude and heading, and these datums always remain constant whatever speed, configuration, or wind changes may take place.

If a go around is performed from below 100 ft RA then the A/THR will disconnect and will not be armed nor active (as the FDs are off). Note the procedure for go around without FDs in FCOM 3.03.23 (SOPs - Go Around). If A/THR is not used for the approach, the speed trend arrow is an excellent aid in maintaining the correct approach speed.

06 - COMPLETION STANDARDS

- Aircraft configuration correctly controlled.
- Maintains airplane speed within +10 kt/-5 kt of VAPP.
- Remains within half scale deflection on localiser and glideslope.
- Ensures strict application of task sharing procedures and callouts.
- Makes correct decision at Decision Altitude to land or go-around and executes decision correctly.

07 - COMMON ERRORS

- Overcontrolling in pitch and roll.
- Use of FPV as "primary" reference for pitch corrections.
- Failure to follow instrument flying techniques common to all aircraft.

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01 - TRAINING OBJECTIVE

- To safely perform all types of non precision approaches using managed and/or selected guidance as determined by system availability and/or environmental circumstances.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH 3.07, 3.08 (Normal procedures).
- FCOM 1.22.30 (Flight guidance).
- FCOM 3.03.19 (SOP's).
- FCOM 4.02.30 (FMGS principles).
- FCOM 4.05.70 (Approach procedures).
- Briefing Note - Use of FPV

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Criteria for determining type of guidance to be used.
- Correct FMGS approach preparation.
- Full approach briefing including intended guidance modes.
- Meaning and significance of all relevant PFD and ND symbols.
- Use of LOC and APPR modes.
- Aircraft configuration planning.
- Technique / monitoring of descent initiation and trajectory.
- Procedures at MDA.

SECONDARY

- Knowledge of trajectory symbols on ND.
- Relationship of FPD/FPV and wind correction.

05 - TRAINEES' ACTIONS

When an approach other than ILS is expected, it is important that a navigational accuracy check is carried out. Consider also whether to use a managed or selected approach.

Managed approach is only available if it is in the FMGS database and NAV ACCY check is positive. A positive NAV ACCY check can be confirmed even if LOW accuracy is indicated on the PROG page, see FCOM 3.03.19 (SOPs - Non Precision Approach). Otherwise an approach in selected mode (TRK/FPA) is necessary.

A fully managed approach is recommended, with the objective of being fully stabilized, at VAPP and in landing configuration at the final approach fix. By following FCOM 3.03.19 (SOPs - Non Precision Approach) techniques, a safe approach to MDA can be flown.

A non-precision approach will typically take longer to set up than an ILS approach, so allow sufficient time for preparation, briefing, and positioning the aircraft to start the approach. The FMGS must then be programmed correctly for the type of approach to be flown.

Brief accordingly, with specific reference to task sharing procedures and the importance of crosschecking, especially the intended guidance modes (TRK/FPA, HDG/V/S or fully managed). Ensure the correct navigational aids are tuned to facilitate the approach, including course settings if applicable.

<u>MANAGED APPROACH</u>

Follow the guidelines outlined below for a managed non precision approach :

Prior to approach :

- Insertion of correct approach in MCDU
- Set VAPP as a constraint at FAF
- Check all constraints in F-PLN match approach plates
- Navigation accuracy check
- Selection and identification of radio aids for approach
- Approach briefing and cross check of minima

Intermediate approach :

- Check deceleration occurs at decel pseudo waypoint or activate approach phase 10 nm prior to FAF
- Select FPD
- Ensure raw data is correctly displayed
- Verify accuracy is HIGH on PROG page or NAV ACCY positive
- Press APP pb to arm FINAL and APP NAV
- Complete approach checks when cleared to APP

05 - TRAINEES' ACTIONS (CONT'D)

MANAGED APPROACH (END)

Final approach :

- Ensure landing configuration achieved prior to FAF
- Monitor raw data and FMA, calling mode changes
- Set go around altitude

At MDA :

- If visual, disconnect autopilot and continue visually or perform a go around if insufficient visual references

Note : At the earlier of MDA -50 ft or MAP the autopilot will disconnect if in FINAL APP mode. Airbus does not recommend levelling off at MDA.

The knowledge of symbols and guidance information must be sound, and is detailed in FCOM 1.22.30 (Auto Flight - Flight Guidance). The FMGS guidance principles are contained in FCOM 4.02.30 (FMGS Principles - Flight Guidance Principles).

Raw data must be used as a cross check throughout the approach.

SELECTED APPROACH :

Follow the guidelines outlined below for a selected non precision approach :

Prior to approach :

- Keep A/THR engaged
- Select TRK/FPA as the autopilot guidance mode
- Use managed speed

Intermediate approach :

- Crosscheck FPD approach track with approach plates
- Ensure raw data is correctly displayed
- Select FPA at a proper distance prior th the published descent point (allowing time for the aircraft to react).
- Complete approach checks

Final approach :

- Ensure landing configuration achieved prior to FAF
- Monitor raw data and FMA, calling mode changes
- Set go around altitude

05 - TRAINEES’ ACTIONS (END)

SELECTED APPROACH (END)

At MDA :

- If visual, disconnect autopilot and continue visually or perform a go around if insufficient visual references

This selected non precision approach procedure is necessary when the non ILS approach is not in the database **or** the NAV ACCURACY check is negative (see FCOM 3.03.20 [SOPs - Non Precision Approach])

Raw data must be used as a cross check throughout the approach.

When planning for a circling approach, the landing runway should be inserted in the SEC F-PLN. Once downwind, having completed the instrument approach, activate the SEC F-PLN enabling use of managed speed with its associated MINI GS function. Additionally, the landing runway will be shown on the PFD to assist positioning onto final approach. Once the SEC F-PLN is activated the go-around procedure will be that for the landing runway not the instrument approach just carried out. Therefore, if visual reference is lost during the circling approach, the go-around will have to be flown using selected guidance (FCOM 3.03.20 [SOPs - Non Precision Approach]).

The landing is achieved by autopilot disconnect and visual positioning. Remember the effect of wind on your ground track as you "go visual". Be aware that the possibility of a go-around and the procedures to be followed should have been mentioned in the approach brief. The go-around should be autopilot controlled. The approach and go-around patterns are contained in FCOM 4.05.70 (FMGS Procedures - Approach).

06 - COMPLETION STANDARDS

- Makes correct choice of managed and/or selected guidance.
- Ensures standard task sharing procedures applied.
- Ensures aircraft configured in accordance with the procedure corresponding to the type of approach flown.
- Ensures approach flown within 5 of the required track.
- Maintains speed within +10 kt/-5 kt of target.
- At MDA, makes correct decision to continue, land or go around and executes decision correctly.
- Flies visual segment smoothly and lands within touch-down zone.
- Performs correct go around procedure if necessary.
- Conforms with task sharing requirements and ensures good crew communication.

07 - COMMON ERRORS

- Raw data information not monitored closely throughout approach.
- Confusion between managed and selected.
- NAV accuracy not confirmed or checked.
- Misuse of flight plan.
- Navigation aids not forced and/or course not inserted.
- VAPP not stabilized at FAF.
- Incomplete briefing.
- TRACK / FPA selected late.
- Aircraft descent preparation late.
- Poor radial tracking in selected mode.
- Go around altitude not set.
- Going below of MDA.

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01 - TRAINING OBJECTIVE

- To safely perform a visual traffic pattern, approach and landing.
- To perform a "side-step" maneuver during an approach.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 3.03.20 (Visual approach)
- FCOM 4.05.70 (Visual approach)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Visual pattern description.
- Altitude/distance to run/configuration "clues".
- Importance of maintaining visual contact with runway and other traffic.
- Use of all available aids in conjunction with FPV to maintain slope angle and centerline.
- Use of FPV and A/THR.
- Side-step manoeuvre.
- Minimum stabilization requirements.

SECONDARY

- Use of FPV to maintain altitude and track downwind.
- Effects of crosswind on base leg.

05 - TRAINEES' ACTIONS

When arriving in the downwind position, be aware of the height/distance to run and configure accordingly.

On commencement of the visual approach, disconnect auto pilot, select FDs to "off", select FPV and check A/THR active. Activate approach to recover the use of managed speed. The FPV is very useful for maintaining altitude and positioning on downwind leg.

In case of cross wind, such as base leg is flown in headwind, expect thrust and IAS target to increase if speed is managed and A/THR active.

Ensure an even workload, so that PF can keep eyes out of cockpit, maintaining visual contact with runway and any traffic.

The full pattern is found in FCOM 3.03.20 (SOPs - Visual Approach).

Aim to be in landing configuration, stabilized on correct approach path, at VAPP by 500 ft AGL, at latest. If not stabilized, a go-around must be considered.

If a late side-step is required, smooth application of controls will remove the tendency to overbank and destabilize the approach. Do not "duck under " in the late stages of approach.

06 - COMPLETION STANDARDS

- Ensures aircraft is positioned and configured appropriately with regard distance to run and pattern constraints.
- Performs smooth "side-step" manoeuvre.
- Maintains airplane speed within +10 kts/-5 kts of VAPP.
- Ensures that airplane is in landing configuration at VAPP, with engines at approach power, at or above 500 ft AAL <u>or</u> performs a go around.
- Ensures correct task sharing and good crew communications throughout.

07 - COMMON ERRORS

- Insufficient planning for altitude/distance to run.
- Late disconnection of autopilot
- FDs not selected off (at appropriate moment).
- One FD left on.
- Overbanking or 'fly through' during side-step.
- High sink rate, shallow approach angle or "ducking under" on late final approach.
- Approach not stabilized at or above 500 ft AAL and late decision to go around.

01 - TRAINING OBJECTIVE

- To conduct precision approaches in accordance with the specific procedures.
- To take the correct actions in case of failure.

02 - SCHEDULE

Briefing duration : 30 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :

- QRH 5.04 (Ops Data)
- FCOM 3.01.22 (Limitations)
- FCOM 3.03.22 (Landing geometry : visual segment and ground clearance)
- FCOM 4.05.70 (Procedures)
- Appropriate approach charts
- OEB 105 Autoland
- OEB 110 Autoland

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Specific approach briefing for CAT 2/3 approaches.
- Equipment required and action in case of failure.
- Appropriate task sharing.
- Decision making process.
- Landing procedures.

<u>SECONDARY</u>

- Stabilized approach objective.
- Aircraft, crew and airport requirements.

05 - TRAINEES' ACTIONS

GENERAL INFORMATION

Crew qualification : as per state regulation.
Aircraft qualification and status : check airplane technical log, ECAM status page, crew monitored equipment against the required equipment table in QRH 5.04. When APP pb is pressed to arm the approach mode the FMA will annunciate the airplane landing capability i.e. CAT 2, CAT 3 SINGLE or CAT 3 DUAL. The STATUS page will indicate any loss of autoland capability in the inoperative systems column e.g. CAT 3 DUAL.

Airport qualification : check NOTAM's, navaids and ground equipment availability. ATC clearance for CAT 2/3 operations and statement of low visibility procedures in effect, implies that airport conditions are fulfilled.

Airport met report : for destination airport, check RVR (TDZ and MID as per state regulation) against approach charts. Also check wind and pressure altitude limits.

For alternate airport check weather above CAT 1 minimum. Check minimum diversion fuel.

USE OF APPROACH CHARTS

Specific CAT 2/3.
Aircraft category =C
Check minima on Airline En Route Manual if necessary.

APPROACH BRIEFING

The approach briefing should include the normal items as for any IFR arrival and in addition the following subjects should be covered prior to the first approach.

- Crew/FMGS/airplane/airport capabilities
- Failure cases and procedures - above and below 1000 ft AAL
- Navigation equipment set-up (check ILS course)
- Standby horizon flag monitoring
- Task sharing in approach phase
- Check RVRs and that an approach is permitted.
- Seat position
- Use of autobrake
- Use of landing lights not recommended
- Callouts for parameter exceedance e.g. "Speed"
- Consider fuel remaining with regard to holding, missed approach and diversion to alternate

TASK SHARING

Be aware of specific division of workload in low visibility operations. CM1 duties are supervision and decision making. CM2 monitors Auto Flight System (AFS), FMA, standard calls and is "go-around minded".

05 - TRAINEES' ACTIONS (END)

FAILURE AND ASSOCIATED ACTIONS

These are specific to the category of operation. In general, there are three possible responses to system failure :

- GO AROUND - reassess the situation following the go-around
- REVERT to higher minima
- CONTINUE to original minima

In practice, it is useful to consider failures above and below 1000 ft AAL. Above 1000 ft AAL, sufficient time may be available for autopilot switching and so forth. Below 1000 ft AAL, a go-around should be considered in the event of any significant failure.

NOTES

- For full capability, both engine driven generators must be available. The APU generator will not satisfy this requirement.
- In the event of A/THR fail when using one autopilot, try engaging the other autopilot and its associated A/THR channel.
- For antiskid and nosewheel failures, disconnect autopilot after touchdown and perform manual roll-out.
- ILS course must be correct as the autopilot uses this as the reference when correcting drift in the flare.
- No switching is permitted below 1000 ft AAL.
- Category II and III approaches are only permitted with CONF FULL and not permitted with flaps and/or slats in abnormal config.
- Automatic landing whilst over MLW is not permitted.
- Be aware of the possibility of a manual go-around using the standby horizon (CHECK ATT warning case).
- Remember to disconnect autopilot at end of landing roll to vacate runway.
- With fail operational capability an automatic landing can be made in the event of a failure below alert height. This is Cat III Dual.
- With fail passive capability, a failure below DH will leave aircraft in trim, with no significant deviation of flight path or attitude. A landing is then completed manually - the pilot must assume control. This is Cat III Single.
- Below 100 ft Radio Height, no single failure will cause a capability downgrade.
- Be prepared to disconnect autopilot after landing if excessive nose-up pitch is experienced (due to spoiler deployment). Maintain directional control with rudder pedals.

06 - COMPLETION STANDARDS

- Demonstrates correct application of standard procedures.
- Takes safe, correct action in case of failure during the approach.
- Makes the correct decision to land or go around.
- Applies proper technique during landing and roll out.
- Ensures strict application of specific task-sharing requirements and ensures good crew communication.

07 - COMMON ERRORS

- Specific task sharing not briefed.
- Action in case of failure not briefed.
- Incorrect decision in case of failure.
- Stand by horizon flag not monitored.
- Not considering use of autobrake.
- ILS course not checked at "LAND" green.
- Autopilot not disengaged at end of roll out.

01 - TRAINING OBJECTIVE

- To land the aircraft in a safe manner.
- To decelerate the aircraft after landing using appropriate combination of reverse thrust and manual or auto wheel brakes.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.32.30 (Brakes and anti-skid)
- FCOM 1.70.70 (Thrust reverser system)
- FCOM 3.01.40 (Limitations)
- FCOM 3.03.18 (SOPs)
- FCOM 3.03.22 (SOPs)
- FCOM 3.04.27 (Supplementary techniques)

04 - INSTRUCTOR’S ACTIONS

Briefing of the following key points.

MAIN

- Flare at correct height.
- Crosswind landing technique.
- Awareness of possible tailstrike (especially A321).
- Selection of idle thrust and standard use of reverse thrust.
- Normal use of autobrake system and related indications.
- Manual braking and directional control techniques.
- Brake and reverser limitations.
- Actions in case of abnormal braking behavior.
- Conditions for spoiler deployment.

SECONDARY

- Flight controls flare mode.
- Possible pitch up with spoiler deployment.
- Brake and anti-skid indications on SD WHEEL page.
- Recommendations for use of autobrakes.

05 - TRAINEES' ACTIONS

As a basic rule for all approaches, no later than 1 000 ft AGL, the PF should have one hand on the THRUST LEVERS and the other one on the side stick. This should apply regardless of AP - ATHR selection.

During the final visual segment of the approach it is very important not to over control with the sidestick. The aircraft will maintain pitch and roll attitudes resisting any atmospheric disturbance until 50 ft when landing mode becomes active (FCOM 3.04.27 [Supplementary Techniques - Flight Controls]). Landing mode is only a pitch mode and roll control is the same as normal law until the wheels are on the ground.
At approximately 20 ft the aircraft should be progressively flared and the thrust levers selected to idle. Due to the engagement of landing mode in pitch it is necessary to make a progressive pull on the sidestick in order to increase the pitch angle in the flare. The 'Retard' call at 20 ft is a reminder to retard the thrust levers to idle if they have not already been retarded.

For crosswind landing techniques read the briefing given in FCOM bulletin number 21 (blue pages in FCOM 3).

At touch down the ground spoilers will deploy automatically which may give a slight pitch up. Automatic ground spoiler deployment will occur with both main landing gear compressed or with one MLG on the ground and reverse thrust selected (FCOM 1.27.10 [Flight Controls - Ground Spoiler Control]). Ground spoiler deployment will enable autobrake operation (if selected). The green DECEL light on the AUTO/BRK panel enable the crew to monitor whether the selected rate of deceleration is achieved.

Tailstrike occurs (A320) at 13.5 or 11.5 (landing gear compressed), so pitch attitude should be monitored in the flare (see FCOM bulletin 22). FCOM 3.03.22 (SOPs Landing) contains information on pitch and roll limits.

Autobrake should normally be used for landing, however on long dry runways it will not be necessary. Only LO or MED should be used for landing. If landing on a short or slippery runway MED autobrake should be selected and then use appropriate manual braking to stop the airplane.

The normal method of disarming the autobrake is by even pressure on both brake pedals. The auto brake may also be disconnected by action on the respective AUTO/BRK pb (not recommended as both pilots should be heads up during the landing roll) or by pushing down the speedbrake control lever. Autobrake should be disconnected before 20 kt is reached.

Max reverse (or idle reverse depending on airport regulations or airline policy) should be selected immediately after main gear touchdown. PNF should monitor spoiler deployment (ECAM WHEEL page), operation of reverse thrust (E/WD) and the operation of autobrake (green decel light on AUTO/BRK panel) and notify PF of any non normal indications.

05 - TRAINEES' ACTIONS (END)

LIFT IMPROVEMENT PACKAGE (LIP)

The A321-200 (and some later A321-100) is fitted with aerodynamic improvements to the wing leading edge (LIP) which improve the maximum Lift Coefficient in CONF FULL. This leads to a reduction of 3 to 4 knots of VLS CONF FULL, lower possible approach speeds and a reduction in landing distance required. However, for normal landings and Autolands with the lower approach speeds there would be a reduced margin relative to landing tailstrike . Therefore the use of the reduced approach speeds is restricted to short runway operations.

The CONF FULL VAPP displayed in the MCDU may be modified,depending on pin program to **VLS + 9 + wind** from the present logic of VLS + 5 + wind. The objective is to keep, for normal landings, the current VAPP despite the lower VLS (LIP). There is no change in the current philosophy concerning the use and modifications of VAPP on the MCDU for all manual landings and Autolands.

For landing on short runways the MCDU VAPP must be overwritten by the crew to select a lower approach speed (limited to VLS).

When using reduced approach speeds, crews should be aware of the reduced margins relative to a landing tailstrike. Autoland is not allowed with the reduced approach speed.

In failure cases where an approach speed increment is specified (in the QRH), an extra 5 kt should be added in order to keep the same approach speed values for A321-100 and -200.

06 - COMPLETION STANDARDS

- Awareness of landing limitations.
- Use of correct landing technique and execution of standard landing.
- Employs correct technique for use of reverse thrust and manual braking or properly monitors autobrake deceleration.
- Avoids significant deviation from runway centerline.

07 - COMMON ERRORS

- Overcontrolling in pitch or roll.
- Flaring too high.
- Failure to flare or flaring too late.
- Not selecting idle thrust for landing.
- Delayed selection of reverse thrust.
- Failure to monitor SD WHEEL page and/or AUTO/BRK panel during deceleration.
- Maximum reverse thrust maintained below 70 kt or reverse stowed before taxi speed.
- Differential braking used during roll out.

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01 - TRAINING OBJECTIVE

- To perform a safe go around in accordance with standard procedures.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH 3.09 (Normal procedures)
- FCOM 1.22.30 (Flight guidance)
- FCOM 3.03.23 (SOP's)
- FCOM 4.03.20 (MCDU Page description)
- FCOM 4.05.80 (FMGS procedures)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Situational awareness.
- Correct announcement / crew actions.
- Pitch control.
- Navigation.

SECONDARY

- Engine out.
- Reject landing.
- Go around without FD.

05 - TRAINEES' ACTIONS

The go-around mode is engaged by setting the thrust levers to the TOGA gate, provided at least CONF 1 is selected. Monitor FMA annunciations for correct operation.

If going around from a visual approach (FDs off), set thrust levers to TOGA, rotate to 15 nose up, and maintain VAPP or above. The restoration of the FDs may not give accurate pitch information as the FDs return in basic modes (HDG V/S).

Lateral navigation will stay in GA TRACK mode until the heading selector knob is pulled or pushed to engage HDG or NAV mode. The go-around can be flown with two autopilots engaged, but when another lateral or vertical mode is selected, one autopilot drops out. Speed target will be green dot when GA ACCEL ALT is reached, as the design assumes another approach will be flown, following the go-around.

The previously flown approach will be automatically strung back in the F-PLN at the end of the missed approach procedure. The approach must be activated if another approach is planned. If proceeding to an alternate, switching out of FMGS GO AROUND phase to CLIMB phase is achieved by selecting ALTN or inserting NEW DEST and CRZ FL. Either of these actions will switch the FMGS flight phase to CLIMB (FCOM 4.02.20 [FMGS Principles - Flight Phases]).

Be very careful when going-around with FPV selected as it is easy to over-rotate, and put the aircraft symbol at 15, not the FPV.

In the event of low altitude capture and engine failure whilst in ALT* mode, monitor the speed carefully as there is no low speed protection in ALT * mode.

06 - COMPLETION STANDARDS

- Initiates go-around at +50 ft/-0 ft of decision altitude/height.
- Initiates go-around at +100 ft/-0 ft of minimum descent altitude/height.
- Immediate application of TOGA and positive rotation to required pitch angle.
- Follows SRS and maintains target speed +/- 10 kt (minimum VREF).
- Follows published missed approach procedure or maintains ATC heading +/- 5°.
- Ensures application of task sharing requirements and good crew communications.

07 - COMMON ERRORS

- Incomplete or missed callouts.
- Rotation too slow and/or delayed.
- Pitch / speed / thrust control.
- Flap retraction completed before acceleration altitude.
- Wrong or no selection of lateral mode.
- When FPD/FPV selected confusion between pitch angle and FPV.

01 - TRAINING OBJECTIVE

- To be familiar with and apply special requirements for dispatch with gear down.
- To be able to compute Take-off and Go around performance data.
- To calculate a valid fuel plan.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :
- FCOM 2.04.25 (Special operations)
- FCOM 3.05.35 (Go around)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Knowledge of limitations (speed, icing).
- Take-off performance computation.
- Recommended speeds (climb, cruise, descent : 240 kt/M 0.50).
- Go around.

SECONDARY

- Disregard FMGS fuel predictions.

05 - TRAINEES' ACTIONS

Revenue flight is permitted with the landing gear in the down position and the gear doors closed, subject to certain limitations contained in FCOM 2.04.25 (Special Operations - Flight With Gear Down). The MEL must also be consulted before planning a flight with gear down.

Be aware that failures which would normally degrade flight controls to ALTN law, now degrade to DIRECT law.

Note special procedures for emergency electrical generation in all generators failed case.

Performance is severely degraded and special attention must be paid to weight and fuel consumption calculations. Should the gear fail to retract after take off, FCOM 2.04.25 (Special Operations - Flight with Gear Down) will be of use in deciding whether flight can continue to destination or another aiport enroute. This is one of the few occasions when FCOM Vol 2 is used in flight.

Consider the effect of terrain on the planned departure route and the go-around due to poor climb performance.

Examine the planned route carefully as drift down level off is very much lower than with gear retracted. Terrain clearance is a concern.

06 - COMPLETION STANDARDS

- Applies special operating procedures.
- Determines correct Take-off and Go around performance.
- Accurate fuel plan.

07 - COMMON ERRORS

- Lack of awareness of severe performance limitations.

01 - TRAINING OBJECTIVE

- To take required action in the event of any GPWS warning.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 1.08 (GPWS warning)
- FCOM 1.34.70 (GPWS)
- FCOM 3.02.34 (GPWS warning)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Immediate reaction (except as stated in QRH 1.08).
- GPWS modifies profile at certain airports.
- Configuration requirements below VLS.
- Description of GPWS modes.

<u>SECONDARY</u>

- Awareness of the active flight control law and how it will affect the escape maneuver.
- Reaction adapted to type of warning (Emergency pull up or go around).
- Inhibition or cancelling possibilities (configuration selection pb's on overhead panel).

05 - TRAINEES' ACTIONS

The A320 family is equipped with GPWS protection down to 30 ft Radio Altitude. If a warning is received, **IMMEDIATE** action must be taken unless operating in daylight VMC and the cause of the warning can be positively identified.

Full back stick is recommended. Care must be taken when operating on one engine, with flaps extended and at light weight as in this configuration directional control may be difficult.

The drill must be carried out positively, with clear announcement of intent, positive control action and the control input retained until clear of danger.

In certain situations, nuisance warnings may be inhibited by action on the GPWS panel and may be required by ECAM.

Remember to retract spoilers, if in use, to permit maximum climb performance. Spoilers will retract automatically if speed is reduced below ALPHA PROT.

06 - COMPLETION STANDARDS

- Reacts immediately to warning.
- Applies correct emergency pull-up procedure.

07 - COMMON ERRORS

- Delayed reactions due to hesitation.
- Mistrust of warnings.
- Stick not maintained in full back position during emergency pull up.
- Configuration modified with speed below VLS.
- Decision not clearly announced.

01 - TRAINING OBJECTIVE

- To identify the circumstances requiring a FMGS position update.
- To correctly update the FMGS position.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

FMGS Freeplay Trainer

DOC references :
- FCOM 4.02.20 (Flight management principles)
- FCOM 4.03.20 (Progress page)
- FCOM 4.04.30 (Update at)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Situation requiring position correction.
- Procedure for updating position.

SECONDARY

- Understanding of position computation.
- Understanding of radio updating.

05 - TRAINEES' ACTIONS

This procedure is a very rough way of correcting gross errors in the FMGS computed position and should only be used when an major position error is apparent or when a CHK A/C POSITION message occurs along with an obvious position error.

When such a position error occurs it is important that the aircraft is navigated using raw data until such time as an update can be affected. The position error may have occurred due to either the FMGS misidenting a VOR (new VOR frequency or position change NOTAM but not yet included in FMGS database) or corruption of a VOR signal (e.g. in war zones). Careful checking of NOTAMS will allow the crew to deselect a suspect VOR (FCOM 4.03.20 (Pilot interface - Page Description). Pilots must also be aware of the possibility of aircraft equipment failure.

To update the FMGS position follow the procedure given in FCOM 4.04.30 (How to use).

06 - COMPLETION STANDARDS

- Makes correct decision to update position.
- Performs an accurate update of FMGS position.

07 - COMMON ERRORS

- Updating confirmed without check or using NAV display instead of raw data indications.
- Unintentional updating.
- Unnecessary updating.

01 - TRAINING OBJECTIVE

- To be able to use the GPS for navigation and non precision approaches.
- To understand the limits on the use of the GPS.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

FMGS Freeplay Trainer

DOC references :
- FCOM 1.34.15 (GPS)
- FCOM 3.01.22 (Limitations)
- FCOM 3.02.34 (Abnormal Procedures)
- FCOM 4.02.20 (Flight Management Principles)
- FCOM 4.03.20 (MCDU Page Description)
- FCOM 4.05.70 (Approach)

04 - INSTRUCTOR’S ACTIONS

Briefing of the following key points.

MAIN

- GPS PRIMARY, an operational concept
- FMGS position calculation
- MCDU pages associated with GPS
- GPS overlay approach

SECONDARY

- GPS deselection
- Check of NOTAMs for satellite availability, prior to flight

05 - TRAINEES' ACTIONS

The GPS is a satellite based radio navigation aid. GPS PRIMARY is an Airbus term defining an operational concept. It means that adequate GPS accuracy and integrity are provided and that GPS is available as the basis for the FM position. The GPS fitted to the Airbus family of aircraft monitor the integrity of the position information provided, and give indications of when this position information cannot be relied upon.

The position calculated by the twin GPS receivers is added to the IRS calculated position producing a GPIRS position. This is then fed to the FMGCs and a FM position is produced. At take off, even with GPS, the FM position is updated to runway threshold (+ T/O SHIFT if applicable). The FMGCs will use the GPIRS position as the FM position so long as GPS PRIMARY is indicated on the MCDU PROG page.

Reasonableness tests on the GPIRS and IRS positions are carried out and any unreasonable position is disregarded for the purpose of FM position calculation. The table below summarizes how FM position is derived with and without GPS PRIMARY.

	FM POSITION	
	WITHOUT GPS	WITH GPS
On ground before T.O.	Mix IRS position	GPIRS
At T.O.	Runway threshold (+ T/O shift)	GPIRS
Flight	MIX IRS & Radio Position (tending towards Radio Position)	GPIRS
Flight without GPS or Radio Position update	MIX IRS position + Last memorized FM position, gradually tending towards IRS position.	

AFTL section 1.22.20 FCOM 4.02.20 (FMGS Principles - Navigation) provides a full description of FMGS position computation.

During flight preparation, GPS PRIMARY will be indicated on the MCDU PROG page and the ND. This message should be cleared using the CLR pb. This is a positive confirmation to the crew that GPS is accurate.

The GPS workings are transparent to the crew and will only require attention in the case of a fault or a downgrading of the position information e.g. GPS PRIMARY LOST or GPS 1 (2) FAULT. If the GPS status changes , a message will be displayed on the MCDU and ND [GPS PRIMARY (white) or GPS PRIMARY LOST (amber on ND)]. The amber GPS PRIMARY LOST cannot be cleared from the ND and is to remind the pilots that GPS is not available. Navigation accuracy up- or downgrade will be shown in the same way as already used for non GPS navigation.

05 - TRAINEES' ACTIONS (CONT'D)

The following is a list of MCDU pages associated with the use of GPS and a brief description of their use.

MCDU PAGE	FUNCTION
SELECTED NAVAIDS	Allows deselection or selection of GPS.
GPS MONITOR	Display of GPS positions and other GPS derived information.
IRS 1 (2) (3)	GPIRS Position for each IRS
PROG	When GPS PRIMARY is shown, indicates that GPIRS is used for FM position calculation. Navigation accuracy is shown.
PREDICTIVE GPS*	Displays information about the predicted availability of GPS at destination ETA or at a particular waypoint.
ARRIVALS	Allows selection of GPS approach.

* PREDICTIVE GPS page not relevant when Litton GPS fitted.

Full descriptions of the above pages can be found in FCOM 4.03.20 (Pilot Interface - MCDU Page Description).

The full GPS standard will permit predictions to be made regarding the feasibility of a GPS approach at destination. The calculation involved relies on the number of, and the position of, the satellites at ETA. The "time window" is pilot modifiable.

The current status of GPS permits approaches to Cat 1 limits at best. Individual certification authorities are discussing GPS accuracy, reliability and so forth. Thus, the minima and acceptance of GPS in each country must be checked before using GPS as a prime means of navigation in the approach phase.

There are two types of GPS approach :

GPS OVERLAY APPROACH

The aircraft performs a managed approach along the trajectory of a published non precision approach using GPS position information in GPS PRIMARY navigation mode. Before beginning the approach a check of GPS PRIMARY and HIGH accuracy must be made which replaces the navigation accuracy check. Additionally, before the FAF check GPS PRIMARY and HIGH accuracy with a RNP of 0.3 nm or less. Raw data must be displayed and monitored at all times. FCOM 4.05.70 (FMGS Procedures) details the procedures to be used. If raw data indicates that the aircraft is not on the required flight path the pilot must use HDG/V/S or TRK /FPA to correct the flight path.

05 - TRAINEES' ACTIONS (END)

GPS STAND ALONE APPROACH

The aircraft is guided along the trajectory of an approach the waypoints of which are not referenced to any ground base navigation aid. As yet, only a few GPS stand alone approaches are published and they require an operational approval.

If GPS PRIMARY is lost during a non precision approach, a GPS PRIMARY LOST message in amber will be displayed accompanied by a triple click. If this occurs or there is a navigation accuracy downgrade, the approach may only be continued in managed navigation as long as raw data continue to indicate satisfactory guidance.

06 - COMPLETION STANDARDS

- Good awareness of how GPS aids navigation.
- Accuracy check carried out before FAF during GPS approach.

07 - COMMON ERRORS

- No check of NOTAMs relevant to satellites prior to flight.
- On GPS overlay approach, raw data is not displayed and/or monitored.
- Lack of knowledge of correct procedure in failure cases.

COLD/HOT WEATHER AND HIGH ALTITUDE RUNWAY OPERATION

01 - TRAINING OBJECTIVE

- To operate the aircraft according to recommended procedures in adverse weather.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.30 (Ice and rain protection)
- FCOM 1.34.60 (Weather radar)
- FCOM 1.36 (Pneumatic system)
- FCOM 3.01.70 (Limitations)
- FCOM 3.04.30 (Ice and rain protection)
- FCOM 3.04.34 (Weather radar)
- FCOM 3.04.91 (Adverse Weather)
- Briefing notes on adverse weather operations

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Aircraft preparation in adverse weather
- Correct procedure for de-icing
- Operations in icing conditions
- Performance considerations in "hot and high" conditions

SECONDARY

- Recognition of conditions requiring the use of anti icing
- Use of weather radar

COLD/HOT WEATHER AND HIGH ALTITUDE RUNWAY OPERATION (CONT'D)

05 - TRAINEES' ACTIONS

The A320 is certificated for operations in the temperature range of -40 C up to +50°C (at sea level). The environmental envelope is shown in FCOM 3.01.20 (Operating Limitations). The APU envelope is similar.

COLD WEATHER

The A320 is certified for flight in icing conditions. Icing conditions may be expected when OAT (on ground) is below +10 C and there is visible moisture in the air (such as clouds, fog with low visibility, rain, snow, sleet, ice crystals) or standing water, slush, ice or snow is present on the taxiways or runway. Furthermore, preparation and ground operation of the aircraft following a cold soak may require procedures which are additional to the normal operating procedures. FCOM 3.04.91 (Supplementary Techniques - Cold Weather).

The normal preliminary cockpit inspection should be carried out. If the weather radar is unserviceable the MEL may contain restrictions on the flight. Thereafter, a full exterior inspection should be done. The main items are listed in FCOM 3.04.91 (Supplementary Techniques - Cold Weather).

Probe/window heat may be used. When selected ON, the system provides a low level of heating to clear cockpit transparencies and ensures adequate probe heating. The level of heating changes automatically to high, once airborne. The TAT probe is not heated on the ground.

At temperatures below -15°C, the ECAM and EFIS DUs may not be available until cabin conditioning has warmed the avionics compartment and cockpit. Also, at this temperature, IRS alignment takes up to 15 minutes.

When conducting the external inspection, take care to inspect all critical surfaces to ensure that they are clear of snow, frost and ice. Also ensure that all inlets, drains, probes etc are clear of contaminant. If they are not, the airplane must be de iced. (A thin film, maximum of 3 mm, of frost is acceptable on the underside of the wing tank area.)

There are two main types of de icing fluid, Type I and Type II. They are both based on a mixture of glycol and water. The more modern Type II fluids have greater holdover times and flow off the aircraft better than the Type I fluids, thereby negating any performance penalties. The holdover time is the estimated time anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected surfaces of the airplane, under average weather conditions mentioned in the guideline table.

Guidelines for holdover times and mixture application are listed in FCOM 3.04.91 (Supplementary Techniques - Cold Weather).

COLD/HOT WEATHER AND HIGH ALTITUDE RUNWAY OPERATION (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

COLD WEATHER (CONT'D)

Note that any airplane which has been anti-iced can not receive a further coating of anti-ice fluid on top of the existing film. In continuing precipitation, the original anti-icing coating will be diluted at the end of the holdover time and refreezing could begin. In this case the airplane must be de-iced and then anti-iced using either a one step or a two step process FCOM 3.04.91 (Supplementary Techniques - Cold Weather).

Before commencement of spraying, a procedure must be carried out which minimizes the ingress of de-icing fluid into the cabin. This procedure is listed in FCOM 3.04.91(Supplementary Techniques - Cold Weather).

It is recommended to wait 60 seconds after the completion of spraying before selecting APU bleed ON. If engines were running during the spraying operation, they should be run up to 60% N1 (1.09 EPR) for 10-15 seconds to eliminate any residual fluids. Note that a visual inspection (by maintentance personnel or flight crew according to airline policy), of the sprayed areas is essential before completing the technical log.

The minimum fuel temperature is -43°C, for JET A1, and slightly higher for other commonly available fuels. If the fuel is colder than this, it may be possible to add warm fuel to raise its temperature.

When taxiing in slush, delay flap extension until reaching the holding point ready for departure. Do not use reverse thrust, even at idle (except in emergency) as it may cause recirculation of snow off snow covered areas, which can result in engine flame out or roll back. When engine anti-icing is in use, ground idle thrust is increased and greater care must be taken on slippery surfaces.

When the engines have been cold soaked and to avoid thermal shock, they should be operated at or near idle for a minimum of 5 minutes before take-off power is applied. (Time spent taxiing may be included as part of this). Before take-off, the engines should be run at 50 % N1 for 10 seconds to shed any ice that may have accumulated.

If moderate or severe turbulence is expected after take-off, place the engine start selector to IGN. The use of weather radar for departure is outlined in FCOM 3.03.10 (SOPs - Taxi).

The engines are supplied with hot air from the pneumatic system to provide anti-icing and de-icing. If the electrical supply fails, the valve remains open. External lights shine on wing leading edge and engine intake enabling visual inspection of any ice build up. Wing anti icing is provided and in the event of electrical power supply failure, the valves close.

Use the criteria of visible moisture and temperature as the primary means for assessing when to use the engine anti icing system. Do not wait for ice to build up.

COLD/HOT WEATHER AND HIGH ALTITUDE RUNWAY OPERATION (CONT'D)

05 - TRAINEES' ACTIONS (END)

COLD WEATHER (END)

The use of engine anti-ice has a marked effect on the descent profile. The FMGS calculates that anti ice will be used for one third of the descent and adjusts the descent point accordingly. However, if the anti ice usage is prolonged, an increase in descent speed or a speedbrake selection may be required to remain on profile.

Landing distances for contaminated runways are given in FCOM 2.03.10. Special notice should be taken of the runway condition. A slippery runway is the most common reason for overrun at landing. As far as possible, avoid landing on a contaminated runway with any significant failure. Company regulations may prohibit landing on runways with particular braking actions.

Do not retract flaps after landing until after engine shutdown, and they have been visually inspected to be clear of ice, slush or other obstructions.

If the airplane is to be left in conditions likely to produce a cold soak, follow the procedure for securing the aircraft in FCOM 3.04.91 (Supplementary Techniques - Adverse Weather). Even in quite mild conditions, it is advisable to drain the water system to prevent freezing and possibility of split pipes. This procedure is given in FCOM 3.04.91 (Supplementary Techniques - Adverse Weather).

HOT WEATHER & HIGH ALTITUDE RUNWAY OPERATIONS

Maximum fuel temperature is +54°C, for most fuels (+49°C for JP4 and JET B). There are additional altitude restrictions if the fuel (JP4 or JET B) is still warm when reaching cruising altitude (FCOM 3.01.40 [Limitations]). The maximum brake temperature for take off is 300°C, and if the brakes are above this, the brake fans (if fitted) should be used to aid cooling. Both fuel temperature and brake temperature are monitored by ECAM and the crew informed when temperatures approach or exceed a limit. The minimum flight crew oxygen requirement increases with increasing temperature (FCOM 3.01 [Limitations]).

The avionics ventilation system has limitations on its use, when ground operations in high temperatures are envisaged. These can be quite penalizing in very hot weather as shown in FCOM 3.01.40 (Operating Limitations - Systems). It is prohibited to use conditioned air from packs and LP ground units simultaneously.

Performance will be noticeably worse in hot and high conditions, and care must be taken when calculating MTOW, any thrust reduction and V1, VR & V2 speeds.

The SOPs and ABN & EMER procedures remain applicable for high altitude airfields. At high altitude airports towards the upper limit of the environmental envelope, great care must be taken when calculating performance.

COLD/HOT WEATHER AND HIGH ALTITUDE RUNWAY OPERATION (END)

06 - COMPLETION STANDARDS

- Demonstrates a clear knowledge of procedures and documentation associated with adverse weather operations.

07 - COMMON ERRORS

- Lack of knowledge of documentation and its location
- Poor knowledge of relevant procedures

FLIGHT IN SEVERE TURBULENCE

01 - TRAINING OBJECTIVE

- To be aware of circumstances likely to give rise to severe turbulence.
- To take the correct actions if severe turbulence is encountered.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 5.01 (Ops data)
- FCOM 01.34.60 (Weather radar)
- FCOM 03.04.91 (Flight in turbulence)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Turbulence penetration speed/mach, actions and handling consequences.

SECONDARY

- Air mass characteristics leading to possible severe turbulence.
- Use of documentation : temperature and wind gradient on computer flight plan.

05 - TRAINEES' ACTIONS

The best advice is to avoid areas of severe turbulence either by use of the weather radar (for thunderstorms etc), at the pre-flight planning stage (clear air turbulence forecast in met briefing) or by a change of flight level if turbulence is reported by preceding aircraft.

Turbulence speeds are 250 kt below 20,000 ft and 275 kt or 0.76 Mach (whichever is slower) above 20,000 ft.

Follow FCOM 3.04.34 (Supplementary Techniques - Navigation) for use of the weather radar and FCOM 3.04.91 (Supplementary Techniques - Adverse Weather) for procedures should severe turbulence be encountered. Also refer to QRH 5.01 for speed and thrust settings recommended for turbulence.

Cruise levels at close to maximum level should not be used when turbulence is anticipated, as there will be a much smaller margin between VMAX and VLS leading to the increased risk of overspeed warnings or activation of low speed protections.

FLIGHT IN SEVERE TURBULENCE (END)

06 - COMPLETION STANDARDS

- Takes appropriate measures to avoid areas of known severe turbulence (altitude and/or navigation adjustments).
- Takes correct actions in the event of severe turbulence penetration.

07 - COMMON ERRORS

- Late decision to apply turbulence procedures.
- Partial application only of possible actions to reduce the effects of turbulence.

WINDSHEAR - TAKE-OFF / APPROACH

01 - TRAINING OBJECTIVE

- To recognize windshear and recover using techniques and guidance unique to Airbus fly-by-wire aircraft.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.22.40 (Windshear detection)
- FCOM 3.02.22 (Windshear)
- FCOM 3.04.91 (Operation in windshear/ downburst conditions)
- FCOM Bulletin N°5 (Operation in windshear / downburst conditions)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Groundspeed mini computations.
- Recovery actions when windshear/microburst is identified or warning is triggered.
- PFD indications (pitch and V/S).
- FD commands and stick handling implications.
- Crew coordination and callouts.
- Configuration requirements.

<u>SECONDARY</u>

- Weather conditions and indications of possible windshear/microburst.
- Monitoring PFD and ND (Speed trend, Ground speed, Wind).
- Knowledge of flight control laws.

WINDSHEAR - TAKE-OFF / APPROACH (END)

05 - TRAINEES' ACTIONS

The best defence against a windshear encounter is to avoid it in the first place. Use your knowledge and experience combined with weather reports to assess the possibility of windshear and plan accordingly. If it is possible, delay take-off or landing, or plan a course of action to avoid the worst of the weather. The use of the groundspeed mini function will give added protection in strong winds.

The protection envelope is from lift-off to 1300 ft on take-off, and 1300 ft down to 50 ft for landing. In both cases, at least CONF 1 must be selected. If windshear is suspected for landing VAPP should be increased to VLS +15 kts.

Aural and visual warnings are generated when the airplane's predicted energy level falls below a predicted minimum energy threshold. This is expressed as an angle of attack.

Know the indications and the correct response.

Do not change configuration and follow SRS orders closely. When following SRS orders be positive but smooth with your actions on the sidestick. Monitor V/S and pitch as together they are good indicators of the airplane's energy. If FDs are not available, target pitch attitude should be 17°5.

Full back stick is always available. This might trigger alpha floor.

06 - COMPLETION STANDARDS

- Is aware of conditions in which windshear can be expected.
- Recognizes windshear condition and immediately takes the required actions.

07 - COMMON ERRORS

- Early symptoms disregarded.
- Incorrect and/or late GO/NO GO decision.
- Maximum thrust not used.
- SRS bars not followed.
- Configuration changed whilst still in windshear conditions.

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FLIGHT PREPARATION - FUEL CALCULATION

01 - TRAINING OBJECTIVE

- To make correct calculation of fuel requirements.
- To be aware of specific company requirements regarding fuel minima.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 2.05.10 to 60 (Flight planning)
- FCOM 3.03.02 (Flight preparation)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Weather briefing.
- Notams : destination and alternate.
- Aircraft status.
- Loading.
- Fuel calculation.
- Flight planning.

SECONDARY

- Flight level effect (cruise level).
- Weather effects : wind, anti-ice.
- Minimum fuel requirements.
- Extra weight effects.
- En route alternates (weather, notams).
- Fuel tankering.

FLIGHT PREPARATION - FUEL CALCULATION (END)

05 - TRAINEES' ACTIONS

One of the most important aspects of flight planning is the calculation of fuel requirements. If no computer produced fuel plan is available, calculations can be made using the information contained in FCOM 2.05.10 to 60 (Flight planning).

Other factors to be taken into consideration are :

- Weather conditions at destination and alternate (more fuel required due to holding / delays ?), and en-route requiring weather avoidance and anti-ice
- Notams affecting navigation equipment for the flight
- Aircraft status and if the MEL indicates increased fuel consumption in particular cases
- Expected passenger/cargo load and distribution
- Whether the optimum flight level will be available (a level 4000 ft below optimum will increase fuel burn by 5%, and a level 8000 ft below optimum increases fuel burn by more than 10%)
- Fuel tanking requirements and its effect on fuel burn and optimum flight levels

During preflight preparation a comparison should be made between the paper flight plan and the FMGS calculated burn off. In order that the predictions are valid, the following items must be inserted :

- Initial cruise altitude in the INIT A page
- Forecast winds and temperatures along the route in F-PLN B page
- Expected steps in F-PLN A page
- Block fuel in INIT B page

If the predictions show that there will be insufficient fuel at destination, a modification to cruising flight levels may help, or more fuel may have to be loaded.

Some other items of note are national/airline minimum fuel policy and "island reserve " policy for remote destinations

06 - COMPLETION STANDARDS

- Makes valid fuel requirements calculation and ensures correct quantity loaded before engine start.

07 - COMMON ERRORS

- Weak knowledge of national and company regulations for fuel minima and alternate airports.

APPROACH SPEEDS

01 - TRAINING OBJECTIVE

- To determine the correct approach speed for normal and abnormal landing configurations
- To understand the mini ground speed function.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :
- QRH 2.20 to 2.24
- QRH 4.01
- FCOM 1.22.30 (Flight Guidance)
- FCOM 3.04.10 (Operating speeds definition)
- FCOM 4.03.20 (MCDU Page Description)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Minimum ground speed function
- Normal approach speed
- Approach speed for autoland
- Approach speed in failure cases

SECONDARY

- Landing distance increments in case of failures

APPROACH SPEEDS (CONT'D)

05 - TRAINEES' ACTIONS

NORMAL CONFIGURATION

The VAPP displayed on the MCDU PERF APPR page is calculated using the following formula :

VAPP = VLS + 5 kts + 1/3 of the headwind component

NOTES :

- VAPP is limited to VLS + 20 kt
- Headwind component is computed from the wind inserted in the PERF APPR page
- VLS is the VLS of the landing configuration (3 or FULL) selected on the PERF APPR page.

However the pilot may overwrite the VAPP according to the following formula:

```
                         { VLS
                         {   or
VAPP  = the greater of   { VLS + 5 kt *
                         {   or
                         { VLS + wind correction
```

NOTES :

- The 5 kt* correction is an airworthiness requirement for autoland with A/THR, or approaches with A/THR active.
- Wind correction is 1/3 of headwind component of reported tower wind, limited to 15 kt. Use the reported steady wind not the gust.
- When there is a gusty crosswind greater than 20 kt, add 5 kt to VAPP (VAPP may now be up to VLS + 20 kt)

When CONF 3 is used for landing the CONF 3 prompt on the PERF APPR page should be pressed. The VLS on the PERF APPR page will change to VLS CONF3. VAPP should then be determined in the normal manner and managed speed used for the approach.

APPROACH SPEEDS (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

GROUND SPEED MINI FUNCTION

This function will compute a target IAS on approach in order to maintain a minimum aircraft energy level. The minimum energy level is an FMGS computed minimum ground speed (GS mini). This GS mini is not displayed to the crew but is used by the FMGS to calculate the IAS target on approach with managed speed. The relationship between VAPP, GS mini and approach IAS target is shown below.

VAPP = calculated in the manner described above and displayed or overwritten on MCDU PERF APPR page.
GS mini = VAPP - Tower headwind component

The headwind is counted as a positive value with a minimum value of 10 kt. For example if the headwind is less than 10 kt or there is a tailwind GS mini = VAPP -10 kt

IAS target = Maximum of VAPP or GS mini + Current Headwind Component

Current Headwind is counted positively and tailwind negatively.
The following extreme example should demonstrate how this function affects target speed :

- Approach to Runway 15R
- Tower wind in PERF APPR page : 150/45
- VLS = 130 kt

From the first two formulae above we get the following speeds :

- VAPP = 140kt (130 kt + maximum of 5 kt or 1/3 of 30 kt)
- GS mini = 110 kt (140 kt - 30 kt)

Altitude	Current wind	GS mini	VAPP	IAS target
1500 ft	150°/60 kt	110 kt	140 kt	170 kt
1000 ft	330°/10 kt	110 kt	140 kt	140 kt
500 ft	150°/60 kt	110 kt	140 kt	160 kt
Runway	150°/30 kt	110 kt	140 kt	140 kt

The effect of this GS mini function as far as the pilot is concerned is that the IAS target (with managed speed) will vary, sometimes considerably, on approach depending on the actual wind. It is recommended that all normal approaches be flown using managed speed to take advantage of this function. When there are large variations in IAS target the use of A/THR will allow accurate speed control. In certain circumstances the IAS target may be greater than the CONF FULL limiting IAS of 177 kt, in which case it will be necessary to use selected speed so that CONF FULL can be used.

APPROACH SPEEDS (END)

05 - TRAINEES' ACTIONS (END)

ABNORMAL CONFIGURATION

When carrying out an approach in any abnormal configuration it is recommended that selected speed is used. The approach should be flown using the configuration shown on ECAM and with the PERF APPR page CONF FULL prompt pushed. Approaches in abnormal or emergency configuration should be carried out in selected speed.

VAPP = VREF + CONF CORRECTION + WIND CORRECTION

NOTES :

- VREF is VREF FULL from MCDU PERF page or QRH
- CONF CORRECTION is determined from QRH 2.21
- WIND CORRECTION is 1/3 headwind component
- If CONF CORRECTION is 20 kt or greater do not apply WIND CORRECTION
- If CONF CORRECTION is less than 20 kt then CONF CORRECTION + WIND CORRECTION should be limited to 20 kt.

See QRH 2.22 (Abnormal Procedures) for how to determine approach speed when there are multiple failures.

Remember, use selected speed in abnormal or emergency configurations.

Landing distance increments are necessary because of increased approach speeds, braking malfunctions or unserviceability of some ground spoilers. The increments to be used and how to apply them are detailed in QRH 2.23 and 2.24.

06 - COMPLETION STANDARDS

- Correctly calculates approach speed
- Understands logic of Mini ground speed function
- Correctly applies landing distance increments when required.

07 - COMMON ERRORS

- Confusion over wind correction
- Not using selected speed when appropriate

CONTAMINATED RUNWAYS

01 - TRAINING OBJECTIVE

- To be aware of circumstances defined as "special operations".
- To locate and use the appropriate documentation.
- To be able to compute Take-off and/or Landing parameters.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :

- QRH 4.03 (Ops data)
- FCOM 2.03.10 (Landing Performance)
- FCOM 2.03.20 (Use of autobrake)
- FCOM 2.04.10 (Fluid contaminated runway)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Aircraft operational requirement.
- Runway contaminant definitions.
- Use of charts.
- Specific limitations (Crosswind...)
- Special operations for Taxi and Take-off.
- Landing operations.

SECONDARY

- Wet runways.

05 - TRAINEES' ACTIONS

The information required for operations from contaminated runways is contained in FCOM 2.04.10 (Special Operations - Fluid Contaminated Runway), including definitions of terms used in the fluid contaminated runway performance. When operating from a damp runway there is no performance penalty. The safest policy, if possible, is to delay departure until the runway has been cleared to an acceptable standard.
Do not take off on an icy runway. (FCOM 2.04.10 [Special Operations - Definitions])

CONTAMINATED RUNWAYS (CONT'D)

05 - TRAINEES' ACTIONS (END)

When contaminated runway operations are anticipated, it will be necessary to take extra time in flight planning, and to bear in mind that runway conditions can change rapidly, thereby necessitating a recalculation of take-off data.

It is vital that the correct chart is used for the calculation of the take-off data. All retardation devices (antiskid, spoilers and reverse thrust) must be fully serviceable when operating from contaminated runways. There are additional crosswind limits to be considered (FCOM 2.04.10 [Special Operations - Fluid Contaminated Runway]).

When a runway is contaminated it may also be necessary to use de-icing fluids and apply procedures for winter operations (see briefing note on cold weather operations).

Note that a FLEX power take-off is not permissible from a contaminated runway. Airbus recommends that maximum power is used for take off from a contaminated runway

If APU bleed is to be used e.g. packs off take-off, wing anti-ice must not be used.

When taxiing, avoid high thrust settings and taxi at a low speed. The anti skid does not operate at low speeds, so allow sufficient room for turning and stopping. Do not select flap until at the holding point and ready for departure.

Carrying out an RTO, even at low speeds, on a contaminated runway may cause directional control difficulties. Ensure that the take off briefing is modified to take account of runway conditions. Directional control during the take off roll should be maintained with rudder. Do not attempt to get the nosewheel airborne before VR to avoid spray as this would increase aerodynamic drag. Complete the take off in the normal manner.

