

# Get Ready for **LPR Interview**



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**EXPEDITE CLIMB UNTIL PASSING LEVEL4**

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# IRANBOOKLET

مرجع آزمون های شبیه سازی شده هوانوردی

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## INTRODUCTION

**Registration** Before taking the test, you must register online at <http://st.catc.ac.ir/spcatc/lprexam> and book your exam date and slot time. To complete your registration, you will need to pay the test fee online.

**On Arrival** On the day of the exam, you need to **show up half an hour in time**. Upon arrival, the clerical staff will verify your identity; you can only use these forms of valid photo-identification; either your **national ID card** or **passport**. (If you fail to produce sufficient ID on the day of exam, you can NOT take the test.) Then, you will be asked to fill out an **application form**. You are also required to submit a recent photo of yourself (**standard-size 3x4**) which will be attached to the form. Remember that you are not allowed to take anything except your identification into the examination room. When your slot time arrives, the staff will store your belongings including your **bag, mobile phone, smartwatch**, any **recording devices** etc. Then you will be shown to your test room. The interlocutor will introduce himself to you, and you will take a seat. Then the test will begin. At the start of the test, your identity will be verified once again by the interlocutor.

**The test is recorded for audit purposes.**

**Effective Communication Module Structure** There are three parts to this module and may take up to 34 minutes to complete.

## Main Natures of EMERGENCY

- Fume ---> Smoke ---> Fire (in-flight fire)
- Loss of pressurization (hypoxia)
- emergency descent
- Engine Failure/ engine fire/ engine flame out
- Bomb threat - suspicious object
- Hydraulic failure
- electrics failure
- Bird strike/ingestion
- Control problems (e.g. due to icing/engine failure)
- Medical emergency
- Fuel shortage/ Fuel dumping/ fuel contamination
- Icing
- Radio failure
- Tail strike
- Landing gear problem
- Near collision (TCAS), mid-air collision
- structural failure (e.g. of a wing/tailfin/the right tailplane)
- stall/spin
- wind shear/microburst/lightning/CB/TCU
- Brake problems
- Crew incapacitation
- VFR loss of positional orientation
- Unlawful interference
- Turbulence (severe/moderate/light)
- Bounced landing
- Ditching
- Undershoot/overshoot
- Runway incursion/excursion
- Drone dangers
- etc

**For each case, write down your definition, expectations and actions.**

**Bomb threat or Bomb scare:**

It is a case in which a bomb is possibly installed in the a/c, The pilot should consider it real and he should consult with the air marshal and also a place to land as soon as possible. Descending to a low altitude should also be considered.

**Hydraulic failure:**

Hydraulic Failure may happen to hydraulic and fly by wire a/c. When hydraulic failure happens Flight control surfaces will not move easily. In case of hydraulic failure the flight control surfaces will not work, so the pilot uses asymmetrical thrust. Asymmetrical thrust is using the power of the engines asymmetrically. We will increase the engine power on one side and decrease it on the other side.

**Electrics failure:**

It is the most dangerous emergency situation that may happen to Fly by wire or new generation a/c, because all displays in cockpit will be failed, since in fly by wire a/c everything is electrical. If electrical power is lost, we should land as soon as Possible. In such cases RAT can provide the minimum required electrical power.

**Bird strike:**

It's a collision between a bird and an a/c which happens in flight or on a take-off roll or landing roll. Bird strike is the most common scenario in the world. Usually, the most flocks of birds fly at lower levels. There are some strategies to reduce this danger like using sound frequencies or shooting guns near airports.

**Near Collision (TCAS):**

It is a case in which the separation between two a/c becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS In near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses. Near collision has other names as well, air miss and near miss.

**Structural failure:**

Structural failure happens when a part of the a/c is removed or detached from the a/c. The a/c cannot get the required lift. Immediately we will turn back and check the a/c. We will not fly to the destination Also fuel dumping is possible.

**Stall:**

Stall is a very dangerous situation in which the aircraft loses its lift. This can be due to an increase in angle of attack to a point which is more than the critical angle of attack. The following stage can normally be spin.

**SPIN:**

Spin is the rotation of aircraft around the spin axis while at the same time it loses altitude. If the aircraft is not recovered," it will crash to the ground. spin can be

intentional for training purposes.

**Drone dangers:**

Drones are divided into Helishot, quadcopters or big aircraft. But the point is that the pilot is not present in the aircraft. It is controlled from a remote site, using a remote control or a very complex system. The danger of drones to flight operations is nowadays expanding, because the strike of drones to the aircraft can happen and it is really dangerous.

**Fume, Smoke, Fire:**

Fume is when you can only smell something in the cockpit. Smoke is when you can see something and in fire not only can you see, but also you feel something. As a pilot when I smell fume in the cockpit, I expect a fire or at least smoke to be available in the cockpit or in the cabin. And in such cases at first my action will be to diagnose the source of the smoke and secondly, we will decide whether to declare an emergency or not. We will remove that part from the circuit to stop the smoke or fume.

**Fire and fire on board:**

Fire is when a part of the aircraft catches fire. If it's inside the cabin or cockpit, we will ask the cabin crew members to come and help us, and if it's outside the aircraft, for example if the engine catches fire, at first, we will shut the engine down and after that we will empty the bottles, I mean fire detergents.

**Loss of pressurization (hyperoxia):**

In case of loss of pressurization emergency descent is usually performed by the pilot, If the pilot fails to make an emergency descent, the passengers may suffer from hyperoxia, I mean they cannot be able to breathe easily. They may have lack of oxygen so they may faint.

**Turbulence (severe, moderate, light):**

Turbulence can be either light, moderate or severe. In case of severe turbulence, as a pilot, I expect that the aircraft will go up and down severely or rapidly, so I will turn on the seatbelt lights and I will immediately tell the cabin crew to take their seats and stop serving foods.

Severe turbulence may also cause crash, because the pilot will lose the control of the aircraft. Also, in case of severe turbulence RVSM should be suspended. I mean we, as pilots, will tell the controller that we are in severe turbulence and the controller will increase vertical separation to 2000 feet.

But light turbulence is not dangerous, also it's called light chops. "Light chops" is another term for light turbulence.

Light chops are very regular light movement of the aircraft but light turbulence is not a regular movement.

In case of turbulence the pilot usually asks for level change. Also the controller

may be aware of presence of turbulence in different levels. For example, if the pilot is flying at FL290 and is experiencing moderate turbulence, he may ask the controller such a question: "Is there any turbulence reported at Flight level 310?", and the controller says: "no turbulence is reported", the pilot may ask to go to flight level 310 in order to check whether that level is better or not.

**Ditching:**

It is emergency landing in the water. It's not a normal landing of a float plane in the water, but it's emergency landing of aircraft in the water. After the pilot has recognized the problem and decided that he cannot continue to an airport, he may decide to land in a safe area, and because water is usually free of obstacles, the pilot may decide to land in the water. The most famous case of Ditching is Hodson river by Capt. Sally.

**Control problems:**

It is a case in which flight control surfaces will not be moved. It can be due to icing, engine failure or hydraulic failure. In case of control problem, the pilot will not be able to control pitch, Roll or yaw of the aircraft.

The pilot's action depends on the source of the problem. If it's due to Icing, de-icing can be a good action.

**Medical emergency:**

It is divided into different parts:

Flight crew incapacitation, Cabin Crew incapacitation or passenger medical problems.

In case of pilot incapacitation, the co-pilot should be able to take action and continue the flight safely towards to the destination. In case of flight crew incapacitation there will be no serious risk for the safety of the flight. As a pilot we just should consider the situation and see whether immediate landing is required or not. If it's life-threatening we will usually find a suitable area to land immediately. But if it's not life-threatening we will continue the flight to the destination.

The passengers may have medical cases, too. If a passenger is sick in the aircraft it depends on situation whether to continue to the destination or to ask for immediate landing. Declaring a PAN-PAN is what a pilot will do in order to tell the controller that they are in a case of medical emergency. Pilot incapacitation or flight crew interpretation is a specific kind of medical emergency.

**Fuel dumping:**

Usually, maximum take-off weight is more than maximum landing weight., so, if the pilot has to land immediately after departure, he or she should dump fuel in order to reach maximum landing weight. All aircraft are not able to dump fuel, instead they burn off fuel in order to reach the maximum landing weight.

**Wind shear:**

Wind shear is defined as a rapid change in the direction or velocity of the wind. It's more dangerous when we are approaching the threshold at lower levels.

**Microburst:**

In case of microburst at first, we may get lift more than expected and immediately after that we usually want to nose down the aircraft, but a little while after, we will get a down draft and we may collide with the ground, so microburst is very dangerous when we are approaching the runway, that is why we say that we should not fly below CBs or TCUs.

**Lightning:**

I know lightning is caused by CB which is in the sky. Lightning also causes the aircraft to catch fire. It may lead to electric failure, too.

**Brake problems:**

Brake problems may be due to hydraulic failure and after that in such cases, runway excursion will happen. Because the aircraft has not hydraulic power, the aircraft may not be able to stop on the runway and enter the stop way. Fighters use some special arresting systems like net barrier or hook barrier to stop on the runway. Some advanced airports have EMAS or Engineered Material Arresting System to stop the aircraft on the stop-way.

**Engine failure:**

In single engine at first, we should maintain the best glide speed and after that try to recover the engine. Finally, if it does not work, we should find a suitable field to land as soon as possible or make an emergency landing.

**Engine flame out:**

Engine flameout happens when for any reason ignition does not take place in the combustion chamber. Engine flameout is when fuel does not reach the engine due to any reason including fuel icing or fuel exhaustion.

**Undershoot and overshoot:**

Both can happen in the air or on the ground. On the ground it refers to the case that the aircraft touches the ground before reaching the runway. It has many reasons like fuel exhaustion or engine failure.

runway overshoot is a specific case of runway excursion when the aircraft leaves the runway from far end.

But in the air, overshoot and undershoot refer to the base turn, if the turn is so steep that the aircraft will not reach the final approach track, we will call it undershoot, and if we pass the final approach track, we will call it overshoot.

**Runway Incursion and Runway Excursion:**

Runway Incursion is the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide whether to go around or touch the runway it depends on the place of runway incursion and the situation.



In case of runway excursion, the aircraft may enter the grass margin not the desired taxiway. A specific kind of runway excursion is overshoot or over run where it happens at the far end of the runway not to the side of the runway.

After runway excursion we need a crane or tow car to come and help the aircraft to go back onto the desired route and to recover from that situation or to be moved onto the ramp.

**Icing:**

Is situation in which a part of the aircraft is frozen. The icing is when ice is formed on the surface of the aircraft and we want to remove it. But anti-icing is the prevention of ice formation. Icing may result in control problems.

**Radio failure:**

In case of VMC, we should continue in VMC and we should be careful of traffic around us and land at the nearest aerodrome

But in case of IMC, we should set squawk 7600, and then keep the last ATC clearance for seven minutes and then continue to destination via flight plan.

**Tail strike:**

during take-off if the nose of the aircraft is higher than normal and the tail of the aircraft touches the ground, tail strike is happened.

Also, if the aircraft's CG has shifted to the aft of the aircraft tail strike may happen. If we fly, it may result in structural failure during the flight and after that the aircraft may be depressurized, so, we should return to the airport and then land as soon as possible.

**Landing gear problem:**

Landing gear problem happens when either the landing gear cannot be retracted or extended, also when the landing gear is twisted, we have this problem. It may also result in runway foaming. Because if the aircraft wants to land without landing gear a foamed runway may prevent fire.

**VFR loss of positional orientation:**

It is another term to refer to a lost VFR aircraft. As a VFR pilot when we are lost, we should declare an emergency. For air traffic controllers a lost VFR flight is an emergency aircraft. They will help the pilot to find their flight path to the destination. When a VFR flight is lost, it may enter the cloud or IMC, so the pilot must be very careful not to enter IMC and continue flight in VMC.

**Unlawful interference:**

It is another name for hijack. In such cases the hijacker takes the control of the flight and the hijacker tells the pilot where to go. I mean they force the pilot to change the flight plan and divert to another airport. Also taking hostage is possible in case of unlawful interference. As a pilot if I am in such a situation, I will ask for help from the ACM, but it depends on the situation. Sometimes I may not be able to declare such a

case. I can just set squawk 7500 to show the controller that I am stuck in such a situation.

**Bounced landing or porpoise landing:**

It is a specific kind of landing in which the aircraft touches the ground and again lifts off and again touches the ground. This sequence may be repeated a lot of times.

Porpoise Landing can be caused by high-speed landing or by nose wheel first touching the ground.

I mean if the pilot does not flare at last part of landing and the aircraft touches the ground with nose wheel, porpoise landing may happen.

## **PART 1: Oral interview (12-14 min)**

### **LPR SAMPLE QUESTIONS**

**Note.** *Since the interviewer uses probing (asking new questions using what you yourself have said) be careful of what you say. Don't say a word for which you are not ready to give an explanation.*

1. A flight crew sometimes includes a flight engineer; sometimes it doesn't. Why?
2. According to investigators, some aircraft accidents and incidents were caused by pilot error due to stress. These findings are opposed by some groups who believe that pilot stress is either a myth or would not have a significant effect on pilot's performance.
3. According to investigators, some aircraft accidents and incidents were caused by pilot error due to stress. In your opinion, is there such a thing as pilot stress?
4. Aircraft accidents in the news often result in fatalities. How can an airliner crash-land safely? (*crash-land: to land an airplane under emergency conditions usually with damage to it.*)
5. Aircraft delays are unavoidable occurrences in flight operations. What do you usually do when your flight is delayed?
6. Aircraft delays are unavoidable occurrences in flight operations. What usually causes these delays?
7. Airline passengers are always asking whether a particular airline is safe or not. Are some airlines safer than others?
8. An airline pilot once said: "Flying is just like driving a car but you also go up and down". Do you think this statement is an oversimplification or an accurate description of how an aircraft is flown?
9. An airliner has at least two pilots who take turns flying the aircraft. What is the autopilot for and when is it used?
10. Are pilots obliged to follow the air traffic controller's instruction all the time? Why?
11. Are you willing to be trained to become a member of the flight crew of a Space Shuttle? Why or why not?
12. As a pilot who is always away from your family, do you think it is necessary for you to make up for important family occasions that you failed to attend? Why or why not?
13. As a pilot, what are the things that you still need to learn and why do you need to learn them?
14. As a pilot, what are your weak points, if any?
15. As a pilot, what was the most difficult decision you have made so far?
16. As a pilot, what's the most difficult part of your job?
17. As an airline pilot, do you still enjoy flying small, two-seat conventional aircraft? Why or why not?
18. As an airline pilot, do you still find pleasure in flying small airplanes like the PIPER 28? Why or why not?
19. Aside from becoming a pilot, what else do you want to achieve in life?
20. Aside from flying skill, what other skills you need to have to be a good pilot?
21. Aviation technology is changing at a fast rate, how do you keep yourself updated?
22. Before takeoff, what do you usually do to check if you are on the correct runway?

23. Can the autopilot do everything that the pilot does during a flight?
24. Can turbulence be avoided? How?
25. Can you differentiate TORA/TODA/ASDA/LDA?
26. Can you remember your first flight? Talk about it.
27. Compare IFR and VFR.
28. Compare new generation and conventional aircraft.
29. Compare Piper and Tecnam.
30. Compare your last and first solo flight.
31. Competition for a job as an airline pilot is fierce. How did you feel when you learned that you were one of the successful applicants?
32. Define TCAS.
33. Define TCAS.
34. Describe one of your flight maneuvers.
35. Describe what happened during your last training flight in a Payam airport.
36. Describe what happened during your last training in a simulator.
37. Describe your lifestyle as a pilot.
38. Describe your most memorable flight.
39. Describe your ordinary working day as a pilot. 38. What does the first officer usually do?
40. Do you believe that constant training can really make you a better pilot? Why or why not?
41. Do you feel proud about your job? Why?
42. Do you have job? What do you like about your present job?
43. Do you know what "glide ratio" is?
44. Do you remember Yasouj accident? What would you do if you were the pilot?
45. Do you still intend to fly airplanes even after retirement? Why or why not?
46. Do you think a female pilot can perform as well as a male pilot? Why or why not?
47. Do you think it is advisable for pilots to read reports about aircraft accidents? Why or why not?
48. Do you think it would be better for the passengers aboard an airplane if flight attendants possessed medical or nursing degrees? Why or why not?
49. Do you think it would be fair for airlines to implement a policy to hire only pilots who are non-smokers? Why or why not?
50. Experts say that old airplanes are as safe as new ones. If this is the case, why do you think airline companies like to replace old airplanes with new models?
51. Explain ATC for a person who is not familiar with it at all.
52. Explain mass and balance.
53. Good health is required for a pilot to maintain his/her license. What do you do to keep stay healthy?
54. Have you ever had a case of emergency or abnormal situation?
55. Have you ever had an air miss?
56. Have you ever had the experience of hard landing?
57. Have you ever heard about NTSB?
58. How are your eating habits affected by traveling as a pilot?
59. How can CAT affect flight operations?
60. How can CAT affect flight operations?

61. How can pilots avoid fatigue?
62. How can pilots avoid fatigue?
63. How did you become an airline pilot?
64. How did you become interested in becoming a pilot?
65. How did you feel in your first solo flight?
66. How did you feel that time you flew as a pilot in your first solo?
67. How did you finance your flight training?
68. How did your family react when you informed them that you wanted to be a pilot?
69. How do you balance your time between your family and your job?
70. How do you choose a flight route?
71. How do you conduct preflight inspections?
72. How do you develop a sound working relationship with your captain/co-pilot?
73. How do you feel after safely completing a flight?
74. How do you hand over the control to other pilot while in flight?
75. How do you handle disorientation during a flight?
76. How do you keep yourself fit to fly?
77. How do you prepare your aircraft for taxi to the terminal?
78. How do you prepare your aircraft to taxi to the terminal?
79. How do you usually deal with flight delays which cannot be avoided?
80. How does an aircraft fly?
81. How does having good English language skills help you do your job?
82. How does it feel to be in charge of a million-dollar airplane with hundreds of passengers flying at 39,000 feet?
83. How does it feel to be responsible for the lives of hundreds of passengers aboard a million-dollar airplane?
84. How does jetlag influence passenger and pilot behavior?
85. How does maneuvering an aircraft on the ground differ from driving an automobile?
86. How does the ILS (Instrument Landing System) help the pilot land the airplane in poor visibility?
87. How has the job of the pilots changed during the last 20 years?
88. How important is teamwork between flight crews?
89. How important is teamwork in the cockpit?
90. How many types of aircraft have you flown? Explain the structure of them.
91. How realistic are flight simulators?
92. How was your first solo flight?
93. How was your first/last flight?
94. I've heard pilots talking about V1 a lot of times; what's Vi?
95. If a hijacker threatens to kill the passengers one by one if you don't open the cockpit door, what will you do and why?
96. If a hijacker threatens to shoot the passengers one by one if you don't open the cockpit door, what will you do? Why?
97. If given the chance, would you like to try flying a fighter jet? Why or why not?
98. If one of cockpit crew is incapacitated during a flight and one of your passengers is a qualified airline pilot and offers you assistance in controlling the plane, will you accept his offer?

99. If something goes wrong with the aircraft while taking off, how do you decide whether to abort or continue the takeoff?
100. If you are the plane's captain, what would you do if your first officer refuses to accept your command?
101. If you were given the freedom to make your own work schedule, what would that schedule be like?
102. Imagine that you are the pilot of an aircraft that is making a descent in preparation to land. What will you do if you hear radio communications but get no response from the controller when you call on the radio?
103. In emergency cases, what are your expectations from ATC?
104. In flying passenger airplane, what does the captain expect from the first officer?
105. In what situations do you engage the autopilot and in what situation do you take direct control of the airplane?
106. In your opinion is there such a thing as pilot stress?
107. In your opinion, what is the most important qualification that a pilot must possess?
108. Introduce yourself?
109. Is flying difficult? Why or why not?
110. Is it proper to inform the passengers about problems that the airplane encounters during the flight? Why or why not?
111. It's the policy of some airlines to prohibit the members of a flight crew from eating the same food. What do you think is the reason for this policy?
112. lift/weight/drag/thrust
113. Many people believe that modern equipment aboard airplanes perform many of the duties of a pilot. Some even say that the equipment makes a pilot redundant and unnecessary. What do you think?
114. Many people think being a pilot is a dangerous job. What do you think?
115. Many pilots find long haul flights boring. How do you cope with boredom on long flights?
116. Many young people say that they want to become pilots but not all of them make it. Why do some young people give up their dream of becoming a pilot?
117. Most people in the aviation industry believe that flying is the safest means of travel. Do you share the same belief? Why?
118. Most radio communications are between pilots and Air Traffic Controllers. When does a pilot of one aircraft need to communicate directly to a pilot of another aircraft over the radio?
119. Name 5 things about flight that you enjoy most.
120. Name some natures of emergency.
121. Navigation maps are readily available, but why is it necessary for a pilot to be familiar with the route he is flying?
122. Now that you are a commercial pilot, what else do you need to get or learn in order to further your career?
123. Of all the cities you have visited as a pilot, which is your favorite?
124. On a scale of 1-10 with ten being the highest, how would you rate air travel in terms of safety? Explain your rating.

125. One of the auxiliary systems of an airplane is the electrical system. How and when is this used?
126. Pilots need to have a clean bill of health to maintain their license. How do you keep yourself healthy?
127. Please tell me, why did you become a pilot?
128. Prior to takeoff, pilots normally brief passengers about flight details such as expected weather conditions along the way and estimated arrival time. Why is this briefing important?
129. Regulations and company policy require pilots to make a 360 degree inspection around the aircraft. Do you think it would be better if mechanics make this walk-around inspection?
130. Should a pilot always follow the instructions of the air traffic controller? Explain.
131. Some airline companies prohibit their employees from establishing romantic relationships with their co-workers. Do you think this policy is reasonable? Why or why not?
132. Some airlines allow their senior pilots to remain in service until they reach their 70th birthday. Other airlines enforce compulsory retirement when their pilots turn 56 years of age. At what age do you think pilots should retire? Why?
133. Some airlines totally prohibit their pilots from reading books or magazines while in flight, even on long haul flights. When the autopilot is engaged, what do you think is the best way for pilots to cope with boredom?
134. Some companies have a policy prohibiting pilots from drinking alcoholic beverages 12 hours before a flight. Do you think 12 hours will give pilots enough time to recover?
135. Some delays are avoidable. What do you usually do to avoid flight delays?
136. Some experts believe that twin engine airplanes are safer than four-engine airplanes. Which of the two do you think is safer? Why?
137. Some hopeful and ambitious pilots are said to have little chance to get a job at some airlines because of their nationality. Do you think a pilot's suitability can be determined by his nationality?
138. Some passengers believe that some seat locations in the airplane are safer than other locations. As a pilot, do you think there is such a safe seat location?
139. Some passengers feel apprehensive at riding an airplane, especially the first-timers. As a cockpit crew, what do you usually do to remove their fear or uneasiness?
140. Some pilots are expected by the company to do non-flying duties such as supervising refueling, keeping records, scheduling flights and other non-flying duties. Do you think it is appropriate to assign such duties to the pilot?
141. Some say that choosing a career in aviation is a big gamble because the airline industry is one of the most unstable businesses. Do you think this is a fair assessment?
142. Some say that choosing a career in aviation is a big gamble because the airline industry is one of the most unstable businesses. Do you think this is a fair assessment?
143. Speak about the dangers of runway contamination.
144. Speak about the importance of simulators.
145. Speak about the role of animals in aviation.
146. Suppose you are in En-route flight and suddenly you lose your radios; what will you do?
147. Talk about an activity that you always do before flying?
148. Tell me about an activity that you always do before flying.

149. Tell me about pilot personality & pilot life style?
150. The airplane has evolved into a comfortable, reliable and dependable means of travel. Some people, however, are still uncomfortable about riding in it and try to avoid doing so. Do you think their fear is unreasonable? Why?
151. The effect of COVID-19 on aviation. How does jetlag influence passenger and pilot behavior?
152. There are many requirements in order to be a pilot. Which requirement do you think is the most important?
153. There are situations when a passenger aircraft needs to dump a large amount of fuel. Describe and explain these situations.
154. We know for sure that airplanes don't fly backward; so what is the thrust reverser for?
155. What activities are part of the regular line orientation flight training?
156. What aircraft system do you think is the most vulnerable? Why?
157. What are major factors for CFIT accidents?
158. What are major factors for CFIT accidents?
159. What are the actions of a good pilot in dealing with adverse weather conditions?
160. What are the differences between B747 and Piper 28? (*Any other types are probable to be asked for comparing*).
161. What are the difficulties of being a pilot?
162. What are the duties and responsibilities of a First Officer?
163. What are the problems that a pilot may normally have in a flight?
164. What are the requirements for transferring your rating to another kind aircraft?
165. What are the usual causes of flight delays?
166. What are you going to do to improve your English language proficiency?
167. What are your actions in case of radio failure?
168. What are your expectations now in your career?
169. What are your privileges and responsibilities as an airline pilot?
170. What are your suggestions for newcomers to aviation field?
171. What can be done to avoid miscommunication between air traffic controllers and pilots?
172. What can suspend airport operations?
173. What can suspend airport operations?
174. What challenges have confronted you as a pilot?
175. What changes have you experienced since you started studying at your company?
176. What could be the reasons for fuel starvation?
177. What could be the reasons for fuel starvation?
178. What did you do last weekend?
179. What do you dislike about being a pilot?
180. What do you do in "walk around"?
181. What do you do these days?
182. What do you do to avoid bad weather along your route?
183. What do you do to improve your flying skills?
184. What do you do to stay awake during a long-haul flight?
185. What do you do when your approaching a HOTSPOT?
186. What do you know about PBN/RNAV/GNSS/VOR/NDB?
187. What do you like most about being a pilot?



188. What do you like most about being a pilot?
189. What do you like most about the type of aircraft that you are flying?
190. What do you like most about the type of aircraft that you are flying?
191. What do you say to alleviate the frustration felt by passengers during a flight delay?
192. What do you think a world without aircraft would be like?
193. What do you think when you hear about an accident involving a passenger airplane?
194. What do you usually discuss with the flight dispatcher before a flight?
195. What do you usually discuss with your flight and cabin crew in the preflight briefing?
196. What do you usually do during a brief stopover at an airport?
197. What do you usually do once the autopilot is engaged during a flight?
198. What do you usually do when you are scheduled to work during an important family occasion?
199. What do you usually talk about in the cockpit during long flights?
200. What does PAPI stand for?
201. What does PAPI stand for?
202. What has been the biggest surprise you have experienced since you started working as an airline pilot?
203. What have you learned in actual flight training that you did not learn or experience during flight simulator training? Why?
204. What is a bomb scare?
205. What is a bomb scare?
206. What is a flight plan?
207. What is airfoil?
208. What is belly landing?
209. What is CRM?
210. What is forced landing/emergency landing?
211. What is Jetstream?
212. What is more cost-efficient: a jet airplane or a propeller airplane?
213. What is situational awareness?
214. What is so special about being a pilot?
215. What is the auto-landing system and when do you use it?
216. What is the biggest fear you have when flying?
217. What is the difference between accident and incident?
218. What is the difference between actual flight training and simulator training?
219. What is the difference between low approach and low pass?
220. What is the difference between missed approach and go around?
221. What is the difference between plain language and phraseology?
222. What is the most unforgettable thing that has happened to you as a pilot?
223. What is the penalty for crashing your airplane during simulator training? How does it make you feel?
224. What is your definition of an emergency situation?
225. What is your idea for new generation of aviation?
226. What is your plan for your future?
227. What is your suggestion/advice for new pilot students?

228. What is your typical routine at work?
229. What made you choose to become a pilot?
230. What made you choose to become a pilot?
231. What makes you different from your colleagues?
232. What motivates you to do your job as best as you can?
233. What problems do you think the airlines will encounter in future?
234. What should be the primary purpose of accident investigation? Why?
235. What situation in flight might force pilots to use RAT?
236. What situation in flight might force pilots to use RAT?
237. What sports do you and your co-workers like to do together? Why?
238. What steps do you take to follow the noise abatement regulation during takeoff?
239. What was the most difficult part of becoming a pilot? pros
240. What was the most exciting moment as a pilot?
241. What was your biggest worry about taking flying lessons?
242. What was your impression when you first flew an aircraft?
243. What were your challenges during your course of piloting?
244. What were your expectations when you first started working as a pilot?
245. What will you do if after touching down on the runway, the visibility reduces to zero and you can't see the taxiway to exit?
246. What will you do if your instructor is incapacitated in flight?
247. What would you do if a passenger gets upset and starts disturbing other passengers?
248. What would you do if an air traffic controller instructs you to execute a maneuver that is beyond the capability of your aircraft?
249. What would you do if during a flight, an attendant informs you that some very suspicious passengers are communicating through sign language?
250. What would you do if the other cockpit crew gets drunk and attempts to fly the aircraft?
251. What would you do if while taking off, the controller tells you that smoke is coming out from the tail of your aircraft?
252. What would you do if you are about to land and you suddenly see a flock of birds along your flight path?
253. What would you do if you encounter a weather condition that is worse than you had expected?
254. What would you do if you find out midway through a flight that the navigational charts available in the cockpit are outdated and no longer applicable?
255. What would you do if you find out that another pilot in your company is flying while under the influence of alcohol?
256. What would you do if you found out that your co-pilot is unfriendly to passengers and harsh to flight attendants?
257. What would you do if you learned that a shoulder-launched missile was fired at your aircraft while in flight?
258. What would you do if you need to land immediately at an airport with poor visibility but the ILS is temporarily out of service?
259. What would you do if you see one of your engines ingest a large bird?
260. What would you do if you sense that your co-pilot is having a panic attack?

261. What would you do if your airplane needs to land immediately but you are not familiar with the nearest airport, and you don't have the appropriate approach chart?
262. What would you do if your altimeter fails during approach?
263. What would you do if your captain/first officer looks too tired to fly?
264. What would you do if your co-pilot/captain becomes really sick during the flight?
265. What would you do if your company closes due to bankruptcy?
266. What would you do if, after deplaning, a flight attendant reports that a bag was left unattended in the cabin?
267. What would you do if, after having been given takeoff clearance by the controller, you see another aircraft taxiing towards you along the runway?
268. What would you do if, during a flight, you notice that your co-pilot is unusually silent and seems to be suffering from some kind of psychological illness?
269. What would you do if, during a flight, you notice that your IP is unusually silent and seems to be suffering from some kind of psychosomatic illness?
270. What would you do if, during takeoff, you feel a slight but annoying vibration?
271. What would you do if, while accelerating for takeoff, you discover that you are on the wrong runway?
272. What would you do if, while descending for an approach, you see a glider coming towards your aircraft?
273. What would you do if, while flying en route, you see storm cells ahead?
274. What would you do if, while in flight, your aircraft encounters a system problem that is not found in the reference handbook?
275. What would you do if, while landing on the runway, you cannot see the runway or even the runway lights due to poor visibility?
276. What would you do if, while on cruise, a flight attendant informs you that she discovered a handgun in one of the aircraft's toilets?
277. What would you do if, while on cruise, a flight attendant informs you that he/she discovered a very suspicious bag in one of the aircraft's toilets?
278. What would you do if, while rolling for takeoff, you notice that the compass does not conform to the runway number?
279. What would you do if, while taking off, you recall that the pitot tube cover was not removed?
280. What would you do to improve your English proficiency level?
281. What's the difference between flying a simulator and flying a real airplane?
282. When considering a job, what is more important to you: the amount of money or the job responsibilities?
283. When do aircraft need to go through anti-icing procedure?
284. When do aircraft need to go through anti-icing procedure?
285. When flying passenger jets, what are the respective responsibilities of the captain and the first officer?
286. When flying, some passengers prefer one make or type of aircraft over others. Do you think some aircraft are safer or better than others? Why or why not?
287. When taking off over a populated area, what do you do to minimize the noise made by your aircraft?
288. When you were a student pilot, how did your first-ever solo flight turn out?

289. When you were a student pilot, what was the most difficult subject for you? Why?
290. When you were still studying, did you have any doubts about becoming a pilot? Why or why not?
291. When you're off-duty, how do you spend your time?
292. Which airline do you like? why?
293. Which flight phase do you think is more critical, landing or take off? Why?
294. Which is better, a jet airplane or an airplane with a propeller? Why?
295. Which is harder, flying or navigating? Explain your answer.
296. Which is more enjoyable to you, daytime flying or night-time flying? Why?
297. Which of your lessons was the most interesting one for you? Why?
298. Which phase or portion of the flight do you enjoy most and what do you usually do during these occasions?
299. Which route would you prefer to fly, domestic or international? Why?
300. Which type of air craft would you like to fly in future? Why?
301. Who is a cabin crew member?
302. Who is a good pilot/first officer/IP?
303. Who is an SPIC?
304. Who was the most supportive of your decision to become a pilot and how did he or she express his or her support?
305. Why did you start pilotage course in your company?
306. Why do you have to constantly make position reports while flying en route?
307. Why do you think many people regard flying as dangerous?
308. Why do you want to be a pilot?
309. Why does flying satisfy you?
310. Why does it take so long to earn an air transport pilot (ATP) license?
311. Why is it crucial to avoid thunderstorms?
312. Why is it crucial to avoid thunderstorms?
313. Why is it important for pilots to have very good English skills?
314. Why is it important to check the weather reports before a flight?
315. Why is it prohibited to use a mobile phone in an airplane, especially during takeoff and landing?
316. Why is it so important for pilots to have very good English skills?
317. Why should a pilot be good at Mathematics, Meteorology, Aerodynamics, performance?
318. Would it be safer if passengers are provided with parachutes?
319. Would you be willing to reduce your salary in order to save the company from bankruptcy? Why or why not?
320. Would you still proceed to your destination if the landing gear in the nose fails to retract after takeoff?
321. If a hijacker threatens to shoot the passengers one by one if you don't open the cockpit door, what will you do? Why?
322. If one of cockpit crew is incapacitated during a flight and one of your passengers is a qualified airline pilot and offers you assistance in controlling the plane, will you accept his offer?
323. If you are the plane's captain, what would you do if your first officer refuses to accept your command?

