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Table of Contents

AIR TRAFFIC CONTROL POSITIONS	3
VISUAL RANGES	4
COMMUNICATION	4
METEOROLOGY	5
TYPES OF AIRSPACE	6
SEPARATION METHODS AND MINIMA	9
LONGITUDINAL SEPARATION	10
LONGITUDINAL SEPARATION MINIMA WITH MACH NUMBER TECHNIQUE BASED ON TIME	11
WAKE TURBULENCE CATEGORIES	12
TIME-BASED WAKE TURBULENCE LONGITUDINAL SEPARATION MINIMA	12
DISTANCE-BASED WAKE TURBULENCE SEPARATION MINIMA	16
ESSENTIAL TRAFFIC INFORMATION	16

AIR TRAFFIC CONTROL POSITIONS

Clearance Delivery (DEL)

Delivery, normally responsible for delivery of start-up and ATC clearances to departing IFR flights.

Ground (GND)

Ground controller, normally responsible for traffic on the manoeuvring area with the exception of runways. Where parallel or near-parallel runways are used for simultaneous operations, individual aerodrome controllers should be responsible for operations on each of the runways.

Tower (TWR)

Aerodrome controller, normally responsible for operations on the runway and aircraft flying within the area of responsibility of the aerodrome control tower.

Departure Control (DEP)

Departure Control is responsible for ensuring separation between departures once they are handed over from TWR.

Approach Control (APP)

A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

Area Control Center (ACC)

A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Flight Information Centre (FIS)

A unit established to provide flight information service and alerting service.

VISUAL RANGES

The VATSIM community relies on a network of computers interlinked to provide position updates to controllers and pilots alike. The network is donated by third parties. In an effort to avoid any wasting of bandwidth the following Maximum ranges have been imposed.

Position	Maximum Allowed Range
DEL/GND	20 nm
TWR	50 nm
APP/DEP	150 nm
CTR	600 nm
FSS	1500 nm

COMMUNICATION

Trainee must comply with instructions given in ICAO 9432 - Manual of Radiotelephony and DHMI Manual

RECAP

- Get a Good Microphone,
- When you speak, use a calm and even voice,
- Don't speed up or speed down your voice,
- Don't change the voice Pitch,
- Don't get excited or stressed when using voice, as this clearly is transmitted to all,
- Before you speak, think what you are about to say,
- Do not start a sentence and then fall into the 'uhmm' or 'ahhmn',
- Learn the Alphabet as published,
- Lear and use the standard phraseology,
- Pause slightly before and after numbers,
- Ensure the Read Back is correct, if not Identify and correct the read back.

METEOROLOGY

Weather knowledge is essential in aviation: Visibility, air pressure, thunderstorms, temperature, clouds, rain and dew point etc. There are many acronyms and concepts in weather reporting.

METAR (Meteorological Terminal Air Report) refers to a scheduled observation taken between 55-59 minutes past the hour (also referred to as a routine hourly observation).

TAF (Terminal Aerodrome Forecast) is a format for reporting weather forecast information. TAFs are issued every six hours for major civil airfields: 0000,0600,1200,1800 UTC, and generally apply to a 24- or 30-hour period.

The following is part of a METAR:

- Airport
- Observation time
- Wind at ground level: direction, speed and unit
- Meteorological visibility
- Runway Visual Range if visibility is below 1500 m.
- Present weather
- Clouds, amount, type and base
- Air temperature and dew point
- Air pressure
- Other information, for example wind change.
- Landing forecast, trend.

The following is a brief breakdown of some of the basic METAR and TAF elements:

METAR LTBA 181120Z 21006KT 170V250 CAVOK 30/12 Q1015 NOSIG RMK RWY17L 21006KT
180V240 RWY05 22005KT 190V250 RWY23 20005KT 170V240