Landing performance and recommendations are contained in FCOM 2.03.10 (Landing Performance - Landing) and should be studied if the destination airfield runway is forecast to be contaminated or icy.

Landing on contaminated runways without anti skid should be avoided. A positive touchdown is recommended, without a prolonged flare. Do not hold the nose off the ground and select maximum reverse thrust as soon as possible. If necessary, max reverse can be maintained until the airplane is fully stopped. Be aware that visibility may be impaired by blowing snow if reverse thrust is kept to a low speed.

On completion of the landing roll, do not retract flaps. Taxi in and shut down as normal, and after a visual inspection of the flaps/slats, they may be selected up. This is to reduce the possibility of damage to the flaps occurring due to any contaminant accretion. Special procedures for securing the aircraft are discussed in the cold weather briefing note.

CONTAMINATED RUNWAYS (END)

06 - COMPLETION STANDARDS

- Correct application of Special Operations requirements.
- Ensures crew crosscheck of calculated data.

07 - COMMON ERRORS

- Use of inappropriate charts.
- Lack of parameters cross-check.
- Take-off data not updated in case of unexpected change in runway status.

CLIMB AND DESCENT

01 - TRAINING OBJECTIVE

- To be aware of aircraft climb performance (CFIT)
- To be aware of aircraft descent performance
- To make full use of FMGS capabilities (constraints...)

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- QRH Chapter 4
- FCOM 3.05.10 / 30

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Aircraft climb gradient according to weight.
- Verification of top of descent point.
- Control of aircraft descent profile.
- Use of PROG Page.
- Use of PERF Page.
- Approach planning.

SECONDARY

- Use of FMGS constraints for approach planning.
- Knowledge of descent/deceleration performance.

CLIMB AND DESCENT (CONT'D)

05 - TRAINEES' ACTIONS

CLIMB

In the managed climb, the aircraft climbs with thrust levers set at the climb gate, producing climb thrust, maintaining a speed/Mach number computed dependant on the cost index. The higher the cost index, the higher the speed. Speed control is via elevator and will give varying rates of climb to maintain a set speed.
A similar situation is true in OPEN CLB.
Selected speed may be used to increase/decrease climb rate, with thrust remaining at climb power.

Be careful when leaving an altitude and selecting climb, that you allow the aircraft to begin climbing with climb power before selecting a lower speed than target, or the aircraft may reduce power initially to follow speed rather then beginning the climb. At all times, the aircraft will try to maintain speed, thus if a lower speed is selected too quickly, thrust will be reduced to achieve this. EXPEDITE (A320 only) is useful here, though take care not to remain in EXPEDITE mode too long, as the target speed is green dot, and accelerating from green dot to cruise speed at altitude takes a long time.

If a set rate of climb is required, V/S mode may be used. Be very careful to watch the speed if high rates of climb are selected. Thrust will vary to maintain the speed and V/S. However, if V/S is too great, speed will begin to decay, and care must be taken not to end up in a slow speed, low energy situation.
If a low V/S is specified, thrust will vary to maintain both climb rate and the chosen speed.

On the ND, the top of climb point is displayed and can be monitored to comply with ATC or other requirements. This point will be the level off point of the current selected altitude. The FMGS however, will always give the top of climb point of the altitude specified in the F-PLAN (shown on PROG page). Also useful is the PERF page, which will give predictions to the selected altitude.

DESCENT

The descent may be in OPEN DES mode, managed DES mode or V/S.

In DES mode, the aircraft will calculate an ideal profile and will try to fly it. Its progress can be monitored on the PROG and PERF pages. Speed varies to match the required descent path.

In OPEN DES, the thrust is at idle and a set speed is flown. Again, progress can be monitored on both PROG and PERF pages.

In EXP DES (A320 only), the thrust is idle and the speed target is just short of Vmo/Mmo. Very high rates of descent can be achieved and careful monitoring is vital.
Mentally checking that the aircraft will arrive at its descent windows is useful so that the approach is not rushed, nor fuel burned needlessly.

CLIMB AND DESCENT (END)

06 - COMPLETION STANDARDS

- Has sound knowledge of aircraft performance.
- Demonstrates understanding of FMGS capabilities and limitations.

07 - COMMON ERRORS

- No cross check of descent profile.
- No anticipation of possible navigation changes (Dir to, Hdg...)

PREFLIGHT PLANNING FOR ONE ENGINE OUT

01 - TRAINING OBJECTIVE

- To correctly use appropriate FCOM information.
- To choose the appropriate strategy.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 4.04 - 07
- FCOM 3.06 (Single engine operations)
- FCOM 4.04.30 (Engine out in cruise phase)
- FCOM 4.05.50 (Engine failure in cruise)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Gross ceiling.
- Standard strategy in cruise.
- Obstacle strategy in cruise.
- ETOPS/Fixed speed strategy in cruise.
- Descent.
- Holding.

SECONDARY

- Effects of bleeds.
- Effects of temperature.

PREFLIGHT PLANNING FOR ONE ENGINE OUT (END)

05 - TRAINEES' ACTIONS

This supplementary information will deal with the pre-flight planning and in flight performance determination following an engine failure. Procedures for dealing with an engine failure in the cruise and landing on one engine are dealt with in the abnormal operations section of this manual.

At the pre-flight planning stage, should the flight be over mountainous terrain, then it is important to consider the calculation of a point of no return (PNR) and aircraft net flight path. This is detailed in FCOM 2.04.35 (Special Operations - Flight Over Mountainous Area) and the aircraft flight manual.

Performance for the three strategies of standard strategy (no obstacles), obstacle strategy and ETOPS strategy is detailed in FCOM 3.06 (Single Engine Operations). In flight gross ceiling at drift down speed and at long range cruise speed can be determined from QRH 4.04. Also gross flight path at drift down speed, fuel consumption at long range cruise speed and quick check of fuel and time to landing are available in QRH 4.05 to 4.07. These tables are very useful but require a little bit of studying in order to fully appreciate the information contained in them.

06 - COMPLETION STANDARDS

- Demonstrates good knowledge of documentation.
- Makes valid use of information.

07 - COMMON ERRORS

- Not disconnecting ATHR following engine failure in the cruise.
- Misreading QRH tables.

01 - TRAINING OBJECTIVE

- To handle the aircraft using basic skills without FD and A/THR.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :

- FCOM 1.22.30 (Auto Flight)
- FCOM 1.27 (Flight Controls)
- FCOM 3.02.80 (Flight with unreliable speed indication)
- FCOM 3.04.27 (Flight controls)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Flight path stability
- Pitch attitude / Power setting characteristics

<u>SECONDARY</u>

- Pitch attitude / Power settings for all flight phases.

05 - TRAINEES' ACTIONS

This briefing will provide an overview of the flight control laws on the A320 family of aircraft and the protections provided to the pilot. It will not provide a full technical description of the flight control system which is available in FCOM 1.27 (Flight Controls) and excellent guide to the flight control laws is provided in FCOM 3.04.27 (Supplementary Techniques - Flight Controls).

The aircraft can be flown in normal law, alternate law (with and without reduced protections), direct law and mechanical back up.

NORMAL LAW

There are three modes of normal law; ground mode, flight mode and flare mode.

Ground mode

- Direct control of elevator, spoilers, ailerons and rudder. This is progressively blended out when airborne so that flight mode becomes effective.

Flight mode

- Side-stick movement in the pitch axis commands a change in "g". Zero displacement is a positive command for 1g flight. 1g flight means no change in flight path. So once the correct flight path has been established, in the short term it will be maintained, despite any changes to thrust or speed. Hence there is no need to trim.
- Side-stick movement in the roll axis commands a given rate of roll. Zero displacement is a positive command for zero roll rate flight. Once the required bank angle has been established, release the side-stick to neutral and it will be maintained.
- Resist the temptation to "overcontrol" the aircraft. Make a small input then gently release to neutral and leave the stick alone unless a further adjustment is required. All turns may require some side-stick and power adjustments.

Flare mode

- A change in pitch control below 50 ft only, requiring a gentle pull on the sidestick during the flare in order to maintain a progressive flare.

Protections :

Full flight envelope protection is provided in normal law using the following individual protections.

- Load factor limitation
- Attitude protection (Pitch and Bank)
- High angle of attack protection (between VPROT and VMAX the sidestick demands angle of attack up to MAX and the aircraft does not stall)
- High speed protection

05 - TRAINEES' ACTIONS (CONT'D)

ALTERNATE LAW

Depending on the particular failure that causes the degrading of the flight control laws, ECAM will indicate whether Alternate Law with or without protections is active. The indications will be ALTN LAW or ALTN LAW : PROT LOST . The main differences between these two laws and normal law are detailed below.

In alternate law pitch control is similar to normal law with some changes in the protections available.

Roll control is the same as direct law with the sidestick demanding aileron deflection rather than roll rate.

Protections :

Load factor limitation.. same as normal law
Pitch attitude protection .... not provided
High angle of attack protection .... - changed to low speed stability (PFD display also changes, VSWis shown and stall warning is provided)
High speed protection...................................... changed to alternate high speed stability

In some failure cases alternate law without protection is available. All protections except load factor limitation are lost.

DIRECT LAW

ECAM will indicate to the crew when direct law is the active flight control law and USE MAN PITCH TRIM will be displayed on the PFD as a reminder.

In direct law, the sidestick is coupled directly to the controls, without any stabilization feedback. In effect, it becomes like a conventional aircraft. Manual pitch trim must be used. No protections are available.

MECHANICAL BACK-UP

In the unlikely event of certain multiple failures, pitch trim and rudder can be used to control the aircraft by mechanically controlling the associated hydraulic motors. If it is necessary to use the pitch trim wheel to control the aircraft in pitch, MAN PITCH TRIM ONLY will be displayed in red on the PFD. There is no turn coordination and no protections are operative.

05 - TRAINEES' ACTIONS (END)

NORMAL HANDLING

The aircraft can be flown like a conventional aircraft using pitch attitudes and power settings. The following table gives an idea of the attitudes and thrust settings to use in some phases of flight. Bear in mind that these are average values and will vary at different aircraft weights.

	N1	**PITCH**
T/O Initial	CL	13
Accel	CL	10
Climb	CL	7
Cruise	80%	2
Descent	Idle	-2
Downwind	57%	6
Final	52%	2

ALPHA FLOOR

Alpha floor is an autothrust mode, however it is also a part of the flight envelope protection. At high angles of attack TOGA thrust is commanded by the autothrust system. Alpha floor is available from lift off until 100 ft RA on approach. It provides protection against stall and windshear and has priority over all other protections. (FCOM 1.27.20 [FLT Controls - Normal Law] & 1.22.40 [Auto FLT - FLT Augmentation]). Alpha floor is only available in normal law.

LOW ENERGY WARNING

In normal law, a warning is included to alert the pilot to a low energy situation. It is not a protection, and occurs before floor operates (FCOM 1.22.40 [Auto Flight - Flight Augmentation]. This warning is only available below 2000 ft radio altitude and in CONF 2, 3 or FULL.

ALPHA LOCK

This protection prevents the retraction of flap from CONF 1 to zero, if speed is too low or AOA is too high (FCOM 1.27.50 [Flight Controls - Flaps and Slats]).

06 - COMPLETION STANDARDS

- Safe, accurate and confident handling.
- In normal and alternate laws, maintains heading +/-5, height +/-100 ft and speed +/-10 kt.
- In direct law maintains heading +/-10, height +/-200 ft and speed within +/-15 kt.

07 - COMMON ERRORS

- Basic scan too slow.
- Excessive control inputs (including thrust).

01 - TRAINING OBJECTIVE

- To understand the various guidance modes and flight director reversions

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.22.30 (Flight Guidance)
- FCOM 4.02.30 (Flight Guidance Principles)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- FMA annunciations
- Crew coordination
- Reasons for reversion modes

SECONDARY

- Flight guidance principles

05 - TRAINEES' ACTIONS

REVERSION DUE TO FCU ALTITUDE CHANGE

This reversion is caused when there is pilot action on the ALT selector knob while the aircraft is climbing or descending. It applies equally whether the aircraft is being hand flown or if the autopilot is engaged.

VERTICAL MODE ENGAGED	FCU ALTITUDE SELECTION CHANGE	VERTICAL MODE SWITCHES TO
CLB, OP CLB, EXP CLB	Below current altitude	V/S on current V/S
DES, OP DES, EXP DES	Above current altitude	V/S on current V/S
ALT* active	Any change	V/S on current V/S

REVERSION DUE TO LOSS OF NAV MODE

This reversion is caused by loss of NAV mode, for example selecting a HDG, or when entering a discontinuity. Again, this applies whether the aircraft is being hand flown or through the autopilot.

CONDITIONS	EVENT	CONSEQUENCE
CLB engaged	Loss of the lateral managed mode : NAV	OP CLB engages
DES engaged	Loss of the lateral managed mode : NAV	V/S engages

REVERSION WHEN FD ORDERS ARE NOT FOLLOWED

These reversions occur when the aircraft is in manual flight and the pilot fails to follow the FD bars.

CONDITIONS	EVENT	CONSEQUENCE
FD engaged AP Off A/THR active (IDLE thrust) DES, OP DES or EXP DES engaged	IAS = VLS - 2 kts IAS = VLS - 17 kts (if speedbrakes extended)	Automatic engagement of SPD mode on A/THR, and consequently of V/S (FPA) mode on FD to regain the target speed, or VLS, whichever is the greater.
FD engaged AP Off A/THR active (CL thrust) CLB, OP CLB or EXP CLB engaged	IAS = VMAX + 4 kts where VMAX = VFE or VLE or VMO/MMO	Automatic engagement of SPD mode on A/THR, and consequently of V/S (FPA) mode on FD to regain the target speed, or VMAX, whichever is lower.

05 - TRAINEES' ACTIONS (END)

REVERSION DUE TO EXCESSIVE V/S

When an excessive V/S has been selected, the aircraft cannot achieve the V/S demanded. The airplane is trying to maintain a V/S and a speed, but the priority is to maintain the V/S. When this is not possible, speed will decrease (climbing) or increase (descending) up to a maximum. After this point, a mode reversion will occur to protect the airplane from entering a potentially hazardous situation. The table below explains the consequences of selecting excessive V/S and the reversions. They apply equally with autopilot engaged or not.

CONDITIONS	REVERSION OCCURS WHEN	CONSEQUENCE
Excessive V/S - FPA > 0 selected	IAS = VLS + 5 kt	Open mode engages in order to regain the target speed.
Excessive V/S - FPA < 0 selected and clean configuration	IAS = VMAX - 5 kt where Vmax = VMO/MMO	OP CLB engages when the FCU selected altitude is higher than the current airplane altitude.
Excessive V/S - FPA < 0 selected and configuration other than clean	IAS = Vmax + 4 kt where Vmax = VFE or VLE	OP DES engages when the FCU selected altitude is lower than the current airplane altitude.

The reversions with autopilot engaged can be demonstrated using the FMGS Freeplay Trainer.

Reversions are recognised by monitoring the FMA.

06 - COMPLETION STANDARDS

- Demonstrates a thorough knowledge and understanding of flight guidance and the various reversion modes

07 - COMMON ERRORS

- Lack of appreciation of flight guidance reversions
- Incorrect procedure following reversions

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01 - TRAINING OBJECTIVE

- To understand the philosophy of the FPV and FPD.
- To correctly interpret the information given by the FPV.
- Uses FPV to achieve desired flight path.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

- FMGS Freeplay Trainer

DOC references :
- FCOM 1.22.10 (FCU)
- FCOM 1.22.30 (FPD)
- FCOM 1.31.40 (PFD)
- FCOM 3.04.31 (Use of FPV)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Use of HDG/VS - TRK-FPA pushbutton and associated FCU indications, FMA modes and PFD/ND changes.
- Differences in trajectory between HDG and TRK, VS and FPA.
- Information provided by FPV (lateral and vertical).
- How to follow FPD demands in manual flight.

SECONDARY

- Caution regarding use of FPV during go around.
- Use of FPV and selected TRK index to maintain a radial or an approach course in raw data.

05 - TRAINEES' ACTIONS

When selecting HDG/ VS - TRK/FPA push-button, note the changes on FCU, FMA modes and ND/PFD displays.

FPD is commanding a trajectory. If followed it will give a required trajectory that is stabilized by reference to the ground. FPV is an indicator of performance, and is not in itself a director or a command.

However it is very useful in a non-precision approach. HDG/VS on the other hand is referenced to the air mass.

The FPV shows the present lateral track and present flight path angle relative to you. It is dynamic and indicates where we will be if all else remains the same. If any changes are introduced, the FPV will show the result of these changes. There is a slight lag in response.

Great care must be taken to remember which mode is in operation, especially in differentiating between VS (i.e. feet per minute) and FPA (an angle relative to the airplane). This is determined by monitoring the FMA.

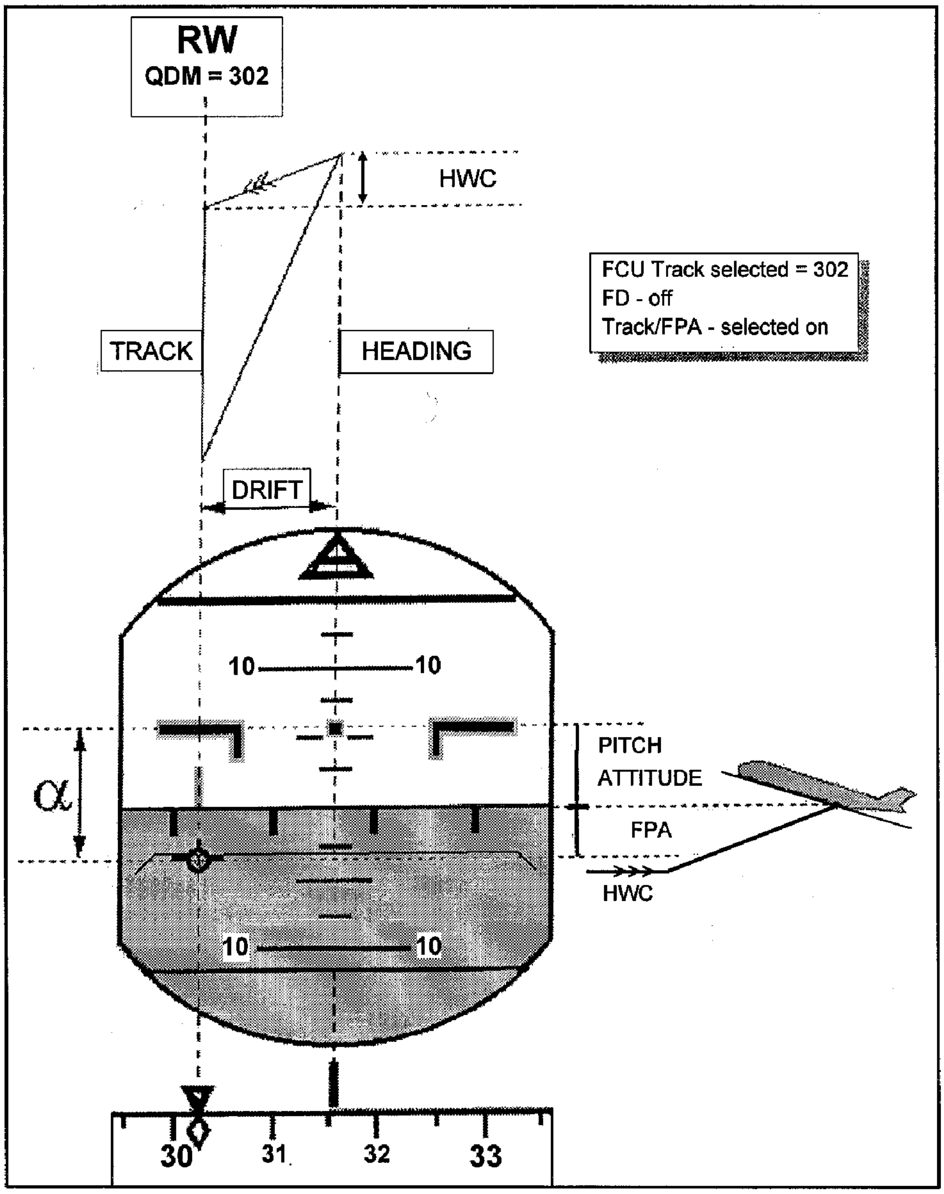
When flying a go-around, remember to use the aircraft attitude as the primary reference. It should be noted that when using FPV, the aircraft attitude symbol is dimmed. The use of the FPV is not recommended for high dynamic manoeuvres such as take-off and go-around.

The FPV, managed speed target on approach and the speed trend are efficient indications to the crew of wind variation and windshear.
The accuracy of the FPV is directly linked to the accuracy of the IRS speeds. For example, an error of 5 kt in ground speed may cause an error of up to 2.5° in track on the approach. Therefore, during even short turnarounds, it is recommended to realign the IRS when ground speed reaches 5 kt.

Wings level change of FD mode gives current TRK on current HDG.
Does not apply to a turn.

05 - TRAINEES' ACTIONS (END)

This diagram illustrates the relationships between : heading and track - pitch attitude and FPA.



06 - COMPLETION STANDARDS

- Makes correct selection of FPV, with FPD as appropriate, and uses the information provided to achieve the desired flight path.

07 - COMMON ERRORS

- Information provided by FPV not understood (e.g. relationship between heading and track).
- Confusion between FPV and pitch angle required (e.g. during go around).

CHAPTER 03

- ABNORMAL OPERATION BRIEFINGS -

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01 - TRAINING OBJECTIVE

- To use MMEL/MEL correctly and make a valid decision regarding dispatch.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- Master Minimum Equipment List (MMEL)
- Minimum Equipment List (MEL)
- FCOM bulletin nº 18/2-B (MMEL/MEL use)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Description and use of MMEL and MEL.
- Significance of operational and maintenance procedures.

SECONDARY

- Cross-referencing for additional procedures or limitations following equipment failure.

05 - TRAINEES' ACTIONS

The main purpose of the MMEL is to permit aircraft dispatch when equipment or functions are inoperative, to avoid delays and cancellations.

The MEL is the operators' own version of the MMEL. The MMEL is produced by Airbus Industrie. The MMEL cannot be used as a substitute for the MEL. The MEL must be more restrictive than the MMEL.

The MEL should contain the following basic information :

- a list of equipment or functions which may be inoperative for dispatch
- associated operational procedures
- associated maintenance procedures
- list of ECAM warnings, associated with the corresponding dispatch conditions

When a failure is detected or identified, the crew must enter the MEL to determine if dispatch is possible, and limitations or conditions. Items not listed in this section indicate NO DISPATCH.

If an (O) is associated with an item, then dispatch may be possible following an operational procedure. Operational procedures are contained within the MEL document.

If an (M) is associated, then a maintenance procedure must be applied. Maintenance procedures are generally to be found in maintenance manuals which are not held on the aircraft.

06 - COMPLETION STANDARDS

- Determines dispatch situation and applies operational procedures, if appropriate.
- Ensures maintenance procedures are applied, if appropriate.

07 - COMMON ERRORS

- No check of possible "secondary" failures leading to additional restrictions.

REJECTED TAKE-OFF

01 - TRAINING OBJECTIVE

- To recognize circumstances requiring an RTO.
- To take correct actions in the event of RTO.

02 - SCHEDULE

Briefing duration : 15 minutes + 45 minutes for video

03 - EQUIPMENT

DOC references :

- FCOM 3.02.10 (RTO Procedure)
- Video available (45 min.)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Failure identification (crew communication).
- Decision and call out (STOP, GO and V1).
- Deceleration actions and control.
- Task sharing.
- ECAM actions (if appropriate).
- Notify ATC.

SECONDARY

- Review of non inhibited warnings.
- Complementary actions and check-list.
- Specific engine fire on ground check list.
- Decision with tire problems or windshear.

REJECTED TAKE-OFF (END)

05 - TRAINEES' ACTIONS

The action of rejecting a take-off can be hazardous, and the time available to make the correct decision is limited. To assist with this, the ECAM inhibits warnings which are not of paramount importance between 80 kts and, 1500 ft or 2 minutes after lift off, whichever occurs first. Therefore, any warning received in this period should be carefully considered. To assist decision making, the take-off is divided into low and high speed regimes. 100 kt is chosen as the dividing line. There is no significance to 100 kts, merely that it divides the take-off into low and high speed.

- Below 100 kts, it is possible to reject for any reason.
- Above 100 kts, and approaching V1, be "go-minded" unless major failures or ECAM warnings occur.
- Once above V1, the take-off must be continued as it may be impossible to stop the aircraft on the runway remaining.

Remember to bring the airplane to a complete stop, not slowed, **stopped**. Set the Parking Brake. When the airplane is stopped identify/confirm failure. If ENG FIRE, it is recommended to use the QRH as ECAM will normally be lost on second engine shut down (APU not normally running). In other cases where evacuation is considered necessary use the ON GROUND EMER/EVAC checklist. The ENG FIRE ON GROUND checklist includes the possibility of emergency evacuation, therefore there is no need to use the EMER/EVACUATION checklist when this checklist is being used.

Use ATC, fire service and cabin staff to gain as much information as possible to assist in making a decision on whether to evacuate or not. Remember that the simplest way to confirm an engine fire, on the ground, is to open the cockpit window and look out.

If no evacuation is necessary, clear the runway if safe to do so.

06 - COMPLETION STANDARDS

- Makes appropriate decision before V1.
- Carries out correct actions to ensure a safe stop on runway centerline.

07 - COMMON ERRORS

- Disarming of autobrake due to instinctive manual braking.
- ATC and/or Cabin crew not informed.
- Reversers thrust remains engaged after aircraft stop.
- Omitting to select parking brake on.
- Non respect of task-sharing during emergency procedure.
- Failure to have QRH available.
- Confusion over use of ON GROUND EMER/EVACUATION or ENG FIRE ON GROUND checklist.
- Inability to use mechanical seat controls.

ENGINE FAILURE OR FIRE AFTER V1

01 - TRAINING OBJECTIVE

- To recognize engine failure and/or fire warning.
- Take correct actions to maintain a safe trajectory.
- To perform correct engine fail or fire after V1procedure.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- QRH 2.19 (Engine stall)
- QRH 2.21 (Overweight landing)
- FCOM 1.27.20 (Sideslip target)
- FCOM 3.02.10 (Operating techniques)
- FCOM 3.02.26 (Engine fire)
- FCOM 3.02.70 (Engine fail)
- FCOM 4.04.30 (EOSID) if applicable
- FCOM 4.05.30 (Engine Out Procedure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points :

MAIN

- GO/STOP decision making.
- Aircraft control on the ground and at rotation.
- Roll control, sideslip target and "Fly by wire" characteristics.
- Pitch attitude and speed control.
- Specific task sharing procedures.
- Confirmation of non-reversible items with ECAM actions.
- Engine-out profile.

SECONDARY

- A/P engagement / Rudder trim.
- EOSID activation.
- Availability and use of TOGA.
- FD roll limit below green dot speed.

ENGINE FAILURE OR FIRE AFTER V1 (CONT'D)

05 - TRAINEES' ACTIONS

ENGINE FAILURE

After detecting an engine failure, PNF is to call "engine failure", without identifying which engine has failed.

TOGA power is available, but should only be applied when required by PF. This is because the increase in power may cause directional control difficulties when at light weights and low speeds.

PF should maintain runway centerline with rudder, visually or with assistance of the PFD yaw bar (if available). At VR, rotate smoothly to 12°5 nose up and centralize blue β target (see below for explanatory note) with rudder. Adjust pitch attitude and monitor speed trend arrow (minimum speed V2) until SRS has stabilized. The change over from yellow side slip index to blue β target may not occur instantaneously. Use rudder trim to neutralize rudder pedal pressure. When a positive climb has been achieved, call for retraction of the gear. Use autopilot if it is available.

PNF should closely monitor the aircraft's flight path, cancel warnings and identify the failure when appropriate. Note when a positive climb has been established and announce accordingly. Retract gear on command.

Once well clear of the ground, minimum 400 ft, the ECAM actions may be started.
It is not necessary to rush into doing the ECAM drills and 400 ft is the MINIMUM altitude at which commencement of ECAM drills should be considered. The priority is to ensure that the aircraft is climbing, stabilized and is flying in a safe direction. Do not get too distracted with ECAM. Furthermore, ECAM should be interrupted when necessary to allow both pilots to monitor level-off, configuration changes etc.

It is important to determine whether the engine has suffered a flameout or has structural damage. The action of putting the start switch to ignition confirms the relight attempt being made by the FADEC. If a flameout has occurred, then a relight (QRH 2.18) may be considered at a later stage when aircraft has been cleaned up and a safe flight path established.

There must be no movement of thrust lever, master switch or fire pb without positive confirmation from both pilots.

ENGINE FAILURE OR FIRE AFTER V1 (CONT'D)

05 - TRAINEES' ACTIONS(CONT'D)

ENGINE FIRE

Should an engine fire develop, follow the general series of actions described above. However, the ECAM drill should be commenced as soon as is practicable (though not below 400 ft). Be aware that the engine may still be developing a significant amount of thrust until the engine master switch is placed to off. Consider the use of autopilot to reduce workload. The ECAM will count down the seconds to initial agent discharge and the time period between discharges.

Do not attempt to restart an engine which has been shut down due to fire.

The ECAM notes that a landing should be carried out as soon as possible. Bear in mind the prevailing weather conditions, but an engine fire which will not extinguish is a very serious matter.

Following engine shutdown, consider all affected systems and their impact on the approach and landing.

ECAM PROCEDURES

ECAM procedures should be started not below 400 ft. At this height, only immediate actions to secure an engine should be carried out as shown below. ECAM actions may be interrupted at any stage for the PNF to assist PF (e.g flap retraction). Do not allow ECAM actions to interfere with monitoring of the flight path.

- Engine flame out, no damage - ignition on, thrust lever to idle, engine master switch off - stop ECAM.
- Engine failure, with damage - continue ECAM to discharge of AGENT 1 - stop ECAM.
- Engine fire - continue ECAM to discharge of AGENT 2, if necessary, or until FIRE warning is out - stop ECAM.

ECAM procedures should be recommenced once the aircraft is clean (or at 'S' speed with CONF 1, if returning for an immediate VMC landing) and climbing to a safe altitude . Complete ECAM until STATUS page appears then carry out the after take-off C/L before reading STATUS.

ENGINE FAILURE OR FIRE AFTER V1 (CONT'D)

05 - TRAINEES' ACTIONS (CONT'D)

FMGS PROCEDURES

The two FMGS procedures which are worthy of note are the use of the EO SID prompt and the EO CLR prompt. The in depth explanation of both these functions is contained in FCOM 4.04.30 (How to Use - Other Functions).

The use of EOSID routing is dependent on there being a EOSID defined in the database for that particular runway. If an engine failure occurs before the point at which the EOSID differs from the planned SID then the EOSID will appear as a TMPY F-PLAN. To follow the EOSID all the crew has to do is to insert this as the active F-PLAN. Therefore the first leg of the active F/PLN should be a common leg in database.

If the engine failure occurs beyond the point at which the two SIDs differ there will be no TMPY F-PLAN created although the EOSID will be shown in yellow on the ND. To follow an EOSID in this case the crew can perform a DIR TO one of the EOSID waypoints and then modify the F-PLAN or, more simply follow the EOSID, which is displayed as a yellow line on the ND, using HDG mode.

When an engine failure is detected the bank angle commanded by the FD is limited to 15° when speed is below or at maneuvering speed of current configuration (F, S, O). The EO CLR prompt on the active PERF page would remove this bank angle limit if depressed.

But the EO CLR prompt should be pressed ONLY in the event of a successful relight on a failed engine or in the event of wrong detection or FADEC fault. Holding may be performed in managed NAV, if speed is selected and is just greater then Green Dot speed. This will ensure the aircraft stays within the protected holding area. Appropriate action should be taken, if any speed - and / or bank variation occur.

SINGLE ENGINE APPROACH AND LANDING

If an engine failure/fire has occurred on take off, the overweight landing checklist may be required (QRH 2.21).

Autoland (CAT 3 single) is available on one engine (as shown on ECAM). Maximum use should be made of the autopilot to reduce crew workload. In manual flight an engine out landing is essentially conventional. Good trimming is beneficial, keeping the slip indication centered. Consider the use of manual thrust when the autopilot is off, as it is easier to anticipate rudder and trim inputs as thrust requirements vary.
The approach should be carried out in CONFIG FULL unless a further failure, and therefore ECAM requires a CONF 3 approach. Do not select gear down too early, the power requirement for level flight at high altitude airports and/or high weight will be large.
Rudder trim may be reset to zero on short finals, to make the landing run easier, to center the nosewheel steering and to recover full rudder travel both sides but should be reset prior to land.

ENGINE FAILURE OR FIRE AFTER V1 (END)

05 - TRAINEES' ACTIONS (END)

SINGLE ENGINE GO-AROUND

The go-around is essentially the same as on 2 engines, the pitch target is now 12°5. Apply rudder to compensate for the increase in thrust and keep the β target centered. FMA will indicate GA TRK, think about aircraft navigation with respect to terrain. Flap retraction and acceleration will take place in level flight at acceleration altitude. As this is a go-around, target speed is the memorized approach speed or the speed at engagement of go-around, becoming green dot at acceleration altitude.

b TARGET

The side slip indicator (yellow) gives the same indications as traditional slip ball. The β target (blue) replaces the side slip indicator on the PFD when there is engine power asymmetry and CONF 1, 2 or 3 is set [see FCOM 1.27.20 (Flight Controls - Normal law)].
When the β target is centered, total drag is minimized even though there is a small amount of side slip

The calculation of β target is a trade off between drag produced by deflection of control surfaces, and airframe drag produced by a slight side slip. This is better than a traditional ball as rudder deflection, aileron deflection, spoiler deployment and aircraft body angle are all taken into incount.

06 - COMPLETION STANDARDS

- Makes correct decision to continue the take-off.
- Ensures minimum deviation from runway centerline.
- Establishes correct pitch attitude at rotation with wings level and β target centered.
- Accurately follows flight director and ensures correct FCU selections.
- Maintains speed, V2 +5 kt/-0 kt during second segment.
- Adheres to engine-out vertical profile maintaining acceleration altitude +200 ft/-0 ft.
- Follows EOSID, emergency turn procedure, ATC instructions or required heading +/- 10.
- Respects task sharing.

07 - COMMON ERRORS

- Over rotation to high pitch attitude.
- b Target not fully centered.
- ECAM non-reversible actions carried out without proper crew confirmation.
- SID, EOSID or ATC instructions not accurately followed.
- Poor maintenance and monitoring of required track.
- Lack of task sharing discipline during manual flight (FCU actions).
- Not trimming the rudder.
- Not rotating to correct pitch attitude on go-around.

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01 - TRAINING OBJECTIVE

- To ensure continued safe flight following loss of all engine generators.
- To carry out ECAM procedure strictly respecting task sharing requirements.
- To perform a safe approach and landing using raw data information and degraded flight control laws.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- QRH 02.02 to 02.05 (Systems remaining)
- FCOM 03.02.24 (Elec emerg CONF)
- QRH 2.08 & FCOM 03.02.28 (Fuel gravity feeding)
- Briefing note - ECAM use in case of failures
- Briefing note - ILS raw data approach
- Briefing note - Use of FPV

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- EFIS, ECAM, AUTO FLIGHT and FMGS availability following failure.
- ECAM procedure (one ECAM DU lost) and status page APPR PROC considerations (RAT, direct law...).
- Navigation aid tuning by RMP.
- QRH use for approach and landing data.
- Specific procedure for go around (EMER GEN recovery).
- Task sharing and communications.

SECONDARY

- Non-use of APU generator.
- Communications (ATC, cabin,...).
- Raw data approach (reminder).
- Direct law approach and landing (reminder).
- Fuel gravity feeding considerations.
- Cockpit lighting.

05 - TRAINEES' ACTIONS

When all engine driven generators have been lost, the workload is immediately greatly increased. It is important that task-sharing procedures are understood and adhered to. Remember one of the golden rules; fly the aircraft.
Autopilot is not available and CM1 must take control as only the following equipment is available:

- CM1 PFD (FPV but no FD)
- CM1 ND (on ETOPs aircraft until gear down)
- Upper ECAM
- CM1 MCDU
- FCU

The FPV will have to be selected in order to be displayed on the CM1 PFD. However it is important to deselect the FDs so that the blue track index is indicated on the PFD, assisting heading/track keeping. Once a safe flight path is established and the aircraft under control, the focus can shift to the next priority - navigation.
Although the ECAM advises a landing as soon as possible, it would be unwise to attempt an approach at a poorly equipped airfield in marginal weather. Prolonged flight in this configuration is not recommended.

Communication can be of great help here, ATC may be able to give radar headings to the nearest suitable airfield, once informed of your problem. This is a serious emergency and ATC should be notified using appropriate phraseology (MAYDAY) so that greater separation between you and other traffic can be arranged.

It is important to identify the failure that has occurred - it is possible for pilots to confuse emergency electrical configuration with an all engine failure. Therefore, read the title of the ECAM failure. The ECAM drill may then be started. It is a lengthy and complicated procedure, as only one display is available. Consider carefully the feasibility of starting the APU. If a simultaneous engine generator failure has occurred, the probability of coupling will be low. Any APU start will drain batteries, reducing flight time available on batteries only.
Take care to respect minimum speed (140 kts), as any lower could lead to RAT stall. All probe heating is lost, except CAPT Pitot and AOA, so if a discrepancy occurs between airspeed indications on CM1 PFD and on STBY, disregard STBY indication.
Allow sufficient time to plan and discuss the approach and landing. Navaid tuning including ILS must be through RMP 1 as navaid autotune through FMGS will be lost at gear extension.

When the gear is extended, the aircraft reverts to DIRECT law. It would be wise to review the implications of DIRECT law control and procedures before beginning the approach. Further, at gear lowering, the RAT stalls and electrical power supply is battery only, limited to approximately 25 minutes. Do not lower the gear earlier than necessary in order to conserve battery life. In the event of a go-around, a drill is available to extend this time (QRH 2.02 - FLT ON BAT ONLY), and should be mentioned in the approach briefing.
Delay lowering the gear until after CONFIG 3 has been set and the aircraft will be in a trimmed state when DIRECT law becomes active.
Few retardation devices are fully serviceable, so a short runway will cause problems.

06 - COMPLETION STANDARDS

- Maintains flight path in accordance with ATC clearance.
- Performs ECAM actions accurately and without undue delay.
- Makes sound decision to continue or divert according to circumstances.
- Performs safe, accurate approach and landing, taking into account degraded systems and flight control laws, within half scale deflection of localiser and glideslope.
- Adheres strictly to task sharing requirements at all times and ensures good crew and ATC communications.

07 - COMMON ERRORS

- Confusion with all engine fail.
- Lack of task sharing discipline during ECAM procedure.
- FD not selected OFF to regain blue track index.
- VAPP selected below 140 kts (minimum RAT speed).
- Early extension of landing gear.

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ABNORMAL FLAPS/SLATS CONFIGURATION

01 - TRAINING OBJECTIVE

- To perform the correct procedure to configure the aircraft for approach and landing.
- To carry out actions required by ECAM/QRH procedures.
- To handle the aircraft smoothly during approach and landing complying with published procedure for configurations and speeds.
- To respect task sharing requirements throughout.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- QRH 2.05 to 2.06 (Landing with abnormal Slats/Flaps)
- QRH 2.20 to 2.25 (Approach Speeds and Landing distance)
- FCOM 1.27.50 (Flaps and Slats)
- FCOM 3.02.10 (Operating techniques)
- FCOM 3.02.27 (Slats and/or Flaps fault/locked)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Task sharing and crew coordination.
- Use selected speed.
- ECAM procedure and STS page "APPR. PROC".
- Approach speed and landing distance calculations.
- Speed control for no flaps/no slats approach.
- Approach briefing and abnormal configuration procedure use.

SECONDARY

- A/THR management.
- Pitch angle (tail-strike) at landing if no flaps.
- Use of autobrake.
- Go around procedure and briefing.
- CONF FULL selected on MCDU PERF page for VAPP calculation.

ABNORMAL FLAPS/SLATS CONFIGURATION (CONT'D)

05 - TRAINEES' ACTIONS

Should this problem arise when in the intermediate approach phase, a delay in starting the approach should be considered.

The figure given on ECAM for multiplying landing distance is calculated on flap handle position and may be incorrect until the final CONF selection has been made. The landing distance factors are available in QRH 2.25, along with speed increments. Speed increments are based on VREF CONF FULL in all cases. When calculating VAPP, see QRH 2.24 for information on the use of wind correction in failure cases. Do not rush these calculations. Use selected speed and the use of auto thrust is recommended for most cases.

There are two cases to consider:

- flaps/slats locked with the wing tip brake on when selecting a different flap setting - do not recycle flap lever.
- flaps/slats fail to move with movement of the flap lever - recycle the flap lever.

If the fault cannot be cleared apply QRH 2.05 or 2.06 as appropriate.

QRH 2.05 (Landing with slats or flaps jammed) needs a little amplification as the line "-SPEED SEL ....VFE NEXT" can be misinterpreted. An example will illustrate the procedure.

- When CONF 1 is selected slats lock (WTB on) between 0 and 1.
- Take control of the aircraft speed - use selected speed for the rest of the approach. Managed speed will aim for S speed which is the wrong speed at this stage, and may be below VLS. At this stage select an appropriate speed depending on aircraft position and intentions.
- Follow ECAM drill and then when ready for CONF 2 select VFE NEXT as shown on the PFD. It is preferable to reduce speed and change configuration in non maneuvering flight.
- Do not go below VLS - at high gross weights VLS may be greater than VFE NEXT in which case decelerate to VLS, select the flap lever one step down and progressively select slower speeds as the surfaces extend.
- Repeat until landing configuration is reached.

No flaps no slats landing is a fairly simple procedure, however more room is required for maneuvering. The flap handle should be placed in the CONF 1 position so that FD go-around modes (SRS and GA TRK) are available in the event of a go-around. During approach the aircraft pitch attitude will be unusually high, therefore a tail strike is more of a concern and only a minimal flare is required.

Consider fuel available and the quantity that may be required if a diversion is necessary with flaps and/or slats jammed.
The autopilot may be available but monitor its operation closely as it is only authorized for use in normal configuration. However, do not use the autopilot below 500 ft AGL.

ABNORMAL FLAPS/SLATS CONFIGURATION (END)

06 - COMPLETION STANDARDS

- Correctly responds to failure ensuring a safe flight path and speed.
- Performs ECAM actions and QRH procedures in a methodical manner.
- Makes correct adjustments to VAPP and selects appropriate configuration.
- Makes smooth and accurate approach and lands within the touchdown zone at the correct speed (+10 / - 0 kts).

07 - COMMON ERRORS

- Rushing procedure.
- Starting approach before completing all procedures.
- Selected speed not used immediately at failure recognition.
- Wrong VAPP selection on MCDU.
- Rough handling.
- Use of managed speed on final approach
- Incorrect go around procedure.

RECONFIGURATION LAWS - RECOVERY FROM APPROACH TO STALL

01 - TRAINING OBJECTIVE

- To recognize the indications of an impending stall.
- To take immediate and appropriate actions to recover to controlled flight.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- FCOM 1.27.30 (Abnormal control laws)
- FCOM 3.04.27 (Supplementary Techniques - Flight controls)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

<u>MAIN</u>

- Stall possible only in Alternate and Direct laws ("Fly-by-wire" aircraft).
- Speed scale symbols change (VSW) and aural warning.
- Recovery technique according to altitude and configuration.

<u>SECONDARY</u>

- Control of pitch
- Risk of secondary stall

RECONFIGURATION LAWS - RECOVERY FROM APPROACH TO STALL (CONT'D)

05 - TRAINEES' ACTIONS

The conventional stall is only possible in alternate and direct control laws, because of the protections provided in normal law. Alternate or direct law will be indicated by ECAM and the changes on the PFD ; bank angle and pitch limitation replaced by amber X, low speed indications change from alpha prot. to VSW. VSW is load factor dependant and will increase with increase in pitch up rate or bank angle.

Also, an aural warning is produced on entering the stall regime. This aural warning is produced by the AOA sensors not the FACs. It is possible to experience "false warnings" if pitch control is rough during the recovery from the stall. VSW indications are always correct as these are generated by the FACs.

INDICATION .... "STALL, STALL, STALL"
THRUST LEVERS .... TOGA

At the same time :

PITCH ATTITUDE .... REDUCE
BANK ANGLE .... ROLL WINGS LEVEL
SPD BRAKES .... CHECK RETRACTED

If a danger of ground contact exists, reduce pitch attitude no more than necessary to allow airspeed to increase.
After initial recovery, maintain speed close to VSW until it is safe to accelerate.

If below 20,000 ft, and in clean configuration, select CONF 1.
Out of stall when there is no threat of ground contact:

LANDING GEAR .... UP

Recover to normal speed and retract flaps as required.
In case of engine inoperative, use power and rudder with care.
Be prepared for a strong pitch up due to power application and the need for large manual pitch trim changes in DIRECT law.
Care must be exercised not to re-enter the stall regime and set off another warning. With prompt action, very little height is lost.

RECONFIGURATION LAWS - RECOVERY FROM APPROACH TO STALL (END)

06 - COMPLETION STANDARDS

- Takes immediate action at first indication of impending stall.
- Employs correct recovery technique and ensures minimum altitude loss.

07 - COMMON ERRORS

- Recovery not initiated immediately.
- Insufficient pitch control at desired attitude.
- Stall re-entry due to uncontrolled high pitch attitude.
- Use of manual trim below VLS.
- Clean up before acceleration above VLS.

01 - TRAINING OBJECTIVE

- To manually control the aircraft in abnormal flight control laws.
- To carry out ECAM and QRH procedures respecting task sharing requirements.
- To safely perform approach and landing in abnormal configuration.

02 - SCHEDULE

Briefing duration : 25 minutes

03 - EQUIPMENT

DOC references :

- QRH 2.05 & 2.06 (Landing with slats or flaps jammed)
- QRH 2.20 & 2.25 (Approach Speeds and landing distances)
- QRH 2.13 (Landing gear gravity extension)
- FCOM 1.27 (Flight Controls)
- FCOM 1.29 (Hydraulic)
- FCOM 3.02.29 (Procedure)
- Training Memo N° 2008 Issue 4
- Briefing note - Abnormal Flaps/Slats configuration

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Control of flight path and navigation.
- Importance of good crew communication and co-ordination as autopilot is inoperative.
- Coordination with ATC.
- Correct prioritization of tasks.
- Use of selected speed.
- Accurate following of FD and smooth control inputs.

SECONDARY

- Flight control system architecture (QRH 5.03).
- QRH landing distance.
- CONF FULL selected on MCDU PERF page for VAPP calculation.

05 - TRAINEES' ACTIONS

When a dual hydraulic failure is recognized, the autopilot will not be available. It is vital to control the aircraft and ensure a safe flight path. Task sharing is important, as procedures are lengthy, approach briefing necessarily comprehensive and good crew co-ordination is vital.

The golden rule of fly, navigate and communicate applies.

As there are usually many tasks to fulfil, establish clear priorities. Bear in mind that if sufficient fuel remains, taking time to plan and brief properly is time well spent. Remember that flight controls will be in ALTERNATE law for G + B or G + Y until gear lowering when reversion to DIRECT law occurs.

There is no need to memorize the following points as ECAM will give sufficient information concerning inoperative systems.

In an HYD G + Y failure, there is no hydraulic power available to move the stabilizer. In effect, it is frozen. With the gear retracted alternate law is active and autotrim is available. This is achieved by displacement of the elevators which can be moved over the full range. When the gear is lowered direct law becomes active and the elevators have only a reduced range of movement with a direct stick to elevator relationship. The center of this reduced range of movement is the trimmed elevator position prior to lowering the gear. If the gear is lowered before the aircraft is at CONFIG 3 and VAPP, this limited range of elevator deflection may not be sufficient to control the aircraft in pitch, once CONFIG 3 and VAPP are reached. It is vital therefore, that the aircraft is in a trimmed state, with CONFIG 3 set, at VAPP before gear is lowered. Ignore the "USE MAN PITCH TRIM " message, as stabilizer pitch trimming is not available. Use a long runway as few retardation devices are available (spoiler 3 and accumulator brake pressure only).

With HYD G + Y or G + B failure, autobrakes are inoperative, but are not listed in ECAM inoperative systems list. With either of these failures flaps or slats will respectively be lost.

When HYD G + B failed, extend landing gear at 200 kt to improve controllability on single elevator.

In the case of a dual hydraulic failure, ECAM will give information on the STATUS page concerning inoperative systems. Approach speed and landing distance increments will also be shown on ECAM. However the figure given on ECAM for multiplying landing distance is calculated on flap handle position and may be incorrect until the final CONF selection has been made. The landing distance factors are available in QRH 2.25, along with speed increments. Speed increments are based on VREF CONF FULL in all cases. When calculating VAPP, see QRH 2.24 for information on the use of wind correction in failure cases. Do not rush these calculations.

06 - COMPLETION STANDARDS

- Maintains a safe flight path.
- Ensures strict application of task sharing requirements.
- Ensures correct application of ECAM, QRH and FMGS procedures.
- Handles the aircraft smoothly without major deviations from required trajectory (+/- 200 ft ; +/- 10 º ; +/- 10 kt).
- Makes correct determination of VAPP and landing distance.
- Performs accurate approach within standard limits for instrument approach.
- Lands within the landing zone and uses correct braking technique.
- Abnormal configuration approach procedure.
- Specific approach and go around briefing.
- Ensures any special requirements are communicated to ATC and cabin crew.

07 - COMMON ERRORS

- No emergency declared to ATC.
- Incorrect use of selected speed.
- Incorrect prioritization of tasks.
- Incomplete approach and go around briefing for abnormal configuration.
- FD not followed precisely due to over controlling.
- Confusion between VAPP/VREF/VLS for corrected speed.
- Approach initiated before completion of all necessary tasks.
- Not using QRH for gravity gear extension.

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PHILOSOPHY AND NORMAL USE

01 - TRAINING OBJECTIVE

- To fully understand the philosophy and normal use of the ECAM.
- To understand ECAM use for abnormal and emergency operations.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.31 10 to 1.31.30 (ECAM Description)
- FCOM 3.02.01(ABN and EMER PROCEDURES)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Warning levels and associated master lights.
- ECAM control panel.
- Switching.
- ECAM display philosophy.
- MEMO display.

SECONDARY

- Use of RCL and EMER CANC.
- Flight phases and associated displays.

PHILOSOPHY AND NORMAL USE (CONT'D)

05 - TRAINEES' ACTIONS

The Electronic Centralised Aircraft Monitoring (ECAM) system monitors and displays all information concerning aircraft systems and system failures. It is a system which, through text and graphic displays, enables the crew to do most things from ensuring passenger comfort by monitoring cabin temperature to dealing with multiple system failures without the need for paper checklists.

Essentially the ECAM provides the following :

- System indications - temperatures, pressures etc.
- System monitoring - display of system failure, level 1 to 3 or advisory.
- Memo - displays use of systems by the crew e.g. anti-ice and also take off and landing memo.
- Crew actions - in case of failures the E/WD indicates crew action necessary to deal with the failure, replacing the traditional QRH.
- Status - the status page provides the crew with an operational summary of the aircraft systems at any stage of the flight. If STS is displayed on E/WD, when CONF 1 is selected, the STATUS page is automatically displayed.

Display of system failures and take off / landing memo is flight phase sensitive. Take off and landing memo are only displayed at the appropriate time. Before announcing "no blue",ensure that the take-off or landing memo is displayed by reference to the memo title i.e. **T.O or LDG**.

Some warnings and cautions are suppressed at critical phases of flight, however failures critical a particular phase of flight will always be displayed. Note that these flight phases are different from the flight phases used by the FMGS. On the SD some pages are phase-selected i.e. the WHEEL page is automatically displayed after engine start. The cruise page is not selectable, but is continuously displayed from 1500 ft after take-off to landing gear extension unless a warning/caution is displayed, or a system page has been manually selected.(FCOM 1.31.20 [Indicating/ Recording Systems - Indications on SD])

There are three levels of warning/caution, Levels 3, 2 and 1 with level 3 being the highest (FCOM 1.31.10 (Indicating/Recording Systems - ECAM Description)). Level 3 is associated with a master warning and is displayed in red on the E/WD. Level 2 is associated with a master caution and is displayed in amber on the E/WD. Level 1 is displayed in amber on the E/WD, however there is no master caution associated with Level 1.

In addition to the three levels of warning/caution, ECAM also differentiates between Independent Failures, Primary Failures and Secondary Failures as follows:

PHILOSOPHY AND NORMAL USE (END)

05 - TRAINEES' ACTIONS (END)

INDEPENDENT FAILURES

A failure that does not affect other systems. The system title is underlined on the E/WD.

PRIMARY FAILURE

A failure that affects other systems and causes secondary failures. The failure title is boxed on the E/WD.

SECONDARY FAILURE

A failure that is caused by a primary failure and not unserviceability of that particular system. Secondary failures are in amber preceded by an asterisk on the bottom right hand side of the E/WD.
In the event of multiple failures there is a hierarchy which determines which failures are displayed on the E/WD i.e. level 3 takes priority over level 2. Furthermore there is a hierarchy within each of the three levels to ensure that the most important failures are displayed to the pilots first. Details of how failures are dealt with are given in the following briefing note.

All screens are identical, providing the option of multiple redundancy, and simple switching. The various options to allow switching of screens in the event of screen failure are detailed in FCOM 1.31.05 (Indicating/Recording Systems - EIS General). ECAM failure modes are also dealt with in the following briefing note.

The ECAM control panel is described in FCOM 1.31.30 (Indicating/Recording Systems - ECAM Controls), however the operational use of the RCL and EMER CANC pb's requires a little explanation. The EMER CANC pb may be used by the crew to cancel any cautions or warnings that are spurious or intermittent, and are effectively nuisance warnings. The RCL pb is used to either recover cancelled cautions suppressed by the EMER CANC pb or, to review cautions or warnings which have been cleared using the CLR pb.

06 - COMPLETION STANDARDS

- Knowledge and correct use of the ECAM system.

07 - COMMON ERRORS

- No deselection of manually selected system page.
- Landing "no blue" call made before landing memo displayed.
- Memo display not included in normal instrument scan.