324. Imagine that you are the pilot of an aircraft that is making a descent in preparation to land. What will you do if you hear radio communications but get no response from the controller when you call on the radio?
325. What would you do if a passenger gets upset and starts disturbing other passengers?
326. What would you do if after touching down on the runway, the visibility has reduced to zero and you can't see the taxiway to exit?
327. What would you do if an air traffic controller instructs you to execute a maneuver that is beyond the capability of your aircraft?
328. What would you do if during a flight, an attendant informs you that some very suspicious passengers are communicating through sign language?
329. What would you do if the other cockpit crew gets drunk and attempts to fly the aircraft?
330. What would you do if while taking off, the controller tells you that smoke is coming out from the tail of your aircraft?
331. What would you do if you are about to land and you suddenly see a flock of birds along your flight path?
332. What would you do if you are already scheduled to depart but are still waiting for some passengers to board?
333. What would you do if you encounter a weather condition that is worse than you had expected?
334. What would you do if you find out midway through a flight that the navigational charts available in the cockpit are outdated and no longer applicable?
335. What would you do if you find out that another pilot in your company is flying while under the influence of alcohol?
336. What would you do if you found out that your co-pilot is unfriendly to passengers and harsh to flight attendants?
337. What would you do if you learned that a shoulder-launched missile was fired at your aircraft while in flight?
338. What would you do if you need to land immediately at an airport with poor visibility but the ILS is temporarily out of service?
339. What would you do if you see one of your engines ingest a large bird?
340. What would you do if you sense that your co-pilot is having a panic attack?
341. What would you do if your airplane needs to land immediately but you are not familiar with the nearest airport, and you don't have the appropriate approach chart?
342. What would you do if your altimeter fails during approach?
343. What would you do if your captain / first officer looks too tired to fly?
344. What would you do if your co-pilot/captain becomes really sick during the flight?
345. What would you do if, after deplaning, a flight attendant reports that a bag was left unattended in the cabin?
346. What would you do if, after having been given takeoff clearance by the controller, you see another aircraft taxiing towards you along the runway?
347. What would you do if, after takeoff, the landing gears fail to retract from their deployed position?
348. What would you do if, during a flight, you notice that your co-pilot is unusually silent and seems to be suffering from some kind of psychosomatic illness?

349. What would you do if, during takeoff, you feel a slight but annoying vibration?
350. What would you do if, while accelerating for takeoff, you discover that you are on the wrong runway?
351. What would you do if, while descending for an approach, you see a glider coming towards your aircraft?
352. What would you do if, while flying en route, you see storm cells ahead?
353. What would you do if, while in flight, your aircraft encounters a system problem that is not found in the reference handbook?
354. What would you do if, while landing on the runway, you cannot see the runway or even the runway lights due to poor visibility?
355. What would you do if, while on cruise, a flight attendant informs you that he/she discovered a very suspicious bag in one of the aircraft's toilets??
356. What would you do if, while rolling for takeoff, you notice that the compass does not conform to the runway number?
357. What would you do if, while taking off, you recall that the Pitot tube cover was not removed?
358. Would you still proceed to your destination if the landing gear in the nose fails to retract after takeoff?
- 359.

## The most important questions for student pilots

- 1) Can you compare Mechanical and fly-by-wire aircraft?
- 2) Can you compare these two types of aircraft: ..... and .....?
- 3) Can you describe the layout of ..... airport?
- 4) Can you explain different parts of an airport? [*Explaining the functions of each part is necessary*]
- 5) Can you explain how aircraft fly?
- 6) Can you explain the challenges that you have in your job? [bad weather, delay, lack of sleep]
- 7) Can you name some abnormal situations that may occur on an airport?
- 8) Could you speak about the dangers of “high-speed rejected take-off”?
- 9) Could you Speak about the dangers of runway contamination?
- 10) Could you talk about “Hydraulic Failure”?
- 11) Could you talk about common problems involving wildlife (I mean animals) on the ground and in the sky?
- 12) Could you talk about problems involving wildlife (I mean animals) on the ground and in the sky?
- 13) Do you know what “glide ratio” is?
- 14) Do you remember your communication with ATC in your first solo flight?
- 15) Have you ever had a near miss or other abnormal situations? Explain the occurrence.
- 16) Have you ever had a serious problem in flight? What was that?
- 17) Have you ever watched Captain Sully Movie? If yes please talk about that flight, if not please talk about ditching in aviation?
- 18) Have you thought about becoming a controller rather than a pilot? Why?
- 19) How can a strong cross wind affect your landing?
- 20) How can pilots be informed of a CB cell in front of them and what should they do in such a situation?
- 21) How can you improve your flying skills?
- 22) How do you carry out a walk around?
- 23) How has the job of the pilots changed during the last 20 years?
- 24) How many types of airplane have you flown, which one was the best?
- 25) In emergency cases, what are your expectations from ATC?
- 26) Name some abnormal occurrences that may happen on an aerodrome.
- 27) How can pilots have a good lifestyle? I mean how do you keep yourself healthy?
- 28) Suppose ATC informs you of smoke coming from your aircraft. What will you do?
- 29) What abnormal occurrences may happen on an airport to an aircraft?
- 30) What are flight control surfaces? Explain their functions.
- 31) What are the characteristics of a good IP/Pilot/First officer/Student Pilot/ATCO/ATC supervisor?
- 32) What are the consequences of a tire burst upon landing?
- 33) What are the dangers of runway contamination by snow or slush?
- 34) What are the main differences between Piper and Cessna? Which airplane do you think is safer?

- 35) What are the possible reasons for fuel starvation (=fuel shortage)??
- 36) What are your actions in case of radio failure?
- 37) What are your actions in case of total engine failure?
- 38) What are your suggestions for newcomers to aviation field?
- 39) What can be done to reduce the consequences of a runway excursion?
- 40) What can the aviation industry do to reduce the number of runway incursions?
- 41) What do you do from the time you board the plane until you start taxi?
- 42) What do you do in case your IP is incapacitated?
- 43) What do you do in walk-around?
- 44) What do you do to avoid bad weather along your route?
- 45) What do you do when you are approaching a HOTSPOT at an airport?
- 46) What do you expect from a controller to do in case of aircraft emergencies?
- 47) What do you expect when you smell burning fume in the cockpit?
- 48) What do you know about CRM?
- 49) What do you know about propeller strike?
- 50) What do you know about steep turn?
- 51) What do you normally do from the time you reach the airport until you get onto your aircraft?
- 52) What do you think are the common causes of on-board medical emergency?
- 53) What do you think are the common causes of on-board medical emergency?
- 54) What do you think when you hear about an accident involving a passenger airplane?
- 55) What does PAPI stand for and how does it work?
- 56) What effect do you think computer has had on new generation aircraft?
- 57) What effect do you think COVID-19 has had on aviation?
- 58) What happens if the ailerons don't move? How can you maneuver the aircraft in such a situation?
- 59) What is a hotspot? What do you do when you reach a hotspot?
- 60) What is a near miss? What does TCAS do in such a case?
- 61) What is belly landing? Why is the runway foamed, sometimes, in such cases?
- 62) What is CAT and how can it affect flight operation?
- 63) What is ditching, and what can make a pilot ditch?
- 64) What is ditching? Do you know the most famous case of ditching?
- 65) What is engine flame out? What do you do in such a case?
- 66) What is icing? Can you compare de-icing with anti-icing?
- 67) What is microburst/CB/Wind-shear?
- 68) What is pilot incapacitation and what should be done in that situation?
- 69) What is runway incursion and what can cause a runway incursion?
- 70) What is situational awareness and how can you keep it during flight?
- 71) What is situational awareness?
- 72) What is standard phraseology? Can you compare it with plain language?
- 73) What is TCAS? Explain its role in near misses.
- 74) What is the difference between explosive and gradual decompression?
- 75) What is the difference between IFR and VFR flights?
- 76) What is the difference between low approach and low pass?



- 77) What is the difference between MINIMUM FUEL and MAYDAY FUEL?
- 78) What is the difference between runway incursion and runway excursion?
- 79) What is the difference between tail strike and propeller strike?
- 80) What is the Flight Plan? Why should a flight have a Flight Plan?
- 81) What is wind shear and why is it so dangerous for airplanes?
- 82) What is your favorite type of aircraft? Why?
- 83) What landing gear problems may happen during take-off or landing?
- 84) What lessons do you study in your training courses?
- 85) What made you choose to become a pilot?
- 86) What situation in flight might force pilots to use oxygen masks?
- 87) What was your favorite lesson in your ground school? Why?
- 88) What will you do if the engine of your single engine aircraft fails during flight?
- 89) What will you do if your IP is incapacitated?
- 90) What would you do if you found out that your IP is unfriendly to you don't feel comfortable sitting next to him/her?
- 91) What would you do if, while flying en route, you see storm cells ahead?
- 92) What would you do if, while landing on the runway, you cannot see the runway or even the runway lights due to poor visibility?
- 93) What's the difference between accident and incident?
- 94) What's the difference between flying a simulator and flying a real airplane?
- 95) When did you start studying pilot training course? Where?
- 96) When do you declare emergency due to fuel starvation?
- 97) When do you report a TCAS RA? What should you do in such a case?
- 98) Which one do you prefer, flying in daylight or night? Why?
- 99) Which one is more challenging, flying a single engine or twin engine aircraft?
- 100) Why do aircraft need to go through anti-icing procedure?
- 101) Why do you think a pilot should be good at meteorology?
- 102) Why do you think medical check is necessary for pilots?
- 103) Why do you think pilots and controllers may not understand each other?
- 104) Why do you think pilots should study meteorology?
- 105) Why do you want to become a pilot?
- 106) Why might a flight suddenly run out of fuel?
- 107) Why should an airport have markings and signage?
- 108) Why should the PIC and first officer eat different foods?
- 109) Would speak about the importance of simulators?
- 110) Would you compare the layout of [PAYAM] airport and [Qazvin]?
- 111) You have had many landings and take-offs at Payam, could you describe this airport?  
(Runway, taxiway, apron, ...)

**1) Can you compare Mechanical and fly-by-wire aircraft?**

Old aircraft simply use cable, pole, and pulleys but new generation use fly by wire technology. It means that they use strong computers. Fly-by-wire (FBW) is a system that replaces the conventional manual flight controls of an aircraft with an electronic interface. The movements of flight controls are converted to electronic signals transmitted by wires (hence the fly-by-wire term) and flight control computers determine how to move the actuators at each control surface to provide the ordered response.

**2) Can you compare these two types of aircraft: ..... and .....?**

clearly piper is a low wing A/C while Tecnam is a high wing A/C. both of them are in light A/C category and used for training in Iran. piper looks to me more stable and maneuverable than Tecnam. more over piper is heavier than Tecnam. If you ask me What your selection is for flight, I will say I prefer to fly by Piper.

**3) Can you describe the layout of Qazvin airport?**

Qazvin Airport has a one taxiway and a one-kilometer runway and its approach procedure for runway 10 is teardrop with NDB device. And the approach procedure for runway 28 is a procedure 10 by NDB device.

**4) Can you explain different parts of an airport? [Explaining the functions of each part is**

Apron: the paved area around the terminal buildings, hangars and cargo terminals where aircraft park  
Taxiway: paved way for aircraft to move to and from the terminals and different parts of the airport  
Runway: the paved surface designed for aircraft take-off and landing. Runways have different designated orientations (QFU) such as 05L / 23R 180° apart and are generally some distance from the terminal buildings. The runways may be parallel, offset or intersecting

**5) Can you explain how aircraft fly?**

Airplanes fly when the movement of air across their wings creates an upward force called lift. Where the lift is greater than the weight of the aircraft, it will fly. But to explain why this lift is generated on the wing, I should speak about the airfoil. Airfoil is the cross-sectional shape of a wing. It has a rounded leading edge, and a sharp trailing edge. The curve on top of an airfoil is greater than its bottom. According to Bernoulli force, this will cause the air to move faster on top than bottom of the wing. Consequently, the resulted pressure differential will produce lift and the aircraft flies.

**6) Can you explain the challenges that you have in your job? [bad weather, delay, lack of sleep]**

We were on our way to Hamedan when we got stuck in the air in the spring due to the bad weather in the spring and due to the lack of performance the plane did not climb. Finally, we diverted to the destination airport

**7) Can you name some abnormal situations that may occur on an airport?**

Runway Incursion is the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide whether to go around or touch the runway it depends on the place of runway incursion and the situation. In case of runway excursion, the aircraft may enter the grass margin not the desired taxiway. A specific kind of runway excursion is overshoot or over run where it happens at the far end of the runway not to the side of the runway. After runway excursion we need a crane or tow car to come and help the aircraft to go back onto the desired route and to recover from that situation or to be moved onto the ramp.

**8) Could you speak about the dangers of “high-speed rejected take-off”?**

High speed rejected take-off is a very threatening occurrence. We should expect a critical and serious problem to happen. Tire and brake fires and tire burst will probably occur and we normally expect runway blockage or runway overrun. The tower controller must inform the flight crew of exterior conditions of the aircraft, because the crew may not be able to understand the severity of the situation.

**9) Could you Speak about the dangers of runway contamination?**

Runway contamination is actually the presence of any unwanted material like water, soil, stone, slush, etc. that may cause runway excursion or FOD. FOD stands for Foreign Object Damage which is for example when soil is ingested into the engine. There is a specific category of information called essential information on airport conditions which include some warnings of runway contamination for flight crew. Snowplow or sweeper car may be taken advantage of in order to clear the runway of such harmful material.

**10) Could you talk about “Hydraulic Failure”?**

Hydraulic Failure may happen to hydraulic and fly by wire a/c. When hydraulic failure happens Flight control surfaces will not move easily. In case of hydraulic failure the flight control surfaces will not work, so the pilot uses asymmetrical

thrust. Asymmetrical thrust is using the power of the engines asymmetrically. We will increase the engine power on one side and decrease it on the other side.

**11) Could you talk about common problems involving wildlife (I mean animals) on the ground and in the sky?**

The role of animals in aviation is divided into two parts: on the ground and in the air. In the air, the danger of engine ingestion or bird strike may cause an emergency but on the ground the presence of animals on the airside may necessitate a go-around or aborting of a take-off. Wildlife on the runway is a major prop strike concern. Wildlife strike is a serious hazard to aircraft safety and have caused a number of fatal accidents. Especially in-flight bird strikes can cause broken windshield, engine failure or pilot incapacitation. In north of Europe they have a specific NOTAM for bird hazards which is called BIRDTAM. Of course, it is not a term used by ICAO but it has a NATO standard. Around the airports, the birds may be scared away by gun-shot or emission of specific sound frequencies.

**12) Could you talk about problems involving wildlife (I mean animals) on the ground and in the sky?**

The role of animals in aviation is divided into two parts: on the ground and in the air. In the air, the danger of engine ingestion or bird strike may cause an emergency but on the ground the presence of animals on the airside may necessitate a go-around or aborting of a take-off. Wildlife on the runway is a major prop strike concern. Wildlife strike is a serious hazard to aircraft safety and have caused a number of fatal accidents. Especially in-flight bird strikes can cause broken windshield, engine failure or pilot incapacitation. In north of Europe they have a specific NOTAM for bird hazards which is called BIRDTAM. Of course, it is not a term used by ICAO but it has a NATO standard. Around the airports, the birds may be scared away by gun-shot or emission of specific sound frequencies.

**13) Do you know what “glide ratio” is?**

Glide Ratio is related to emergency situations when the engine is failed. Each aircraft has a specific glide ratio to give the most distance to be flown without the help of the engines. By definition, Glide Ratio is the altitude lost for each nautical mile of distance flown. Seeking optimal glide in case of total engine failure is very important because it will help the pilots to have time to relight the engine or reach a suitable field to land.

The Glide ratio of an aircraft is the distance of forward travel divided by the altitude lost in that distance. The glide ratio is affected by all of the four fundamental forces that act on an aircraft in flight lift, drag, weight and thrust. If all these factors remain constant, the glide ratio will not change.

**14) Do you remember your communication with ATC in your first solo flight?**

Yes, I remember it, when I was doing solo flight, I told Qazvin Information good morning, EP-MGH request start up and taxi, Traffic pattern, then he told me, start up and taxi approve to hold short runway active 10, QNH 1018, and then I read back to him. QNH 1018 active runway 10 E-GH.

When I reached hold short runway 10 and did check list, I told him, Qazvin information E-GH ready for departure and he told me runway 10 clear for line up and take off and report joining right down wind runway 10, I read back again, runway 10 clear for line up and take off and report when joining right down wind runway 10.

When I reached right down wind runway 10, I told, Qazvin information E-GH right down wind runway 10 full stop, he said report turning runway 10 and I told wilco E-GH

When I was turning final runway 10, I told Qazvin information E-GH final runway 10 Full stop then he said runway 10 clear to land and wind 255 degree 5 knots then I told runway 10 clear to land and copy wind information thank you. When I landed on runway 10, I said request back track on runway 10 to parking area and he told clear 180 back track on runway 10 to parking area and I read back again.

When leaved runway I said Qazvin information E-GH runway vacated thank you good day then he said good day to you bye.

**15) Have you ever had a near miss or other abnormal situations? Explain the occurrence.**

It is a case in which the separation between two aircraft becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses.

Near miss or Air miss is a situation in which the separation of aircraft has become lower than standard and there is danger of collision. I remember one day in Ankara airspace, just a couple of minutes after departure, we got TCAS TA and we heard TRAFFIC. It means be aware and ready to take control. But thank God it was not so serious that an RA to be generated.

**16) Have you ever had a serious problem in flight? What was that?**

I remember that once I had a navigation flight from Qazvin to Hamedan

On this flight, Captain Shakur accompanied me

Contrary to the weather forecast, we were stuck in a severe bumpy weather and the wind direction was completely head wind and the intensity was so high that our ground speed had dropped to 60 nautical miles.

It was a hard but very good experience and I was able to keep the plane stable well in this bumpy weather, but due to the wind, our flight lasted 5 hours instead of 3 hours

**17) Have you ever watched Captain Sully Movie? If yes please talk about that flight, if not please talk about ditching in aviation?**

alighting on water in an emergency: *the successful ditching in the Hudson River of US Air 1549 has become famous in aviation history* It is emergency landing in the water. It's not a normal landing of a float plane in the water, but it's emergency landing of aircraft in the water. After the pilot has recognized the problem and decided that he cannot continue to an airport, he may decide to land in a safe area, and because water is usually free of obstacles, the pilot may decide to land in the water. The most famous case of Ditching is Hodson river by Capt. Sally

**18) Have you thought about becoming a controller rather than a pilot? Why?**

No, I never thought about it because I'm not interested to it

**19) How can a strong cross wind affect your landing?**

It usually affects to the landing, but according to our learning and experiences, we try to minimize the risk of flying to the risk of landing in cross wind.

**20) How can pilots be informed of a CB cell in front of them and what should they do in such a situation?.....**

CB: a type of cloud characterized by its density, large size and height, its tendency to create stormy conditions and the hazard it represents for aircraft. It often has a characteristic 'anvil' shape Avoiding adverse weather is necessary to maintain flight safety. The PIC has the ultimate responsibility for the safety of the aircraft, crew and passengers.

**21) How can you improve your flying skills?.....**

Nontechnical skills like teamwork and effective decision making to solve on-board problems, reducing errors and avoiding stress. The relationship between flight crew in the cockpit is very important for safe conduct of flight and it is dealt with in CRM.

Becoming a pilot makes you smarter. You'll gain knowledge that you never thought you would need to know. You'll become a better planner, a logical decision-maker, and a meteorologist. You'll learn good resource management, how to be patient and how to operate safely, with a sense of urgency.

**22) How do you carry out a walk around?**

The pilot primarily inspects outside parts of the aircraft. He will steer, e.g. control surfaces, tires and possible leaks of fuel or oil.

**23) How has the job of the pilots changed during the last 20 years?**

Communication has improved with satellite communication and improved VHF radios. Weather radar is now colorful and shows areas of wind shear instead of just precipitation being a green return. Auto pilot is improved more and pilot work load is reduced and the computer gets control instead of the pilot.

**24) How many types of airplanes have you flown, which one was the best?**

I have flown with 4 models of airplanes

P-92 & P-2010 & Cessna 172 & Piper Seneca

In my opinion, the best training aircraft I have flown with in the single engine is the Cessna 172.

But I have the best flight experience with a piper Seneca. This aircraft is really great and high performance

**25) In emergency cases, what are your expectations from ATC?**

I expect them to just take a proper action. It means giving a direct routing to the location that we request and clear traffic in our way.

**26) Name some abnormal occurrences that may happen on an aerodrome.**

In the most of aerodrome in the hotspot we usually have some traffic conflict.

I remember one day we were flying to Arak airport and we had another traffic in Taxiway A. flight Persia Boeing 737 ..... and we had conflict together because we don't have any traffic information so we have to standby in runway up to backtrack the traffic and then return back to the apron.

**27) How can pilots have a good lifestyle? I mean how do you keep yourself healthy?.....**

Adjust bedtime by an hour a day a few days before the flight to match the sleep schedule at your destination. Reset your watch at the beginning of the flight to adjust more quickly to the new time zone.

Drink plenty of water before, during, and after the flight.

to clarify myself I should mention eating heavy meals and drinking alcohol before flight. Furthermore, the stress of unpredictable events during flight as well as emergencies make piloting a difficult job. Travelling a lot and being away from family are also among those reasons.

**28) Suppose ATC informs you of smoke coming from your aircraft. What will you do?.....**

fumes caused by combustion. Both smoke and fire remain number one hazards on board the aircraft.

Response time is critical. The crew's priority is to land as soon as possible while trying to contain and extinguish the fire. The flight crew will be working under a lot of stress. Communication will be less clear as they crew will be wearing masks. It will be necessary to make an emergency evacuation using the escape slides as soon as the aircraft is on the ground.

**29) What abnormal occurrences may happen on an airport to an aircraft?**

hydraulic failure  
engine fire  
depressurization  
pilot incapacitation  
smoke in the cockpit

**30) What are flight control surfaces? Explain their functions.....**

The rudder is a large panel attached to the trailing edge of a plane's vertical stabilizer in the rear of the plane. It is used to control yaw, which is the movement of the nose left or right. The rudder is used mostly during takeoffs and landings to keep the nose of an aircraft on the centerline of the runway. It is manipulated via foot pedals in the cockpit.

The elevators are panels attached to the trailing edge of an aircraft's two horizontal stabilizers, they are part of the tail assembly, or empennage. The elevators control the pitch of an aircraft, which is the movement of the nose up or down. They are used during flight and are manipulated by pulling or pushing on the control wheel or side-stick controller in the cockpit.

The ailerons are panels built into the trailing edge of the wings. Like the elevators, they are used during flight to steer an aircraft and are manipulated by turning the control wheel or side-stick controller in the cockpit to the left or right. These steering motions deflect the ailerons up or down, which in turn affect the relative lift of the wings. An aileron deflected down increases the lift



of the wing to which it is attached, while an aileron deflected up decreases the lift of its wing. Thus, if a pilot deflects downward the aileron on the left wing of the aircraft, and defects upward the aileron on the right wing, the aircraft will roll, or bank, to the right.

**31) What are the characteristics of a good IP/Pilot/First officer/Student Pilot/ATCO/ATC supervisor?.....**

a good pilot must always analyze the situation and calculate to perform a safe flight. A good pilot before starting the flight checks the weather and pressure to calculate the best performance.

An excellent first officer must be a highly responsible person. If anything happens to the pilot, the first officer must be able to step in, take control of the situation and make the right decisions in a split second.

Becoming a pilot makes you smarter. You'll gain knowledge that you never thought you would need to know. You'll become a better planner, a logical decision-maker, and a meteorologist. You'll learn good resource management, how to be patient and how to operate safely, with a sense of urgency.

**32) What are the consequences of a tire burst upon landing?**

Many things can happen, the most likely of which is that the aircraft have a tendency to direction of the tire which is burst, this causes runway excursion to occur.

**33) What are the dangers of runway contamination by snow or slush?**

The presence on the runway of water, snow, slush or ice adversely affects the aircraft's braking performance by: Reducing the friction force between the tires and the runway surface; and creating a layer of fluid between the tires and the runway, which reduces the contact area and leads to a risk of hydroplaning.

**34) What are the main differences between Piper and Cessna? Which airplane do you think is safer?**

In the different between piper and Cessna is initially is location of the wings because the Cessna is high wing but the piper is a low wing in the second case the wing span of Cessna aircraft is more than piper So it produces more lift which is more need that in normal and emergency condition

### **35) What are the possible reasons for fuel starvation (=fuel shortage)??**

Fuel shortage can have a number of reasons, for example having adverse weather condition and the requirement for frequent and long circumnavigations. Also, miscalculation of fuel amount at the beginning of the flight may cause fuel shortage. The other reason is fuel leak and also fuel contamination. Engine flame out is the obvious consequence of fuel shortage. Runway undershoot is another possible result.

### **36) What are your actions in case of radio failure?**

In case of VFR flight, we should continue in VMC and we should be careful of traffic around us and land at the nearest aerodrome. But in case of IFR flight, if we are identified, we will maintain the last ATC instruction and then we go to flight planned route and level. we will continue to the initial approach fix of the destination airport and we will follow a normal approach to land. When we are in sight of the tower, they may use visual signals and signaling lamp to send messages to us. The SSR code of 7600 should also be set.

Of course, you must set squawk 7600 and then continue last ATC clearances for 7 min in control flight and then resume to destination via flight plan.

### **37) What are your actions in case of total engine failure?**

In case of Total engine failure, the crew must be informed of the nearest suitable or available airfield to glide the aircraft safely to the ground as soon as possible. Imposing RTF silence for other aircraft can help the crew to concentrate more effectively. The flight crew will follow engine relight techniques, so their workload will be high. In such a case a steeper than normal approach path can be expected and when giving turns, the rate of descent may double.

In single engine at first, we should maintain the best glide speed and after that try to recover the engine. Finally, if it does not work, we should find a suitable field to land as soon as possible or make an emergency landing.

### **38) What are your suggestions for newcomers to aviation field?**

My suggestion to them is that they should try well to learn their technical lessons and to improve their English language proficiency. Moreover, they should be careful about their attitude and appearance. My other suggestion to them is about their job. Because it is not easy to be employed in an airline, I suggest them to have another job or university major. Of course, I believe that a pilot should at least have a bachelor degree and it is not good for a pilot to have only a high school diploma.

I think the most important thing is to have patience Most pilots are not always on the plane. You need to learn how to spend ground time by reading lessons and getting ready to fly

**39) What can be done to reduce the consequences of a runway excursion?**

**Definition:** In case of runway excursion, the aircraft may enter the grass margin not the desired taxiway. A specific kind of runway excursion is overshoot or over run where it

happens at the far end of the runway not to the side of the runway.

After runway excursion we need a crane or tow car to come and help the aircraft to

go back onto the desired route and to recover from that situation or to be moved

onto the ramp.

Pilots knows his/her limitations. every body shall know her limitations about flight and handling and knowledge so he doesn't have any risk to landing in bad runway condition or such as tire burst.

And try to avoid doing extra work in landing phase and reduce workload

**40) What can the aviation industry do to reduce the number of runway incursions?**

**Definition:** Runway Incursion is the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of

landing as a pilot we should decide whether to go around or touch the runway it

depends on the place of runway incursion and the situation

working in the field of training. in most developed country training is the most important issue. Training on human power is every serious to Having a safe flight

**41) What do you do from the time you board the plane until you start taxi?**

Doing the checklist and contact tower

**42) What do you do in case your IP is incapacities?**

During Ip incapacitation because one of pilot is in state of emergency, we have to announce may day on frequency and informing controller, and we have to

hold the IP in firmly in place and we have to continue flight alone and land as soon as possible at closest airport

**43) What do you do in walk-around?**

The pilot primarily inspects outside parts of the aircraft. He will steer, e.g. control surfaces, tires and possible leaks of fuel or oil.

**44) What do you do to avoid bad weather along your route?**

I know maybe I can handle it but I want to divert to altn airport.

**45) What do you do when you are approaching a HOTSPOT at an airport?**

Hotspot is a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

- awareness campaigns;
- enhanced visual aids (signs, markings and lights);
- use of alternative routings;
- changes to the movement area infrastructure, such as construction of new taxiways, and decommissioning of taxiways;
- closed-circuit television (CCTV) for critical VCR sight line deficiencies.

**46) What do you expect from a controller to do in case of aircraft emergencies?.....**

The tower controller must inform the flight crew of exterior conditions of the aircraft, because the crew may not be able to understand the severity of the situation.

Also, they should monitor headings and levels as they maybe different from those indicated on the flight deck It is important that the controller listens carefully to pilot input on the nature of the emergency, requests clarification if in doubt, and gives the crew reassurance that their problem is understood. Requesting and providing clarification, paraphrasing, confirming and acknowledging all play a key role in such exchanges: *In case of radio failure, acknowledge by flashing headlights.*

**47) What do you expect when you smell burning fume in the cockpit?**

As a pilot when I smell fume in the cockpit, I expect a fire or at least smoke to be available in the cockpit or in the cabin. And in such cases at first my action will be to diagnose the source of the smoke and secondly, we will decide

whether to declare an emergency or not. We will remove that part from the circuit to stop the smoke or fume.

#### **48) What do you know about CRM?**

CRM stands for Cockpit or Crew Resource Management. Actually, many accidents do not result from a technical malfunction or failure of systems, but they are caused by the inability of flight crew to respond appropriately to the present situation. It may result in a wrong decision or series of decisions which can cause a serious incident or a fatal accident. The main purpose of CRM is to increase safety by use of nontechnical skills like teamwork and effective decision making to solve on-board problems, reducing errors and avoiding stress. The relationship between flight crew in the cockpit is very important for safe conduct of flight and it is dealt with in CRM.

It stands for Crew Resource Management, in order to help prevent any accident or incident and to ensure flight efficiency, let me explain it in another way, it means use of all resources in cockpit and cabin for the best decision in the worst situations.

#### **49) What do you know about propeller strike?**

A Propeller Strike is any incident during engine operation where the propeller impacts a solid object. This incident includes propeller strikes against the ground. It may result in loss of propeller blade tip. Prop strikes are one of the costliest incidents that can happen to propeller-driven aircraft. They usually require an engine overhaul, and they can easily take an airplane out of service for weeks, if not months. Poor aircraft control during gusty crosswinds, or a porpoise landing, are some of the most common causes of prop strikes.

#### **50) What do you know about steep turn?.....**

A steep turn is a maneuver that consists of a 180° or 360° turn in one direction, followed by a repeat in the opposite direction. The turn is made at a larger-than-normal bank angle: 45° for pilots on a Private Pilot check ride, and 50° for pilots on a Commercial check ride

#### **51) What do you normally do from the time you reach the airport until you get onto your aircraft?**

I go to Dispatch first and get the weather forecast from Dispatch

Then I decode the weather forecasts and adjust my flight plan according to the weather forecast and plan announced by Dispatch.

After that, I go to the plane and do the walk around

Finally, with the permission of the IP, I board the plane and start doing the checklists

**52) What do you think are the common causes of on-board medical emergency?**

In Medical emergency flight crew, cabin crew or the passengers may be involved. If the case is really life threatening the pilot may wish to declare an emergency and divert to an airport in a big city which has a good hospital. The pilot should tell the controller that they need ambulance after landing. A brief explanation of the nature of the medical problem will be helpful for medical services to be present with the required medicine. Pilot incapacitation is a subcategory of medical emergencies. If the pilot in command of the aircraft is not able to perform his or her duties, the first officer should inform the ATC and should try to perform the flight safely while asking for help from cabin crew to recover the pilot.

It is divided into different parts: Flight crew incapacitation, Cabin Crew incapacitation or passenger medical problems. In case of pilot incapacitation, the co-pilot should be able to take action and continue the flight safely towards the destination. In case of flight crew incapacitation there will be no serious risk for the safety of the flight. As a pilot we just should consider the situation and see whether immediate landing is required or not. If it's life-threatening we will usually find a suitable area to land immediately. But if it's not life-threatening we will continue the flight to the destination. The passengers may have medical cases, too. If a passenger is sick in the aircraft it depends on situation whether to continue to the destination or to ask for immediate landing. Declaring a PAN-PAN is what a pilot will do in order to tell the controller that they are in a case of medical emergency. Pilot incapacitation or flight crew interpretation is a specific kind of medical emergency.

**53) What do you think are the common causes of on-board medical emergency?**

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**54) What do you think when you hear about an accident involving a passenger airplane?**

It's very painful and I feel sad about that and I think why this event happened? and what factors were influencing it? and finally I try to read the accident report and I analyze the root causes that does not happen to me.

**55) What does PAPI stand for and how does it work?**

PAPI is the abbreviation of Precision Approach Path Indicator. It is installed as four lights in a single row. A similar system is VASIS which stands for visual approach slope indicator system, which consists of four light units situated on the left side of the runway in the form of two rows. They actually use lights to tell the pilot whether he is on, above or below the optimum glide slope for landing on a runway. PAPI is normally located on the left-hand side of the runway but it can be seen to the right of the runway, too. When two lights are red and two lights are white it shows that the slope is correct.

**56) What effect do you think computer has had on new generation aircraft?.....**

**Flight Management System:** an aircraft computer system that uses a large data base to 1) allow routes to be pre-programmed; 2) interface with the AFCS (Automatic Flight Control System) i.e. autopilot and flight director; 3) memorise and update navigation aids; 4) provide information to the EFIS (Electronic Flight Instrument System) for PFD and ND displays pilot work load is reduced and the computer gets control instead of the pilot.

**57) What effect do you think COVID-19 has had on aviation?**

It is so great that the job career of a lot of people is adversely affected. People are afraid of being in enclosed spaces like a/c cabins, so the number of travelers and air passengers is reduced so that a lot of flights are cancelled. It is not strange to hear that some airlines have gone bankrupt. But they may be right to be worried about their health.

**58) What happens if the ailerons don't move? How can you maneuver the aircraft in such a situation?**

Keep our shirt on and use the rudder for make a turn and bank angle and if I had any procedure in abnormal checklist, I do that and try to land as soon as possible at nearest airport

**59) What is a hotspot? What do you do when you reach a hotspot?**

Hotspot is a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

- awareness campaigns;
- enhanced visual aids (signs, markings and lights);
- use of alternative routings;
- changes to the movement area infrastructure, such as construction of new taxiways, and decommissioning of taxiways;
- closed-circuit television (CCTV) for critical VCR sight line deficiencies.

**60) What is a near miss? What does TCAS do in such a case?**

It is a case in which the separation between two a/c becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses. Near collision has other names as well, air miss and near miss.

**61) What is belly landing? Why is the runway foamed, sometimes, in such cases?**

landing of an aircraft on the underside of the fuselage, without lowering the undercarriage.

Belly landing is performed when the landing gear of the aircraft cannot be extended before landing. In other words, we say that the landing gear is jammed. foaming a part of the runway is probably requested by the pilot in order to reduce the risk of fire when the bottom of the fuselage touches the ground.



**62) What is CAT and how can it affect flight operation?**

it stands for clear air turbulence; It happens when we don't have any visible phenomenon in the sky but we encounter with turbulence. Because it usually happens in cruise phase, the pilot should only try to control the a/c and he cannot do anything special.