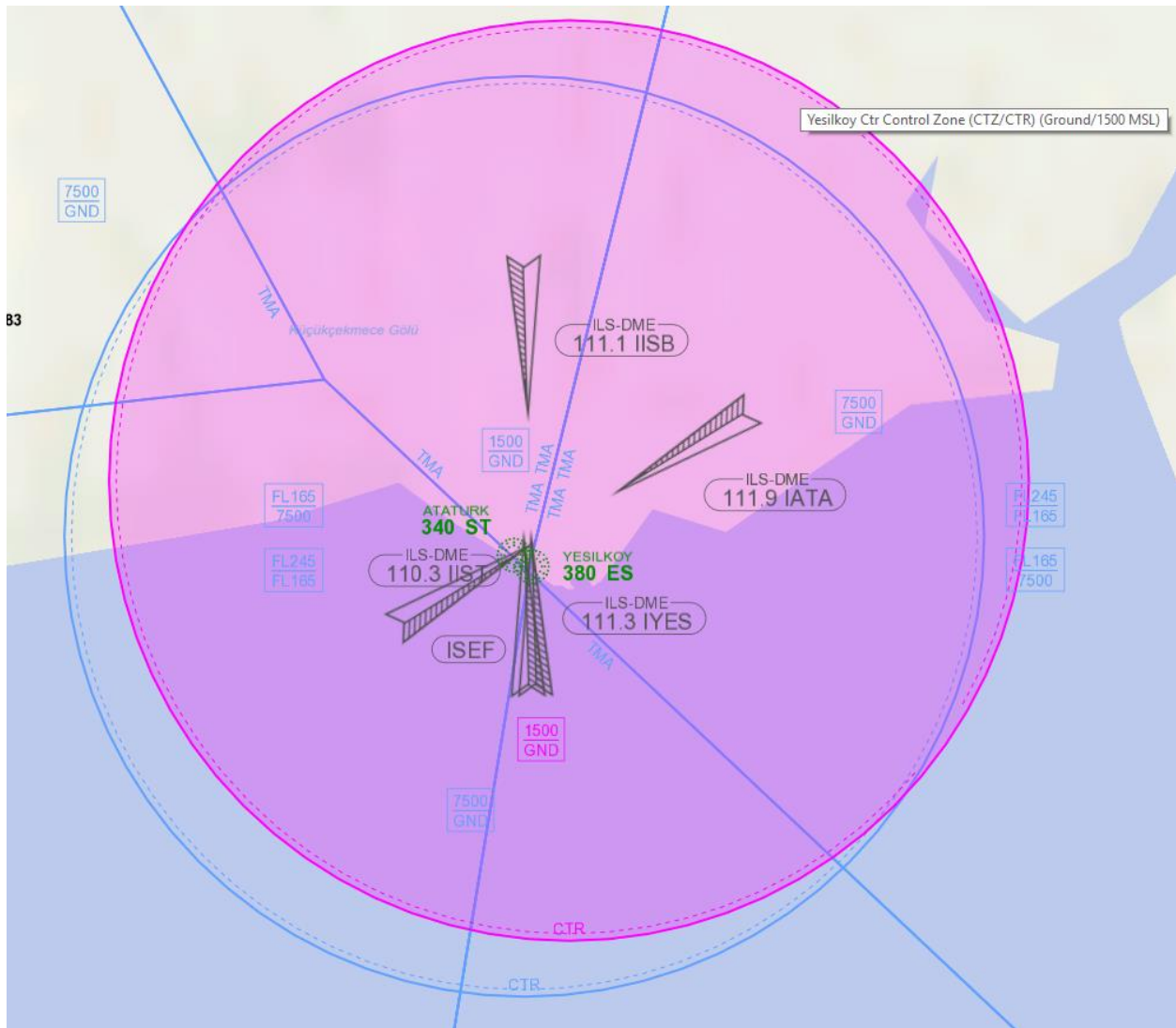
TAF LTBA 181040Z 1812/1918 VRB02KT CAVOK BECMG 1812/1814 03012KT BECMG 1819/1822
VRB02KT BECMG 1907/1910 03012KT

- For METAR / TAF abbreviations list, contact with your mentor.