USE IN CASE OF FAILURES

01 - TRAINING OBJECTIVE

- To use ECAM procedures effectively and correctly.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :
- QRH 0.00 (Task sharing)
- FCOM 1.24.10 & 20 (Electrical)
- FCOM 1.31.10 to 1.31.30 (ECAM Description)
- FCOM 3.02.01 (Procedure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Task sharing.
- Identification of the failure.
- Co-ordinated ECAM actions and application of procedures.

SECONDARY

- Advisory information.
- Flight phase inhibition.
- Priority of warnings.
- Abnormal ECAM configurations.
- OEBs application.

USE IN CASE OF FAILURES (CONT'D)

05 - TRAINEES' ACTIONS

When the ECAM displays a warning or caution it is of primary importance , that task sharing is respected and secondly, to remember not to rush. The first priority, as always, is to ensure a safe flight path. Task sharing is important but ensure that monitoring and cross checking procedures are maintained.

FCOM 3.02.01(Abnormal and Emergency Procedures - Introduction) details procedures for the use of ECAM in the event of a failure, however the key points are :

- PF - fly, navigate and communicate-- in that order (golden rule).
- PNF - deal with the failure on command of PF
- Both pilots to identify failure and confirm by reference to SD, E/WD.
- PNF to request clear, PF to confirm before CLR is pressed.

In addition remember the following points :

- In the case of multiple failures complete all required actions (blue) associated with the first red or amber title. Request clearance to press CLR and then deal with next failure. The second drill is then carried out until its red/amber title can be cleared, before starting on the third etc. Don't leave the red or amber title on the E/WD when all actions associated with that failure have been completed. Clear each one as it is dealt with. When all necessary actions are complete there will be no amber or red displayed on the lower part of the E/WD.
- Read the ECAM carefully, as it is possible to misread drills particularly the countdown for fire bottle discharge.
- Although the A320 overhead panel is uncluttered, misidentification of switches or pb's is possible. When action on overhead panel pb's or switches is required by ECAM, identification of the correct panel is aided by reference to the white writing etched on the side of each system panel.
- When carrying out system pb selection, verify on SD that the required action has occurred e.g. switching off an hydraulic pump changes the indications on the SD.
- Cross check by both pilots before movement of engine controls or fire buttons.
- When reviewing secondary failures (FCOM 1.31.25 [Indicating/Recording Systems - ECAM Sequence]) follow the same discipline of request and confirmation before action on CLR pb.
- Certain procedures may be modified by OEB, check that this is not the case before reading and analyzing status. The status page is then reviewed by both pilots. A green overflow arrow indicates further pages of status messages. Status page can be recalled at any time and is very useful as an aid for descent and approach planning. Don't be in too much of a hurry to clear it.

USE IN CASE OF FAILURES (CONT'D)

05 - TRAINEES' ACTIONS (END)

- Following certain failures, or after multiple failures, the STATUS page may contain an excess of information. In order to extract the information essential for landing the aircraft safely use of the following guide :

CONFIG	- flap/slat setting, approach speed increment, landing distance factor and control law for landing.
GEAR	- when to lower gear and whether normal or gravity lowering
BRAKES	- normal, alternate or alternate without anti-skid (1000 psi max brake pressure, accumulator provides pressure).
REVERSE	- availability. (**NOTE** : If a reverser is inoperative on status page, do not select that reverser on landing; as the reverser will not deploy but reverse idle is selected. This is higher than modulated idle and will produce increased forward thrust.)

When dealing with failures in mono ECAM display the same principles discussed above are valid but disciplined use of the ECAM control panel is even more important.

- There is no automatic display of SD associated with the failure - confirmation of the failure will require the relevant system page pb being pressed and held. This is also true when reviewing secondary failures.
- STATUS page is only displayed when STS pb is pressed and held. In order to view page two or three of status messages the STS pb must be released for less than 2 seconds and then pressed and held again.

Dealing with failures when in mono ECAM display requires discipline and practice.

ECAM advisory mode (FCOM 1.31.20 (Indicating/Recording Systems - Indications on SD)) requires the crew to monitor a parameter and does not necessarily require action. FCOM 3.02.80 (Abnormal and Emergency Procedures - Miscellaneous) contains recommended actions in the event of certain advisory conditions.

OEBs (FCOM 3.07.10) are issued by AIRBUS and contain information which may have implications for crew actions in the event of system failures. The most important OEBs are reproduced in the QRH. Depending on the software status of the particular aircraft, there may be an OEB reminder function within the ECAM system. This OEB reminder function will replace the actions required by ECAM, associated with a system failure, with a message directing the crew to consult a relevant OEB.

If time permits consider consulting FCOM Vol 3 after ECAM actions have been completed. It may contain additional notes or information not displayed on ECAM. However do not prolong the flight for the sole purpose of consulting this volume.

USE IN CASE OF FAILURES (END)

06 - COMPLETION STANDARDS

- Applies correct crew co-ordination and task sharing at all times.
- Performs ECAM procedure correctly, accurately without undue delay.

07 - COMMON ERRORS

- PF distracted from primary duties.
- Clear action without cross-check.
- Non application of STATUS approach procedure.
- STATUS page(s) reviewed at the wrong time.
- During mono ECAM procedure, SD pages and STS page not reviewed.

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IRS/ADR FAILURES

01 - TRAINING OBJECTIVE

- To recognize and successfully deal with multiple IRS or ADR failures

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC References :
- QRH 2.16 (ADR 1+2+3 FAULT)
- FCOM 1.34.10 (ADIRS)
- FCOM 3.02.34 (Navigation)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Use of IRS in ATT mode
- Flight control laws
- Use of standby instruments
- Separate ADR and IRS parts of ADIRS

05 - TRAINEES' ACTIONS

Each ADIRS has two parts (ADR and IRS) which may fail independently of each other.
Additionally the IRS part may fail totally or may be available in ATT mode.
Single ADR or IRS failures are simply dealt with and only require action on the switching panel as indicated by ECAM.

Dual IRS or ADR failures will cause the loss of A/P and A/THR. Flight controls will be in alternate law without protections and at landing gear extension will revert to direct law. With any of the three dual IRS failures attitude information will be lost on one PFD. It is essential that both pilots cross-check attitude and air data with the standby instruments.
A triple IRS or ADR failure is very unlikely. Triple failures will not be displayed on ECAM. Only two double failures will be displayed (i.e. ADR 1 + 2 FAULT and ADR 2 + 3 FAULT). Following ECAM actions would give conflicting instructions. Follow the procedure for ADR 1 + 2 + 3 failure contained in QRH 2.16. This is one of the few cases where the crew will not follow ECAM.

There is no procedure for IRS 1 + 2 + 3 failure but the ECAM status page will give approach procedure and inoperative systems. In this unlikely eventuality, standby instruments are the only attitude, altitude, speed and heading reference.

IRS/ADR FAILURES (END)

06 - COMPLETION STANDARDS

- Carries out required ECAM drills in accordance with SOPs.
- Recognizes triple ADR failure and uses QRH for drill.
- When flying on standby instruments achieves a reasonable level of accuracy

07 - COMMON ERRORS

- Fails to recognize triple ADR or IRS failure
- Poor flying accuracy when using standby instruments

DUAL RADIO ALTIMETER FAILURE

01 - TRAINING OBJECTIVE

- To be aware of approach and landing capabilities.
- To understand effects on auto-pilot, FD, approach mode and flight controls.
- To carry out instrument or visual approach and landing in direct law.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :

- FCOM 1.34.40 (Radio altimeter)
- FCOM 1.22.30 (Auto flight)
- FCOM 3.02.27 (Direct law procedure)
- FCOM 3.02.34 (RA 1 +2 fault procedure)
- Briefing Note - ILS raw data approach

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Effects of failure/gear position on auto-pilot, FD, approach mode and flight controls.
- Approach and landing in direct law.
- Raw data approach (reminder).

SECONDARY

- Flight controls logic.

DUAL RADIO ALTIMETER FAILURE (END)

05 - TRAINEES' ACTIONS

GPWS is lost, therefore apply extra caution with regard terrain. The autopilot is available until the gear is lowered.

It should be noted that the flight director will not be able to capture and track the glideslope (FCOM 1.22.30 [Auto Flight - Flight Guidance]). However be careful of following flight director commands close to the ground as it will command excessive roll rates. Interception of the localiser may be done using LOC but the final stages of the approach should be flown using raw data to avoid excessive roll rates if LOC is still engaged.

The approach and landing are only to Cat 1 limits, bearing in mind that the aircraft will revert to DIRECT law when the gear is lowered. As with most cases reverting to DIRECT law, it is advisable to set CONFIG 3 before lowering the gear so that the aircraft is in trim when DIRECT law becomes operative.

The ECAM procedure comes up with gear down. The crew have time to read and to properly apply.

06 - COMPLETION STANDARDS

- Determines correct approach and landing configuration.
- Makes smooth, accurate approach and landing within limits as per ILS raw data approach.

07 - COMMON ERRORS

- Use of FD guidance in LOC mode.
- Over-controlling in direct law.

ENGINE FAILURE IN CRUISE

01 - TRAINING OBJECTIVE

- To recognize engine failure or fire warnings and take correct actions to maintain a safe trajectory.
- To perform correct procedure dependent on circumstances.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 4.04 - 4.07 (Operational data)
- FCOM 1.22.10 (Thrust lever function)
- FCOM 2.04.35 & 2.04.40 (Special Operations)
- FCOM 3.06.10 (Single engine operation)
- FCOM 4.04.30 (Single engine procedures)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Strategy and diversion decision making.
- Aircraft control and trajectory established.
- Pitch attitude and speed control.
- Specific task sharing procedures.
- ECAM actions - Relight envelope consideration.
- Subsequent approach planning.

SECONDARY

- A/P engagement mode / A/THR disconnection.
- ETOPS / Mountainous area considerations.

ENGINE FAILURE IN CRUISE (CONT'D)

05 - TRAINEES' ACTIONS

If an engine should fail in cruise, there are three strategies available for dealing with this occurrence. These are the standard, obstacle and ETOPS strategy. Unless a specific procedure has been established before dispatch (such as ETOPS or Mountainous areas) the recommended procedure is the standard strategy.

STANDARD STRATEGY (FCOM 4.04.30)

Before descent, start ECAM actions, set MCT on the remaining engine and disconnect A/THR. Set a lower altitude in the altitude window and pull for OPEN DES. The descent should be performed at .78/300 kts so select on FCU and pull. When in the descent establish, from the QRH, cruise flight level for level off. Inform ATC and set in the FCU altitude window.

As the thrust is fixed at MCT, the speed is controlled by elevator. On reaching the new altitude, set speed according to the QRH, and select A/THR on. Continue flight to destination or as appropriate.

OBSTACLE STRATEGY (FCOM 4.04.30)

To maintain the highest possible level due to terrain, the drift down procedure must be adopted. This requires MCT on the remaining engine and A/THR off, but speed target is now green dot.

The procedure is similar to the standard strategy, but as the speed target is green dot, rate and angle of descent will be lower. Carefully consider the airplane's position at the end of the drift down, as obstacles may still present a problem. If clear of obstacles, return to normal LRC speed and engage A/THR.

ETOPS STRATEGY (FCOM 4.04.30)

The constraint in ETOPS operation is time to the nearest diversion. Thus, the speed target is now .78/320 kts or .80/340 kts (the figure established before dispatch). Further, the altitude selected should be 15000 ft or other established before dispatch. Once levelling off, cruise at 340 kts (or other established figure) or the thrust limited speed. ETOPS is taught as a separate course as required by your airline.

ENGINE FAILURE IN CRUISE (END)

05 - TRAINEES' ACTIONS (END)

OVERVIEW

The FMGS PROG page will show the EO MAX REC altitude. In the QRH there are tables containing details of engine out ceiling, time to descend, distance taken and fuel used. There is also a graph to calculate gross ceiling. Tables are available for long range cruise performance, an in-flight check of fuel consumed and time to destination. The decision on which technique is appropriate should be taken during the aircraft deceleration following the failure.

Once established in the descent, the relevant table can be entered, and the information assimilated.

If V/S becomes less than 500 fpm during any of the descent profiles, select V/S mode and maintain a minimum of 500 fpm. This is likely to happen as level off altitude is approached.

The ECAM actions and placing the thrust lever to MCT should not be hurried, as it is important to complete the drill correctly, not in the shortest possible time. Generally, there is sufficient time to check all actions before rushing into them. However at high flight levels close to limiting weights, if an engine fails speed will decay very quickly requiring prompt crew response.

In congested airspace, be aware that a low rate of descent may be unacceptable to ATC, and be prepared to adjust accordingly.

Single engine operations will typically use 15% more fuel than with both engines, which may become a factor if a long diversion is contemplated.

06 - COMPLETION STANDARDS

- Makes correct decision on which strategy to use.
- Ensures safe terrain clearance.
- Respects task sharing and ECAM procedures requirements.
- Establishes correct parameters from QRH.
- Follows flight director accurately and ensures correct FCU selections.
- Maintains good situational awareness.
- Establishes effective communication with ATC and crew members.

07 - COMMON ERRORS

- A/THR not disconnected.
- Incorrect strategy.
- OPEN DES not selected.
- Distraction from primary tasks.
- Rushed actions.

ENGINE RELIGHT IN FLIGHT

01 - TRAINING OBJECTIVE

- To make a valid decision to attempt relight in flight.
- To perform correct engine relight procedure.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- QRH 2.15 (Engine relight in flight checklist)
- FCOM 1.70.80 (Ignition and starting)
- FCOM 3.01.40 (Limitations)
- FCOM 3.02.70 (Engine relight in flight procedure)
- OEB Nº48 (CFM : Engine relight in flight)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Factors influencing decision to attempt relight.
- Engine relight in flight procedure (windmilling and starter assisted).
- Relight envelope and limitations (loss of protections).
- Task sharing and actions requiring crew confirmation.

SECONDARY

- Systems to restore or engine shut down procedure.

05 - TRAINEES' ACTIONS

Before attempting a relight in flight, gather all relevant information to decide whether a relight should be attempted. Consider engine damage, icing or volcanic ash encounter and their effects on a successful relight. Check for satisfactory indications of N1, N2 and oil quantity. Further, is there an appropriate time to relight, when workload is low ?

Refer to QRH 2.15 for ENG RELIGHT (in flight) drill. Auto start is recommended as FADEC will determine whether an assisted start or a windmilling start is appropriate. The crew must be ready to take appropriate action in case of abnormal start as no start protections are provided in flight. The stopwatch should be used to monitor light up after fuel flow increase.

Ensure cross checking of vital controls before moving them: thrust lever, master switch etc.

ENGINE RELIGHT IN FLIGHT (END)

06 - COMPLETION STANDARDS

- Uses all available information to make a sound decision to attempt an engine relight in flight.
- Applies correct engine relight procedure and respects all related limitations.
- Ensures correct task sharing and good crew communications.

07 - COMMON ERRORS

- Relight attempt made without checking engine parameters.
- Actions requiring crew confirmation not cross checked during relight (e.g. Eng Master "on" or "off").
- No timing for light-up or engine draining.
- Procedure initiated at inappropriate time in relation to workload and without checklist.

ALL ENGINE FLAME OUT

01 - TRAINING OBJECTIVE

- To establish a safe flight path.
- To recognize the indications of a dual engine failure.
- To carry out correct procedure.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :

- QRH 1.01 to 1.04 (Systems remaining)
- QRH 2.18 (Engine relight in flight)
- FCOM 1.70.80 (Ignition and starting)
- FCOM 3.02.70 (Engine Dual Failure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Monitoring of flight path and parameters.
- Choice of optimum speed.
- ECAM actions (APU use, relight parameters...).
- Situational awareness.
- Relight monitoring and system recovery.

SECONDARY

- Aircraft status : systems, F/CTL law..
- Minimum RAT speed.
- Communications (ATC, transponder, cabin).
- Related consequences (Pressurization, forced landing, ditching...).

ALL ENGINE FLAME OUT (END)

05 - TRAINEES' ACTIONS

Following a dual engine failure the flight deck indications change drastically as generators drop off line, the RAT is deployed and ECAM prioritizes checklists.

Control of the aircraft must be taken immediately by CM1, and a safe flight path established. It is important at this stage to correctly identify the failure as it can be easily confused with all engine generators fault. ECAM will prioritize checklists so to avoid confusion read ECAM carefully to correctly identify the failure. It is vital to establish good crew communications and to apply efficient task-sharing.

Establish communications with ATC, stating nature of emergency and intentions. Consider use of transponder emergency code.

The ECAM actions can be commenced, with attention to optimum relight speed . If there is no relight within 30 sec ECAM will order the engine master switches to be placed off for 30 sec and then on again. This is to permit ventilation of the combustion chamber. Start the APU.

Maximum gliding range is achieved at green dot speed. Think ahead and plan the approach. Depending on the airplane's position, a forced landing or a ditching may be required if the relight is unsuccessful. Find the relevant QRH page and review the procedure.

The list of affected systems is long and flight controls will be much degraded. If the relight attempts are successful, consider the options of immediate landing versus continuing the flight. If the engines failed simultaneously, was there a common cause ?

At all times, maintain correct speed and situational awareness.

06 - COMPLETION STANDARDS

- Establishes immediately a safe flight path.
- Makes correct analysis and carries out procedure.
- Ensures strict application of task-sharing and good crew communications.
- Makes appropriate decision according to outcome of relight attempt.

07 - COMMON ERRORS

- Incorrect speed choice and lack of monitoring.
- Confusion with ELEC EMER CONFIG.
- Lack of situational awareness.
- APU started too late.
- Engine relight not monitored (stopwatch/parameters).
- Lack of communication.

THRUST LEVER DISAGREE / FAULT

01 - TRAINING OBJECTIVE

- To understand the consequences and differences related to thrust lever malfunctions.
- To ensure continued safe flight and landing by applying correct procedures.

02 - SCHEDULE

Briefing duration : 10 minutes

03 - EQUIPMENT

DOC references :
- FCOM 1.70.30 (Thrust control)
- FCOM 3.02.70 (Abnormal procedure)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Differences between "Disagree" and "Fault" and related thrust control consequences.
- Importance of PF not being distracted by failure.

SECONDARY

- Caution relating to thrust lever Fault during take-off.
  (on ground, between V1 and VR : warning inhibited)

THRUST LEVER DISAGREE / FAULT (END)

05 - TRAINEES' ACTIONS

DISAGREE

This failure occurs when the two validated thrust lever angle signals are not in agreement.

Should the failure occur on take-off, TOGA or FLEX thrust is maintained until thrust reduction, after which maximum available thrust is MCT.

If the failure occurs when the thrust lever is between idle and MCT, FADEC will automatically select the larger thrust lever angle, limited to MCT. On the ground, thrust is limited to idle.

In flight, keep the A/THR engaged (or engage A/THR if not in use) to allow it to manage thrust between idle and the larger thrust lever angle position.
The FADEC will automatically set the thrust of the affected engine to idle when CONF 1 is selected.

Note that reverse thrust is available for landing.

FAULT

If this fault develops, it indicates that a non-valid signal has been received from engine 1 or 2 thrust lever angle.

The fault on the ground freezes thrust to idle, and furthermore commands the reversers to stow.

In flight, keep the A/THR engaged (or engage A/THR if not in use) to allow it to manage thrust between idle and the larger thrust lever angle position. A/THR should be engaged before slat retraction.
The FADEC will automatically set the thrust of the affected engine to idle when CONF 1 is selected.

Note that reverse thrust is NOT available for landing.

06 - COMPLETION STANDARDS

- Maintains safe trajectory in all flight phases.
- Ensures application of ECAM procedures, including specific approach requirements.
- Respects task sharing procedures and ensures good crew communications.

07 - COMMON ERRORS

- Different reason for "Disagree" and "Fault" not clearly understood.
- Specific procedure not applied for approach.

ENGINE ABNORMAL STARTS

01 - TRAINING OBJECTIVE

- To carry out the correct ECAM or QRH actions in the event of an abnormal start (auto or manual).
- To know engine start limitations and restrictions.

02 - SCHEDULE

Briefing duration : 15 minutes

03 - EQUIPMENT

DOC references :
- QRH 2.19 (Start valve manual operations)
- QRH 2.17 (Tailpipe fire)
- FCOM 1.70.80 (Ignition and Starting)
- FCOM 3.01.40 (Limitations)
- FCOM 3.02.70 (Power Plant)
- Briefing Notes - Engine start auto/manual

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Autostart fault ECAM procedures.
- Engine starter limitations.
- Lack of automatic protections during manual start.
- Manual operation of start valve.
- Tailpipe fire.

SECONDARY

- Timing during manual start

ENGINE ABNORMAL STARTS (END)

05 - TRAINEES' ACTIONS

It is important to have a thorough knowledge of limitations and procedures, particularly when performing a manual start.

In general, the autostart function will protect the engine, but in manual start it is the crews responsibility to take any appropriate action.

For the CFM engine, if a stall condition occurs and N2 is above idle, the warning is not displayed. Consequently, the crew must take action to shut the engine down.

Following shut down for any reason, maintenance action may be required, or a dry crank before another start attempt.

06 - COMPLETION STANDARDS

- Applies correct ECAM or QRH procedure according to fault condition.
- Knows starter limitations.

07 - COMMON ERRORS

- Instinctive Engine Master switch cut off.
- ECAM procedure not followed precisely.
- No, or incorrect, timing during manual start.
- Starter limitations not known.

ENGINE TAILPIPE FIRE

01 - TRAINING OBJECTIVE

- To recognize and deal correctly with an engine tailpipe fire.
- To be aware of possible engine damage due to external fire agents.
- To correctly respect task-sharing and establish effective communication.

02 - SCHEDULE

Briefing duration : 5 minutes

03 - EQUIPMENT

DOC references :
- QRH 2.17 (Eng Tailpipe Fire)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Engine tailpipe fire indications.
- QRH use.
- Task sharing and communications.

SECONDARY

- Communications (cabin, ground crew).

05 - TRAINEES' ACTIONS

The most likely sources of information concerning an engine tailpipe fire are the ground crew or cabin staff when starting engines. The procedure for dealing with a tailpipe fire is contained in QRH 2.17. It is important to establish which engine is on fire and react accordingly. Establishing good communications between the cockpit and ground crew or cabin staff to establish which engine is on fire, and consider opening the cockpit window to confirm. The engine must be cranked which enables the engine to be ventilated to remove fuel vapors after the unsuccessful start attempt.

If the burning has not stopped, consider the use of external fire extinguishers (Note that they can cause severe corrosive damage and should only be considered after the procedure has been completed.)

ENGINE TAILPIPE FIRE (END)

06 - COMPLETION STANDARDS

- Demonstrates knowledge of correct procedure and considerations.
- Adheres strictly to task sharing requirements at all times and ensures good crew and ATC communications.
- Calls for checklist.

07 - COMMON ERRORS

- Does not know where to find the appropriate procedure.
- Poor communication leading to confusion.

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01 - TRAINING OBJECTIVE

- To recognize the circumstances requiring initiation of an emergency descent.
- To carry out the correct actions to achieve a safe descent at the maximum appropriate rate.
- To respect minimum safe altitude.

02 - SCHEDULE

Briefing duration : 20 minutes

03 - EQUIPMENT

DOC references :
- QRH 1.12 (Emergency descent)
- FCOM 3.02.10 (Operating techniques)
- FCOM 3.02.80 (Procedure)
- FCOM 3.05.30 (In flight performance)

04 - INSTRUCTOR'S ACTIONS

Briefing of the following key points.

MAIN

- Oxygen mask and crew communication before any other actions.
- Do not rush the procedure.
- Each action on FCU should be checked on FMA to ensure correct engagement of the desired mode.
- Where structural damage is suspected maintain current IAS.
- Use of half or full speedbrake dependent on FL and MACH number.
- Be careful of speedbrake auto retraction.
- ECAM/check-list actions.
- Control and monitoring of descent and level-off.

05 - TRAINEES' ACTIONS

The procedures for an emergency descent are detailed on ECAM, in the QRH and in FCOM 3.02.80 (ABN and EMER procedures - EMER DESCENT).

The use of autopilot and autothrust is recommended for all emergency descents. The modes used will depend on whether structural damage is assumed or a high speed descent is required. The following are the two ways in which to use the autopilot and autothrust depending on which type of descent is required. As per standard ECAM procedures PF flies the aircraft and PNF carries out ECAM drill. However before initiating descent the crew must don oxygen masks and establish crew communications.

STRUCTURAL DAMAGE ASSUMED

- Turn altitude selector knob to MEA or FL 100 and pull
- Pull and turn heading selector knob
- Pull SPD selector knob
- Push speed/mach pb (target speed for descent is current IAS and may be adjusted as necessary)
- Check FMA reads IDLE | OP DES | HDG |
- Check target altitude and speed are as desired
- Select speedbrake (see note below)

HIGH SPEED DESCENT

- Turn altitude selector knob to MEA or FL 100 and pull
- A320 - Press EXPED mode engagement button
  A319/321 pull speed knob and increase speed to MMO/VMO
- Pull and turn heading selector knob
- Check FMA reads IDLE | EXP DES | HDG | (A320 only)
- Check FMA reads IDLE | OP DES | HDG | (A319/321)
- Check target altitude and speed are as desired
- Select speedbrake (see note below)

NOTE : Speedbrakes should not be extended beyond the 1/2 position while speed is lower than .75 Mach and aircraft is above FL310. This is because prot is much lower at high level, which could lead to auto-retraction of the speedbrake. In addition to this limit, at high FLs the speedbrake should be extended slowly while monitoring VLS, so that angle of attack protection does not become active thereby causing speedbrake retraction. Use caution when using speedbrake if structural damage exists.

06 - COMPLETION STANDARDS

- Dons oxygen mask within 5 seconds and crew communications established immediately.
- Initiates descent without delay using correct technique, according to circumstances.
- Monitors flight path throughout descent.
- Monitors aircraft systems during descent.
- Establishes ATC communications.
- Employs correct level-off technique at selected altitude.
- Remembers to reset O2 flaps to reactivate boom set microphone.

07 - COMMON ERRORS

- Rushed initiation of descent leading to incorrect speed selection.
- Headset not used.
- Recommended sequence of FCU actions not respected.
- Initial altitude selection not below current altitude.
- ALT knob pulled and turned at the same time.
- FMA not checked and announced after each FCU selection.
- Incorrect speed brake selection sequence.
- Lack of speed control during descent in manual flight.
- Lack of ATC communication/transponder code.
- Levelling off at high speed.
- Incorrect level-off technique.

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CHAPTER 04

- PERFORMANCE -

CHAP 04

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01 - INTRODUCTION

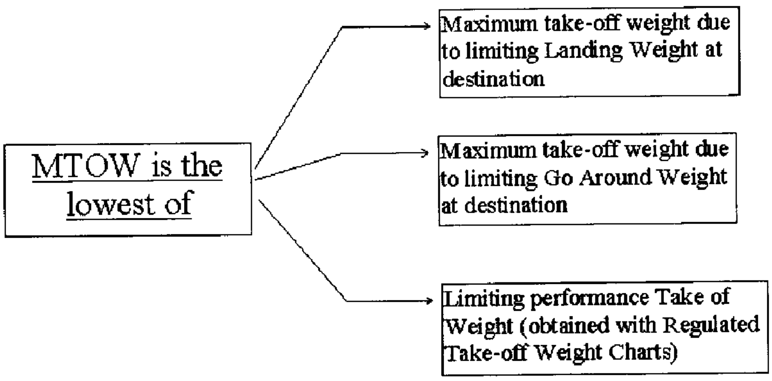
This section recaps the A320 RTOLW charts utilization and details the use for the new influence corrections (bleeds, QNH, wet runway) presentation.

Several examples summarizing the different possibilities of corrections use are solved step by step :

- Example 1 : MTOW
- Example 2 : MTOW on wet runway
- Example 3 : MTOW - use of grad 1 and grad 2
- Example 4 : Determination of flexible temperature
- Example 5 : Contaminated runway
- Example 6 : Determination of V_{APP}
- Example 7 : Abnormal procedures

For a complete and thorough information about the RTOLW charts, refer to the FCOM Vol 2 - Chapter 2

02 - MTOW



Use of RTOLW Charts

(EMTOW.PCX)

02 - MTOW (CONT'D)

A. MTOW

PURPOSE

Find the MTOW and the Optimum configuration.

LFPO ATIS

Provides the following data:

Take-off runway	: 08	**BLEEDS STATUS**	
Runway condition	: DRY	Air conditioning	: ON
No wind		Total Anti-ice	: ON
Temperature	: 0°C		
QNH	: 1003 hPa		

Step 1 - Refer to RTOLW

- Enter the table Wind 0 / Temperature 0°C
- Read 73 500 kg for Conf 1 + F, 72 600 kg for Conf 2 (with interpolation) and 72 700 kg for Conf 3

Step 2 - Corrections - Refer to 2.02.30 p 9

- QNH : - 70 kg x 10 hPa = - 700 kg
- Total Anti-ice : - 800 kg

Step 3 - Correct the weights

- Conf 1 + F 73 500 - 700 - 800 = 72 000 kg
- Conf 2 72 600 - 700 - 800 = 71 100 kg
- Conf 3 71 200 - 700 - 800 = 71 200 kg

Answer

MTOW = 72 000 kg in configuration 1 + F

Speeds: 156 - 156 - 156

(EEXA1.PCX)

02 - MTOW (CONT'D)

B. MTOW ON WET RUNWAY

PURPOSE

Find the MTOW, the Optimum configuration and the speeds.

LFPO ATIS

Provides the following data:

Take-off runway	: 08	**BLEEDS STATUS**	
Runway condition	: WET	Air conditioning	: ON
5 kt Tailwind		Engine Anti-ice	: ON
Temperature	: 9°C		
QNH	: 1016 hPa		
Reverses available			

Step 1 - Refer to RTOLW

- Enter the table Wind - 5 / Temperature 9°C
- Read 72 000 kg for Conf 1 + F, 70 950 kg for Conf 2 (with interpolation) and 71 050 kg for Conf 3

Step 2 - Corrections - Refer to 2.02.30 p 9

- QNH : + 30 kg x 3 hPa = + 90 kg
- Engine Anti-ice : - 300 kg

Step 3 - Correct the weights

- Conf 1 + F 72 000 + 90 - 300 = 71 790 kg
- Conf 2 70 950 + 90 - 300 = 70 740 kg
- Conf 3 71 050 + 90 - 300 = 70 840 kg

Step 4 - Find the speeds

- Conf 1 + F V1 = 156 kt, Vr = 156 kt, V2 = 156 kt (Optimum configuration)

Step 5 - Correction for Wet (with reverse thrust) - Refer to 2.04.10 p 3

- V1 = 156 - 3 = 153 kt

Answer

MTOW = 71 790 kg in configuration 1 + F
V1 = 153 kt, Vr = 156 kt, V2 = 156 kt

Rq: Without Reverse thrust, MTOW = 71290 in Conf 1 + F and V1 = 146, Vr = 154, V2 = 154

(EEXA2.PCX)

02 - MTOW (CONT'D)

C. MTOW - USE OF GRAD 1 AND 2

PURPOSE

Find the MTOW and the speeds.

CAIRO ATIS

Provides the following data:

Take-off runway Cairo	: 23R	**BLEEDS STATUS**	
Runway condition	: DRY	Air conditioning	: ON
10 kt Headwind		Engine Anti-ice	: OFF
Temperature	: 25°C		
QNH	: 983 hPa		

Step 1 - Refer to RTOLW

- Enter the table Wind 10
- Read 73 600 kg for 37°C

Step 2 - Use of Grad 1 and Grad 2 to find MTOW at 25°C

- MTOW = 73 600 + 200 x (37 - 29) + 50 x (29 - 25) = 75 400 kg

Step 3 - Corrections - Refer to 2.02.30 p 9

- QNH : - 70 kg x 30 hPa = - 2 100 kg

Step 4 - Correct the weights

- Conf 1 + F   75 400 - 2 100 = 73 300 kg

Answer

MTOW = 73 300 kg

Speeds: 159 - 159 - 159

(EEXA3.PCX)

02 - MTOW (END)

Exercise 1

Take-off runway LFPO 08

Runway condition: WET

No reverse thrust

Wind + 10 kts

Temperature 14°C

QNH 993 hPa

Air conditioning ON

Total Anti-icing: ON

Answer

Optimum configuration = 1 + F

MTOW = 70 800 kg

V1 = 146 kt, Vr = 154 kt, V2 = 154 kt

(EMEXE1.PCX)

Exercise 2

Take-off runway LFPO 08

Runway condition: DRY

Configuration = 1+F

Wind + 20 kts

Temperature 5°C

QNH 990 hPa

Air conditioning ON

Total Anti-icing: ON

Answer

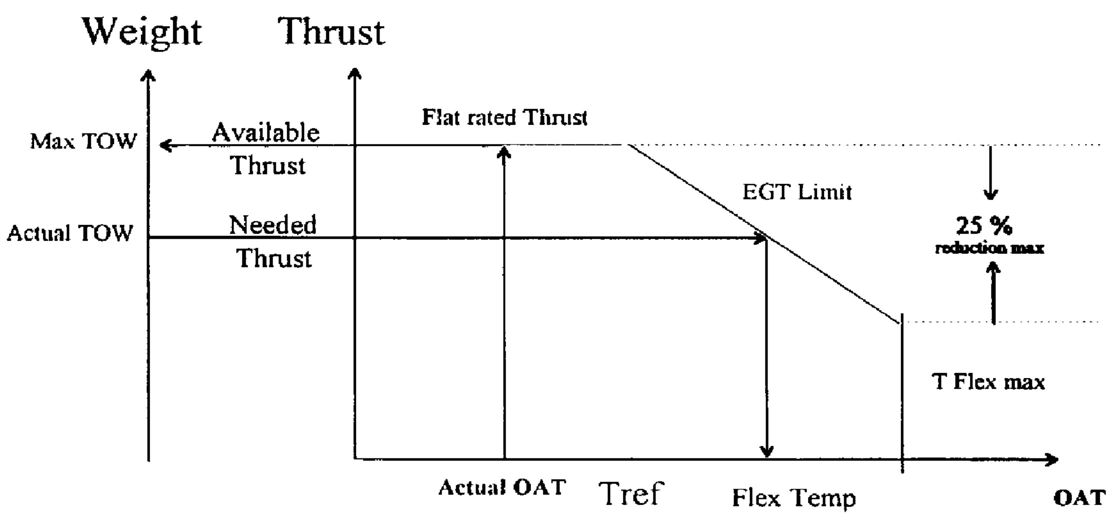
MTOW = 72 690 kg

V1 = 158 kt, Vr = 158 kt, V2 = 158 kt

(EMEXE2.PCX)

03 - FLEXIBLE TEMPERATURE

Flexible Temperature Principle



(EFLEX.PCX)

03 - FLEXIBLE TEMPERATURE

A. DETERMINATION OF FLEXIBLE TEMPERATURE

Purpose

Find the Flexible Temperature and the speeds.

LFPO ATIS

Provides the following data:

Take-off runway	: LFPO 08	**BLEEDS STATUS**	
Runway condition	: WET	Air conditioning	: ON
Wind	: 080 / 10-15	Total Anti-ice	: ON
Temperature	: 0°C		
QNH	: 1023 hPa		
TOW	: 70 000 kg		
Conf	: 1 + F		

Step 1 - Refer to RTOLW

- Enter the table Wind 10 / Weight 70 100
- Read 35°C for flex
- Speeds: 155 - 155 - 155

Step 2 - Corrections - Refer to 2.02.30 p 9

- QNH : + 1°C * 1 = + 1°C
- Total Anti-ice : - 1°C

Step 3 - Correct the Temperature

- CT = 35 - 1 + 1 = 35°C

Step 4 - Correction for Wet runway - Refer to 2.04.10 p 10

- CT = 35°C
- V1 = 155 - 3 = 152 kt

Step 5 - Check of CT

- OAT	= 0	CT higher than OAT
- T flex max	= 59°C	CT lower than Tflex max
- T ref	= 29°C	CT higher than Tref

Answer

Tflex = 35°C
V1 = 152 kt, Vr = 155 kt, V2 = 155 kt

(EEXA4.PCX)

03 - FLEXIBLE TEMPERATURE (END)

Exercise

LFPO ATIS provides the following data:

R/W 08

RUNWAY DRY

WIND 080 / 2

OAT 25°C

QNH 993

TOW = 67 500 kg

AIR CONDITIONING ON

WHAT IS THE FLEX TEMP AND THE ASSOCIATED TAKE OFF SPEEDS?

Answer

Tflex = 35°C

Speeds: 153 - 153 - 153

(EFEXE1.PCX)

04 - CONTAMINATED RUNWAY

PURPOSE

Find the MTOW and speeds.

LFPO RWY 08 3 320 m

runway covered with 7 mm slush

	Conf 1 + F	Conf 2	Conf 3
MTOW (dry)	72 000	71 100	71 200

Step 1 - Weight decrements - Refer to 2.04.10 p 8

- Enter the table Runway length = 3 500 for Conf 1 + F, > 3 000 for Conf 2 and > 2 500 for Conf 3
- Read decrements: 13.6 t for Conf 1 + F, 13.7 t for Conf 2, 11.5 t for Conf 3

Step 2 - Correct the weights

- Conf 1 + F: 72 000 - 13 600 = 58 400 kg
- Conf 2 : 71 100 - 13 700 = 57 400 kg
- Conf 3 : 71 200 - 11 500 = 59 700 kg

Step 3 - Check that MTOW are equal to corrected weight

- Conf 1 + F = 58 400 kg
- Conf 2 = 57 400 kg
- Conf 3 = 59 700 kg

Step 4 - Speeds determination 2.04.10 p 8

- Conf 3 = 59 700 kg is the optimum configuration
- Enter the table Conf 3 with actual weight = 60 t
- Read speeds: 124 - 133 - 133

Answer

MTOW = 59 700 kg in Conf 3

Speeds: 124 - 133 - 133

(EEXA5.PCX)

04 - CONTAMINATED RUNWAY (END)

Exercise

LFPO RWY 08 3 320 m

runway covered with 5 mm water

	Conf 1 + F	Conf 2	Conf 3
MTOW (dry)	72 000	71 100	71 200

Find the MTOW and the speeds.

Answer

MTOW = 65 800 kg in Conf 2
V1 = 126 kt, Vr = 141 kt, V2 = 141 kt

(EFEXE2.PCX)

05 - DETERMINATION OF V_{APP}

PURPOSE

Find the Vapp.

Landing

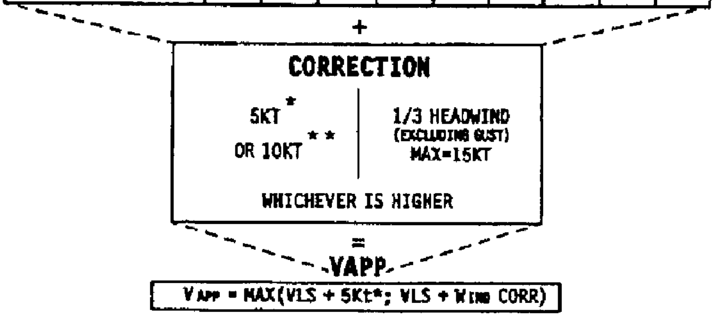
GW : 62 000 kg

Elevation : 197 ft

No wind

Conf full

W(1000Kg)	52	56	60	64	68	72	76	80	84
VLS CONF FULL (KT)	117	121	125	129	133	137	141	144	147
VLS CONF 3 (KT)	122	127	131	135	139	143	147	150	154



Step 1 - Refer to QRH 2

- Enter the table Weight 60-64/Conf full
- Read VLS = 127 kt (with interpolation)

Step 2 - Correction

- No wind, add 5 kt

Step 3 - Determine the Vapp

- Vapp = 127 + 5 = 132 kt

Answer

- Vapp = 132 kt

(EEXA6.PCX)

06 - ABNORMAL PROCEDURES

PURPOSE

Find the Actual Landing Distance and Vapp.

Landing

GW : 62 000 kg

Elevation : 197 ft

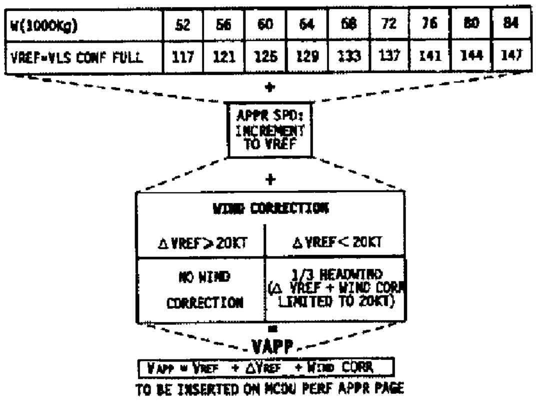
No wind

Conf full

Green + Yellow Hyd out

Step 1 - Refer to QRH 2.25

- Enter the table HYD Green + Yellow
- Read corrections: Flaps pos 3, increment to VREF = 30 kt, landing distance is multiplied by 2.3



Step 2 - Corrections

- Vapp = 127 + 30 = 157 kt
- Landing Distance = 849 x 2.3 = 1 953 m

Answer

- Vapp = 157 kt
- Actual Landing Distance = 1 953 m

(EEXA7.PCX)

06 - ABNORMAL PROCEDURES (END)

Exercise

LFPO RWY 08 3 320 m

runway covered with 5 mm water

	Conf 1 + F	Conf 2	Conf 3
MTOW (dry)	72 000	71 100	71 200

Find the MTOW and the speeds.

Answer

MTOW = 65 800 kg in Conf 2
V1 = 126 kt, Vr = 141 kt, V2 = 141 kt

(EFEXE2.PCX)

A320-211 (KG) :

A320-211 (LB) :

A320-231 (KG) :

A320-231 (LB) :

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TOULOUSE (LFBO) - RWY 15 R - CONF 1 + F

LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 ELEV. 486.FT CONF. 1+F

FOR TRAINING ONLY MC69 TORA 3500.M

ASDA 3560.M CG25%

A320-211/AB/CFM565A1 DRY RUNWAY TODA 3500.M

-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 200 ***** SLOPE .10 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5	0 4-4 .0 152-154-154	23 4-4 .0 152-153-153	32 4-4 .0 158-158-158	33 4-4 .4 161-161-161	35 2-4 .2 162-162-162	31 31
74.0	19 4-4 .0 148-150-150	29 4-4 1.0 151-152-152	35 4-4 .2 159-159-159	36 4-4 .5 160-160-160	38 2-4 .2 161-161-161	34 33
72.0	29 4-4 1.2 145-149-149	37 4-4 .0 154-154-154	39 4-4 .3 157-157-157	40 2-4 .5 158-158-158	42 2-4 .1 160-160-160	37 37
70.0	38 4-4 .0 148-149-149	41 4-4 .2 155-155-155	43 4-4 .3 156-156-156	44 4-4 .4 157-157-157	45 2-4 .5 159-159-159	41 40
68.0	43 4-4 .1 151-151-151	45 4-4 .2 153-153-153	47 4-4 .2 155-155-155	48 4-4 .3 156-156-156	49 2-4 .3 158-158-158	44 44
66.0	47 4-4 .1 150-150-150	49 4-4 .1 152-152-152	51 4-4 .0 154-154-154	52 2-4 .2 154-154-154	53 2-4 .1 157-157-157	48 47
64.0	51 4-4 .1 149-149-149	53 4-4 .0 151-151-151	54 4-4 .5 152-152-152	55 2-4 .6 153-153-153	55 2-4 .9 158-158-158	49 49
62.0	55 4-4 .1 148-148-148	55 4-4 1.0 150-150-150	55 4-4 2.0 151-151-151	55 2 .0 135-141-141	55 2 .0 133-141-141	49 49
60.0	55 .0 135-136-136	55 .0 130-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	49 49
58.0	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	49 49
56.0	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	49 49
54.0	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	49 49
52.0	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	49 49
50.0	55 .0 118-123-124	55 .0 118-123-124	55 .0 118-123-124	55 .0 118-123-124	55 .0 118-123-124	49 49
48.0	55 .0 116-121-122	55 .0 116-121-122	55 .0 116-121-122	55 .0 116-121-122	55 .0 116-121-122	49 49
46.0	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	49 49

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)

/MAXI. ACCELERATION HEIGHT : 2089.(FT) QNH ALT. : 2575.(FT)

(11KGTLS1.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 2

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:LFBO TOULOUSE-BLAGNAC        RWY 15R      JARA 12 SEP 95 ELEV.     486.FT*CONF.*
:FOR TRAINING ONLY                                    MC69    TORA     3500.M *  2  *
:                                                             ASDA     3560.M *CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                            TODA     3500.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 200       *****    SLOPE     .10 % : TGA :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	-2 4-4 .0 151-151-153	21 4-4 .0 151-151-153	31 4-4 .0 154-154-156	32 4-4 .3 155-155-157	34 2-4 .0 156-156-158	31 31
74.0	18 4-4 .0 146-147-148	29 4-4 1.0 149-149-151	34 4-4 .0 154-154-156	35 4-4 .3 155-155-157	36 4-4 .5 155-155-157	34 33
72.0	29 4-4 1.2 144-145-146	35 4-4 .4 151-151-153	38 4-4 .0 153-153-155	39 4-4 .2 153-153-155	40 2-4 .4 154-154-156	37 37
70.0	37 4-4 .1 147-147-148	39 4-4 .4 151-151-152	41 4-4 .5 152-152-153	43 4-4 .2 152-152-153	44 2-4 .3 153-153-155	41 40
68.0	41 4-4 .3 148-148-149	43 4-4 .4 149-149-150	45 4-4 .4 150-150-151	47 2-4 .0 149-149-150	48 2-4 .1 152-152-153	44 44
66.0	45 4-4 .3 147-147-148	47 4-4 .3 148-148-148	49 4-4 .3 148-148-149	50 2-4 .4 148-148-149	51 2-4 .5 151-151-152	48 47
64.0	49 4-4 .3 145-145-146	51 4-4 .3 146-146-146	53 4-4 .2 146-146-146	54 2-4 .3 147-147-147	55 2-4 .3 149-149-150	49 49
62.0	53 4-4 .3 143-143-144	55 4-4 .2 144-144-144	55 4-4 1.2 145-145-145	55 2-4 1.8 147-147-147	55 2 .0 132-139-139	49 49
60.0	55 4-4 1.3 143-143-143	55 4 .0 132-132-132	55 2 .0 124-131-131	55 2 .0 121-131-131	55 2 .0 121-131-131	49 49
58.0	55 .0 122-126-127	55 .0 118-126-127	55 .0 118-126-127	55 .0 118-126-127	55 .0 118-126-127	49 49
56.0	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	49 49
54.0	55 .0 116-121-123	55 .0 116-121-123	55 .0 116-121-123	55 .0 116-121-123	55 .0 116-121-123	49 49
52.0	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	49 49
50.0	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	49 49
48.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49
46.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2057.(FT) QNH ALT. : 2543.(FT)

(11KGTLS2.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 3

:LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 ELEV. 486.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 3500.M * 3 *
: ASDA 3560.M *CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 3500.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 50/GRAD2= 300 ***** SLOPE .10 % : TGA :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	1 4-4 .0 152-152-153	24 4-4 .0 152-152-152	31 4-4 .0 155-155-155	32 4-4 .3 157-157-157	33 2-4 .5 158-158-158	31 31
74.0	22 4-4 .0 146-147-148	29 4-4 1.2 151-151-151	34 4-4 .0 155-155-155	35 4-4 .3 155-155-155	36 2-4 .4 158-158-158	34 33
72.0	29 4-4 1.5 145-146-146	35 4-4 .4 152-152-152	38 4-4 .0 153-153-153	39 2-4 .2 153-153-153	40 2-4 .4 156-156-156	37 37
70.0	37 4-4 .3 148-148-149	39 4-4 .4 151-151-151	41 4-4 .5 151-151-151	43 2-4 .2 152-152-152	44 2-4 .2 155-155-155	41 40
68.0	41 4-4 .3 148-148-148	43 4-4 .4 149-149-149	45 4-4 .4 150-150-150	47 2-4 .0 151-151-151	48 2-4 .1 154-154-154	44 44
66.0	45 4-4 .4 146-146-146	47 4-4 .4 147-147-147	49 4-4 .3 148-148-148	50 2-4 .4 150-150-150	51 2-4 .4 153-153-153	48 47
64.0	49 4-4 .3 144-144-145	51 4-4 .3 145-145-145	53 4-4 .3 146-146-146	54 2-4 .4 149-149-149	55 2-4 .3 151-151-151	49 49
62.0	53 4-4 .3 143-143-143	55 4-4 .3 143-143-143	55 2-4 1.2 145-145-145	55 2-4 1.8 148-148-148	55 2 .0 130-139-139	49 49
60.0	55 4-4 1.4 142-142-142	55 4 .0 131-131-131	55 2 .0 121-130-131	55 2 .0 120-130-131	55 2 .0 120-130-131	49 49
58.0	55 4 .0 125-125-125	55 4 .0 123-123-124	55 2 .0 116-123-124	55 2 .0 116-123-124	55 2 .0 116-123-124	49 49
56.0	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	49 49
54.0	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	49 49
52.0	55 .0 112-114-116	55 .0 112-114-116	55 .0 112-114-116	55 .0 112-114-116	55 .0 112-114-116	49 49
50.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49
48.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49
46.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2071.(FT) QNH ALT. : 2557.(FT)

(11KGTLS3.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 1 + F

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---------------------------------------------------------------------------*******
:LFBO TOULOUSE BLAGNAC          RWY 33L      JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                    MC69   TORA    3500.M *  1+F*
:                                                            ASDA    3800.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                            TODA    3500.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 200     *****     SLOPE   -.10 % : TGA :
:WEIGHT:-------------------------------------------------------------------:  2  :
:1000KG:    -10     :     -5      :      0      :     10      :     20     :  3  :
:-------------------------------------------------------------------------------:
:      :  1     4-4 : 23     4-4 : 32     4-4 : 34     4-4 : 35     4-4 :31   :
: 75.5 :  .1        :  .0        :  .0        :  .0        :  .1        :     :
:      :151-152-152 :152-152-152 :157-157-157 :162-162-162 :164-164-164 :  31:
:------:------------:------------:------------:------------:------------:-----:
:      : 19     4-4 : 29     4-4 : 35     4-4 : 37     4-4 : 38     4-4 :34   :
: 74.0 :  .0        : 1.1        :  .3        :  .0        :  .1        :     :
:      :147-150-150 :150-151-151 :158-158-158 :161-161-161 :163-163-163 :  33:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 37     4-4 : 39     4-4 : 41     4-4 : 42     4-4 :37   :
: 72.0 : 1.2        :  .1        :  .4        :  .0        :  .0        :     :
:      :145-149-149 :153-153-153 :158-158-158 :160-160-160 :161-161-161 :  37:
:------:------------:------------:------------:------------:------------:-----:
:      : 38     4-4 : 41     4-4 : 43     4-4 : 44     4-4 : 45     4-4 :41   :
: 70.0 :  .2        :  .3        :  .4        :  .4        :  .4        :     :
:      :148-148-148 :155-155-155 :157-157-157 :160-160-160 :162-162-162 :  40:
:------:------------:------------:------------:------------:------------:-----:
:      : 43     4-4 : 45     4-4 : 47     4-4 : 48     4-4 : 49     4-4 :44   :
: 68.0 :  .1        :  .3        :  .3        :  .3        :  .2        :     :
:      :150-150-150 :153-153-153 :156-156-156 :159-159-159 :159-159-159 :  44:
:------:------------:------------:------------:------------:------------:-----:
:      : 47     4-4 : 49     4-4 : 51     4-4 : 52     4-4 : 53     2-4 :48   :
: 66.0 :  .3        :  .2        :  .1        :  .1        :  .1        :     :
:      :151-151-151 :151-151-151 :155-155-155 :157-157-157 :156-156-156 :  47:
:------:------------:------------:------------:------------:------------:-----:
:      : 51     4-4 : 53     4-4 : 54     4-4 : 55     4-4 : 55     2-4 :49   :
: 64.0 :  .2        :  .2        :  .5        :  .5        :  .9        :     :
:      :148-148-148 :149-149-149 :154-154-154 :155-155-155 :157-157-157 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 55     4-4 : 55     4-4 : 55     2   : 55     2   :49   :
: 62.0 :  .2        : 1.1        : 2.0        :  .0        :  .0        :     :
:      :146-146-146 :149-149-149 :153-153-153 :136-141-141 :133-141-141 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 60.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :132-136-136 :129-136-136 :126-136-136 :126-136-136 :126-136-136 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 58.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :124-134-134 :124-134-134 :124-134-134 :124-134-134 :124-134-134 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 56.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :121-131-131 :121-131-131 :121-131-131 :121-131-131 :121-131-131 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 54.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :120-129-129 :120-129-129 :120-129-129 :120-129-129 :120-129-129 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 52.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :119-126-126 :119-126-126 :119-126-126 :119-126-126 :119-126-126 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 50.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :118-123-124 :118-123-124 :118-123-124 :118-123-124 :118-123-124 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 48.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :116-120-122 :116-120-122 :116-120-122 :116-120-122 :116-120-122 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 46.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1297.(FT)
/MAXI. ACCELERATION HEIGHT :  2070.(FT)  QNH ALT. :  2567.(FT)
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(11KGTLS4.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 2

LFBO TOULOUSE BLAGNAC RWY 33L JARA 12 SEP 95 MC69
FOR TRAINING ONLY
A320-211/AB/CFM565A1 DRY RUNWAY
TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 300 *****