It is the abbreviation of Clear Air Turbulence. It happens in cloudless regions and it may have severe turbulence that surprises the flight crew. It usually happens in higher altitudes and in cruise phase of flight. The pilot cannot do anything special but to control the aircraft until it is over. Of course, there are a number of strategies to predict them which are taught in meteorology courses. For example, Cirrus or Lenticular clouds can give a clue to the pilots of the presence of CAT. The effect of CAT on the aircraft can be structural damage, injury to people on-board and also it may make it impossible to read the instruments in the cockpit. Passengers and crew should fit seat belts and harnesses when seated to protect them in the event of unforeseen turbulence. In such situations cabin service should be suspended and the seat belt sign should be illuminated. All passengers and crew should immediately sit down and fit seat belts/harnesses.

**63) What is ditching, and what can make a pilot ditch?**

It is emergency landing in the water. It's not a normal landing of a float plane in the water, but it's emergency landing of aircraft in the water. After the pilot has recognized the problem and decided that he cannot continue to an airport, he may decide to land in a safe area, and because water is usually free of obstacles, the pilot may decide to land in the water. The most famous case of Ditching is Hodson river by Capt. Sally.

**64) What is ditching? Do you know the most famous case of ditching?**

It is emergency landing in the water. It's not a normal landing of a float plane in the water, but it's emergency landing of aircraft in the water. The most famous case of Ditching is Hodson river by Capt. Sally.

**65) What is engine flame out? What do you do in such a case?**

Engine flameout happens when for any reason ignition does not take place in the combustion chamber. Engine flameout is when fuel does not reach the engine due to any reason including fuel icing or fuel exhaustion.

**66) What is icing? Can you compare de-icing with anti-icing?**

Is situation in which a part of the aircraft is frozen. The icing is when ice is formed on the surface of the aircraft and we want to remove it. But anti-icing is the prevention of ice formation. Icing may result in control problems.

De-icing is ice removal performed by the airport services in cold weather either by aircraft passing under a gantry or by special tankers with hydraulic platforms which spray de-icing fluid onto the wings, flight control surfaces, empennage and fuselage.

Anti-icing is all the pneumatic systems which prevent the accumulation of ice on the wing leading edges and engine air intakes: wing anti-ice, engine anti-ice

**67) What is microburst/CB/Wind-shear?**

In case of microburst at first, we may get lift more than expected and immediately after that we usually want to nose down the aircraft, but a little while after, we will get a down draft and we may collide with the ground, so microburst is very dangerous when we are approaching the runway, that is why we say that we should not fly below CBs or TCUs.

CB is a type of cloud characterised by its density, large size and height, its tendency to create stormy conditions and the hazard it represents for aircraft. It often has a characteristic 'anvil' shape

Wind-shear is a large local wind gradient, i.e. sudden changes in wind speed and direction which may cause aircraft to lose airspeed and altitude and are especially dangerous close to the ground during approach and landing

**68) What is pilot incapacitation and what should be done in that situation?**

Pilot incapacitation is a subcategory of medical emergencies. If the pilot in command of the aircraft is not able to perform his or her duties, the first officer should inform the ATC and should try to perform the flight safely while asking for help from cabin crew to recover the pilot.

**69) What is runway incursion and what can cause a runway incursion?**

Runway Incursion is the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide whether to go around or touch the runway it depends on the place of runway incursion and the situation.

**70) What is situational awareness and how can you keep it during flight?**

Situational awareness is a mental situation in which the flight crew are aware of what is happening in flight, where they are, how is their attitude and how should it be a couple of minutes later. Also speaking the same language on the frequency channel will help the pilot to be aware of what is happening around him. Inadequate situational awareness will cause safety risks like encountering with wake turbulence, adverse weather or icing.

**71) What is situational awareness?**

Situational awareness is a term used to describe a person's awareness of their surroundings, the meaning of these surroundings, a prediction of what these surroundings will mean in the future, and then using this information to act.

**72) What is standard phraseology? Can you compare it with plain language?**

Standard phraseologies are pre-set phrases introduced by ICAO to be used in specified conditions. But where there is an abnormal or emergency situation, standard phraseologies are not enough and we should speak plain English which is formal and without idioms or very informal slang words and sentences.

Phraseology is the specialized language used by pilots and controllers to conduct unambiguous and effective communications. ... Still though, when facing situations for which phraseology does not exist, pilots and controllers must resort to a more natural language known as 'plain language'.

**73) What is TCAS? Explain its role in near misses.**

It is a case in which the separation between two a/c becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses. Near collision has other names as well, air miss and near miss.

**74) What is the difference between explosive and gradual decompression?**

There are 3 types of depressurizations: Gradual, Rapid and explosive. Gradual decompression is the result of for example a crack in the windshield or a window of the aircraft in which gradually and little by little the aircraft will be decompressed. But in Rapid depression for example a window is sucked into the air and in a couple of minutes the aircraft will be depressurized. in Explosive case, a big part of the fuselage is detached and in a couple of seconds the aircraft is depressurized.

**75) What is the difference between IFR and VFR flights?**

To fly any aircraft there are generally two sets of rules: VFR and IFR. IFR stands for Instrument Flight Rules and VFR stands for Visual Flight rules. A pilot may decide to go for one of the set of rules on the basis of the weather conditions. VFR rule: the aircraft must remain clear of clouds with the surface in sight, and maintain a certain flight visibility minimum (1,500 metres according to ICAO, one statute mile in the US, 1,500 m visibility, in sight of surface and clear of cloud in Europe).

Initially IFR results from IMC condition. IFR is done according to A/C instruments. We should pass IR course for flying according to IFR. Whereas VFR is performed in VMC conditions. VFR is done according to Visual ground check point and we don't need any special license for flying according to VFR.

**76) What is the difference between low approach and low pass?**

low pass is done for checking exterior parts of the aircraft by tower like tail or undercarriage, but low approach is used for training purposes. In a low approach we bring the aircraft to runway about 500ft down and it's not a touch-down and go around.

**77) What is the difference between MINIMUM FUEL and MAYDAY FUEL?**

Minimum fuel is a case in which the fuel supply of an aircraft has reached a state where the flight is committed to land at a specific aerodrome and no additional delay can be accepted. It is not as severe as Full Emergency, in that the aircraft is able to reach a runway and most probably doesn't crash to the ground before reaching it.

The term Minimum Fuel should be used when you currently expect to land with more than the minimum fuel reserves (so everything is OK right now), but any further delay would result in being below minimum reserves when landing. This situation is not yet an emergency and ATC does not need to give you any priority, but they know that keeping you in a holding pattern could result in you declaring an emergency.

The term Mayday Fuel should be used when it is clear that you will land with less than the minimum fuel reserves. This constitutes an emergency and requires ATC to act immediately (this could be priority for landing or diverting you to a different airport, if available).

**78) What is the difference between runway incursion and runway excursion?**

Runway Incursion is the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide whether to go around or touch the runway it depends on the place of runway incursion and the situation. In case of runway excursion, the aircraft may enter the grass margin not the desired taxiway. A specific kind of runway excursion is overshoot or over run where it happens at the far end of the runway not to the side of the runway. After runway excursion we need a crane or tow car to come and help the aircraft to go back onto the desired route and to recover from that situation or to be moved onto the ramp.

**79) What is the difference between tail strike and propeller strike?**

during take-off if the nose of the aircraft is higher than normal and the tail of the aircraft touches the ground, tail strike is happened. Also, if the aircraft's CG has shifted to the aft of the aircraft tail strike may happen. If we fly, it may result in structural failure during the flight and after that the aircraft may be depressurized, so, we should return to the airport and then land as soon as possible.

A Propeller Strike is any incident during engine operation where the propeller impacts a solid object. This incident includes propeller strikes against the ground. It may result in loss of propeller blade tip. Prop strikes are one of the costliest incidents that can happen to propeller-driven aircraft. They usually require an engine overhaul, and they can easily take an airplane out of service for weeks, if not months. Poor aircraft control during gusty crosswinds, or a porpoise landing, are some of the most common causes of prop strikes.

**80) What is the Flight Plan? Why should a flight have a Flight Plan?**

Flight plans are documents filed by a pilot or flight dispatcher with the local Air Navigation Service Provider prior to departure which indicate the plane's planned route or flight path. Flight plan format is specified by ICAO in document 4444.

**81) What is wind shear and why is it so dangerous for airplanes?**

Wind shear is a large local wind gradient, i.e. sudden changes in wind speed and direction which may cause aircraft to lose airspeed and altitude and are especially dangerous close to the ground during approach and landing

Wind shear is defined as a rapid change in the direction or velocity of the wind. It's more dangerous when we are approaching the threshold at lower levels.

**82) What is your favorite type of aircraft? Why?**

In the training planes in Iran, in my opinion, it is the best Cessna 172  
My reason for considering Cessna the best aircraft is that it is extremely stable and has good performance, and among all the aircraft I flew with, I received the best sense of flight and safety from this aircraft.

But I'm very interested in the Boeing 787 Dreamliner

In my opinion, this aircraft is one of the best in the world in every way  
Because this aircraft has many capabilities and has the latest navigation equipment and etc.

**83) What landing gear problems may happen during take-off or landing?**

Landing gear problems include for example TWISTED LANDING GEAR, JAMMED LANDING GEAR and BUCKELED OR BROKEN LANDING GEAR. When it is jammed it means that if it is extended, we cannot retract it and if it is retracted, we cannot extend it. In other words, it is stuck in its place and it doesn't move. Twisted landing gear is when it is at 90-degree angle. After landing with a twisted gear, it may catch fire and the fire may penetrate into flight deck. A go-around is likely if problem first occurs on final approach. If the pilot is not sure of retraction or extension of the gear, a visual inspection may be required to check it, for example by a 'low pass' or sighting from another aircraft. Undercarriage collapse or loss of directional control or steering problem is possible upon landing.

**84) What lessons do you study in your training courses?**

I studied the following lessons during my studies in the CPL course  
Annexes, Human performance, Aircraft performance, Aerodynamic, System, Operational procedure, Flight plan, General navigation, Radio navigation, Radio telephony, etc.

**85) What made you choose to become a pilot?**

Becoming a pilot makes you smarter. You'll gain knowledge that you never thought you would need to know. You'll become a better planner, a logical decision-maker, and a meteorologist. You'll learn good resource management, how to be patient and how to operate safely, with a sense of urgency.

**86) What situation in flight might force pilots to use oxygen masks?**

Depressurization/decompression/loss of pressurization/ smoke in the cockpit

**87) What was your favorite lesson in your ground school? Why?**

My favorite lesson during the Ground School was the system

I have been interested in technical work since I was a child, so it was very sweet for me to study aircraft systems and how they work.

**88) What will you do if the engine of your single engine aircraft fails during flight?**

In single engine at first, we should maintain the best glide speed and after that try to recover the engine. Finally, if it does not work, we should find a suitable field to land as soon as possible or make an emergency landing.

**89) What will you do if your IP is incapacitated?**

During IP incapacitation because one of pilot is in state of emergency we have to announce may day on frequency and informing controller, and we have to hold the IP in firmly in place and we have to continue flight alone and land as soon as possible at closest airport

**90) What would you do if you found out that your IP is unfriendly to you don't feel comfortable sitting next to him/her?**

I will not say anything on the flight and ... I will try observe the CRM. After the flight, I will request that I stop flying with this IP. Because the CRM doesn't observe and if something happens, the performance to solve the problem decreases and it cannot be handled.

But it is good that a person can fly with any kind of IP because we do not have the right to choose a IP but always safety is first

**91) What would you do if, while flying en route, you see storm cells ahead?**

Use of weather radar can help the pilots detect the areas with the possibility of thunderstorms

and they can avoid such areas.

**92) What would you do if, while landing on the runway, you cannot see the runway or even the runway lights due to poor visibility?**

We should not land at this condition because we have minima for visibility and if we have under the minima we shall divert to alternate airport but Each action depends on the type of flight

If our flight is VFR, according to the rules, we must change my route to the alternate airport with better visibility and land there and wait for the visibility at the destination airport will be over 5000 meters.

If our flight is IFR, we must follow the aircraft and airport navigation equipment especially instrument approach available at airport and minimum decision height approved at the airport.

**93) What's the difference between accident and incident?**

An incident is actually an uncomplete accident. In other words, an accident is an occurrence in which injury, fatality and damage are included. To put it another way, persons suffer death or serious injury, or the aircraft receives substantial damage. So, a passenger's broken arm while exiting the aircraft would be a reportable accident. But, in an incident, there is only the probability or potential of them. The severity of an accident is much greater than an incident. "Accidents" and "serious incidents" must be reported, but non-serious incidents do not need to be reported.

**94) What's the difference between flying a simulator and flying a real airplane?**

I think the most important point about simulators is that we can simulate all emergency situations and find the weak points and find solution for them.

**95) When did you start studying pilot training course? Where?**

I started studying pilot training course on February twenty second 2021 at Meraj Aviation flight Academy

**96) When do you declare emergency due to fuel starvation?**

In an internal combustion engine, fuel starvation is defined as the failure of the fuel system to supply sufficient fuel to allow the engine to run properly, for example due to blockage, vapor lock, contamination by water, malfunction of the fuel pump or incorrect operation, leading to loss of power or engine stoppage.

**97) When do you report a TCAS RA? What should you do in such a case?**

TCAS RA: an automatically-generated warning such as '*descend, descend*' requiring immediate crew action RA or Resolution Advisory is an instruction to climb, descend or maintain level of the aircraft, otherwise a collision is possible.

The pilot should follow TCAS instructions even if it differs from what is instructed by the controller.

**98) Which one do you prefer, flying in daylight or night? Why?**

The most important thing for me is flying



But I prefer flying in night because I have never experienced flying at night, I am now very eager to fly at night.

**99) Which one is more challenging, flying a single engine or twin-engine aircraft?**

I think flying a twin-engine aircraft is more challenging and exciting than single engine, Because the twin-engine aircraft has more workload and highest performances and the pilot can get new experience and good sense of fly with it

**100) Why do aircraft need to go through anti-icing procedure?**

If winter precipitation is falling, such as snow, freezing rain or sleet, further action needs to be taken to prevent ice from forming again on the aircraft before takeoff. We have some conditions like we see frost on wing 3 mm or more and oat temp 0 degree.

**101) Why do you think a pilot should be good at meteorology?**

a good pilot must always analyze the situation and calculate to perform a safe flight. A good pilot before starting the flight checks the weather and pressure to calculate the best performance.

**102) Why do you think medical check is necessary for pilots?.....**

In the pilot incapacitation occur, the co-pilot should be able to take action and continue the flight safely towards to the destination. In case of flight crew incapacitation there will be no serious risk for the safety of the flight. As a pilot we just should consider the situation and see whether immediate landing is required or not. If it's life-threatening we will usually find a suitable area to land immediately. But if it's not life-threatening we will continue the flight to the destination

**103) Why do you think pilots and controllers may not understand each other?**

There are several reasons:

- 1-accent
- 2- rate of speech
- 3- Use complex structures and sentences
- 4-use of hesitation
- 5-Do not speak fluently

#### **104) Why do you think pilots should study meteorology?**

Since pilot flies aircraft in the air it is inevitable for pilots to consider the effects of weather on flight operations.

Pilots study meteorology to understand the nature and Idea of how weather develops and this helps pilots to anticipate for upcoming weather which might affect their flight.

So why is it important to anticipate such case? Its all goes back to the safety of the flight. Knowing what the pilots is going to face especially in fuel quantity. To have enough fuel to avoid significant weather like Thunderstorms, or having extra fuel for extra time spend taxiing on low visibility airport, or to cater for delays caused by weather, is necessary to ensure the flight goes safely and efficiently.

#### **105) Why do you want to become a pilot?**

When I was a child, I always held a rosary in my hand and held it in front of me and started spinning it, At that moment, I turned to the plane and started running around the house, Those moments are the sweetest memories of my childhood

As I got older, I used to go to Fatah Square and watch the planes fly

I don't know how to express this feeling, but flying is like water to fish for me

I don't want to make the discussion emotional, but I think the courage to fly with the pilot is born and this courage is complemented by gaining knowledge.

This is the most important game in my life, I want to play this game, the game of flying without inhibitions, because unlike football, golf or volleyball, this game requires two balls!

#### **106) Why might a flight suddenly run out of fuel?**

We have fuel planning before takeoff but If fuel is suddenly depleted in flight we have fuel leakage problem. Which has its own processor with which we land safely

#### **107) Why should an airport have markings and signage?**

Because sometimes the visibility is low and some airports are a bit complicated and we have to navigate to going which taxiway and parking.

This must be done correctly because if it is not done properly, the traffic flow will be disrupted

#### **108) Why should the PIC and first officer eat different foods?**

Due to safety. Prevent food poisoning and If one of them is poisoned, the other pilot can to fly.

**109) Would speak about the importance of simulators?**

I think the most important point about simulators is that we can simulate all emergency situations and find the weak points and find solution for them.

**110) Would you compare the layout of [PAYAM] airport and [Qazvin]?**

If I want to compare the layout of Payam and Qazvin I can point to

We have VOR/DME approach in Payam but we have just NDB in Qazvin and in Payam we have two taxiways (A-B) but in Qazvin we have one taxiway and in Payam we have DME so can the receive the distance information but in Qazvin we don't have

Overall, in Payam due to better navigate device the approach is more accurate

**111) You have had many landings and take-offs at Payam, could you describe this airport? (Runway, taxiway, apron, ...)**

Apron: the paved area around the terminal buildings, hangars and cargo terminals where aircraft park

Taxiway: paved way for aircraft to move to and from the terminals and different parts of the airport

Runway: the paved surface designed for aircraft take-off and landing. Runways have different designated orientations (QFU) such as 05L / 23R 180° apart and are generally some distance from the terminal buildings. The runways may be parallel, offset or intersecting

## The most important questions for pilots

- 1) A flight crew sometimes includes a flight engineer; sometimes it doesn't. Why?
- 2) Can you compare Mechanical and fly-by-wire aircraft?
- 3) Can you compare these two types of aircraft: ..... and .....?
- 4) Can you compare your first solo flight and your last flight?
- 5) Can you describe the layout of ..... airport?
- 6) Can you explain different parts of an airport? [*Explaining the functions of each part is necessary*]
- 7) Can you explain how aircraft fly?
- 8) Can you explain the challenges that you have in your job? [bad weather, delay, lack of sleep]
- 9) Can you name some abnormal situations that may occur on an airport?
- 10) Could you speak about the dangers of "high-speed rejected take-off"?
- 11) Could you Speak about the dangers of runway contamination?
- 12) Could you talk about "Hydraulic Failure"?
- 13) Could you talk about common problems involving wildlife (I mean animals) on the ground and in the sky?
- 14) Do you know what "glide ratio" is?
- 15) Do you remember your first solo flight?
- 16) Generally, how can aircraft be endangered by animals on the ground?
- 17) Have you ever had a near miss or other abnormal situations? Explain the occurrence.
- 18) Have you ever had a serious problem in flight? What was that?
- 19) Have you ever watched Captain Sully Movie? If yes please talk about that flight, if not please talk about ditching in aviation?
- 20) Have you thought about becoming a controller rather than a pilot? Why?
- 21) How can a bird strike lead to decompression?
- 22) How can Jet Stream affect your flight?
- 23) How can pilots be informed of a CB cell in front of them and what should they do in such a situation?
- 24) How can you improve your flying skills?
- 25) How do you deal with a sick passenger in flight?
- 26) How has the job of the pilots changed during the last 20 years?
- 27) How many types of airplane have you flown, which one was the best?
- 28) In case of ditching, what coordination should you have with your cabin crew/OCC?
- 29) In emergency cases, what are your expectations from ATC?
- 30) Now let's change the topic. How can pilots have a good lifestyle? I mean how do you keep yourself healthy?
- 31) One emergency situation is depressurization. What is that and what will you do if such a case happens to you?
- 32) Suppose ATC informs you of a bomb scare. What will you do?
- 33) What are flight control surfaces? Explain their functions.
- 34) What are the characteristics of a good IP/Pilot/First officer/Student Pilot/ATCO/ATC supervisor?
- 35) What are the characteristics of a good pilot?
- 36) What are the consequences of a tire burst upon landing?
- 37) What are the consequences of one of your engines ingesting a large bird?
- 38) What are the dangers of runway contamination by snow or slush?
- 39) What are the main differences between A340 and A330? Which airplane do you think is safer?
- 40) What are the possible reasons for fuel starvation (=fuel shortage)??

- 41) What are your actions in case of radio failure?
- 42) What are your actions in case of total engine failure?
- 43) What are your suggestions for newcomers to aviation field?
- 44) What can be done to reduce the consequences of a runway excursion?
- 45) What can cause incapacitation?
- 46) What can the aviation industry do to reduce the number of runway incursions?
- 47) What do you do from the time you board the plane until you start taxi?
- 48) What do you do in case of a medical urgency? How do you inform ATC of your situation?
- 49) What do you do to avoid bad weather along your route?
- 50) What do you do when you are approaching a HOTSPOT at an airport?
- 51) What do you expect from a controller to do in case of aircraft emergencies?
- 52) What do you expect when you smell burning fume in the cockpit?
- 53) What do you know about CRM?
- 54) What do you know about tail strike?
- 55) What do you normally do from the time you are picked up until you get onto your aircraft?
- 56) What do you think are the common causes of on-board medical emergency?
- 57) What do you think are the common causes of on-board medical emergency?
- 58) What do you think when you hear about an accident involving a passenger airplane?
- 59) What does PAPI stand for and how does it work?
- 60) What effect do you think computer has had on new generation aircraft?
- 61) What effect do you think COVID-19 has had on aviation?
- 62) What happens if the ailerons don't move? How can you maneuver the aircraft in such a situation?
- 63) What is a bomb scare? What do you do in such a case?
- 64) What is a hotspot? What do you do when you reach a hotspot?
- 65) What is a near miss? What does TCAS do in such a case?
- 66) What is a near miss? What will you do if you are engaged in a near miss?
- 67) What is belly landing? Why is the runway foamed, sometimes, in such cases?
- 68) What is CAT and how can it affect flight operation?
- 69) What is ditching? Do you know the most famous case of ditching?
- 70) What is icing? Can you compare de-icing with anti-icing?
- 71) What is jetlag and how can it affect your performance?
- 72) What is microburst/CB/Wind-shear?
- 73) What is pilot incapacitation and what should be done in that situation?
- 74) What is runway incursion and what can cause a runway incursion?
- 75) What is situational awareness and how can you keep it during flight?
- 76) What is situational awareness?
- 77) What is standard phraseology? Can you compare it with plain language?
- 78) What is TCAS? Explain its role in near misses.
- 79) What is the difference between explosive and gradual decompression?
- 80) What is the difference between IFR and VFR flights?
- 81) What is the difference between low approach and low pass?
- 82) What is the difference between MINIMUM FUEL and MAYDAY FUEL?
- 83) What is the difference between runway incursion and runway excursion?
- 84) What is the Flight Plan? Why should a flight have a Flight Plan?
- 85) What is the role of Air Marshal [ACM] in flight? Have you ever had a problem with them?
- 86) What is wind shear and why is it so dangerous for airplanes?
- 87) What is your favorite type of aircraft? Why?
- 88) What lessons do you study in your recurrent training courses?

- 89) What made you choose to become a pilot?
- 90) What situation in flight might force pilots to use RAT?
- 91) What will you do if you take off with a fully-filled-up-with-fuel aircraft and a bird strike happens shortly after take-off and the windshield smashes?
- 92) What will you do if your first officer/Captain is incapacitated?
- 93) What would you do if you found out that your co-pilot is unfriendly to passengers and harsh to flight attendants?
- 94) What would you do if, while flying en route, you see storm cells ahead?
- 95) What would you do if, while landing on the runway, you cannot see the runway or even the runway lights due to poor visibility?
- 96) What's the difference between accident and incident?
- 97) What's the difference between flying a simulator and flying a real airplane?
- 98) When do you declare emergency due to fuel starvation?
- 99) When do you report a TCAS RA? What should you do in such a case?
- 100) Which one do you prefer, flying in daylight or night? Why?
- 101) Which one is more challenging, flying a domestic flight or a cross country one?
- 102) Who is an unruly passenger and what will you do if you have one in flight?
- 103) Why do aircraft need to go through anti-icing procedure?
- 104) Why do you think a pilot should be good at meteorology?
- 105) Why do you think maintenance release is important for each flight operation?
- 106) Why do you think pilots and controllers may not understand each other?
- 107) Why do you think pilots should study meteorology?
- 108) Why is there a checklist for different phases of flight?
- 109) Why might a flight suddenly run out of fuel?
- 110) Why should an airport have markings and signage?
- 111) Why should the PIC and first officer eat different foods?
- 112) Would speak about the importance of simulators?
- 113) Would you name some natures of emergency that a flight may encounter with?
- 114) You have had many landings and take-offs at airports, could you describe one airport that you are familiar with? (Runway, taxiway, apron, ...)

## The most important questions for Air Traffic Controllers

- 1) Can you compare ACC and Approach?
- 2) Can you compare working as a tower controller and an ACC one?
- 3) Can you describe the layout of ..... airport?
- 4) Can you explain different parts of an airport? [*Explaining the functions of each part is necessary*]
- 5) Can you explain the challenges that you have in your job? [shift work, heavy traffic, stress]
- 6) Can you name some abnormal situations that may occur on an airport?
- 7) Can you name some natures of emergency?
- 8) Could you talk about "Hydraulic Failure"?
- 9) Could you talk about common problems involving wildlife (I mean animals) on the ground and in the sky?
- 10) Could you talk about difficulties of single runway operation?
- 11) Could you talk about problems involving landing gear of an aircraft?
- 12) Could you talk about problems involving wildlife (I mean animals) on the ground and in the sky?
- 13) Could you talk about problems involving wildlife (I mean animals) on the ground and in the sky?
- 14) Do you think wake turbulence may discomfort flight operations en-route? How?
- 15) Due to a landing gear problem the pilot asks for a low pass. What does it mean?
- 16) Explain depressurization?
- 17) Explain the difference between airport markings and signage.
- 18) Generally, how can aircraft be endangered by animals on the ground?
- 19) Have you ever wanted to be a pilot rather than an ATCO? Why?
- 20) Have you ever watched Captain Sully Movie? If yes please talk about that flight, if not please talk about ditching in aviation?
- 21) Have you ever witnessed an emergency case? if yes, what was that, if no explain Medical Emergency?
- 22) Have you thought about becoming a pilot rather than an ATCO? Why?
- 23) How can a bird strike lead to decompression?
- 24) How can aircraft be endangered by animals on the ground?
- 25) How can you be informed of bad weather in your area of responsibility what do you do in such a situation?
- 26) How did you become familiar with ATC?
- 27) How do you separate aircraft from each other?
- 28) In case an aircraft reports navigation system failure, how can you help them?
- 29) Is there any contingency plan for your airport/ACC? Explain what that is.
- 30) Let's talk about aircraft cabin pressurization. Why should an aircraft cabin be pressurized?
- 31) Now let's change the topic. What is the difference between radar control and procedural control?
- 32) One emergency situation is depressurization. What is that and what will you do if such a case happens to an aircraft under your control?
- 33) Some airports have a ground controller and some only a tower controller. Why?
- 34) Suppose an unknown person calls your unit and says that there is a bomb in an aircraft? What do you do? Speak about "isolated parking position" in your answer.
- 35) What air traffic control units do we have? Explain their functions.
- 36) What are ATC units? Explain their functions.?
- 37) What are the challenges of a GND/TWR/APP/RDR controller?
- 38) What are the characteristics of a good ATCO/Assistant/ATC supervisor?
- 39) What are the most probable accidents or incidents that may happen to an aircraft at an airport?

- 40) What are the possible reasons for delaying arrival and departure flights?
- 41) What are your actions in case of communication failure with an aircraft?
- 42) What are your actions in case of total ground radar/radio failure?
- 43) What are your suggestions for newcomers to aviation field?
- 44) What can be done to reduce the consequences of a runway excursion?
- 45) What can cause a decompression and how fatal can it be?
- 46) What can the aviation industry do to reduce the number of runway incursions?
- 47) What do you do in case of receiving report of on-board medical emergencies?
- 48) What do you expect to happen if a fully-filled-up-with-fuel aircraft takes off and a bird strike happens shortly after take-off and its windshield smashes?
- 49) What do you expect to happen when a pilot declares emergency due to fuel starvation?
- 50) What do you expect when a pilot reports burning fume in the cockpit?
- 51) What do you normally do when you want to hand over control position to a colleague?
- 52) What do you normally do when you want to take over control position from a colleague?
- 53) What do you think when you hear about an accident involving a passenger airplane?
- 54) What does SSR stand for and how does it work?
- 55) What effect do you think computer has had on ATC systems?
- 56) What effect do you think COVID-19 has had on aviation?
- 57) What is a CB cell and why is it so dangerous for airplanes?
- 58) What is a hot spot?
- 59) What is a hotspot? What do you expect from pilots to do when they reach a hotspot?
- 60) What is air traffic control?
- 61) What is Asymmetrical Thrust?
- 62) What is belly landing? Why is the runway foamed, sometimes, in such cases?
- 63) What is bird strike and how can we reduce its possibility to happen, around airports?
- 64) What is ditching? Do you know the most famous case of ditching?
- 65) What is Electrics failure? What do you do if such a case is reported by a pilot?
- 66) What is Hydraulic Failure?
- 67) What is icing? Can you compare de-icing with anti-icing?
- 68) What is ILS and how does it work?
- 69) What is microburst/CB/Wind-shear?
- 70) What is runway incursion and what can cause a runway incursion?
- 71) What is standard phraseology? Can you compare it with plain language?
- 72) What is the difference between accident and incident?
- 73) What is the difference between anti-icing and de-icing?
- 74) What is the difference between explosive and gradual decompression?
- 75) What is the difference between low approach and low pass?
- 76) What is the difference between MINIMUM FUEL and MAYDAY FUEL?
- 77) What is the difference between runway incursion and runway excursion?
- 78) What is the role of experience in controlling aircraft?
- 79) What is wake turbulence and why should you apply wake turbulence separation??
- 80) What is wind shear and why is it so dangerous for airplanes?
- 81) What is your favorite ATC unit? Why??
- 82) What is your idea about the structure of Tehran FIR/...CTR/...TMA?
- 83) What lessons did you study in your initial training course?
- 84) What made you choose to become a controller?
- 85) What should a controller do in case of aircraft emergencies?
- 86) What will you do if you see smoke coming out of an engine of a departing aircraft?



- 87) What's the difference between working in a simulator and at real ATC position?
- 88) When does a pilot reports TCAS RA? What should you do in such a case?
- 89) Where do you work?
- 90) Which facilities do you use to provide Air Traffic Services.?
- 91) Which one do you prefer, working in a busy airport or an empty one? Why?
- 92) Which one is more challenging, working in a tower or an approach unit?
- 93) Which one is worse, radio failure or radar failure?
- 94) Which one is worse, RCF or radar failure?
- 95) Why do aircraft need to go through anti-icing procedure?
- 96) Why do the controllers need an assistant?
- 97) Why do you think airports should have markings and signage?
- 98) Why do you think controllers should study meteorology?
- 99) Why do you think pilots and controllers may not understand each other?
- 100) Why do you think pilots and controllers may not understand each other?
- 101) Why should an airport have markings and signage?
- 102) Would you categorize your [OIII] airport layout simple or complicated? why?
- 103) Would you categorize your airport layout simple or complicated? why?
- 104) Would you name some natures of emergency that a flight may encounter with?
- 105) Your single runway is blocked by a landing aircraft and you have 3 arrivals in the stack waiting for approach clearance. What will be your reaction?

## Sample answers to high frequency questions

### What is Depressurization/decompression/loss of pressurization?

Normally the aircraft at higher levels must be pressurized. I mean the cabin altitude should be around 8000 feet for the occupants to be comfortable and able to breathe normally. When the pressurization system of the aircraft malfunctions, the aircraft will be depressurized and the pilot makes an emergency descent to prevent the passengers from bursting their eardrums or getting Hypoxia. Oxygen masks will be dropped for the passengers to help them breathe.

There are 3 types of depressurization: Gradual, Rapid and explosive. **Gradual** decompression is the result of for example a crack in the windshield or a window of the aircraft in which gradually and little by little the aircraft will be decompressed. But in **Rapid** depression for example a window is sucked into the air and in a couple of minutes the aircraft will be depressurized. in **Explosive** case, a big part of the fuselage is detached and in a couple of seconds the aircraft is depressurized.

**CFIT /sifit/:** It stands for Controlled Flight Into Terrain. When the aircraft is totally under the control of the pilot and it is not broken down or in a state of emergency, but it hits the ground, we call it CFIT. The pilot is usually unaware that they are getting close to the terrain and only when it is too late, they will notice the danger. Most commonly it occurs in the approach or landing phase of flight, especially in poor visibility and bad weather.

### What are the possible reasons for fuel starvation (=fuel shortage)?

Fuel shortage can have a number of reasons, for example having adverse weather condition and the requirement for frequent and long circumnavigations. Also, miscalculation of fuel amount at the beginning of the flight may cause fuel shortage. The other reason is fuel leak and also fuel contamination. Engine flame out is the obvious consequence of fuel shortage. Runway undershoot is another possible result.

### What is the difference between plain language and standard phraseology?

Standard phraseologies are pre-set phrases introduced by ICAO to be used in specified conditions. But where there is an abnormal or emergency situation, standard phraseologies are not enough and we should speak plain English which is formal and without idioms or very informal slang words and sentences.

### What were your challenges in the training course of piloting?

Frankly speaking, financial issues were really challenging. But regarding the professional matters, flying in crowded airports where there was danger of collision was really threatening. Also Understanding some lessons was very difficult and passing them was really a challenge for me.

### What do you do in case of radio failure?

In case of VFR flight, we should continue in VMC and we should be careful of traffic around us and land at the nearest aerodrome. But in case of IFR flight, if we are identified, we will maintain the last ATC instruction and then we go to flight planned route and level. we will continue to the initial approach fix of the

destination airport and we will follow a normal approach to land. When we are in sight of the tower, they may use visual signals and signaling lamp to send messages to us. The SSR code of 7600 should also be set.

### **Why being a pilot is difficult?**

Being a pilot can be difficult because of a number of reasons. Firstly, pilots should avoid a lot of enjoyable things to keep themselves healthy. To clarify myself I should mention eating heavy meals and drinking alcohol before flight. Furthermore, the stress of unpredictable events during flight as well as emergencies make piloting a difficult job. Travelling a lot and being away from family are also among those reasons.

### **What are the dangers of runway contamination?**

Runway contamination is actually the presence of any unwanted material like water, soil, stone, slush, etc. that may cause runway excursion or FOD. FOD stands for Foreign Object Damage which is for example when soil is ingested into the engine. There is a specific category of information called essential information on airport conditions which include some warnings of runway contamination for flight crew. Snowplow or sweeper car may be taken advantage of in order to clear the runway of such harmful material.