TYPES OF AIRSPACE

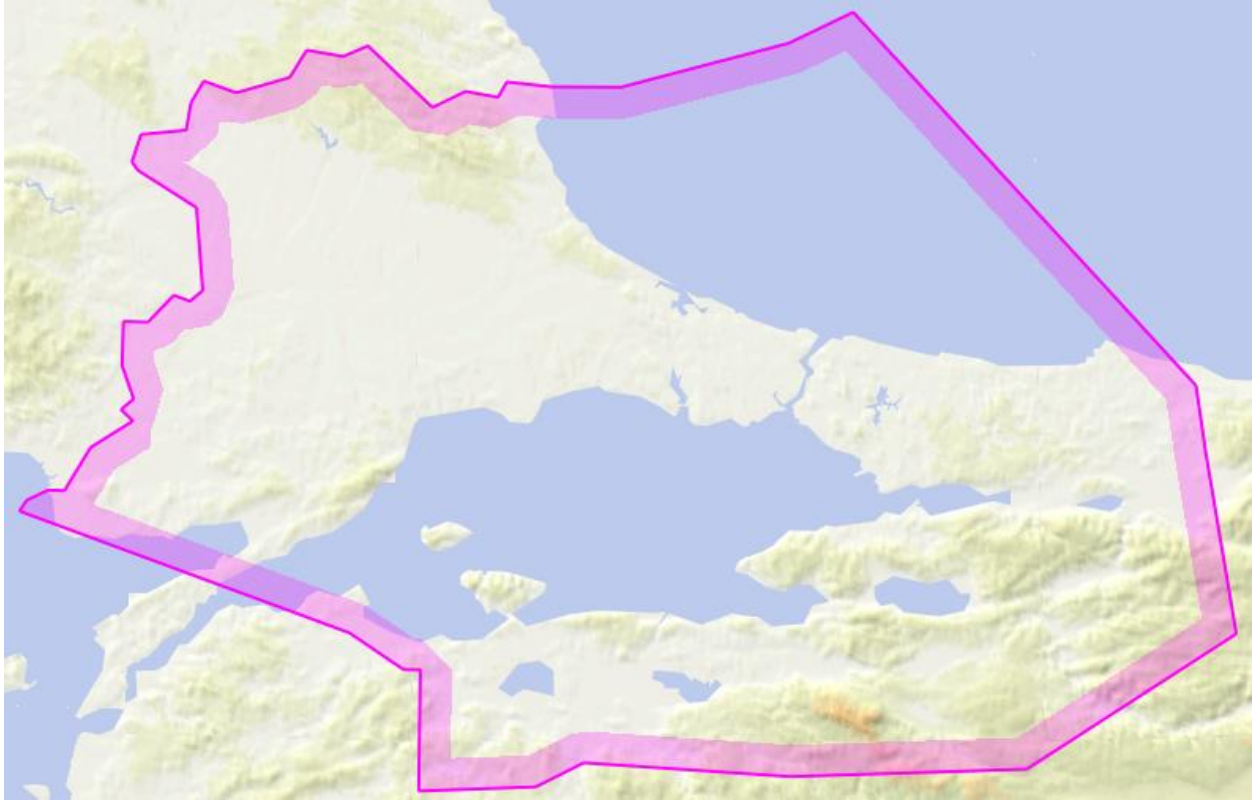
Control Zone (CTR): A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

LTBA CTR;



Terminal Control Area (TMA): A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

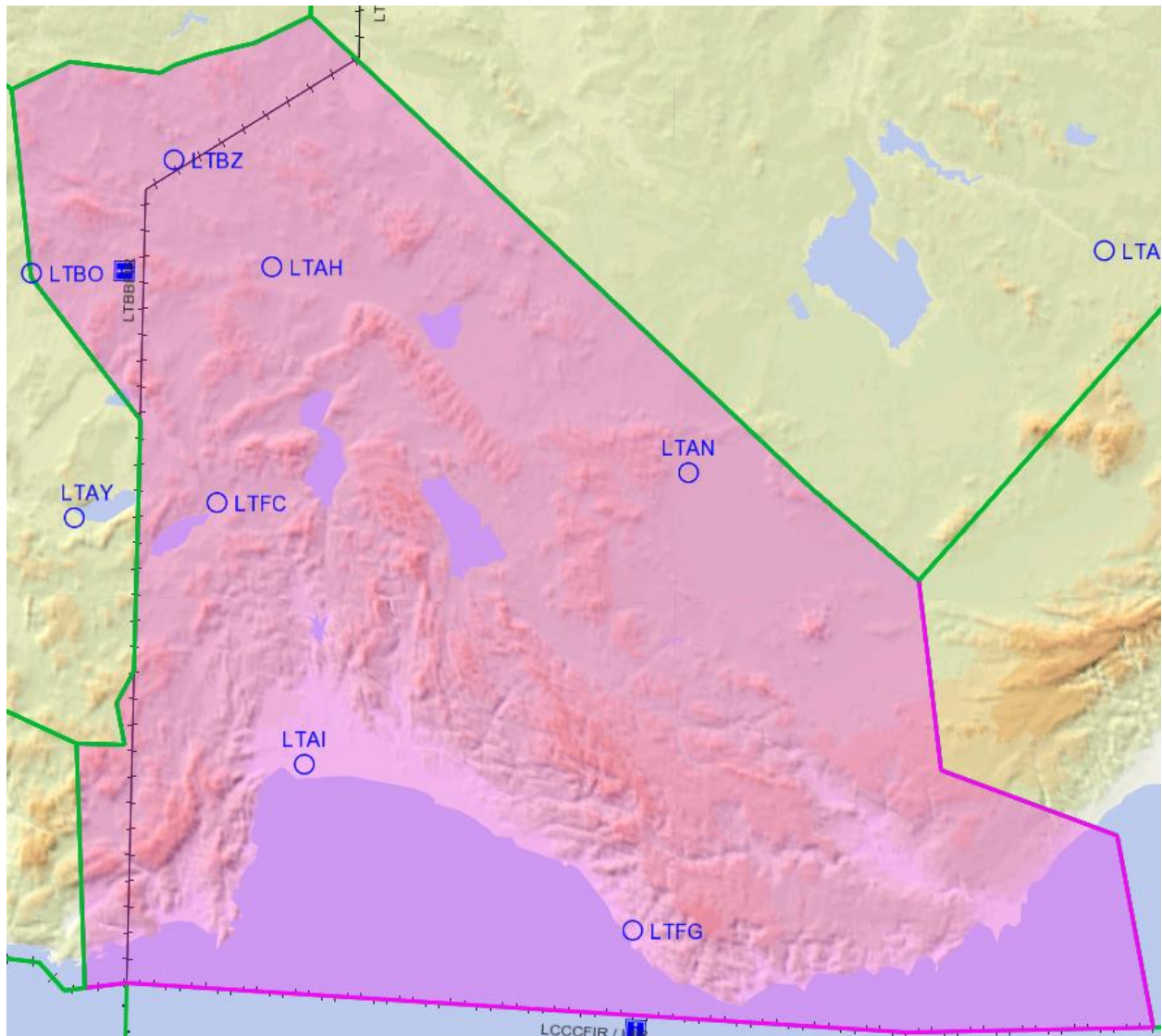
LTBA TMA;