ELEV. 497.FT
TORA 3500.M
ASDA 3800.M
TODA 3500.M
SLOPE -.10 %

CONF. 2
CG25%
TGA: 2 3

WEIGHT 1000KG	-10	-5	0	10	20	TGA
75.5	-2 4-4 .0 150-150-152	21 4-4 .0 150-150-152	30 4-4 .4 154-154-156	32 4-4 .2 154-154-156	33 2-4 .4 155-155-158	31 31
74.0	18 4-4 .1 145-145-147	29 4-4 1.0 148-148-150	33 4-4 .4 154-154-156	35 4-4 .2 153-153-155	36 2-4 .4 155-155-157	34 33
72.0	29 4-4 1.2 143-143-144	35 4-4 .4 151-151-152	37 4-4 .4 157-157-159	39 2-4 .2 152-152-153	40 2-4 .3 154-154-156	37 37
70.0	37 4-4 .2 146-146-147	40 4-4 .0 152-152-154	41 4-4 .4 149-149-150	43 2-4 .1 151-151-152	44 2-4 .2 153-153-154	41 40
68.0	41 4-4 .5 147-147-148	43 4-4 .5 151-151-153	45 4-4 .4 147-147-148	47 2-4 .0 149-149-150	48 2-4 .0 152-152-153	44 44
66.0	45 4-4 .5 147-147-148	47 4-4 .4 150-150-151	49 2-4 .3 146-146-147	50 2-4 .4 148-148-149	51 2-4 .4 150-150-151	48 47
64.0	49 4-4 .4 145-145-146	51 4-4 .3 149-149-149	53 2-4 .2 145-145-145	54 2-4 .3 147-147-147	55 2-4 .3 149-149-150	49 49
62.0	53 4-4 .4 144-144-144	55 4-4 .2 146-146-147	55 2-4 1.2 144-144-144	55 2-4 1.8 147-147-147	55 2 .0 132-139-139	49 49
60.0	55 4-4 1.4 143-143-143	55 2 .0 127-131-132	55 2 .0 123-131-132	55 2 .0 121-131-132	55 2 .0 121-131-132	49 49
58.0	55 .0 120-126-127	55 .0 118-126-127	55 .0 118-126-127	55 .0 118-126-127	55 .0 118-126-127	49 49
56.0	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	49 49
54.0	55 .0 115-121-123	55 .0 115-121-123	55 .0 115-121-123	55 .0 115-121-123	55 .0 115-121-123	49 49
52.0	55 .0 114-118-120	55 .0 114-118-120	55 .0 114-118-120	55 .0 114-118-120	55 .0 114-118-120	49 49
50.0	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	49 49
48.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49
46.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1297.(FT)
/MAXI. ACCELERATION HEIGHT : 2005.(FT) QNH ALT. : 2502.(FT)

(11KGTLS5.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 3

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:LFBO TOULOUSE BLAGNAC          RWY 33L       JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                      MC69 TORA    3500.M *  3  *
:                                                            ASDA    3800.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                            TODA    3500.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 300       *****   SLOPE   -.10 % : TGA :
```

:WEIGHT: :1000KG:	-10	-5	0	10	20	TGA : 2 : 3 :
75.5	1 4-4 .1 151-151-152	23 4-4 .0 152-152-152	31 4-4 .0 158-158-158	32 4-4 .1 160-160-160	33 2-4 .4 158-158-158	31 31
74.0	22 4-4 .1 146-146-147	29 4-4 1.1 150-150-151	34 4-4 .0 158-158-158	35 2-4 .2 154-154-154	36 2-4 .3 157-157-157	34 33
72.0	29 4-4 1.5 144-146-146	36 4-4 .1 152-152-152	37 4-4 .5 157-157-157	39 2-4 .2 153-153-153	40 2-4 .2 156-156-156	37 37
70.0	37 4-4 .4 148-148-148	40 4-4 .1 151-151-151	41 2-4 .5 149-149-149	43 2-4 .1 152-152-152	44 2-4 .1 155-155-155	41 40
68.0	42 4-4 .0 147-147-148	44 4-4 .0 150-150-150	45 2-4 .5 148-148-148	46 2-4 .5 151-151-151	47 2-4 .5 154-154-154	44 44
66.0	46 4-4 .0 146-146-146	47 4-4 .5 149-149-149	49 2-4 .4 147-147-147	50 2-4 .4 150-150-150	51 2-4 .4 152-152-152	48 47
64.0	50 4-4 .0 143-143-144	51 4-4 .4 148-148-148	53 2-4 .3 146-146-146	54 2-4 .3 148-148-148	55 2-4 .2 151-151-151	49 49
62.0	54 4-4 .0 142-142-143	55 4-4 .4 141-141-142	55 2-4 1.3 145-145-145	55 2-4 1.8 148-148-148	55 2 .0 131-139-139	49 49
60.0	55 4-4 1.5 142-142-142	55 2 .0 125-130-131	55 2 .0 121-130-131	55 2 .0 120-130-131	55 2 .0 120-130-131	49 49
58.0	55 2 .0 117-123-124	55 2 .0 116-123-124	55 2 .0 116-123-124	55 2 .0 116-123-124	55 2 .0 116-123-124	49 49
56.0	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	55 .0 114-119-120	49 49
54.0	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	55 .0 113-116-118	49 49
52.0	55 .0 111-114-116	55 .0 111-114-116	55 .0 111-114-116	55 .0 111-114-116	55 .0 111-114-116	49 49
50.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49
48.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49
46.0	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	55 .0 111-113-115	49 49

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/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1297.(FT)
/MAXI. ACCELERATION HEIGHT :  2018.(FT)  QNH ALT. :  2515.(FT)
```

(11KGTLS6.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 1 + F

:CYUL MONTREAL-DORVAL RWY 06R JARA 12 SEP 95 ELEV. 98.FT *CONF.*
:FOR TRAINING ONLY MC69 TORA 2926.M * 1+F*
: ASDA 2972.M *CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 3231.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 50/GRAD2= 0 ***** SLOPE .20 % : TGA :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5		-15 4-4 -1.4 158-158-158	-15 4-4 -.4 161-161-161	-9 4-4 .0 162-162-162	6 4-4 .0 160-160-160	33 33
74.0	-15 4-4 -1.0 157-157-157	-14 4-4 .0 158-158-158	8 4-4 .0 158-158-158	21 4-4 .1 158-158-158	30 4-4 .2 159-159-159	36 35
72.0	3 4-4 .0 155-155-155	24 4-4 .0 155-155-155	30 4-4 .7 157-157-157	30 4-4 1.5 158-158-158	34 4-4 .3 157-157-157	39 39
70.0	30 4-4 .3 150-150-150	30 4-4 1.6 154-154-154	35 4-4 .4 155-155-155	37 4-4 .2 155-155-155	38 4-4 .4 155-155-155	43 42
68.0	35 4-4 .2 149-149-149	37 4-4 .4 152-152-152	40 4-4 .1 152-152-152	41 4-4 .3 153-153-153	42 4-4 .4 154-154-154	46 45
66.0	39 4-4 .4 149-149-149	42 4-4 .1 150-150-150	44 4-4 .2 150-150-150	45 4-4 .3 152-152-152	46 4-4 .4 154-154-154	49 49
64.0	44 4-4 .1 148-148-148	46 4-4 .2 148-148-148	48 4-4 .2 149-149-149	49 4-4 .3 151-151-151	50 4-4 .4 151-151-151	50 50
62.0	48 4-4 .2 145-145-145	50 4-4 .2 146-146-146	52 4-4 .2 148-148-148	53 4-4 .3 149-149-149	54 4-4 .3 149-149-149	50 50
60.0	52 4-4 .2 143-143-143	54 4-4 .2 145-145-145	56 4-4 .2 146-146-146	56 4-4 .8 147-147-147	56 4-4 1.3 148-148-148	50 50
58.0	56 4-4 .3 142-142-142	56 4-4 1.3 145-145-145	56 .0 130-134-134	56 .0 128-134-134	56 .0 126-134-134	50 50
56.0	56 .0 127-131-131	56 .0 124-131-131	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	50 50
54.0	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
52.0	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	50 50
50.0	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	50 50
48.0	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	50 50
46.0	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 898.(FT)
/MAXI. ACCELERATION HEIGHT : 2839.(FT) QNH ALT. : 2937.(FT)

(11KGMRL1.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

:CYUL MONTREAL-DORVAL RWY 06R JARA 12 SEP 95 ELEV. 98.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 2926.M * 2 *
: ASDA 2972.M *CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 3231.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 40/GRAD2= 0 ***** SLOPE .20 % : TGA :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5			-15 4-4 -1.3 155-155-158	-15 4-4 -.7 157-157-160	-12 4-4 .0 154-154-157	33 33
74.0	-15 4-4 -2.0 153-153-155	-15 4-4 -.9 154-154-157	-12 4-4 .0 155-155-157	4 4-4 .0 155-155-157	19 4-4 .0 155-155-157	36 35
72.0	-15 4-4 .0 153-153-155	8 4-4 .0 152-152-155	29 4-4 .0 151-151-153	30 4-4 .6 153-153-155	30 4-4 1.3 154-154-156	39 39
70.0	25 4-4 .0 148-148-150	30 4-4 .8 149-149-151	30 4-4 1.9 151-151-153	35 4-4 .2 151-151-153	36 4-4 .4 152-152-153	43 42
68.0	30 4-4 1.6 147-147-149	36 4-4 .0 148-148-150	38 4-4 .1 149-149-150	39 4-4 .3 149-149-151	40 4-4 .5 150-150-151	46 45
66.0	37 4-4 .5 145-145-146	40 4-4 .1 147-147-148	42 4-4 .2 147-147-149	43 4-4 .4 148-148-149	44 4-4 .5 149-149-150	49 49
64.0	42 4-4 .1 144-144-145	44 4-4 .2 145-145-146	46 4-4 .2 146-146-146	47 4-4 .4 146-146-147	48 4-4 .4 148-148-149	50 50
62.0	46 4-4 .3 143-143-143	48 4-4 .3 143-143-144	50 4-4 .2 144-144-144	51 4-4 .3 144-144-145	52 4-4 .5 141-141-142	50 50
60.0	50 4-4 .4 141-141-141	52 4-4 .3 141-141-142	54 4-4 .3 142-142-143	55 4-4 .3 144-144-144	56 4-4 .5 139-139-139	50 50
58.0	55 4-4 .0 138-138-139	56 4-4 .4 139-139-140	56 4-4 1.3 143-143-143	56 4-4 1.8 144-144-144	56 .0 122-126-127	50 50
56.0	56 4-4 1.5 138-138-138	56 .0 120-124-125	56 .0 117-124-125	56 .0 117-124-125	56 .0 117-124-125	50 50
54.0	56 .0 116-121-123	56 .0 116-121-123	56 .0 116-121-123	56 .0 116-121-123	56 .0 116-121-123	50 50
52.0	56 .0 114-119-120	56 .0 114-119-120	56 .0 114-119-120	56 .0 114-119-120	56 .0 114-119-120	50 50
50.0	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	50 50
48.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50
46.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 898.(FT)
/MAXI. ACCELERATION HEIGHT : 2723.(FT) QNH ALT. : 2821.(FT)

(11KGMRL2.PCX)

MONTREAL (CYUL) - RWY 06 L - CONF 1 + F

:CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 ELEV. 96.FT *CONF.*
:FOR TRAINING ONLY MC69 TORA 3353.M * 1+F*
: ASDA 3398.M *CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 3441.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 60/GRAD2= 200 ***** SLOPE .09 % : TGA :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5	-11 4-4 .0 158-158-158	12 4-4 .0 157-157-157	30 4-4 .1 159-159-159	32 4-4 .0 160-160-160	33 4-4 .3 161-161-161	33 33
74.0	10 4-4 .1 152-152-152	30 4-4 .3 153-153-153	33 4-4 .3 159-159-159	35 4-4 .1 159-159-159	36 4-4 .3 161-161-161	36 35
72.0	30 4-4 .5 147-148-148	35 4-4 .2 155-155-155	37 4-4 .4 157-157-157	39 4-4 .2 158-158-158	40 4-4 .3 160-160-160	39 39
70.0	36 4-4 .4 149-149-149	39 4-4 .4 157-157-157	42 4-4 .0 155-155-155	43 4-4 .2 157-157-157	44 4-4 .3 155-155-155	43 42
68.0	41 4-4 .3 151-151-151	43 4-4 .4 156-156-156	45 4-4 .5 153-153-153	47 4-4 .1 156-156-156	48 4-4 .2 153-153-153	46 45
66.0	45 4-4 .4 151-151-151	47 4-4 .4 151-151-151	49 4-4 .4 152-152-152	50 4-4 .5 155-155-155	52 4-4 .0 151-151-151	49 49
64.0	49 4-4 .4 150-150-150	51 4-4 .4 148-148-148	53 4-4 .3 151-151-151	54 4-4 .3 154-154-154	55 4-4 .5 150-150-150	50 50
62.0	53 4-4 .4 148-148-148	55 4-4 .3 147-147-147	56 4-4 .8 150-150-150	56 4-4 1.3 153-153-153	56 4-4 1.9 150-150-150	50 50
60.0	56 4-4 .9 147-147-147	56 4-4 1.8 146-146-146	56 .0 131-136-136	56 .0 128-136-136	56 .0 126-136-136	50 50
58.0	56 .0 127-134-134	56 .0 124-134-134	56 .0 124-134-134	56 .0 124-134-134	56 .0 124-134-134	50 50
56.0	56 .0 121-131-131	56 .0 121-131-131	56 .0 121-131-131	56 .0 121-131-131	56 .0 121-131-131	50 50
54.0	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
52.0	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	50 50
50.0	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	50 50
48.0	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	56 .0 116-121-122	50 50
46.0	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2133.(FT) QNH ALT. : 2229.(FT)

(11KGMRL3.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

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-----------------------------------------------------------------------*******
:CYUL MONTREAL-DORVAL          RWY 06L       JARA 12 SEP 95 ELEV.      96.FT*CONF.*
:FOR TRAINING ONLY                                  MC69   TORA     3353.M *  2  *
:                                                          ASDA     3398.M *CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                         TODA     3441.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 50/GRAD2= 300      *****  SLOPE     .09 % : TGA :
:WEIGHT:---------------------------------------------------------------------:  2  :
:1000KG:     -10      :      -5      :       0      :      10      :      20      :  3  :
:-----------------------------------------------------------------------------------:
:      :-15      4-4 : 0       4-4 : 23      4-4 : 30      4-4 : 32      4-4 :33    :
: 75.5 : -.4         :  .0         :  .0         :  .2         :  .0         :      :
:      :154-154-156 :155-155-158 :156-156-158 :154-154-156 :154-154-156 :   33:
:------:------------:------------:------------:------------:------------:-----:
:      : 5       4-4 : 29      4-4 : 30      4-4 : 33      4-4 : 35      4-4 :36    :
: 74.0 :  .1         :  .0         : 1.1         :  .2         :  .1         :      :
:      :151-151-153 :151-151-153 :155-155-157 :153-153-155 :152-152-154 :   35:
:------:------------:------------:------------:------------:------------:-----:
:      : 30      4-4 : 30      4-4 : 36      4-4 : 37      4-4 : 39      4-4 :39    :
: 72.0 :  .4         : 1.9         :  .1         :  .3         :  .1         :      :
:      :145-145-147 :151-151-153 :154-154-156 :151-151-152 :151-151-152 :   39:
:------:------------:------------:------------:------------:------------:-----:
:      : 35      4-4 : 38      4-4 : 40      4-4 : 41      4-4 : 43      4-4 :43    :
: 70.0 :  .3         :  .1         :  .1         :  .3         :  .0         :      :
:      :147-147-149 :149-149-151 :149-149-150 :149-149-150 :149-149-150 :   42:
:------:------------:------------:------------:------------:------------:-----:
:      : 39      4-4 : 42      4-4 : 44      4-4 : 45      4-4 : 46      4-4 :46    :
: 68.0 :  .4         :  .1         :  .1         :  .3         :  .5         :      :
:      :147-147-148 :148-148-149 :147-147-148 :147-147-148 :148-148-148 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 43      4-4 : 46      4-4 : 48      4-4 : 49      4-4 : 50      4-4 :49    :
: 66.0 :  .5         :  .1         :  .0         :  .2         :  .3         :      :
:      :145-145-146 :147-147-148 :145-145-146 :145-145-146 :147-147-147 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 47      4-4 : 50      4-4 : 51      4-4 : 53      4-4 : 54      4-4 :50    :
: 64.0 :  .5         :  .0         :  .5         :  .1         :  .3         :      :
:      :143-143-144 :146-146-147 :143-143-144 :144-144-145 :145-145-146 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 52      4-4 : 53      4-4 : 55      4-4 : 56      4-4 : 56      4-4 :50    :
: 62.0 :  .0         :  .4         :  .4         :  .6         : 1.2         :      :
:      :141-141-141 :141-141-142 :142-142-142 :144-144-144 :144-144-145 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56      4-4 : 56      4-4 : 56      4-4 : 56      2   : 56      2   :50    :
: 60.0 :  .0         : 1.0         : 1.9         :  .0         :  .0         :      :
:      :140-140-140 :144-144-144 :142-142-142 :126-130-131 :123-130-131 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 58.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :125-126-127 :121-126-127 :118-126-127 :118-126-127 :118-126-127 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 56.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :117-124-125 :117-124-125 :117-124-125 :117-124-125 :117-124-125 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 54.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :115-121-123 :115-121-123 :115-121-123 :115-121-123 :115-121-123 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 52.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :114-119-120 :114-119-120 :114-119-120 :114-119-120 :114-119-120 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 50.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :113-116-118 :113-116-118 :113-116-118 :113-116-118 :113-116-118 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 48.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50    :
: 46.0 :  .0         :  .0         :  .0         :  .0         :  .0         :      :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   50:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    800.(FT)   QNH ALT. :    896.(FT)
/MAXI. ACCELERATION HEIGHT :   2101.(FT)   QNH ALT. :   2197.(FT)
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(11KGMRL4.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 1 + F

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----------------------------------------------------------------------*******
:VHHH HONG KONG              RWY 13       JARA 12 SEP 95 ELEV.     15.FT*CONF.*
:FOR TRAINING ONLY                                MC69   TORA    3331.M *  1+F*
:                                                        ASDA    3331.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                        TODA    3444.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 40/GRAD2= 300    *****  SLOPE    .00 % : TGA :
:WEIGHT:--------------------------------------------------------------:  2  :
:1000KG:     -10      :      -5      :       0      :      10      :      20      :  3  :
:-------------------------------------------------------------------------------:
:      :              :-15      4-4 : 11       4-4 : 28       4-4 : 31       4-4 :34   :
: 75.5 :              : -.2         :  .0          :  .1          :  .4          :     :
:      :              :167-172-172  :165-170-170   :165-170-170   :169-171-171   :  33:
:------:--------------:-------------:--------------:--------------:--------------:-----:
:      :-15      4-4 : 12      4-4 : 30       4-4 : 30       4-4 : 35       4-4 :36   :
: 74.0 : -.1         :  .0         :  .5          : 1.4          :  .1          :     :
:      :161-170-171  :159-168-168  :160-167-167   :164-170-170   :171-171-171   :  36:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 21      4-6 : 30      4-6 : 35       4-4 : 37       4-4 : 39       4-4 :40   :
: 72.0 :  .0         : 1.0         :  .3          :  .3          :  .1          :     :
:      :151-162-162  :154-164-164  :162-166-166   :168-169-169   :172-172-172   :  39:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 30      4-6 : 36      4-4 : 40       4-4 : 41       4-4 : 43       4-4 :43   :
: 70.0 : 1.5         :  .4         :  .0          :  .4          :  .0          :     :
:      :148-160-160  :157-164-164  :165-166-166   :169-169-169   :172-172-172   :  42:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 38      4-4 : 41      4-4 : 44       4-4 : 45       4-4 : 46       4-4 :46   :
: 68.0 :  .1         :  .2         :  .1          :  .3          :  .4          :     :
:      :152-161-161  :159-162-162  :166-166-166   :169-169-169   :172-172-172   :  46:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 42      4-4 : 45      4-4 : 48       4-4 : 49       4-4 : 50       4-4 :50   :
: 66.0 :  .4         :  .4         :  .0          :  .1          :  .2          :     :
:      :154-161-161  :161-162-162  :165-165-165   :168-168-168   :170-170-170   :  49:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 47      4-4 : 49      4-4 : 51       4-4 : 52       4-4 : 53       4-4 :50   :
: 64.0 :  .2         :  .4         :  .4          :  .5          :  .5          :     :
:      :156-160-160  :160-161-161  :165-165-165   :167-167-167   :168-168-168   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 51      4-4 : 53      4-4 : 55       4-4 : 56       4-4 : 56       4-4 :50   :
: 62.0 :  .2         :  .3         :  .3          :  .3          :  .9          :     :
:      :156-158-158  :160-160-160  :164-164-164   :165-165-165   :167-167-167   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 55      4-4 : 56      4-4 : 56       4-4 : 56       4    : 56       4    :50   :
: 60.0 :  .2         :  .8         : 1.8          :  .0          :  .0          :     :
:      :155-155-155  :159-159-159  :164-164-164   :142-142-142   :140-140-140   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56      4-4 : 56      4   : 56       4   : 56           : 56           :50   :
: 58.0 : 1.7         :  .0         :  .0          :  .0          :  .0          :     :
:      :155-155-155  :137-137-137  :134-134-134   :129-134-134   :124-134-134   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 56.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :129-131-131  :121-131-131  :121-131-131   :121-131-131   :121-131-131   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 54.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :120-129-129  :120-129-129  :120-129-129   :120-129-129   :120-129-129   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 52.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :119-126-126  :119-126-126  :119-126-126   :119-126-126   :119-126-126   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 50.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :118-123-124  :118-123-124  :118-123-124   :118-123-124   :118-123-124   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 48.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :116-120-122  :116-120-122  :116-120-122   :116-120-122   :116-120-122   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
:      : 56          : 56          : 56           : 56           : 56           :50   :
: 46.0 :  .0         :  .0         :  .0          :  .0          :  .0          :     :
:      :115-118-119  :115-118-119  :115-118-119   :115-118-119   :115-118-119   :  50:
:------:-------------:-------------:--------------:--------------:--------------:-----:
/MINI. ACCELERATION HEIGHT :  1242.(FT)  QNH ALT. :  1257.(FT)
/MAXI. ACCELERATION HEIGHT :  3342.(FT)  QNH ALT. :  3357.(FT)
```

(11KGHGK1.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 2

```
:VHHH HONG KONG              RWY 13      JARA 12 SEP 95 ELEV.     15.FT*CONF.*
:FOR TRAINING ONLY                                 MC69   TORA    3331.M *  2  *
:                                                         ASDA    3331.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                         TODA    3444.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 40/GRAD2=   0    *****   SLOPE    .00 % : TGA :
```

:WEIGHT: 1000KG:	-10	-5	0	10	20	TGA 2 3
75.5		-15 4-4 -.7 164-164-168	0 4-4 .0 165-165-168	22 4-4 .0 164-166-168	30 4-4 .5 166-166-169	34 33
74.0	-15 4-4 -.6 159-163-166	4 4-4 .0 159-164-167	30 4-4 .1 158-164-166	30 4-4 1.1 162-165-168	33 4-4 .4 165-165-167	36 36
72.0	15 4-4 .1 150-159-162	30 4-4 .7 152-160-163	34 4-4 .3 159-162-165	36 4-4 .1 162-162-164	37 4-4 .2 162-162-165	40 39
70.0	30 4-4 1.2 147-157-159	36 4-4 .1 155-160-162	38 4-4 .4 160-160-162	39 4-4 .5 160-160-163	41 4-4 .0 160-160-162	43 42
68.0	37 4-4 .2 150-157-159	40 4-4 .3 157-158-160	42 4-4 .3 158-158-160	43 4-4 .3 158-158-160	44 4-4 .4 158-158-160	46 46
66.0	42 4-4 .1 153-155-157	44 4-4 .2 156-156-157	46 4-4 .1 156-156-157	47 4-4 .1 156-156-157	48 4-4 .2 156-156-157	50 49
64.0	46 4-4 .2 153-153-155	48 4-4 .1 154-154-155	49 4-4 .5 154-154-155	50 4-4 .5 154-154-155	51 4-4 .5 154-154-155	50 50
62.0	50 4-4 .1 151-151-152	52 4-4 .0 151-151-152	53 4-4 .3 152-152-153	54 4-4 .3 152-152-153	55 4-4 .3 152-152-153	50 50
60.0	54 4-4 .0 149-149-150	55 4-4 .4 149-149-150	56 4-4 .7 150-150-151	56 4-4 1.3 151-151-151	56 4-4 1.8 151-151-152	50 50
58.0	56 4-4 1.0 148-148-148	56 4-4 1.9 149-149-149	56 4 .0 132-132-133	56 4 .0 130-130-131	56 4 .0 128-128-129	50 50
56.0	56 4 .0 128-128-129	56 4 .0 125-125-127	56 .0 120-124-125	56 .0 117-124-125	56 .0 117-124-125	50 50
54.0	56 .0 115-121-123	56 .0 115-121-123	56 .0 115-121-123	56 .0 115-121-123	56 .0 115-121-123	50 50
52.0	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	50 50
50.0	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	50 50
48.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50
46.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

```
/MINI. ACCELERATION HEIGHT :  1251.(FT)  QNH ALT. :  1266.(FT)
/MAXI. ACCELERATION HEIGHT :  3098.(FT)  QNH ALT. :  3113.(FT)
```

(11KGHGK2.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 1 + F

VHHH HONG KONG — RWY 31 — JARA 12 SEP 95 — MC69
FOR TRAINING ONLY
A320-211/AB/CFM565A1 DRY RUNWAY
TREF= 30/TMAX= 50 GRAD1= 40/GRAD2= 0 *****

ELEV. 15.FT — TORA 2892.M — ASDA 3242.M — TODA 3032.M — SLOPE .00 %
CONF. 1+F* — *CG25%*

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5				-15 4-4 -1.3 161-161-161	-15 4-4 -.5 162-162-162	34 33
74.0		-15 4-4 -1.8 158-158-158	-15 4-4 -.6 160-160-161	-11 4-4 .0 160-160-161	5 4-4 .0 159-159-159	36 36
72.0	-15 4-4 -1.1 157-157-157	-12 4-4 .0 157-157-158	14 4-4 .0 156-156-156	29 4-4 .0 156-156-156	30 4-4 .8 157-157-157	40 39
70.0	3 4-4 .0 153-153-154	27 4-4 .0 153-153-154	30 4-4 1.1 155-155-155	30 4-4 1.9 156-156-156	35 4-4 .4 154-154-154	43 42
68.0	30 4-4 .5 151-151-152	30 4-4 1.8 153-153-153	36 4-4 .4 152-152-152	38 4-4 .2 152-152-152	40 4-4 .1 152-152-152	46 46
66.0	35 4-4 .3 149-149-149	38 4-4 .3 150-150-150	41 4-4 .1 150-150-150	42 4-4 .3 151-151-151	44 4-4 .1 152-152-152	50 49
64.0	40 4-4 .1 147-147-147	42 4-4 .4 148-148-148	45 4-4 .2 150-150-150	46 4-4 .4 151-151-151	48 4-4 .1 151-151-151	50 50
62.0	44 4-4 .3 145-145-145	47 4-4 .0 146-146-146	49 4-4 .2 148-148-148	50 4-4 .4 149-149-149	52 4-4 .1 148-148-148	50 50
60.0	48 4-4 .4 144-144-144	51 4-4 .1 145-145-145	53 4-4 .2 146-146-146	54 4-4 .4 146-146-146	56 4-4 .1 146-146-146	50 50
58.0	53 4-4 .0 142-142-142	55 4-4 .2 143-143-143	56 4-4 .8 144-144-144	56 4-4 1.4 145-145-145	56 .0 130-134-134	50 50
56.0	56 4-4 .6 141-141-141	56 4-4 1.7 143-143-143	56 .0 125-131-131	56 .0 122-131-131	56 .0 121-131-131	50 50
54.0	56 .0 122-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
52.0	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	56 .0 119-126-126	50 50
50.0	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	56 .0 118-123-124	50 50
48.0	56 .0 116-120-122	56 .0 116-120-122	56 .0 116-120-122	56 .0 116-120-122	56 .0 116-120-122	50 50
46.0	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	56 .0 115-118-119	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 815.(FT)
/MAXI. ACCELERATION HEIGHT : 3109.(FT) QNH ALT. : 3124.(FT)

(11KGHGK3.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 2

```
:VHHH HONG KONG                RWY 31      JARA 12 SEP 95 ELEV.      15.FT*CONF.*
:FOR TRAINING ONLY                                   MC69  TORA     2892.M *  2  *
:                                                          ASDA     3242.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                          TODA     3032.M *******
:-------TREF= 30/TMAX= 50 GRAD1= 40/GRAD2=   0    *****    SLOPE     .00 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000KG:    -10      :      -5     :       0     :      10     :      20     :  3  :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5					-15 4-4 -1.1 155-155-158	34 33
74.0			-15 4-4 -1.2 153-153-156	-15 4-4 -.4 154-154-157	-7 4-4 .0 154-154-157	36 36
72.0	-15 4-4 -1.8 150-150-153	-15 4-4 -.5 152-152-155	1 4-4 .0 152-152-155	19 4-4 .0 152-152-154	30 4-4 .2 151-151-154	40 39
70.0	-12 4-4 .0 150-150-153	16 4-4 .0 149-149-151	30 4-4 .5 149-149-151	30 4-4 1.4 150-150-152	34 4-4 .3 150-150-152	43 42
68.0	28 4-4 .0 145-145-147	30 4-4 1.2 147-147-149	35 4-4 .2 147-147-149	37 4-4 .1 148-148-150	38 4-4 .4 149-149-151	46 46
66.0	30 4-4 1.9 145-145-147	37 4-4 .0 145-145-146	39 4-4 .4 146-146-148	41 4-4 .2 147-147-148	42 4-4 .5 147-147-148	50 49
64.0	38 4-4 .3 142-142-144	41 4-4 .2 144-144-145	43 4-4 .5 145-145-146	45 4-4 .3 145-145-146	47 4-4 .0 145-145-146	50 50
62.0	43 4-4 .1 141-141-142	45 4-4 .3 142-142-143	48 4-4 .0 143-143-144	49 4-4 .3 143-143-144	51 4-4 .0 143-143-144	50 50
60.0	47 4-4 .2 139-139-140	49 4-4 .4 140-140-141	52 4-4 .1 141-141-142	53 4-4 .3 141-141-142	55 4-4 .0 141-141-142	50 50
58.0	51 4-4 .3 138-138-139	54 4-4 .1 138-138-139	56 4-4 .2 139-139-139	56 4-4 .9 140-140-140	56 4-4 1.6 141-141-141	50 50
56.0	56 4-4 .1 136-136-137	56 4-4 1.1 137-137-138	56 .0 121-124-125	56 .0 118-124-125	56 .0 117-124-125	50 50
54.0	56 .0 118-121-123	56 .0 115-121-123	56 .0 115-121-123	56 .0 115-121-123	56 .0 115-121-123	50 50
52.0	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	56 .0 114-118-120	50 50
50.0	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	56 .0 113-116-118	50 50
48.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50
46.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

```
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :    815.(FT)
/MAXI. ACCELERATION HEIGHT :  3033.(FT)  QNH ALT. :   3048.(FT)
```

(11KGHGK4.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 1 + F

```
---------------------------------------------------------------------------*******
:LFPO PARIS-ORLY              RWY 25      JARA 12 SEP 95 ELEV.    286.FT*CONF.*
:FOR TRAINING ONLY                                  MC69  TORA    3650.M *  1+F*
:                                                         ASDA    3650.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                         TODA    3710.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 200      *****  SLOPE    .02 % : TGA :
:WEIGHT:-------------------------------------------------------------------:  2  :
:1000KG:     -10     :     -5      :      0      :     10      :     20      :  3  :
:------------------------------------------------------------------------------:
:      :-10     4-4 : 14      4-4 : 31      4-4 : 33      4-4 : 34      4-4 :32   :
: 75.5 :  .0        :  .1         :  .0         :  .2         :  .4         :     :
:      :156-159-159 :156-157-157 :158-158-158 :163-163-163 :166-166-166 :   32:
:------:------------:------------:------------:------------:------------:-----:
:      : 11     4-4 : 29      4-4 : 34      4-4 : 36      4-4 : 37      4-4 :35   :
: 74.0 :  .1        :  .5         :  .3         :  .2         :  .4         :     :
:      :151-154-154 :152-154-154 :159-159-159 :164-164-164 :165-165-165 :   34:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 35      4-4 : 39      4-4 : 40      4-4 : 41      4-4 :38   :
: 72.0 :  .7        :  .3         :  .0         :  .2         :  .3         :     :
:      :146-151-151 :154-155-155 :162-162-162 :163-163-163 :164-164-164 :   38:
:------:------------:------------:------------:------------:------------:-----:
:      : 36     4-4 : 40      4-4 : 42      4-4 : 44      4-4 : 45      4-4 :42   :
: 70.0 :  .3        :  .3         :  .5         :  .1         :  .2         :     :
:      :149-151-151 :156-156-156 :161-161-161 :161-161-161 :162-162-162 :   41:
:------:------------:------------:------------:------------:------------:-----:
:      : 42     4-4 : 44      4-4 : 46      4-4 : 47      4-4 : 49      4-4 :45   :
: 68.0 :  .0        :  .4         :  .4         :  .5         :  .0         :     :
:      :151-152-152 :158-158-158 :159-159-159 :160-160-160 :159-159-159 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 46     4-4 : 48      4-4 : 50      4-4 : 51      4-4 : 52      4-4 :48   :
: 66.0 :  .3        :  .3         :  .3         :  .3         :  .4         :     :
:      :153-153-153 :157-157-157 :157-157-157 :157-157-157 :157-157-157 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 50     4-4 : 52      4-4 : 54      4-4 : 55      4-4 : 55      4-4 :49   :
: 64.0 :  .3        :  .2         :  .1         :  .2         :  .8         :     :
:      :154-154-154 :155-155-155 :155-155-155 :155-155-155 :156-156-156 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 54     4-4 : 55      4-4 : 55      4-4 : 55      4   : 55      2   :49   :
: 62.0 :  .2        :  .7         : 1.6         :  .0         :  .0         :     :
:      :152-152-152 :153-153-153 :154-154-154 :141-141-141 :139-140-140 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 55      4   : 55          : 55          : 55          :49   :
: 60.0 : 1.7        :  .0         :  .0         :  .0         :  .0         :     :
:      :151-151-151 :136-136-136 :128-136-136 :126-136-136 :126-136-136 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 58.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :124-134-134 :124-134-134 :124-134-134 :124-134-134 :124-134-134 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 56.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :121-131-131 :121-131-131 :121-131-131 :121-131-131 :121-131-131 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 54.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :120-129-129 :120-129-129 :120-129-129 :120-129-129 :120-129-129 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 52.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :119-126-126 :119-126-126 :119-126-126 :119-126-126 :119-126-126 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 50.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :118-123-124 :118-123-124 :118-123-124 :118-123-124 :118-123-124 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 48.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :116-121-122 :116-121-122 :116-121-122 :116-121-122 :116-121-122 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55          : 55          : 55          : 55          :49   :
: 46.0 :  .0        :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   936.(FT)  QNH ALT.  :  1222.(FT)
/MAXI. ACCELERATION HEIGHT :  2367.(FT)  QNH ALT.  :  2653.(FT)
```

(11KGORY1.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 2

```
-------------------------------------------------------------------------*******
:LFPO PARIS-ORLY              RWY 25       JARA 12 SEP 95 ELEV.    286.FT*CONF.*
:FOR TRAINING ONLY                                  MC69  TORA    3650.M *  2  *
:                                                         ASDA    3650.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                         TODA    3710.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 50/GRAD2= 300    *****   SLOPE    .02 % : TGA :
:WEIGHT:---------------------------------------------------------------:  2  :
:1000KG:    -10     :     -5     :      0     :     10     :     20     :  3  :
:-------------------------------------------------------------------------------:
:      :-13     4-4 : 13     4-4 : 30     4-4 : 32     4-4 : 33     4-4 :32   :
: 75.5 :  .0        :  .0        :  .2        :  .1        :  .3        :     :
:      :155-155-158 :153-154-156 :155-155-158 :158-158-161 :160-160-162 :  32:
:------:------------:------------:------------:------------:------------:-----:
:      : 9      4-4 : 29     4-4 : 33     4-4 : 35     4-4 : 36     4-4 :35   :
: 74.0 :  .1        :  .4        :  .3        :  .1        :  .3        :     :
:      :149-151-153 :150-151-153 :156-156-159 :158-158-160 :158-158-161 :  34:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 35     4-4 : 37     4-4 : 39     4-4 : 40     4-4 :38   :
: 72.0 :  .6        :  .1        :  .3        :  .0        :  .2        :     :
:      :145-147-149 :152-152-154 :156-156-158 :156-156-158 :157-157-158 :  38:
:------:------------:------------:------------:------------:------------:-----:
:      : 36     4-4 : 39     4-4 : 41     4-4 : 42     4-4 : 44     4-4 :42   :
: 70.0 :  .1        :  .2        :  .3        :  .4        :  .0        :     :
:      :147-147-149 :154-154-156 :155-155-156 :155-155-157 :155-155-157 :  41:
:------:------------:------------:------------:------------:------------:-----:
:      : 41     4-4 : 43     4-4 : 45     4-4 : 46     4-4 : 47     4-4 :45   :
: 68.0 :  .0        :  .2        :  .2        :  .3        :  .4        :     :
:      :149-149-151 :153-153-154 :153-153-154 :153-153-154 :154-154-156 :  45:
:------:------------:------------:------------:------------:------------:-----:
:      : 45     4-4 : 47     4-4 : 49     4-4 : 50     4-4 : 51     4-4 :48   :
: 66.0 :  .1        :  .1        :  .0        :  .1        :  .2        :     :
:      :150-150-151 :150-150-152 :151-151-152 :152-152-153 :154-154-155 :  48:
:------:------------:------------:------------:------------:------------:-----:
:      : 49     4-4 : 51     4-4 : 52     4-4 : 54     4-4 : 55     4-4 :49   :
: 64.0 :  .0        :  .0        :  .5        :  .0        :  .1        :     :
:      :148-148-149 :148-148-149 :150-150-151 :151-151-152 :151-151-152 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 52     4-4 : 54     4-4 : 55     4-4 : 55     4-4 : 55     4   :49   :
: 62.0 :  .5        :  .5        :  .9        : 1.5        :  .0        :     :
:      :147-147-147 :147-147-147 :149-149-150 :151-151-151 :138-138-138 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 55     4-4 : 55     4   : 55     4   : 55     2   :49   :
: 60.0 : 1.0        : 2.0        :  .0        :  .0        :  .0        :     :
:      :145-145-145 :147-147-147 :132-132-132 :130-130-131 :127-130-130 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4   : 55         : 55         : 55         : 55         :49   :
: 58.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :128-128-129 :123-126-127 :118-126-127 :118-126-127 :118-126-127 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 56.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :117-124-125 :117-124-125 :117-124-125 :117-124-125 :117-124-125 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 54.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :115-121-123 :115-121-123 :115-121-123 :115-121-123 :115-121-123 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 52.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :114-118-120 :114-118-120 :114-118-120 :114-118-120 :114-118-120 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 50.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :113-116-118 :113-116-118 :113-116-118 :113-116-118 :113-116-118 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 48.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :  49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
: 46.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :  49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    936.(FT)  QNH ALT. :   1222.(FT)
/MAXI. ACCELERATION HEIGHT :   2377.(FT)  QNH ALT. :   2663.(FT)
```

(11KGORY2.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 1 + F

```
:LFPO PARIS-ORLY          RWY 26      JARA 12 SEP 95 ELEV.    285.FT*CONF.*
:FOR TRAINING ONLY                              MC69  TORA    3320.M *  1+F*
:                                                     ASDA    3320.M *CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                     TODA    3640.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 200  ***** SLOPE   -.07 % : TGA :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5	11 4-4 .1 149-155-155	30 4-4 .2 150-154-154	34 2-4 .3 157-159-159	36 2-4 .3 162-162-162	38 2-4 .1 165-165-165	32 32
74.0	29 4-4 .1 144-151-151	34 4-4 .2 151-154-154	38 2-4 .2 159-159-159	39 2-4 .5 163-163-163	40 2-4 .5 165-165-165	35 34
72.0	35 4-4 .1 146-151-151	39 4-4 .2 153-155-155	42 2-4 .3 159-159-159	43 2-4 .4 162-162-162	44 2-4 .4 164-164-164	38 38
70.0	40 4-4 .2 148-151-151	44 4-4 .2 155-155-155	46 2-4 .2 158-158-158	47 2-4 .2 160-160-160	47 2-4 .6 164-164-164	42 41
68.0	45 4-4 .3 150-152-152	48 4-4 .2 154-154-154	50 2-4 .0 156-156-156	50 2-4 .6 159-159-159	51 2-2 .0 161-161-161	45 45
66.0	50 4-4 .1 151-151-151	52 4-4 .0 153-153-153	53 2-4 .4 155-155-155	54 2-2 .1 159-159-159	54 2-2 .1 158-159-159	48 48
64.0	54 4-4 .0 150-150-150	55 4-4 .5 152-152-152	55 2-4 1.3 155-155-155	55 2-2 1.4 158-158-158	55 2-2 1.4 157-158-158	49 49
62.0	55 4-4 1.5 150-150-150	55 2 .0 139-140-140	55 2 .0 132-140-140	55 2 .0 129-140-140	55 2 .0 129-140-140	49 49
60.0	55 .0 128-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	49 49
58.0	55 .0 123-133-133	55 .0 123-133-133	55 .0 123-133-133	55 .0 123-133-133	55 .0 123-133-133	49 49
56.0	55 .0 121-131-131	55 .0 121-131-131	55 .0 121-131-131	55 .0 121-131-131	55 .0 121-131-131	49 49
54.0	55 .0 120-128-129	55 .0 120-128-129	55 .0 120-128-129	55 .0 120-128-129	55 .0 120-128-129	49 49
52.0	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	55 .0 119-126-126	49 49
50.0	55 .0 117-123-124	55 .0 117-123-124	55 .0 117-123-124	55 .0 117-123-124	55 .0 117-123-124	49 49
48.0	55 .0 116-120-122	55 .0 116-120-122	55 .0 116-120-122	55 .0 116-120-122	55 .0 116-120-122	49 49
46.0	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	55 .0 115-118-119	49 49

```
/MINI. ACCELERATION HEIGHT :   927.(FT)  QNH ALT. :  1212.(FT)
/MAXI. ACCELERATION HEIGHT :  2065.(FT)  QNH ALT. :  2350.(FT)
```

(11KGORY3.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 2

```
-----------------------------------------------------------------------------*******
:LFPO PARIS-ORLY              RWY 26      JARA 12 SEP 95 ELEV.    285.FT*CONF.*
:FOR TRAINING ONLY                                  MC69 TORA    3320.M *  2  *
:                                                        ASDA    3320.M *CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                       TODA    3640.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 60/GRAD2= 300    *****  SLOPE   -.07 % : TGA :
:WEIGHT:---------------------------------------------------------------:  2  :
:1000KG:     -10     :      -5     :      0      :     10      :     20     :  3  :
:-------------------------------------------------------------------------------:
:      : 11      4-4 : 30      4-4 : 34      2-4 : 35      2-4 : 36      2-4 :32   :
: 75.5 :  .1         :   .2        :   .2        :   .3        :   .4        :     :
:      :146-150-152 :148-150-152 :154-154-157 :157-157-159 :159-159-162 :   32:
:------:------------:------------:------------:------------:------------:-----:
:      : 29      4-4 : 34      4-4 : 37      2-4 : 38      2-4 : 39      2-4 :35   :
: 74.0 :  .2         :   .1        :   .1        :   .3        :   .4        :     :
:      :143-146-148 :149-150-152 :154-154-156 :156-156-158 :159-159-161 :   34:
:------:------------:------------:------------:------------:------------:-----:
:      : 35      4-4 : 39      4-4 : 41      2-4 : 42      2-4 : 43      2-4 :38   :
: 72.0 :  .0         :   .0        :   .1        :   .2        :   .2        :     :
:      :144-147-148 :151-151-152 :153-153-155 :155-155-157 :158-158-159 :   38:
:------:------------:------------:------------:------------:------------:-----:
:      : 40      4-4 : 42      4-4 : 44      2-4 : 46      2-4 : 46      2-4 :42   :
: 70.0 :  .1         :   .5        :   .5        :   .0        :   .5        :     :
:      :146-147-149 :150-150-151 :152-152-154 :154-154-156 :157-157-158 :   41:
:------:------------:------------:------------:------------:------------:-----:
:      : 44      4-4 : 46      4-4 : 48      2-4 : 49      2-4 : 50      2-4 :45   :
: 68.0 :  .4         :   .4        :   .3        :   .4        :   .2        :     :
:      :147-147-149 :149-149-150 :151-151-152 :153-153-154 :155-155-157 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 48      4-4 : 50      4-4 : 52      2-4 : 53      2-4 : 53      2-2 :48   :
: 66.0 :  .3         :   .3        :   .2        :   .2        :   .4        :     :
:      :147-147-147 :148-148-148 :150-150-150 :152-152-153 :153-154-155 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 52      4-4 : 54      4-4 : 55      2-4 : 55      2-4 : 55      2-2 :49   :
: 64.0 :  .2         :   .2        :   .6        :  1.1        :  1.1        :     :
:      :145-145-146 :146-146-147 :149-149-149 :151-151-152 :151-152-153 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55      4-4 : 55      4-4 : 55      2   : 55      2   : 55      2   :49   :
: 62.0 :  .7         :  1.7        :   .0        :   .0        :   .0        :     :
:      :144-144-144 :146-146-146 :130-137-138 :127-137-138 :127-137-138 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55      4   : 55      2   : 55      2   : 55      2   : 55      2   :49   :
: 60.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :131-131-132 :128-130-130 :120-130-130 :120-130-130 :120-130-130 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 58.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :118-126-127 :118-126-127 :118-126-127 :118-126-127 :118-126-127 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 56.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :117-124-125 :117-124-125 :117-124-125 :117-124-125 :117-124-125 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 54.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :115-121-123 :115-121-123 :115-121-123 :115-121-123 :115-121-123 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 52.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :114-118-120 :114-118-120 :114-118-120 :114-118-120 :114-118-120 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 50.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :113-116-118 :113-116-118 :113-116-118 :113-116-118 :113-116-118 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 48.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
: 46.0 :  .0         :   .0        :   .0        :   .0        :   .0        :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    927.(FT)  QNH ALT. :   1212.(FT)
/MAXI. ACCELERATION HEIGHT :   2058.(FT)  QNH ALT. :   2343.(FT)
```

(11KGORY4.PCX)

PARIS ORLY (LFPO) - RWY 08 - CONF 1 + F

```
:LFPO PARIS-ORLY OUEST        RWY 08        JARA XX/XX /XX ELEV.    276.FT*CONF.*
:FOR TRAINING ONLY                                 MC69    TORA    3320.M *  1+F*
:AEF T-TP3 - OBS : ANTENNA, TREES                          ASDA    3320.M *CG25%*
:A320                    DRY RUNWAY                        TODA    3320.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 50/GRAD2=   0    *****   SLOPE    .07 % : TGA :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.0	-16 4-4 -1.1 159-159-159	-16 4-4 .0 161-161-161	4 4-4 .0 160-160-160	18 4-4 .0 159-159-159	29 4-4 .1 160-160-160	33 33
73.5	-9 4-4 .0 158-158-158	14 4-4 .0 158-158-158	29 4-4 .2 158-158-158	29 4-4 .9 159-159-159	32 4-4 .4 159-159-159	36 35
70.0	29 4-4 1.1 149-149-149	29 4-4 2.6 155-155-155	37 4-4 .2 154-154-154	38 4-4 .3 156-156-156	40 4-4 .0 158-158-158	42 41
68.0	37 4-4 .1 152-152-152	39 4-4 .2 152-152-152	41 4-4 .2 155-155-155	42 4-4 .4 156-156-156	44 4-4 .1 153-153-153	45 45
66.0	41 4-4 .2 150-150-150	43 4-4 .3 151-151-151	45 4-4 .3 153-153-153	46 4-4 .4 154-154-154	48 4-4 .0 150-150-150	48 48
64.0	45 4-4 .3 148-148-148	47 4-4 .3 150-150-150	49 4-4 .2 151-151-151	50 4-4 .3 151-151-151	51 4-4 .5 149-149-149	49 49
62.0	49 4-4 .3 147-147-147	51 4-4 .3 149-149-149	53 4-4 .2 149-149-149	54 4-4 .3 148-148-148	55 4-4 .4 146-146-146	49 49
60.0	53 4-4 .4 146-146-146	55 4-4 .3 146-146-146	57 4-4 .2 147-147-147	58 4-4 .3 144-144-144	59 4-4 .4 144-144-144	49 49
58.0	57 4-4 .4 144-144-144	59 4-4 .3 144-144-144	60 4-4 .7 145-145-145	60 4-4 1.3 142-142-142	60 4-4 1.9 143-143-143	49 49
56.0	60 4-4 1.0 142-142-142	60 4-4 1.9 144-144-144	60 .0 126-132-132	60 .0 123-132-132	60 .0 122-132-132	49 49
54.0	60 .0 122-129-129	60 .0 120-129-129	60 .0 120-129-129	60 .0 120-129-129	60 .0 120-129-129	49 49
52.0	60 .0 119-126-126	60 .0 119-126-126	60 .0 119-126-126	60 .0 119-126-126	60 .0 119-126-126	49 49
50.0	60 .0 118-124-124	60 .0 118-124-124	60 .0 118-124-124	60 .0 118-124-124	60 .0 118-124-124	49 49
48.0	60 .0 116-121-122	60 .0 116-121-122	60 .0 116-121-122	60 .0 116-121-122	60 .0 116-121-122	49 49

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/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1076.(FT)
/MAXI. ACCELERATION HEIGHT :  2438.(FT)  QNH ALT. :  2714.(FT)
TLC:H  OCT.1991  A320-211/AB/        CONF1F-AC-MC69-1---C APP/LD-AD-MC69-1---B
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(11KGORY4.PCX)

PARIS ORLY (LFPO) - RWY 08 - CONF 2

:LFPO PARIS-ORLY OUEST RWY 08 JARA XX/XX/XX ELEV. 276.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 3320.M * 2 *
:AEF T-TP3 - OBS : ANTENNA, TREES ASDA 3320.M *CG25%*
:A320 DRY RUNWAY TODA 3320.M *******
:-------TREF= 29/TMAX= 49 GRAD1= 40/GRAD2= 0 ***** SLOPE .07 % : TGA :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.0		-16 4-4 -1.1 156-156-159	-12 4-4 .0 153-153-155	4 4-4 .0 153-153-155	19 4-4 .0 153-153-155	33 33
73.5	-16 4-4 -.6 154-154-156	-6 4-4 .0 155-155-158	17 4-4 .0 154-154-157	29 4-4 .1 150-150-152	29 4-4 .9 152-152-154	36 35
70.0	29 4-4 .6 147-147-149	29 4-4 1.8 152-152-154	29 4-4 2.9 153-153-155	37 4-4 .0 149-149-150	38 4-4 .3 149-149-150	42 41
68.0	35 4-4 .1 148-148-150	37 4-4 .2 149-149-150	39 4-4 .3 147-147-148	41 4-4 .1 147-147-148	42 4-4 .4 147-147-148	45 45
66.0	39 4-4 .2 147-147-148	41 4-4 .3 147-147-149	43 4-4 .3 145-145-146	45 4-4 .1 145-145-146	46 4-4 .3 145-145-146	48 48
64.0	43 4-4 .3 145-145-147	45 4-4 .3 146-146-147	47 4-4 .4 143-143-144	49 4-4 .1 143-143-143	50 4-4 .3 143-143-144	49 49
62.0	47 4-4 .4 143-143-144	49 4-4 .3 144-144-144	51 4-4 .4 141-141-141	53 4-4 .1 141-141-141	54 4-4 .3 142-142-142	49 49
60.0	51 4-4 .5 141-141-142	53 4-4 .4 143-143-144	55 4-4 .4 139-139-139	57 4-4 .1 139-139-140	58 4-4 .3 141-141-141	49 49
58.0	56 4-4 .1 140-140-141	57 4-4 .4 142-142-142	59 4-4 .5 137-137-137	60 4-4 .6 138-138-139	60 4-4 1.3 140-140-140	49 49
56.0	60 4-4 .2 139-139-139	60 4-4 1.0 140-140-140	60 4-4 2.0 136-136-136	60 .0 119-124-125	60 .0 117-124-125	49 49
54.0	60 .0 118-122-123	60 .0 116-122-123	60 .0 116-122-123	60 .0 116-122-123	60 .0 116-122-123	49 49
52.0	60 .0 114-119-120	60 .0 114-119-120	60 .0 114-119-120	60 .0 114-119-120	60 .0 114-119-120	49 49
50.0	60 .0 113-116-118	60 .0 113-116-118	60 .0 113-116-118	60 .0 113-116-118	60 .0 113-116-118	49 49
48.0	60 .0 112-113-116	60 .0 112-113-116	60 .0 112-113-116	60 .0 112-113-116	60 .0 112-113-116	49 49

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1076.(FT)
/MAXI. ACCELERATION HEIGHT : 2363.(FT) QNH ALT. : 2639.(FT)
TLC:H OCT.1991 A320-211/AB/ CONF 2-AD-MC69-1---C APP/LD-AD-MC69-1---B

(11KGORY4.PCX)

PARIS ORLY (LFPO) - RWY 08 - CONF 3

LFPO PARIS-ORLY OUEST — RWY 08 — JARA XX/XX/XX — ELEV. 276.FT — CONF. 3
FOR TRAINING ONLY — MC69 — TORA 3320.M — CG25%
AEF T-TP3 - OBS : ANTENNA, TREES — ASDA 3320.M
A320 — DRY RUNWAY — TODA 3320.M
TREF= 29/TMAX= 49 GRAD1= 40/GRAD2= 0 ***** SLOPE .07 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.0		-16 4-4 -.9 156-156-157	-10 4-4 .0 153-153-154	5 4-4 .0 153-153-154	20 4-4 .0 153-153-153	33 33
73.5	-16 4-4 -.4 154-154-155	-3 4-4 .0 154-154-155	18 4-4 .0 154-154-155	29 4-4 .2 150-150-151	29 4-4 1.0 152-152-152	36 35
70.0	29 4-4 .7 149-149-150	29 4-4 1.9 152-152-152	29 4-4 2.9 153-153-154	37 4-4 .1 148-148-149	38 4-4 .4 149-149-149	42 41
68.0	35 4-4 .2 147-147-148	37 4-4 .3 148-148-148	39 4-4 .3 146-146-147	41 4-4 .2 146-146-147	42 4-4 .4 147-147-147	45 45
66.0	39 4-4 .3 145-145-146	41 4-4 .4 147-147-147	43 4-4 .4 144-144-145	45 4-4 .2 144-144-145	46 4-4 .4 144-144-145	48 48
64.0	43 4-4 .4 144-144-145	45 4-4 .4 145-145-145	47 4-4 .5 142-142-143	49 4-4 .2 142-142-143	50 4-4 .4 143-143-144	49 49
62.0	47 4-4 .5 142-142-143	49 4-4 .5 143-143-143	52 4-4 .0 139-139-140	53 4-4 .2 141-141-141	54 4-4 .4 142-142-142	49 49
60.0	52 4-4 .1 140-140-141	54 4-4 .0 141-141-142	56 4-4 .1 138-138-138	57 4-4 .3 139-139-140	58 4-4 .4 139-139-140	49 49
58.0	56 4-4 .2 138-138-139	58 4-4 .1 140-140-141	60 4-4 .2 137-137-137	60 4-4 .8 138-138-138	60 4-4 1.4 138-138-139	49 49
56.0	60 4-4 .3 138-138-139	60 4-4 1.2 134-134-135	60 2 .0 119-121-122	60 2 .0 117-121-122	60 2 .0 115-121-122	49 49
54.0	60 .0 115-117-118	60 .0 113-117-118	60 .0 113-117-118	60 .0 113-117-118	60 .0 113-117-118	49 49
52.0	60 .0 112-114-116	60 .0 112-114-116	60 .0 112-114-116	60 .0 112-114-116	60 .0 112-114-116	49 49
50.0	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	49 49
48.0	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	60 .0 111-113-115	49 49