### **What is the difference between missed approach and go-around?**

Missed approach procedure is a set of maneuvers to be followed by aircraft in any case that makes a landing impossible or inadvisable. When the pilot wants to tell ATC that they want to follow that procedure, he/she uses the phrase "GOING AROUND" and when the controller wants to instruct the pilot to follow that procedure, he/she uses the phrase "GO AROUND".

### **Speak a little about the importance of weight and balance.**

Weight is actually the name of the force that pulls everything toward the center of the Earth and its magnitude is determined by the mass of the aircraft. The greater the aircraft's mass, the greater the weight force. On the other hand, the aircraft has a CG or Center of Gravity which is actually its balance point. It is very important during flight because of its effect on the stability and performance of the aircraft. It must remain within carefully defined limits at all stages of flight. To achieve this, load distribution by adding, subtracting or shifting the position of passengers, cargo or fuel in the aircraft is performed.

### **Why shouldn't the flight crew eat and drink specific things in stopovers?**

Flight crew should be very careful about what they eat and drink to avoid getting poisoned, specially between flight legs. If the pilot gets sick during flight duty period, the safe conduct of flight will be adversely affected. Pilot incapacitation or even fainting can be of the consequences of eating improper food and drinks.

### **What is Glide Ratio?**

Glide Ratio is related to emergency situations when the engine is failed. Each aircraft has a specific glide ratio to give the most distance to be flown without the help of the engines. By definition, Glide Ratio is the altitude lost for each nautical mile of distance flown. Seeking optimal glide in case of total engine failure is very important because it will help the pilots to have time to relight the engine or reach a suitable field to land.

**What is CRM and why is it important?**

CRM stands for Cockpit or Crew Resource Management. Actually, many accidents do not result from a technical malfunction or failure of systems, but they are caused by the inability of flight crew to respond appropriately to the present situation. It may result in a wrong decision or series of decisions which can cause a serious incident or a fatal accident. The main purpose of CRM is to increase safety by use of non-technical skills like teamwork and effective decision making to solve on-board problems, reducing errors and avoiding stress. The relationship between flight crew in the cockpit is very important for safe conduct of flight and it is dealt with in CRM.

**What do you know about the role of animals in aviation?**

The role of animals in aviation is divided into two parts: on the ground and in the air. In the air, the danger of engine ingestion or bird strike may cause an emergency but on the ground the presence of animals on the airside may necessitate a go-around or aborting of a take-off. Wildlife on the runway is a major prop strike concern. Wildlife strike is a serious hazard to aircraft safety and have caused a number of fatal accidents. Especially in-flight bird strikes can cause broken windshield, engine failure or pilot incapacitation. In north of Europe they have a specific NOTAM for bird hazards which is called BIRDTAM. Of course, it is not a term used by ICAO but it has a NATO standard.

Around the airports, the birds may be scared away by gun-shot or emission of specific sound frequencies.

**What are your suggestions for newcomers to the aviation field?**

My suggestion to them is that they should try well to learn their technical lessons and to improve their English language proficiency. Moreover, they should be careful about their attitude and appearance. My other suggestion to them is about their job. Because it is not easy to be employed in an airline, I suggest them to have another job or university major. Of course, I believe that a pilot should at least have a bachelor degree and it is not good for a pilot to have only a high school diploma.

**What are the effects of Covid-19 on aviation?**

Well, Covid-19 stands for Coronavirus Disease 2019. It is an infectious disease caused by the new coronavirus which was discovered in Wuhan, China.

Its effect on aviation is so great that the job career of a lot of people is endangered. People are afraid of being in enclosed spaces like aircraft cabins and that is why the number of air travels is reduced dramatically. It is not strange to hear that some airlines have gone bankrupt and a lot of employees are fired. I think the best strategy is to observe social distancing in aircraft and also disinfection of passengers and cargo before boarding the aircraft. The requirement for health documents with short validities can also be considered.

Airlines, to prevent the outbreak of Covid-19 pandemic, should disinfect the aircraft and passengers before each flight. Also, both crew and passengers should wear face masks and hand gloves during flight to reduce the negative effect of the virus on the occupants.

**What is CAT and why is it important in flight?**

It is the abbreviation of Clear Air Turbulence. It happens in cloudless regions and it may have severe turbulence that surprises the flight crew. It usually happens in higher altitudes and in cruise phase of flight. The pilot cannot do anything special but to control the aircraft until it is over. Of course, there are a number of strategies to predict them which are taught in meteorology courses. For example, Cirrus or Lenticular clouds can give a clue to the pilots of the presence of CAT. The effect of CAT on the aircraft can be structural damage, injury to people on-board and also it may make it impossible to read the instruments in the cockpit. Passengers and crew should fit seat belts and harnesses when seated to protect them in the event of unforeseen turbulence. In such situations cabin service should be suspended and the seat belt sign should be illuminated. All passengers and crew should immediately sit down and fit seat belts/harnesses.

### **What is Jet-stream?**

A Jet Stream is a narrow rapid moving air close to the Tropopause which is generated as a result of the temperature gradient between air masses. A Jet Stream can be several thousand miles long, but only a few hundred miles wide and a few thousand feet in depth. The minimum speed of a jet stream is 60 knots, but speeds of up to even 300 knots are also reported. Because it is usually westerly, aircraft flying from west to east will try to use it to increase ground speed and, similarly, aircraft flying East-West will plan to avoid the Jet Streams. An aircraft descending from calmer winds to stronger winds will encounter an increase in indicated airspeed. care should be taken when flying at maximum speed not to overspeed the aircraft. Likewise, an aircraft flying into a rapidly increasing tail wind jet stream can see a reduction in indicated air-speed and if not managed end up in an airspeed low scenario.

### **Why should the pilots avoid thunderstorms?**

Thunderstorms are associated with heavy precipitation, like heavy rain, heavy snow, or Hail, Thunder, and Lightning. Such a storm will be caused by CB clouds. Lightning may lead to fire or electrical failure. Up and Down drafts in CB clouds may cause even a crash to the ground and heavy precipitations may endanger the flight. Use of weather radar can help the pilots detect the areas with the possibility of thunderstorms and they can avoid such areas.

### **What is the role of PAPI in landing?**

PAPI is the abbreviation of Precision Approach Path Indicator. It is installed as four lights in a single row. A similar system is VASIS which stands for visual approach slope indicator system, which consists of four light units situated on the left side of the runway in the form of two rows. They actually use lights to tell the pilot whether he is on, above or below the optimum glide slope for landing on a runway. PAPI is normally located on the left-hand side of the runway but it can be seen to the right of the runway, too. When two lights are red and two lights are white it shows that the slope is correct.

### **Explain RAT and its function.**

It stands for Ram Air Turbine. It is a small turbine that is installed in an aircraft and used as an alternate or emergency hydraulic or electrical power source. In general, modern aircraft only utilize the RAT in

emergency: either in the event of loss of hydraulic systems or following the loss of primary electrical generation. Under normal conditions, the RAT is stowed in a compartment in the fuselage or wing. It can be deployed manually when required or, in some installations, will deploy automatically following a complete loss of AC power. In the interval between power loss and RAT deployment, aircraft batteries are used to power essential instrumentation.

### **What is bomb scare and what are your reactions to it?**

It is a special case in which it is suspected that a bomb or another explosive device is installed on board the aircraft. Although the vast majority of bomb threats are false, all received bomb warnings must be considered real. The pilot's reaction should normally be diverting to the nearest suitable aerodrome and proceeding to the isolated parking area as instructed by ATC to search for the bomb and defusing it. If the bomb is located in the aircraft, it should be moved to the designated least risk bomb location, usually next to an external door in the rear galley.

### **How can jet lag affect pilots and passengers?**

Jet lag occurs when people travel rapidly across time zones. It is a physiological condition that results from a disruption in the body clock. The more time zones a person crosses in a short period, the more severe the symptoms are likely to be. Traveling east makes the day shorter, and Traveling west makes the day longer. Flight crews should be trained about coping with fatigue related to jet lag. Of course, jet lag is more than just fatigue. Also, sleepiness, digestive problems, impaired judgement, impaired decision making, memory lapses, bad temper and lack of interest and concern are other outcomes. I think managing the sleep and nap strategies is the best thing that we can do to reduce its negative effects.

Why is the course of piloting so expensive?

It is due to a number of reasons. I can mention for example the high exchange rate; I mean the great value of Dollar in comparison with our Rial. Also, the airport charge, especially for take-off and landings and parking fees, are not cheap. The problem of maintenance and provision of aircraft spare parts is another reason. But the point is that when someone really intends to become a pilot, he should accept the expenses, too.

### **What is the difference between accident and incident?**

An incident is actually an uncomplete accident. In other words, an accident is an occurrence in which injury, fatality and damage are included. To put it another way, persons suffer death or serious injury, or the aircraft receives substantial damage. So, a passenger's broken arm while exiting the aircraft would be a reportable accident. But, in an incident, there is only the probability or potential of them. The severity of an accident is much greater than an incident. "Accidents" and "serious incidents" must be reported, but non-serious incidents do not need to be reported.

### **What Is A Propeller Strike?**

A Propeller Strike is any incident during engine operation where the propeller impacts a solid object. This incident includes propeller strikes against the ground. It may result in loss of propeller blade tip. Prop strikes are one of the costliest incidents that can happen to propeller-driven aircraft. They usually require an engine overhaul, and they can easily take an airplane out of service for weeks, if not months. Poor

aircraft control during gusty crosswinds, or a porpoise landing, are some of the most common causes of prop strikes.

### **What Is A Porpoise Landing (Bounced Landing)?**

A porpoise landing is a bounced landing that, if not recovered, results in your plane touching down nose first. If you let it continue, it will set your plane off into a series of "jumps" and "dives", like a real porpoise. Porpoise landings can happen when you are flying too fast during touchdown, or if your descent rate is too high at touchdown. And if you force your airplane down and touch the nosewheel first, you can send your plane into an unrecoverable sequence of events.

### **What is an airfoil? How does an aircraft fly?**

Airplanes fly when the movement of air across their wings creates an upward force called lift. Where the lift is greater than the weight of the aircraft, it will fly. But to explain why this lift is generated on the wing, I should speak about the airfoil. Airfoil is the cross-sectional shape of a wing. It has a rounded leading edge, and a sharp trailing edge. The curve on top of an airfoil is greater than its bottom. According to Bernoulli force, this will cause the air to move faster on top than bottom of the wing. Consequently, the resulted pressure differential will produce lift and the aircraft flies.

### **What is the function of rudder?**

The rudder is a large panel attached to the trailing edge of a plane's vertical stabilizer in the rear of the plane. It is used to control yaw, which is the movement of the nose left or right. The rudder is used mostly during takeoffs and landings to keep the nose of an aircraft on the centerline of the runway. It is manipulated via foot pedals in the cockpit.

### **What is the function of the elevators?**

The elevators are panels attached to the trailing edge of an aircraft's two horizontal stabilizers, they are part of the tail assembly, or empennage. The elevators control the pitch of an aircraft, which is the movement of the nose up or down. They are used during flight and are manipulated by pulling or pushing on the control wheel or side-stick controller in the cockpit.

### **What is the function of the ailerons?**

The ailerons are panels built into the trailing edge of the wings. Like the elevators, they are used during flight to steer an aircraft and are manipulated by turning the control wheel or side-stick controller in the cockpit to the left or right. These steering motions deflect the ailerons up or down, which in turn affect the relative lift of the wings. An aileron deflected down increases the lift of the wing to which it is attached, while an aileron deflected up decreases the lift of its wing. Thus, if a pilot deflects downward the aileron on the left wing of the aircraft, and defects upward the aileron on the right wing, the aircraft will roll, or bank, to the right.

### **What is the function of the Spoilers?**

Spoilers are panels built into the top surfaces of the wings and mostly are used during landings to spoil the lift of the wings and keep the aircraft on the ground when it touches down. They also can be used during flight to expedite a descent.

**Compare Broadcast, General Call and Blind Transmission.**

Broadcast is the transmission of messages to unknown stations. Every station equipped with a proper receiver can listen to the transmission. General Call is addressed to known stations. A message is transmitted at the same time to a number of known recipients. Blind Transmission is for a specific station which is believed to be able to receive and unable to respond.

**What is air miss/near miss?**

It is a case in which the separation between two aircraft becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses.

**What is ACAS?**

ACAS is only a mental concept or a definition, but TCAS is a physical and actual instrument that meets the requirements of that definition. TCAS works by using SSR transponders to prevent aircraft from colliding with each other in case of near misses. It generates TAs and RAs. TA or Traffic Advisory gives the pilot information that he should be careful because they may get close to another aircraft. RA or Resolution Advisory is an instruction to climb, descend or maintain level of the aircraft, otherwise a collision is possible. The pilot should follow TCAS instructions even if it differs from what is instructed by the controller.

**Who is a cabin crew member?**

A Cabin crew member is a qualified crew member who is assigned by the airline to perform duties related to the safety of passengers and flight during operations. We should be careful not to confuse it with flight crew members who are actually the pilot and the first officer.

**Role of animals in aviation?**

The main role is wildlife strike. It is a collision between an animal and an aircraft which is in flight or on a take-off or landing roll. The main case is bird strike which is the most common scenario. However, the increased number of flights and airfields used resulted, among other things, in the increase of collisions between aircraft and animals other than birds.

Wildlife strikes may occur during any phase of flight but are most likely during the take-off, initial climb, approach and landing phases. The reason is that most birds fly at lower levels and other animals (except bats) can only hit an aircraft while on the ground.

**What is situational awareness?**

Situational awareness is a term used to describe a person's awareness of their surroundings, the meaning of these surroundings, a prediction of what these surroundings will mean in the future, and then using this information to act.

**What is belly landing?**

landing of an aircraft on the underside of the fuselage, without lowering the undercarriage.



**How was your first/last flight?**

My first solo flight was very interesting because I was very young and I was so happy to be able to do it alone.

Actually, my last flight was four months ago and I really miss the cockpit.

**How many types of aircraft have you ever flown?**

At first, I used to fly cessna172, but after that I flew tecnam and piper. The first airliner that I flew was an A306. I started to fly with airbus about 3years ago.

**What are the actions of a good pilot in dealing with adverse weather condition?**

Avoiding adverse weather is necessary to maintain flight safety. The PIC has the ultimate responsibility for the safety of the aircraft, crew and passengers.

**What is the difference between accident and incident?**

An incident is actually an uncomplete accident. In other words an accident is an occurrence in which injury, fatality and damage is included but in an incident there is only the probability and potential of them.

**Have you ever heard about NTSB?**

The National Transportation Safety Board is an independent U.S. government investigative agency responsible for civil transportation accident investigation.

**Compare new generations and conventional aircraft?**

Old aircraft simply use cable, pole, and pulleys but new generation use fly by wire technology. It means that they use strong computers. Fly-by-wire (FBW) is a system that replaces the conventional manual flight controls of an aircraft with an electronic interface. The movements of flight controls are converted to electronic signals transmitted by wires (hence the fly-by-wire term) and flight control computers determine how to move the actuators at each control surface to provide the ordered response.

**Why should a pilot be good at mathematics, meteorology, aerodynamics, performance?**

a good pilot must always analyze the situation and calculate to perform a safe flight. A good pilot before starting the flight checks the weather and pressure to calculate the best performance.

**Speak about the dangers of runway contamination. (covered 25% of Runway standing water or slash or snow)**

The presence on the runway of water, snow, slush or ice adversely affects the aircraft's braking performance by: Reducing the friction force between the tires and the runway surface; and creating a layer of fluid between the tires and the runway, which reduces the contact area and leads to a risk of hydroplaning.

**Speak about the importance of simulators.**

I think the most important point about simulators is that we can simulate all emergency situations and find the weak points and find solution for them.

**Who is a good F/O?**

An excellent first officer must be a highly responsible person. If anything happens to the pilot, the first officer must be able to step in, take control of the situation and make the right decisions in a split second.

**What did you do last weekend?**

Actually, we stayed at home, because I do not want anyone in my family to get Covid-19 so we just stayed at home and watched movies.

**What is an airfoil?**

Airfoil is a shape with more curve at the top and less curve at the bottom. It will cause the air to have more speed at the top than the bottom and consequently the pressure differential will produce lift in the desired direction. The wing of the a/c uses this shape to provide the required lift for the flight.

**What is CRM?**

It stands for Crew Resource Management, in order to help prevent any accident or incident and to ensure flight efficiency, let me explain it in another way, it means use of all resources in cockpit and cabin for the best decision in the worst situations.

**Do you know what "glide ratio" is?**

The Glide ratio of an aircraft is the distance of forward travel divided by the altitude lost in that distance. The glide ratio is affected by all of the four fundamental forces that act on an aircraft in flight - lift, drag, weight and thrust. If all these factors remain constant, the glide ratio will not change.

**What is your plan for your future?**

My plan? Honestly, in Iran we can't have many plans but I try to stay alive!

**What are you going to do to improve your English language proficiency?**

I just registered for a language class and I try to watch more educational videos and read textbooks.

**What is jet stream?**

Jet streams are strong westerly winds that blow in a narrow band in the Earth's upper atmosphere – at the altitudes used by most aircraft. ... By flying in a jet stream, aircraft travelling from west to east get carried along by the tailwind, saving them time – and/or fuel.

**What do you do when you are approaching a HOTSPOT?**

Hotspot is a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

- awareness campaigns;
- enhanced visual aids (signs, markings and lights);
- use of alternative routings;
- changes to the movement area infrastructure, such as construction of new taxiways, and decommissioning of taxiways;
- closed-circuit television (CCTV) for critical VCR sight line deficiencies.

### **Compare IFR and VFR.**

To fly any aircraft there are generally two sets of rules: VFR and IFR. IFR stands for Instrument Flight Rules and VFR stands for Visual Flight rules. A pilot may decide to go for one of the set of rules on the basis of the weather conditions.

VFR rule: the aircraft must remain clear of clouds with the surface in sight, and maintain a certain flight visibility minimum (1,500 metres according to ICAO, one statute mile in the US, 1,500 m visibility, in sight of surface and clear of cloud in Europe).

### **How does an aircraft fly?**

A plane's engines are designed to move it forward at high speed. That makes air flow rapidly over the wings, which throw the air down toward the ground, generating an upward force called lift that overcomes the plane's weight and holds it in the sky. ... The wings force the air downward and that pushes the plane upward.

### **What is the difference between missed approach and go around?**

Go around is the phraseology used for initiation of a missed approach procedure but the missed approach is a procedure printed on the approach chart.

### **Name some natures of emergency?**

hydraulic failure  
engine fire  
depressurization  
pilot incapacitation  
smoke in the cockpit

### **What is the difference between low approach and low pass?**

low pass is done for checking exterior parts of the aircraft by tower like tail or undercarriage, but low approach is used for training purposes. In a low approach we bring the aircraft to runway about 500ft down and it's not a touch-down and go around.

### **What do you do in "walk around"?**

The pilot primarily inspects outside parts of the aircraft. He will steer, e.g. control surfaces, tires and possible leaks of fuel or oil.

### **What are your actions in case of radio failure?**

Of course, you must set squawk 7600 and then continue last ATC clearances for 7 min in control flight and then resume to destination via flight plan.

### **What is the flight plan?**

Flight plans are documents filed by a pilot or flight dispatcher with the local Air Navigation Service Provider prior to departure which indicate the plane's planned route or flight path. Flight plan format is specified by ICAO in document 4444.

### **Do you remember the Yasouj accident?**

If I were the pilot or even F/O I would say Capt this is bad weather I know you can handle it but I want to divert to Shiraz or turn back to Tehran.

### **How has the job of the pilots changed during the last 20 years?**

Communication has improved with satellite communication and improved VHF radios.

Weather radar is now colorful and shows areas of wind shear instead of just precipitation being a green return. Auto pilot is improved more and pilot work load is reduced and the computer gets control instead of the pilot.

### **Have you ever had an air miss?**

Near miss or Air miss is a situation in which the separation of aircraft has become lower than standard and there is danger of collision. I remember one day in Ankara airspace, just a couple of minutes after departure, we got TCAS TA and we heard TRAFFIC TRAFFIC. It means be aware and ready to take control. But thank God it was not so serious that an RA to be generated.

### **In emergency cases, what are your expectations from ATC?**

I expect them to just take a proper action. It means giving a direct routing to the location that we request and clear traffic in our way.

### **Explain mass and balance.**

When the weight of the aircraft is at or below the allowable limit(s) for its configuration (parked, ground movement, take-off, landing, etc.) and its center of gravity is within the allowable range, and both will remain so for the duration of the flight, the aircraft is said to be within weight and balance.

### **What do you know about PBN/RNAV/GNSS/NDB?**

**PBN:** The ICAO PBN Manual (Doc 9613) definition is: Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

... PBN is then described through means of RNAV and RNP applications with respective RNAV and RNP operations.

**RNAV:** is a method of navigation which permits the operation of an aircraft on any desired flight path; it allows its position to be continuously determined wherever it is rather than only along tracks between individual ground navigation aids.

**GNSS:** Global Navigation Satellite System ( GNSS ) is a worldwide position, navigation, and time determination system which includes one or more satellite constellations, aircraft receivers, and system integrity monitoring augmented as necessary to support the required navigation performance for the intended operation.

**VOR:** VHF Omnidirectional Radio Range (VOR) is defined as VHF Omnidirectional Radio Range, an aircraft navigation system operating in the VHF band

**NDB:** A non-directional beacon (NDB) is a radio beacon operating in the MF or LF band-widths. NDBs transmit a signal of equal strength in all directions. The signal contains a coded element which is used for station identification (normally 1-3 letters in Morse Code).

### **What is the difference between plain language and phraseology?**

Phraseology is the specialized language used by pilots and controllers to conduct unambiguous and effective communications. ... Still though, when facing situations for which phraseology does not exist, pilots and controllers must resort to a more natural language known as 'plain language'.

### **Can you differentiate TORA/TODA/ASDA/LDA?**

**TORA:** The length of runway declared available and suitable for the ground run of an aeroplane taking off.

**TODA:** The length of the take-off run available (Takeoff Run Available (TORA)) plus the length of the clearway, where provided.

**ASDA:** The runway plus stop way length declared. available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.

**LDA:** The length of the runway which is declared available by the appropriate Authority and is suitable for the ground run of an aeroplane landing.

### **What are your suggestions for newcomers to aviation field?**

I think the most important thing is to have patience Most pilots are not always on the plane. You need to learn how to spend ground time by reading lessons and getting ready to fly.

### **What is forced landing/emergency landing?**

A forced landing is a landing by an aircraft made under factors outside the pilot's control, such as the failure of engines, systems, components or weather which makes continued flight impossible.

### **Who is a SPIC?**

Student Pilot in Command.

**Lift/weight/drag/trust?**

An airplane has four main forces that act on it. These forces are called thrust, drag, lift, and weight. Thrust is the forward force that pushes the plane along the runway and forwards through the sky. Drag is the backward force that resists the plane's forward motion - the pushing of the air molecules on the plane, more commonly called air resistance. Lift is the upward force that pushes on the wings and causes the plane to rise into the sky and stay there once it reaches a cruising altitude. And last of all, weight is the force of gravity pulling down on the plane, pulling it toward the ground - the force that needs to be overcome for flight to be possible.

**The effect of COVID-19 on aviation?**

It is so great that the job career of a lot of people is adversely affected. People are afraid of being in enclosed spaces like a/c cabins, so the number of travelers and air passengers is reduced so that a lot of flights are cancelled. It is not strange to hear that some airlines have gone bankrupt. But they may be right to be worried about their health.

**How does jetlag influence the passengers' and pilot's behavior?**

Jet lag isn't just a sleepy sensation after reaching a destination, but can be a physical reaction to flying and changing time zones. Some passengers feel nauseated and fatigued. There may be headaches and confusion. Even anxiety could be an issue.

**What is a bomb scare?**

It is a special case in which it is suspected that a bomb is installed in the a/c. The pilot reaction should be normally to divert to the nearest a/d and proceed to the isolated parking area for reducing the threat to other people and installations.

**What situation in flight might force the pilot to use RAT?**

RAT stands for ram air turbine. This is the last choice after both engines have flame-out to get hydraulic and electrical power.

**What does PAPI stand for?**

A precision approach path indicator (PAPI) is a visual aid that provides guidance information to help a pilot acquire and maintain the correct approach (in the vertical plane) to an airport or an aerodrome.

**Why is it crucial to avoid thunderstorms?**

Because it may lead to fire or electrical failure also because it is produced in CB and TCU clouds the danger of updrafts and down draft may cause even a crash into the ground.

**How can CAT affect flight operations?**

it stands for clear air turbulence; It happens when we don't have any visible phenomenon in the sky but we encounter with turbulence. Because it usually happens in cruise phase, the pilot should only try to control the a/c and he cannot do anything special.

### **When do aircraft need to go through anti-icing procedure?**

If winter precipitation is falling, such as snow, freezing rain or sleet, further action needs to be taken to prevent ice from forming again on the aircraft before takeoff. We have some conditions like we see frost on wing 3 mm or more and oat temp 0 degree.

### **What could be reasons for fuel starvation?**

In an internal combustion engine, fuel starvation is defined as the failure of the fuel system to supply sufficient fuel to allow the engine to run properly, for example due to blockage, vapor lock, contamination by water, malfunction of the fuel pump or incorrect operation, leading to loss of power or engine stoppage.

### **What can suspend airport operation?**

The airport may be closed for a number of reasons like a disabled aircraft on the runway, industrial action and bomb threat. Also construction work and rubber deposit removal are other reasons for closing an airport.

### **What are the major factors for CFIT accidents?**

CFIT is defined as an unintentional collision with terrain (the ground, a mountain, a body of water, or an obstacle) while an aircraft is under positive control. Most often, the pilot or crew is unaware of the looming disaster until it is too late. CFIT most commonly occurs in the approach or landing phase of flight.

### **How can a avoid fatigue?**

Adjust bedtime by an hour a day a few days before the flight to match the sleep schedule at your destination. Reset your watch at the beginning of the flight to adjust more quickly to the new time zone. Drink plenty of water before, during, and after the flight.

### **What made you choose to become a pilot?**

Becoming a pilot makes you smarter. You'll gain knowledge that you never thought you would need to know. You'll become a better planner, a logical decision-maker, and a meteorologist. You'll learn good resource management, how to be patient and how to operate safely, with a sense of urgency.

**Full Emergency** happens when it is known that an aircraft is, or is suspected to be, in such difficulties that there is a danger of an accident. In other words, the remaining fuel in the aircraft fuel tanks is not sufficient to get the aircraft to a nearby airport for a safe landing and most probably the aircraft crashes to the ground before reaching a runway.

**Minimum fuel** is a case in which the fuel supply of an aircraft has reached a state where the flight is committed to land at a specific aerodrome and no additional delay can be accepted. It is not as severe as

Full Emergency, in that the aircraft is able to reach a runway and most probably doesn't crash to the ground before reaching it.

**Fume** is the smoke smell in the cockpit or the cabin of the aircraft. It cannot be seen but when it turns into **smoke**, not only we can feel it, but also, we can see it. Smoke may turn into **fire**. In such cases time is critical because the flight crew will want to land the aircraft as quickly as possible. In such a case, an emergency descent is highly likely. The use of oxygen masks can limit the ability of the flight crew to communicate. Also, the ATC and the flight crew must know that frequency changes may hinder communication.

### **Loss of pressurization**

Normally when the aircraft climbs to higher altitudes, the air pressure and density will be reduced and if we do not charge the cabin with extra air to increase the pressure, the passengers will not be able to breathe. This is called pressurization. By pressurization we keep the cabin altitude around 8000 feet. **Loss of pressurization or depressurization or decompression** happens when this system fails to work properly and the pilot must descend immediately to about 10000 feet to save the passengers. This is called **emergency descent**. While making an emergency descent, the pilot must look out not to hit another aircraft below. TCAS is very helpful in this situation.

In case of **Total engine failure**, the crew must be informed of the nearest suitable or available airfield to glide the aircraft safely to the ground as soon as possible. Imposing RTF silence for other aircraft can help the crew to concentrate more effectively. The flight crew will follow engine relight techniques, so their workload will be high. In such a case a steeper than normal approach path can be expected and when giving turns, the rate of descent may double.

If **engine failure happens during take-off**, aircraft may continue straight ahead or follow its own emergency turn procedure. The flight crew may elect to dump fuel in order to get close to Maximum Landing Weight for an immediate landing. The flight crew may experience other handling difficulties, for example, turns in one direction may be preferred.

**High speed rejected take-off** is a very threatening occurrence. We should expect a critical and serious problem to happen. Tire and brake fires and tire burst will probably occur and we normally expect runway blockage or runway overrun. The tower controller must inform the flight crew of exterior conditions of the aircraft, because the crew may not be able to understand the severity of the situation.

In case of **Bomb threat or the presence of a suspicious object in aircraft**, for example a bag which is left aside and we suspect that there is a bomb in it, a diversion to more suitably equipped or nominated airfield may be required. The aircraft must be vectored clear of populated areas and an emergency evacuation upon landing is possible. Usually the aircraft will be parked in an isolated parking area at the airport until the risk is eliminated.



**Landing gear problems** include for example TWISTED LANDING GEAR, JAMMED LANDING GEAR and BUCKELED OR BROKEN LANDING GEAR. When it is jammed it means that if it is extended, we cannot retract it and if it is retracted, we cannot extend it. In other words, it is stuck in its place and it doesn't move. Twisted landing gear is when it is at 90-degree angle. After landing with a twisted gear, it may catch fire and the fire may penetrate into flight deck. A go-around is likely if problem first occurs on final approach. If the pilot is not sure of retraction or extension of the gear, a visual inspection may be required to check it, for example by a 'low pass' or sighting from another aircraft. Undercarriage collapse or loss of directional control or steering problem is possible upon landing.

**Total (or nearly total) electrics failure** is a very critical situation for modern aircraft. In such a case an immediate diversion is essential to land the aircraft as soon as possible. The pilot must know that transmission by aircraft will consume a lot of battery power so read back and sending unnecessary information should be carried out very attentively. Also, navigation may be difficult, because navigation equipment may have less than enough power to work properly. Controllers should consider the use of radar vectors to help the pilot navigate accurately. Also, they should monitor headings and levels as they may be different from those indicated on the flight deck.

**Bird strike** happens when a bird or a flock of birds hit the wing, tail assembly or fuselage of the aircraft. **Bird ingestion** is when the bird is sucked into the engine of the aircraft. The flight crew may have difficulty in establishing the damage or effects of the strike on the aircraft, because they may not be able to see the place of the impact. The flight crew may elect to continue with flight if no effects are apparent. Incidents involving engines are usually the most serious. In case of hole, depressurization and emergency descent are probable and if immediately after departure, fuel dumping is probable.

In **Medical emergency** flight crew, cabin crew or the passengers may be involved. If the case is really life threatening the pilot may wish to declare an emergency and divert to an airport in a big city which has a good hospital. The pilot should tell the controller that they need ambulance after landing. A brief explanation of the nature of the medical problem will be helpful for medical services to be present with the required medicine. **Pilot incapacitation** is a subcategory of medical emergencies. If the pilot in command of the aircraft is not able to perform his or her duties, the first officer should inform the ATC and should try to perform the flight safely while asking for help from cabin crew to recover the pilot.

**Situational awareness** is a mental situation in which the flight crew are aware of what is happening in flight, where they are, how is their attitude and how should it be a couple of minutes later. Also speaking the same language on the frequency channel will help the pilot to be aware of what is happening around him. Inadequate situational awareness will cause safety risks like encountering with wake turbulence, adverse weather or icing.

Hydraulic failure is a situation in which the aircraft loses the power needed for movement of some of its parts, specially flight control surfaces. Without hydraulic power also engine thrust reverser will not be available for bringing the aircraft into a halt after landing and that is why runway excursion or overshoot is probable.

Using the engines asymmetrically will help turning the aircraft to left or right but the turns will be very big.

### **What are your plans for future?**

My plan in future is to join military service and during it I want to improve my English language proficiency. finally, when I finish it, I should search and find an airline to apply for working.

### **what did you do last week?**

honestly All of the last week I just studied English language for this interview Because I must pass this interview whereas if I fail my check ride will be expired.

### **what are the difficulties of being a pilot?**

Basically, when a person wants to be a pilot, he must be able to read and understand English language. Then after He should be Approved in medical test. moreover, he should pay a lot of money for studying piloting courses and flying by training A/C. At the end he should pass CAO exam, flight checks and LPR for receiving her certificate.

### **What is the difference between accident and incident?**

In my idea Accident happens when an A/C is completely damaged and the crew or passengers fatally injured whereas incident happens when an A/C is faced with abnormal or emergency situations in flight or on the ground but we don't have any fatality and just the A/C needs assistance or replacement.

### **Compare piper and Tecnam**

clearly piper is a low wing A/C while Tecnam is a high wing A/C. both of them are in light A/C category and used for training in Iran. piper looks to me more stable and maneuverable than Tecnam. more over piper is heavier than Tecnam. If you ask me What your selection is for flight, I will say I prefer to fly by Piper.

### **Compare IFR and VFR**

Initially IFR results from IMC condition. IFR is done according to A/C instruments. We should pass IR course for flying according to IFR. Whereas VFR is performed in VMC conditions. VFR is done according to Visual ground check point and we don't need any special license for flying according to VFR.

**The role of mathematics in aviation**, including the job of a pilot, is very important. Generally speaking, calculation is an integral part of navigation. Fortunately, computer performs this task for the pilot to a great amount but still for less computerized aircraft, like piper and Cessna the pilot must do the calculations like time of top of descent, rate of climb or descent to reach a level at a specific time, ...

**Belly landing** is performed when the landing gear of the aircraft cannot be extended before landing. in other words, we say that the landing gear is jammed. foaming a part of the runway is probably requested by the pilot in order to reduce the risk of fire when the bottom of the fuselage touches the ground.

## PART 2: PICTURE DESCRIPTION & DISCUSSION (6-10 min)

Well, there are two pictures here.

The picture on the top is showing a (/TWO) propeller/jet/glider/helicopter that is painted in blue/white/red.

It has a long stripe down the fuselage/It doesn't have any stripes on it.

It shows an aircraft with some stripes on it.

The main subject of the image is (*Near Collision/ Decompression/ Engine fire/ Fuel Jettisoning/Bomb threat/Runway incursion/Runway excursion/Adverse weather/Tire problem/Landing gear jamming/twisted landing gear/etc.*).

It is a single/twin/triple/four engine aircraft. It has two/three/four engines.

The aircraft has its gear deployed and its landing lights on.