Control Area (CTA): A controlled airspace extending upwards from a specified limit above the earth.

Area Control Center (ACC): A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

LTAACC 7;



SEPARATION METHODS AND MINIMA

VERTICAL SEPARATION

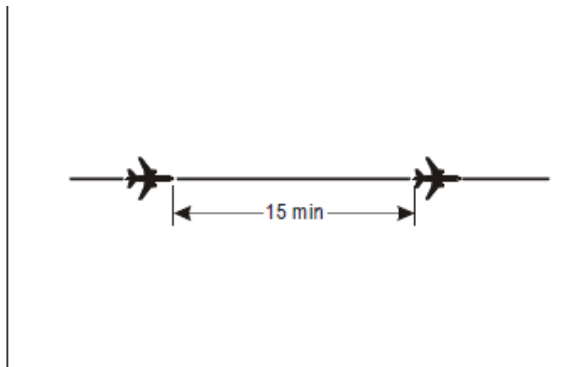
Vertical separation is obtained by requiring aircraft using prescribed altimeter setting procedures to operate at different levels expressed in terms of flight levels or altitudes.

The vertical separation minimum (VSM) shall be:

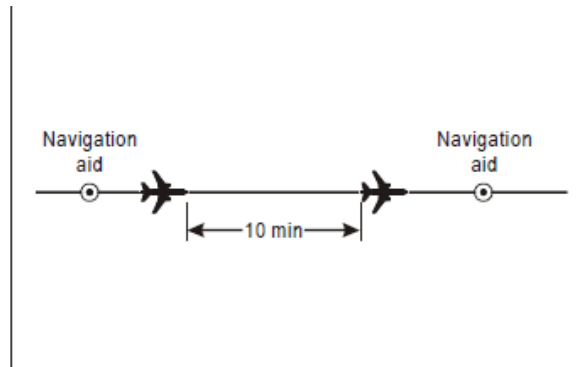
- a) a nominal 300 m (1 000 ft) below FL 290 and a nominal 600 m (2 000 ft) at or above this level, except as provided for in b) below; and
- b) within designated airspace, subject to a regional air navigation agreement: a nominal 300 m (1 000 ft) below FL 410 or a higher level where so prescribed for use under specified conditions, and a nominal 600 m (2 000 ft) at or above this level.