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1076.(FT)
/MAXI. ACCELERATION HEIGHT : 2281.(FT) QNH ALT. : 2557.(FT)
TLC:H OCT.1991 A320-211/AB/ CONF 3-AD-MC69-1---C APP/LD-AD-MC69-1---B

(11KGORY7.PCX)

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TOULOUSE (LFBO) - RWY 15 R - CONF 1 + F

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:LFBO TOULOUSE-BLAGNAC          RWY 15R      JARA 12 SEP 95 ELEV.    486.FT*CONF.*
:FOR TRAINING ONLY                                  MC69    TORA   11483.FT*   1+F*
:                                                           ASDA   11680.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                           TODA   11483.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=140/GRAD2= 600     *****    SLOPE    .10 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-1 4-4 .1 153-154-154	22 4-4 .1 153-154-154	32 4-4 .0 158-158-158	33 4-4 .9 161-161-161	35 2-4 .3 162-162-162	31 31
164.0	14 4-4 .1 149-151-151	29 4-4 1.4 151-152-152	34 4-4 .6 159-159-159	36 4-4 .2 160-160-160	37 2-4 .6 161-161-161	33 33
160.0	29 4-4 1.4 145-149-149	35 4-4 .6 153-153-153	38 4-4 .5 158-158-158	39 2-4 .9 158-158-158	41 2-4 .1 161-161-161	36 36
156.0	36 4-4 .0 148-149-149	39 4-4 .9 155-155-155	42 4-4 .0 156-156-156	43 2-4 .4 157-157-157	44 2-4 .7 160-160-160	40 39
152.0	40 4-4 .8 149-150-150	43 4-4 .6 154-154-154	45 4-4 .6 155-155-155	46 4-4 .9 157-157-157	47 2-4 1.1 159-159-159	43 42
148.0	45 4-4 .0 151-151-151	47 4-4 .1 152-152-152	48 4-4 1.1 155-155-155	50 4-4 .2 155-155-155	51 2-4 .3 157-157-157	46 45
144.0	48 4-4 .7 150-150-150	50 4-4 .6 152-152-152	52 4-4 .5 153-153-153	53 2-4 .7 154-154-154	54 2-4 .5 157-157-157	49 48
140.0	52 4-4 .2 149-149-149	54 4-4 .1 151-151-151	55 4-4 1.0 151-151-151	55 2-4 2.3 153-153-153	55 2-4 3.1 158-158-158	49 49
136.0	55 4-4 .8 148-148-148	55 4-4 2.9 150-150-150	55 2 .0 135-140-140	55 2 .0 133-140-140	55 2 .0 131-140-140	49 49
132.0	55 .0 134-136-136	55 .0 129-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	49 49
128.0	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	49 49
124.0	55 .0 122-132-132	55 .0 122-132-132	55 .0 122-132-132	55 .0 122-132-132	55 .0 122-132-132	49 49
120.0	55 .0 121-129-129	55 .0 121-129-129	55 .0 121-129-129	55 .0 121-129-129	55 .0 121-129-129	49 49
116.0	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	49 49
112.0	55 .0 118-125-125	55 .0 118-125-125	55 .0 118-125-125	55 .0 118-125-125	55 .0 118-125-125	49 49
108.0	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	49 49
104.0	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	49 49

```
/MINI. ACCELERATION HEIGHT :   943.(FT)  QNH ALT. :  1429.(FT)
/MAXI. ACCELERATION HEIGHT :  2089.(FT)  QNH ALT. :  2575.(FT)
```

(11LBTLS1.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 2

LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 ELEV. 486.FT CONF. 2

FOR TRAINING ONLY MC69 TORA 11483.FT

ASDA 11680.FT CG25%

A320-211/AB/CFM565A1 DRY RUNWAY TODA 11483.FT

-------TREF= 29/TMAX= 49 GRAD1=130/GRAD2= 600 ***** SLOPE .10 % TGA 2 3

WEIGHT 1000LB	-10	-5	0	10	20	
166.5	-2 4-4 .0 151-151-153	21 4-4 .0 151-151-153	31 4-4 .0 154-154-156	32 4-4 .6 155-155-157	33 4-4 1.1 156-156-159	31 31
164.0	13 4-4 .0 147-148-149	29 4-4 1.3 149-149-151	33 4-4 .3 154-154-156	34 4-4 .9 155-155-157	36 4-4 .2 155-155-157	33 33
160.0	29 4-4 1.3 144-145-146	34 4-4 .6 151-151-152	36 4-4 1.0 154-154-155	38 4-4 .4 154-154-155	39 2-4 .8 155-155-156	36 36
156.0	35 4-4 .4 146-146-147	38 4-4 .4 151-151-153	40 4-4 .6 152-152-153	41 4-4 1.0 152-152-154	43 2-4 .1 154-154-155	40 39
152.0	39 4-4 .7 147-147-149	41 4-4 1.0 150-150-152	44 4-4 .0 150-150-151	45 4-4 .4 151-151-152	46 2-4 .6 153-153-154	43 42
148.0	43 4-4 .4 147-147-148	45 4-4 .6 148-148-149	47 4-4 .5 149-149-150	48 2-4 .8 149-149-150	49 2-4 1.0 152-152-152	46 45
144.0	46 4-4 1.1 147-147-148	48 4-4 1.1 147-147-148	50 4-4 1.0 148-148-148	52 2-4 .1 148-148-148	53 2-4 .2 150-150-151	49 48
140.0	50 4-4 .6 145-145-145	52 4-4 .6 145-145-146	54 4-4 .4 146-146-146	55 2-4 .6 147-147-147	55 2-4 1.9 149-149-150	49 49
136.0	54 4-4 .2 143-143-143	55 4-4 1.2 144-144-144	55 4-4 3.2 145-145-145	55 2 .0 132-138-138	55 2 .0 129-138-138	49 49
132.0	55 4-4 3.1 143-143-143	55 4 .0 131-131-132	55 2 .0 123-131-131	55 2 .0 121-131-131	55 2 .0 121-131-131	49 49
128.0	55 .0 123-127-127	55 .0 118-127-127	55 .0 118-127-127	55 .0 118-127-127	55 .0 118-127-127	49 49
124.0	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	49 49
120.0	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	49 49
116.0	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	49 49
112.0	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	49 49
108.0	55 .0 112-115-117	55 .0 112-115-117	55 .0 112-115-117	55 .0 112-115-117	55 .0 112-115-117	49 49
104.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2057.(FT) QNH ALT. : 2543.(FT)

(11LBTLS2.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 3

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----------------------------------------------------------------------*******
:LFBO TOULOUSE-BLAGNAC         RWY 15R      JARA 12 SEP 95 ELEV.    486.FT*CONF.*
:FOR TRAINING ONLY                                   MC69   TORA  11483.FT*  3  *
:                                                           ASDA  11680.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                           TODA  11483.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=120/GRAD2= 600     *****    SLOPE    .10 % : TGA :
:WEIGHT:---------------------------------------------------------------:  2  :
:1000LB:    -10     :      -5     :       0     :      10     :      20     :  3  :
:----------------------------------------------------------------------------:
:      :  0     4-4 : 23     4-4 : 30     4-4 : 32     4-4 : 33     2-4 :31   :
:166.5 :  .1        :  .1        : 1.1        :  .6        : 1.0        :     :
:      :153-153-153 :153-153-153 :156-156-156 :157-157-157 :158-158-158 :   31:
:------:------------:------------:------------:------------:------------:-----:
:      : 16     4-4 : 29     4-4 : 33     4-4 : 34     4-4 : 36     2-4 :33   :
:164.0 :  .1        : 1.7        :  .3        :  .9        :  .1        :     :
:      :148-148-149 :151-151-151 :155-155-155 :156-156-156 :158-158-158 :   33:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 34     4-4 : 36     4-4 : 38     2-4 : 39     2-4 :36   :
:160.0 : 2.0        :  .7        : 1.0        :  .4        :  .7        :     :
:      :145-146-146 :152-152-152 :154-154-154 :154-154-154 :157-157-157 :   36:
:------:------------:------------:------------:------------:------------:-----:
:      : 35     4-4 : 38     4-4 : 40     4-4 : 41     2-4 : 43     2-4 :40   :
:156.0 :  .9        :  .4        :  .6        : 1.0        :  .0        :     :
:      :147-147-148 :151-151-151 :152-152-152 :153-153-153 :156-156-156 :   39:
:------:------------:------------:------------:------------:------------:-----:
:      : 39     4-4 : 41     4-4 : 44     4-4 : 45     2-4 : 46     2-4 :43   :
:152.0 :  .8        : 1.1        :  .0        :  .3        :  .5        :     :
:      :149-149-149 :150-150-150 :151-151-151 :152-152-152 :155-155-155 :   42:
:------:------------:------------:------------:------------:------------:-----:
:      : 43     4-4 : 45     4-4 : 47     4-4 : 48     2-4 : 49     2-4 :46   :
:148.0 :  .5        :  .6        :  .6        :  .8        :  .8        :     :
:      :147-147-148 :148-148-148 :149-149-149 :151-151-151 :153-153-153 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 47     4-4 : 49     4-4 : 50     4-4 : 52     2-4 : 53     2-4 :49   :
:144.0 :  .0        :  .1        : 1.1        :  .2        :  .1        :     :
:      :145-145-145 :146-146-146 :147-147-147 :149-149-149 :152-152-152 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 50     4-4 : 52     4-4 : 54     2-4 : 55     2-4 : 55     2-4 :49   :
:140.0 :  .7        :  .7        :  .6        :  .7        : 1.8        :     :
:      :144-144-144 :145-145-145 :145-145-145 :148-148-148 :151-151-151 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 54     4-4 : 55     4-4 : 55     2-4 : 55     2   : 55     2   :49   :
:136.0 :  .4        : 1.4        : 3.4        :  .0        :  .0        :     :
:      :142-142-143 :143-143-143 :145-145-145 :131-137-138 :128-137-138 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 55     4   : 55     2   : 55     2   : 55     2   :49   :
:132.0 : 3.3        :  .0        :  .0        :  .0        :  .0        :     :
:      :142-142-142 :130-130-131 :121-130-130 :120-130-130 :120-130-130 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4   : 55     4   : 55     2   : 55     2   : 55     2   :49   :
:128.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :125-125-126 :123-123-124 :116-123-124 :116-123-124 :116-123-124 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:124.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :114-119-120 :114-119-120 :114-119-120 :114-119-120 :114-119-120 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:120.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :113-117-118 :113-117-118 :113-117-118 :113-117-118 :113-117-118 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:116.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :112-115-116 :112-115-116 :112-115-116 :112-115-116 :112-115-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:112.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:108.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49   :
:104.0 :  .0        :  .0        :  .0        :  .0        :  .0        :     :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   943.(FT)  QNH ALT. :  1429.(FT)
/MAXI. ACCELERATION HEIGHT :  2071.(FT)  QNH ALT. :  2557.(FT)
```

(11LBTLS3.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 1 + F

```
----------------------------------------------------------------------------*******
:LFBO TOULOUSE BLAGNAC         RWY 33L      JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                 MC69    TORA  11483.FT*   1+F*
:                                                          ASDA  12467.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                          TODA  11483.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=150/GRAD2= 500     *****   SLOPE  -.10 %  : TGA :
:WEIGHT:----------------------------------------------------------------:  2  :
:1000LB:    -10      :     -5      :      0      :     10      :     20      :  3  :
:-------------------------------------------------------------------------------:
:      : 1       4-4 : 23      4-4 : 31      4-4 : 34      4-4 : 35      4-4 :31   :
:166.5 :  .1         :  .0         :  .9         :  .0         :  .3         :     :
:      :151-152-152 :152-152-152 :157-157-157 :162-162-162 :164-164-164 :   31:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 15      4-4 : 29      4-4 : 34      4-4 : 36      4-4 : 37      4-4 :33   :
:164.0 :  .0         : 1.5         :  .7         :  .3         :  .5         :     :
:      :148-150-150 :150-151-151 :158-158-158 :162-162-162 :163-163-163 :   33:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 29      4-4 : 35      4-4 : 38      4-4 : 39      4-4 : 40      4-4 :36   :
:160.0 : 1.3         :  .7         :  .7         : 1.0         : 1.1         :     :
:      :145-149-149 :152-152-152 :158-158-158 :161-161-161 :162-162-162 :   36:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 36      4-4 : 40      4-4 : 42      4-4 : 43      4-4 : 44      4-4 :39   :
:156.0 :  .3         :  .1         :  .3         :  .4         :  .4         :     :
:      :147-147-147 :154-154-154 :157-157-157 :159-159-159 :162-162-162 :   39:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 41      4-4 : 43      4-4 : 45      4-4 : 46      4-4 : 47      4-4 :43   :
:152.0 :  .1         :  .9         :  .9         :  .9         :  .8         :     :
:      :149-149-149 :154-154-154 :157-157-157 :160-160-160 :161-161-161 :   42:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 45      4-4 : 47      4-4 : 49      4-4 : 50      4-4 : 50      2-4 :46   :
:148.0 :  .3         :  .4         :  .1         :  .1         : 1.2         :     :
:      :151-151-151 :152-152-152 :155-155-155 :158-158-158 :157-157-157 :   45:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 48      4-4 : 50      4-4 : 52      4-4 : 53      4-4 : 54      2-4 :49   :
:144.0 : 1.0         :  .9         :  .6         :  .5         :  .4         :     :
:      :150-150-150 :150-150-150 :154-154-154 :156-156-156 :156-156-156 :   48:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 52      4-4 : 54      4-4 : 55      4-4 : 55      4-4 : 55      2-4 :49   :
:140.0 :  .5         :  .3         : 1.1         : 2.2         : 3.1         :     :
:      :148-148-148 :149-149-149 :153-153-153 :155-155-155 :157-157-157 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55      4-4 : 55      4-4 : 55      2   : 55      2   : 55      2   :49   :
:136.0 : 1.1         : 3.2         :  .0         :  .0         :  .0         :     :
:      :146-146-146 :149-149-149 :135-140-140 :133-140-140 :131-140-140 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:132.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :132-136-136 :129-136-136 :126-136-136 :126-136-136 :126-136-136 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:128.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :124-134-134 :124-134-134 :124-134-134 :124-134-134 :124-134-134 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:124.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :122-131-131 :122-131-131 :122-131-131 :122-131-131 :122-131-131 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:120.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :120-129-129 :120-129-129 :120-129-129 :120-129-129 :120-129-129 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:116.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :119-127-127 :119-127-127 :119-127-127 :119-127-127 :119-127-127 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:112.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :118-124-125 :118-124-125 :118-124-125 :118-124-125 :118-124-125 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:108.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :117-122-123 :117-122-123 :117-122-123 :117-122-123 :117-122-123 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:104.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :116-119-121 :116-119-121 :116-119-121 :116-119-121 :116-119-121 :   49:
:------:-----------:-----------:-----------:-----------:-----------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1297.(FT)
/MAXI. ACCELERATION HEIGHT :  2070.(FT)  QNH ALT. :  2567.(FT)
```

(11LBTLS4.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 2

```
---------------------------------------------------------------------------*******
:LFBO TOULOUSE BLAGNAC          RWY 33L      JARA 12 SEP 95  ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                   MC69    TORA   11483.FT*  2  *
:                                                            ASDA   12467.FT*CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                           TODA   11483.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=140/GRAD2= 600     *****    SLOPE   -.10 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000LB:     -10      :      -5      :      0       :     10       :     20      :  3  :
:------------------------------------------------------------------------------:
:      : -2       4-4 : 20      4-4 : 30      4-4 : 32      4-4 : 33      2-4 :31   :
:166.5 :  .0          :  .1          :  .7          :  .3          :  .8          :     :
:      :150-150-152 :150-150-152 :154-154-156 :154-154-156 :155-155-158 :   31:
:------:------------:------------:------------:------------:------------:-----:
:      : 14       4-4 : 29      4-4 : 33      4-4 : 34      4-4 : 35      2-4 :33   :
:164.0 :  .0          : 1.2          :  .1          :  .7          : 1.1          :     :
:      :146-146-148 :148-148-150 :154-154-156 :153-153-155 :155-155-157 :   33:
:------:------------:------------:------------:------------:------------:-----:
:      : 29       4-4 : 34      4-4 : 36      4-4 : 38      2-4 : 39      2-4 :36   :
:160.0 : 1.4          :  .5          :  .8          :  .3          :  .6          :     :
:      :143-143-144 :150-150-152 :154-154-156 :152-152-153 :154-154-156 :   36:
:------:------------:------------:------------:------------:------------:-----:
:      : 35       4-4 : 38      4-4 : 40      4-4 : 41      2-4 : 42      2-4 :39   :
:156.0 :  .4          :  .6          :  .4          :  .9          : 1.1          :     :
:      :145-147-148 :152-152-154 :150-150-151 :151-151-153 :153-153-155 :   39:
:------:------------:------------:------------:------------:------------:-----:
:      : 40       4-4 : 42      4-4 : 43      4-4 : 45      2-4 : 46      2-4 :43   :
:152.0 :  .0          :  .1          : 1.1          :  .3          :  .4          :     :
:      :147-147-148 :152-152-153 :148-148-149 :150-150-151 :152-152-153 :   42:
:------:------------:------------:------------:------------:------------:-----:
:      : 43       4-4 : 45      4-4 : 47      2-4 : 48      2-4 : 49      2-4 :46   :
:148.0 :  .8          :  .7          :  .5          :  .7          :  .8          :     :
:      :147-147-148 :151-151-152 :147-147-148 :149-149-150 :151-151-152 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 47       4-4 : 49      4-4 : 50      2-4 : 52      2-4 : 53      2-4 :49   :
:144.0 :  .3          :  .1          : 1.0          :  .0          :  .1          :     :
:      :146-146-147 :150-150-150 :146-146-146 :148-148-148 :150-150-150 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 50       4-4 : 52      4-4 : 54      2-4 : 55      2-4 : 55      2-4 :49   :
:140.0 : 1.0          :  .6          :  .4          :  .6          : 1.7          :     :
:      :145-145-145 :148-148-149 :144-144-145 :147-147-147 :149-149-150 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 54       4-4 : 55      4-4 : 55      2-4 : 55      2   : 55      2   :49   :
:136.0 :  .5          : 1.2          : 3.3          :  .0          :  .0          :     :
:      :143-143-144 :146-146-147 :144-144-144 :132-138-138 :130-138-138 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55       4-4 : 55      2   : 55      2   : 55      2   : 55      2   :49   :
:132.0 : 3.4          :  .0          :  .0          :  .0          :  .0          :     :
:      :143-143-143 :126-131-131 :123-131-131 :121-131-131 :121-131-131 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:128.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :120-126-127 :118-126-127 :118-126-127 :118-126-127 :118-126-127 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:124.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :117-124-125 :117-124-125 :117-124-125 :117-124-125 :117-124-125 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:120.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :116-122-123 :116-122-123 :116-122-123 :116-122-123 :116-122-123 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:116.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :115-119-121 :115-119-121 :115-119-121 :115-119-121 :115-119-121 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:112.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :113-117-119 :113-117-119 :113-117-119 :113-117-119 :113-117-119 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:108.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :112-114-117 :112-114-117 :112-114-117 :112-114-117 :112-114-117 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55           : 55           : 55           : 55           : 55           :49   :
:104.0 :  .0          :  .0          :  .0          :  .0          :  .0          :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    800.(FT)  QNH ALT. :   1297.(FT)
/MAXI. ACCELERATION HEIGHT :   2005.(FT)  QNH ALT. :   2502.(FT)
```

(11LBTLS5.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 3

```
-----------------------------------------------------------------------*******
:LFBO TOULOUSE BLAGNAC        RWY 33L      JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                 MC69    TORA  11483.FT*  3  *
:                                                          ASDA  12467.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                          TODA  11483.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=130/GRAD2= 600    *****    SLOPE  -.10 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000LB:    -10     :     -5      :      0      :     10      :     20     :  3  :
:-----------------------------------------------------------------------------:
:      :  1     4-4 : 23     4-4 : 31     4-4 : 32     4-4 : 33     2-4 :31    :
:166.5 :  .1        :  .0        :  .0        :  .2        :  .8        :      :
:      :151-151-152 :152-152-152 :158-158-158 :160-160-160 :158-158-158 :   31:
:------:------------:------------:------------:------------:------------:-----:
:      : 17     4-4 : 29     4-4 : 33     4-4 : 34     2-4 : 35     2-4 :33    :
:164.0 :  .1        : 1.6        :  .3        :  .7        : 1.0        :      :
:      :147-147-148 :150-150-151 :158-158-158 :155-155-155 :157-157-157 :   33:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 34     4-4 : 36     4-4 : 38     2-4 : 39     2-4 :36    :
:160.0 : 2.1        : 1.0        :  .9        :  .3        :  .4        :      :
:      :144-146-146 :152-152-153 :157-157-157 :154-154-154 :156-156-156 :   36:
:------:------------:------------:------------:------------:------------:-----:
:      : 36     4-4 : 38     4-4 : 40     4-4 : 41     2-4 : 42     2-4 :39    :
:156.0 :  .2        :  .7        :  .4        :  .9        : 1.0        :      :
:      :147-147-148 :152-152-152 :156-156-156 :153-153-153 :155-155-155 :   39:
:------:------------:------------:------------:------------:------------:-----:
:      : 40     4-4 : 42     4-4 : 44     2-4 : 45     2-4 : 46     2-4 :43    :
:152.0 :  .1        :  .2        :  .1        :  .3        :  .3        :      :
:      :147-147-148 :151-151-151 :149-149-149 :151-151-151 :154-154-154 :   42:
:------:------------:------------:------------:------------:------------:-----:
:      : 43     4-4 : 45     4-4 : 47     2-4 : 48     2-4 : 49     2-4 :46    :
:148.0 :  .8        :  .8        :  .6        :  .7        :  .7        :      :
:      :147-147-148 :150-150-150 :148-148-148 :150-150-150 :153-153-153 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 47     4-4 : 49     4-4 : 51     2-4 : 52     2-4 : 52     2-4 :49    :
:144.0 :  .4        :  .2        :  .0        :  .1        : 1.1        :      :
:      :145-145-146 :149-149-149 :146-146-146 :149-149-149 :152-152-152 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 51     4-4 : 52     4-4 : 54     2-4 : 55     2-4 : 55     2-4 :49    :
:140.0 :  .0        :  .9        :  .6        :  .7        : 1.6        :      :
:      :143-143-144 :148-148-148 :145-145-145 :148-148-148 :151-151-151 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 54     4-4 : 55     4-4 : 55     2-4 : 55     2   : 55     2   :49    :
:136.0 :  .7        : 1.5        : 3.5        :  .0        :  .0        :      :
:      :142-142-143 :141-141-142 :145-145-145 :131-137-138 :128-137-138 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 55     2   : 55     2   : 55     2   : 55     2   :49    :
:132.0 : 3.6        :  .0        :  .0        :  .0        :  .0        :      :
:      :142-142-142 :124-130-130 :121-130-130 :120-130-130 :120-130-130 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     2   : 55     2   : 55     2   : 55     2   : 55     2   :49    :
:128.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :118-123-124 :116-123-124 :116-123-124 :116-123-124 :116-123-124 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:124.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :114-119-120 :114-119-120 :114-119-120 :114-119-120 :114-119-120 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:120.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :113-117-118 :113-117-118 :113-117-118 :113-117-118 :113-117-118 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:116.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :112-114-116 :112-114-116 :112-114-116 :112-114-116 :112-114-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:112.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:108.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55         : 55         : 55         : 55         : 55         :49    :
:104.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :111-113-115 :111-113-115 :111-113-115 :111-113-115 :111-113-115 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1297.(FT)
/MAXI. ACCELERATION HEIGHT :  2018.(FT)  QNH ALT. :  2515.(FT)
```

(11LBTLS6.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 1 + F

```
--------------------------------------------------------------------------*******
:CYUL MONTREAL-DORVAL          RWY 06R      JARA 12 SEP 95 ELEV.     98.FT*CONF.*
:FOR TRAINING ONLY                                 MC69    TORA    9600.FT*  1+F*
:                                                          ASDA    9750.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                          TODA   10600.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=110/GRAD2=   0    *****    SLOPE   .20 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000LB:    -10     :      -5     :       0     :      10     :      20     :  3  :
:------------------------------------------------------------------------------:
:      :            :            :-15     4-4 : -9     4-4 : 5      4-4 :33    :
:166.5 :            :            : -.8        :  .0        :  .1        :      :
:      :            :            :161-161-161 :162-162-162 :160-160-160 :   33:
:------:------------:------------:------------:------------:------------:-----:
:      :-15    4-4 :-15     4-4 : 0      4-4 : 15     4-4 : 27     4-4 :35    :
:164.0 :-3.1        : -.7        :  .1        :  .0        :  .1        :      :
:      :157-157-157 :158-158-158 :159-159-159 :159-159-159 :159-159-159 :   35:
:------:------------:------------:------------:------------:------------:-----:
:      : -7     4-4 : 14     4-4 : 30     4-4 : 30     4-4 : 30     4-4 :38    :
:160.0 :  .0        :  .1        :  .3        : 1.9        : 3.5        :      :
:      :156-156-156 :157-157-157 :157-157-157 :158-158-158 :159-159-159 :   38:
:------:------------:------------:------------:------------:------------:-----:
:      : 24     4-4 : 30     4-4 : 34     4-4 : 35     4-4 : 37     4-4 :41    :
:156.0 :  .0        : 1.8        :  .3        :  .9        :  .3        :      :
:      :151-151-151 :154-154-154 :155-155-155 :155-155-155 :155-155-155 :   41:
:------:------------:------------:------------:------------:------------:-----:
:      : 30     4-4 : 35     4-4 : 38     4-4 : 39     4-4 : 40     4-4 :44    :
:152.0 : 3.0        :  .9        :  .2        :  .7        : 1.1        :      :
:      :150-150-150 :153-153-153 :153-153-153 :154-154-154 :154-154-154 :   44:
:------:------------:------------:------------:------------:------------:-----:
:      : 37     4-4 : 39     4-4 : 42     4-4 : 43     4-4 : 44     4-4 :47    :
:148.0 :  .3        :  .9        :  .0        :  .4        :  .7        :      :
:      :149-149-149 :151-151-151 :151-151-151 :152-152-152 :155-155-155 :   47:
:------:------------:------------:------------:------------:------------:-----:
:      : 41     4-4 : 43     4-4 : 45     4-4 : 46     4-4 : 48     4-4 :50    :
:144.0 :  .4        :  .7        :  .8        : 1.1        :  .2        :      :
:      :149-149-149 :149-149-149 :150-150-150 :152-152-152 :153-153-153 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 45     4-4 : 47     4-4 : 49     4-4 : 50     4-4 : 51     4-4 :50    :
:140.0 :  .3        :  .4        :  .4        :  .6        :  .8        :      :
:      :147-147-147 :148-148-148 :149-149-149 :151-151-151 :151-151-151 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 49     4-4 : 51     4-4 : 52     4-4 : 54     4-4 : 55     4-4 :50    :
:136.0 :  .0        :  .0        : 1.0        :  .2        :  .3        :      :
:      :145-145-145 :145-145-145 :148-148-148 :148-148-148 :149-149-149 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 52     4-4 : 54     4-4 : 56     4-4 : 56     4-4 : 56     4-4 :50    :
:132.0 :  .8        :  .8        :  .7        : 1.9        : 3.2        :      :
:      :143-143-143 :145-145-145 :146-146-146 :147-147-147 :148-148-148 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56     4-4 : 56     4-4 : 56         : 56         : 56         :50    :
:128.0 :  .6        : 2.7        :  .0        :  .0        :  .0        :      :
:      :142-142-142 :145-145-145 :130-134-134 :128-134-134 :126-134-134 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:124.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :128-132-132 :125-132-132 :122-132-132 :122-132-132 :122-132-132 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:120.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :121-129-129 :121-129-129 :121-129-129 :121-129-129 :121-129-129 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:116.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :119-127-127 :119-127-127 :119-127-127 :119-127-127 :119-127-127 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:112.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :118-125-125 :118-125-125 :118-125-125 :118-125-125 :118-125-125 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:108.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :117-122-123 :117-122-123 :117-122-123 :117-122-123 :117-122-123 :   50:
:------:------------:------------:------------:------------:------------:-----:
:      : 56         : 56         : 56         : 56         : 56         :50    :
:104.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :116-119-121 :116-119-121 :116-119-121 :116-119-121 :116-119-121 :   50:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :   898.(FT)
/MAXI. ACCELERATION HEIGHT :  2839.(FT)  QNH ALT. :  2937.(FT)
```

(11LBMRL1.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

```
:CYUL MONTREAL-DORVAL          RWY 06R      JARA 12 SEP 95 ELEV.     98.FT*CONF.*
:FOR TRAINING ONLY                                   MC69  TORA    9600.FT*  2  *
:                                                          ASDA    9750.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                          TODA   10600.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=100/GRAD2=    0     *****  SLOPE    .20 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5				-15 4-4 -1.5 157-157-160	-13 4-4 .1 154-154-156	33 33
164.0		-15 4-4 -2.8 154-154-157	-15 4-4 -.5 155-155-158	-5 4-4 .0 155-155-158	10 4-4 .1 155-155-158	35 35
160.0	-15 4-4 -1.2 153-153-155	-4 4-4 .1 153-153-155	19 4-4 .0 153-153-155	30 4-4 .1 153-153-155	30 4-4 1.7 154-154-156	38 38
156.0	11 4-4 .0 149-149-152	30 4-4 .1 149-149-151	30 4-4 2.5 151-151-153	33 4-4 1.0 152-152-154	35 4-4 .4 152-152-154	41 41
152.0	30 4-4 1.5 147-147-149	33 4-4 1.0 148-148-150	36 4-4 .3 150-150-151	37 4-4 .7 150-150-152	39 4-4 .0 150-150-152	44 44
148.0	35 4-4 .5 146-146-147	37 4-4 .9 148-148-150	40 4-4 .1 148-148-149	41 4-4 .5 149-149-150	42 4-4 .7 146-146-147	47 47
144.0	39 4-4 .5 144-144-145	41 4-4 .8 146-146-147	43 4-4 .9 147-147-148	45 4-4 .1 147-147-148	46 4-4 .3 149-149-150	50 50
140.0	43 4-4 .4 144-144-145	45 4-4 .6 145-145-145	47 4-4 .5 145-145-146	48 4-4 .7 145-145-146	49 4-4 1.0 145-145-146	50 50
136.0	47 4-4 .2 142-142-143	49 4-4 .2 143-143-144	51 4-4 .1 143-143-144	52 4-4 .3 144-144-145	53 4-4 .7 141-141-141	50 50
132.0	51 4-4 .0 140-140-141	52 4-4 1.0 141-141-142	54 4-4 .9 142-142-143	55 4-4 1.0 144-144-144	56 4-4 1.4 139-139-139	50 50
128.0	54 4-4 .9 139-139-140	56 4-4 .8 139-139-140	56 4-4 2.7 143-143-143	56 4-4 3.9 144-144-144	56 .0 122-127-127	50 50
124.0	56 4-4 2.9 138-138-138	56 .0 121-124-125	56 .0 118-124-125	56 .0 117-124-125	56 .0 117-124-125	50 50
120.0	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	50 50
116.0	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	50 50
112.0	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	50 50
108.0	56 .0 112-115-117	56 .0 112-115-117	56 .0 112-115-117	56 .0 112-115-117	56 .0 112-115-117	50 50
104.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

```
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :   898.(FT)
/MAXI. ACCELERATION HEIGHT :  2723.(FT)  QNH ALT. :  2821.(FT)
```

(11LBMRL2.PCX)

MONTREAL (CYUL) - RWY 06 L - CONF 1 + F

:CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 ELEV. 96.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 11000.FT* 1+F*
: ASDA 11150.FT*CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 11290.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=130/GRAD2= 600 ***** SLOPE .09 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-11 4-4 .0 158-158-158	12 4-4 .0 157-157-157	30 4-4 .3 159-159-159	31 4-4 1.0 161-161-161	33 4-4 .5 161-161-161	33 33
164.0	5 4-4 .1 153-153-153	29 4-4 .0 153-153-153	32 4-4 .8 159-159-159	34 4-4 .4 159-159-159	35 4-4 .9 161-161-161	35 35
160.0	29 4-4 .1 147-148-148	30 4-4 3.7 153-153-153	36 4-4 .7 158-158-158	38 4-4 .2 158-158-158	39 4-4 .5 161-161-161	38 38
156.0	30 4-4 3.8 147-148-148	38 4-4 .2 156-156-156	40 4-4 .5 156-156-156	41 4-4 .9 157-157-157	43 4-4 .0 157-157-157	41 41
152.0	39 4-4 .4 151-151-151	41 4-4 1.0 156-156-156	44 4-4 .2 154-154-154	45 4-4 .4 157-157-157	46 4-4 .5 157-157-157	44 44
148.0	43 4-4 .6 152-152-152	45 4-4 .7 152-152-152	47 4-4 .7 153-153-153	48 4-4 .9 156-156-156	49 4-4 1.1 152-152-152	47 47
144.0	47 4-4 .1 153-153-153	49 4-4 .1 150-150-150	51 4-4 .1 152-152-152	52 4-4 .2 152-152-152	53 4-4 .4 151-151-151	50 50
140.0	50 4-4 .8 149-149-149	52 4-4 .8 148-148-148	54 4-4 .7 151-151-151	55 4-4 .7 153-153-153	56 4-4 1.0 150-150-150	50 50
136.0	54 4-4 .4 148-148-148	56 4-4 .3 146-146-146	56 4-4 2.4 150-150-150	56 4-4 3.5 153-153-153	56 2 .0 135-139-139	50 50
132.0	56 4-4 2.2 147-147-147	56 .0 133-136-136	56 .0 130-136-136	56 .0 128-136-136	56 .0 126-136-136	50 50
128.0	56 .0 128-134-134	56 .0 124-134-134	56 .0 124-134-134	56 .0 124-134-134	56 .0 124-134-134	50 50
124.0	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	50 50
120.0	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
116.0	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	50 50
112.0	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	50 50
108.0	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	50 50
104.0	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2133.(FT) QNH ALT. : 2229.(FT)

(11LBMRL3.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

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:CYUL MONTREAL-DORVAL          RWY 06L      JARA 12 SEP 95 ELEV.     96.FT*CONF.*
:FOR TRAINING ONLY                                     MC69   TORA  11000.FT*  2  *
:                                                             ASDA  11150.FT*CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                            TODA  11290.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=120/GRAD2= 700        *****   SLOPE    .09 % : TGA :
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WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-15 4-4 -.9 154-154-156	0 4-4 .0 155-155-158	22 4-4 .1 156-156-159	30 4-4 .4 154-154-156	31 4-4 1.1 154-154-156	33 33
164.0	-1 4-4 .0 152-152-155	22 4-4 .1 152-152-154	30 4-4 1.5 155-155-157	32 4-4 .7 153-153-155	34 4-4 .3 153-153-155	35 35
160.0	27 4-4 .1 146-146-148	30 4-4 2.8 151-151-153	35 4-4 .0 154-154-156	36 4-4 .5 151-151-153	37 4-4 1.1 152-152-153	38 38
156.0	30 4-4 3.5 145-145-147	36 4-4 .6 150-150-151	38 4-4 .7 151-151-153	40 4-4 .1 150-150-151	41 4-4 .7 150-150-151	41 41
152.0	37 4-4 .8 148-148-149	40 4-4 .3 149-149-150	42 4-4 .3 148-148-149	43 4-4 .8 148-148-149	45 4-4 .1 148-148-149	44 44
148.0	41 4-4 .7 146-146-147	43 4-4 1.0 148-148-149	45 4-4 1.0 146-146-147	47 4-4 .3 146-146-147	48 4-4 .6 147-147-148	47 47
144.0	45 4-4 .4 144-144-145	47 4-4 .6 147-147-148	49 4-4 .4 144-144-145	50 4-4 .8 145-145-145	51 4-4 1.1 146-146-147	50 50
140.0	48 4-4 1.1 143-143-143	51 4-4 .0 146-146-146	52 4-4 1.0 143-143-143	54 4-4 .2 144-144-144	55 4-4 .5 145-145-145	50 50
136.0	52 4-4 .7 141-141-141	54 4-4 .6 141-141-141	56 4-4 .5 142-142-142	56 4-4 2.0 144-144-144	56 4-4 3.4 144-144-145	50 50
132.0	56 4-4 .4 140-140-140	56 4-4 2.4 144-144-144	56 2 .0 128-130-130	56 2 .0 126-130-130	56 2 .0 122-130-130	50 50
128.0	56 .0 126-126-127	56 .0 122-126-127	56 .0 118-126-127	56 .0 118-126-127	56 .0 118-126-127	50 50
124.0	56 .0 117-124-125	56 .0 117-124-125	56 .0 117-124-125	56 .0 117-124-125	56 .0 117-124-125	50 50
120.0	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	50 50
116.0	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	50 50
112.0	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	50 50
108.0	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	50 50
104.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

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/MINI. ACCELERATION HEIGHT :    800.(FT)  QNH ALT. :    896.(FT)
/MAXI. ACCELERATION HEIGHT :   2101.(FT)  QNH ALT. :   2197.(FT)
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(11LBMRL4.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 1 + F

:VHHH HONG KONG RWY 13 JARA 12 SEP 95 ELEV. 15.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 10930.FT* 1+F*
: ASDA 10930.FT*CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 11300.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=100/GRAD2= 700 ***** SLOPE .00 % : TGA :

WEIGHT: 1000LB:	-10	-5	0	10	20	TGA 2 3
166.5		-15 4-4 -.4 167-172-172	10 4-4 .1 166-171-171	28 4-4 .1 165-170-170	31 4-4 .8 169-171-171	34 33
164.0	-15 4-4 -1.1 161-170-171	4 4-4 .1 161-169-169	30 4-4 .2 160-167-167	30 4-4 2.3 164-170-170	34 4-4 .3 170-171-171	36 35
160.0	11 4-4 .1 153-164-164	30 4-6 1.0 154-164-164	34 4-4 .3 162-167-167	36 4-4 .3 167-168-168	38 4-4 .1 172-172-172	39 38
156.0	30 4-6 1.6 148-160-160	35 4-4 .2 156-164-164	38 4-4 .4 164-166-166	40 4-4 .2 169-169-169	41 4-4 .7 172-172-172	42 41
152.0	36 4-4 .1 151-161-161	39 4-4 .3 158-163-163	42 4-4 .3 166-166-166	43 4-4 .9 169-169-169	45 4-4 .0 172-172-172	45 44
148.0	40 4-4 .3 153-161-161	43 4-4 .4 160-162-162	45 4-4 1.0 165-166-166	47 4-4 .2 169-169-169	48 4-4 .3 171-171-171	48 47
144.0	44 4-4 .5 155-160-160	47 4-4 .1 161-162-162	49 4-4 .4 165-165-165	50 4-4 .6 168-168-168	51 4-4 .7 170-170-170	50 50
140.0	48 4-4 .3 156-159-159	50 4-4 .8 160-160-160	52 4-4 .9 165-165-165	53 4-4 1.0 167-167-167	54 4-4 1.0 168-168-168	50 50
136.0	51 4-4 1.1 156-158-158	54 4-4 .3 159-159-159	56 4-4 .2 164-164-164	56 4-4 1.4 165-165-165	56 4-4 2.6 167-167-167	50 50
132.0	55 4-4 .7 155-155-155	56 4-4 2.1 159-159-159	56 4 .0 144-144-144	56 4 .0 142-142-142	56 4 .0 140-140-140	50 50
128.0	56 4-4 3.7 155-155-155	56 4 .0 137-137-137	56 4 .0 134-134-134	56 .0 130-134-134	56 .0 124-134-134	50 50
124.0	56 4 .0 131-131-131	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	56 .0 122-131-131	50 50
120.0	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
116.0	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	50 50
112.0	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	50 50
108.0	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	50 50
104.0	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	50 50

/MINI. ACCELERATION HEIGHT : 1242.(FT) QNH ALT. : 1257.(FT)
/MAXI. ACCELERATION HEIGHT : 3342.(FT) QNH ALT. : 3357.(FT)

(11LBHGK1.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 2

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----------------------------------------------------------------------*******
:VHHH HONG KONG              RWY 13       JARA 12 SEP 95 ELEV.    15.FT*CONF.*
:FOR TRAINING ONLY                               MC69   TORA  10930.FT*  2  *
:                                                       ASDA  10930.FT*CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                      TODA  11300.FT*******
:-------TREF= 30/TMAX= 50 GRAD1= 90/GRAD2=    0    *****  SLOPE   .00 % : TGA :
:WEIGHT:----------------------------------------------------------------:  2  :
:1000LB:    -10      :      -5      :       0      :     10      :     20      :  3  :
:----------------------------------------------------------------------------:
:      :             :-15      4-4 : -1      4-4 : 21      4-4 : 30      4-4 :34   :
:166.5 :             :-1.6         :  .0         :  .1         : 1.0         :     :
:      :             :164-164-168 :165-165-168 :164-166-168 :166-166-169 :   33:
:------:-------------:------------:------------:------------:------------:-----:
:      :-15      4-4 : -5      4-4 : 25      4-4 : 30      4-4 : 32      4-4 :36   :
:164.0 :-2.1         :  .0         :  .1         : 1.6         : 1.1         :     :
:      :159-163-166 :162-164-167 :159-164-167 :162-165-168 :165-165-168 :   35:
:------:-------------:------------:------------:------------:------------:-----:
:      : 3       4-4 : 30      4-4 : 30      4-4 : 35      4-4 : 36      4-4 :39   :
:160.0 :  .1         :  .3         : 3.5         :  .2         :  .4         :     :
:      :154-162-165 :152-160-163 :158-164-166 :163-163-165 :163-163-165 :   38:
:------:-------------:------------:------------:------------:------------:-----:
:      : 30      4-4 : 34      4-4 : 37      4-4 : 38      4-4 : 39      4-4 :42   :
:156.0 : 1.0         :  .4         :  .3         :  .6         :  .8         :     :
:      :147-157-159 :154-160-163 :160-161-163 :161-161-163 :161-161-163 :   41:
:------:-------------:------------:------------:------------:------------:-----:
:      : 35      4-4 : 38      4-4 : 40      4-4 : 41      4-4 : 42      4-4 :45   :
:152.0 :  .3         :  .5         :  .9         : 1.0         : 1.2         :     :
:      :149-157-159 :156-159-161 :159-159-161 :159-159-161 :159-159-161 :   44:
:------:-------------:------------:------------:------------:------------:-----:
:      : 39      4-4 : 42      4-4 : 44      4-4 : 45      4-4 : 46      4-4 :48   :
:148.0 :  .5         :  .4         :  .1         :  .3         :  .3         :     :
:      :151-157-159 :157-157-159 :157-157-159 :157-157-159 :157-157-159 :   47:
:------:-------------:------------:------------:------------:------------:-----:
:      : 43      4-4 : 45      4-4 : 47      4-4 : 48      4-4 : 49      4-4 :50   :
:144.0 :  .7         :  .9         :  .5         :  .6         :  .7         :     :
:      :153-155-157 :155-155-157 :155-155-157 :155-155-157 :155-155-157 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 47      4-4 : 49      4-4 : 50      4-4 : 51      4-4 : 52      4-4 :50   :
:140.0 :  .3         :  .2         : 1.0         : 1.0         : 1.0         :     :
:      :153-153-154 :153-153-154 :153-153-155 :154-154-155 :154-154-155 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 50      4-4 : 52      4-4 : 54      4-4 : 55      4-4 : 56      4-4 :50   :
:136.0 :  .9         :  .7         :  .3         :  .3         :  .2         :     :
:      :151-151-152 :151-151-152 :151-151-152 :151-151-152 :151-151-152 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 54      4-4 : 56      4-4 : 56      4-4 : 56      4-4 : 56      4   :50   :
:132.0 :  .4         :  .1         : 1.9         : 3.1         :  .0         :     :
:      :149-149-150 :149-149-149 :150-150-151 :151-151-151 :138-138-138 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56      4-4 : 56      4   : 56      4   : 56      4   : 56      4   :50   :
:128.0 : 2.1         :  .0         :  .0         :  .0         :  .0         :     :
:      :148-148-148 :135-135-136 :132-132-133 :130-130-131 :129-129-130 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56      4   : 56      4   : 56          : 56          : 56          :50   :
:124.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :129-129-130 :127-127-128 :124-124-125 :117-124-125 :117-124-125 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50   :
:120.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :119-122-123 :116-122-123 :116-122-123 :116-122-123 :116-122-123 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50   :
:116.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-119-121 :115-119-121 :115-119-121 :115-119-121 :115-119-121 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50   :
:112.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :113-117-119 :113-117-119 :113-117-119 :113-117-119 :113-117-119 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50   :
:108.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :112-114-117 :112-114-117 :112-114-117 :112-114-117 :112-114-117 :   50:
:------:-------------:------------:------------:------------:------------:-----:
:      : 56          : 56          : 56          : 56          : 56          :50   :
:104.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   50:
:------:-------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :  1251.(FT)  QNH ALT. :  1266.(FT)
/MAXI. ACCELERATION HEIGHT :  3098.(FT)  QNH ALT. :  3113.(FT)
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(11LBHGK2.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 1 + F

:VHHH HONG KONG RWY 31 JARA 12 SEP 95 ELEV. 15.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 9490.FT* 1+F*
: ASDA 10638.FT*CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 9950.FT*******
:-------TREF= 30/TMAX= 50 GRAD1=100/GRAD2= 0 ***** SLOPE .00 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5					-15 4-4 -1.2 162-162-162	34 33
164.0			-15 4-4 -2.2 160-160-161	-15 4-4 -.4 161-161-161	-3 4-4 .1 160-160-160	36 35
160.0	-15 4-4 -3.7 157-157-157	-15 4-4 -.9 158-158-158	2 4-4 .0 157-157-157	18 4-4 .1 156-156-156	30 4-4 .4 157-157-157	39 38
156.0	-13 4-4 .1 156-156-157	14 4-4 .0 154-154-154	30 4-4 .8 155-155-155	30 4-4 2.6 156-156-156	34 4-4 .3 155-155-155	42 41
152.0	23 4-4 .0 152-152-152	30 4-4 2.0 153-153-153	34 4-4 .8 153-153-153	36 4-4 .5 153-153-153	38 4-4 .2 153-153-153	45 44
148.0	30 4-4 3.1 151-151-152	36 4-4 .1 150-150-150	38 4-4 .7 151-151-151	40 4-4 .4 151-151-151	41 4-4 1.0 152-152-152	48 47
144.0	37 4-4 .3 148-148-148	40 4-4 .0 149-149-149	42 4-4 .6 150-150-150	44 4-4 .1 151-151-151	45 4-4 .7 152-152-152	50 50
140.0	41 4-4 .3 147-147-147	43 4-4 .9 147-147-147	46 4-4 .3 150-150-150	47 4-4 .9 150-150-150	49 4-4 .2 150-150-150	50 50
136.0	45 4-4 .3 144-144-144	47 4-4 .7 146-146-146	49 4-4 1.1 148-148-148	51 4-4 .5 148-148-148	52 4-4 .9 148-148-148	50 50
132.0	49 4-4 .0 144-144-144	51 4-4 .4 145-145-145	53 4-4 .7 146-146-146	55 4-4 .1 146-146-146	56 4-4 .5 146-146-146	50 50
128.0	52 4-4 .9 143-143-143	55 4-4 .2 143-143-143	56 4-4 1.5 144-144-144	56 4-4 3.0 145-145-145	56 .0 130-134-134	50 50
124.0	56 4-4 .8 141-141-141	56 4-4 3.2 143-143-143	56 .0 126-131-131	56 .0 123-131-131	56 .0 122-131-131	50 50
120.0	56 .0 124-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	56 .0 120-129-129	50 50
116.0	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	56 .0 119-127-127	50 50
112.0	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	56 .0 118-124-125	50 50
108.0	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	56 .0 117-122-123	50 50
104.0	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	56 .0 116-119-121	50 50

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 815.(FT)
/MAXI. ACCELERATION HEIGHT : 3109.(FT) QNH ALT. : 3124.(FT)

(11LBHGK3.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 2

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:VHHH HONG KONG                RWY 31      JARA 12 SEP 95 ELEV.     15.FT*CONF.*
:FOR TRAINING ONLY                                   MC69  TORA    9490.FT*  2  *
:                                                          ASDA   10638.FT*CG25%*
:A320-211/AB/CFM565A1   DRY RUNWAY                         TODA    9950.FT*******
:-------TREF= 30/TMAX= 50 GRAD1= 90/GRAD2=    0     *****  SLOPE    .00 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5					-15 4-4 -2.5 155-155-158	34 33
164.0			-15 4-4 -3.6 153-153-156	-15 4-4 -1.8 154-154-157	-15 4-4 .0 155-155-158	36 35
160.0		-15 4-4 -2.4 152-152-155	-12 4-4 .1 153-153-156	7 4-4 .0 153-153-155	23 4-4 .1 152-152-155	39 38
156.0	-15 4-4 -1.3 150-150-153	0 4-4 .0 151-151-153	26 4-4 .0 149-149-151	30 4-4 1.4 150-150-152	30 4-4 3.2 151-151-154	42 41
152.0	10 4-4 .1 147-147-150	30 4-4 .6 147-147-149	30 4-4 3.5 149-149-151	35 4-4 .2 149-149-151	36 4-4 .9 150-150-152	45 44
148.0	30 4-4 1.7 145-145-147	34 4-4 .6 145-145-147	37 4-4 .3 147-147-148	39 4-4 .1 148-148-149	40 4-4 .7 148-148-149	48 47
144.0	35 4-4 .8 144-144-145	38 4-4 .6 144-144-146	41 4-4 .2 146-146-147	42 4-4 .9 146-146-148	44 4-4 .4 147-147-148	50 50
140.0	39 4-4 .8 142-142-143	42 4-4 .5 143-143-145	45 4-4 .0 144-144-145	46 4-4 .6 145-145-146	48 4-4 .0 145-145-146	50 50
136.0	43 4-4 .8 141-141-142	46 4-4 .4 142-142-143	48 4-4 .8 143-143-144	50 4-4 .2 143-143-144	51 4-4 .7 143-143-144	50 50
132.0	47 4-4 .7 139-139-140	50 4-4 .2 140-140-141	52 4-4 .5 141-141-142	53 4-4 1.0 141-141-142	55 4-4 .4 141-141-142	50 50
128.0	51 4-4 .6 138-138-139	54 4-4 .0 138-138-139	56 4-4 .3 139-139-139	56 4-4 1.8 140-140-140	56 4-4 3.3 141-141-141	50 50
124.0	55 4-4 .6 136-136-137	56 4-4 2.0 137-137-138	56 .0 122-124-125	56 .0 120-124-125	56 .0 117-124-125	50 50
120.0	56 4-4 3.6 136-136-137	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	56 .0 116-122-123	50 50
116.0	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	56 .0 115-119-121	50 50
112.0	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	56 .0 113-117-119	50 50
108.0	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	56 .0 112-114-117	50 50
104.0	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	56 .0 111-113-116	50 50

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/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :   815.(FT)
/MAXI. ACCELERATION HEIGHT :  3033.(FT)  QNH ALT. :  3048.(FT)
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(11LBHGK4.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 1 + F

:LFPO PARIS-ORLY RWY 25 JARA 12 SEP 95 ELEV. 286.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 11975.FT* 1+F*
: ASDA 11975.FT*CG25%*
:A320-211/AB/CFM565A1 DRY RUNWAY TODA 12172.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=130/GRAD2= 600 ***** SLOPE .02 %

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-10 4-4 .0 156-159-159	14 4-4 .1 156-157-157	31 4-4 .0 158-158-158	33 4-4 .3 163-163-163	34 4-4 .8 166-166-166	32 32
164.0	6 4-4 .0 152-155-155	29 4-4 .2 152-154-154	33 4-4 .8 159-159-159	35 4-4 .7 164-164-164	37 4-4 .0 165-165-165	34 34
160.0	29 4-4 .3 146-151-151	34 4-4 .3 153-155-155	37 4-4 .9 161-161-161	39 4-4 .3 163-163-163	40 4-4 .6 165-165-165	37 37
156.0	34 4-4 .6 148-151-151	39 4-4 .0 155-155-155	41 4-4 .5 162-162-162	42 4-4 .9 163-163-163	44 4-4 .0 162-162-162	40 40
152.0	39 4-4 .4 150-151-151	42 4-4 1.0 157-157-157	44 4-4 1.1 161-161-161	46 4-4 .2 160-160-160	47 4-4 .4 160-160-160	44 43
148.0	44 4-4 .1 152-152-152	46 4-4 .6 158-158-158	48 4-4 .4 158-158-158	49 4-4 .6 158-158-158	50 4-4 .8 159-159-159	47 46
144.0	47 4-4 1.0 154-154-154	49 4-4 1.1 156-156-156	51 4-4 .9 156-156-156	52 4-4 1.1 157-157-157	54 4-4 .0 156-156-156	49 49
140.0	51 4-4 .5 154-154-154	53 4-4 .5 154-154-154	55 4-4 .2 154-154-154	55 4-4 1.5 155-155-155	55 4-4 2.8 156-156-156	49 49
136.0	55 4-4 .0 151-151-151	55 4-4 2.2 153-153-153	55 4 .0 141-141-141	55 4 .0 140-140-140	55 2 .0 138-139-139	49 49
132.0	55 4 .0 138-138-138	55 .0 135-136-136	55 .0 127-136-136	55 .0 126-136-136	55 .0 126-136-136	49 49
128.0	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	49 49
124.0	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	49 49
120.0	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	49 49
116.0	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	49 49
112.0	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	49 49
108.0	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	49 49
104.0	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	49 49