It has its engine **running**. It has its engine **stopped**.

It looks to me like a B757.

I cannot/can identify the airline/type of aircraft. (It [possibly] belongs to Malaysian Airlines).

The tail/engine/wing/ etc. is/are obscured, and the tail/engine/wing/ etc. is/are visible.

The aircraft is on fire/ broken [into 2 pieces]/ [NOT]badly damaged. It is on the runway/out of the runway/moving in the sky/stationary etc.

Its wing/wheels/fuselage is/are (NOT) damaged/INTACT.

I think no one/a number of the occupants is/are injured/killed in the accident **because** the damage to the aircraft is major/minor.

There should be no **fatality**/ There should be a number of **fatalities**.

The passengers seem to have landed with/without injury.

**Now let's talk about the surroundings.**

The weather is looking quite nice/cloudy/foggy/rainy/windy.

It is [NOT] a nice sunlit situation.

It looks like a quite pleasant day.

In the **background** there is a wooded area. **In the background I can see .....**

In the background I see a clear/cloudy sky.

At the top/bottom left/right corner there is/are .....

On the left/right of the picture we see .....

In the **foreground** (*airport vehicles, fire services, grass margin, tarmac/airport marking/a number of masts/terrified passengers/construction work*) is/are visible.

**Now let me talk about the picture below.**

**REPEAT FOR THE OTHER PICTURE**

**If I want to differentiate them**, I will say that this aircraft is smaller/bigger /newer/older /less damaged/more damaged/ **than the PREVIOUS**.

**If I were the pilot (if I were in pilot's shoes), I would .....**

## Note Taking for picture description

- **SUBJECT:**
- **Aircraft**
  - Type
  - Airline
  - Color/stripe/painting
  - Situation (escape slide, dented, split, fire, etc.)
  - Obscured/Visible
- Background:
- Foreground:
- Left/right/corners:
- Injury/damage/fatality
- Weather



## PART 3: LISTENING COMPREHENSION (6-10 min)

Dialogues of the books:

*Check your Aviation English/Aviation English/English for Aviation/Flight Path*

### This audio was a conversation between ....

This audio was about a flight with the call sign of *IRC550*.

This audio was about two flights with the call sign of *IRC550* and *KIS7020*.

The nature of the problem was UNRETRACTED LANDING GEAR

*(NearCollision/Decompression/Engine fire/ Fuel Jettisoning/Bomb threat/Runway incursion/Runway excursion/Adverse weather/Tire problem/Landing gear jamming/twisted landing gear/etc.).*

### GIVE A BRIEF STORY IN GENERAL TERMS, USING PAST TENSES.

When they were **taking off/landing/taxiing/flying en-route/etc.**, they **noticed that .../faced a problem with their.../had an airmiss with .../encountered .../**

They decided to ...

Finally, they ...

**If I want to speak about more details, I can add that ...**

- The number of the passengers was 124.
- It **had** 124 occupants including 6 crew and 118 passengers.
- The engine that **caught** fire **was** number 2. Engine number 2 **caught** fire.
- It **was** runway 29L which **was foamed**. Runway 29L was foamed. They foamed runway 29L.
- No one **was injured** and the aircraft landed **safely**.
- A number (e.g.24) of the passengers **were** injured/killed.
- The accident **had** 24 fatalities/injuries/casualties (didn't have any injuries/fatalities/casualties).
- Etc.

As I said, this audio was about *Bird strike/tail strike/hydraulic failure, etc.* Generally, it is defined as .... If such a case happens, we expect that .... The pilot will .....

## Unit 4

19

**P1 = pilot 1, P2 = pilot 2, G1 / G2 = ground 2**

**P1** OK, that's the pre-flight checklist finished. Is the cargo nearly ready?

**P2** Yes, the containers for the next leg are loaded. I think the ground handlers are with the fork-lift truck unloading the animals now. I'll go and check on progress.

**P1** OK. We need to push back in twenty minutes really, at five past one. I don't want to miss our slot.

**P2** Hey, how's it going down here? Nearly ready?

**G1** We've got a problem in the aft hold! A cage door is damaged, and one of the lions is breaking out of its cage!

**P2** Is everyone OK?

**G1** Yes, everybody's safe – we got out quickly and closed the door behind us. What should we do?

**P2** I'd rather know what's going on in there before I make any decisions. This is what I'd like you to do – open the door quickly, assess the situation, and close it again.

**G1** Well ... OK. There he is. He's halfway out.

**G2** Look – the cage lock's broken off. And also the thing that holds the door onto the cage is broken.

**G1** The hinge? Yes, that's broken too. So, we've got a cargo net for catching him, but someone's got to get in and throw it over him.

**P2** Look, I don't want anyone to put themselves in danger. I'd prefer to get some help with this. We need a vet.

**G1** I agree. Oh no – he's out. Close the door again, quick!

## AE 1.19

This audio was a conversation between pilot in command and first officer and ground handling

The nature of the problem was about wildlife in cargo

When ground handlers were unloading the animals and loading the cargo for the next leg with fork lift truck, they noticed that a lion was released in the cargo area because cage lock and the hinge in the cage were broken. finally, after the situation was checked, they decided to close the cargo door as safety and they preferred to get help from a vet.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

They had got problem in the aft hold.

The pilots didn't want to miss slot time but they missed it.

They decided to close the door and inform the vet.


They had to wait for the vet.

They had got a cargo net for catching the lion.

As I said, this audio was about wildlife

Generally, it is defined as the role of animals in aviation and it is divided into two parts: on the ground and in the air. In the air, the danger of engine ingestion or bird strike may cause an emergency but on the ground the presence of animals on the airside or on the aircraft may necessitate a go-around or aborting take-off and isolated the aircraft.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to close the door and inform the vet, finally no one was injured.

 05 **Listening script**

**PF** What was that? This isn't right.

**PNF** What's happened?

**PF** Three circuit-breakers have tripped. They're showing a problem.

**PNF** Where's the problem?

**PF** In one of the washrooms. Maybe the fan overheated.

**PNF** I'll ask the cabin crew manager to look into it.

**PF** I'll try and reset the circuit-breakers.

**PNF** OK?

**CCM** Yes, hi, I'm getting reports of an unpleasant smell back here, coming from the rear washrooms, like an electrical burning smell. Some of the passengers are getting a little uncomfortable with it.

**PNF** Could you move the passengers away?

**CCM** Sure, will do.

**PNF** Go have a look.

**CCM** I'll check it out now.

**PF** Why didn't it set off the smoke detector? I'm not happy with this at all. Something's wrong.

**CCM** There was smouldering in the washroom. I don't know if any wiring has come loose. I sprayed it with the extinguisher – I think it's gone out.

**PNF** What do you think caused it?

**CCM** I don't know. Maybe the vacuum outlet overloaded. I couldn't see where it was coming from. I'll go back now and double check.

**PF** Yeah, go. We need to know the source of the fire.

**CCM** I'll take my goggles, just in case.

**PF** Yeah, we'll put our masks on. Go back, but don't get yourself incapacitated.



## AE 2.05

This audio was a conversation between pilot in command and first officer and cabin crew manager

The nature of the problem was about smoke in cabin

When they were in flight the circuit-breakers set off and the pilots tried to reset the circuit - breakers. they noticed that the problem was at the washroom and asked the cabin crew manager to take look into it. the cabin crew manager came back and said There was smoldering and unpleasant smell. And the detector didn't set off the smoke. Finally, they decided to find source of fire, so the cabin crew manager came back again to the washroom.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

Some passengers were getting a little uncomfortable by smoke.

They moved passengers away.

They sprayed smoke detector with the extinguisher.

They took their goggles and put their oxygen masks to prevent of themselves incapacitation.

As I said, this audio was about smoke in cabin

Generally, it is defined as when you can see fire or you don't see it but you can feel it, like smelling something burning by fire. As a pilot when I smell fume in the cockpit, I expect a fire or at least smoke to be present in the cockpit or in the cabin. And in such cases at first my action will be to diagnose the source of the smoke and secondly, we will decide whether to declare an emergency or not. We will remove that part from the circuit to stop the smoke or fume...

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to move the passengers away and ordered cabin crew manager to spray on source of smell with the extinguisher.

## Check your AE 1.03



### 1.03

**P1/2 = pilot 1/2, C = controller**

**P1** Kamket control. Good morning. YG343. Maintaining FL370, 10 DME to ATI, squawking 2662.

**C** YG343. Kamket Control. Roger, squawk 4113.

**P1** 4133. YG343.

**C** YG343. Incorrect readback. I say again. Squawk 4113.

**P1** Squawking 4113. YG343.

**C** Readback correct.

**P2** Kamket control. DF211. Good morning. FL340.

**C** DF211 good morning. Maintain 340. Expect higher.

**P2** Maintaining 340. DF211.

**C** YG343. Radar contact. Descend to FL310.

**P1** Descending to FL310. YG343.

**C** DF211 turn right heading 270° due traffic.

**P2** Right heading 270°. DF211.

**C** YG343 Traffic north-east, seven miles, slightly below, fast moving.

**P2** Roger.

**C** DF211 I say again. Turn right heading 270° due traffic.

DF211. Avoiding action. Immediately turn hard right heading 270° due traffic. Break break.

YG343. Cancel descent. Turn right immediately heading 090°.

**P1** Kamket control YG343, TCAS climb.

**C** Roger.

**P1** Kamket control YG343, we are clear of traffic, level at 360. We have some injuries.

**C** YG343. I'm sorry. What is your problem?

**P1** We have medical problems, people on board are hurt. Request immediate descent.

**C** Roger. Understand you have medical problems. Descend to FL230. Contact Kamket approach 124.885.

## CHECK YOUR AE 1.03

This audio was a conversation between pilot of YG343 And pilot of DF211 and ATC of Kamket control

The nature of the problem was about near miss and medical emergency

When YG343 and DF211 were in communication with the Kamket control, near miss happened between them. The Kamket control gave the order to DF211 and YG343 to change their heading and YG343 received TCAS climb alert and did it. Finally, due to the altitude changes in YG343, they noticed that a passengers had got medical problem and pilots decided to contact tower and request immediately descend.

If I want to speak about more details, I can add that

Squawk code of YG343 was 4113 and maintaining FL370

ATC ordered YG343 to descend to FL310

DF211 was maintaining FL340

At FL340 near miss happened between them

DF211 turned right heading 270 degree due to traffic

YG343 canceled descend and turned right heading 090 degree due to traffic

YG343 received TCAS climb alert and did it

YG343 had medical problem at FL360 and requested descend to FL230

YG343 contacted kamket approach on 124.885 frequency

As I said, this audio was about near miss and medical emergency

Generally, it is defined as when the passengers may have medical cases. If a passenger is sick in the aircraft it depends on situation whether to continue to the destination or to ask for immediate landing. The pilot will declare a PAN-PAN and tell the controller that they are in a case of medical emergency. Pilot incapacitation or flight crew interpretation is a specific kind of medical emergency.

And near miss is a case in which the separation between two aircraft becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near miss is crucial because if TCAS were not developed, a lot of people would be dead in air misses.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot did TCAS climb and because of a medical problem he decided to Descend to FL230 and Contacted Kamket approach.

## Check your AE 1.09



### 1.09

**P = pilot, ATC = air-traffic controller**

**ATC** Cargolux 233 leave Midhurst heading 027° and descend FL180.

**P** Heading 027°, descend FL180. Cargolux 233.

**ATC** Cargolux 233 this is Essex Radar, possible delay, expect to hold at VATON at FL180.

**P** Roger, expect hold at VATON. Cargolux 233.  
Essex radar. Cargolux 233 request.

**ATC** Cargolux 233. Essex radar, pass your message.

**P** Roger. London informed us no delay expected.  
Confirm we have to hold at VATON? Cargolux 233.

**ATC** Cargolux 233 affirm. Due to VIP movement: we have Air Force One inbound to Stanstead, delays are expected to all inbound and departing aircraft.

**P** Understood, but our NOTAM says scheduled air carriers AND cargo flights are excepted. Cargolux 233.

**ATC** Cargolux 233. Say again?

**P** Our copy of the NOTAM says no delays to scheduled passenger and cargo flights adhering to schedule and following the LOREL STAR.

**ATC** Ah, copied Cargolux 233. Will double check that for you ... Cargolux 233. There was a short notice amendment to the NOTAM for security reasons, ALL inbound traffic subject to delay. Expect holding at VATON and maintain FL180.

**P** Copy that and maintaining FL180. Unfortunately we did not get that information before leaving JFK and we are approaching minimum fuel as the winds did not work out as forecast crossing the pond. We will have to take our alternate, Gatwick, if we cannot get a clearance in the next 10 minutes. Cargolux 233.

**ATC** Cargolux 233, I'll keep you advised in the next 15 miles, report passing Ockham.

**P** Wilco Cargolux 233.  
Passing Ockham, maintaining FL180. Cargolux 233.

**ATC** Cargolux 233. Airforce One is on ILS now, there'll be no more than a five-minute delay and you are number three in traffic. Reduce speed to 320 kn and we should be able to avoid a hold at VATON.

**P** Roger. Thank you very much. Cargolux 233.

## CHECK YOUR AE 1.09

This audio was about a flight with the call sign of Cargolux 233

This audio was a conversation between pilot and ATC of ESSEX Radar

The nature of the problem was about MINIMUM FUEL

When they were near the destination and Communicate with the ATC. the ATC announced the possible delay, but the pilot said when they were in JFK, ATC of London didn't report any delay, but a new notice amendment of notam issued, due to security reason, and they did not get that information before leaving JFK. They were near the minimum fuel as the wind. Finally, the pilot decided to divert to the alternate if couldn't get a clearance in the next 10 minute. after that the ATC gave clearance to Cargolux 233 as number 3.

If I want to speak about more details, I can add that

they left Midhurst with heading 027 degree and descended to FL180  
When air force one was on ILS, ATC gave clearance to cargolux233 that reduced speed to 320 knots and they were able to avoid hold at VATON  
they reported when they were passing Ockham and they kept FL180  
the reason of delay was VIP movement (they had Air Force One inbound to Stanstead)

As I said, this audio was about minimum fuel

Generally, it is defined as a case in which the fuel supply of an aircraft has reached a state where the flight is committed to land at a specific aerodrome and no additional delay can be accepted. It is not as severe as full emergency, in that the aircraft is able to reach a runway and most probably doesn't crash to the ground before reaching it.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the ATC decided to give clearance to Cargolux 233 as number 3

## Check your AE 2.03



### 2.03

**P = pilot, ATC = air-traffic controller**

**P** We've got some heavy rain and thunderstorms. Can we go north? GH1559.

**ATC** GH1559, you can either go north or turn left and try and get south of it. My radar doesn't see as far as yours.

**P** I'd like to go north, the weather appears to be moving south so that's a pretty much better option right now. GH1559.

**ATC** GH1559. Roger, what heading do you want?

**P** 315 or 320° should be sufficient to clear it. GH1559.

**ATC** GH1559. Turn right heading 320°. All traffic runway 28 departure windshear alert. Runway 28 departure microburst activity one mile north of centreline, 20 kn loss, range five miles.

All traffic. SIGMET extreme weather warning. Severe precipitation, north-west of the field moving eastbound extending approximately five miles across.

GH1559. We have a thunderstorm right over the airport right now. I can take you somewhere to hold or give you delaying vectors while you wait it out. We have a windshear alert and microburst reports for runway 28.

**P** Why don't you just give us vectors around it? GH1559.

**ATC** GH1559. Roger, expect descent in a couple of miles and maintain your current heading. This will be vectors to the ILS for runway 28. There really isn't much once you go through the current area. Depending on what the wind does we may be able to bring you in on runway 19.

**P** Roger. Keep us informed and let us know what works for you, we are maintaining 320°. GH1559. ATC GH1559, expect some delay, vectors for now, turn further right heading 350°. The thunderstorm should clear in the next ten minutes or so and we can bring you in behind it. Can you reduce speed to 200 kn?

**P** Roger. We'll slow down to 200 indicated, heading 350° and standing by for descent. GH1559.

## CHECK YOUR AE 2.03

This audio was about a flight with the call sign of GH1559

This audio was a conversation between pilot and ATC

The nature of the problem was about bad weather

When they were approaching runway 28, they got stuck in bad weather. they requested to turn north, because their aircraft's weather radar indicated that the bad weather was moving south. The ATC issued a SIGMET extreme weather warning to all traffic runway 28 departure that they had windshear and microburst for runway28. Finally, the ATC ordered GH1559 to turn heading 350 and reduced speed to 200 knots indicated and stand by to descent and land on runway 19.

If I want to speak about more details, I can add that

they had gotten stuck in heavy rain and thunderstorms.

they turned right heading 320 degrees to clear bad weather

ATC declared weather warning for all traffic

They requested RADAR VECTOR to ILS runway 28

ATC expected that the thunderstorm should be cleared in the next ten minutes and they could bring GH1559 behind it.

As I said, this audio was about bad weather

Generally, it is defined as a case in which we keep our separation with bad weather. we try avoid get stuck in the bad weather with check the weather forecast, METAR and TAF before the flight and we know maybe we can handle it by use of weather radar. However, if we get stuck in bad weather, we should divert to alternate airport.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the ATC decided to give clearance to GH1559 that it turned to heading 350 and standing by to descend and land on runway 19.

## Check your AE 2.06



### 2.06

**P1/2 = pilot 1/2, C = controller**

**P1** Mayday, Mayday, Mayday. Varburg approach. Dornier 28D. Altitude 8,000. Descending.

**C** Mayday 28D. Say again.

**P1** Mayday, Mayday, Mayday. 7,200. Descending. Cannot control the aircraft Dornier 28D.

**C** 28D. Roger Mayday. We have emergency services standing by in the area. Varburg airport is about five miles north-east of you.

**P1** 6,500. I'm just getting some control now. I'm indicating 80 kn. I'm trying to maintain airspeed. Mayday 28D.

**C** 28D. I show your ground speed as 160 kn. Maybe your pitot tube is frozen up?

**P1** I'm in the clouds, altitude 6,000. Heading 040°. I have control again now, but had to dive because we lost all airspeed with no warning, 28D.

**C** 28D. Roger.

28D. Radar shows more showers to the north-east of you. I don't know what the temperature is, but you might pick up some more icing.

**P2** United 883. Overhead Talsi. Passing altitude 5,000 ft in the descent. Temperature -2. -5 at 7,000. We do have some snow in the clouds.

**C** United 883. Did you pick up any icing on the descent?

**P2** Affirm. United 883.

**C** United 883. Roger. Descend and maintain altitude 4,000 ft. Cleared ILS approach runway 04. Thanks for the report.

**P2** Cleared ILS approach runway 04. United 883.

**C** Mayday 28D. There is a report of icing conditions to the east of you at 5,000. State intentions.

**P1** I'd like to proceed to Varburg. I've got the boots and heat on, and ... it seems to be OK. 28D.

**C** Mayday 28D. Readability 2. You might have ice on your antenna.



## CHECK YOUR AE 2.06

This audio was a conversation between pilot of Dornier 28D and pilot of united 883 and ATC of Varburg approach

The nature of the problem was about control surfaces icing

When Dornier 28D noticed that their control surfaces didn't work, it declared mayday to ATC. Dornier 28D was getting some control at 6,500 ft and air speed indicated 80 knots. But ATC informed Dornier 28D that its ground speed as 160 knot because Dornier 28D had done dive to compensate lost airspeed with no warning and Dornier 28D had got the boots and heats ON. In the same time United 883 reported to ATC that it was passing 5,000 ft and it did have some snow in the clouds at 7,000 ft. ATC gave clearance to United 883 to descend and maintain 4000ft and then cleared ILS approach on runway 04.

If I want to speak about more details, I can add that

Dornier 28D at 8,000 ft declared mayday  
Varburg airport had emergency services that they were standing by in the area.  
Varburg airport was located about five miles north-east of Dornier 28D position.  
Dornier 28D had gotten full control at 6,000 ft and heading 040 degree.  
Readability Dornier 28D was 2 due to ice on its antenna.

As I said, this audio was about control surfaces icing

Generally, it is defined as a case in which flight control surfaces will not be moved. It can be due to icing. In case of control problem, the pilot will not be able to control pitch, Roll or yaw of the aircraft. The pilot's action depends on the source of the problem. If it's due to Icing, de-icing can be a good action.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the Dornier 28D decided to turn ON the boots and heats and dive to compensate speed.

## Check your AE 2.15



### 2.15

- P** Dragey control. F634TG. Florie 23 altitude 3,500 ft estimating PRETE 32.
- C1** F634TG.
- P** PAN PAN PAN PAN PAN PAN Dragey control. F634TG. Cirrus SR22. Loss of power. Request immediate diversion to Frine-Le-Bourg. Four miles northeast of Florie, passing altitude 3,000 ft, descending, heading 310°. Two persons on board.
- C1** F634TG. Dragey control. Roger PAN. Frine-Le-Bourg is nine miles to the east of your position. Turn right heading 080°.
- P** Right, heading 080°. F634TG.  
F634TG. Declaring an emergency. We've lost all engine power now. I say again, we have no engine power. Passing altitude 2,600. Descending. Heading 050°.
- C1** Roger MAYDAY. The emergency services have been alerted. Frine-Le-Bourg is now one o'clock, seven miles. Contact Frine-Le-Bourg on 124.050.
- P** 124.050. F634TG.  
Frine-Le-Bourg tower. F634TG. We're six miles east your field, altitude 2,100, descending, heading 080. We have no power.
- C2** F-TG. Frine-Le-Bourg tower. Roger MAYDAY. We are ready for your arrival.
- P** Altitude 1,600, descending. What is the closest suitable terrain for a forced landing? F-TG.
- C2** F-TG. You have unwooded fields, one o'clock, four miles. Frine-Le-Bourg is now 12 o'clock, five miles.
- P** Altitude 1,400. I don't think we have enough height to make it over the water. We may put it down in the lake. F-TG.
- C2** F-TG. Roger. We are in contact with the sailing club on Lac de Frine. Frine-Le-Bourg is now 12 o'clock, four miles.
- P** Altitude 900. F-TG.
- C2** F-TG. A right turn, heading 100°, will take you closer to rescue vessels.
- P** Roger. 100°. Sailing club in sight. Preparing to ditch. F-TG.
- C2** F-TG. Roger. We are advised there is no activity on the lake. Surface wind calm.

## CHECK YOUR AE 2.15

This audio was about a flight with the call sign of F634TG

This audio was a conversation between Pilot and ATC of Dragey control and ATC of Frine-Le-Bourg tower

The nature of the problem was about Ditching

When the pilots noticed that they had lost all engines power, they declared PANPAN to Dragey control. they requested immediate diversion to Frine-Le-Bourg that it was located on nine miles to the east of their position with right turned to heading 080 degree. Dragey tower said to them that they called Frine-Le-Bourg tower on 124.050 frequency. So they called Frine-Le-Bourg and they declared that we were six miles east of your station, altitude 2,100 ft and we had no power and they got field information from Frine-Le-Bourg tower. Finally, they noticed that they had not enough height to reach Frine-Le-Bourg and they decided to force landing and they were preparing to ditch on the lake.

If I want to speak about more details, I can add that

They had lost engines power at 3,000 ft with heading 310 degree.

F634TG had two occupants.

Frine-Le-Bourg tower were in contact with the sailing club on Lac de Frine lake to clear surface of the lake for ditching and sending rescue vessels.

As I said, this audio was about Ditching

Generally, it is defined as emergency landing in the water. It's not a normal landing of a float plane in the water, but it's emergency landing of aircraft in the water. After the pilot has recognized the problem and decided that he cannot continue to an airport, he may decide to land in a safe area, and because water is usually free of obstacles, the pilot may decide to land in the water. The most famous case of Ditching is Hodson river by Capt. Sally.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to force landing and they were preparing to ditch on lake.

## Check your AE 2.24



### 2.24

**P = pilot, ATC = air-traffic controller**

**ATC** Fairair 354, this is Seaforth Control we have had a report of three suspicious passengers aboard your aircraft who all boarded in the last minute and all have passport numbers in sequence. All are male.

**P** Roger. Do you have seat numbers 354?

**ATC** They are sitting together in row H seats 2, 3 and 4.

**P** Seaforth Control. We have a problem. There are three armed passengers standing in the aisle. One is carrying what he says is a bomb and they are demanding I open the cockpit door. Otherwise they will blow up the aircraft. Fairair 354.

**ATC** Roger 354. What are your intentions?

**P** I have briefed the purser and the security marshals that I intend to put the aircraft into negative 'g'. This will not be expected and it will cause the standing passengers to fall down. When this happens the purser and security marshalls are in a position to overpower them. Fairair 354.

**ATC** Seaforth Control. Roger. Keep us informed.

**P** Wilco 354

**P** Seaforth Control, the manoeuvre was successful. The three passengers are restrained and the package is not a bomb. Request immediate diversion to Pemroke for a radar vectored straight-in approach for an ILS approach runway 34, Fairair 354.

## CHECK YOUR AE 2.24

This audio was about a flight with the call sign of Fairair 354

This audio was a conversation between Pilot and ATC of Seaforth Control

The nature of the problem was about Unlawful interference

ATC of Seaforth Control informed pilot that there were three suspicious passengers who all boarded and they had passport numbers in sequence and they were male. After that the pilot declared hijack and he said three armed passengers standing in the aisle and they were demanding the pilot to open the cockpit door otherwise they would blow up the aircraft. Finally, because hijackers were standing, the pilot had briefed marshals and put the aircraft into negative g to make hijackers fall down and marshals could overpower them.

If I want to speak about more details, I can add that

hijackers were sitting together in row H seats 2, 3 and 4.

the maneuver was successful and the three hijackers were restrained and they didn't have a bomb.

The pilot requested diversion to Pemroke and RADAR VECTOR for ILS approach runway 34

As I said, this audio was about Unlawful interference

Generally, It is another name for hijack. In such cases the hijacker takes the control of the flight and the hijacker tells the pilot where to go. I mean they force the pilot to change the flight plan and divert to another airport. Also taking hostage is possible in case of unlawful interference. As a pilot if I am in such a situation, I will ask for help from the ACM, but it depends on the situation. Sometimes I may not be able to declare such a case. I can just set squawk 7500 to show the controller that I am stuck in such a situation.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot of Fairair 354 decided to put the aircraft into negative g to make hijackers fall down and marshals could overpower them.

## Check your AE 2.38



### 2.38

**P = pilot, C = Controller**

- P** Chervitzna tower. Flagline 46. On runway 26. We're going to have to hold position until we've sorted this out.
- C** Flagline 46. Chervitzna tower. Roger.  
All Stations. Chervitzna tower. Runway 26 out of service due disabled aircraft. All traffic use runway 34 until further notice.  
Flagline 46. From the tower it definitely looks like both the covers that close up after the wheels go up ... it looks as though they are hanging down, dragging on the pavement.
- P** Roger, thank you. Flagline 46.
- C** Flagline 46. Could we organize for a tow for you?
- P** Negative. We think if we can get the doors lifted up and locked then we will taxi the aircraft, but we can't move until then. Flagline 46.
- C** Flagline 46. Do you want to disembark your passengers?
- P** Negative. We'd like to wait and disembark the passengers at the gate. Flagline 46.  
We need to get the main landing gear pinned. We have pins with us and we can throw them out of the window. Do you have anyone trained to fit them, or is there maintenance on the field that can do it?  
Flagline 46.
- C** Flagline 46. We're checking if a mechanic is on site for you. Stand by.  
Flagline 46. There is a maintenance mechanic for your type available. He should be with you in a few moments.
- P** Thank you. Flagline 46.

## CHECK YOUR AE 2.38

This audio was about a flight with the call sign of Flagline 46

This audio was a conversation between Pilot and ATC of Chervitzna tower

The nature of the problem was about runway incursion

Flagline 46 informed ATC that they had a problem and they had to hold on runway 26 until they had sorted this out. ATC informed Flagline 46 that it looked like both the the main landing gear covers were hanging down and dragging on the pavement. ATC wanted to send tow for Flagline 46 but the they didn't want to send tow and the they thought if they could get the doors lifted up and locked, they could taxi the aircraft. Finally, the they requested maintenance who could fix the main landing gear covers pin and there was maintenance at airport.

If I want to speak about more details, I can add that

they had to hold on runway 26.

ATC declared to all station that runway 26 was out of service and used the runway 34 until further notice.

they didn't want to disembark passengers in the runway.

they had pins for main landing gear covers in cockpit.

There was a maintenance mechanic for its type of aircraft in airport.

As I said, this audio was about runway incursion

Generally, it is defined as presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide to go around or touch the runway that it depends on the place of runway incursion and the situation.

When such a case happens, we expect that the pilot acts according to safety and the handle the problem, that here the pilot of Flagline 46 decided to fix the aircraft with maintenance that was available in airport and disembark passengers at the gate.

## Check your AE 3.12



### 3.12

**P = pilot, ATC = air-traffic controller**

**ATC** Flyfast 001, Filton Tower.

**P** Flyfast 001. Pass your message.

**ATC** Flyfast 100. Request your intentions. What do you want to do?

**P** Stand by. Flyfast 001.

Flyfast 001. We're talking to company at the moment

and we're trying to decide whether to continue or come back. We'll give you a call in a minute. Maybe for vectors to down wind. Flyfast 001.

We're going to return to the airport and it looks like we're going to have to dump fuel. Stand by. But we're coming back. Flyfast 001.

**ATC** 001, understand you're going to come back and you need to dump fuel?

Fuel dumping area is in the Severn estuary. Suggest start dumping fuel five miles north of Lundy island. I'll give you vectors to Filton on completion.

Fly heading 210 °.

Flyfast 001. Once you get 20 DME from Filton you can start to dump fuel.

**P** To what DME?

**ATC** Flyfast 001. 20 miles.

Do you know the nature of your problem?

**P** It's a flap problem, we can't retract the flaps below 10%.

**ATC** Roger.

Flyfast 001, do you have an estimate on how long you'll be dumping fuel for?

**P** We're just checking now. We want to dump about 70,000 kilos, it's going to take about 30 minutes. We'll try to find a figure where we can land overweight.



## CHECK YOUR AE 3.12

This audio was about a flight with the call sign of Flyfast 001

This audio was a conversation between Pilot and ATC of Filton tower

The nature of the problem was about Fuel dumping

When they had recognized the problem, they decided to talk to their company. After that they declared to ATC that they came back to airport due to flap problem and they were going to dump fuel.

If I want to speak about more details, I can add that

Fuel dumping area was in the Severn Estuary.  
they could start to dump fuel at 20 DME from Filton with heading 210 degree.  
they couldn't retract flaps below 10%.  
they wanted to dump fuel about 70,000 kilos and it was going to take about 30 minutes.

As I said, this audio was about fuel dumping

Generally, maximum take-off weight is more than maximum landing weight. so, if the pilot has to land immediately after departure, the pilot should dump fuel in order to reach maximum landing weight. All aircraft are not able to dump fuel, instead they burn off fuel in order to reach the maximum landing weight.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot of flyfast 001 had recognized the problem and decided to dump fuel in order to reach a maximum landing weight.

## Check your AE 3.30



### 3.30

**P1/2 = pilot1/2, ATC = air-traffic controller**

**ATC** 914, left via F and A. When you get to Y follow Korean Air.

**P1** OK. Left F, Y and then YPB you said?

**ATC** Negative. When you get to Y, follow Korean Air.

**P1** Ah, follow Korean Air. United 914.

**P2** Ground. Korean 257. We think we hit a vehicle. A truck near the taxiway.

**ATC** I'm sorry, you think you hit a vehicle?

**P2** Yes.

**ATC** OK Korean 257, hold your position.

**P2** Holding position.

**ATC** United 914 do you see anything near Korean Air?

**P1** I'm looking. I don't see anything. Does he think he's just hit something? United 914.

**ATC** Affirm. He said that there might be a vehicle damaged or something.

**P2** Check on the right side please.

**P1** OK. We're looking at the right side. I don't see anybody who looks upset. We'll take a closer look.

Ground. United 914. It's really hard to tell, there is a vehicle parked there. Maybe his outboard engine hit it. I can't tell from here.

**ATC** Roger, United. Thank you very much.

Korean 257, a follow-me vehicle is on its way to you. They'll make a visual inspection.

**P2** Roger. Thank you. Korean 257.

**ATC** Korean 257. Ground.

**P2** Pass your message. 257.

**ATC** Yeah, the airport vehicle is inspecting the right side of the aircraft, can you cut the engines?

**P2** Say again. Korean 257.

**ATC** Cut your engines down to idle.

**P** They are already at idle, do you want us to shut down the engines?

**ATC** Affirm 257. Shut down your engines.

### **CHECK YOUR AE 3.30**

**This audio was a conversation between** Pilot of United 914 and Pilot of Korean 257 and ATC

**The nature of the problem was about** HOTSPOT

The pilot of Korean 257 declared to ATC that they thought hit a vehicle near the taxiway. ATC called United 914 and requested to check on the right side of Korean 257. Pilot of United 914 reported that there was a vehicle that it parked there and maybe their outboard engine was hit vehicle but I couldn't tell exactly from here. Finally, ATC decided to send follow me vehicle to inspect the Korean 257 and ATC ordered Korean 257 to shut down its engines.

**If I want to speak about more details, I can add that**


The pilot of Korean 257 held position and shut down its engines. At first pilot of United 914 didn't see anybody who looks upset but when they took a closer look, they saw a vehicle that it parked there.

**As I said, this audio was about** HOTSPOT

**Generally,** Hotspot is a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

**When such a case happens, we expect that** the pilot acts according to safety and handle the problem, that here the pilot hit a vehicle, so held position and ATC sent follow me vehicle to inspect the aircraft.

### UNIT 3, EXERCISE 10

- 19  1 Be informed. Centreline lights out of order on runway 27.
- 2 Caution. Construction work at the edge of the taxiway. It's marked by red flags.
- 3 Be advised. Ice reported at the holding area. Braking action poor. Caution.
- 4 Be advised. Standing water at the midpoint on the runway.
- 5 Caution. Slush on stand E40.
- 6 Be advised. Edge of apron partly covered with gravel opposite the terminal building.

## E4A Track 19 unit3-exercise 10

This audio was about field information

The nature of the information was about situational awareness

When the pilots received these information's. they understood what dangers threaten them and what facilities were available to them at an airport.

If I want to speak about more details, I can add that

Centerline light out of order on runway 27.

Construction worked at the edge of the taxiway which it was marked by red flag.

Ice reported at the holding area so that braking action was poor.

There was standing water at the midpoint on the runway.

There was slush on stand E40.

Edge of apron partly covered with gravel opposite the terminal building.

As I said, this audio was about situational awareness

Generally, Situational awareness is a term used to describe a person's awareness of their surroundings, the pilot should predict of what these surroundings will mean in the future, and then using this information to act.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot have to listen and follow the information.