LONGITUDINAL SEPARATION

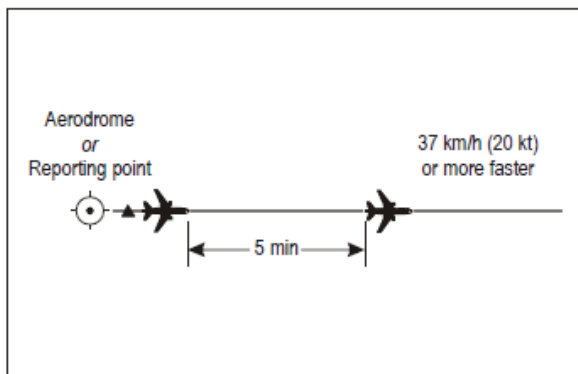
LONGITUDINAL SEPARATION MINIMA BASED ON DISTANCE



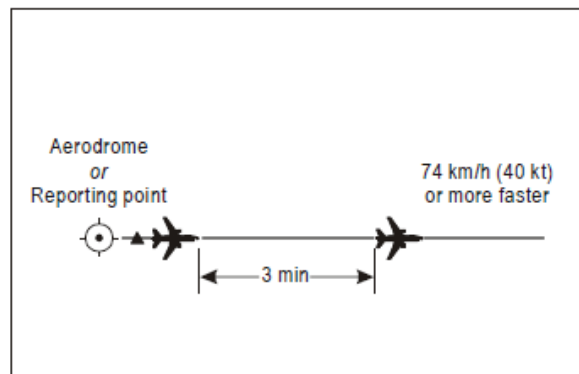
Fifteen-minute separation between aircraft on same track and same level



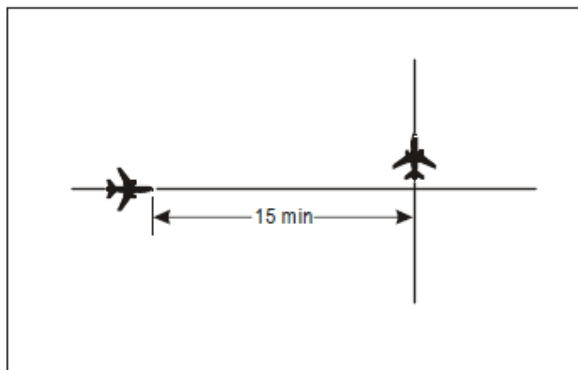
Ten-minute separation between aircraft on same track and same level



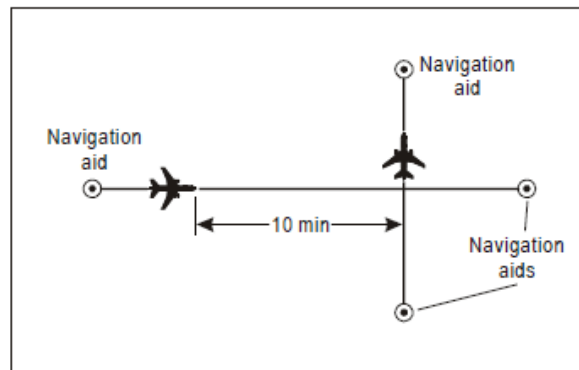
Five-minute separation between aircraft on same track and same level



Three-minute separation between aircraft on same track and same level



Fifteen-minute separation between aircraft on crossing tracks and same level



Ten-minute separation between aircraft on crossing tracks and same level

LONGITUDINAL SEPARATION MINIMA WITH MACH NUMBER TECHNIQUE BASED ON TIME

Turbojet aircraft shall adhere to the true Mach number approved by ATC and shall request ATC approval before making any changes thereto. If it is essential to make an immediate temporary change in the Mach number (e.g. due to turbulence), ATC shall be notified as soon as possible that such a change has been made. If it is not feasible, due to aircraft performance, to maintain the last assigned Mach number during en-route climbs and descents, pilots of aircraft concerned shall advise ATC at the time of the climb/descent request.

When the Mach number technique is applied and provided that:

- a) the aircraft concerned have reported over the same common point and follow the same track or continuously diverging tracks until some other form of separation is provided; or
- b) if the aircraft have not reported over the same common point and it is possible to ensure, by radar, other means, that the appropriate time interval will exist at the common point from which they either follow the same track or continuously diverging tracks; minimum longitudinal separation between turbojet aircraft on the same track, whether in level, climbing or descending flight shall be:
 - 1) 10 minutes; or
 - 2) between 9 and 5 minutes inclusive, provided that:

the preceding aircraft is maintaining a true Mach number greater than the following aircraft in accordance with the following:

- 9 minutes, if the preceding aircraft is Mach 0.02 faster than the following aircraft;
- 8 minutes, if the preceding aircraft is Mach 0.03 faster than the following aircraft;
- 7 minutes, if the preceding aircraft is Mach 0.04 faster than the following aircraft;
- 6 minutes, if the preceding aircraft is Mach 0.05 faster than the following aircraft;
- 5 minutes, if the preceding aircraft is Mach 0.06 faster than the following aircraft.