/MINI. ACCELERATION HEIGHT : 936.(FT) QNH ALT. : 1222.(FT)
/MAXI. ACCELERATION HEIGHT : 2367.(FT) QNH ALT. : 2653.(FT)

(11LBORY1.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 2

LFPO PARIS-ORLY RWY 25 JARA 12 SEP 95 MC69
FOR TRAINING ONLY
A320-211/AB/CFM565A1 DRY RUNWAY
-------TREF= 29/TMAX= 49 GRAD1=120/GRAD2= 600 *****

ELEV. 286.FT
TORA 11975.FT
ASDA 11975.FT
TODA 12172.FT
SLOPE .02 %
CONF. 2
CG25%

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 / 3
166.5	-13 4-4 .0 155-155-158	12 4-4 .1 154-154-156	30 4-4 .5 155-155-158	32 4-4 .1 158-158-161	33 4-4 .6 160-160-162	32 32
164.0	4 4-4 .0 150-152-154	29 4-4 .0 150-151-153	32 4-4 1.0 156-156-158	34 4-4 .4 158-158-161	35 4-4 .9 159-159-161	34 34
160.0	29 4-4 .1 145-147-149	33 4-4 .8 151-151-153	36 4-4 .6 157-157-159	37 4-4 1.0 157-157-159	39 4-4 .3 157-157-159	37 37
156.0	34 4-4 .3 146-147-149	37 4-4 .9 153-153-154	40 4-4 .1 155-155-157	41 4-4 .5 155-155-157	42 4-4 .8 156-156-157	40 40
152.0	38 4-4 .8 148-148-149	41 4-4 .6 153-153-155	43 4-4 .7 154-154-155	44 4-4 1.0 154-154-155	46 4-4 .0 155-155-156	44 43
148.0	42 4-4 .9 150-150-151	45 4-4 .1 152-152-153	46 4-4 1.2 152-152-153	48 4-4 .2 153-153-154	49 4-4 .4 154-154-155	47 46
144.0	46 4-4 .5 150-150-151	48 4-4 .6 150-150-151	50 4-4 .4 151-151-151	51 4-4 .7 152-152-153	52 4-4 .8 153-153-154	49 49
140.0	50 4-4 .0 148-148-148	51 4-4 1.1 148-148-149	53 4-4 1.0 150-150-151	54 4-4 1.2 151-151-152	55 4-4 1.3 151-151-152	49 49
136.0	53 4-4 .7 146-146-147	55 4-4 .6 147-147-147	55 4-4 2.7 149-149-150	55 4-4 4.0 151-151-151	55 4 .0 136-136-137	49 49
132.0	55 4-4 2.5 145-145-145	55 4 .0 134-134-134	55 4 .0 131-131-132	55 4 .0 130-130-130	55 2 .0 126-129-130	49 49
128.0	55 4 .0 128-128-129	55 .0 124-126-127	55 .0 118-126-127	55 .0 118-126-127	55 .0 118-126-127	49 49
124.0	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	55 .0 117-124-125	49 49
120.0	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	55 .0 116-122-123	49 49
116.0	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	55 .0 115-119-121	49 49
112.0	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	55 .0 113-117-119	49 49
108.0	55 .0 112-114-117	55 .0 112-114-117	55 .0 112-114-117	55 .0 112-114-117	55 .0 112-114-117	49 49
104.0	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	55 .0 111-113-116	49 49

/MINI. ACCELERATION HEIGHT : 936.(FT) QNH ALT. : 1222.(FT)
/MAXI. ACCELERATION HEIGHT : 2377.(FT) QNH ALT. : 2663.(FT)

(11LBORY2.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 1 + F

LFPO PARIS-ORLY   RWY 26   JARA 12 SEP 95   ELEV. 285.FT*CONF.*
FOR TRAINING ONLY   MC69   TORA 10892.FT* 1+F*
ASDA 10892.FT*CG25%*
A320-211/AB/CFM565A1 DRY RUNWAY   TODA 11942.FT*******
-------TREF= 29/TMAX= 49 GRAD1=130/GRAD2= 600 *****   SLOPE -.07 %

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	11 4-4 .1 149-155-155	30 4-4 .3 150-154-154	34 2-4 .5 157-159-159	36 2-4 .7 162-162-162	38 2-4 .1 165-165-165	32 32
164.0	25 4-4 .1 145-152-152	33 4-4 .4 151-154-154	37 2-4 .4 158-159-159	39 2-4 .2 163-163-163	40 2-4 .3 165-165-165	34 34
160.0	29 4-4 3.5 144-151-151	38 4-4 .1 153-155-155	41 2-4 .5 159-159-159	42 2-4 .8 162-162-162	43 2-4 .8 164-164-164	37 37
156.0	38 4-4 .5 147-151-151	42 4-4 .6 154-155-155	44 2-4 1.1 159-159-159	46 2-4 .0 161-161-161	46 2-4 1.1 164-164-164	40 40
152.0	43 4-4 .3 149-151-151	46 4-4 .6 155-155-155	48 2-4 .4 157-157-157	49 2-4 .4 159-159-159	49 2-2 .8 163-163-163	44 43
148.0	47 4-4 .8 151-152-152	49 4-4 1.1 154-154-154	51 2-4 .8 156-156-156	52 2-4 .5 159-159-159	52 2-2 .5 160-161-161	47 46
144.0	51 4-4 .6 151-151-151	53 4-4 .4 152-152-152	55 2-4 .0 155-155-155	55 2-2 .2 158-158-158	55 2-2 .2 157-158-158	49 49
140.0	55 4-4 .0 150-150-150	55 4-4 2.1 152-152-152	55 2 .0 142-146-146	55 2 .0 140-146-146	55 2 .0 138-146-146	49 49
136.0	55 4 .0 141-141-141	55 2 .0 138-139-139	55 2 .0 130-139-139	55 2 .0 128-139-139	55 2 .0 128-139-139	49 49
132.0	55 .0 127-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	55 .0 126-136-136	49 49
128.0	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	55 .0 124-134-134	49 49
124.0	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	55 .0 122-131-131	49 49
120.0	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	55 .0 120-129-129	49 49
116.0	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	55 .0 119-127-127	49 49
112.0	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	55 .0 118-124-125	49 49
108.0	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	55 .0 117-122-123	49 49
104.0	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	55 .0 116-119-121	49 49

/MINI. ACCELERATION HEIGHT : 927.(FT) QNH ALT. : 1212.(FT)
/MAXI. ACCELERATION HEIGHT : 2065.(FT) QNH ALT. : 2350.(FT)

(11LBORY3.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 2

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:LFPO PARIS-ORLY                RWY 26        JARA 12 SEP 95 ELEV.    285.FT*CONF.*
:FOR TRAINING ONLY                                   MC69    TORA  10892.FT*  2  *
:                                                            ASDA  10892.FT*CG25%*
:A320-211/AB/CFM565A1  DRY RUNWAY                            TODA  11942.FT*******
:-------TREF= 29/TMAX= 49 GRAD1=130/GRAD2= 600    *****      SLOPE  -.07 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000LB:    -10      :      -5     :       0     :      10     :      20     :  3  :
:-----------------------------------------------------------------------------:
:      : 11      4-4 : 30      4-4 : 34      2-4 : 35      2-4 : 36      2-4 :32   :
:166.5 :  .1         :  .4         :  .3         :  .7         :  .9         :     :
:      :146-150-152 :148-150-152 :154-154-157 :157-157-159 :159-159-162 :   32:
:------:------------:------------:------------:------------:------------:-----:
:      : 26      4-4 : 33      4-4 : 36      2-4 : 37      2-4 : 38      2-4 :34   :
:164.0 :  .0         :  .3         :  .6         :  .9         : 1.1         :     :
:      :143-147-149 :149-150-152 :154-154-156 :157-157-159 :159-159-161 :   34:
:------:------------:------------:------------:------------:------------:-----:
:      : 29      4-4 : 37      4-4 : 40      2-4 : 41      2-4 : 42      2-4 :37   :
:160.0 : 3.5         :  .7         :  .1         :  .3         :  .4         :     :
:      :143-146-148 :150-151-152 :153-153-155 :156-156-157 :158-158-160 :   37:
:------:------------:------------:------------:------------:------------:-----:
:      : 38      4-4 : 41      4-4 : 43      2-4 : 44      2-4 : 45      2-4 :40   :
:156.0 :  .2         :  .5         :  .6         :  .8         :  .7         :     :
:      :145-147-148 :150-150-152 :153-153-154 :155-155-156 :157-157-159 :   40:
:------:------------:------------:------------:------------:------------:-----:
:      : 42      4-4 : 45      4-4 : 46      2-4 : 47      2-4 : 48      2-4 :44   :
:152.0 :  .7         :  .0         : 1.1         : 1.2         : 1.1         :     :
:      :147-148-149 :149-149-151 :152-152-153 :154-154-155 :156-156-157 :   43:
:------:------------:------------:------------:------------:------------:-----:
:      : 46      4-4 : 48      4-4 : 50      2-4 : 51      2-4 : 51      2-2 :47   :
:148.0 :  .5         :  .5         :  .3         :  .3         : 1.1         :     :
:      :147-147-148 :148-148-149 :150-150-151 :152-152-153 :155-155-156 :   46:
:------:------------:------------:------------:------------:------------:-----:
:      : 49      4-4 : 51      4-4 : 53      2-4 : 54      2-4 : 54      2-2 :49   :
:144.0 : 1.0         : 1.0         :  .7         :  .7         :  .9         :     :
:      :146-146-147 :147-147-148 :149-149-150 :151-151-152 :152-153-154 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 53      4-4 : 55      4-4 : 55      2-4 : 55      2-4 : 55      2-2 :49   :
:140.0 :  .5         :  .4         : 2.4         : 3.5         : 3.5         :     :
:      :145-145-145 :146-146-146 :149-149-149 :151-151-152 :151-152-153 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55      4-4 : 55      4   : 55      2   : 55      2   : 55      2   :49   :
:136.0 : 2.3         :  .0         :  .0         :  .0         :  .0         :     :
:      :144-144-144 :136-136-137 :128-136-137 :126-136-137 :126-136-137 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55      4   : 55      2   : 55      2   : 55      2   : 55      2   :49   :
:132.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :131-131-131 :127-129-130 :120-129-130 :120-129-130 :120-129-130 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:128.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :118-126-127 :118-126-127 :118-126-127 :118-126-127 :118-126-127 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:124.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :117-124-125 :117-124-125 :117-124-125 :117-124-125 :117-124-125 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:120.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :116-122-123 :116-122-123 :116-122-123 :116-122-123 :116-122-123 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:116.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-119-121 :115-119-121 :115-119-121 :115-119-121 :115-119-121 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:112.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :113-117-119 :113-117-119 :113-117-119 :113-117-119 :113-117-119 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:108.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :112-114-117 :112-114-117 :112-114-117 :112-114-117 :112-114-117 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 55          : 55          : 55          : 55          : 55          :49   :
:104.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :111-113-116 :111-113-116 :111-113-116 :111-113-116 :111-113-116 :   49:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    927.(FT)  QNH ALT. :  1212.(FT)
/MAXI. ACCELERATION HEIGHT :   2058.(FT)  QNH ALT. :  2343.(FT)
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(11LBORY4.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 1 + F

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:LFBO TOULOUSE-BLAGNAC         RWY 15R      JARA 12 SEP 95 ELEV.    486.FT*CONF.*
:FOR TRAINING ONLY                                    MC69  TORA    3500.M *  1+F*
:                                                           ASDA    3560.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA    3500.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 200     *****    SLOPE    .10 % : TGA :
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WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5	-6 4-4 .0 154-155-155	20 4-4 .0 152-153-153	32 4-4 .1 157-157-157	34 4-4 .0 161-161-161	35 4-4 .3 161-161-161	29 30
74.0	15 4-4 .0 148-151-151	29 4-4 .9 150-152-152	35 4-4 .3 158-158-158	37 4-4 .0 159-159-159	38 2-4 .2 160-160-160	31 32
72.0	29 4-4 1.1 144-150-150	36 4-4 .3 152-152-152	39 4-4 .3 158-158-158	40 4-4 .5 158-158-158	42 2-4 .1 159-159-159	35 35
70.0	37 4-4 .2 147-148-148	41 4-4 .1 155-155-155	43 4-4 .2 156-156-156	44 4-4 .3 157-157-157	45 2-4 .5 158-158-158	38 39
68.0	42 4-4 .3 149-149-149	45 4-4 .1 153-153-153	47 4-4 .1 155-155-155	48 4-4 .3 156-156-156	49 2-4 .4 157-157-157	41 42
66.0	46 4-4 .5 151-151-151	49 4-4 .1 152-152-152	51 4-4 .1 154-154-154	52 4-4 .3 154-154-154	53 2-4 .4 156-156-156	44 45
64.0	51 4-4 .1 149-149-149	53 4-4 .2 151-151-151	55 4-4 .2 152-152-152	56 4-4 .4 152-152-152	57 2-4 .4 155-155-155	48 48
62.0	55 4-4 .2 148-148-148	57 4-4 .3 149-149-149	59 4-4 .3 150-150-150	60 2-4 .4 150-150-150	60 2-2 .8 153-154-154	51 52
60.0	59 4-4 .4 146-146-146	60 4-4 .9 148-148-148	60 4-4 1.8 149-149-149	60 2 .0 133-140-140	60 2 .0 131-140-140	54 54
58.0	60 4-4 1.9 146-146-146	60 .0 127-134-134	60 .0 124-134-134	60 .0 124-134-134	60 .0 124-134-134	54 54
56.0	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	54 54
54.0	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	54 54
52.0	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	54 54
50.0	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	54 54
48.0	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	54 54
46.0	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	54 54

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2068.(FT) QNH ALT. : 2554.(FT)

(31KGTLS1.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 2

LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 ELEV. 486.FT *CONF.* 2
FOR TRAINING ONLY MC69 TORA 3500.M
ASDA 3560.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3500.M
-------TREF= 29/TMAX= 54 GRAD1= 40/GRAD2= 300 ***** SLOPE .10 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	-8 4-4 .0 154-154-157	22 4-4 .0 151-151-154	31 4-4 .4 156-156-158	33 4-4 .2 157-157-159	34 2-4 .4 158-158-161	29 30
74.0	16 4-4 .0 147-149-151	29 4-4 1.1 150-150-152	34 4-4 .4 156-156-158	36 4-4 .1 155-155-158	37 2-4 .3 158-158-160	31 32
72.0	29 4-4 1.3 144-147-149	36 4-4 .2 152-152-154	38 4-4 .3 154-154-156	39 2-4 .5 154-154-156	41 2-4 .1 157-157-159	35 35
70.0	37 4-4 .2 147-147-149	40 4-4 .1 152-152-153	42 4-4 .2 152-152-154	43 4-4 .4 154-154-155	44 2-4 .4 156-156-157	38 39
68.0	41 4-4 .5 149-149-150	44 4-4 .0 150-150-151	46 4-4 .0 151-151-153	47 4-4 .2 153-153-154	48 2-4 .2 154-154-156	41 42
66.0	45 4-4 .4 148-148-149	47 4-4 .4 149-149-150	49 4-4 .5 151-151-152	51 4-4 .2 151-151-152	52 2-4 .2 153-153-154	44 45
64.0	49 4-4 .4 146-146-147	52 4-4 .0 147-147-148	54 4-4 .1 148-148-149	55 2-4 .2 149-149-150	56 2-2 .2 151-151-152	48 48
62.0	54 4-4 .1 144-144-145	56 4-4 .1 146-146-147	58 4-4 .1 146-146-147	59 2-4 .2 147-147-148	60 2-2 .1 149-149-149	51 52
60.0	58 4-4 .2 143-143-143	60 4-4 .3 144-144-144	60 4-4 1.2 145-145-146	60 2-4 1.7 147-147-147	60 2 .0 130-139-139	54 54
58.0	60 4-4 1.3 143-143-143	60 4 .0 132-132-132	60 2 .0 123-131-132	60 2 .0 122-131-132	60 2 .0 122-131-132	54 54
56.0	60 4 .0 126-126-126	60 2 .0 124-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	54 54
54.0	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	54 54
52.0	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	54 54
50.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
48.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
46.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2098.(FT) QNH ALT. : 2584.(FT)

(31KGTLS2.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 3

```
---------------------------------------------------------------------*******
:LFBO TOULOUSE-BLAGNAC          RWY 15R      JARA 12 SEP 95 ELEV.    486.FT*CONF.*
:FOR TRAINING ONLY                                  MC69    TORA    3500.M *  3  *
:                                                           ASDA    3560.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA    3500.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 300     *****    SLOPE    .10 % : TGA :
:WEIGHT:-------------------------------------------------------------------:  2  :
:1000KG:     -10      :      -5      :       0      :      10      :      20      :  3  :
:-----------------------------------------------------------------------------------:
:      :  3      4-4 : 29      4-4 : 32      4-4 : 33      2-4 : 35      2-4 :29   :
: 75.5 :  .0         :  .3         :  .3         :  .5         :  .0         :     :
:      :153-153-154 :151-152-153 :155-155-156 :158-158-159 :161-161-162 :  30:
:------:------------:------------:------------:------------:------------:-----:
:      : 27      4-4 : 33      4-4 : 35      2-4 : 36      2-4 : 37      2-4 :31   :
: 74.0 :  .0         :  .1         :  .2         :  .4         :  .3         :     :
:      :146-148-149 :153-153-154 :155-155-155 :158-158-158 :161-161-161 :  32:
:------:------------:------------:------------:------------:------------:-----:
:      : 29      4-4 : 37      4-4 : 39      4-4 : 40      2-4 : 41      2-4 :35   :
: 72.0 : 1.9         :  .0         :  .1         :  .2         :  .0         :     :
:      :145-148-149 :152-152-152 :154-154-154 :157-157-157 :160-160-160 :  35:
:------:------------:------------:------------:------------:------------:-----:
:      : 38      4-4 : 40      4-4 : 42      4-4 : 43      2-4 : 44      2-2 :38   :
: 70.0 :  .3         :  .4         :  .5         :  .5         :  .2         :     :
:      :150-150-150 :151-151-152 :153-153-153 :156-156-156 :159-159-159 :  39:
:------:------------:------------:------------:------------:------------:-----:
:      : 42      4-4 : 44      4-4 : 46      2-4 : 47      2-4 : 47      2-2 :41   :
: 68.0 :  .2         :  .3         :  .2         :  .2         :  .4         :     :
:      :148-148-149 :151-151-151 :151-151-151 :155-155-155 :156-157-157 :  42:
:------:------------:------------:------------:------------:------------:-----:
:      : 46      4-4 : 48      4-4 : 50      2-4 : 51      2-4 : 51      2-2 :44   :
: 66.0 :  .1         :  .2         :  .2         :  .1         :  .2         :     :
:      :148-148-148 :148-148-148 :150-150-150 :153-153-153 :153-154-154 :  45:
:------:------------:------------:------------:------------:------------:-----:
:      : 50      4-4 : 52      4-4 : 54      2-4 : 55      2-4 : 55      2-2 :48   :
: 64.0 :  .2         :  .3         :  .2         :  .1         :  .1         :     :
:      :146-146-146 :146-146-146 :149-149-149 :152-152-152 :150-152-152 :  48:
:------:------------:------------:------------:------------:------------:-----:
:      : 54      4-4 : 56      4-4 : 58      2-4 : 58      2-2 : 58      2-2 :51   :
: 62.0 :  .3         :  .3         :  .3         :  .5         :  .5         :     :
:      :144-144-144 :145-145-145 :147-147-147 :150-150-150 :148-150-150 :  52:
:------:------------:------------:------------:------------:------------:-----:
:      : 58      4-4 : 60      4-4 : 60      2-4 : 60      2-2 : 60      2-2 :54   :
: 60.0 :  .5         :  .4         : 1.3         : 1.5         : 1.5         :     :
:      :141-141-142 :143-143-143 :146-146-146 :148-149-149 :146-149-149 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60      4-4 : 60      4   : 60      2   : 60      2   : 60      2   :54   :
: 58.0 : 1.5         :  .0         :  .0         :  .0         :  .0         :     :
:      :140-140-140 :131-131-131 :121-131-131 :121-131-131 :121-131-131 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60      4   : 60      2   : 60      2   : 60      2   : 60      2   :54   :
: 56.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :125-125-126 :121-124-124 :118-124-124 :118-124-124 :118-124-124 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 54.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 52.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 50.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 48.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 46.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :  54:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   943.(FT)  QNH ALT. :  1429.(FT)
/MAXI. ACCELERATION HEIGHT :  2097.(FT)  QNH ALT. :  2583.(FT)
```

(31KGTLS3.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 1 + F

```
-----------------------------------------------------------------------------*******
:LFBO TOULOUSE BLAGNAC         RWY 33L      JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                 MC69    TORA    3500.M *  1+F*
:                                                          ASDA    3800.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                         TODA    3500.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 200     *****   SLOPE   -.10 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000KG:    -10      :     -5      :      0      :     10      :     20      :  3  :
:-------------------------------------------------------------------------------:
:      : -6     4-4 : 19     4-4 : 31     4-4 : 34     4-4 : 35     4-4 :29    :
: 75.5 :  .1        :  .0        :  .3        :  .0        :  .1        :      :
:      :153-153-153 :152-155-155 :156-156-156 :161-161-161 :164-164-164 :   30:
:------:------------:------------:------------:------------:------------:-----:
:      : 15     4-4 : 29     4-4 : 35     4-4 : 37     4-4 : 38     4-4 :31    :
: 74.0 :  .1        :  .9        :  .2        :  .0        :  .1        :      :
:      :147-151-151 :149-153-153 :157-157-157 :162-162-162 :162-162-162 :   32:
:------:------------:------------:------------:------------:------------:-----:
:      : 29     4-4 : 36     4-4 : 39     4-4 : 40     4-4 : 41     4-4 :34    :
: 72.0 : 1.1        :  .3        :  .3        :  .5        :  .5        :      :
:      :144-149-149 :152-154-154 :159-159-159 :161-161-161 :160-160-160 :   35:
:------:------------:------------:------------:------------:------------:-----:
:      : 37     4-4 : 41     4-4 : 43     4-4 : 44     4-4 : 45     2-4 :38    :
: 70.0 :  .2        :  .2        :  .3        :  .3        :  .3        :      :
:      :147-148-148 :154-154-154 :158-158-158 :159-159-159 :158-158-158 :   38:
:------:------------:------------:------------:------------:------------:-----:
:      : 42     4-4 : 45     4-4 : 47     4-4 : 48     2-4 : 49     2-4 :41    :
: 68.0 :  .3        :  .2        :  .1        :  .2        :  .3        :      :
:      :149-149-149 :153-153-153 :156-156-156 :154-154-154 :156-156-156 :   42:
:------:------------:------------:------------:------------:------------:-----:
:      : 47     4-4 : 49     4-4 : 51     4-4 : 52     2-4 : 53     2-4 :44    :
: 66.0 :  .1        :  .2        :  .1        :  .2        :  .3        :      :
:      :151-151-151 :152-152-152 :154-154-154 :153-153-153 :155-155-155 :   45:
:------:------------:------------:------------:------------:------------:-----:
:      : 51     4-4 : 53     4-4 : 55     4-4 : 56     4-4 : 57     2-4 :48    :
: 64.0 :  .2        :  .3        :  .2        :  .2        :  .3        :      :
:      :149-149-149 :150-150-150 :153-153-153 :155-155-155 :153-153-153 :   48:
:------:------------:------------:------------:------------:------------:-----:
:      : 55     4-4 : 57     4-4 : 59     4-4 : 60     2-4 : 60     2-4 :51    :
: 62.0 :  .4        :  .4        :  .2        :  .3        :  .7        :      :
:      :147-147-147 :149-149-149 :150-150-150 :150-150-150 :153-153-153 :   52:
:------:------------:------------:------------:------------:------------:-----:
:      : 60     4-4 : 60     4-4 : 60     2-4 : 60     2   : 60     2   :54    :
: 60.0 :  .0        : 1.0        : 1.7        :  .0        :  .0        :      :
:      :145-145-145 :148-148-148 :147-147-147 :134-140-140 :131-140-140 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 58.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :130-133-133 :127-133-133 :124-133-133 :124-133-133 :124-133-133 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 56.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :122-131-131 :122-131-131 :122-131-131 :122-131-131 :122-131-131 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 54.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :121-128-128 :121-128-128 :121-128-128 :121-128-128 :121-128-128 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 52.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :120-126-126 :120-126-126 :120-126-126 :120-126-126 :120-126-126 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 50.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :118-123-123 :118-123-123 :118-123-123 :118-123-123 :118-123-123 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 48.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :117-120-121 :117-120-121 :117-120-121 :117-120-121 :117-120-121 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60         : 60         : 60         : 60         : 60         :54    :
: 46.0 :  .0        :  .0        :  .0        :  .0        :  .0        :      :
:      :116-119-119 :116-119-119 :116-119-119 :116-119-119 :116-119-119 :   54:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :  1297.(FT)
/MAXI. ACCELERATION HEIGHT :  2018.(FT)  QNH ALT. :  2515.(FT)
```

(31KGTLS4.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 2

```
:LFBO TOULOUSE BLAGNAC          RWY 33L      JARA 12 SEP 95 ELEV.     497.FT*CONF.*
:FOR TRAINING ONLY                                     MC69   TORA    3500.M *  2  *
:                                                             ASDA    3800.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                            TODA    3500.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 200     *****      SLOPE   -.10 %  : TGA :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5	-7 4-4 .0 153-153-156	22 4-4 .0 150-150-153	31 4-4 .3 154-154-156	33 2-4 .1 155-155-158	34 2-4 .3 158-158-160	29 30
74.0	17 4-4 .0 146-147-148	29 4-4 1.2 149-149-151	34 4-4 .3 153-153-155	36 2-4 .1 155-155-157	37 2-4 .2 157-157-160	31 32
72.0	29 4-4 1.3 144-145-147	36 4-4 .1 151-151-152	38 4-4 .3 153-153-155	39 2-4 .5 154-154-156	41 2-4 .0 156-156-158	34 35
70.0	37 4-4 .2 147-147-148	40 4-4 .2 154-154-156	42 4-4 .2 152-152-153	43 2-4 .3 153-153-155	44 2-4 .4 155-155-157	38 38
68.0	42 4-4 .1 149-149-151	44 4-4 .1 152-152-154	46 4-4 .0 150-150-151	47 2-4 .1 152-152-153	48 2-4 .1 154-154-155	41 42
66.0	46 4-4 .1 148-148-150	47 4-4 .4 148-148-149	50 2-4 .0 148-148-149	51 2-4 .2 150-150-151	52 2-4 .1 153-153-154	44 45
64.0	50 4-4 .1 147-147-148	52 4-4 .0 146-146-146	54 2-4 .1 146-146-147	55 2-4 .2 149-149-150	56 4-4 .1 151-151-152	48 48
62.0	54 4-4 .3 145-145-146	56 4-4 .1 144-144-144	58 2-4 .1 145-145-145	59 2-4 .2 147-147-148	60 2-2 .1 149-149-149	51 52
60.0	58 4-4 .4 144-144-144	60 4-4 .3 142-142-142	60 2-4 1.2 144-144-144	60 2-4 1.7 147-147-147	60 2 .0 131-139-139	54 54
58.0	60 4-4 1.5 143-143-144	60 2 .0 126-131-132	60 2 .0 122-131-132	60 2 .0 121-131-132	60 2 .0 121-131-132	54 54
56.0	60 2 .0 119-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	54 54
54.0	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	54 54
52.0	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	54 54
50.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
48.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
46.0	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	54 54

```
/MINI. ACCELERATION HEIGHT :    800.(FT)  QNH ALT. :   1297.(FT)
/MAXI. ACCELERATION HEIGHT :   2049.(FT)  QNH ALT. :   2546.(FT)
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(31KGTLS5.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 3

LFBO TOULOUSE BLAGNAC RWY 33L JARA 12 SEP 95 ELEV. 497.FT *CONF.*
FOR TRAINING ONLY MC69 TORA 3500.M * 3 *
ASDA 3800.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3500.M *******
-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 200 ***** SLOPE -.10 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	4 4-4 .1 152-152-153	29 4-4 .4 150-151-152	32 2-4 .3 155-155-156	33 2-4 .5 158-158-159	34 2-4 .5 161-161-161	29 30
74.0	28 4-4 .0 145-145-147	33 4-4 .1 152-152-153	35 2-4 .2 155-155-155	36 2-4 .3 157-157-158	37 2-4 .3 160-160-161	31 32
72.0	29 4-4 1.9 144-145-147	37 4-4 .1 151-151-152	39 2-4 .1 154-154-154	40 2-4 .1 157-157-157	40 2-4 .5 160-160-160	34 35
70.0	38 4-4 .4 149-149-149	40 4-4 .5 150-150-150	42 2-4 .5 153-153-153	43 2-4 .5 156-156-156	44 2-4 .2 159-159-159	38 38
68.0	42 4-4 .4 150-150-150	44 2-4 .4 148-148-148	46 2-4 .3 152-152-152	47 2-4 .1 155-155-155	47 2-2 .3 156-157-157	41 42
66.0	46 4-4 .3 148-148-149	48 2-4 .3 146-146-146	50 2-4 .2 150-150-150	51 2-4 .1 153-153-153	51 2-2 .2 153-154-154	44 45
64.0	50 4-4 .3 147-147-147	52 2-4 .4 145-145-145	54 2-4 .3 149-149-149	55 4-4 .1 152-152-152	55 2-2 .1 150-152-152	48 48
62.0	54 4-4 .5 145-145-145	57 2-4 .0 143-143-143	58 2-4 .3 147-147-147	58 2-2 .5 150-150-150	58 2-2 .5 148-150-150	51 52
60.0	59 4-4 .1 143-143-143	60 2-4 .6 142-142-142	60 2-4 1.3 146-146-146	60 2-2 1.5 148-149-149	60 2-2 1.5 146-149-149	54 54
58.0	60 4-4 1.7 143-143-143	60 2 .0 124-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	54 54
56.0	60 2 .0 117-124-124	60 2 .0 117-124-124	60 2 .0 117-124-124	60 2 .0 117-124-124	60 2 .0 117-124-124	54 54
54.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
52.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
50.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
48.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
46.0	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	54 54

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1297.(FT)
/MAXI. ACCELERATION HEIGHT : 2030.(FT) QNH ALT. : 2527.(FT)

(31KGTLS6.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 1 + F

CYUL MONTREAL-DORVAL RWY 06R JARA 12 SEP 95 ELEV. 98.FT *CONF.*
FOR TRAINING ONLY MC69 TORA 2926.M * 1+F*
ASDA 2972.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3231.M *******
-------TREF= 30/TMAX= 55 GRAD1= 40/GRAD2= 0 ***** SLOPE .20 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5			-15 4-4 -1.3 161-161-161	-15 4-4 -.6 163-163-163	-14 4-4 .0 163-163-163	30 31
74.0	-15 4-4 -1.9 158-158-158	-15 4-4 -.8 159-159-159	-10 4-4 .0 160-160-160	8 4-4 .0 159-159-159	27 4-4 .0 159-159-159	32 33
72.0	-13 4-4 .0 157-157-157	14 4-4 .0 157-157-157	30 4-4 .4 157-157-157	30 4-4 1.1 158-158-158	30 4-4 1.8 159-159-159	36 36
70.0	29 4-4 .0 150-150-150	30 4-4 1.3 155-155-155	35 4-4 .0 155-155-155	36 4-4 .2 155-155-155	37 4-4 .4 156-156-156	39 40
68.0	30 4-4 1.9 150-150-150	36 4-4 .5 153-153-153	39 4-4 .1 153-153-153	40 4-4 .3 153-153-153	41 4-4 .4 156-156-156	42 43
66.0	38 4-4 .4 150-150-150	41 4-4 .0 150-150-150	43 4-4 .1 151-151-151	44 4-4 .3 153-153-153	45 4-4 .4 154-154-154	45 46
64.0	43 4-4 .0 148-148-148	45 4-4 .1 149-149-149	47 4-4 .1 151-151-151	48 4-4 .2 152-152-152	49 4-4 .4 152-152-152	49 50
62.0	47 4-4 .1 146-146-146	49 4-4 .2 148-148-148	51 4-4 .2 149-149-149	52 4-4 .4 150-150-150	54 4-4 .1 149-149-149	52 53
60.0	51 4-4 .3 144-144-144	53 4-4 .4 147-147-147	55 4-4 .4 147-147-147	57 4-4 .1 147-147-147	58 4-4 .2 147-147-147	55 55
58.0	56 4-4 .1 142-142-142	58 4-4 .2 144-144-144	60 4-4 .2 144-144-144	61 4-4 .3 145-145-145	61 4-4 .8 145-145-145	55 55
56.0	60 4-4 .4 141-141-141	61 4-4 .9 143-143-143	61 4-4 1.8 144-144-144	61 .0 127-131-131	61 .0 124-131-131	55 55
54.0	61 4-4 2.0 141-141-141	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	55 55
52.0	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	55 55
50.0	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	55 55
48.0	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	55 55
46.0	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 898.(FT)
/MAXI. ACCELERATION HEIGHT : 2875.(FT) QNH ALT. : 2973.(FT)

(31KGMRL1.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

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:CYUL MONTREAL-DORVAL          RWY 06R      JARA 12 SEP 95 ELEV.     98.FT*CONF.*
:FOR TRAINING ONLY                                    MC69  TORA    2926.M *  2  *
:                                                           ASDA    2972.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA    3231.M *******
:-------TREF= 30/TMAX= 55 GRAD1= 20/GRAD2=   0      *****   SLOPE    .20 % : TGA :
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WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5					-15 4-4 -.7 153-153-155	30 31
74.0		-15 4-4 -1.9 155-155-157	-15 4-4 -.8 157-157-160	-15 4-4 -.1 152-152-154	7 4-4 .0 152-152-154	32 33
72.0	-15 4-4 -1.0 152-152-155	-12 4-4 .0 154-154-157	24 4-4 .0 153-153-155	30 4-4 .5 153-153-156	30 4-4 1.2 154-154-157	36 36
70.0	15 4-4 .0 151-151-153	30 4-4 .6 152-152-154	30 4-4 1.8 153-153-155	35 4-4 .0 151-151-153	36 4-4 .2 151-151-153	39 40
68.0	30 4-4 1.4 148-148-150	35 4-4 .2 149-149-151	37 4-4 .3 150-150-151	39 4-4 .0 151-151-152	40 4-4 .3 147-147-148	42 43
66.0	37 4-4 .2 147-147-149	39 4-4 .3 148-148-149	41 4-4 .4 149-149-150	43 4-4 .0 150-150-151	44 4-4 .2 145-145-146	45 46
64.0	41 4-4 .3 145-145-147	43 4-4 .4 146-146-147	45 4-4 .4 148-148-149	47 4-4 .0 148-148-149	48 4-4 .2 144-144-144	49 50
62.0	45 4-4 .4 143-143-144	47 4-4 .4 145-145-146	49 4-4 .4 146-146-147	51 4-4 .1 146-146-147	52 4-4 .4 143-143-143	52 53
60.0	50 4-4 .1 141-141-142	52 4-4 .2 144-144-144	54 4-4 .2 144-144-144	55 4-4 .3 144-144-145	57 4-4 .1 141-141-141	55 55
58.0	54 4-4 .4 139-139-140	57 4-4 .0 141-141-142	58 4-4 .4 142-142-142	60 4-4 .1 138-138-138	61 4-4 .3 139-139-139	55 55
56.0	59 4-4 .3 138-138-139	61 4-4 .3 139-139-139	61 4-4 1.1 141-141-141	61 4-4 1.7 138-138-138	61 2 .0 123-125-125	55 55
54.0	61 4-4 1.4 138-138-138	61 .0 120-122-122	61 .0 117-122-122	61 .0 117-122-122	61 .0 117-122-122	55 55
52.0	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	55 55
50.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
48.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
46.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

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/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :   898.(FT)
/MAXI. ACCELERATION HEIGHT :  2585.(FT)  QNH ALT. :  2683.(FT)
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(31KGMRL2.PCX)

MONTREAL (CYUL) - RWY 06 L - CONF 1 + F

CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 MC69
FOR TRAINING ONLY
A320-231/AA/V2500 DRY RUNWAY
TREF= 30/TMAX= 55 GRAD1= 50/GRAD2= 200 *****
ELEV. 96.FT TORA 3353.M ASDA 3398.M TODA 3441.M SLOPE .09 %
CONF. 1+F CG25%

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	-15 4-4 -.6 158-158-158	0 4-4 .0 159-159-159	29 4-4 .1 158-158-158	31 4-4 .2 160-160-160	32 4-4 .5 162-162-162	30 31
74.0	2 4-4 .0 154-154-154	28 4-4 .1 153-153-153	30 4-4 1.4 157-157-157	34 4-4 .3 159-159-159	35 4-4 .5 162-162-162	32 33
72.0	30 4-4 .1 147-148-148	30 4-4 1.9 152-153-153	37 4-4 .1 156-156-156	38 4-4 .3 159-159-159	39 4-4 .4 157-157-157	36 36
70.0	35 4-4 .3 148-149-149	38 4-4 .4 154-154-154	41 4-4 .1 155-155-155	42 4-4 .2 158-158-158	43 4-4 .3 156-156-156	39 40
68.0	40 4-4 .2 150-150-150	42 4-4 .4 153-153-153	45 4-4 .0 154-154-154	46 4-4 .1 156-156-156	47 4-4 .3 153-153-153	42 43
66.0	44 4-4 .4 152-152-152	46 4-4 .4 151-151-151	48 4-4 .5 153-153-153	50 4-4 .1 154-154-154	51 4-4 .3 151-151-151	45 46
64.0	48 4-4 .4 151-151-151	51 4-4 .0 148-148-148	53 4-4 .1 152-152-152	54 4-4 .2 149-149-149	55 4-4 .4 149-149-149	49 50
62.0	52 4-4 .4 147-147-147	55 4-4 .2 147-147-147	57 4-4 .2 150-150-150	58 4-4 .3 147-147-147	59 4-4 .5 147-147-147	52 53
60.0	57 4-4 .2 144-144-144	59 4-4 .3 145-145-145	61 4-4 .3 148-148-148	61 4-4 .9 145-145-145	61 4-4 1.5 146-146-146	55 55
58.0	61 4-4 .4 142-142-142	61 4-4 1.4 144-144-144	61 .0 130-133-133	61 .0 127-133-133	61 .0 124-133-133	55 55
56.0	61 .0 126-131-131	61 .0 122-131-131	61 .0 122-131-131	61 .0 122-131-131	61 .0 122-131-131	55 55
54.0	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	55 55
52.0	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	55 55
50.0	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	55 55
48.0	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	55 55
46.0	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2101.(FT) QNH ALT. : 2197.(FT)

(31KGMRL3.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 ELEV. 96.FT *CONF.*
FOR TRAINING ONLY MC69 TORA 3353.M * 2 *
ASDA 3398.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3441.M *******
-------TREF= 30/TMAX= 55 GRAD1= 40/GRAD2= 300 ***** SLOPE .09 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	-15 4-4 -1.3 154-154-157	-15 4-4 -.2 158-158-161	15 4-4 .0 158-158-162	30 4-4 .3 154-154-156	32 4-4 .1 154-154-157	30 31
74.0	-10 4-4 .0 154-154-157	26 4-4 .0 153-153-155	30 4-4 1.0 157-157-160	33 4-4 .3 153-153-155	35 4-4 .1 154-154-157	32 33
72.0	30 4-4 .1 147-148-150	30 4-4 1.8 152-152-154	35 4-4 .5 156-156-158	37 4-4 .3 153-153-155	39 4-4 .0 153-153-155	36 36
70.0	35 4-4 .2 149-149-150	37 4-4 .4 152-152-154	39 4-4 .5 151-151-153	41 4-4 .2 152-152-153	42 4-4 .4 152-152-154	39 40
68.0	39 4-4 .2 147-147-149	41 4-4 .4 151-151-152	43 4-4 .4 150-150-151	45 4-4 .1 150-150-151	46 4-4 .3 150-150-151	42 43
66.0	43 4-4 .2 146-146-147	45 4-4 .3 150-150-151	47 4-4 .3 148-148-149	49 4-4 .1 148-148-149	50 4-4 .3 148-148-149	45 46
64.0	47 4-4 .2 145-145-146	49 4-4 .3 148-148-149	51 4-4 .4 146-146-147	53 4-4 .1 146-146-146	54 4-4 .3 146-146-147	49 50
62.0	51 4-4 .4 144-144-144	53 4-4 .4 145-145-146	56 4-4 .1 144-144-144	57 4-4 .2 144-144-144	58 4-4 .4 145-145-145	52 53
60.0	56 4-4 .1 142-142-142	58 4-4 .1 141-141-142	60 4-4 .2 142-142-142	61 4-4 .3 142-142-142	61 4-4 1.0 144-144-144	55 55
58.0	60 4-4 .3 140-140-140	61 4-4 .8 140-140-140	61 4-4 1.7 141-141-141	61 2 .0 127-131-132	61 2 .0 123-131-132	55 55
56.0	61 4-4 1.9 140-140-140	61 4 .0 125-125-125	61 2 .0 120-125-125	61 2 .0 118-125-125	61 2 .0 118-125-125	55 55
54.0	61 .0 117-122-122	61 .0 117-122-122	61 .0 117-122-122	61 .0 117-122-122	61 .0 117-122-122	55 55
52.0	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	55 55
50.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
48.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55
46.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2100.(FT) QNH ALT. : 2196.(FT)

(31KGMRL4.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 1 + F

VHHH HONG KONG — RWY 13 — JARA 12 SEP 95 — MC69
FOR TRAINING ONLY
A320-231/AA/V2500 — DRY RUNWAY
TREF= 30/TMAX= 55 GRAD1= 30/GRAD2= 300 *****

ELEV. 15.FT — TORA 3331.M — ASDA 3331.M — TODA 3444.M — SLOPE .00 %

CONF. 1+F — CG25%

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 / 3
75.5		-15 4-4 -.7 167-169-169	4 4-4 .0 167-170-170	29 4-4 .0 163-169-169	31 4-4 .4 168-171-171	30 31
74.0	-15 4-4 -.7 161-168-168	5 4-4 .0 161-168-168	30 4-4 .5 159-166-166	30 4-4 1.5 163-169-169	34 4-4 .4 169-169-169	33 34
72.0	18 4-4 .0 150-162-162	30 4-4 1.0 153-163-163	35 4-4 .2 161-167-167	37 4-4 .1 167-167-167	38 4-4 .2 167-167-167	36 37
70.0	30 4-4 1.5 147-160-160	36 4-4 .3 156-163-163	39 4-4 .3 164-165-165	40 4-4 .4 165-165-165	41 4-4 .5 165-165-165	39 40
68.0	37 4-4 .4 151-160-160	40 4-4 .5 158-162-162	43 4-4 .1 162-162-162	44 4-4 .2 162-162-162	45 4-4 .2 162-162-162	42 43
66.0	42 4-4 .2 154-160-160	45 4-4 .0 160-160-160	46 4-4 .4 160-160-160	47 4-4 .5 160-160-160	48 4-4 .5 160-160-160	46 46
64.0	46 4-4 .4 156-158-158	48 4-4 .4 158-158-158	50 4-4 .3 158-158-158	51 4-4 .4 158-158-158	52 4-4 .5 158-158-158	49 50
62.0	50 4-4 .4 155-155-155	52 4-4 .4 155-155-155	54 4-4 .4 155-155-155	55 4-4 .4 156-156-156	56 4-4 .5 156-156-156	53 53
60.0	55 4-4 .1 152-152-152	57 4-4 .1 153-153-153	58 4-4 .4 153-153-153	59 4-4 .5 153-153-153	61 4-4 .0 153-153-153	55 55
58.0	59 4-4 .2 150-150-150	61 4-4 .2 150-150-150	61 4-4 1.0 151-151-151	61 4-4 1.5 152-152-152	61 4 .0 139-139-139	55 55
56.0	61 4-4 1.3 149-149-149	61 4 .0 135-135-135	61 4 .0 133-133-133	61 4 .0 131-131-131	61 .0 125-131-131	55 55
54.0	61 4 .0 129-129-129	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	61 .0 121-128-128	55 55
52.0	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	55 55
50.0	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	55 55
48.0	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	55 55
46.0	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	55 55

/MINI. ACCELERATION HEIGHT : 1247.(FT) QNH ALT. : 1262.(FT)
/MAXI. ACCELERATION HEIGHT : 3002.(FT) QNH ALT. : 3017.(FT)

(31KGHGK1.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 2

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:VHHH HONG KONG              RWY 13       JARA 12 SEP 95 ELEV.      15.FT*CONF.*
:FOR TRAINING ONLY                                  MC69   TORA     3331.M *  2  *
:                                                          ASDA     3331.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                         TODA     3444.M *******
:-------TREF= 30/TMAX= 55 GRAD1= 20/GRAD2=    0     *****  SLOPE     .00 % : TGA :
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:WEIGHT: 1000KG:	-10	-5	0	10	20	2 / 3
75.5			-15 4-4 -1.2 160-160-164	-15 4-4 -.5 161-161-165	5 4-4 .0 162-162-165	30 31
74.0	-15 4-4 -1.8 158-158-161	-15 4-4 -.7 159-159-163	18 4-4 .0 160-160-163	30 4-4 .6 161-161-164	30 4-4 1.3 162-162-165	33 34
72.0	-6 4-4 .0 157-158-161	30 4-4 .4 154-159-162	30 4-4 1.8 159-160-163	34 4-4 .4 159-159-162	35 4-4 .5 159-159-162	36 37
70.0	30 4-4 1.0 148-157-160	35 4-4 .1 156-157-159	37 4-4 .0 157-157-159	38 4-4 .1 157-157-159	39 4-4 .2 157-157-159	39 40
68.0	36 4-4 .3 151-155-157	38 4-4 .5 155-155-157	40 4-4 .4 155-155-157	41 4-4 .5 155-155-157	42 4-4 .5 155-155-157	42 43
66.0	40 4-4 .4 153-153-155	42 4-4 .4 153-153-155	44 4-4 .2 153-153-154	45 4-4 .3 153-153-155	46 4-4 .3 153-153-155	46 46
64.0	44 4-4 .3 151-151-152	46 4-4 .2 151-151-152	48 4-4 .1 151-151-152	49 4-4 .1 151-151-152	50 4-4 .2 151-151-152	49 50
62.0	48 4-4 .2 149-149-150	50 4-4 .2 149-149-150	52 4-4 .1 149-149-150	53 4-4 .2 149-149-150	54 4-4 .3 149-149-150	53 53
60.0	52 4-4 .4 146-146-147	54 4-4 .4 147-147-147	56 4-4 .3 147-147-147	57 4-4 .3 147-147-147	58 4-4 .4 147-147-147	55 55
58.0	57 4-4 .1 144-144-144	59 4-4 .1 144-144-144	60 4-4 .4 144-144-145	61 4-4 .4 145-145-145	61 4-4 .9 145-145-145	55 55
56.0	61 4-4 .4 142-142-142	61 4-4 1.2 143-143-143	61 4-4 1.9 144-144-144	61 4 .0 130-130-131	61 4 .0 129-129-129	55 55
54.0	61 4 .0 128-128-128	61 4 .0 125-125-126	61 4 .0 124-124-124	61 4 .0 122-122-123	61 .0 120-122-122	55 55
52.0	61 4 .0 119-119-121	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	55 55
50.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
48.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55
46.0	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	55 55

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/MINI. ACCELERATION HEIGHT :  1257.(FT)  QNH ALT. :  1272.(FT)
/MAXI. ACCELERATION HEIGHT :  2883.(FT)  QNH ALT. :  2898.(FT)
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(31KGHGK2.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 1 + F

VHHH HONG KONG RWY 31 JARA 12 SEP 95 ELEV. 15.FT *CONF.*
FOR TRAINING ONLY MC69 TORA 2892.M * 1+F*
ASDA 3242.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3032.M
-------TREF= 30/TMAX= 55 GRAD1= 30/GRAD2= 0 ***** SLOPE .00 %

WEIGHT: 1000KG:	-10	-5	0	10	20	TGA 2 3
75.5					-15 4-4 -1.3 161-161-161	30 31
74.0			-15 4-4 -1.4 159-159-159	-15 4-4 -.6 160-160-160	-11 4-4 .0 160-160-160	33 34
72.0	-15 4-4 -1.9 156-156-156	-15 4-4 -.6 157-157-157	0 4-4 .0 157-157-157	21 4-4 .0 156-156-156	30 4-4 .5 157-157-157	36 37
70.0	-13 4-4 .0 156-156-156	18 4-4 .0 154-154-154	30 4-4 .8 154-154-154	30 4-4 1.6 156-156-156	35 4-4 .1 155-155-155	39 40
68.0	30 4-4 .2 149-149-149	30 4-4 1.5 152-152-152	35 4-4 .5 153-153-153	37 4-4 .3 153-153-153	39 4-4 .1 153-153-153	42 43
66.0	34 4-4 .4 148-148-148	37 4-4 .3 150-150-150	40 4-4 .1 150-150-150	41 4-4 .4 151-151-151	43 4-4 .1 151-151-151	46 46
64.0	39 4-4 .0 147-147-147	41 4-4 .4 148-148-148	44 4-4 .1 149-149-149	45 4-4 .4 150-150-150	47 4-4 .1 151-151-151	49 50
62.0	43 4-4 .2 146-146-146	45 4-4 .4 146-146-146	48 4-4 .2 147-147-147	49 4-4 .4 148-148-148	51 4-4 .3 149-149-149	53 53
60.0	47 4-4 .3 143-143-143	50 4-4 .1 144-144-144	52 4-4 .4 146-146-146	54 4-4 .2 146-146-146	56 4-4 .0 146-146-146	55 55
58.0	52 4-4 .1 141-141-141	54 4-4 .4 142-142-142	57 4-4 .2 144-144-144	58 4-4 .4 144-144-144	60 4-4 .2 144-144-144	55 55
56.0	57 4-4 .0 139-139-139	59 4-4 .3 140-140-140	61 4-4 .5 142-142-142	61 4-4 1.1 143-143-143	61 4-4 1.8 144-144-144	55 55
54.0	61 4-4 .4 137-137-137	61 4-4 1.4 140-140-140	61 .0 123-128-128	61 .0 121-128-128	61 .0 121-128-128	55 55
52.0	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	55 55
50.0	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	61 .0 118-123-123	55 55
48.0	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	61 .0 117-120-121	55 55
46.0	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	61 .0 116-119-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 815.(FT)
/MAXI. ACCELERATION HEIGHT : 3125.(FT) QNH ALT. : 3140.(FT)

(31KGHGK3.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 2

VHHH HONG KONG RWY 31 JARA 12 SEP 95 ELEV. 15.FT *CONF.*
FOR TRAINING ONLY MC69 TORA 2892.M * 2 *
ASDA 3242.M *CG25%*
A320-231/AA/V2500 DRY RUNWAY TODA 3032.M *******
TREF= 30/TMAX= 55 GRAD1= 20/GRAD2= 0 ***** SLOPE .00 %

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5						30 31
74.0				-15 4-4 -1.4 153-153-156	-15 4-4 -.5 154-154-157	33 34
72.0		-15 4-4 -1.5 151-151-154	-15 4-4 -.2 152-152-155	5 4-4 .0 153-153-155	30 4-4 .1 152-152-155	36 37
70.0	-15 4-4 -.9 150-150-152	-1 4-4 .0 151-151-153	30 4-4 .3 149-149-151	30 4-4 1.2 151-151-153	34 4-4 .2 151-151-153	39 40
68.0	17 4-4 .0 147-147-149	30 4-4 1.0 147-147-149	34 4-4 .4 148-148-150	36 4-4 .3 149-149-151	38 4-4 .2 149-149-151	42 43
66.0	30 4-4 1.6 146-146-148	36 4-4 .2 146-146-147	39 4-4 .1 147-147-149	40 4-4 .4 148-148-149	42 4-4 .2 147-147-149	46 46
64.0	37 4-4 .4 143-143-144	40 4-4 .3 144-144-146	43 4-4 .1 145-145-146	44 4-4 .4 146-146-147	46 4-4 .2 145-145-146	49 50
62.0	42 4-4 .1 142-142-143	44 4-4 .4 143-143-144	47 4-4 .2 143-143-144	48 4-4 .4 144-144-144	50 4-4 .2 144-144-144	53 53
60.0	46 4-4 .2 140-140-141	49 4-4 .1 141-141-142	51 4-4 .3 141-141-142	53 4-4 .2 142-142-142	55 4-4 .0 143-143-143	55 55
58.0	51 4-4 .1 138-138-139	53 4-4 .4 139-139-139	56 4-4 .2 139-139-140	58 4-4 .0 141-141-141	59 4-4 .2 142-142-142	55 55
56.0	56 4-4 .0 136-136-137	58 4-4 .3 136-136-137	61 4-4 .1 139-139-139	61 4-4 .7 140-140-140	61 4-4 1.4 141-141-141	55 55
54.0	61 4-4 .0 134-134-134	61 4-4 1.1 135-135-136	61 4 .0 122-122-123	61 .0 120-122-122	61 .0 117-122-122	55 55
52.0	61 .0 119-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	61 .0 115-119-120	55 55
50.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
48.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55
46.0	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	61 .0 114-117-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 815.(FT)
/MAXI. ACCELERATION HEIGHT : 2958.(FT) QNH ALT. : 2973.(FT)