## E4A Track 23 unit 4- exercise 1

### UNIT 4, EXERCISE 1

#### 23 Exchange 1

- Tower* 456, expedite taxi to runway 06 left.  
*Co-pilot 456* Which holding point are we heading for?  
*Pilot 456* It's usually A, but I'm taking AG. We get a shorter runway, but it's still OK. I never like this runway. That rise in the middle blocks the view. You can't see the other end until you're at the midpoint.  
*Tower* 456, line up and take off immediately runway 06 left.  
*Pilot 456* Taking off. Runway 06 left, 456. There are vehicles on the runway!  
*Co-pilot 456* We'll make it. V1 ... rotate.  
*Pilot 456* What the hell ...  
*Co-pilot 456* Looked like works of some sort.  
*Pilot 456* Control, we've just had a near miss with some vehicles near the end of the runway.  
*Tower* Yeah, we saw 456. You cleared them by about 50 feet. You entered the runway at the wrong point. We do not have the full length available today.

#### Exchange 2

- ATC* BVL, for identification purposes, Could you to turn left heading 340.  
BVL identified. Maintain flight level 190.  
After passing GANET turn left heading 270.  
*BVL* Flight level 190, turn left heading 270. BVL.

#### Exchange 3

- Departure* N355, climb flight level 80.  
*N355* Climbing flight level 90. N355.  
*Departure* N355, I say again flight level 80, 80. Keep at flight level 80 due traffic. You're up at 8600 feet already. Descend immediately.  
*N355* Did you say flight level 80? Are you sure? N355.  
*Departure* Affirm, N355. Descend immediately. There's inbound traffic at 6 miles now, flight level 90.

#### Exchange 4

- Departure* GBL, airborne 1905. Climb straight ahead heading 050. Report when you're past 5000 feet.  
*GBL* Roger GBL.  
Passing 5000 feet. GBL.  
*Departure* GBL, continue climb flight level 120. No speed restrictions.  
*Alert* Traffic, traffic. Descend, descend.  
*GBL* TCAS descend. GBL.  
*Alert* Clear of conflict.  
*GBL* Clear of conflict. Level at 5000. GBL.  
*Departure* GBL, roger. GBL, maintain 5000 feet. Turn right heading 090.  
GBL, clear of traffic. Heading 350. Continue climb flight level 120 and call on reaching.

- GBL* Can you confirm climb back 120? GBL.  
*Departure* GBL, affirm. Flight level 120. Heading 350. Do you want to file a report?  
*GBL* Er - affirm ...

#### Exchange 5

- Departure* N3E, what's your level?  
*N3E* Just out of 5500 for flight level 150. Heading 050. N3E.  
*Departure* N3E, are you able to level off at 6000 feet?  
*N3E* Affirm. Maintaining 6000 feet. Can I stay on same heading? N3E.  
*Departure* N3E, just stay on the same heading for the time being. You have opposite traffic 7000 feet. Expect further climb shortly.

#### Exchange 6

- ATC* D6V, this is en route holding. Make one right hand orbit in your present position and leave on heading 130. Report abeam HOLLY.  
*D6V* Sorry - we're not very keen on orbiting. Do you mind if we have a level change instead? D6V.  
*ATC* D6V, stand by for level change. D6V, level change approved. Cleared to 160. Same heading. Expect further clearance at 16. Landing delays at Milan 15 minutes.

#### Exchange 7

- Tower* C23 cleared for take off, wind 085 degrees, 15 knots.  
*Pilot C23* Cleared for take off, C23.  
*Co-pilot C23* OK, we've got a red on hydraulics - and on flight controls. Rudder hydraulics on the overhead ...  
Red's everywhere now. Do you want ...  
*Tower* C23, abort your take off. Abort your take off. You've got smoke coming from one of your engines. Abort your take off.  
*Co-pilot C23* Aborting take off. Where's the smoke coming from?  
*Tower* It appears to be from the central engine by the looks of it - number 2.  
*Pilot C23* Closing down number 2.

## E4A Track 23 unit4-exercise 1

### Exchange 1

This audio was about a flight with the call sign of 456

This audio was a conversation between pilot in command and first officer and ATC

The nature of the problem was about Runway Incursion and near miss

When they were in taxiway AG and waiting for clear for line up. ATC got clear for line up and takeoff immediately at runway 06 left. When they were rolling, suddenly they noticed that there were vehicles on the runway. Finally, they decided to lift off rapidly and contact ATC and say the problem.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

They entered the runway at the wrong point.

They had near miss with some vehicles near the end of runway.

They cleared vehicles by about 50ft.

As I said, this audio was about Runway Incursion and near miss

Generally, it is defined as the presence of persons, vehicles or aircraft on the runway without the permission of the control tower. In such cases as a pilot when we are taking off, we may decide to abort take off or lift off the ground rapidly, or in case of landing as a pilot we should decide whether to go around or touch the runway that it depends on the place of runway incursion and the situation.

And near miss is a case in which the separation between two aircraft becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS in near miss is crucial because if TCAS were not developed, a lot of people would be dead in air misses.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to lift off rapidly and cleared vehicles by 50 ft.

## E4A Track 23 unit4-exercise 1

### Exchange 2

This audio was about a flight with the call sign of BVL

This audio was a conversation between Pilot and ATC

The nature of the problem was about READABILITY

When they were in cruise, they got radio communication problem. Finally, the ATC decided to give new heading and flight level to identify them.

If I want to speak about more details, I can add that

ATC said, they turned to heading 340 for identification.

after identifying them, ATC said, after passing GANET they turned to heading 270 and maintained flight level 190.

As I said, this audio was about READABILITY

Generally, it is defined as non-transmission of transmitted radio messages and sent radio messages cannot be identified

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot did exactly what ATC wanted.



## E4A Track 23 unit4-exercise 1

### Exchange 3

This audio was about a flight with the call sign of N355

This audio was a conversation between ATC and Pilot

The nature of the problem was about conflicting traffic

When they were in flight, ATC said to N355 climb to flight level 80. but they heard wrongly and they were Climbing to flight level 90, finally ATC said again flight level 80, 80 and they descent to flight level 80

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

N355 read back the ATC message incorrectly.

When they were in 8600 ft that they got message from ATC to descend immediately because there was inbound traffic at 6 miles and flight level 90.

As I said, this audio was about conflicting traffic

Generally, it is defined as traffic at or near the same flight level with heading towards each other.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to descend to flight level 80 and keep safe separation with other aircraft on flight level 90.

## E4A Track 23 unit4-exercise 1

### Exchange 4

This audio was about a flight with the call sign of GBL

This audio was a conversation between ATC and Pilot

The nature of the problem was about near miss

When they were in climb phase and according to the instruction of the ATC, they continued climb to flight level 120 without speed restrictions. suddenly TCAS warned to descent descend and pilot did it, finally TCAS warned Clear of conflict. after that pilot of GBL decided to file a report.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

They were airborne 1905

They reported when passing 5000ft

They received TCAS alert descend at 5000ft.

After the conflict was cleared, they turned to heading 350 and continued climb to flight level 120.

As I said, this audio was about near miss

Generally, it is defined as a case in which the separation between two aircraft becomes less than standard and they pass each other with less than the required safe distance. The role of TCAS In near misses is crucial because if TCAS were not developed, a lot of people would be dead in air misses.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to listen to the instructions of TCAS and did it.

## E4A Track 23 unit4-exercise 1

### Exchange 5

This audio was about a flight with the call sign of N3E

This audio was a conversation between ATC and Pilot

The nature of the problem was about traffic information

When they were in climb phase and passing 5500 the ATC ordered N3E to level off at 6000 feet due to opposite traffic at 7000 feet.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

They had planned to climb to flight level 150 with heading 050 degree.

According to the ATC message, they were maintaining 6000ft they had opposite traffic at 7000ft.

As I said, this audio was about traffic information

Generally, it is defined as an information issued by an air traffic services unit to alert a pilot of other air traffic which may be in proximity to the position or intended route of flight and help the pilot to avoid a collision.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot listened to the instructions of the ATC and did it.

## E4A Track 23 unit4-exercise 1

### Exchange 6

This audio was about a flight with the call sign of D6V

This audio was a conversation between ATC and Pilot

The nature of the problem was about traffic information

When they were flying en-route, the ATC gave instruction to make one right hand orbit in its present position and leave on heading 130 degree and reported when they were abeam HOLLY but the pilot said sorry and requested level change instead of making an orbit.

If I want to speak about more details, I can add that

They got clearance to level change to flight level 160.

They had got 15 minutes delay for landing at Milan.

As I said, this audio was about traffic information

Generally, it is defined as an information issued by an air traffic services unit to alert a pilot of other air traffic which may be in proximity to the position or intended route of flight and help the pilot to avoid a collision or help pilot to navigate in specific area and etc.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot listened to the instructions of the ATC and did it.

## E4A Track 23 unit4-exercise 1

### Exchange 7

This audio was about a flight with the call sign of C23

This audio was a conversation between ATC and pilot in command and first officer

The nature of the problem was about Hydraulic failure

When they were rolling on the runway, they got a red on hydraulic, flight controls, rudder and then red on everywhere. At same time the ATC got instruction to abort take off due to smokes from engine number 2. Finally, pilot decided to Close down engine number 2.

If I want to speak about more details, I can add that

When they got clearance for takeoff, wind was 085 degrees and 15 knots. Everyone was ok.

As I said, this audio was about Hydraulic failure

Generally, Hydraulic failure may happen to hydraulic and fly by wire aircraft, when hydraulic failure happens flight controls will not work. As pilot, in flight we use asymmetrically engine power for controlling aircraft and land as soon as possible, but on the ground, we should abort takeoff and shut engines down.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot aborted takeoff and closed down the engine number 2.

## E4A Track 34 unit 5- exercise 12

### UNIT 5, EXERCISE 12



#### Exchange 1

34 B333 OK – we're fine at this level. Next time please give us at least 6 miles behind a heavy. B333.

#### Exchange 2

Buck 36 We're turning back to Lohoa. I think it was the engine ... the engine fell off.

Departure Buck 36, say your intentions.

Buck 36 We are going to maintain this heading. We're having problems with speed and with flight controls. Buck 36.

Departure Buck 36, roger. Choose your runway. We'll clear everything. Are you able to maintain terrain clearance?

Buck 36 Affirmative. We are maintaining 1500 feet. We need to get rid of fuel. Buck 36.

Departure Buck 36, roger.

Buck 36 All right. I want runway 6 left.

Departure Buck 36, runway 6 left, cleared to land.

Buck 36 All right. All right. We're landing 6 left. Buck 36.

Departure Buck 36, all the gear appears good.

Buck 36 Thank you. Buck 36.

Heh-heh ... we did it!

Departure Affirm 36. You did a good job!

#### Exchange 3

AF39 Pan-pan, pan-pan, pan-pan, Fairview Tower. Fumes in cockpit. Request priority landing. AF-39 pan-pan.

Tower AF-39 pan-pan, Fairview Tower. You are number one. Cleared to land. Straight in. Runway 17, wind 170 degrees, eight knots. QNH 1008. Fire service requested.

AF-39 Runway 17, QNH 1008, AF-39 pan-pan.

Tower Take first right when vacated. Contact Fire Service directly on 118.5.

AF-39 First right, 118.5. AF-39 pan-pan.

FS1 AF-39, Fire Service 1. Suggest you evacuate your passengers as soon as possible, sir. Fire Service 1.

AF-39 Do I need an emergency evacuation. Fire Service 1? We've still got a strong smell of fumes – we may have an oil leak somewhere.

FS1 Negative, AF-39. That won't be necessary. The passengers can disembark normally. The bus is just pulling up now to take them to the terminal. We'll come on board as soon as you're all clear. Fire Service 1.

## E4A Track 34 unit5-exercise 12

### Exchange 1

This audio was about a flight with the call sign of B333

The nature of the problem was about passing the position information

When they were in cruise phase, they passed position information and requested to get advice at least 6 miles behind heavy.

If I want to speak about more details, I can add that

They were fine at that Flight level

As I said, this audio was about passing the position information

Generally, an air traffic services unit and pilots get and give these informations together to announce the position or intended route of flight for avoiding conflict, collision or etc.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot reported their position as safety.

## E4A Track 34 unit5-exercise 12

### Exchange 2

This audio was about a flight with the call sign of Buck 36

This audio was a conversation between ATC and Pilot

The nature of the problem was about Control surfaces

When they were in initial climb phase, they noticed that the engine fell off and they had problems with flight controls and speed, Finally, pilot decided to get rid of fuel and land on runway 06 left.

If I want to speak about more details, I can add that

Everyone was ok

They were able to maintain terrain clearance and maintaining 1500 ft.

They dumped fuel before landing.

They wanted to land on runway 06 left.

All landing gears extended without problem.

As I said, this audio was about Control surfaces

Generally, it is defined as a case in which flight control surfaces will not be moved. It can be due to icing, engine failure, hydraulic failure, etc. In case of control problem, the pilot will not be able to control pitch, Roll, yaw or speed of the aircraft and pilot's action depends on the source of the problem.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to come back to airport and land as soon as possible.



## E4A Track 34 unit5-exercise 12

### Exchange 3

This audio was about a flight with the call sign of AF39

This audio was a conversation between Pilot and ATC of Fairview tower and fire service officer

The nature of the problem was about smoke in cabin

When they were in flight, they noticed that they had fume in cockpit and requested priority landing, Finally, when they vacated the runway, they contacted fire service on 118.5 frequency and fire services declared to pilot that emergency evacuation was not necessary and they could disembark passengers normally.

If I want to speak about more details, I can add that

Everyone was ok.

They got clearance to land on runway 17. wind was 170 degrees 8 knots and QNH was 1008.

They thought have an oil leak somewhere.

The bus was pulling up to take occupants to the terminal


As I said, this audio was about smoke in cabin

Generally, it is defined as when you can see fire or you don't see it but you can feel it, like smelling something burning by fire. As a pilot when I smell fume in the cockpit, I expect a fire or at least smoke to be available in the cockpit or in the cabin. And in such cases at first my action will be to diagnose the source of the smoke and secondly, we will decide to declare an emergency or not. We will remove that part from the circuit to stop the smoke or fume.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to declare pan-pan and land as soon as possible.

E4A Track 45 unit 6- exercise 18

UNIT 6, EXERCISE 18

- 45  *Tower* F22, Newbury Tower. Turn right heading 060. Reduce speed to 180 knots.
- WHF-22* Turning right heading 060. Speed now 200 knots. Turning base leg. F22.
- Tower* F22, cleared altitude 2500 feet. Say again 2500 feet. You're already lower than that. You must stay above 2500 feet.
- WHF-22* 2500. F22. 2500.
- Tower* F22, yes – you're still too low – you have to be above 2500 feet. If you could climb back up to 2500 please and turn right now onto 120 degrees.
- WHF-22* Turning 120. F22.
- Tower* F22, you are still descending! You must climb now. Climb 2500 feet.
- WHF-22* 2500 feet. F22.
- Tower* F22, climb immediately. There is a mast 4 miles due east of your current position. Height is 1300 feet. When you get to it, it'll be higher than you.
- WHF-22* F22, QNH 982. Can you confirm you are indicating 1500?
- WHF-22* Just got it now and climbing. Reading 2000 feet. F22.
- Tower* F22, you can level off at 2000 feet please to intercept the glidepath at 7 miles. You are now clear of the TV mast.

## E4A Track 45 unit6-exercise 18

This audio was about a flight with the call sign of WHF-22

This audio was a conversation between Pilot and ATC of Newbury Tower

The nature of the problem was about Altimeter setting

When ATC gave clearance to F22 for altitude 2,500 ft, ATC noticed that F22 was lower than 2,500 ft. So, ATC informed F22 that you were still too low and you had to be above 2,500 ft but F22 was still descending. Finally, ATC declared QNH 982 and asked the pilot to confirm it. The pilot of F22 recognized the problem and they were tuning altimeter and climbing to 2,500 ft.

If I want to speak about more details, I can add that

F22 was turning base leg when it was lower than 2,500 feet.

When height of F22 was 1,300 feet, there was danger of collision with TV mast.

When pilot of F22 readjusted altimeter, they got clearance to level off at 2,000 ft to intercept the glide path at 7 miles.

As I said, this audio was about Altimeter setting

Generally, it is referred to standard pressure altitude with reference to sea level (QNH) or local pressure altitude at the airport elevation (QFE) that must set by the crew on their altimeter and critical, especially during descent and approach

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot of F22 readjusted altimeter setting and climb to 2,000 ft and kept safe distance with TV mast.

## UNIT 7. EXERCISE 8

- 49 *Approach* SAS 105, what's the fuel situation?
- Co-pilot 105* We're at maximum weight but I don't want to wait any longer. It'll be dark soon. SAS 105.
- Approach* OK, SAS 105. I know you didn't specifically request foam, but expect foam carpet in approximately 15 minutes. How many passengers aboard?
- Co-pilot 105* 237 plus 8 crew. All services needed. SAS 105.
- Approach* Roger, 105.  
SAS 105, cleared for straight-in approach. Runway 06 left. Wind 025, 10 knots. QNH 1008. Fire services advised.
- Co-pilot 105* 105 is established.
- Approach* 105, continue to reduce speed. The foam carpet begins 500 metres after the threshold and continues for further 700 metres. 15 metres wide.
- Co-pilot 105* Roger. 105.

## E4A Track 49 unit7-exercise 8

This audio was about a flight with the call sign of SAS105

This audio was a conversation between pilot and ATC

The nature of the problem was about Forced landing

When they were in flight, they faced a problem which had put them in an emergency situation. So they decided to reduce weight to maximum landing weight for emergency landing. Finally, they did forced landing.

If I want to speak about more details, I can add that

SAS105 had 245 occupants including 8 crew and 237 passengers.

They got clearance to straight in approach runway 06 left, wind was 025 degree 10 knots and QNH was 1008.

Fire services got advice and prepared the foam carpet on runway 06 left in 15 minutes.

The foam carpet began 500 meters after the threshold and continued for further 700 meters and it had 15 meters wide.

As I said, this audio was about forced landing

Generally, forced landing is a emergency landing by an aircraft due to the failure of engines, systems, components or weather which makes continued flight impossible. pilot under these factors has to land as soon as possible even if pilot can not be able to reach suitable airport, pilot should land in safe area.

When such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot of SAS reduced weight to maximum landing weight and did forced landing.

**ATCO:** Hijet 451, taxi via outer taxiway to Stand one–seven.

**F/O:** Outer taxiway, Stand one–seven, Hijet 451.

**ATCO:** Hijet 451, for information, during your landing you had a big flame from your right engine.

**F/O:** Thank you. That's copied. We had some problems with our engine, so we will have a check done by our maintenance. Can you see anything now?

**ATCO:** There is still some smoke and occasional flames coming from the exhaust. The fire service is on its way. It is approaching you from the left.

**F/O:** Thank you very much.

**ATCO:** Hijet 451, stop there, please.

**F/O:** Roger. We are stopping, Hijet 451. For information, Engine Number 2, our right-hand engine is shut down.

**ATCO:** Thank you.

**F/O:** Hijet 451, is it still on fire?

**ATCO:** Hijet 451, could you shut down all engines now?

**F/O:** We are also shutting down Engine Number 1 Hijet 451.

**ATCO:** Thank you, sir. Can you change frequency to 121 decimal 85?

**F/O:** 121 decimal 85, Hijet 451.

**Fire Officer:** Quebec Oscar Kilo from Chief Fire Officer.

**F/O:** Go ahead.

**Fire Officer:** We have checked your right-hand engine. We have some flames at the rear of the engine. We are cooling it down. Would you like to disembark?

**F/O:** We have shut down both engines and discharged both fire agents. Yes, I think we'd like to disembark the passengers. Could you organise some stairs for us?

**Fire Officer:** There is actually no risk. We will continue to cool down the engine. We will put some stairs in place on the left, but on the right-hand side, please stand by to disembark by the slide.

**F/O:** OK. We will keep the slide armed on the right-hand side.

**Fire Officer:** OK. Just stand by in case of a degradation of the situation.

**F/O:** OK. Will do.

**Fire Officer:** Quebec Oscar Kilo from Fire Officer.

**F/O:** OK. Go ahead.

**Fire Officer:** We will organise the bus and stairs and we will keep standing by with my guys and the appliances.

**F/O:** OK. Thank you very much.

## FP 1.38

This audio was about a flight with the call sign of Hijet 451

This audio was a conversation between Pilot and ATC and Fire Officer

The nature of the problem was about engine flame out

When they were in taxi way, The ATC warned them that they had flame on right engine after landing. After that they communicated with fire officer. Fire officer checked right-hand engine. They saw some flames at the rear of the engine and they were cooling it down. Finally, pilot decided to shut down both engines and discharged both fire deterrents. And also decided to disembark the passengers, so they requested to organize some stairs.

If I want to speak about more details, I can add that

No one was injured or everyone was ok

They had flame in engine number 2

They contacted fire officer on 121.85 frequency

Identification code of aircraft was QOK

They had kept the slide armed on the right-hand side.

Fire Officer organized the bus and stairs and they had kept standing by with their appliances.

They attached stairs to the left-hand side of aircraft.

As I said, this audio was about engine flame out

Generally, Engine flameout happens when for any reason ignition does not take place in the combustion chamber. Engine flameout is when fuel does not reach the engine due to any reason including fuel icing or fuel exhaustion.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to shut down both engines and discharged both fire agents and disembark the passengers and requested to organize some stairs and bus.

9b **3.15**

**Pilot:** Bangkok Approach, Fedex 3479, there was a loud crashing noise during our descent and we had a sudden pitch-down moment. When the flight engineer went to investigate, he found that one of the cargo pallets on the main deck had come detached and had slid three or four metres. He has secured it temporarily, but we are trying to avoid any sudden manoeuvres. Request long straight-in approach, Fedex 3479.

**ATCO:** Fedex 3479, Bangkok Approach. Roger. Turn left heading 160. Intercept ILS Runway 19 Left. Are you familiar with the approach procedure?

**Pilot:** Affirm, Fedex 3479.

**ATCO:** Do you accept visual approach, Runway 19 Left, behind A330?

**Pilot:** Behind A330, Fedex 3479.

**ATCO:** Fedex 3479, cleared visual approach Runway 19 Left, maintain own separation from preceding A330.



### FP 3.15

This audio was about a flight with the call sign of Fedex 3489

This audio was a conversation between Pilot and ATC of Bangkok approach

The nature of the problem was about CG Problem

When they were in descend phase for landing, they noticed that one of the pallets had come detached and had slid four meters and the flight engineer went to investigate and secured it temporarily. The pilot decided to request long straight-in approach to avoid any sudden maneuvers. Finally, they got clearance to visual approach for Runway 19 Left

If I want to speak about more details, I can add that

No one was injured or everyone was ok

They were approaching ILS runway 19 left by turned left to heading 160 degree

They were familiar with the approach procedure of Bangkok

They did visual approach behind A330

As I said, this audio was about CG Problem

Generally, each aircraft has a CG or Center of Gravity which is actually its balance point. It is very important during flight because of its effect on the stability and performance of the aircraft. It must remain within carefully defined limits at all stages of flight. To achieve this, load distribution is performed by adding, subtracting or shifting the position of passengers, cargo or fuel in the aircraft.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to ask to the flight engineer to secure the pallet and pilot also Requested long straight-in approach ILS runway 19 left to avoid any sudden maneuvers.

## FP3.41

5 3.41

**Tower:** Etihad 339 Heavy, Abu Dhabi Tower, Runway 19 Left, cleared to land.

**Pilot:** Cleared to land, 19 Left, Etihad 339 Heavy.

**Tower:** Winds 170 degrees at three knots.

**Pilot:** Copy 170 / 3. I've got the right engine shut down and everything appears to be OK from the inside here. When we've come to a standstill, we'd appreciate it if you could take a look at the right-hand engine.

**Tower:** We have the request and we're planning on that.

**Pilot:** Thank you.

**Tower:** Etihad 339 Heavy, your right engine is still on fire.

**Pilot:** Thank you. We're going to stop once we've vacated the runway and hold. If they could, please put it out?

**Tower:** The fire service is on the runway now.

**Pilot:** Tower, Etihad 339, are you with me?

**Tower:** Etihad 339 Heavy, go ahead.

**Pilot:** Is the fire service on the same frequency?

**Tower:** They're on Ground frequency.

**Pilot:** OK, what is that?

**Tower:** Contact them on 121.75.

**Pilot:** OK. Etihad 339 here, Fire Service, are you there?

**Fire Service:** I'm here, go ahead.

**Pilot:** How does that engine look?

**Fire Service:** We're putting foam on it now. It appears like it was in the tail pipe, but I'm going to spray the whole engine.

**Pilot:** OK. No need to evacuate the passengers, is that correct?

**Fire Service:** Negative, not at this time. Give me a minute or two... Confirm you have that engine shut down.

**Pilot:** Yes, it's shut down. It's been off for a little while. The Number 1 engine is still running.

**Fire Service:** I understand that. Hopefully you can turn it down to just a slow speed.

**Pilot:** It's at idle.

**Fire Service:** We're having a hard time putting this out. Have you fired your bottle?

**Pilot:** Both bottles have been discharged ... How does it look?

**Fire Service:** It looks like we're almost there. We're just going to make a mess out here.

**Pilot:** Well, that's OK.

### FP 3.41

This audio was about a flight with the call sign of Etihad 339

This audio was a conversation between Pilot and ATC of Abu Dhabi Tower and Fire service

The nature of the problem was about Engine fire

When they were in approach phase, the ATC gave clearance to land on runway 19 Left, while the pilot shut down the right engine, they requested ATC to take a look at the right-hand engine and ATC said that their right engine was still on fire. finally, they landed and they decided to vacate the runway and hold there. The fire services were ready on the runway for operation. they communicated with Fire Services and Fire Services said they were putting foam on it. The pilot got confirm from Fire Service about the evacuated the passengers and the Fire Service notified that it was not necessary now and the pilot said both bottles had been discharged.

If I want to speak about more details, I can add that

No one was injured or everyone was ok.

The engine number 2 caught fire.

They were approaching ILS runway 19 left.

After landing they came to stand still for inspecting right-hand engine.

Pilot contacted fire service on ground frequency and ground frequency was 121.75.

Although both bottles had been discharged, they looked like didn't fully discharge.

As I said, this audio was about Engine fire

Generally, an engine fire is normally detected and contained satisfactorily by the aircraft fire detection and suppression systems. sometimes onboard systems may not be able to contain the fire and it may spread to the wing and fuselage. As pilot, when engine catches fire, we will shut the engines down and we will empty the bottles and the declare emergency and land the aircraft as soon as possible and allow fire crews to carry out a visual examination of the engine.

Such a case happens, we expect that the pilot acts according to safety and handle the problem, that here the pilot decided to use fire detergents and land as soon as possible and Communicates with Fire Service.

Book: English for aviation page: 88

Audio: 23 exchange: 1

Case: near-miss

@learn\_english\_with\_asma

The airplane was 456. At the beginning of the communication the controller wanted the pilot to expedite taxi to runway 06 L. Then we had a communication between the first officer and the captain of flight in cockpit. They were heading for holding point A. The pilot said, "it's usually A but I'm taking AG." By taking AG they would get a shorter runway. The pilot didn't like that runway because the rise in middle of the runway was always blocking the view and the pilots couldn't see the end until they got to the midpoint. Controller said, "line up and take off immediately." During take-off suddenly they saw some vehicles (h: silent) on the runway and luckily they passed those vehicles with a very short distance about 50 feet. In fact they had a near miss. (near-miss) = (airprox) = (aircraft proximity) = (loss of separation) It was the pilots' fault because they entered the rwy at the wrong point.

-Book: flightpath -page: 190/191

-audio: 3.41 (Etihad 339 heavy)

@learn\_english\_with\_asma

It was a communication between Etihad 339 heavy and Abu Dhabi tower. They had an engine fire, in fact the right-hand engine. At the beginning of the communication the controller cleared them to land on RWY 19L. Wind was 170 degrees at 3 knots. Shortly after landing the pilot shut down the right engine. Since the right engine was still on fire, they needed fire service to check the engine and put out the fire. The fire service was on the way. The pilot had to change the frequency to 121.75 to contact the fire service because the fire service was on ground frequency. The firefighters foamed the right engine and the left engine was at idle. The pilot had discharged both extinguisher bottles to put out the engine fire before he landed the airplane. They decided to evacuate the passengers after extinguishing the fire.

Page 1

Book: check your aviation English

Page: 94 audio: 1.03

@learn\_english\_with\_asma

It was a near-miss case. It happened during the daytime. They said good morning to each other. We had two pilots from different airplanes, YG343 and DF211. At the beginning of the communication YG343 contacted Kamket control and said, "maintaining FL370. 10 DME to ATI. Squawking 2662" and the ATC said, "Roger, squawk 4113" and then the pilot's readback was wrong (incorrect), the squawk was 4113 but the pilot said 4133 instead. We had another communication between that controller and DF211. The ATC instructed DF211 to maintain 340 and then instructed YG343 to descend to FL310.

After that the controller wanted DF211 to turn right heading 270 due to traffic and then he gave the traffic information to YG343 and said, "YG343 traffic north-east, seven miles, slightly below, fast moving." Unfortunately DF211 failed to comply with the instruction so the ATC instructed YG343 to turn right and he said, "cancel descent, turn right immediately heading 090,"

then the pilot of YG343 reported that he followed TCAS and he climbed.

YG343 was at 360 and the pilot reported some injuries in cabin due to that near-miss. He asked for immediate descent and the ATC said, "descend to FL230, contact Kamket approach on 124.885."

Book: English for aviation page: 85

Audio: 7 case: unruly passenger

@learn\_english\_with\_asma

It was about an unruly passenger. The call sign was Blaze606. At first the pilot requested for a priority landing because they had a violent passenger on board. The unruly passenger had hit a crew member. The first controller didn't get the pilot. My guess is that the controller was not good at English. The pilot tried to explain the problem to her but to no avail.

فایده‌ای نداشت، بی نتیجه بود.

The pilot used some different words such as "violent", "aggressive", "drunk" in order to clarify but unfortunately she didn't understand again. The pilot wanted to land as soon as possible. Finally another controller picked up the emergency call and he understood the problem. At first he thought the pilot needed a medical assistance but then he understood they requested for priority landing to remove the unruly passenger from the airplane. Actually the unruly passenger endangered the flight safety.

Page: 1

Book: Check your aviation English page: 106

Audio: 2.03 GH1559

@learn\_english\_with\_asma

We had a communication between an ATC and a pilot, I mean the pilot of GH1559. They encountered heavy rain and thunderstorms. They had two options from ATC, "going north" or "turning left and getting south of the weather." The pilot intended to go north because the weather was moving south. The ATC asked the pilot to choose heading and the pilot said, "315 or 320 should be sufficient to clear it". Then the ATC instructed GH1559 to turn right heading 320. rwy was 28. The ATC gave the pilot all traffic alerts about windshear, microburst activity and severe precipitation. Later on the ATC informed GH1559 that a thunderstorm was over the airport and she gave GH1559 two options, "going somewhere to hold" or "getting delaying vectors." The pilot requested delaying vectors. They were maintaining 320 and waiting for the ATC's instructions. And then the ATC said, "depending on what the wind does, we may be able to bring you in on rwy 19. The ATC instructed the pilot to reduce speed to 200kn and turn right heading 320 and she said to the pilot that the thunderstorm would clear in the next 10 minutes.

Page 1

Book: Check your aviation English

Page: 108 audio: 2.15 F634TG

@learn\_english\_with\_asma

It was a ditching case, the pilot was forced to land on the lake due to loss of all engine power. The call sign of the airplane was F634TG. At the beginning of the communication the pilot contacted Dragey control and said, "F634TG. Florie 23, altitude 3.500 ft, estimating PRETE 32." Then he declared an urgency and said PANPAN. The airplane lost its power and the pilot made a request for an immediate diversion to Frine-Le-Bourg. The airplane was 4 miles northeast of Florie and it passed altitude 3.000 ft, it was descending and heading was 310. There were two people on board. The ATC instructed the pilot to turn right with heading 080. Frine-Le-Bourg was nine miles to the east of F-TG position. After that the pilot declared an emergency due to loss of all engine power. The airplane was passing altitude 2.600 and it was descending with heading 050. The emergency services were alerted and they were on standby. The ATC said, "Frine-Le-Bourg" is now one o'clock seven miles."

and she wanted the pilot to contact Frine-Le-Bourg on 124.050. The pilot contacted Frine-Le-Bourg tower and said, "we're six miles east your field, altitude 2.100, descending, heading 080, we have no power."

The second controller from Frine-Le-Bourg tower picked up the emergency call and said, "we are ready for your arrival." The airplane was at an altitude of 1.600 and it was descending. The pilot asked for nearest suitable terrain for a forced landing. The ATC said to the pilot that they had unwooded field at one o'clock 4 miles and the Frine-Le-Bourg was at 12 o'clock five miles. At an altitude of 1.400 the pilot decided to put the airplane down in the lake. The ATC contacted the sailing club on Lac De Frine. At an altitude of 900 the controller instructed the pilot to turn right with heading 100. The rescue vessels were there and the pilot had the sailing club in sight. There was no activity on the lake and the surface wind was calm and the pilot was ready to ditch the airplane.

Book: English for aviation  
 Page: 88 audio: 23 exchange: 7 (C23)  
 @learn\_english\_with\_asma

It was C23 and it had a hydraulic failure. Wind was 085 degrees at 15 knots. At first the controller cleared them for take-off and the airplane was about to leave the runway but suddenly they had a red indication on hydraulics and on flight control surfaces. Later on the controller saw smoke coming from one of the engines, actually the central engine, engine number 2 and he wanted the pilot to abort take-off and the pilot aborted take-off and shut down the engine, I mean engine number 2.

Book: English for aviation page: 88  
 Audio: 23 Exchange: 6 (D6V)  
 @learn\_english\_with\_asma

We had a communication between an air traffic controller and the pilot of D6V. At first the controller wanted the pilot to make one right hand orbit and leave on heading 130 and also he asked for reporting abeam HOLLY. The pilot preferred changing level to orbiting and then the controller wanted him to stand by and later on cleared him for changing flight level to 160 with the same heading. And they would expect a delay of 15 minutes for landing at Milan.