When the 10-minute longitudinal separation minimum with Mach number technique is applied, the preceding aircraft shall maintain a true Mach number equal to or greater than that maintained by the following aircraft.

WAKE TURBULENCE CATEGORIES

The term “wake turbulence” is used in this context to describe the effect of the rotating air masses generated behind the wing tips of large jet aircraft, in preference to the term “wake vortex” which describes the nature of the air masses.

Wake turbulence categories of aircraft;

According to the maximum certificated take-off mass as follows:

HEAVY (H) — all aircraft types of 136 000 kg or more;

MEDIUM (M) — aircraft types less than 136 000 kg but more than 7 000 kg; and

LIGHT (L) — aircraft types of 7 000 kg or less.

Helicopters should be kept well clear of light aircraft when hovering or while air taxiing.

TIME-BASED WAKE TURBULENCE LONGITUDINAL SEPARATION MINIMA

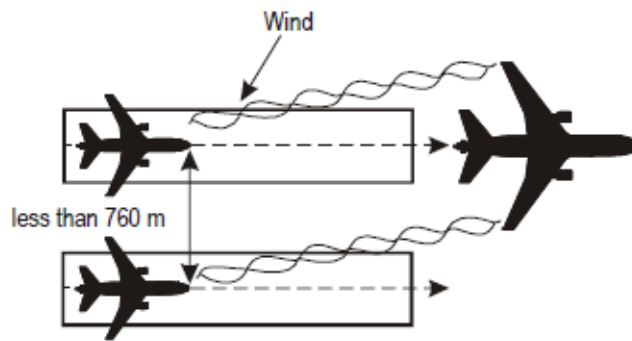
The following minima shall be applied to aircraft landing behind a HEAVY or a MEDIUM aircraft:

- MEDIUM aircraft behind HEAVY aircraft — 2 minutes;
- LIGHT aircraft behind a HEAVY or MEDIUM aircraft — 3 minutes.

A minimum separation of 2 minutes shall be applied between a LIGHT or MEDIUM aircraft taking off behind a HEAVY aircraft or a LIGHT aircraft taking off behind a MEDIUM aircraft when the aircraft are using:

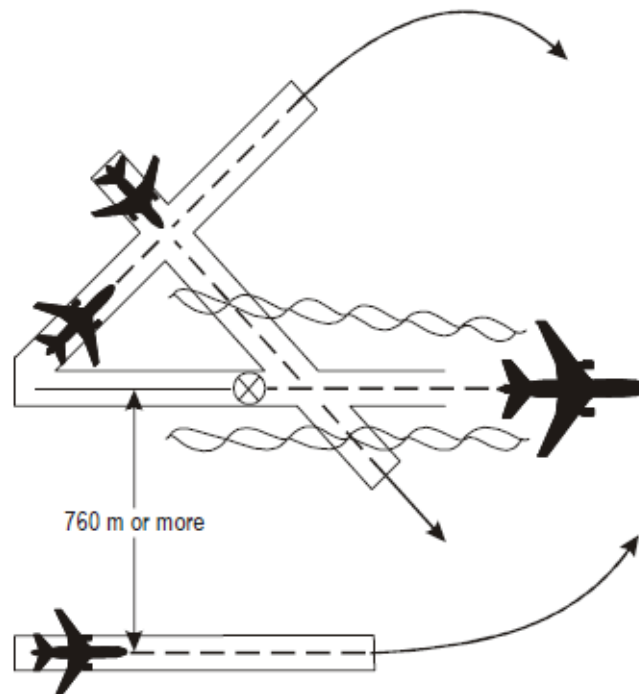
- the same runway,
- parallel runways separated by less than 760m,
- crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300m below,
- parallel runways separated by 760m or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300m below.