(31KGHGK4.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 1 + F

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--------------------------------------------------------------------------*******
:LFPO PARIS-ORLY                  RWY 25      JARA 12 SEP 95 ELEV.   286.FT*CONF.*
:FOR TRAINING ONLY                                    MC69   TORA   3650.M *  1+F*
:                                                            ASDA   3650.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                           TODA   3710.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 40/GRAD2= 200     *****     SLOPE   .02 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000KG:     -10      :     -5       :      0      :     10      :     20      :  3  :
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      :-16      4-4 : 10      4-4 : 31      4-4 : 33      4-4 : 34      4-4 :30   :
: 75.5 :  .0         :  .0         :  .0         :  .2         :  .4         :     :
:      :158-159-159 :156-158-158 :157-157-157 :162-162-162 :164-164-164 :   30:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 6       4-4 : 29      4-4 : 34      4-4 : 36      4-4 : 37      4-4 :32   :
: 74.0 :  .0         :  .4         :  .3         :  .2         :  .4         :     :
:      :151-156-156 :151-156-156 :158-158-158 :162-162-162 :163-163-163 :   33:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 29      4-4 : 35      4-4 : 38      4-4 : 40      4-4 : 41      4-4 :35   :
: 72.0 :  .6         :  .2         :  .4         :  .1         :  .2         :     :
:      :146-153-153 :153-154-154 :160-160-160 :160-160-160 :162-162-162 :   36:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 36      4-4 : 40      4-4 : 42      4-4 : 43      4-4 : 45      4-4 :38   :
: 70.0 :  .1         :  .2         :  .3         :  .5         :  .1         :     :
:      :148-152-152 :155-155-155 :159-159-159 :160-160-160 :161-161-161 :   39:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 41      4-4 : 44      4-4 : 46      4-4 : 47      4-4 : 48      4-4 :42   :
: 68.0 :  .2         :  .2         :  .2         :  .3         :  .5         :     :
:      :150-151-151 :156-156-156 :158-158-158 :159-159-159 :160-160-160 :   42:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 46      4-4 : 48      4-4 : 50      4-4 : 51      4-4 : 52      4-4 :45   :
: 66.0 :  .0         :  .1         :  .2         :  .3         :  .5         :     :
:      :153-153-153 :155-155-155 :157-157-157 :157-157-157 :158-158-158 :   46:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 50      4-4 : 52      4-4 : 54      4-4 : 55      4-4 : 56      4-4 :48   :
: 64.0 :  .1         :  .2         :  .2         :  .4         :  .5         :     :
:      :152-152-152 :154-154-154 :155-155-155 :155-155-155 :155-155-155 :   49:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 54      4-4 : 56      4-4 : 58      4-4 : 59      4-4 : 60      4-4 :52   :
: 62.0 :  .2         :  .3         :  .3         :  .4         :  .5         :     :
:      :150-150-150 :152-152-152 :153-153-153 :153-153-153 :153-153-153 :   53:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 58      4-4 : 60      4-4 : 60      4-4 : 60      4-4 : 60      2   :54   :
: 60.0 :  .4         :  .4         : 1.4         : 1.9         :  .0         :     :
:      :148-148-148 :150-150-150 :152-152-152 :152-152-152 :138-139-139 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60      4-4 : 60      4   : 60          : 60          : 60          :54   :
: 58.0 : 1.5         :  .0         :  .0         :  .0         :  .0         :     :
:      :148-148-148 :135-135-135 :131-133-133 :124-133-133 :124-133-133 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 56.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :122-131-131 :122-131-131 :122-131-131 :122-131-131 :122-131-131 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 54.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :121-128-128 :121-128-128 :121-128-128 :121-128-128 :121-128-128 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 52.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :120-126-126 :120-126-126 :120-126-126 :120-126-126 :120-126-126 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 50.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :118-123-123 :118-123-123 :118-123-123 :118-123-123 :118-123-123 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 48.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :117-120-121 :117-120-121 :117-120-121 :117-120-121 :117-120-121 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
: 46.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :116-119-119 :116-119-119 :116-119-119 :116-119-119 :116-119-119 :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
/MINI. ACCELERATION HEIGHT :    936.(FT)  QNH ALT. :   1222.(FT)
/MAXI. ACCELERATION HEIGHT :   2346.(FT)  QNH ALT. :   2632.(FT)
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(31KGORY1.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 2

:LFPO PARIS-ORLY RWY 25 JARA 12 SEP 95 ELEV. 286.FT *CONF.*
:FOR TRAINING ONLY MC69 TORA 3650.M * 2 *
: ASDA 3650.M *CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 3710.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 40/GRAD2= 300 ***** SLOPE .02 % : TGA :
:WEIGHT: : 2 :
:1000KG: : 3 :

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	-16 4-4 -.4 158-158-161	8 4-4 .0 156-156-159	30 4-4 .4 156-156-159	32 4-4 .3 159-159-162	33 4-4 .5 160-160-163	30 30
74.0	5 4-4 .0 151-153-155	29 4-4 .5 151-153-155	33 4-4 .5 157-157-160	35 4-4 .2 158-158-161	36 4-4 .4 158-158-161	32 33
72.0	29 4-4 .7 146-149-151	35 4-4 .2 153-153-155	37 4-4 .4 157-157-159	39 4-4 .1 156-156-158	40 4-4 .2 156-156-159	35 36
70.0	36 4-4 .1 148-149-151	39 4-4 .2 154-154-156	41 4-4 .3 155-155-156	42 4-4 .4 155-155-157	43 4-4 .5 155-155-157	38 39
68.0	40 4-4 .5 150-150-151	43 4-4 .1 152-152-154	45 4-4 .1 153-153-154	46 4-4 .2 153-153-154	47 4-4 .3 154-154-155	42 42
66.0	44 4-4 .5 151-151-152	47 4-4 .0 150-150-152	48 4-4 .5 151-151-152	50 4-4 .1 151-151-152	51 4-4 .2 152-152-153	45 46
64.0	48 4-4 .4 149-149-150	51 4-4 .0 148-148-149	53 4-4 .0 149-149-149	54 4-4 .2 150-150-151	55 4-4 .3 151-151-152	48 49
62.0	53 4-4 .1 146-146-147	55 4-4 .2 146-146-147	57 4-4 .1 147-147-148	58 4-4 .2 149-149-149	59 4-4 .3 149-149-150	52 53
60.0	57 4-4 .3 144-144-145	59 4-4 .3 144-144-145	60 4-4 .7 147-147-147	60 4-4 1.2 148-148-148	60 4-4 1.8 149-149-149	54 54
58.0	60 4-4 .9 143-143-143	60 4-4 1.8 144-144-144	60 4 .0 132-132-132	60 4 .0 131-131-131	60 2 .0 125-131-131	54 54
56.0	60 4 .0 128-128-128	60 4 .0 126-126-127	60 4 .0 125-125-125	60 .0 122-124-125	60 .0 118-124-125	54 54
54.0	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	60 .0 117-122-122	54 54
52.0	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	54 54
50.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
48.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
46.0	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	54 54

/MINI. ACCELERATION HEIGHT : 936.(FT) QNH ALT. : 1222.(FT)
/MAXI. ACCELERATION HEIGHT : 2263.(FT) QNH ALT. : 2549.(FT)

(31KGORY2.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 1 + F

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:LFPO PARIS-ORLY              RWY 26      JARA 12 SEP 95 ELEV.    285.FT*CONF.*
:FOR TRAINING ONLY                               MC69    TORA    3320.M *  1+F*
:                                                        ASDA    3320.M *CG25%*
:A320-231/AA/V2500      DRY RUNWAY                       TODA    3640.M *******
:-------TREF= 29/TMAX= 54 GRAD1= 50/GRAD2= 300    *****  SLOPE   -.07 % : TGA :
```

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	6 4-4 .1 149-154-154	30 4-4 .1 149-153-153	34 2-4 .2 156-158-158	36 2-4 .3 161-161-161	38 2-4 .0 164-164-164	30 30
74.0	28 4-4 .1 144-152-152	34 4-4 .1 151-153-153	38 2-4 .1 158-158-158	39 2-4 .4 161-161-161	40 2-4 .4 164-164-164	32 33
72.0	29 4-4 2.0 144-152-152	39 4-4 .1 152-154-154	42 2-4 .1 158-158-158	43 2-4 .2 160-160-160	43 2-4 .6 164-164-164	35 36
70.0	40 4-4 .0 147-150-150	43 4-4 .4 154-155-155	45 2-4 .5 157-157-157	47 2-4 .0 160-160-160	47 2-2 .1 161-162-162	38 39
68.0	45 4-4 .1 150-151-151	47 4-4 .4 154-154-154	49 2-4 .5 156-156-156	50 2-4 .4 159-159-159	50 2-2 .4 159-160-160	42 42
66.0	49 4-4 .4 151-151-151	51 4-4 .5 152-152-152	53 2-4 .5 155-155-155	54 2-2 .3 157-157-157	54 2-2 .3 156-157-157	45 46
64.0	54 4-4 .0 149-149-149	56 4-4 .1 150-150-150	58 2-4 .0 152-152-152	58 2-2 .2 154-155-155	58 2-2 .2 153-155-155	48 49
62.0	58 4-4 .1 147-147-147	60 4-4 .1 148-148-148	60 2-4 1.0 152-152-152	60 2-2 1.1 153-154-154	60 2-2 1.1 151-154-154	52 53
60.0	60 4-4 1.2 146-146-146	60 2 .0 137-139-139	60 2 .0 130-139-139	60 2 .0 129-139-139	60 2 .0 129-139-139	54 54
58.0	60 .0 128-133-133	60 .0 124-133-133	60 .0 124-133-133	60 .0 124-133-133	60 .0 124-133-133	54 54
56.0	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	54 54
54.0	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	60 .0 121-128-128	54 54
52.0	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	54 54
50.0	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	60 .0 118-123-123	54 54
48.0	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	60 .0 117-120-121	54 54
46.0	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	60 .0 116-119-119	54 54

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/MINI. ACCELERATION HEIGHT :   927.(FT)  QNH ALT. :  1212.(FT)
/MAXI. ACCELERATION HEIGHT :  2039.(FT)  QNH ALT. :  2324.(FT)
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(31KGORY3.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 2

LFPO PARIS-ORLY	RWY 26	JARA 12 SEP 95	ELEV. 285.FT	CONF. 2	
FOR TRAINING ONLY		MC69	TORA 3320.M		
			ASDA 3320.M	CG25%	
A320-231/AA/V2500	DRY RUNWAY		TODA 3640.M		
TREF= 29/TMAX= 54	GRAD1= 40/GRAD2= 300	*****	SLOPE -.07 %		

WEIGHT 1000KG	-10	-5	0	10	20	TGA 2 3
75.5	8 4-4 .0 148-152-154	30 4-4 .3 149-151-154	34 2-4 .3 155-156-159	36 2-4 .0 159-159-162	36 2-4 .5 162-162-165	30 30
74.0	29 4-4 .2 143-148-150	34 4-4 .2 150-152-154	37 2-4 .4 156-156-159	38 2-4 .4 159-159-161	39 2-2 .3 161-161-164	32 33
72.0	35 4-4 .1 145-149-150	39 4-4 .1 152-152-154	41 2-4 .2 156-156-158	42 2-4 .2 158-158-160	42 2-2 .4 159-159-162	35 36
70.0	40 4-4 .1 147-149-150	43 4-4 .0 152-152-153	44 2-4 .5 155-155-156	45 2-4 .5 157-157-159	45 2-2 .6 156-158-160	38 39
68.0	44 4-4 .4 149-149-151	46 4-4 .4 151-151-152	48 2-4 .3 153-153-155	49 2-2 .2 155-155-157	49 2-2 .2 153-155-157	42 42
66.0	48 4-4 .3 148-148-149	50 4-4 .4 149-149-150	52 2-4 .3 152-152-153	53 2-2 .1 153-153-154	53 2-2 .1 151-153-154	45 46
64.0	52 4-4 .4 146-146-147	54 4-4 .4 148-148-149	56 2-4 .3 150-150-151	56 2-2 .5 151-152-152	56 2-2 .5 149-152-152	48 49
62.0	57 4-4 .0 144-144-145	59 4-4 .0 146-146-146	60 2-4 .3 149-149-149	60 2-2 .4 148-149-150	60 2-2 .4 146-149-150	52 53
60.0	60 4-4 .6 143-143-144	60 4-4 1.5 145-145-146	60 2 .0 130-138-138	60 2 .0 128-138-138	60 2 .0 128-138-138	54 54
58.0	60 4 .0 132-132-132	60 2 .0 126-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	54 54
56.0	60 4 .0 125-125-125	60 .0 118-124-125	60 .0 118-124-125	60 .0 118-124-125	60 .0 118-124-125	54 54
54.0	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	60 .0 117-121-122	54 54
52.0	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	60 .0 115-119-120	54 54
50.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
48.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
46.0	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	60 .0 114-117-119	54 54

/MINI. ACCELERATION HEIGHT : 927.(FT) QNH ALT. : 1212.(FT)
/MAXI. ACCELERATION HEIGHT : 2110.(FT) QNH ALT. : 2395.(FT)

(31KGORY4.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 1 + F

:LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 ELEV. 486.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 11483.FT* 1+F*
: ASDA 11680.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11483.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=110/GRAD2= 600 ***** SLOPE .10 % : TGA :

:WEIGHT: :1000LB:	-10	-5	0	10	20	2 3
166.5	-7 4-4 .1 154-155-155	19 4-4 .1 152-153-153	32 4-4 .1 157-157-157	33 4-4 1.1 161-161-161	35 4-4 .5 161-161-161	29 30
164.0	9 4-4 .1 149-152-152	29 4-4 1.2 150-152-152	34 4-4 .7 157-157-157	36 4-4 .3 160-160-160	37 4-4 .8 160-160-160	31 31
160.0	29 4-4 1.1 145-150-150	35 4-4 .3 152-152-152	38 4-4 .5 158-158-158	39 4-4 .9 158-158-158	41 2-4 .1 159-159-159	34 34
156.0	35 4-4 .4 147-148-148	39 4-4 .7 154-154-154	41 4-4 1.0 157-157-157	43 4-4 .3 157-157-157	44 2-4 .6 159-159-159	37 37
152.0	40 4-4 .2 149-149-149	43 4-4 .4 154-154-154	45 4-4 .4 155-155-155	46 4-4 .7 156-156-156	47 2-4 1.1 158-158-158	39 40
148.0	44 4-4 .7 150-150-150	46 4-4 .9 153-153-153	48 4-4 1.0 155-155-155	50 4-4 .3 155-155-155	51 2-4 .6 156-156-156	42 43
144.0	48 4-4 .4 150-150-150	50 4-4 .6 152-152-152	52 4-4 .7 153-153-153	54 4-4 .0 153-153-153	55 2-4 .2 155-155-155	46 46
140.0	52 4-4 .2 149-149-149	54 4-4 .4 150-150-150	56 4-4 .5 151-151-151	57 4-4 .8 152-152-152	58 2-4 .8 155-155-155	49 49
136.0	56 4-4 .1 147-147-147	58 4-4 .2 149-149-149	60 4-4 .2 149-149-149	60 2-4 1.6 150-150-150	60 2-2 2.4 153-154-154	52 53
132.0	60 4-4 .1 146-146-146	60 4-4 2.2 148-148-148	60 2 .0 135-139-139	60 2 .0 132-139-139	60 2 .0 130-139-139	54 54
128.0	60 4 .0 135-135-135	60 .0 129-134-134	60 .0 124-134-134	60 .0 124-134-134	60 .0 124-134-134	54 54
124.0	60 .0 123-131-131	60 .0 123-131-131	60 .0 123-131-131	60 .0 123-131-131	60 .0 123-131-131	54 54
120.0	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	54 54
116.0	60 .0 120-127-127	60 .0 120-127-127	60 .0 120-127-127	60 .0 120-127-127	60 .0 120-127-127	54 54
112.0	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	54 54
108.0	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	54 54
104.0	60 .0 117-119-120	60 .0 117-119-120	60 .0 117-119-120	60 .0 117-119-120	60 .0 117-119-120	54 54

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2068.(FT) QNH ALT. : 2554.(FT)

(31LBTLS1.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 2

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:LFBO TOULOUSE-BLAGNAC         RWY 15R      JARA 12 SEP 95 ELEV.   486.FT*CONF.*
:FOR TRAINING ONLY                                  MC69    TORA  11483.FT*  2  *
:                                                           ASDA  11680.FT*CG25%*
:A320-231/AA/V2500     DRY RUNWAY                           TODA  11483.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=100/GRAD2= 600     *****    SLOPE   .10 % : TGA :
:WEIGHT:------------------------------------------------------------------:  2  :
:1000LB:    -10      :     -5       :      0      :     10      :     20      :  3  :
:---------------------------------------------------------------------------------:
:      : -8      4-4 : 22      4-4 : 31      4-4 : 33      4-4 : 34      2-4 :29   :
:166.5 :  .0         :  .0         :  .9         :  .4         :  .9         :     :
:      :154-154-157 :151-151-154 :156-156-158 :157-157-159 :158-158-161 :   30:
:------:------------:------------:------------:------------:------------:-----:
:      : 10      4-4 : 29      4-4 : 34      4-4 : 35      4-4 : 36      2-4 :31   :
:164.0 :  .1         : 1.7         :  .1         :  .6         : 1.0         :     :
:      :149-150-152 :150-150-152 :156-156-158 :156-156-158 :158-158-160 :   31:
:------:------------:------------:------------:------------:------------:-----:
:      : 29      4-4 : 35      4-4 : 37      4-4 : 38      2-4 : 40      2-4 :34   :
:160.0 : 1.5         :  .2         :  .6         : 1.1         :  .3         :     :
:      :144-147-149 :152-152-154 :154-154-156 :154-154-156 :157-157-159 :   34:
:------:------------:------------:------------:------------:------------:-----:
:      : 35      4-4 : 38      4-4 : 40      4-4 : 42      4-4 : 43      2-4 :37   :
:156.0 :  .6         : 1.0         : 1.1         :  .3         :  .5         :     :
:      :147-147-148 :153-153-154 :153-153-154 :154-154-155 :156-156-158 :   37:
:------:------------:------------:------------:------------:------------:-----:
:      : 39      4-4 : 42      4-4 : 44      4-4 : 45      4-4 : 46      2-4 :39   :
:152.0 : 1.0         :  .3         :  .3         :  .7         :  .8         :     :
:      :148-148-150 :151-151-152 :152-152-153 :154-154-155 :155-155-157 :   40:
:------:------------:------------:------------:------------:------------:-----:
:      : 43      4-4 : 45      4-4 : 47      4-4 : 49      4-4 : 50      2-4 :42   :
:148.0 :  .7         :  .8         :  .8         :  .1         :  .1         :     :
:      :149-149-150 :149-149-150 :151-151-152 :152-152-153 :154-154-155 :   43:
:------:------------:------------:------------:------------:------------:-----:
:      : 47      4-4 : 49      4-4 : 51      4-4 : 52      4-4 : 53      4-4 :46   :
:144.0 :  .1         :  .3         :  .4         :  .8         :  .8         :     :
:      :147-147-148 :148-148-149 :150-150-151 :150-150-151 :153-153-154 :   46:
:------:------------:------------:------------:------------:------------:-----:
:      : 50      4-4 : 53      4-4 : 55      4-4 : 56      2-4 : 57      2-2 :49   :
:140.0 : 1.0         :  .1         :  .2         :  .4         :  .3         :     :
:      :146-146-146 :147-147-148 :148-148-149 :149-149-149 :151-151-151 :   49:
:------:------------:------------:------------:------------:------------:-----:
:      : 54      4-4 : 56      4-4 : 58      4-4 : 60      2-4 : 60      2-2 :52   :
:136.0 :  .9         : 1.0         : 1.0         :  .1         :  .9         :     :
:      :144-144-145 :146-146-147 :146-146-147 :147-147-147 :149-149-149 :   53:
:------:------------:------------:------------:------------:------------:-----:
:      : 58      4-4 : 60      4-4 : 60      4-4 : 60      2   : 60      2   :54   :
:132.0 :  .8         :  .9         : 2.9         :  .0         :  .0         :     :
:      :143-143-143 :144-144-144 :145-145-146 :132-138-138 :130-138-138 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60      4-4 : 60      4   : 60      2   : 60      2   : 60      2   :54   :
:128.0 : 2.8         :  .0         :  .0         :  .0         :  .0         :     :
:      :143-143-143 :132-132-132 :123-132-132 :122-132-132 :122-132-132 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60      4   : 60      4   : 60      2   : 60      2   : 60      2   :54   :
:124.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :127-127-127 :125-125-126 :119-125-126 :119-125-126 :119-125-126 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
:120.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :117-122-123 :117-122-123 :117-122-123 :117-122-123 :117-122-123 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
:116.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :116-120-121 :116-120-121 :116-120-121 :116-120-121 :116-120-121 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
:112.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
:108.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-118-119 :115-118-119 :115-118-119 :115-118-119 :115-118-119 :   54:
:------:------------:------------:------------:------------:------------:-----:
:      : 60          : 60          : 60          : 60          : 60          :54   :
:104.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :115-117-119 :115-117-119 :115-117-119 :115-117-119 :115-117-119 :   54:
:------:------------:------------:------------:------------:------------:-----:
/MINI. ACCELERATION HEIGHT :    943.(FT)  QNH ALT. :   1429.(FT)
/MAXI. ACCELERATION HEIGHT :   2098.(FT)  QNH ALT. :   2584.(FT)
```

(31LBTLS2.PCX)

TOULOUSE (LFBO) - RWY 15 R - CONF 3

LFBO TOULOUSE-BLAGNAC RWY 15R JARA 12 SEP 95 MC69
FOR TRAINING ONLY
A320-231/AA/V2500 DRY RUNWAY
TREF= 29/TMAX= 54 GRAD1=110/GRAD2= 600 *****
ELEV. 486.FT
TORA 11483.FT
ASDA 11680.FT
TODA 11483.FT
SLOPE .10 %
CONF. 3
CG25%

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 / 3
166.5	3 4-4 .0 153-153-154	29 4-4 .6 151-152-153	32 4-4 .6 155-155-156	33 2-4 1.1 158-158-159	34 2-4 1.2 161-161-162	29 30
164.0	21 4-4 .0 147-149-151	32 4-4 .3 152-153-153	34 2-4 .8 155-155-156	35 2-4 1.2 158-158-158	36 2-4 1.2 161-161-161	31 31
160.0	29 4-4 2.9 145-148-149	35 4-4 1.1 152-152-153	38 4-4 .1 154-154-155	39 2-4 .3 157-157-157	40 2-4 .0 160-160-160	34 34
156.0	37 4-4 .0 149-149-150	39 4-4 .4 151-151-152	41 4-4 .5 154-154-154	42 2-4 .7 156-156-156	43 2-4 .1 159-159-159	37 37
152.0	40 4-4 .7 149-149-149	42 4-4 .9 151-151-151	44 2-4 .9 152-152-152	45 2-4 .9 155-155-155	46 2-2 .1 157-158-158	39 40
148.0	44 4-4 .1 148-148-148	46 4-4 .2 149-149-149	48 2-4 .1 151-151-151	48 2-4 1.1 154-154-154	49 2-2 .2 154-156-156	42 43
144.0	47 4-4 .7 147-147-148	49 4-4 .8 148-148-148	51 2-4 .8 150-150-150	52 2-4 .6 153-153-153	52 2-2 .8 152-154-154	46 46
140.0	51 4-4 .5 145-145-145	53 4-4 .6 146-146-146	55 2-4 .5 148-148-148	56 2-2 .1 151-151-151	56 2-2 .1 149-151-151	49 49
136.0	55 4-4 .4 143-143-143	57 4-4 .4 144-144-144	59 2-4 .2 147-147-147	59 2-2 .7 149-149-149	59 2-2 .7 147-149-149	52 53
132.0	59 4-4 .2 141-141-141	60 4-4 1.2 143-143-143	60 2-4 3.1 146-146-146	60 2-2 3.5 148-149-149	60 2-2 3.5 146-149-149	54 54
128.0	60 4-4 3.2 140-140-140	60 4 .0 131-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	54 54
124.0	60 4 .0 126-126-126	60 2 .0 123-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	54 54
120.0	60 4 .0 119-119-120	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
116.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
112.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
108.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
104.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54

/MINI. ACCELERATION HEIGHT : 943.(FT) QNH ALT. : 1429.(FT)
/MAXI. ACCELERATION HEIGHT : 2097.(FT) QNH ALT. : 2583.(FT)

(31LBTLS3.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 1 + F

LFBO TOULOUSE BLAGNAC   RWY 33L   JARA 12 SEP 95   ELEV. 497.FT   CONF.
FOR TRAINING ONLY   MC69   TORA 11483.FT   1+F
ASDA 12467.FT   CG25%
A320-231/AA/V2500   DRY RUNWAY   TODA 11483.FT
TREF= 29/TMAX= 54 GRAD1=120/GRAD2= 600   *****   SLOPE -.10 %

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-6 4-4 .1 153-153-153	18 4-4 .1 152-155-155	31 4-4 .7 156-156-156	33 4-4 .9 160-160-160	35 4-4 .3 164-164-164	29 30
164.0	10 4-4 .1 148-151-151	29 4-4 1.1 149-153-153	34 4-4 .5 157-157-157	36 4-4 .3 162-162-162	37 4-4 .5 163-163-163	31 31
160.0	29 4-4 1.1 144-149-149	35 4-4 .2 151-152-152	38 4-4 .6 159-159-159	39 4-4 .9 161-161-161	40 4-4 .9 161-161-161	34 34
156.0	35 4-4 .5 146-148-148	39 4-4 .7 153-154-154	42 4-4 .1 158-158-158	43 4-4 .1 159-159-159	44 2-4 .3 158-158-158	36 37
152.0	40 4-4 .3 148-149-149	43 4-4 .7 154-154-154	45 4-4 .6 157-157-157	46 4-4 .5 156-156-156	47 2-4 .7 157-157-157	39 40
148.0	44 4-4 .9 150-150-150	47 4-4 .1 153-153-153	48 4-4 1.1 156-156-156	50 2-4 .1 153-153-153	51 2-4 .4 156-156-156	42 43
144.0	48 4-4 .7 150-150-150	50 4-4 .9 152-152-152	52 4-4 .7 154-154-154	53 2-4 .9 152-152-152	54 2-4 1.1 154-154-154	45 46
140.0	52 4-4 .6 148-148-148	54 4-4 .7 150-150-150	56 4-4 .4 153-153-153	57 4-4 .3 154-154-154	58 2-4 .6 153-153-153	49 49
136.0	56 4-4 .4 146-146-146	58 4-4 .5 149-149-149	60 2-4 .1 147-147-147	60 2-4 1.4 150-150-150	60 2-4 2.3 153-153-153	52 52
132.0	60 4-4 .4 145-145-145	60 4-4 2.5 148-148-148	60 2 .0 135-139-139	60 2 .0 133-139-139	60 2 .0 130-139-139	54 54
128.0	60 .0 131-133-133	60 .0 127-133-133	60 .0 124-133-133	60 .0 124-133-133	60 .0 124-133-133	54 54
124.0	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	54 54
120.0	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	54 54
116.0	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	54 54
112.0	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	54 54
108.0	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	54 54
104.0	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	54 54

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1297.(FT)
/MAXI. ACCELERATION HEIGHT : 2018.(FT) QNH ALT. : 2515.(FT)

(31LBTLS4.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 2

```
LFBO TOULOUSE BLAGNAC          RWY 33L       JARA 12 SEP 95 ELEV.   497.FT*CONF.*
FOR TRAINING ONLY                                   MC69    TORA  11483.FT*  2   *
                                                            ASDA  12467.FT*CG25%*
A320-231/AA/V2500      DRY RUNWAY                           TODA  11483.FT*******
-------TREF= 29/TMAX= 54 GRAD1=110/GRAD2= 600     *****     SLOPE  -.10 %
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-8 4-4 .1 153-153-156	22 4-4 .0 150-150-153	31 4-4 .7 154-154-156	33 2-4 .2 155-155-158	34 2-4 .7 158-158-160	29 30
164.0	11 4-4 .0 148-148-150	29 4-4 1.7 149-149-151	33 4-4 .9 153-153-155	35 2-4 .4 155-155-157	36 2-4 .8 157-157-160	31 31
160.0	29 4-4 1.5 144-145-147	34 4-4 1.1 151-151-153	37 4-4 .4 153-153-155	38 2-4 1.0 154-154-156	40 2-4 .0 157-157-159	34 34
156.0	35 4-4 .6 146-146-147	38 4-4 .9 153-153-155	40 4-4 1.0 153-153-154	42 2-4 .2 153-153-155	43 2-4 .4 156-156-157	36 37
152.0	39 4-4 .9 148-148-149	42 4-4 .4 153-153-155	44 4-4 .3 151-151-152	45 2-4 .6 152-152-154	46 2-4 .6 155-155-156	39 40
148.0	43 4-4 1.1 149-149-150	45 4-4 .8 152-152-153	47 4-4 .8 149-149-150	49 2-4 .0 151-151-152	49 2-4 1.1 154-154-155	42 43
144.0	47 4-4 .5 148-148-149	49 4-4 .3 147-147-148	51 2-4 .5 148-148-148	52 2-4 .8 150-150-151	53 2-4 .7 152-152-153	45 46
140.0	51 4-4 .3 147-147-147	53 4-4 .1 145-145-146	55 2-4 .2 146-146-147	56 2-4 .4 148-148-149	57 4-4 .2 151-151-151	49 49
136.0	55 4-4 .2 145-145-146	56 4-4 1.0 144-144-144	58 2-4 1.0 145-145-145	60 2-4 .1 147-147-147	60 2-2 .8 149-149-149	52 52
132.0	59 4-4 .2 144-144-144	60 4-4 .9 142-142-142	60 2-4 2.9 144-144-144	60 2 .0 132-138-138	60 2 .0 130-138-138	54 54
128.0	60 4-4 3.2 143-143-144	60 2 .0 127-131-132	60 2 .0 123-131-132	60 2 .0 122-131-132	60 2 .0 122-131-132	54 54
124.0	60 2 .0 120-125-126	60 2 .0 119-125-126	60 2 .0 119-125-126	60 2 .0 119-125-126	60 2 .0 119-125-126	54 54
120.0	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	54 54
116.0	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	54 54
112.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
108.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
104.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 1297.(FT)
/MAXI. ACCELERATION HEIGHT : 2049.(FT) QNH ALT. : 2546.(FT)

(31LBTLS5.PCX)

TOULOUSE (LFBO) - RWY 33 L - CONF 3

```
:LFBO TOULOUSE BLAGNAC          RWY 33L      JARA 12 SEP 95 ELEV.    497.FT*CONF.*
:FOR TRAINING ONLY                                  MC69    TORA  11483.FT*  3  *
:                                                           ASDA  12467.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA  11483.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=120/GRAD2= 600     *****    SLOPE  -.10 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	4 4-4 .1 152-152-153	29 4-4 .7 150-151-152	32 2-4 .6 155-155-156	33 2-4 1.0 158-158-159	34 2-4 1.0 161-161-161	29 30
164.0	22 4-4 .1 146-147-148	32 4-4 .4 152-152-153	34 2-4 .8 155-155-156	35 2-4 1.1 158-158-158	36 2-4 1.0 161-161-161	31 31
160.0	29 4-4 3.0 144-145-147	36 4-4 .0 152-152-152	38 2-4 .1 154-154-155	39 2-4 .2 157-157-157	39 2-4 1.2 160-160-160	34 34
156.0	37 4-4 .2 148-148-149	39 4-4 .6 150-150-151	41 2-4 .6 153-153-154	42 2-4 .6 156-156-156	43 2-4 .0 159-159-159	36 37
152.0	41 4-4 .0 150-150-150	42 4-4 .9 154-154-155	44 2-4 1.0 152-152-152	45 2-4 .8 155-155-155	46 2-2 .0 157-157-157	39 40
148.0	44 4-4 .6 149-149-149	46 2-4 .4 147-147-147	48 2-4 .2 151-151-151	48 2-4 1.1 154-154-154	49 2-2 .2 155-155-155	42 43
144.0	47 4-4 1.1 148-148-148	50 2-4 .0 145-145-146	51 2-4 .9 150-150-150	52 2-4 .6 153-153-153	52 2-2 .7 152-154-154	45 46
140.0	51 4-4 .8 146-146-147	53 2-4 .9 144-144-144	55 2-4 .6 148-148-148	56 2-2 .1 151-151-151	56 2-2 .1 149-151-151	49 49
136.0	55 4-4 .7 145-145-145	57 2-4 .7 143-143-143	59 2-4 .2 147-147-147	59 2-2 .6 149-149-149	59 2-2 .6 147-149-149	52 52
132.0	59 4-4 .5 143-143-143	60 2-4 1.6 142-142-142	60 2-4 3.1 146-146-146	60 2-2 3.5 148-149-149	60 2-2 3.5 146-149-149	54 54
128.0	60 4-4 3.5 143-143-143	60 2 .0 124-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	54 54
124.0	60 2 .0 118-124-125	60 2 .0 118-124-125	60 2 .0 118-124-125	60 2 .0 118-124-125	60 2 .0 118-124-125	54 54
120.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
116.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
112.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
108.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
104.0	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	60 .0 114-118-119	54 54

```
/MINI. ACCELERATION HEIGHT :    800.(FT)   QNH ALT. :   1297.(FT)
/MAXI. ACCELERATION HEIGHT :   2030.(FT)   QNH ALT. :   2527.(FT)
```

(31LBTLS6.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 1 + F

:CYUL MONTREAL-DORVAL RWY 06R JARA 12 SEP 95 ELEV. 98.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 9600.FT* 1+F*
: ASDA 9750.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 10600.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 90/GRAD2= 0 ***** SLOPE .20 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5				-15 4-4 -1.4 163-163-163	-15 4-4 .0 164-164-164	30 31
164.0		-15 4-4 -2.7 159-159-159	-15 4-4 -.4 161-161-161	-2 4-4 .0 160-160-160	16 4-4 .1 159-159-159	32 33
160.0	-15 4-4 -1.1 158-158-158	-1 4-4 .1 157-157-157	27 4-4 .0 157-157-157	30 4-4 1.2 158-158-158	30 4-4 2.8 159-159-159	35 36
156.0	15 4-4 .1 154-154-154	30 4-4 1.1 155-155-155	30 4-4 3.6 157-157-157	34 4-4 1.0 156-156-156	36 4-4 .4 156-156-156	38 38
152.0	30 4-4 2.2 150-150-150	34 4-4 1.0 154-154-154	37 4-4 .3 154-154-154	38 4-4 .7 154-154-154	39 4-4 1.1 156-156-156	41 41
148.0	36 4-4 .4 151-151-151	38 4-4 .8 152-152-152	40 4-4 1.0 152-152-152	42 4-4 .3 153-153-153	43 4-4 .6 155-155-155	44 44
144.0	40 4-4 .3 150-150-150	42 4-4 .5 150-150-150	44 4-4 .6 151-151-151	45 4-4 .9 153-153-153	47 4-4 .1 153-153-153	47 47
140.0	44 4-4 .1 148-148-148	46 4-4 .2 148-148-148	48 4-4 .2 151-151-151	49 4-4 .6 151-151-151	50 4-4 .9 151-151-151	50 50
136.0	47 4-4 .9 146-146-146	50 4-4 .0 147-147-147	52 4-4 .2 149-149-149	53 4-4 .6 149-149-149	54 4-4 .8 149-149-149	53 54
132.0	51 4-4 .9 144-144-144	54 4-4 .1 146-146-146	56 4-4 .2 147-147-147	57 4-4 .5 147-147-147	58 4-4 .8 147-147-147	55 55
128.0	56 4-4 .1 142-142-142	58 4-4 .3 144-144-144	60 4-4 .3 144-144-144	61 4-4 .6 145-145-145	61 4-4 1.7 145-145-145	55 55
124.0	60 4-4 .4 141-141-141	61 4-4 1.4 143-143-143	61 4-4 3.3 144-144-144	61 .0 128-131-131	61 .0 125-131-131	55 55
120.0	61 4-4 3.4 141-141-141	61 .0 124-129-129	61 .0 121-129-129	61 .0 121-129-129	61 .0 121-129-129	55 55
116.0	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	55 55
112.0	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	55 55
108.0	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	55 55
104.0	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 898.(FT)
/MAXI. ACCELERATION HEIGHT : 2875.(FT) QNH ALT. : 2973.(FT)

(31LBMRL1.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

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:CYUL MONTREAL-DORVAL          RWY 06R      JARA 12 SEP 95 ELEV.      98.FT*CONF.*
:FOR TRAINING ONLY                                   MC69   TORA    9600.FT*  2  *
:                                                           ASDA    9750.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA   10600.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 60/GRAD2=    0     *****   SLOPE    .20 % : TGA :
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WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5					-15 4-4 -1.6 153-153-155	30 31
164.0			-15 4-4 -2.6 157-157-160	-15 4-4 -1.0 152-152-154	-4 4-4 .0 152-152-155	32 33
160.0	-15 4-4 -3.4 152-152-155	-15 4-4 -1.0 155-155-157	5 4-4 .0 154-154-156	29 4-4 .1 154-154-156	30 4-4 1.4 154-154-157	35 36
156.0	-7 4-4 .0 152-152-154	27 4-4 .0 152-152-154	30 4-4 2.2 153-153-155	30 4-4 3.8 153-153-156	34 4-4 1.0 153-153-155	38 38
152.0	30 4-4 1.0 148-148-150	30 4-4 3.6 152-152-154	35 4-4 .9 151-151-152	37 4-4 .2 151-151-152	38 4-4 .7 148-148-149	41 41
148.0	34 4-4 .9 148-148-150	37 4-4 .3 149-149-150	39 4-4 .5 149-149-150	40 4-4 .9 151-151-152	42 4-4 .3 146-146-147	44 44
144.0	38 4-4 .8 147-147-148	41 4-4 .0 147-147-148	43 4-4 .1 148-148-149	44 4-4 .4 150-150-151	45 4-4 .9 145-145-146	47 47
140.0	42 4-4 .6 145-145-146	44 4-4 .8 145-145-146	46 4-4 .8 148-148-149	48 4-4 .0 148-148-148	49 4-4 .6 144-144-144	50 50
136.0	46 4-4 .4 143-143-144	48 4-4 .5 145-145-145	50 4-4 .6 146-146-147	51 4-4 1.0 146-146-147	53 4-4 .5 143-143-143	53 54
132.0	50 4-4 .4 141-141-142	52 4-4 .6 144-144-144	54 4-4 .7 144-144-144	56 4-4 .0 142-142-142	57 4-4 .6 141-141-141	55 55
128.0	54 4-4 .7 139-139-140	56 4-4 .8 142-142-142	58 4-4 .8 142-142-142	60 4-4 .1 138-138-138	61 4-4 .6 139-139-139	55 55
124.0	59 4-4 .0 138-138-139	61 4-4 .1 139-139-139	61 4-4 1.9 141-141-141	61 4-4 3.1 138-138-138	61 2 .0 124-125-126	55 55
120.0	61 4-4 2.2 138-138-138	61 4 .0 123-123-123	61 .0 119-122-123	61 .0 117-122-123	61 .0 117-122-123	55 55
116.0	61 .0 117-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	55 55
112.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
108.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
104.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

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/MINI. ACCELERATION HEIGHT :    800.(FT)  QNH ALT. :    898.(FT)
/MAXI. ACCELERATION HEIGHT :   2585.(FT)  QNH ALT. :   2683.(FT)
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(31LBMRL2.PCX)

MONTREAL (CYUL) - RWY 06 L - CONF 1 + F

:CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 ELEV. 96.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 11000.FT* 1+F*
ASDA 11150.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11290.FT*******
:-------TREF= 30/TMAX= 55 GRAD1=110/GRAD2= 600 ***** SLOPE .09 %

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-15 4-4 -1.3 159-159-159	-1 4-4 .1 159-159-159	29 4-4 .1 158-158-158	31 4-4 .5 160-160-160	32 4-4 1.0 162-162-162	30 31
164.0	-5 4-4 .1 156-156-156	22 4-4 .1 154-154-154	30 4-4 2.3 157-157-157	33 4-4 .9 159-159-159	35 4-4 .2 162-162-162	32 33
160.0	23 4-4 .0 148-150-150	30 4-4 2.9 152-153-153	35 4-4 1.1 157-157-157	37 4-4 .5 159-159-159	38 4-4 .8 159-159-159	35 36
156.0	30 4-4 2.9 147-148-148	37 4-4 .3 154-154-154	39 4-4 .8 156-156-156	40 4-4 1.1 158-158-158	42 4-4 .2 158-158-158	38 38
152.0	38 4-4 .4 150-150-150	40 4-4 1.1 154-154-154	43 4-4 .2 155-155-155	44 4-4 .3 154-154-154	45 4-4 .8 154-154-154	41 41
148.0	42 4-4 .4 151-151-151	44 4-4 .7 152-152-152	46 4-4 .8 154-154-154	47 4-4 1.0 156-156-156	49 4-4 .3 152-152-152	44 44
144.0	46 4-4 .1 152-152-152	48 4-4 .2 150-150-150	50 4-4 .4 153-153-153	51 4-4 .6 152-152-152	53 4-4 .0 150-150-150	47 47
140.0	49 4-4 .8 150-150-150	52 4-4 .1 148-148-148	54 4-4 .2 151-151-151	55 4-4 .5 148-148-148	56 4-4 .9 149-149-149	50 50
136.0	53 4-4 .7 146-146-146	56 4-4 .0 146-146-146	58 4-4 .0 149-149-149	59 4-4 .3 146-146-146	60 4-4 .6 147-147-147	53 54
132.0	57 4-4 .7 144-144-144	59 4-4 1.0 145-145-145	61 4-4 .9 148-148-148	61 4-4 2.2 145-145-145	61 4-4 3.6 146-146-146	55 55
128.0	61 4-4 .8 142-142-142	61 4-4 3.0 144-144-144	61 .0 130-134-134	61 .0 127-134-134	61 .0 124-134-134	55 55
124.0	61 .0 127-131-131	61 .0 123-131-131	61 .0 123-131-131	61 .0 123-131-131	61 .0 123-131-131	55 55
120.0	61 .0 121-129-129	61 .0 121-129-129	61 .0 121-129-129	61 .0 121-129-129	61 .0 121-129-129	55 55
116.0	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	61 .0 120-127-127	55 55
112.0	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	55 55
108.0	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	55 55
104.0	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	61 .0 117-119-120	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2101.(FT) QNH ALT. : 2197.(FT)

(31LBMRL3.PCX)

MONTREAL (CYUL) - RWY 06 R - CONF 2

:CYUL MONTREAL-DORVAL RWY 06L JARA 12 SEP 95 ELEV. 96.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 11000.FT* 2 *
: ASDA 11150.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11290.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 90/GRAD2= 700 ***** SLOPE .09 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5		-15 4-4 -.5 158-158-161	14 4-4 .1 158-158-161	30 4-4 .6 154-154-156	32 4-4 .2 154-154-157	30 31
164.0	-15 4-4 -.4 154-154-157	16 4-4 .0 155-155-157	30 4-4 1.4 157-157-160	32 4-4 .9 153-153-155	34 4-4 .4 154-154-157	32 33
160.0	22 4-4 .1 148-149-151	30 4-4 2.6 152-152-154	34 4-4 .9 156-156-159	36 4-4 .5 153-153-155	37 4-4 1.1 154-154-156	35 36
156.0	30 4-4 3.0 147-148-150	36 4-4 .4 152-152-154	38 4-4 .5 151-151-153	39 4-4 1.1 153-153-154	41 4-4 .5 153-153-154	38 38
152.0	37 4-4 .5 148-148-149	39 4-4 1.0 151-151-153	41 4-4 1.1 151-151-152	43 4-4 .5 151-151-152	44 4-4 1.0 151-151-152	41 41
148.0	41 4-4 .2 147-147-148	43 4-4 .5 150-150-152	45 4-4 .5 149-149-150	46 4-4 1.0 149-149-150	48 4-4 .3 149-149-150	44 44
144.0	44 4-4 .9 146-146-147	46 4-4 1.0 149-149-150	49 4-4 .1 147-147-148	50 4-4 .6 147-147-148	51 4-4 1.0 148-148-148	47 47
140.0	48 4-4 .5 145-145-146	50 4-4 .7 148-148-149	52 4-4 .9 146-146-146	54 4-4 .4 145-145-146	55 4-4 .7 146-146-146	50 50
136.0	52 4-4 .5 143-143-144	54 4-4 .5 143-143-144	56 4-4 .8 144-144-144	58 4-4 .2 143-143-144	59 4-4 .5 144-144-145	53 54
132.0	56 4-4 .5 142-142-142	58 4-4 .5 141-141-142	60 4-4 .7 142-142-142	61 4-4 1.0 142-142-142	61 4-4 2.4 144-144-144	55 55
128.0	60 4-4 .6 140-140-140	61 4-4 1.6 140-140-140	61 4-4 3.7 141-141-141	61 2 .0 128-131-132	61 2 .0 124-131-132	55 55
124.0	61 4-4 3.6 140-140-140	61 4 .0 126-126-126	61 2 .0 121-125-126	61 2 .0 119-125-126	61 2 .0 119-125-126	55 55
120.0	61 .0 118-122-123	61 .0 117-122-123	61 .0 117-122-123	61 .0 117-122-123	61 .0 117-122-123	55 55
116.0	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	55 55
112.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
108.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
104.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

/MINI. ACCELERATION HEIGHT : 800.(FT) QNH ALT. : 896.(FT)
/MAXI. ACCELERATION HEIGHT : 2100.(FT) QNH ALT. : 2196.(FT)

(31LBMRL4.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 1 + F

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:VHHH HONG KONG              RWY 13       JARA 12 SEP 95 ELEV.      15.FT*CONF.*
:FOR TRAINING ONLY                                   MC69   TORA  10930.FT*   1+F*
:                                                           ASDA  10930.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                          TODA  11300.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 70/GRAD2= 700     *****    SLOPE   .00 % : TGA :
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WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 / 3
166.5		-15 4-4 -1.6 167-169-169	3 4-4 .0 168-170-170	28 4-4 .1 164-169-169	31 4-4 .8 168-171-171	30 31
164.0	-15 4-4 -2.3 161-168-168	-5 4-4 .0 164-169-169	30 4-4 .3 159-166-166	30 4-4 2.4 163-169-169	34 4-4 .1 169-169-169	32 33
160.0	4 4-4 .1 155-165-165	30 4-4 1.0 153-163-163	34 4-4 .2 161-167-167	36 4-4 .0 166-167-167	37 4-4 .4 167-167-167	35 36
156.0	30 4-4 1.7 147-160-160	35 4-4 .0 156-163-163	37 4-4 1.0 163-166-166	39 4-4 .5 165-165-165	40 4-4 .6 166-166-166	38 39
152.0	35 4-4 .9 150-160-160	38 4-4 1.0 157-163-163	41 4-4 .6 163-163-163	42 4-4 .7 163-163-163	43 4-4 .8 164-164-164	41 42
148.0	39 4-4 .9 152-160-160	42 4-4 .9 160-161-161	44 4-4 .9 161-161-161	45 4-4 1.0 162-162-162	46 4-4 1.1 162-162-162	44 45
144.0	43 4-4 .9 154-159-159	46 4-4 .3 159-159-159	47 4-4 1.2 160-160-160	49 4-4 .2 159-159-159	50 4-4 .3 159-159-159	47 48
140.0	47 4-4 .8 156-157-157	49 4-4 .9 157-157-157	51 4-4 .7 157-157-157	52 4-4 .9 157-157-157	53 4-4 1.0 157-157-157	50 51
136.0	51 4-4 .6 155-155-155	53 4-4 .6 155-155-155	55 4-4 .4 155-155-155	56 4-4 .6 155-155-155	57 4-4 .7 155-155-155	53 54
132.0	55 4-4 .5 152-152-152	57 4-4 .4 153-153-153	59 4-4 .2 153-153-153	60 4-4 .3 153-153-153	61 4-4 .3 153-153-153	55 55
128.0	59 4-4 .4 150-150-150	61 4-4 .2 150-150-150	61 4-4 2.1 151-151-151	61 4-4 3.2 152-152-152	61 4 .0 139-139-139	55 55
124.0	61 4-4 2.3 149-149-149	61 4 .0 137-137-137	61 4 .0 134-134-134	61 4 .0 132-132-132	61 .0 130-131-131	55 55
120.0	61 4 .0 131-131-131	61 .0 126-129-129	61 .0 121-129-129	61 .0 121-129-129	61 .0 121-129-129	55 55
116.0	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	61 .0 120-126-126	55 55
112.0	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	61 .0 119-124-124	55 55
108.0	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	61 .0 118-122-122	55 55
104.0	61 .0 116-119-120	61 .0 116-119-120	61 .0 116-119-120	61 .0 116-119-120	61 .0 116-119-120	55 55

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/MINI. ACCELERATION HEIGHT :  1247.(FT)  QNH ALT. :  1262.(FT)
/MAXI. ACCELERATION HEIGHT :  3002.(FT)  QNH ALT. :  3017.(FT)
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(31LBHGK1.PCX)

HONG KONG (VHHH) - RWY 13 - CONF 2

:VHHH HONG KONG RWY 13 JARA 12 SEP 95 ELEV. 15.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 10930.FT* 2 *
: ASDA 10930.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11300.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 40/GRAD2= 0 ***** SLOPE .00 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5				-15 4-4 -1.1 161-161-165	3 4-4 .0 162-162-165	30 31
164.0		-15 4-4 -2.4 159-159-163	-15 4-4 -.1 160-160-164	30 4-4 .4 161-161-164	30 4-4 1.9 162-162-165	32 33
160.0	-15 4-4 -.9 158-158-161	25 4-4 .0 155-159-162	30 4-4 2.7 159-160-163	33 4-4 .7 159-159-162	34 4-4 1.0 160-160-162	35 36
156.0	30 4-4 .5 148-157-160	30 4-4 3.7 154-159-162	35 4-4 .8 158-158-160	36 4-4 1.1 158-158-160	38 4-4 .0 157-157-160	38 39
152.0	34 4-4 .5 150-156-158	37 4-4 .2 156-156-158	39 4-4 .0 156-156-158	40 4-4 .2 156-156-158	41 4-4 .3 156-156-158	41 42
148.0	38 4-4 .5 152-154-156	40 4-4 .7 154-154-156	42 4-4 .4 154-154-156	43 4-4 .5 154-154-156	44 4-4 .6 154-154-156	44 45
144.0	42 4-4 .1 152-152-153	43 4-4 1.1 152-152-154	45 4-4 .8 152-152-154	46 4-4 .9 152-152-154	47 4-4 1.0 153-153-154	47 48
140.0	45 4-4 .6 150-150-152	47 4-4 .4 150-150-151	49 4-4 .1 150-150-151	50 4-4 .3 150-150-151	51 4-4 .5 150-150-151	50 51
136.0	49 4-4 .2 148-148-149	51 4-4 .1 148-148-149	52 4-4 1.0 149-149-150	54 4-4 .1 148-148-149	55 4-4 .2 148-148-149	53 54
132.0	53 4-4 .1 146-146-147	55 4-4 .1 146-146-147	56 4-4 .9 147-147-147	57 4-4 1.0 147-147-147	59 4-4 .0 146-146-147	55 55
128.0	57 4-4 .2 144-144-144	59 4-4 .1 144-144-144	60 4-4 .8 144-144-145	61 4-4 .8 145-145-145	61 4-4 1.9 145-145-145	55 55
124.0	61 4-4 .3 142-142-142	61 4-4 2.1 143-143-143	61 4-4 3.7 144-144-144	61 4 .0 131-131-132	61 4 .0 130-130-130	55 55
120.0	61 4 .0 130-130-130	61 4 .0 127-127-128	61 4 .0 125-125-126	61 4 .0 124-124-125	61 4 .0 123-123-124	55 55
116.0	61 4 .0 122-122-123	61 4 .0 120-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	55 55
112.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
108.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55
104.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

/MINI. ACCELERATION HEIGHT : 1257.(FT) QNH ALT. : 1272.(FT)
/MAXI. ACCELERATION HEIGHT : 2883.(FT) QNH ALT. : 2898.(FT)