Page 1

Book: Check your aviation English  
 Page: 106, 107 audio: 2.06 Dornier28D  
 @learn\_english\_with\_asma

The communication was between Varburg approach and the pilot of 28D, he declared an emergency and said Mayday, Mayday, Mayday, in fact the airplane had uncontrolled descent. At the beginning 28D was at altitude 8.000 ft and then it went to 7.200. We had another pilot who reported a PIREP (pilot report) from United883. The PIREP was on icing conditions. The Varburg airport was about 5 miles north-east of 28D and the emergency services were on standby. At 6.500 ft the pilot of 28D reported that he got the control. He was trying to maintain airspeed. He said, "I'm indicating 80kn." And then the ATC said, "I show your ground speed as 160kn." The ATC thought the pitot tube was frozen and their airspeed instrument was malfunctioning. The pilot had to dive because they lost all airspeed with no warning. The radar showed more showers to the north-east of 28D. The ATC didn't know the temperature and he guessed 28D would have some more icing. The pilot from United883 was flying over Talsi, he passed altitude 5000 ft and reported the temperature. The TEMP was -2, -5, at 7.000 and also It was snowing in clouds. The controller instructed United883 to descend and maintain altitude 4000 ft and cleared it for ILS approach RWY 04. The ATC thanked the pilot of United883 for his report on weather condition. After getting PIREP, 28D decided to proceed to Varburg and the pilot switched on deicing boots and heat. The readability was 2 and the ATC thought the ice caused communication problems and he guessed 28D had ice on its antenna.

نوار لاستیکی که به بال متصل میشود و با متورم شدن  
 برآمدگی ایجاد میکند تا یخ جمع شده را ترک دهد.

Book: English for aviation  
Page: 88 audio: 23 exchange: 5 (N3E)  
@learn\_english\_with\_asma

It was a communication between the pilot of N3E and a controller. At first the controller ask a question about the flight level. The pilot said to the controller that they were out of 5500 for flight level 150. The controller wanted the pilot to level off at 6000 feet. The pilot asked if he could stay on the same heading and then the controller accepted and the pilot could have the same heading but just for a short time. They had opposite traffic at 7000 feet and they would need to climb higher shortly.

Book: Aviation English page: 116  
Audio: 19 @learn\_english\_with\_asma

It was a cargo airplane. They finished the pre-flight check. The containers were loaded. They needed to push back at five past one. The pilots didn't want to miss their slot time. One of the pilots got off the airplane to check on loading progress and she talked to a ground handler. They had a problem in the aft hold and they opened the door to check the inside of the hold. They had a cage in the hold, there were some lions in the cage but unfortunately the cage door was damaged and also the hinge was broken and one of those lions was out of the cage. The lion roared. They had a cargo net for catching the lion but they needed a vet to catch the lion.

Book: English for aviation page: 90  
Audio: 34 Exchange: 2 (Buck36)  
@learn\_english\_with\_asma

It was a communication between a controller and the pilot of Buck36 and I think it was shortly after take-off. They encountered a very serious situation after take-off and the pilot decided to turn back to the airport, actually one of the engines was detached and fell off. They had problems with speed and flight controls. They were maintaining 1500 feet and they needed to get rid of extra fuel before landing. The controller wanted the pilot to choose the rwy and the pilot chose rwy 6L and the controller cleared them for that rwy. Luckily they landed safely and after landing the pilot laughed and cried happily "id it" and the controller admired him it landing.

Book: English for aviation

Page: 88

Audio: 23 Exchange: 3 (N355)

@learn\_english\_with\_asma

There was a communication between the pilot of N355 and a controller. At first the controller wanted the pilot to climb to flight level 80 but the pilot was climbing to flight level 90. Actually there was inbound traffic at 6 miles at flight level 90 and the pilot had to keep the level at 80. The airplane was at 8600 feet and the controller wanted them to descend immediately.

## Situational awareness

@learn\_english\_with\_asma

It's very important to know about what is happening around us when we are on our airplane.

- we should know about our airplane location, and also the location and status of the other vehicles around our airplane.
- We should have all needed environmental information.
- We should be aware of all threats and factors that can endanger the flight safety.

If we ignore the situational awareness, we may lose the control of our airplane and also separation.

Book: Aviation English page: 120

Audio: 05 @learn\_english\_with\_asma

It was a communication between two pilots in cockpit. At first three circuit-breakers tripped and it was obvious that they had a problem. They understood they had a problem in one of the washrooms. The pilot thought the fan was overheated. They asked the cabin crew manager (flight purser) to check. The cabin crew manager said to the pilots they had a burning smell coming from the rear (aft) washroom and some passengers were uncomfortable. The cabin crew manager wanted to move the passengers away from that washroom. Unfortunately the smoke detector hadn't set off so they didn't know they had a problem in cabin. There was smoldering (burning with smoke but without flames) in the washroom and the cabin crew manager used the fire extinguisher to put out the fire. She guessed there was a problem with a wiring or with an overloaded outlet. The pilot said to the cabin crew manager that they had to find the source of fire and wanted her to put on goggles to prevent getting incapacitated.

-Book: flightpath -page: 187

-audio: 3.15 (FedEx 3479)

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The communication was between Bangkok approach and FedEx 3479. The pilot was explaining what they had encountered before making contact with the controller. There had been a loud crashing noise due to a detached cargo pallet in the main deck. The flight engineer had investigated and secured the detached pallet. The pallet had slid 3 or 4 meters during descent. The pilot was trying to avoid any sudden manoeuvres and he said; request long straight-in approach. The controller said; Roger, turn left heading 160. Intercept ILS 19L.

FedEx 3479 was behind the A330 and the controller wanted the pilot to keep the separation from that A330.



The pilot said to the controller that they had a medical doctor on board. The controller said, "the police and the airport authorities will meet you at the airport."

### Unruly passenger:

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The unruly passenger is a person who endangers the safety of flight and passengers. Maybe he/she is angry, drunk, violent, abusive, aggressive and so on. And sometimes we have a passenger with a mental problem and uncontrollable behavior. In case of unruly passenger if the situation gets worse we have to remove him/her from the airplane and we can divert or request for a priority landing. In this situation ACM has an important role and they can help us to handcuff and restrain the unruly passenger to keep the flight safety.

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## Pilotage and Dead reckoning

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### Pilotage:

We fly by reading maps and we use fixed points and landmarks to find our location, such as fields, valleys, lakes, masts, highways, woods, buildings, etc.

### Dead reckoning:

It's based on mathematical computations (calculations) and we fly by using some devices such as Cr3, compass, plotter, etc. We find our location by calculating our time, airspeed, distance, etc.

## Water salute

Water salute or a so-called shower of affection is a traditional airport ceremony. In this event the airplane taxis in between two fire trucks and the fire trucks spray water over the airplane and they make an eye-catcher arch for the airplane to taxi through.

We perform this ceremony for some reasons,

1. The last flight of a retiring captain, it's a very emotional way of saying goodbye to his/her airline and especially the plane.

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2. The first flight of an airline to an airport, the destination airport welcomes and greets that airline by performing water salute ceremony.

3. The first or last flight of a type of an airplane.

## Dangerous goods

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We have some dangerous materials (gases, liquids, solids) that we can't take them to airplanes and they are prohibited, such as flammable liquids, explosives, fireworks, matches, bottles of acid or poison, etc.

They are forbidden because they can endanger the safety of flight and occupants' lives.



### Microburst

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It's a very dangerous phenomenon. It's a column (n:silent) of powerful, strong and fast-moving winds. These winds come from a thunderstorm and when they hit the ground they spread out very fast. When a low-flying airplane encounters microburst activity especially on take-off or landing it may lose its height and it may stall.



### Tail strike

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"When the tail of an airplane contacts (or touches) (or strikes) the runway surface during take-off or landing."

It's usually due to human error. For example if the pilot lifts up the nose of the airplane too sharply and rapidly (or fast), we may have a tail strike. If the tail strike happens during take-off we may have structural damage to the fuselage so it's very important to land back and check the airplane because if we continue our flight we may have depressurization at higher levels. Some airplanes have (or are equipped with) a small skid and it's mounted at the bottom of the fuselage. "Tail skid" can prevent the damage to the airplane if the tail touches the ground.

### Navigation aids:

For example 🙋

● NDB: It stands for "Non-directional Beacons"

● ADF: It stands for "the Automatic Direction Finder"

● DME: It stands for "Distance Measuring Equipment"

● ILS: It stands for "Instrument Landing System"

● VOR: It stands for "Frequency Omni-directional Range"

And so on. 🙋 @learn\_english\_with\_asma

extra fuel so we dump our fuel through fuel dump nozzle and if the airplane doesn't have the fuel dump nozzle we have to burn off our fuel, we enter a holding and orbit to burn off the fuel and reach the maximum landing weight.

● Before landing: when we have a twisted nose gear at a 90-degree angle. Landing with this abnormal landing gear is dangerous and risky because the nose gear may be collapsed or broken on landing and the engine nacelles contact the ground.

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## Low pass / Low approach

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In case of landing gear problem, normally a pilot requests for a visual inspection to check the landing gear status and the controller clears the pilot for making a **low-pass** on a runway (usually it's not below 500 ft) so the controller can check the landing gear and inform the pilot about the landing gear status.

We perform **low approaches** to practice landings in our pilot training course, actually we bring down the airplane to the ground but not below 500 feet and we don't have any landings and touch-and-goes.

● Turbulence

● PIREP

● Wake turbulence

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**Turbulence:** We have turbulence when we fly through waves of air that are irregular and violent and this violent (strong) (powerful) change in airflow can cause sudden movements and they are dangerous. So when we are experiencing turbulence we make an announcement and we caution (warn) the passengers to fasten their seat belt and stay seated. In case of serious turbulence we may have structural damage and lose the control of the airplane. Fortunately pilots learn how to deal with turbulence on flight simulators so this type of practice prepare them for the actual flights. When pilots are experiencing turbulence or other sudden changes in weather they file a report to alert other pilots and this report is called **PIREP**.

**Wake turbulence:** During flight the wingtip vortices form the wake turbulence behind the airplane and these vortices remain about a few minutes after the passage of the airplane. (Vortex: singular) (Vortices: plural)



## in-flight medical emergency

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When we have a sick passenger on board with symptoms such as "trouble breathing", "heart attack", "coughing blood", "shaking", "vomiting", "losing consciousness", etc. If it's a life-threatening condition we have to land as soon as we can to save the passenger. We usually divert to an alternate airport and request for an ambulance to transfer the passenger to the hospital.

In this emergency case, the flight purser usually makes an announcement and asks if there is a doctor or nurse on board. If so, we want him/her to help us. Some air companies have a standing arrangement with emergency medical service such as MedLink and the crew can have a direct communication with a medical adviser in medical emergencies.

● Engine Failure

● ETOPS

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Airplane engines are very reliable, both turbofan and turboprop, and their lifespan is about thousands of flight hours but unfortunately they can fail and stop working in cruise and we face **engine failure** due to some reasons such as "mechanical problem", "engine fire", "bird ingestion", "fuel starvation", "fuel pump problem", "a broken or damaged part", etc. In this situation we can't maintain our planned airspeed and altitude, we declare an emergency and we make an emergency descent and also we want the controller to give us a suitable diversion airport. (or alternate airport)

Most of airplanes have the **ETOPS** certificate. ETOPS stands for "extended-range twin-engine operation performance standards." According to ETOPS we can fly with one engine and continue our flight by ETOPS rules. We have different ETOPS rating, it depends on the type of the airplane, for example ETOPS-120 and ETOPS-180. If the airplane has ETOPS-120, it is able to fly with one engine for 2 hours and if it has ETOPS-180, it can fly with one engine for 3 hours.

## Page 2

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### Fuel exhaustion

It's a situation when we don't have enough fuel to continue our flight actually there is a lack of fuel. For example It can happen due to miscalculation of fuel when we calculate the amount of fuel mistakenly (wrongly).

### Frozen fuel

You know we have fuel heaters to warm the fuel in freezing weather and protect the engine fuel system from ice formation, but sometimes we have problems with our fuel heater and unfortunately the ice formation blocks the flow of fuel through the lines and the fuel can't reach the engines.

### -Standard Phraseology

#### -plain language

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We know English is the language of aviation and it's very important for all pilots and air traffic controllers to know and speak English well so we can communicate easily despite differences in our languages. And also communication between the pilots and controllers affects the flight safety directly. In order to reduce the risk of misunderstanding, we use **standard phraseology** so we can communicate very easily and quickly. I mean we have standard and specialized phrases and we use them for our communications such as "confirm", "correction", "negative", "acknowledge", etc. Sometimes in routine or non-routine situations and emergencies we use **plain language**, I mean a natural language. For example When we face a situation and we don't have any standard phrases for that situation in aviation so we use plain language and that's why we have to be good at English to manage all of the potential requirements.

## Page 1

### -Fuel starvation

### -Fuel exhaustion

### -Frozen fuel

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All of these situations are very dangerous because they can lead to an engine failure. As a pilot I declare an emergency, find a suitable terrain (area) and try to land the airplane as soon as possible, in fact we have a forced landing for example a ditching (landing on water surfaces).

### Fuel starvation

It's a situation when we have fuel but for some reasons there isn't the flow of fuel in lines and it can't reach the engines. Maybe we have a fuel leak or a problem with our fuel system.



### Aerial firefighter

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When we have a wildfire for example a forest fire, the fire is out of control so it's very difficult to control and put out the fire and it can spread very fast (very quickly, rapidly). In this situation we use aerial firefighters to put out the fire easily and strategically and we dump (drop up) water over the burning area.

## Landing gear problem

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● Before landing: when we can't extend the landing gear. In this situation, to make sure of the landing gear status we request for a visual inspection and we make a low-pass so the controller can check the landing gear. There are different ways to loosen or shift the nose gear or main gear such as a steep turn or a touch-and-go but sometimes we can't extend the landing gear at all and finally we have to perform a belly-landing or land with abnormal landing gear and the ground personnel apply a foam carpet on the runway to secure the emergency landing.

● After take-off: when we can't retract the landing gear and we land back at the airport. It's very important to take account of standard landing weight. Sometimes we can't have an overweight landing and we have to get rid of our

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## Tail strike

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"When the tail of an airplane contacts (or touches) (or strikes) the runway surface during take-off or landing."

It's usually due to human error. For example if the pilot lifts up the nose of the airplane too sharply and rapidly (or fast), we may have a tail strike. If the tail strike happens during take-off we may have structural damage to the fuselage so it's very important to land back and check the airplane because if we continue our flight we may have depressurization at higher levels. Some airplanes have (or are equipped with) a small skid and it's mounted at the bottom of the fuselage. "Tail skid" can prevent the damage to the airplane if the tail touches the ground.

## Hotspot

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It's a location in the movement area of the airport and if we go into this location we may have runway incursion or collision with another airplane. So the pilots and drivers at the airport should be careful about this location.

## What can be done to reduce hotspots?

We should update the hotspot charts and it's very important to improve our visual aids such as markings, signs and lights. We can decommission old taxiways with hotspots and construct new taxiways.

## What factors increase the possibility of hotspots?

1. Poor ground marking and lighting
2. Poor visibility
3. Increased traffic

● Hydroplaning: US 🇺🇸

● Aquaplaning: UK 🇬🇧

When we have standing water on the runway surface. In fact we have a thin layer of water between the tire and the runway surface and it reduces the friction. It's dangerous and it can lead to runway excursion because the runway is wet and slippery and the airplane may slide.

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💣💣💣 Bomb intimidation or

💣💣💣 Bomb threat or

💣💣💣 Bomb scare.

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In this case maybe we have a caller and he/she tells us that they have planted a bomb in the airplane or maybe we have an unruly passenger on board and he/she tells us that they are carrying a bomb and they want to explode the airplane, in this situation ACM has an important role and they can help us with restraining those passengers. Anyway we have to descend to a lower altitude and land at the nearest suitable airport. And after landing we park the airplane in an isolated parking area and also we need disposal experts to defuse the bomb if there is a real bomb and the bomb threat is not a hoax. And we have emergency evacuation.



Wind shear

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Weather plays an important role in aviation safety and it's a major factor in the most accidents and incidents. Wind shear is a sudden change in wind velocity (speed) or direction. It is very difficult to detect the wind shear. Some airplanes have wind shear detection system and when the airplane encounters wind shear, this system alerts (alarms). When we face the wind shear we may lose the control of the airplane and our airspeed.

extra fuel so we dump our fuel through fuel dump nozzle and if the airplane doesn't have the fuel dump nozzle we have to burn off our fuel, we enter a holding and orbit to burn off the fuel and reach the maximum landing weight.

🟡 Before landing: when we have a twisted nose gear at a 90-degree angle. Landing with this abnormal landing gear is dangerous and risky because the nose gear may be collapsed or broken on landing and the engine nacelles contact the ground.

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Page 2



Ditching

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It's an emergency and forced landing into the sea, river or lake when the pilot isn't able to reach the airport due to some reasons such as engine failure, lack of fuel and so on. In this situation we declare an emergency and alert the coast guard to save the passengers. We have emergency evacuation and we use inflatable raft to transfer them onto the land. The most famous case of ditching is Captain Sully's airplane, he encountered bird strike, it led to bird ingestion and he lost both engines and he ditched in the Hudson river and saved all passengers' lives.

## Miscommunication

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It's a serious threat to our flight safety. It can lead to incidents or accidents such as a runway incursion, a near-miss or even a mid-air-collision. It's a situation when a pilot or an air traffic controller misunderstands, mishears or misinterprets the communication. Sometimes we have equipment and technology problems such as problems with electrical systems, power sources, microphones, speakers, etc, and these problems can block our effective communication.

To reduce the risk of miscommunication, we have to improve our radio quality so we can have a better communication. We have to use standard phraseology correctly, for example we can't use "no" instead of "negative", non-native English speaking pilots and controllers have to improve their English constantly and have English language proficiency. That's why we have to take our LPR exam and pass at least ICAO Level 4 (LPR: it stands for "Language Proficiency Requirement"). And also if we don't understand a pilot or a controller during communication we have to ask for repetition.

## Runway excursion

### Causes of runway excursion

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When the airplane veers off the runway (swerves from the runway toward left or right side) or overruns the end of the runway we have a runway excursion and it can happen on landing or on take-off.

It's a dangerous situation and it may lead to an accident with fatalities, injuries and serious damage to our airplane. Sometimes during runway excursion we may damage other airplanes or vehicles and airport installations.

It happens when the pilot loses the control of the airplane and the pilot can't flare and stop the airplane properly on the runway due to different reasons:

- Landing gear problem (e.g. a twisted nose landing gear)
- Runway contamination (e.g. hydroplaning)
- Hydraulic failure (e.g. brakes or spoilers failure)

## Pilot incapacitation

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-What will you do if your First officer/Captain/Instructor/Student is incapacitated during flight? What can cause pilot incapacitation?

Pilot incapacitation is a situation when the pilot is unable to (can't) continue the flight and control the airplane due to different reasons,

-Hypoxia: if the pressurisation system doesn't work normally at altitudes above 10,000 ft we may have pilot incapacitation. We have to use oxygen mask to prevent Hypoxia and being incapacitated.

-Smoke and fumes: if we have fire in the air, we may get incapacitated. We have to use oxygen mask or smoke hood to protect ourselves from smoke and fumes.

-Food poisoning/Food allergy

-Medical conditions such as, heart attack, stroke, etc.

-Bird strike: if we have a bird strike, the bird may hit and break the windshield and injure the pilot.

In this situation I take the control of the airplane, declare an emergency, request for an ambulance and try to land the airplane as soon as possible.

## Runway incursion

### Causes of runway incursion

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We have a runway incursion when an airplane, a person, an animal or a vehicle goes onto a runway **mistakenly** and blocks the runway, I mean the runway that is selected for the take-off or landing of an airplane.

Miscommunication, animals, pilot's error, controller's error, construction work (runway renovation), an unauthorized person and lack of visibility (taking a wrong turn) can cause a runway incursion.

We can reduce the number of runway incursions by improving security and having fences around the airport to prevent unauthorized people and animals from entering the runway.

As a pilot in this situation if I'm during landing I have to make a go-around and if I'm during take-off and it's possible I have to abort my take-off.

**Mistakenly: Wrongly**

## Hidden fire

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As we know "time" is very important in an emergency and we can't save our flight if it gets too late so I think hidden fire is the most dangerous type of on-board fire because it isn't easy to see and find this type of fire. If we have delay to find the fire, it may spread to all parts of the airplane and damage the airplane badly. We have fire detection systems and they can help us to understand that we have fire and sometimes we notice "smoke", "fumes" or "hot spot" on a wall or the floor but we can't locate the fire easily in order to tackle it. In this situation we have to try to find the source of fire and we declare an emergency, make an immediate descent and try to land as soon as possible.

## Engine fire

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**"Fire in the air" is a very dangerous situation and it can happen when the airplane is airborne.**

**We have different types of fire:**

-  Engine fire
-  Cabin fire
-  Hidden fire




Our airplane engine can catch fire in the air due to some reasons, for example "bird ingestion". We know the engine fire can spread to the wings and even the fuselage so at first we try to put out the fire as soon as possible, we have to discharge the extinguisher bottle to put out the engine fire. It's a risky situation even after extinguishing the fire and as a pilot I declare an emergency and try to land the airplane as soon as I can, I make an immediate descent and I request for a diversion and also the fire and rescue service.

## Cabin fire

## Fire fighting equipment

## Cabin fire causes

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It's a dangerous situation and as a pilot I have to declare an emergency and try to land as soon as possible when we have fire in cabin. And at the same time the flight attendants have to tackle the fire. We have some fire fighting equipment in the cabin such as goggles , smoke hood, fire extinguisher , protective gloves , etc. You know if we don't have the fire fighting equipment in cabin, our flight is (a) no go. In this situation the flight crew have to put on goggles and smoke hood or their oxygen masks to avoid incapacitation because fumes and toxic smoke can incapacitate the crew members and also the passengers. We may have cabin fire in our lavatory (lights, fans), galley (oven, coffee maker, water heater), etc.

There are different causes for cabin fire, such as wiring failures, electrical problem, lithium-ion batteries.

Book: English for aviation page: 85

Audio: 7 case: unruly passenger

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It was about an unruly passenger. The call sign was Blaze606. At first the pilot requested for a priority landing because they had a violent passenger on board. The unruly passenger had hit a crew member. The first controller didn't get the pilot. My guess is that the controller was not good at English. The pilot tried to explain the problem to her but to no avail.

فایده‌ای نداشت، بی نتیجه بود.

The pilot used some different words such as "violent", "aggressive", "drunk" in order to clarify but unfortunately she didn't understand again. The pilot wanted to land as soon as possible. Finally another controller picked up the emergency call and he understood the problem. At first he thought the pilot needed a medical assistance but then he understood they requested for priority landing to remove the unruly passenger from the airplane. Actually the unruly passenger endangered the flight safety.

Page: **1**





### in-flight medical emergency

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When we have a sick passenger on board with symptoms such as "trouble breathing", "heart attack", "coughing blood", "shaking", "vomiting", "losing consciousness", etc. If it's a life-threatening condition we have to land as soon as we can to save the passenger. We usually divert to an alternate airport and request for an ambulance to transfer the passenger to the hospital.

In this emergency case, the flight purser usually makes an announcement and asks if there is a doctor or nurse on board. If so, we want him/her to help us. Some air companies have a standing arrangement with emergency medical service such as MedLink and the crew can have a direct communication with a medical adviser in medical emergencies.

### Turbulence

### PIREP

### Wake turbulence

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**Turbulence:** We have turbulence when we fly through waves of air that are irregular and violent and this violent (strong) (powerful) change in airflow can cause sudden movements and they are dangerous. So when we are experiencing turbulence we make an announcement and we caution (warn) the passengers to fasten their seat belt and stay seated. In case of serious turbulence we may have structural damage and lose the control of the airplane. Fortunately pilots learn how to deal with turbulence on flight simulators so this type of practice prepare them for the actual flights. When pilots are experiencing turbulence or other sudden changes in weather they file a report to alert other pilots and this report is called **PIREP**.

**Wake turbulence:** During flight the wingtip vortices form the wake turbulence behind the airplane and these vortices remain about a few minutes after the passage of the airplane. (Vortex: singular) (Vortices: plural)

### How do you keep yourself healthy and fit?

### How can pilots have a good lifestyle?

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It's important to pay a lot of attention to our health, body, mind and lifestyle. You know healthy lifestyle has a very important role in our job. There are a lot of things we can do to have a good and healthy lifestyle.

- We should have a balanced diet.
- We should get enough rest and sleep.
- It's important to have regular check-ups.
- We can work out to get fit.
- We should not smoke and drink alcohol a lot.
- We can limit our sugar and salt intake, fatty foods and red meat.
- It's necessary to eat fruit and vegetables and drink plenty of water.

The pilot said to the controller that they had a medical doctor on board. The controller said, "the police and the airport authorities will meet you at the airport."

### Unruly passenger:

@learn\_english\_with\_asma

The unruly passenger is a person who endangers the safety of flight and passengers. Maybe he/she is angry, drunk, violent, abusive, aggressive and so on. And sometimes we have a passenger with a mental problem and uncontrollable behavior. In case of unruly passenger if the situation gets worse we have to remove him/her from the airplane and we can divert or request for a priority landing. In this situation ACM has an important role and they can help us to handcuff and restrain the unruly passenger to keep the flight safety.

## ● Hydraulic Failure

## ● Asymmetrical thrust

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As we know Hydraulic system is very important to the safety of flight. But unfortunately we may face **hydraulic failure** due to some reasons such as "hydraulic fluid leak", "pump failure", "a break in hydraulic lines or pipes", etc. Hydraulic failure is not very common but it happens to airplanes. In this situation we lose our hydraulic power and it can cause so many problems. We lose the control over the flight control surfaces, I mean the moveable parts of the airplane such as "spoilers", "brakes", "ailerons", "elevator", "rudder", "flaps", etc. It's obvious that hydraulic failure is a very serious problem and we have to declare an emergency. In this case we can use **Asymmetrical thrust** to turn the airplane, actually we use the engine power. We **keep** one engine **idle** and we increase power on the other one so we have turns with long radius. It can lead to accidents and incidents for example during landing we may have runway excursion or overrun the end of the runway.

## ● Electrical failure

## ● Instrument blackout

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Electrical failure is very dangerous and frightening. When it happens to our fly-by-wire airplane, in our glass cockpit the displays (monitors) are shut down and they don't work correctly so we can't access (have) the important information such as airspeed, altitude, attitude, etc. But you know this situation is very rare because modern airplanes have multiple back-up systems to handle this case. As a pilot I declare an emergency and ask for vectors to the nearest suitable airport. In this situation the controller has an important role because he/she can give me the important information such as speed, heading, track, level, etc. Sadly sometimes the electrical failure can lead to a worst-case scenario and we face a radio communication failure, in this situation our radio has no power because of electrical failure and we can't communicate with the controllers.

## Water salute

Water salute or a so-called shower of affection is a traditional airport ceremony. In this event the airplane taxis in between two fire trucks and the fire trucks spray water over the airplane and they make an eye-catcher arch for the airplane to taxi through.

We perform this ceremony for some reasons,

1. The last flight of a retiring captain, it's a very emotional way of saying goodbye to his/her airline and especially the plane.

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2. The first flight of an airline to an airport, the destination airport welcomes and greets that airline by performing water salute ceremony.

3. The first or last flight of a type of an airplane.

## ● Engine Failure

## ● ETOPS

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## Accident and Incident

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An Incident is an unexpected and emergency event, it affects the safety of operation, but in incidents we don't have any serious damage, injuries or fatalities.

Unfortunately sometimes incidents can lead to accidents for example when a near-miss leads to a mid-air-collision.

An accident is the worst happening with serious damage to our airplane and also we have fatalities or serious injuries. (At least one injured or killed passenger)

## Missed approach / Go-around

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Sometimes a pilot can't land for different reasons for example he/she can't see the runway clearly, I mean when we have poor visibility, or maybe there is another airplane or vehicle on the runway, actually when we have a runway incursion, in this situation the controller instructs the pilot to make a **go-around** and the pilot climbs higher and goes around for another landing attempt.

At the same time the controller guides the pilot and gives him/her **a missed approach procedure** / instructions and the pilot has to follow the procedure and instructions step-by-step to land.

## Navigation flight

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In our pilot training course we perform navigation flights from one city to another city, for example we fly from Payam to Zanjan, actually it's a cross-country flight but without landing and ground time at our destination airport and sometimes we have touch-and-goes. We have this kind of flight to learn navigation and our instructor pilot teaches us how to navigate our airplane.

## Hear back and Read back

@learn\_english\_with\_asma

When a pilot repeats a received message to ensure that his/her understanding is correct, it's called reading back. At the same time the controller hears that message and it's called hearing back, in fact the controller hears back the message that he himself has sent to the pilot (Or she herself)

در ارزیابی مهارت زبانی مطابق با سند ۹۸۳۵، شش مهارت مورد آزمون قرار می گیرند. یکی از این مهارتها مربوط به **vocabulary** یا واژگان هوانوردی می شود. از شما انتظار می رود تا لغات مربوط به کار خود را نه تنها به صورت **passive** بلکه به شکل **active** در ذهن داشته باشید، یعنی هم وقتی آنها شنیدید متوجه می شوید و هم در هنگام صحبت کردن بتوانید آنها را به کار ببرید. حال اگر احيانا در هنگام صحبت کردن واژه ای را فراموش کرده بودید به هیچ عنوان زمان را بیش از حد صرف فکر کردن نکنید بلکه سعی کنید اجازه ندهید مصاحبه گر متوجه می فراموشی شما بشود، بدین صورت که سعی کنید به جای استفاده از آن واژه، از مترادف یا تعریف آن استفاده کنید یا به عبارتی **paraphrase** کنید. لیست کلمات مهم را در قالب دو مجموعه دریافت خواهید کرد و تا آنها را خوب به خاطر نسپرده اید، به شرکت در آزمون مبادرت نورزید.

به یکی دیگر از شش مهارت مورد نظر ایکائو یعنی **structure** می پردازیم. گرامر یا **structure** برای سطح ۴ زبان ویژه ی هوانوردی کفایت فقط **basic** باشد .

توجه شما را به **Appendix B** صفحه ی **B-13** از سند ۹۸۳۵ که همینجا قرار داده شده است جلب می کنم تا ببینید به چه گرامری **basic** گفته می شود.

هر کدام از مواردی که در پیوست **B-13** به درستی توسط شما استفاده نشود، سطح زبانی تان را به زیر ۴ تنزل خواهد داد. البته هرگز تصور نکنید با ارتکاب فقط یک اشتباه همه چیز را از دست داده اید، بلکه **rater**، سطح کنترل شما روی این موارد را می سنجد و اگر یک اشتباه مدام تکرار شود نشانگر این است که کنترل روی آن مورد وجود ندارد. پس تکرار اشتباه در اینجا قطعاً منجر به کاهش سطح به زیر ۴ خواهد شد.

به ویژه تاکید می شود دقت نمایید وقتی در حال تعریف کردن موضوعی هستید که در گذشته رخ داده از زمان حال استفاده نکنید. توجه ویژه ای هم به استفاده ی صحیح شکل افعال بی قاعده داشته باشید. بسیاری از افراد بدلیل رعایت نکردن همین موضوع ساده، امکان کسب سطح ۴ را از دست می دهند .

اگر هم در زمان حال صحبت می کنید، **S** سوم شخص فراموشتان نشود.

هرگز خود را درگیر ساختارهای پیچیده نکنید و اگر به سطح ۴ رضایت دارید تمرکز خود را روی آیتم های صفحه ی **B-13** بگذارید.

### Basic structures:

#### • Articles

به خاطر داشته باشید که **a** قبل از کلماتی می آید که با حروف بی صدا شروع می شوند (**a runway, a taxiway**) و **an** قبل از کلماتی که با حروف صدا دار شروع می شوند (**an aircraft, an accident, an emergency case**).

#### • Adverbs of frequency

Always, Generally, Usually, Often, Sometimes, Seldom, Never, etc.

#### • Comparison of adjectives

Airbus A380 is bigger than Airbus A320.

The biggest aircraft in the world is Antonov AN-225.

#### • Discourse markers

Actually, Basically, Anyway, (and) yeah (more and more frequent), Listen, I mean, Let's see/Let me see, Like, Oh, Now, Okay, So, Well, You know, You see, You know what I mean, It is true, Of course, But, Still, (and) by the way, Besides, Another thing is, On top of that, So, Then, First(ly), Second(ly), etc., First of all, In the first/second place, Finally, In the end, In short

سعی کنید هرطور شده در لابه لای صحبت هایتان از این کلمات استفاده کنید. با گفتن هریک، یک امتیاز مثبت به نفع شما ثبت می شود.

### • Modal verbs

Can, May, Must, Have Got to, Should, Ought to, Would, Could, Might, Needn't, Don't have to, Mustn't

بعد از اینها فعل به صورت ساده می آید یعنی نه ing می گیرد، نه S سوم شخص و نه ed.

### • Numbers (cardinal and ordinal)

One, two, three ----- the first, the second, the third

### • Passive voice

Simple present (The runway is closed.)

Simple past (The runway was closed)

### • Position of direct and indirect objects:

Bob sent some flowers to his girlfriend.

Bob sent his girlfriend some flowers.

### • Question words for describing people and things and for requesting information

What? Who? Which? Why? Where? How?

### • Relative pronouns

Who, which, whose

The pilot of an aircraft, whose engine is on fire, should declare emergency.

The Airbus 333 which was unserviceable, is operational now.

The pilot who was incapacitated is hospitalized now.

### • Tenses

*Present simple*

I help. (passive: I am helped)

*Present continuous*

I am helping. (Passive: I am being helped)

*Past simple*

I helped. (Passive: I was helped)

*Past continuous*

I was helping. (Passive: I was being helped)

*Present perfect simple*

I have helped. (Passive: I have been helped)

*Present perfect continuous*

I have been helping. (Passive: I have been being helped)

*Simple future tense*

Will: I will help. (I will be helped)

Future

Going to: I am going to help. (Passive: I am going to be helped.)

### • There to be

Present: There is an aircraft wreck in this picture.

Past: There were a lot of injuries and fatalities in the crash.

Future: There will be no fuel remaining after half an hour.

آزمون مهارت سنجی زبان انگلیسی ویژه هوانوردی از سه بخش تشکیل شده است.

**اول** مصاحبه ای که در طی آن برای حدود ۱۵ دقیقه مصاحبه کننده و مصاحبه شونده با هم به گفتمان تعاملی می پردازند تا در خلال این گفت و شنود شش مهارت زبانی فرد مورد ارزیابی واقع شود. توجه داشته باشید که در این مرحله هر جا متوجه منظور مصاحبه کننده نشدید با شجاعت بگویید. **I didn't understand** و این را بدانید که همین جمله برای شما امتیاز مثبت به همراه خواهد داشت. در ادامه باید به هر طریقی که شده منظور مصاحبه کننده را بفهمید. آنقدر سوال کنید تا مطمئن شوید درست منظور وی را دریافته اید. توجه به مطالب گفته شده در بالا در این مرحله بسیار تعیین کننده است.