2 minutes



Two-minute separation for following aircraft

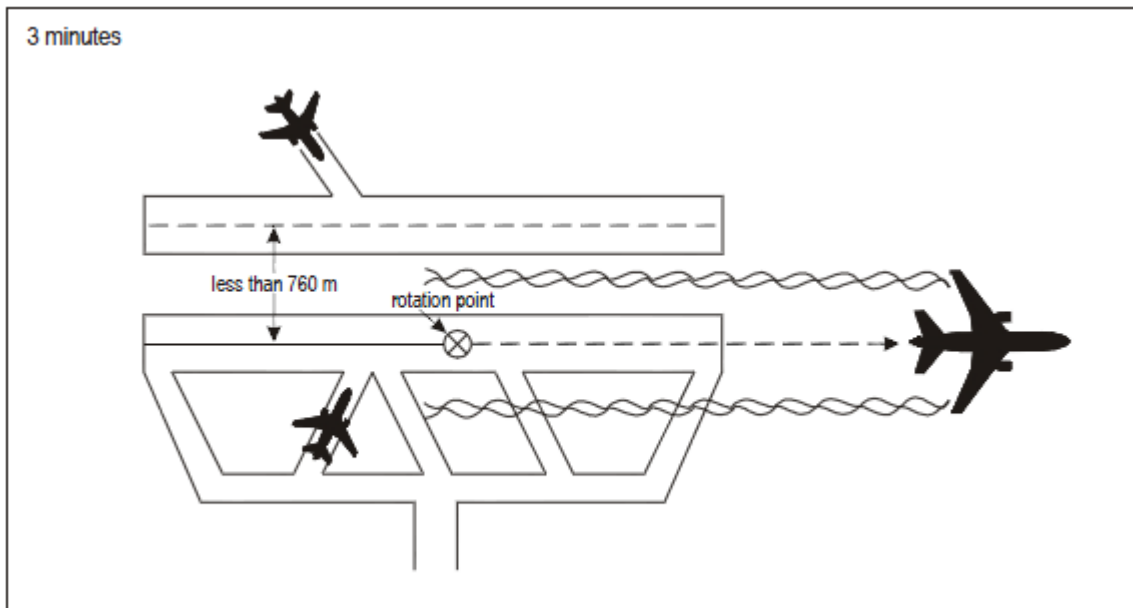
2 minutes



Two-minute wake turbulence separation for crossing aircraft

A separation minimum of 3 minutes shall be applied between a LIGHT or MEDIUM aircraft when taking off behind a HEAVY aircraft or a LIGHT aircraft when taking off behind a MEDIUM aircraft from:

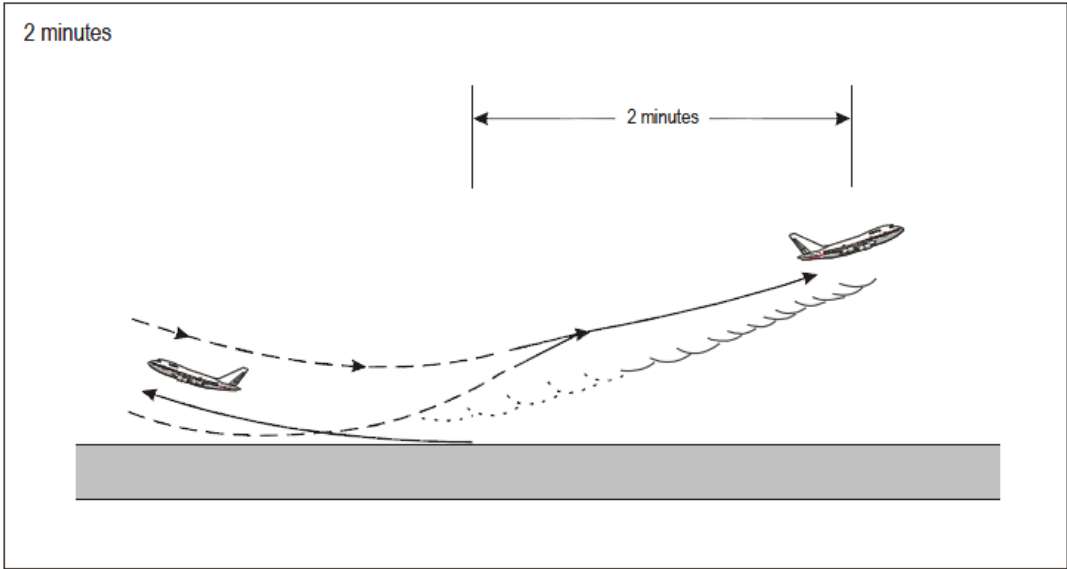
- an intermediate part of the same runway,
- an intermediate part of a parallel runway separated by less than 760m.