(31LBHGK2.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 1 + F

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:VHHH HONG KONG              RWY 31      JARA 12 SEP 95 ELEV.     15.FT*CONF.*
:FOR TRAINING ONLY                                 MC69 TORA    9490.FT*  1+F*
:                                                       ASDA   10638.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                      TODA    9950.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 70/GRAD2=    0    *****  SLOPE    .00 % : TGA :
:WEIGHT:-----------------------------------------------------------------:  2  :
:1000LB:    -10      :     -5      :      0      :     10      :     20      :  3  :
:------------------------------------------------------------------------------:
:      :             :             :             :             :             :30   :
:166.5 :             :             :             :             :             :     :
:      :             :             :             :             :             :   31:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      :             :             :-15      4-4 :-15      4-4 :-15      4-4 :32   :
:164.0 :             :             :-4.0         :-2.2         : -.5         :     :
:      :             :             :159-159-159  :160-160-160  :161-161-161  :   33:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      :             :-15      4-4 :-15      4-4 : 6       4-4 : 27      4-4 :35   :
:160.0 :             :-2.7         :  .0         :  .0         :  .0         :     :
:      :             :157-157-157  :159-159-159  :157-157-157  :157-157-157  :   36:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      :-15      4-4 : 0       4-4 : 30      4-4 : 30      4-4 : 30      4-4 :38   :
:156.0 :-1.5         :  .0         :  .1         : 1.9         : 3.8         :     :
:      :156-156-156  :155-155-155  :154-154-154  :156-156-156  :157-157-157  :   39:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 12      4-4 : 30      4-4 : 33      4-4 : 35      4-4 : 37      4-4 :41   :
:152.0 :  .0         : 1.3         : 1.0         :  .8         :  .4         :     :
:      :152-152-152  :152-152-152  :153-153-153  :154-154-154  :154-154-154  :   42:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 30      4-4 : 35      4-4 : 37      4-4 : 39      4-4 : 41      4-4 :44   :
:148.0 : 2.4         :  .1         :  .9         :  .5         :  .0         :     :
:      :149-149-149  :151-151-151  :152-152-152  :152-152-152  :152-152-152  :   45:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 36      4-4 : 38      4-4 : 41      4-4 : 43      4-4 : 44      4-4 :47   :
:144.0 :  .3         : 1.0         :  .6         :  .1         :  .7         :     :
:      :147-147-147  :150-150-150  :150-150-150  :150-150-150  :151-151-151  :   48:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 40      4-4 : 42      4-4 : 45      4-4 : 46      4-4 : 48      4-4 :50   :
:140.0 :  .2         :  .8         :  .3         :  .8         :  .3         :     :
:      :147-147-147  :148-148-148  :148-148-148  :149-149-149  :150-150-150  :   51:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 44      4-4 : 46      4-4 : 49      4-4 : 50      4-4 : 52      4-4 :53   :
:136.0 :  .0         :  .6         :  .0         :  .7         :  .2         :     :
:      :145-145-145  :146-146-146  :147-147-147  :148-148-148  :149-149-149  :   54:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 47      4-4 : 50      4-4 : 53      4-4 : 54      4-4 : 56      4-4 :55   :
:132.0 :  .9         :  .5         :  .1         :  .7         :  .3         :     :
:      :143-143-143  :144-144-144  :145-145-145  :146-146-146  :146-146-146  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 52      4-4 : 54      4-4 : 57      4-4 : 58      4-4 : 60      4-4 :55   :
:128.0 :  .1         :  .7         :  .3         :  .8         :  .3         :     :
:      :141-141-141  :142-142-142  :144-144-144  :144-144-144  :144-144-144  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 56      4-4 : 59      4-4 : 61      4-4 : 61      4-4 : 61      4-4 :55   :
:124.0 :  .4         :  .0         :  .5         : 1.9         : 3.4         :     :
:      :139-139-139  :140-140-140  :142-142-142  :143-143-143  :144-144-144  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 60      4-4 : 61      4-4 : 61          : 61          : 61          :55   :
:120.0 :  .8         : 2.2         :  .0         :  .0         :  .0         :     :
:      :138-138-138  :140-140-140  :125-129-129  :122-129-129  :121-129-129  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 61      4-4 : 61          : 61          : 61          : 61          :55   :
:116.0 : 3.9         :  .0         :  .0         :  .0         :  .0         :     :
:      :137-137-137  :120-126-126  :120-126-126  :120-126-126  :120-126-126  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 61          : 61          : 61          : 61          : 61          :55   :
:112.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :119-124-124  :119-124-124  :119-124-124  :119-124-124  :119-124-124  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 61          : 61          : 61          : 61          : 61          :55   :
:108.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :118-122-122  :118-122-122  :118-122-122  :118-122-122  :118-122-122  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
:      : 61          : 61          : 61          : 61          : 61          :55   :
:104.0 :  .0         :  .0         :  .0         :  .0         :  .0         :     :
:      :116-119-120  :116-119-120  :116-119-120  :116-119-120  :116-119-120  :   55:
:------:-------------:-------------:-------------:-------------:-------------:-----:
/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :    815.(FT)
/MAXI. ACCELERATION HEIGHT :  3125.(FT)  QNH ALT. :   3140.(FT)
```

(31LBHGK3.PCX)

HONG KONG (VHHH) - RWY 31 - CONF 2

```
:VHHH HONG KONG              RWY 31        JARA 12 SEP 95 ELEV.    15.FT*CONF.*
:FOR TRAINING ONLY                                   MC69  TORA   9490.FT*  2  *
:                                                          ASDA  10638.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                         TODA   9950.FT*******
:-------TREF= 30/TMAX= 55 GRAD1= 50/GRAD2=    0     *****  SLOPE    .00 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5						30 31
164.0				-15 4-4 -3.9 153-153-156	-15 4-4 -2.1 154-154-157	32 33
160.0			-15 4-4 -1.8 152-152-155	-14 4-4 .0 153-153-156	14 4-4 .0 153-153-156	35 36
156.0	-15 4-4 -3.6 150-150-152	-15 4-4 -.6 151-151-154	16 4-4 .1 151-151-153	30 4-4 1.0 151-151-153	30 4-4 2.9 152-152-155	38 39
152.0	-10 4-4 .0 149-149-152	30 4-4 .0 147-147-149	30 4-4 3.0 149-149-151	34 4-4 .8 150-150-152	36 4-4 .5 150-150-152	41 42
148.0	30 4-4 1.0 146-146-148	33 4-4 1.0 146-146-148	36 4-4 .8 148-148-150	38 4-4 .5 149-149-150	40 4-4 .1 148-148-150	44 45
144.0	34 4-4 1.0 144-144-145	37 4-4 .8 145-145-147	40 4-4 .6 147-147-148	42 4-4 .2 147-147-148	43 4-4 .8 147-147-148	47 48
140.0	38 4-4 .9 143-143-144	41 4-4 .7 144-144-145	44 4-4 .3 145-145-146	45 4-4 .9 145-145-146	47 4-4 .4 145-145-146	50 51
136.0	42 4-4 .9 142-142-143	45 4-4 .5 143-143-144	47 4-4 1.0 143-143-144	49 4-4 .6 143-143-144	51 4-4 .2 143-143-144	53 54
132.0	46 4-4 .8 140-140-141	49 4-4 .5 141-141-142	52 4-4 .1 141-141-141	53 4-4 .7 142-142-142	55 4-4 .3 143-143-143	55 55
128.0	51 4-4 .0 138-138-139	53 4-4 .7 139-139-139	56 4-4 .3 139-139-140	57 4-4 .9 141-141-141	59 4-4 .4 142-142-142	55 55
124.0	55 4-4 .4 136-136-137	58 4-4 .1 136-136-137	60 4-4 .5 139-139-139	61 4-4 1.0 140-140-140	61 4-4 2.5 141-141-141	55 55
120.0	59 4-4 .9 134-134-135	61 4-4 1.4 135-135-136	61 4-4 3.6 . 139-139-139	61 4 .0 123-123-123	61 .0 120-122-123	55 55
116.0	61 4-4 3.1 134-134-134	61 .0 118-120-121	61 .0 116-120-121	61 .0 116-120-121	61 .0 116-120-121	55 55
112.0	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	61 .0 115-118-119	55 55
108.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55
104.0	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	61 .0 115-117-119	55 55

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/MINI. ACCELERATION HEIGHT :   800.(FT)  QNH ALT. :   815.(FT)
/MAXI. ACCELERATION HEIGHT :  2958.(FT)  QNH ALT. :  2973.(FT)
```

(31LBHGK4.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 1 + F

```
:LFPO PARIS-ORLY                 RWY 25       JARA 12 SEP 95 ELEV.    286.FT*CONF.*
:FOR TRAINING ONLY                                      MC69     TORA   11975.FT*  1+F*
:                                                                ASDA   11975.FT*CG25%*
:A320-231/AA/V2500      DRY RUNWAY                               TODA   12172.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=100/GRAD2= 600      *****        SLOPE    .02 % : TGA :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	-16 4-4 -.1 158-159-159	10 4-4 .1 156-158-158	30 4-4 .8 157-158-158	33 4-4 .3 162-162-162	34 4-4 .9 164-164-164	29 30
164.0	1 4-4 .0 153-156-156	28 4-4 .1 151-156-156	33 4-4 .6 158-158-158	35 4-4 .7 163-163-163	36 4-4 1.1 163-163-163	31 32
160.0	28 4-4 .1 146-153-153	29 4-4 3.9 151-156-156	37 4-4 .7 160-160-160	39 4-4 .1 161-161-161	40 4-4 .5 162-162-162	34 35
156.0	29 4-4 4.0 146-153-153	38 4-4 .5 154-154-154	41 4-4 .3 159-159-159	42 4-4 .6 160-160-160	43 4-4 .9 162-162-162	37 38
152.0	39 4-4 .0 149-151-151	42 4-4 .6 156-156-156	44 4-4 .7 158-158-158	45 4-4 1.0 160-160-160	47 4-4 .1 160-160-160	40 41
148.0	43 4-4 .5 151-151-151	46 4-4 .0 155-155-155	48 4-4 .0 157-157-157	49 4-4 .4 158-158-158	50 4-4 .7 159-159-159	43 44
144.0	47 4-4 .5 153-153-153	49 4-4 .7 154-154-154	51 4-4 .8 156-156-156	53 4-4 .1 156-156-156	54 4-4 .4 157-157-157	46 47
140.0	51 4-4 .3 151-151-151	53 4-4 .5 153-153-153	55 4-4 .6 154-154-154	56 4-4 .9 155-155-155	58 4-4 .0 154-154-154	49 50
136.0	55 4-4 .2 149-149-149	57 4-4 .3 152-152-152	59 4-4 .3 152-152-152	60 4-4 .6 152-152-152	60 4-4 1.8 153-153-153	52 53
132.0	59 4-4 .1 148-148-148	60 4-4 1.2 150-150-150	60 4-4 3.3 152-152-152	60 4 .0 139-139-139	60 2 .0 137-138-138	54 54
128.0	60 4-4 3.1 148-148-148	60 4 .0 135-135-135	60 .0 132-133-133	60 .0 125-133-133	60 .0 124-133-133	54 54
124.0	60 .0 125-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	54 54
120.0	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	54 54
116.0	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	54 54
112.0	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	54 54
108.0	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	54 54
104.0	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	54 54

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/MINI. ACCELERATION HEIGHT :    936.(FT)   QNH ALT. :   1222.(FT)
/MAXI. ACCELERATION HEIGHT :   2346.(FT)   QNH ALT. :   2632.(FT)
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(31LBORY1.PCX)

PARIS ORLY (LFPO) - RWY 25 - CONF 2

```
:LFPO PARIS-ORLY              RWY 25       JARA 12 SEP 95 ELEV.    286.FT*CONF.*
:FOR TRAINING ONLY                                   MC69  TORA  11975.FT*  2  *
:                                                          ASDA  11975.FT*CG25%*
:A320-231/AA/V2500       DRY RUNWAY                        TODA  12172.FT*******
:-------TREF= 29/TMAX= 54  GRAD1= 90/GRAD2= 600    *****   SLOPE   .02 % : TGA :
:WEIGHT:------------------------------------------------------------------:  2  :
:1000LB:     -10      :      -5      :       0      :      10      :      20      :  3  :
```

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 / 3
166.5	-16 4-4 -.9 158-158-161	8 4-4 .0 156-156-159	30 4-4 .9 156-156-159	32 4-4 .6 159-159-162	33 4-4 1.1 160-160-163	29 30
164.0	-1 4-4 .0 153-154-156	29 4-4 .2 151-153-155	33 4-4 .3 157-157-160	34 4-4 .8 159-159-161	36 4-4 .0 158-158-161	31 32
160.0	29 4-4 .2 146-149-151	34 4-4 .0 152-152-154	36 4-4 .8 157-157-159	38 4-4 .1 157-157-159	39 4-4 .4 157-157-159	34 35
156.0	34 4-4 .3 147-149-151	37 4-4 1.0 154-154-156	40 4-4 .1 155-155-157	41 4-4 .4 155-155-157	42 4-4 .7 155-155-157	37 38
152.0	38 4-4 .8 149-149-151	41 4-4 .5 153-153-155	43 4-4 .5 154-154-155	44 4-4 .8 154-154-155	45 4-4 1.0 154-154-156	40 41
148.0	42 4-4 .8 151-151-153	44 4-4 1.0 152-152-153	46 4-4 .9 152-152-153	47 4-4 1.2 152-152-154	49 4-4 .2 153-153-154	43 44
144.0	46 4-4 .3 150-150-151	48 4-4 .4 150-150-151	50 4-4 .4 150-150-151	51 4-4 .7 151-151-152	52 4-4 .9 152-152-153	46 47
140.0	49 4-4 1.0 148-148-149	52 4-4 .1 148-148-149	54 4-4 .1 148-148-149	55 4-4 .4 150-150-150	56 4-4 .6 151-151-152	49 50
136.0	53 4-4 .9 146-146-147	55 4-4 1.0 146-146-147	57 4-4 .9 147-147-148	59 4-4 .1 149-149-149	60 4-4 .2 149-149-149	52 53
132.0	57 4-4 .8 144-144-145	59 4-4 .9 144-144-145	60 4-4 1.8 147-147-147	60 4-4 3.0 148-148-148	60 .0 137-138-138	54 54
128.0	60 4-4 1.8 143-143-143	60 4-4 3.8 144-144-144	60 4 .0 132-132-133	60 4 .0 131-131-132	60 2 .0 126-131-131	54 54
124.0	60 4 .0 129-129-129	60 4 .0 127-127-128	60 4 .0 126-126-126	60 2 .0 124-125-125	60 2 .0 118-125-125	54 54
120.0	60 4 .0 122-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	54 54
116.0	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	54 54
112.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
108.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
104.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54

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/MINI. ACCELERATION HEIGHT :    936.(FT)  QNH ALT. :   1222.(FT)
/MAXI. ACCELERATION HEIGHT :   2263.(FT)  QNH ALT. :   2549.(FT)
```

(31LBORY2.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 1 + F

:LFPO PARIS-ORLY RWY 26 JARA 12 SEP 95 ELEV. 285.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 10892.FT* 1+F*
: ASDA 10892.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11942.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=110/GRAD2= 600 ***** SLOPE -.07 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	6 4-4 .1 149-154-154	30 4-4 .1 149-153-153	34 2-4 .5 156-158-158	36 2-4 .7 161-161-161	37 2-4 1.1 164-164-164	29 30
164.0	23 4-4 .0 145-152-152	33 4-4 .1 150-153-153	37 2-4 .2 157-158-158	38 2-4 1.1 161-161-161	40 2-4 .1 164-164-164	31 32
160.0	29 4-4 3.1 144-152-152	37 4-4 .7 152-154-154	41 2-4 .2 158-158-158	42 2-4 .5 161-161-161	43 2-4 .1 164-164-164	34 35
156.0	37 4-4 .8 146-153-153	42 4-4 .3 154-154-154	44 2-4 .7 157-157-157	45 2-4 .9 160-160-160	45 2-2 1.3 163-163-163	37 38
152.0	42 4-4 .7 148-150-150	46 4-4 .0 154-154-154	48 2-4 .0 156-156-156	48 2-4 1.1 160-160-160	49 2-2 .1 159-160-160	40 41
148.0	47 4-4 .3 151-151-151	49 4-4 .7 153-153-153	51 2-4 .7 155-155-155	52 2-4 .5 158-159-159	52 2-2 .5 157-159-159	43 44
144.0	51 4-4 .3 150-150-150	53 4-4 .4 151-151-151	55 2-4 .4 154-154-154	55 2-2 1.0 157-157-157	55 2-2 1.0 155-157-157	46 47
140.0	55 4-4 .1 148-148-148	57 4-4 .1 149-149-149	59 2-4 .0 152-152-152	59 2-2 .3 154-154-154	59 2-2 .3 152-154-154	49 50
136.0	58 4-4 .9 147-147-147	60 4-4 1.0 148-148-148	60 2-4 2.9 152-152-152	60 2-2 3.1 153-154-154	60 2-2 3.1 151-154-154	52 53
132.0	60 4-4 2.9 146-146-146	60 2 .0 137-138-138	60 2 .0 129-138-138	60 2 .0 128-138-138	60 2 .0 128-138-138	54 54
128.0	60 .0 130-133-133	60 .0 124-133-133	60 .0 124-133-133	60 .0 124-133-133	60 .0 124-133-133	54 54
124.0	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	60 .0 122-131-131	54 54
120.0	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	60 .0 121-129-129	54 54
116.0	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	60 .0 120-126-126	54 54
112.0	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	60 .0 119-124-124	54 54
108.0	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	60 .0 118-122-122	54 54
104.0	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	60 .0 116-119-120	54 54

/MINI. ACCELERATION HEIGHT : 927.(FT) QNH ALT. : 1212.(FT)
/MAXI. ACCELERATION HEIGHT : 2039.(FT) QNH ALT. : 2324.(FT)

(31LBORY3.PCX)

PARIS ORLY (LFPO) - RWY 26 - CONF 2

:LFPO PARIS-ORLY RWY 26 JARA 12 SEP 95 ELEV. 285.FT*CONF.*
:FOR TRAINING ONLY MC69 TORA 10892.FT* 2 *
: ASDA 10892.FT*CG25%*
:A320-231/AA/V2500 DRY RUNWAY TODA 11942.FT*******
:-------TREF= 29/TMAX= 54 GRAD1=100/GRAD2= 600 ***** SLOPE -.07 % : TGA :

WEIGHT 1000LB	-10	-5	0	10	20	TGA 2 3
166.5	8 4-4 .0 148-152-154	30 4-4 .7 149-151-154	34 2-4 .5 155-156-159	36 2-4 .0 159-159-162	36 2-4 1.1 162-162-165	29 30
164.0	26 4-4 .1 144-149-151	33 4-4 .5 150-152-154	36 2-4 1.0 156-156-159	38 2-4 .1 159-159-161	38 2-4 1.1 161-162-164	31 32
160.0	29 4-4 3.7 143-148-150	37 4-4 .8 151-152-154	40 2-4 .3 156-156-158	41 2-4 .4 158-158-161	41 2-2 1.1 159-160-162	34 35
156.0	38 4-4 .2 147-149-150	41 4-4 .8 152-152-154	43 2-4 .7 155-155-157	44 2-4 .6 157-157-159	44 2-2 .9 157-158-160	37 38
152.0	42 4-4 .6 148-149-150	45 4-4 .0 151-151-152	46 2-4 1.1 154-154-156	47 2-4 .8 156-156-158	47 2-2 .9 155-156-158	40 41
148.0	46 4-4 .5 149-149-150	48 4-4 .5 150-150-151	50 2-4 .4 153-153-154	50 2-2 1.2 154-155-156	50 2-2 1.2 153-155-156	43 44
144.0	50 4-4 .0 147-147-148	52 4-4 .2 149-149-149	53 2-4 1.0 152-152-153	54 2-2 .5 152-153-154	54 2-2 .5 150-153-154	46 47
140.0	53 4-4 .9 146-146-147	55 4-4 1.0 147-147-148	57 2-4 .6 150-150-151	57 2-2 1.0 150-151-152	57 2-2 1.0 148-151-152	49 50
136.0	57 4-4 .7 144-144-145	59 4-4 .7 146-146-146	60 2-4 1.4 149-149-149	60 2-2 1.5 148-149-150	60 2-2 1.5 146-149-150	52 53
132.0	60 4-4 1.6 143-143-144	60 4-4 3.7 145-145-146	60 2 .0 129-137-138	60 2 .0 127-137-138	60 2 .0 127-137-138	54 54
128.0	60 4 .0 132-132-132	60 2 .0 127-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	60 2 .0 121-131-131	54 54
124.0	60 4 .0 125-125-126	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	60 2 .0 118-125-125	54 54
120.0	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	60 .0 117-122-123	54 54
116.0	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	60 .0 116-120-121	54 54
112.0	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	60 .0 115-118-119	54 54
108.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54
104.0	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	60 .0 115-117-119	54 54

/MINI. ACCELERATION HEIGHT : 927.(FT) QNH ALT. : 1212.(FT)
/MAXI. ACCELERATION HEIGHT : 2110.(FT) QNH ALT. : 2395.(FT)

(31LBORY4.PCX)

CHAPTER 05

- MASTER MINIMUM EQUIPMENT LIST -

CHAP 05

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This extract of the Airbus MMEL (Master Minimum Equipment List) is to be used for training purposes only.

It includes the pages which may be consulted during sessions and LOFT to familiarize trainees with MMEL presentation and use.

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A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST MMEL PRESENTATION		

PREAMBLE

OBJECTIVES

An airplane is being type certificated with all required equipments in operating conditions. If deviations from this type certificated configuration and equipment required by the operating rules were not permitted, the aircraft could not be flown in revenue service unless such equipment was operable.
Experience has proven that the operation of every system or component installed on the aircraft is not necessary, in specific conditions and during limited period, when the remaining instruments and equipment provide an acceptable level of safety. Therefore, certain conditional deviations from the original requirement are authorized to permit continued or uninterrupted operation of the aircraft in revenue flight : they are published in the MINIMUM EQUIPMENT LIST (MEL) related to applicable regulations specific operations or airlines particular definitions.

TO FACILITATE THE PREPARATION OF MINIMUM EQUIPMENT LIST FOR OPERATIONS THE MANUFACTURER PROPOSES A MASTER MINIMUM EQUIPMENT LIST (MMEL) FOR APPROVAL TO THE DGAC.

THIS MMEL IS THE REGULAR BASIS ALLOWING OPERATORS TO UTILIZE THE AIRCRAFT WHEN SOME SYSTEMS OR COMPONENTS ARE INOPERATIVE, IN SPECIFIED CONDITIONS AND FOR A LIMITED PERIOD OF TIME, UNDER THE CONDITION THAT AN ACCEPTABLE SAFETY LEVEL BE MAINTAINED BY APPROPRIATE DESIGN REDUNDANCIES, PROCEDURES AND LIMITATIONS.

THIS MMEL CANNOT IN ANY CASE BE USED AS A MEL, DUE TO THE FACT THAT IT IS NOT RELATED TO OPERATIONAL REQUIREMENTS, SPECIFIC OPERATIONS OR AIRLINES PARTICULAR DEFINITIONS.

PRINCIPLES

For the sake of brevity, the MEL does not include obviously required items such as wings, control surfaces, engines, landing gear, etc... or items which do not affect the airworthiness of the aircraft such as galley equipment, entertainment systems, passenger convenience items, etc...

THUS, ALL ITEMS WHICH ARE RELATED TO THE AIRWORTHINESS OF THE AIRCRAFT AND NOT INCLUDED IN THE LIST ARE AUTOMATICALLY REQUIRED TO BE OPERATIVE FOR EACH FLIGHT.

(EMMEL01.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST MMEL PRESENTATION	

UNLESS OTHERWISE SPECIFIED IN THE EXCEPTIONS COLUMN, the MMEL does not define "where or when" an inoperative item is to be repaired or replaced but rather indicates those instruments and items of equipment that may be inoperative for certain flight conditions, with the intent that no revenue flight can take off from an airport with inoperative equipment other than that specified.

The failure of instruments or items of equipment in excess of those allowed to be inoperative by the MEL causes the aircraft to be unairworthy. The MEL makes no distinction between what is required for the flight between origin and destination (including the intermediate stops) and what is required for a flight beyond the scheduled arrival point.

However, as MEL is intended to provide for continued operation of the aircraft for a limited period with inoperative equipments, it is important that the operator make repairs at the first airport where repairs or replacements reasonably may be made, since additional malfunctions may require the aircraft to be taken out of service.

MEL utilization implies that the aircraft is operated within the framework of a controlled and sound program of repairs and parts replacement.

Air carriers are responsible for exercising the necessary operational control to assure that no aircraft is dispatched or flown with one or more MEL item inoperative for an indefinite period and without first determining that any interface or interrelationship between inoperative systems or components will not result in a degradation in the level of safety and/or an undue increase in crew workload.

The exposure to additional failures during operation with failed inoperative systems or components must also be considered to determine that an acceptable level of safety is being maintained.

This MMEL may not deviate from requirements of the flight manual limitations section, emergency procedures, or airworthiness directives, unless the flight manual or airworthiness directive provides otherwise.

HANDLING OF ECAM MAINTENANCE STATUS

At the head of each ATA chapter of this MMEL, the related MAINT STS message(s) on ECAM is (are) listed with the indication of the associated dispatch status.

MAINT STS indicate the presence of a category of failure which can only be identified by the interrogation of CFDS.

Operators must implement procedures to manage MAINT STS and associated maintenance messages, to handle faults recording and repair within 10 days. The 10 days limitation does not apply to the following messages : DAR, DMU, QAR. It is left to the operator to define the role devoted to flight crew and/or maintenance personnel in these procedures, however guidelines given in 01-00 p 6 can be used.

(EMMEL02.PCX)

CAT2, CAT3 SINGLE, CAT3 DUAL AUTOMATIC APPROACH AND LANDING

- Required equipment are listed in AFM 4.03.00 page 8, and FCOM 4.05.70.
- Equipment to be operative to get CAT2, CAT3 SINGLE, or CAT3 DUAL capability displayed on FMAs are also listed in FCOM 4.05.70.

The MMEL does not include these requirements, refer to AFM, and FCOM.

REDUCED VERTICAL SEPARATION MINIMUM (RVSM)

Minimum equipment/functions required to begin RVSM operations are listed in AFM 4.03.00 page 11 and FCOM 2.04.50 page 1.
The MMEL does not include these requirements, refer to AFM and FCOM.

(EMMEL03.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST MMEL PRESENTATION	

GENERAL

A "R" in the margin indicates a change, addition or deletion in the adjacent text for the current revision of that page only. The "R" is dropped at the next revision of that page.

NML5-01-0100-001-A001AA

1. SYSTEM AND SEQUENCE NUMBERS ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH	4. REMARKS OR EXCEPTIONS

COLUMN 1 : "ITEM"

It lists the equipment, components, systems or functions, for which dispatch conditions apply.
System numbers are based on Air Transport Association (ATA) specification number 100.
"(If Installed)" in the ITEM column indicates that the listed item is not applicable to all models or configurations. This does not imply that the airplane may be operated, in accordance with the MMEL, with the item removed.

Note : *One single computer may include several functions. The corresponding MMEL entry is either the computer itself if fully inoperative or each function separately. If several functions are inoperative, reference must be made to each one.*

COLUMN 2 : "NUMBER INSTALLED"

It indicates, for a given item, the quantity of equipment, components, systems or functions, installed on the airplane.
This quantity reflects the airplane type certificated configuration and, therefore required for all flight conditions, unless otherwise indicated in column 3 in conjunction with exceptions or remarks listed in column 4, if necessary.
"Dash" symbol indicates that a variable quantity is installed.
No indication (blank indication) is associated with the wording "as required by regulations" in column 4 (if any)

(EMMEL04.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST MMEL PRESENTATION	

COLUMN 3 : "NUMBER REQUIRED FOR DISPATCH"

It indicates, for a given item, the minimum quantity of equipment, components, systems or functions which must be operative for dispatch, under the conditions listed in column 4 (if any).
"Dash" symbol indicates that a variable quantity is required for dispatch.
No indication (blank indication) is associated with the wording "As required by regulations" in column 4.
It indicates that the number required for dispatch is not known since depending on local regulations.

COLUMN 4 : "REMARKS OR EXCEPTIONS"

* Asterisk requires inoperative equipment, component, system or function to be placarded in the cockpit to inform crewmembers of the equipment condition. Unless otherwise specified herein, placard wording and location will be determined by the operator.
(o) Symbol identifies a crew operational procedure
(m) Symbol indicates a requirement for a specific maintenance procedure which must be accomplished prior to operation with the listed item inoperative. Normally these procedures are accomplished by maintenance personnel ; however, if approved by national authorities, other personnel may be qualified and authorized to perform certain functions. Procedures requiring specialized knowledge or skill, or requiring the use of tools or test equipment should be accomplished by maintenance personnel.
The sastifactory accomplishment of all maintenance procedures, regardless who performs them, is the responsibility of the operator.

<u>Note</u> : *Both symbols (o) and (m) used singularly, or in combination, require the appropriate procedures to be established, published, and complied with, if flight is accomplished with one item inoperative.*

Different possibilities may be considered for an item. They will be identified by a), b), c)...
Within one possibility, different conditions may be required.
They will be identified by 1), 2), 3)...
References given in column 4 (ex : Refer to 21-23) are to bring attention to certain interrelationships between the subject item and other MMEL items.
These references are intended to assist with compliance, but do not relieve the operator of responsibility for determining such interrelationships, as stated in the preamble.
<u>"Note"</u> in column 4 indicates additional information and references for crewmember or maintenance consideration. Notes are not a part of the provisos.

(EMMEL05.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST MMEL PRESENTATION	

DEFINITIONS

1) "Inoperative" means a listed item of equipment is unserviceable or malfunctioning to the extent that it does not accomplish its intended purpose, or is not consistently functioning within its designed operating limits or tolerances.
Some systems have been designed to be fault tolerant and are monitored by digital computers which transmit fault messages to the CFDS. The presence of this category of fault messages does not mean that the system is inoperative.

2) The Centralized Fault Display System (CFDS) indicates the identity of faulty system for maintenance purpose and is not required for dispatch of the aircraft.

3) "VMC" (Visual Meteorological Conditions) – Under IFR or VFR the crew must maintain Visual Meteorological conditions.

4) "Icing Conditions" means an atmospheric environment that may cause ice to form on the airplane or powerplant.

5) "As required by regulations" means that the listed item must comply with applicable operational regulations.

6) "ER" refers to operations according to "Extended Range operations of two engine airplanes" requirements.

7) "Days" – Some items have a time interval given in the remarks column of the MMEL. Except if otherwise specified, "days" must be considered as "calendar days" excluding the calendar day the malfunction was recorded.

(EMMEL06.PCX)

Generally, information provided by means of Temporary Revisions are incorporated in the next normal revision.
In certain remote cases, some Temporary Revisions must remain in the manual even after incorporation of later normal revisions (provisional informations which will never be incorporated in the manual, for example).
They are numbered with index letter Z (ex : 01-52/01Z ISSUE 01)
Cancellation of such Temporary Revisions is indicated by :
- either the "LETTER OF TRANSMITTAL" of a normal revision, or
- the "FILING INSTRUCTIONS – TEMPORARY REVISIONS" when a Temporary Revision is superseded by a new Temporary Revision.

DEFINITIONS OF NOTES LEVEL USED IN SECTION 01

GENERAL

To avoid difficulties to know the applicability of a "NOTE" related with either a single item or a group of items, or a part of an item, in the section 01 of the MMEL, three levels have been defined, as explained below.

NOTE LEVEL 1

21-31 PRESSURE CONTROL AND MONITORING				**— NOTE —** ***The whole pressurization system may be inoperative for a non-pressurized flight. Refer to FCOM.***
31-01 Automatic Cabin Pressure Control System	2	1	(o)	One may be inoperative provided cabin pressure indications are available on ECAM in manual mode.
31-02 Cabin Pressure Manual Control System	1	1		

Written in bold italics characters and delimitated by two bold lines the upper of which contains the title NOTE (see the example above), this note is applicable to all items listed below and related with the associated system or subsystem.

(EMMEL07.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	GENERAL ORGANIZATION OF THE MANUAL	

NOTE LEVEL 2

20-02 Cabin signs (No Smoking/Fasten Seat Belt)				*— NOTE —* *AUTO function may be inoperative.*
	–	–	*	a) One or more signs may be inoperative and passengers may be carried provided : 1) Passenger Address system is operative, can be clearly heard throughout the cabin during the flight, and is used to alert the cabin attendants when seat belts should be fastened and smoking is prohibited, and 2) Call and cabin interphone systems are operative - or -
			*	b) No seat may be occupied from which a passenger cannot see a readily legible "No Smoking/Fasten Seat Belt" sign, and that seat must be blocked.

Written in normal italics characters and delimitated by two lines the upper of which contains the title NOTE (see the example above), this note is applicable to all remarks or exceptions, in column 4, related with a specific item.

(EMMEL08.PCX)

NOTE LEVEL 3

44-01 Stabilizer actuator electrical motor	**3**	**2**	**a) Motor 3 may be inoperative,** **- or -** **b) Except for ER operations motor 2 may be inoperative.** ***Note : With motor 2 inoperative, ELAC 1 pitch channel is inoperative. Refer to 27-93-01.***

Written in normal italics characters and located below a specific remark or exception, in column 4, (see the example above) this note is applicable only to that specific remark or exception associated with a given item.

HOW TO INSERT A REVISION

FILING INSTRUCTIONS

Use the filing instructions as follows :

REMOVE :

The page must be removed. It may be replaced by a new page if associated with an INSERT instruction. If not, the page is cancelled.

INSERT :

The page must be inserted. If not associated with a REMOVE instruction, the page is new for the operator fleet and does not replace an existing one.

The column NOTE indicates EFECTIVITY CHANGE ONLY if the page is revised due to an effectivity change and not due to technical content.

LIST OF EFFECTIVE PAGES (LEP)

The manual after revision must comply with the LEP, which lists all the pages that are in the manual. The new pages are indicated by N and the revised pages by R.

Two additional documents are available :

- the "Letter of Transmittal" which gives some additional general instructions, if necessary.
- the "Highlights" which gives a short explanation on the technical changes for revised pages, and indicates the validation criteria added (removed) for new pages.

(EMMEL09.PCX)

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A319/320/321
MASTER MINIMUM EQUIPMENT LIST

MASTER MINIMUM EQUIPMENT LIST
AIR CONDITIONING

1. SYSTEM AND SEQUENCE NUMBERS / ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH		4. REMARKS OR EXCEPTIONS
21-52 AIR COOLING SYSTEM				
52-01 Air conditioning pack	2	1	*(o)	a) Except for ER operations, one may be inoperative provided : 1) flight altitude is limited to 31000 ft, and 2) ECAM warning ZONE REGUL FAULT is not present, and 3) affected pack pb sw is set at OFF and pack valve is checked closed on ECAM - or -
	2	2	(o)	b) One may be operated on heat exchanger cooling only (air cycle machine failure) provided 1) corresponding pack controller is fully operational and 2) TAT indication is available, and 3) the affected pack is not operated until airborne and the TAT is less than 12° C, and 4) affected PACK OUTLET TEMP indication is available - or -
	2	0		c) Except for ER operations both may be inoperative for a non-pressurized flight Refer to FCOM
52-02 Air cond pack ram air inlet flap	2	0	(m)	a) One or both may be inoperative in open position provided they are not loose
	2	0		b) One or both may be inoperative in closed position provided the associated pack(s) is (are) considered inoperative. Refer to 21-52-01

(EMMEL10.PCX)

21-52 AIR COOLING SYSTEM

52-01 Air conditioning pack

a)
During cockpit preparation :
PACK FLOW . . . . HI

In flight :

If BLOWER and EXTRACT pb sw are set at OVRD, cabin altitude may reach about 9700 ft (EXCESS CAB ALT warning may occur).

b)
Operate the pack in "heat exchanger cooling only" configuration at TAT equal or less than 12°C. If the non affected pack fails, limit the altitude at 31000 ft and check that pack outlet temperature is not too high to obtain correct conditioning of zones.
If temperature is too high close air conditioning pack at the end of descent before landing.

21-61 PACK TEMPERATURE CONTROL

61-01 Pack controller primary channel

- If primary channel is failed pack flow is fixed at the value reached at the time of failure.
- If primary and secondary channels are failed the pack outlet temperature is controlled by the anti-ice valve to a nominal value of 15°C.

(EMMEL10A.PCX)

A319/320/321
MASTER MINIMUM EQUIPMENT LIST

ECAM WARNINGS / MMEL ENTRY

AIR CONDITIONING

ECAM WARNING	DISPATCH CONDITION	REMARK
AIR		
PACK 1 (2) FAULT or OVHT or OFF	Refer to MMEL 21-52-01	
PACK 1 + 2 FAULT	Refer to FCOM 2-04-20	
PACK 1 (2) REGUL FAULT	Refer to MMEL 21-61-01	
FWD CRG VENT FAULT (if installed)	Refer to MMEL 21-28-01	
AFT CRG VENT FAULT (If Installed)	Refer to MMEL 21-28-04	
COND		
CKPT (FWD CAB) (AFT CAB) (FWD CRG) (If Installed) DUCT OVHT	Refer to MMEL 21-63-02	
AFT CRG DUCT OVHT (If Installed)	Refer to MMEL 21-43-02	
HOT AIR FAULT	Refer to MMEL 21-63-03 and	If TRIM AIR SYS FAULT warning not present
	Refer to MMEL 21-43-01 and	If FWD cargo heating installed
	Refer to MMEL 21-43-02	If AFT cargo heating installed
	Refer to MMEL 21-63-02	If TRIM AIR SYS FAULT warning present
TRIM AIR SYS FAULT		Note : If trim air valves are closed when this warning is triggered, it can be disregarded.
	Refer to MMEL 21-63-02, or	AFT CAB/FWD CAB/CKPT TRIM VALVE message displayed on ECAM
	Refer to MMEL 21-63-03 and Refer to MMEL 21-43-01	TRIM AIR HI PR message displayed on ECAM
ZONE REGUL FAULT	Refer to MMEL 21-63-01, a) and Refer to MMEL 21-43-01, or	If the message CAB ZONE AT FIXED TEMPERATURE is displayed
	Refer to MMEL 21-63-01, c) and Refer to MMEL 21-43-01	If the message PACKS AT FIXED TEMPERATURE is displayed
L + R CAB FAN FAULT	Refer to MMEL 21-21-01	
LAV + GALLEY FAN FAULT	Refer to MMEL 21-23-01	
FWD CRG ISOL VALVE (If Installed)	Refer to MMEL 21-28-02	
AFT CRG ISOL VALVE (If Installed)	Refer to MMEL 21-28-05	
FWD CRG HEAT FAULT (If Installed)	Refer to MMEL 21-43-01	
AFT CRG HEAT FAULT (If Installed)	Refer to MMEL 21-43-02	

(EMMEL10B.PCX)

A319/320/321
MASTER MINIMUM EQUIPMENT LIST

MASTER MINIMUM EQUIPMENT LIST
FLIGHT CONTROLS

1. SYSTEM AND SEQUENCE NUMBERS / ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH	4. REMARKS OR EXCEPTIONS
27-93 ELEVATOR AILERON COMPUTER (ELAC)			
93-01 ELAC	2	1	***(o)(m)** Except for ER operations, ELAC 1 or any ELAC 1 function may be inoperative provided : 1) Both accelerometers associated with ELAC 2 are operative, and 2) All sidesticks transducers associated with ELAC 2 and the three SEC's are operative, and 3) All SEC, SFCC, LGCIU, RA, ADIRS and FAC are operative, and 4) All roll spoilers (surfaces 2, 3, 4 and 5) are operative, and 5) TR 1 and TR 2 are operative, and 6) DC TIE contactor 1 is checked closed. *Note : Except if ELAC pitch channel is failed, LAF is in degraded mode. Refer to 27-64-02.*
93-02 ELAC FAULT light	2	1	*
93-03 ELAC indication on ECAM flight control page	2	0	
93-04 Pitch normal law	1	1	

(EMMEL11.PCX)

D) Surfaces 1 and 2

SEC 3 . . . . OFF
C/B FLIGHT CONTROLS/SEC3/SPLY (121 VU Q19) . . . . PULL
Performance penalty with two pairs of ground spoilers inoperative :

Takeoff Performance

Method

The method explained hereafter allows the determination of the MTOW and associated speeds (V1, VR, V2), by applying decrements on the MTOW and associated speeds computed in normal conditions.
The method is based on the use of RTOW charts established at optimum V2/VS, optimum V1/VR, minimum V1. It should not be used with takeoff charts computed with other conditions.
This method is not applicable with tailwind.

Note : *The MTOW and associated speeds (V1, VR, V2) determined by this method may be retained for takeoff on wet runways provided all thrust reversers are operative, and used.*
Takeoff with present failure case and one or more thrust reversers inoperative is not recommended on wet runway.

How to proceed ?

- Read, in 0 kt wind column of the takeoff chart computed in normal condition, the MTOW and associated speeds (V1, VR, V2) corresponding to the actual temperature, even in case of headwind (the method does not take into account the headwind benefit on takeoff performance).
- Apply the QNH and/or bleed corrections, if any, to determine the MTOW.
- Enter the following tables to determine the MTOW and speed decrements.
- Applying these decrements, calculate the MTOW and associated speeds corresponding to the actual temperature.

  Note : *If the actual TOW determined in normal conditions (without failure) is lower than the MTOW calculated using above method, the speeds associated with the actual TOW may be retained provided they are all lower than the speeds calculated using above method.*

- Perform the takeoff using full thrust.

  Note : *Do not extrapolate below the shortest runway lenght provided by the tables.*

(EMMEL11A.PCX)

DECREMENTS (ΔW, ΔV1, ΔVR, ΔV2) WHEN TWO PAIRS OF SPOILERS ARE INOPERATIVE												
RUNWAY LENGTH (m)	CONFIGURATION											
	1 + F				2				3			
	ΔW kg/lb (×1,000)	ΔV1 kt	ΔVR kt	ΔV2 kt	ΔW kg/lb (×1,000)	ΔV1 kt	ΔVR kt	ΔV2 kt	ΔW kg/lb (×1,000)	ΔV1 kt	ΔVR kt	ΔV2 kt
1500	2.0/4.4	2	0	0	2.0/4.4	2	0	0	2.0/4.4	2	0	0
2000	1.0/2.2	2	1	1	1.0/2.2	2	1	1	1.0/2.2	3	2	2
2500	1.0/2.2	2	1	1	1.0/2.2	2	1	1	1.0/2.2	2	1	1
3000	1.0/2.2	2	2	2	1.0/2.2	2	1	1	0.5/1.1	2	2	2
3500	1.0/2.2	6	4	4	0.5/1.1	6	4	4	0.5/1.1	1	1	1
4000 and above	0.5/1.1	4	2	2	0.5/1.1	1	1	1	0.5/1.1	0	0	0

Note :

1) Check that the corrected V1 is above the minimum V1 value shown on the RTOW chart (due to VMCG limitation). If the corrected V1 is lower than minimum V1, take this last value as V1, and further decrease the weight by 2,000 kg (4,410 lb) per kt difference between both values.

2) Check that the corrected VR is above the minimum VR value shown on the RTOW chart (due to VMCA limitation). If the corrected VR is lower than minimum VR, takeoff is not possible.

3) Check that the corrected V2 is above the minimum V2 value shown on the RTOW chart (due to VMCA limitation). If the corrected V2 is lower than minimum V2, takeoff is not possible.

4) Check that the corrected V2 is above the minimum V2 due to VMU limitation (see "MINIMUM V2 LIMITED BY VMU" tables in FCOM 2.02.20). If the corrected V2 is lower than minimum V2, takeoff is not possible.

5) If the actual takeoff weight is lower than the corrected maximum takeoff weight (determined after application of the decrements) the speeds associated with the actual takeoff weight (determined in normal condition without failure) may be retained provided they are all lower than the corrected speeds determined using herabove method.

Landing Performance

Multiply the required landing distance by 1.1.

(EMMEL11B.PCX)

92-13 Spoilers/Speedbrakes indication on ECAM F/CTL and WHEEL page

During cockpit preparation :

– If surface 1 affected :
CAUTION : Aircraft must be stopped.
YELLOW ELEC PUMP . . . . ON
PTU . . . . CHECK AUTO
SPD BRK . . . . FULL
Check visually surface 1 slightly extends (approximately 6°).
YELLOW ELEC PUMP . . . . OFF

– If surface 3 affected :
BLUE ELEC PUMP . . . . CHECK AUTO
BLUE PUMP OVRD . . . . ON
Move the stick from left stop to right stop and check visually the correct movement of surface 3.
BLUE ELEC PUMP . . . . OFF then AUTO

– If surface 2, 4 or 5 affected :
YELLOW ELEC PUMP . . . . ON
PTU . . . . CHECK AUTO
Move the stick from left stop to right stop and check visually the correct movement of surfaces 2, 4 and 5.
YELLOW ELEC PUMP . . . . OFF

27-93 ELEVATOR AILERON COMPUTER (ELAC)

93-01 ELAC

Note : *In case of ELAC1 FAULT warning, after the maintenance procedure has been applied, the warning C/B TRIPPED ON R ELEC BAY and C/B TRIPPED ON OVHD PNL are triggered.*

During cockpit preparation :
1 – Check that elevator and roll spoilers control is operative through the SEC's :
YELLOW ELEC PUMP . . . . ON
PTU . . . . CHECK AUTO
BLUE ELEC PUMP . . . . CHECK AUTO
BLUE PUMP OVRD . . . . ON
ELAC 1 . . . . ON
ELAC 2 . . . . ON
SEC 1, 2 and 3 . . . . ON
After 5 seconds do the following checks :

(EMMEL11C.PCX)

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MASTER MINIMUM EQUIPMENT LIST

OPERATIONAL PROCEDURES

FLIGHT CONTROLS

. 1 a) Check elevator control through SEC 1 and spoilers control through SEC 1 and SEC 3 :

BLUE ELEC PUMP . . . . OFF then AUTO
Wait for hydraulic circuit depressurization and check on ECAM F/CTL page that blue elevator actuator symbol becomes amber.
After 5 seconds :
BLUE PUMP OVRD . . . . ON
ELAC 1 . . . . OFF
ELAC 2 . . . . OFF
SEC 2 . . . . OFF
Move the CAPT stick from right stop to left stop, then from forward stop to aft stop (each stop applied during 3 seconds). Check on ECAM F/CTL page the correct movement of spoilers 2 + 3 + 4 and the full travel of both elevators.
If an expected spoiler or elevator movement does not occur, do not attempt any reset : maintenance action is due. Perform same check from F/O Stick.

. 1 b) Check elevator control through SEC 2 and spoilers control through SEC 2 and SEC 3 :

ELAC 1 . . . . ON
ELAC 2 . . . . ON
SEC 2 . . . . ON
After 5 seconds :
YELLOW ELEC PUMP . . . . OFF
Wait for hydraulic circuits depressurization and check on ECAM F/CTL page that yellow and green elevator actuators symbols become amber.
After 5 seconds :
YELLOW ELEC PUMP . . . . ON
ELAC 1 . . . . OFF
ELAC 2 . . . . OFF
SEC 1 . . . . OFF
Move the CAPT stick from right stop to left stop, then from forward stop to aft stop (each stop applied during 3 seconds). Check on ECAM F/CTL page the correct movement of spoilers 2 + 5 and the full travel of both elevators.
If an expected spoiler or elevator movement does not occur, do not attempt any reset : maintenance action is due. Perform same check from F/O Stick.

. 1 c) Return to normal configuration :

YELLOW ELEC PUMP . . . . OFF
BLUE ELEC PUMP . . . . OFF then AUTO
ELAC 1 . . . . ON
ELAC 2 . . . . ON
SEC 1 . . . . ON
Set ELAC 1 pb sw at OFF only if required by ECAM.

(EMMEL11D.PCX)

2 – Check of DC TIE contactor 1 operation.
Aircraft supplied either by APU generator or by external power : check on ECAM ELEC page link between DC BUS 1 and DC BAT BUS.

(EMMEL11E.PCX)

A319/320/321
MASTER MINIMUM EQUIPMENT LIST

MASTER MINIMUM EQUIPMENT LIST
NAVIGATION

1. SYSTEM AND SEQUENCE NUMBERS — ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH	4. REMARKS OR EXCEPTIONS	
34-30 LANDING AND TAXIING AIDS				
34-01 Paravisual Indicator (PVI) (If Installed)	–	0		
35-01 Head up display (If Installed)	–	0		
36-01 ILS receiver	–	–		***As required by regulations***
34-40 INDEPENDENT POSITION DETERMINING				
41-01 Weather radar system	–	–		***As required by regulations***
41-02 Predictive Windshear Detection System (If Installed)				Refer to 22-66-03
42-01 Radio altimeter system	2	1	(o)	One may be inoperative provided both FCU channels, all ELAC, SEC, ADIRS, SFCC, LGCIU and FAC are operative. *Note : If radio altimeter 1 is inoperative GPWS is inoperative.* *Refer to 34-48-01.*
42-02 Automatic call-out	1	0		
43-01 TCAS (If Installed)	–	–		***As required by regulations***
48-01 GPWS	–	–		***As required by regulations***
48-02 GPWS FAULT light	–	–		***As required by regulations***

(EMMEL12.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	OPERATIONAL PROCEDURES NAVIGATION	

34-22 STANDBY ATTITUDE AND HEADING

22-01 Standby attitude indicator

During cockpit preparation :

ATT HDG sel . . . . CAPT 3
Check normal display on CAPT PFD, ND and RMI VOR
ATT HDG sel . . . . F/O 3
Check normal display on F/O PFD, ND
ATT HDG sel . . . . NORM
EIS DMC . . . . CAPT 3
Check normal display on CAPT PFD, ND
EIS DMC . . . . F/O 3
Check normal display on F/O PFD, ND
EIS DMC . . . . NORM

22-02 Standby compass

During cockpit preparation :

ATT HDG sel . . . . CAPT 3
Check normal display on CAPT PFD, ND and RMI VOR
ATT HDG sel . . . . F/O 3
Check normal display on F/O PFD, ND
ATT HDG sel . . . . NORM
EIS DMC . . . . CAPT 3
Check normal display on CAPT PFD, ND
EIS DMC . . . . F/O 3
Check normal display on F/O PFD, ND
EIS DMC . . . . NORM
CAPT PFD/ND . . . . XFR
Check that CAPT PFD and ND images are interchanged
CAPT PFD/ND . . . . XFR
F/O PFD/ND . . . . XFR
Check that F/O PFD and ND images are interchanged
F/O PFD/ND . . . . XFR

34-40 INDEPENDENT POSITION DETERMINING

42-01 Radio altimeter system

– If R/A1 inoperative.
C/B COM NAV/RAD ALTM/1 (121VU K11) . . . . PULL
– If R/A2 inoperative.
C/B COM NAV/RAD ALTM/2 (121VU K12) . . . . PULL

(EMMEL12A.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST

ECAM WARNINGS / MMEL ENTRY

NAVIGATION

ECAM WARNING	DISPATCH CONDITION	REMARK
NAV		
HDG/ATT/ALTI DISCREPANCY	Refer to MMEL 34-10-01	
ADR FAULT	Refer to MMEL 34-10-01	
IR FAULT	Refer to MMEL 34-10-01	
RA 1 (2) FAULT	Refer to MMEL 34-42-01	
ILS 1 (2) FAULT	Refer to MMEL 34-36-01	
GPWS FAULT	Refer to MMEL 34-48-01	
OVER SPEED		Not applicable
TCAS FAULT (If Installed)	Refer to MMEL 34-43-01	
PRED W/S DET FAULT (if istalled)	Refer to MMEL 34-41-02	
F/CTL		
ADR DISAGREE		Not applicable
IR DISAGREE		Not applicable

(EMMEL12B.PCX)

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MASTER MINIMUM EQUIPMENT LIST

MASTER MINIMUM EQUIPMENT LIST
AUXILIARY POWER UNIT

1. SYSTEM AND SEQUENCE NUMBERS / ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH		4. REMARKS OR EXCEPTIONS
49-00 MESSAGES DISPLAYED ON ECAM MAINT STATUS				
00-01 APU				Dispatch with this MAINT STATUS is granted.
49-10 POWER PLANT				
10-01 APU	1	0	*	**(m)** — *NOTE* — *Any of the APU equipment may be inoperative on an APU inoperative or considered to be inoperative.* May be inoperative (for ER operations, for one flight) provided : 1) Master switch is in OFF position, and 2) Procedures are not depending upon its availability, and 3) Maintenance procedure is applied in case of APU on speed autoshutdown if APU does not accelerate up to 50 % N during the first restart attempt.

(EMMEL13.PCX)

A319/320/321
MASTER MINIMUM EQUIPMENT LIST

OPERATIONAL PROCEDURES
APU

49-30 ENGINE FUEL AND CONTROL

30-01 APU fuel pump

If not required, APU may be used with the APU fuel pump inoperative. For APU start and operation, pressurize the LH fuel manifold with at least one fuel tank pump.

30-02 APU LP valve

b)
Check on ECAM FUEL page that APU LP valve is indicated closed.

(EMMEL13A.PCX)

A319/320/321 MASTER MINIMUM EQUIPMENT LIST	MASTER MINIMUM EQUIPMENT LIST STARTING	REV 21

1. SYSTEM AND SEQUENCE NUMBERS ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH	4. REMARKS OR EXCEPTIONS
80-11 PNEUMATIC STARTER AND VALVE SYSTEM			
11-01 Start valve	2	1	**(o)(m)** One may be inoperative provided the start valve is manually closed after engine start.
11-02 MAN START control	2	0	*
11-03 ENG FAULT light on pedestal	2	0	*
11-04 Start valve position indication on ECAM lower display	2	0	**(m)** One or both may be inoperative provided the start valve is checked closed after engine start.

(EMMEL14.PCX)

80-11 PNEUMATIC STARTER AND VALVE SYSTEM

11-01 Start valve

A) Valve

Engine start with start valve manual operation :

Advise ground crew to prepare for manual start valve operation
AUDIO CONTROL PANEL . . . . CAB

– When ground crew member is ready, order "START 1 or 2"
ENG MOD SEL . . . . IGN/START
MASTER sw . . . . ON
START VALVE . . . . ORDER "OPEN AND KEEP OPEN"

– When N2 at 50 % :
START AIR VALVE . . . . ORDER CLOSURE
Continue with normal procedure.

Note : Starter assisted engine relight is not possible.

(EMMEL14A.PCX)

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MASTER MINIMUM EQUIPMENT LIST

ECAM WARNINGS / MMEL ENTRY

ENGINE

ECAM WARNING	DISPATCH CONDITION	REMARK
ENG		
FUEL FILTER CLOG	NO DISPATCH, or	Actual warning
	Refer to MMEL 73-30-03	False warning
FUEL CTL FAULT	NO DISPATCH	
HP FUEL VALVE	NO DISPATCH	
REVERSER FAULT	Refer to MMEL 78-30-01	
REV PRESSURIZED	NO DISPATCH	
REV SWITCH FAULT	Refer to MMEL 78-30-08	
REVERSE UNLOCKED	NO DISPATCH	
EIU FAULT	NO DISPATCH	
OIL FILTER CLOG	NO DISPATCH	
OIL LO PR	NO DISPATCH, or	Actual warning
	Refer to MMEL 79-33-02	False warning
OIL HI TEMP	NO DISPATCH	
N1/N2/EGT OVERLIMIT		Not applicable
N1/N2/EGT/FF DISCREPANCY	NO DISPATCH	
LOW N1	NO DISPATCH	
START VALVE FAULT	Refer to MMEL 80-11-01	
START FAULT	NO DISPATCH	
ENG DUAL FAILURE		Not applicable
ENG FAIL		Not applicable
After ENG SHUT DOWN		Not applicable
ONE TLA FAULT	Refer to MMEL 76-11-01	
THR LEVER FAULT	NO DISPATCH	
THR LEVER DISAGREE	NO DISPATCH	
IGN FAULT	Refer to MMEL 74-31-01, or	Actual warning
	Refer to MMEL 74-31-03	False warning
FLEX TEMP NOT SET	Refer to MMEL 73-20-05	
ENG STALL		Not applicable
COMPRESSOR VANE	NO DISPATCH	
OVSPD PROT FAULT	NO DISPATCH	
CTL VALVE FAULT	NO DISPATCH, or	If HPTC or RACC valve(s) affected
	Refer to MMEL 73-11-02	If BSV(s) affected
SENSOR/PROBES FAULT	NO DISPATCH	

(EMMEL15.PCX)

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