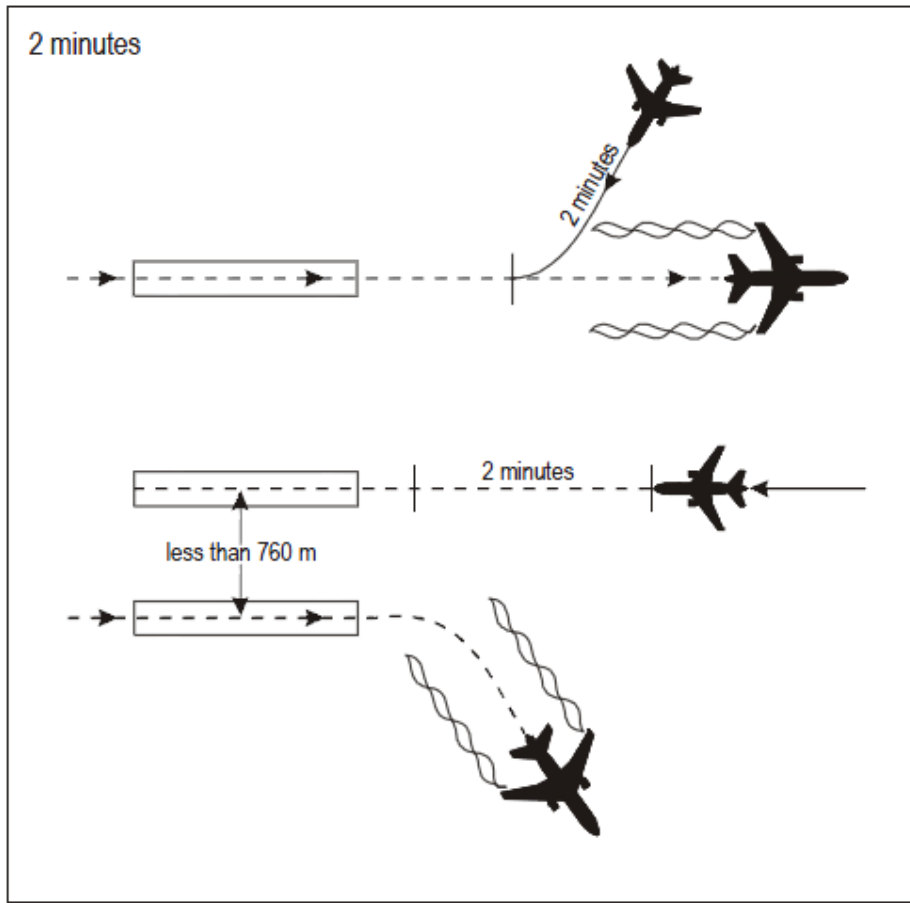
Three-minute wake turbulence separation for following aircraft

A separation minimum of 2 minutes shall be applied between a LIGHT or MEDIUM aircraft and a HEAVY aircraft and between a LIGHT aircraft and a MEDIUM aircraft when the heavier aircraft is making a low or missed approach and the lighter aircraft is:

- utilizing an opposite-direction runway for take-off; or
- landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760m.



Two-minute wake turbulence separation for opposite-direction take-off



Two-minute wake turbulence separation for opposite-direction landing

DISTANCE-BASED WAKE TURBULANCE SEPARATION MINIMA

The following distance-based wake turbulence separation minima shall be applied to aircraft being provided with an ATS surveillance service in the approach and departure phases of flight.

- an aircraft is operating directly behind another aircraft at the same altitude or less than 300m,
- both aircraft are using the same runway, or parallel runways separated by less than 760m,
- an aircraft is crossing behind another aircraft, at the same altitude or less than 300m below.

<i>Aircraft category</i>		<i>Distance-based wake turbulence separation minima</i>
<i>Preceding aircraft</i>	<i>Succeeding aircraft</i>	
HEAVY	HEAVY	7.4 km (4.0 NM)
	MEDIUM	9.3 km (5.0 NM)
	LIGHT	11.1 km (6.0 NM)
MEDIUM	LIGHT	9.3 km (5.0 NM)

ESSENTIAL TRAFFIC INFORMATION

Essential traffic is that controlled traffic to which the provision of separation by ATC is applicable, but which, in relation to a particular controlled flight is not, or will not be, separated from other controlled traffic by the appropriate separation minimum.

Information to be provided;

- direction of flight of aircraft concerned,
- type and wake turbulence category (if relevant) of aircraft concerned,
- cruising level of aircraft concerned,
- estimated time over the reporting point nearest to where the level will be crossed,
- relative bearing of the aircraft concerned in terms of the 12-hour clock as well as distance from the conflicting traffic,
- actual or estimated position of the aircraft concerned.