**فرمت جدید: در شکل جدید آزمون، بخش اول مربوط به role-play می شود که در آن بر اساس کارت تحویلی می بایست سناریوی طراحی شده را پیاده نمایید و در ادامه خلاصه ای آن را برای آزمون گیرنده تعریف کنید. در این بخش باید از عبارات استاندارد در کنار plain language استفاده کنید و از قدرت تخیل خود بهره گیرید و تا جایی که می توانید گرامر صحیح و کلمات مربوط به هوانوردی را به کار ببرید تا نمره ی آنها را کسب نمایید.**

**در دومین مرحله** از آزمون، یک یا دو کلیپ صوتی برای شما پخش می شود و از شما خواسته می شود تا در اولین پخش، جریان کلی کلیپ را بازگو کنید و در دومین پخش به جزئیاتی از قبیل شماره باند، سمت و سوی باد، فشار هوا و غیره که در کلیپ گفته شده، اشاره کنید. در این مرحله حتما کاغذ و قلم به همراه داشته باشید و تا می توانید نوت بردارید.

**فرمت جدید: در شکل جدید آزمون، دو کلیپ صوتی از کتابهای**

**Check your Aviation English/Aviation English/English for Aviation/Flight Path** پخش می شود. دقت داشته باشید که فقط روی فایل هایی تمرکز کنید که مکالمه ی کنترلر و خلبان هستند و وقت خود را صرف باقی فایل ها نکنید. پس از پخش این فایل باید خلاصه ای آن را با تمام جزئیات بازگو کنید. توجه فرمایید که آزمون گیرنده احتمالاً سوالی در این بخش از شما نخواهد پرسید و صرفاً بر اساس پاسخ خودتان به شما نمره خواهد داد.

**مرحله ی آخر** آزمون توصیف تصویر است. در این بخش به شما تصاویری نشان داده می شود و از شما خواسته می شود تا ابتدا یک دقیقه فکر کنید و نوت بردارید و سپس برای مدت حداقل یک دقیقه بلا انقطاع در باره ی آن صحبت کنید. توجه داشته باشید که تا می توانید در این بخش از لغات تخصصی که در پاورپوینت در اختیارتان قرار داده شد استفاده نمایید. تند حرف زدن هیچ امتیازی ندارد بنابراین با آرامش وطمأنینه سعی کنید صحیح صحبت کنید.

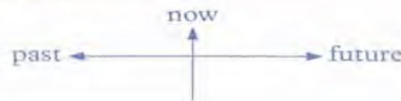
پس از اتمام آزمون که تمام آن ضبط شده است، ارزیابان سطح زبان شما را مشخص می کنند.

ارزیابی توسط دو ارزیاب انجام می شود و در صورت شکایت داوطلب، ارزیاب سومی هم به مصاحبه ی ضبط شده گوش می دهد و با اکثریت آرا سطح قطعی داوطلب اعلام می شود.

# Structure

## 1-1 The Simple Tenses

This basic diagram will be used in all tense descriptions.



| Tense                     | Examples   | Meaning  |
|---------------------------|--|--|
| <b>Simple Present</b><br> | (a) It <i>snows</i> in Alaska.<br>(b) Tom <i>watches</i> TV every day.<br>   | In general, the simple present expresses events or situations that exist <i>always, usually, habitually</i> ; they exist now, have existed in the past, and probably will exist in the future. |
| <b>Simple Past</b><br>    | (c) It <i>snowed</i> yesterday.<br>(d) Tom <i>watched</i> TV last night.   | At one particular time in the past, this happened. It began and ended in the past.   |
| <b>Simple Future</b><br>  | (e) It <i>will snow</i> tomorrow.<br>It <i>is going to snow</i> tomorrow.<br>(f) Tom <i>will watch</i> TV tonight.<br>Tom <i>is going to watch</i> TV tonight. | At one particular time in the future, this will happen.  |

## 1-2 The Progressive Tenses

Form: **be + -ing (present participle)**

Meaning: The progressive tenses\* give the idea that an action is in progress during a particular time. The tenses say that an action *begins before, is in progress during, and continues after* another time or action.

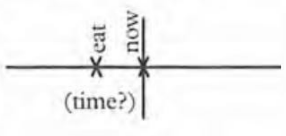


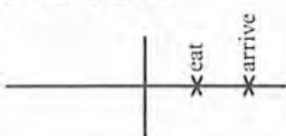
|                                |   |   |
|--------------------------------|---|---|
| <b>Present Progressive</b><br> | (a) Tom <i>is sleeping</i> right now.<br>       | It is now 11:00. Tom went to sleep at 10:00 tonight, and he is still asleep. His sleep began in the past, <i>is in progress at the present time</i> , and probably will continue.   |
| <b>Past Progressive</b><br>    | (b) Tom <i>was sleeping</i> when I arrived.     | Tom went to sleep at 10:00 last night. I arrived at 11:00. He was still asleep. His sleep began before and <i>was in progress at a particular time in the past</i> . It continued after I arrived.                                  |
| <b>Future Progressive</b><br>  | (c) Tom <i>will be sleeping</i> when we arrive. | Tom will go to sleep at 10:00 tomorrow night. We will arrive at 11:00. The action of sleeping will begin before we arrive, and it <i>will be in progress at a particular time in the future</i> . Probably his sleep will continue. |

\*The progressive tenses are also called the "continuous" tenses: present continuous, past continuous, and future continuous.

### 1-3 The Perfect Tenses

Form: **have + past participle**

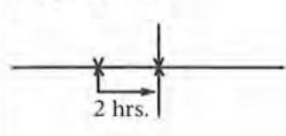

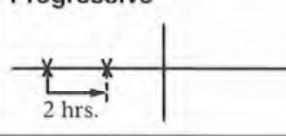
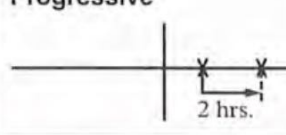
Meaning: The perfect tenses all give the idea that one thing *happens before* another time or event.

|   |   |   |
|---|---|---|
| <p><b>Present Perfect</b></p>  | <p>(a) Tom <b>has</b> already <b>eaten</b>.</p>  | <p>Tom <i>finished</i> eating <i>sometime before now</i>. The exact time is not important.</p>  |
| <p><b>Past Perfect</b></p>     | <p>(b) Tom <b>had</b> already <b>eaten</b> when his friend arrived.</p>   | <p>First Tom finished eating. Later his friend arrived. Tom's eating was completely <i>finished before another time in the past</i>.</p>              |
| <p><b>Future Perfect</b></p>  | <p>(c) Tom <b>will</b> already <b>have eaten</b> when his friend arrives.</p>   | <p>First Tom will finish eating. Later his friend will arrive. Tom's eating will be completely <i>finished before another time in the future</i>.</p> |

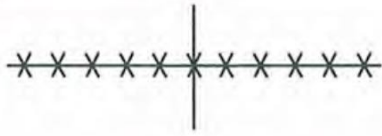
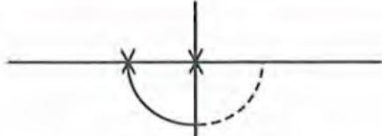
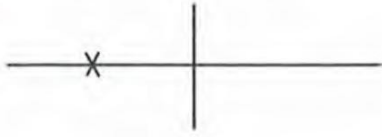
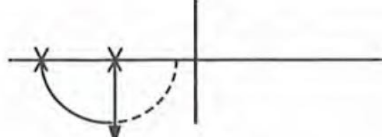
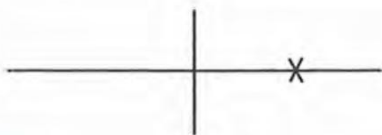
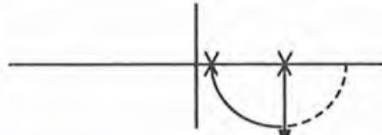
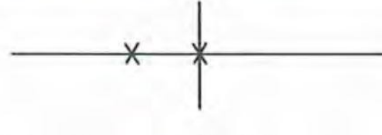
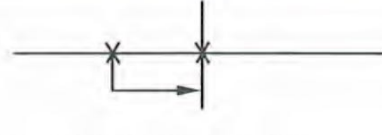
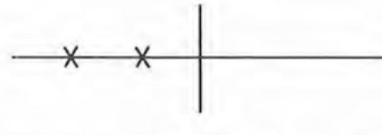
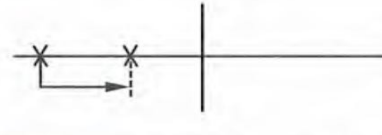
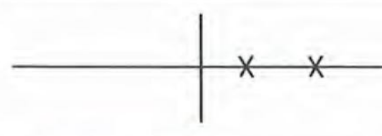
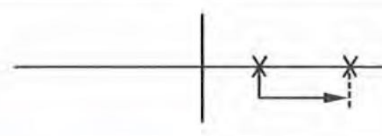
### 1-4 The Perfect Progressive Tenses

Form: **have + been + -ing (present participle)**

Meaning: The perfect progressive tenses give the idea that one event is *in progress immediately before, up to, until another time or event*. The tenses are used to express the *duration* of the first event.

|   |  |   |
|---|--|---|
| <p><b>Present Perfect Progressive</b></p>  | <p>(a) Tom <b>has been studying</b> for two hours.</p>  | <p>Event in progress: studying.<br/>When? <i>Before now, up to now</i>.<br/>How long? For two hours.</p>              |
| <p><b>Past Perfect Progressive</b></p>     | <p>(b) Tom <b>had been studying</b> for two hours before his friend came.</p>  | <p>Event in progress: studying.<br/>When? <i>Before another event in the past</i>.<br/>How long? For two hours.</p>   |
| <p><b>Future Perfect Progressive</b></p>   | <p>(c) Tom <b>will have been studying</b> for two hours by the time his friend arrives.</p>  | <p>Event in progress: studying.<br/>When? <i>Before another event in the future</i>.<br/>How long? For two hours.</p> |



| <b>1-5 Summary Chart of Verb Tenses</b>  |   |
|--|---|
| <p><b>Simple Present</b></p>  <p>Tom <i>studies</i> every day.</p>  | <p><b>Present Progressive</b></p>  <p>Tom <i>is studying</i> right now.</p>  |
| <p><b>Simple Past</b></p>  <p>Tom <i>studied</i> last night.</p>  | <p><b>Past Progressive</b></p>  <p>Tom <i>was studying</i> when they came.</p>   |
| <p><b>Simple Future</b></p>  <p>Tom <i>will study</i> tomorrow.<br/>Tom <i>is going to study</i> tomorrow.</p>           | <p><b>Future Progressive</b></p>  <p>Tom <i>will be studying</i> when they come.<br/>Tom <i>is going to be studying</i> when they come.</p> |
|  |   |
| <p><b>Present Perfect</b></p>  <p>Tom <i>has</i> already <i>studied</i> Chapter 1.</p>                                  | <p><b>Present Perfect Progressive</b></p>  <p>Tom <i>has been studying</i> for two hours.</p>  |
| <p><b>Past Perfect</b></p>  <p>Tom <i>had</i> already <i>studied</i> Chapter 1 before he began studying Chapter 2.</p>  | <p><b>Past Perfect Progressive</b></p>  <p>Tom <i>had been studying</i> for two hours before his friends came.</p>                         |
| <p><b>Future Perfect</b></p>  <p>Tom <i>will</i> already <i>have studied</i> Chapter 4 before he studies Chapter 5.</p> | <p><b>Future Perfect Progressive</b></p>  <p>Tom <i>will have been studying</i> for two hours by the time his roommate gets home.</p>      |

Complete the sentences with the simple present or the present progressive form of the verbs in parentheses.

1. Kristin can't come to the phone because she (wash) \_\_\_\_\_ her hair.
2. Kristin (wash) \_\_\_\_\_ her hair every other day or so.
3. Tony (sit, usually) \_\_\_\_\_ in the front row during class, but today he (sit) \_\_\_\_\_ in the last row.
4. Please be quiet. I (try) . \_\_\_\_\_ to concentrate.
5. (you, lock, always) \_\_\_\_\_ the door to your apartment when you leave?
6. I wrote to my friend last week. She hasn't answered my letter yet. I (wait, still) \_\_\_\_\_ for a reply.
7. After six days of rain, I'm glad that the sun (shine) \_\_\_\_\_ today.
8. Every morning, the sun (shine) \_\_\_\_\_ in my bedroom window and (wake) \_\_\_\_\_ me up.

Choose the correct completions.

1. The chef is in his kitchen right now. He \_\_\_\_\_  
 a. cooks                                      b. is cooking
2. He \_\_\_\_\_ some soup.  
 a. tastes                                        b. is tasting
3. It ----- too salty.  
 a. tastes                                        b. is tasting
4. He \_\_\_\_\_ it.  
 a. doesn't like                                b. isn't liking

| 2-4 Regular and Irregular Verbs   |             |                 |                    |
|---|-------------|-----------------|--------------------|
| <b>Regular Verbs: The simple past and past participle end in -ed.</b>   |             |                 |                    |
| SIMPLE FORM   | SIMPLE PAST | PAST PARTICIPLE | PRESENT PARTICIPLE |
| hope  | hoped       | hoped           | hoping             |
| stop  | stopped     | stopped         | stopping           |
| listen  | listened    | listened        | listening          |
| study   | studied     | studied         | studying           |
| start   | started     | started         | starting           |
| English verbs have four principal parts:<br>(1) simple form<br>(2) simple past<br>(3) past participle<br>(4) present participle                         |             |                 |                    |
| <b>Irregular Verbs: The simple past and past participle do not end in -ed.</b>  |             |                 |                    |
| SIMPLE FORM   | SIMPLE PAST | PAST PARTICIPLE | PRESENT PARTICIPLE |
| hit   | hit         | hit             | hitting            |
| find  | found       | found           | finding            |
| swim  | swam        | swum            | swimming           |
| break   | broke       | broken          | breaking           |
| Some verbs have irregular past forms.<br>Most of the irregular verbs in English are given in the alphabetical list on the inside front and back covers. |             |                 |                    |

## 2-6 Regular Verbs: Pronunciation of -ed Endings

Final **-ed** has three different pronunciations: /t/, /d/, and /əd/. The schwa /ə/ is an unstressed vowel sound. It is pronounced like *a* in *alone* in normal, rapid speech (e.g., *She lives alone.*).

|  |  |
|--|--|
| <p>(a) looked → look /t/<br/>                 clapped → clap /t/<br/>                 missed → miss /t/<br/>                 watched → watch /t/<br/>                 finished → finish /t/<br/>                 laughed → laugh /t/</p> | <p>Final <b>-ed</b> is pronounced /t/ after voiceless sounds.<br/>                 Voiceless sounds are made by pushing air through your mouth; no sound comes from your throat.<br/>                 Examples of voiceless sounds: "k," "p," "s," "ch," "sh," "f."</p>                                      |
| <p>(b) smelled → smell /d/<br/>                 saved → save /d/<br/>                 cleaned → clean /d/<br/>                 robbed → rob /d/<br/>                 played → play /d/</p>   | <p>Final <b>-ed</b> is pronounced /d/ after voiced sounds.<br/>                 Voiced sounds come from your throat. If you touch your neck when you make a voiced sound, you can feel your voice box vibrate.<br/>                 Examples of voiced sounds: "l," "v," "n," "b," and all vowel sounds.</p> |
| <p>(c) decided → decide /əd/<br/>                 needed → need /əd/<br/>                 wanted → want /əd/<br/>                 invited → invite /əd/</p>  | <p>Final <b>-ed</b> is pronounced /əd/ after "t" and "d" sounds. The sound /əd/ adds a whole syllable to a word.<br/>                 COMPARE: looked = one syllable → look/t/<br/>                 smelled = one syllable → smell/d/<br/>                 needed = two syllables → need/əd/</p>             |

## 2-5 Irregular Verb List

### Group 1: All three forms are the same.

| SIMPLE FORM | SIMPLE PAST | PAST PARTICIPLE | SIMPLE FORM | SIMPLE PAST | PAST PARTICIPLE |
|-------------|-------------|-----------------|-------------|-------------|-----------------|
| bet         | bet         | bet             | let         | let         | let             |
| burst       | burst       | burst           | put         | put         | put             |
| cost        | cost        | cost            | quit        | quit        | quit            |
| cut         | cut         | cut             | shut        | shut        | shut            |
| fit         | fit/fitted  | fit/fitted      | split       | split       | split           |
| hit         | hit         | hit             | spread      | spread      | spread          |
| hurt        | hurt        | hurt            | upset       | upset       | upset           |

### Group 2: Past participle ends in -en.

|         |         |             |       |            |                 |
|---------|---------|-------------|-------|------------|-----------------|
| awake   | awoke   | awoken      | hide  | hid        | hidden          |
| bite    | bit     | bitten      | prove | proved     | proven/proved   |
| break   | broke   | broken      | ride  | rode       | ridden          |
| choose  | chose   | chosen      | rise  | rose       | risen           |
| drive   | drove   | driven      | shake | shook      | shaken          |
| eat     | ate     | eaten       | speak | spoke      | spoken          |
| fall    | fell    | fallen      | steal | stole      | stolen          |
| forget  | forgot  | forgotten   | swell | swelled    | swollen/swelled |
| forgive | forgave | forgiven    | take  | took       | taken           |
| freeze  | froze   | frozen      | wake  | woke/waked | woken           |
| get     | got     | gotten/got* | write | wrote      | written         |
| give    | gave    | given       |       |            |                 |

\* In BrE: *get-got-got.*

### Group 3: Vowel changes from *a* in the simple past to *u* in the past participle.

|       |       |       |        |        |        |
|-------|-------|-------|--------|--------|--------|
| begin | began | begun | shrink | shrank | shrunk |
| drink | drank | drunk | sing   | sang   | sung   |
| ring  | rang  | rung  | sink   | sank   | sunk   |
| run   | ran   | run   | swim   | swam   | swum   |

**Group 4: Past tense and past participle forms are the same.**

|       |             |             |            |               |               |
|-------|-------------|-------------|------------|---------------|---------------|
| bend  | bent        | bent        | mislaid    | mislaid       | mislaid       |
| bleed | bled        | bled        | pay        | paid          | paid          |
| bring | brought     | brought     | read       | read          | read          |
| build | built       | built       | say        | said          | said          |
| burn  | burnt       | burnt       | seek       | sought        | sought        |
| buy   | bought      | bought      | sell       | sold          | sold          |
| catch | caught      | caught      | send       | sent          | sent          |
| dig   | dug         | dug         | shoot      | shot          | shot          |
| feed  | fed         | fed         | sit        | sat           | sat           |
| feel  | felt        | felt        | sleep      | slept         | slept         |
| fight | fought      | fought      | slide      | slid          | slid          |
| find  | found       | found       | sneak      | snuck/sneaked | snuck/sneaked |
| flee  | fled        | fled        | speed      | sped/speeded  | sped/speeded  |
| grind | ground      | ground      | spend      | spent         | spent         |
| hang  | hung        | hung        | spin       | spun          | spun          |
| have  | had         | had         | stand      | stood         | stood         |
| hear  | heard       | heard       | stick      | stuck         | stuck         |
| hold  | held        | held        | sting      | stung         | stung         |
| keep  | kept        | kept        | strike     | struck        | struck        |
| lay   | laid        | laid        | sweep      | swept         | swept         |
| lead  | led         | led         | swing      | swung         | swung         |
| leave | left        | left        | teach      | taught        | taught        |
| lend  | lent        | lent        | tell       | told          | told          |
| light | lit/lighted | lit/lighted | think      | thought       | thought       |
| lose  | lost        | lost        | understand | understood    | understood    |
| make  | made        | made        | weep       | wept          | wept          |
| mean  | meant       | meant       | win        | won           | won           |
| meet  | met         | met         |            |               |               |

**Group 5: Past participle adds -n to the simple form, with or without a spelling change.**

|      |      |       |          |          |           |
|------|------|-------|----------|----------|-----------|
| blow | blew | blown | see      | saw      | seen      |
| do   | did  | done  | swear    | swore    | sworn     |
| draw | drew | drawn | tear     | tore     | torn      |
| fly  | flew | flown | throw    | threw    | thrown    |
| grow | grew | grown | wear     | wore     | worn      |
| know | knew | known | withdraw | withdrew | withdrawn |
| lie  | lay  | lain  |          |          |           |

**Group 6: The first and third forms are the same.**

|        |        |        |
|--------|--------|--------|
| become | became | become |
| come   | came   | come   |
| run    | ran    | run    |

**Group 7: One of the three forms is very different.**

|    |           |      |
|----|-----------|------|
| be | was, were | been |
| go | went      | gone |

**Group 8: Both regular and irregular forms are used. (The regular form is more common in AmE, and the irregular form is more common in BrE.)**

|       |                |                |       |                |                |
|-------|----------------|----------------|-------|----------------|----------------|
| burn  | burned/burnt   | burned/burnt   | learn | learned/learnt | learned/learnt |
| dream | dreamed/dreamt | dreamed/dreamt | smell | smelled/smelt  | smelled/smelt  |
| kneel | kneeled/knelt  | kneeled/knelt  | spill | spilled/spilt  | spilled/spilt  |
| lean  | leaned/leant   | leaned/leant   | spoil | spoiled/spoilt | spoiled/spoilt |

## 4-2 Will vs. Be Going To

### Prediction

- (a) According to the weather report, it *will be* cloudy tomorrow.  
 (b) According to the weather report, it *is going to be* cloudy tomorrow.

*Will* and *be going to* mean the same when they make *predictions* about the future (*prediction* = a statement about something the speaker thinks will be true or will occur in the future).

Examples (a) and (b) have the same meaning.

### Prior Plan

- (c) —Why did you buy this paint?  
 —I *'m going to paint* my bedroom tomorrow.

*Be going to* (but not *will*) is used to express a *prior plan* (i.e., a plan made before the moment of speaking).\*

In (c): The speaker already has a plan to paint his/her bedroom.

### Willingness

- (d) —The phone's ringing.  
 —I *'ll get* it.  
 (e) —How old is Aunt Agnes?  
 —I don't know. She *won't tell* me.  
 (f) The car *won't start*. Maybe the battery is dead.

*Will* (but not *be going to*) is used to express *willingness*. In this case, *will* expresses a decision the speaker makes at the moment of speaking.

In (d): The speaker decides to answer the phone at the immediate present moment; she/he does not have a prior plan.

*Will not / won't* can express *refusal*, as in (e) with a person or in (f) with an inanimate object.

## 6-2 Basic Subject-Verb Agreement

| Singular Verb  | Plural Verb   |   |
|--|---|---|
| (a) My <i>friend lives</i> in Boston.  | (b) My <i>friends live</i> in Boston.   | <i>Verb + -s/-es</i> = third person singular in the simple present tense<br><i>Noun + -s/-es</i> = plural   |
|  | (c) My <i>brother and sister live</i> in Boston.<br>(d) My <i>brother, sister, and cousin live</i> in Boston.               | Two or more subjects connected by <i>and</i> require a plural verb.   |
| (e) <i>Every man, woman, and child needs</i> love.<br>(f) <i>Each book and magazine is</i> listed in the bibliography.                   |   | EXCEPTION: <i>Every</i> and <i>each</i> are always followed immediately by singular nouns. (See Chart 7-11, p. 129.) In this case, even when there are two (or more) nouns connected by <i>and</i> , the verb is singular.  |
| (g) That <i>book on political parties is</i> interesting.<br>(i) The <i>book</i> that I got from my parents <i>was</i> very interesting. | (h) The <i>ideas in that book are</i> interesting.<br>(j) The <i>books</i> I bought at the bookstore <i>were</i> expensive. | Sometimes a phrase or clause separates a subject from its verb. These interrupting structures do not affect basic agreement. For example, in (g) the interrupting prepositional phrase <i>on political parties</i> does not change the fact that the verb <i>is</i> must agree with the subject <i>book</i> .<br>In (i) and (j): The subject and verb are separated by an adjective clause. (See Chapter 13.) |
| (k) <i>Watching</i> old movies <i>is</i> fun.  |   | A gerund (e.g., <i>watching</i> ) used as the subject of the sentence requires a singular verb. (See Chart 14-8, p. 322.)   |

## 6-1 Final -s/-es: Use, Pronunciation, and Spelling

### Use

|   |  |
|---|--|
| (a) <i>Noun + -s:</i> <i>Friends</i> are important.<br><i>Noun + -es:</i> I like my <i>classes</i> .  | A final <b>-s</b> or <b>-es</b> is added to a noun to make the noun plural.<br><b>Friend</b> and <b>class</b> = singular nouns<br><b>Friends</b> and <b>classes</b> = plural nouns   |
| (b) <i>Verb + -s:</i> Mary <i>works</i> at the bank.<br><i>Verb + -es:</i> John <i>watches</i> birds. | A final <b>-s</b> or <b>-es</b> is added to a simple present verb when the subject is a singular noun (e.g., <i>Mary, my father, the machine</i> ) or third person singular pronoun ( <i>she, he, it</i> ).<br><b>Mary works</b> = singular <b>She works</b> = singular<br><b>The students work</b> = plural <b>They work</b> = plural |

### Pronunciation

|  |  |
|--|--|
| (c) seats → <i>seat/s/</i><br>ropes → <i>rope/s/</i><br>backs → <i>back/s/</i>   | Final <b>-s</b> is pronounced /s/ after voiceless sounds, as in (c): "t," "p," and "k" are examples of voiceless sounds.*  |
| (d) seeds → <i>seed/z/</i><br>robes → <i>robe/z/</i><br>bags → <i>bag/z/</i><br>sees → <i>see/z/</i>   | Final <b>-s</b> is pronounced /z/ after voiced sounds, as in (d): "d," "b," "g," and "ee" are examples of voiced sounds.*  |
| (e) dishes → <i>dish/ɪz/</i><br>catches → <i>catch/ɪz/</i><br>kisses → <i>kiss/ɪz/</i><br>mixes → <i>mix/ɪz/</i><br>prizes → <i>prize/ɪz/</i><br>edges → <i>edge/ɪz/</i> | Final <b>-s</b> and <b>-es</b> are pronounced /ɪz/ after "sh," "ch," "s," "x," "z," and "ge"/"dge" sounds.<br>The /ɪz/ ending adds a syllable.<br>All of the words in (e) are pronounced with two syllables.<br>COMPARE: All of the words in (c) and (d) are pronounced with one syllable. |

### Spelling

|  |   |
|--|---|
| (f) sing → <i>sings</i><br>song → <i>songs</i>   | For most words (whether a verb or a noun), simply add a final <b>-s</b> to spell the word correctly.  |
| (g) wash → <i>washes</i><br>watch → <i>watches</i><br>class → <i>classes</i><br>buzz → <i>buzzes</i><br>box → <i>boxes</i> | Final <b>-es</b> is added to words that end in <b>-sh</b> , <b>-ch</b> , <b>-s</b> , <b>-z</b> , and <b>-x</b> .  |
| (h) toy → <i>toys</i><br>buy → <i>buys</i><br>(i) baby → <i>babies</i><br>cry → <i>cries</i>                               | For words that end in <b>-y</b> :<br>In (h): If <b>-y</b> is preceded by a vowel, only <b>-s</b> is added.<br>In (i): If <b>-y</b> is preceded by a consonant, the <b>-y</b> is changed to <b>-i</b> and <b>-es</b> is added. |

## 6-4 Subject-Verb Agreement: Using *There + Be*

|  |  |
|--|--|
| (a) <i>There is a fly</i> in the room.<br>(b) <i>There are three windows</i> in this room. | <b>There + be</b> introduces the idea that something exists in a particular place.<br><b>There + be + subject + expression of place*</b><br>The subject follows <b>be</b> when <b>there</b> is used.<br>In (a): The subject is <i>a fly</i> . (singular)<br>In (b): The subject is <i>three windows</i> . (plural) |
| (c) <i>INFORMAL: There's two sides</i> to every story.                                     | In informal spoken English, some native speakers use a singular verb even when the subject is plural, as in (c). The use of this form is fairly frequent but is not generally considered to be grammatically correct.  |

## 7-1 Regular and Irregular Plural Nouns

|  |  |  |  |
|--|--|--|--|
| (a) song— <i>songs</i>   |  |  | The plural of most nouns is formed by adding final <b>-s</b> .*  |
| (b) box— <i>boxes</i>  |  |  | Final <b>-es</b> is added to nouns that end in <b>-sh, -ch, -s, -z, and -x</b> .*  |
| (c) baby— <i>babies</i>  |  |  | The plural of words that end in a consonant + <b>-y</b> is spelled <b>-ies</b> .*  |
| (d) man— <i>men</i><br>woman— <i>women</i><br>child— <i>children</i>   | ox— <i>oxen</i><br>foot— <i>feet</i><br>goose— <i>geese</i>  | tooth— <i>teeth</i><br>mouse— <i>mice</i><br>louse— <i>lice</i>                              | The nouns in (d) have irregular plural forms that do not end in <b>-s</b> .  |
| (e) echo— <i>echoes</i><br>hero— <i>heroes</i>   | potato— <i>potatoes</i><br>tomato— <i>tomatoes</i>   |  | Some nouns that end in <b>-o</b> add <b>-es</b> to form the plural.  |
| (f) auto— <i>autos</i><br>ghetto— <i>ghettos</i><br>kangaroo— <i>kangaroos</i><br>kilo— <i>kilos</i><br>memo— <i>memos</i>                   | photo— <i>photos</i><br>piano— <i>pianos</i><br>radio— <i>radios</i><br>solo— <i>solos</i><br>soprano— <i>sopranos</i>   | studio— <i>studios</i><br>tattoo— <i>tattoos</i><br>video— <i>videos</i><br>zoo— <i>zoos</i> | Some nouns that end in <b>-o</b> add only <b>-s</b> to form the plural.<br><br>NOTE: When in doubt, use your dictionary or spellcheck.     |
| (g) memento— <i>mementoes/mementos</i><br>mosquito— <i>mosquitoes/mosquitos</i><br>tornado— <i>tornadoes/tornados</i>                        | volcano— <i>volcanoes/volcanos</i><br>zero— <i>zeroes/zeros</i>  |  | Some nouns that end in <b>-o</b> add either <b>-es</b> or <b>-s</b> to form the plural (with <b>-es</b> being the more usual plural form). |
| (h) calf— <i>calves</i><br>half— <i>halves</i><br>knife— <i>knives</i><br>leaf— <i>leaves</i>  | life— <i>lives</i><br>loaf— <i>loaves</i><br>self— <i>selves</i><br>shelf— <i>shelves</i>  | thief— <i>thieves</i><br>wolf— <i>wolves</i><br>scarf— <i>scarves/scarfs</i>                 | Some nouns that end in <b>-f</b> or <b>-fe</b> are changed to <b>-ves</b> to form the plural.  |
| (i) belief— <i>beliefs</i><br>chief— <i>chiefs</i>   | cliff— <i>cliffs</i><br>roof— <i>roofs</i>   |  | Some nouns that end in <b>-f</b> simply add <b>-s</b> to form the plural.  |
| (j) one deer— <i>two deer</i><br>one fish— <i>two fish</i> **<br>one means— <i>two means</i><br>one offspring— <i>two offspring</i>          | one series— <i>two series</i><br>one sheep— <i>two sheep</i><br>one shrimp— <i>two shrimp</i> ***<br>one species— <i>two species</i>                                       |  | Some nouns have the same singular and plural form: e.g.,<br><i>One deer is . . . .</i><br><i>Two deer are . . . .</i>                      |
| (k) criterion— <i>criteria</i><br>phenomenon— <i>phenomena</i>   | (m) analysis— <i>analyses</i><br>basis— <i>bases</i><br>crisis— <i>crises</i><br>hypothesis— <i>hypotheses</i><br>parenthesis— <i>parentheses</i><br>thesis— <i>theses</i> |  | Some nouns that English has borrowed from other languages have foreign plurals.  |
| (l) bacterium— <i>bacteria</i><br>curriculum— <i>curricula</i><br>datum— <i>data</i><br>medium— <i>media</i><br>memorandum— <i>memoranda</i> |  |  |  |

## 7-2 Possessive Nouns

| Singular Noun   | Possessive Form         |   |
|---|-------------------------|---|
| (a) the girl  | <i>the girl's</i>       | To show possession, add an apostrophe (') and <b>-s</b> to a singular noun: <i>The <b>girl's</b> book is on the table.</i>  |
| (b) Tom   | <i>Tom's</i>            |   |
| (c) my wife   | <i>my wife's</i>        |   |
| (d) a lady  | <i>a lady's</i>         |   |
| (e) Thomas  | <i>Thomas's/Thomas'</i> |   |
|   |                         | If a singular noun ends in <b>-s</b> , there are two possible forms: <ol style="list-style-type: none"> <li>1. Add an apostrophe and <b>-s</b>: <i><b>Thomas's</b> book.</i></li> <li>2. Add only an apostrophe: <i><b>Thomas'</b> book.</i></li> </ol> |
| Plural Noun   | Possessive Form         |   |
| (f) the girls   | <i>the girls'</i>       | Add only an apostrophe to a plural noun that ends in <b>-s</b> : <i>The <b>girls'</b> books are on the table.</i>   |
| (g) their wives   | <i>their wives'</i>     |   |
| (h) the ladies  | <i>the ladies'</i>      |   |
| (i) the men   | <i>the men's</i>        |   |
| (j) my children   | <i>my children's</i>    |   |
|   |                         |   |
| (k) <i>Alan and Lisa's</i> apartment is on the third floor. |                         | When two (or more) names are connected by <b>and</b> , only the final name shows possession.  |

## 7-6 Some Common Noncount Nouns

This list is a sample of nouns that are commonly used as noncount nouns. Many other nouns can also be used as noncount nouns.

- (a) WHOLE GROUPS MADE UP OF SIMILAR ITEMS: baggage, clothing, equipment, food, fruit, furniture, garbage, hardware, jewelry, junk, luggage, machinery, mail, makeup, money/cash/change, postage, scenery, stuff, traffic, etc.
- (b) FLUIDS: water, coffee, tea, milk, oil, soup, gasoline, blood, etc.
- (c) SOLIDS: ice, bread, butter, cheese, meat, gold, iron, silver, glass, paper, wood, cotton, wool, etc.
- (d) GASES: steam, air, oxygen, nitrogen, smoke, smog, pollution, etc.
- (e) PARTICLES: rice, chalk, corn, dirt, dust, flour, grass, hair, pepper, salt, sand, sugar, wheat, etc.
- (f) ABSTRACTIONS:
- beauty, confidence, courage, education, enjoyment, fun, happiness, health, help, honesty, hospitality, importance, intelligence, justice, knowledge, laughter, luck, music, patience, peace, pride, progress, recreation, significance, sleep, truth, violence, wealth, etc.
  - advice, information, news, evidence, proof, etc.
  - time, space, energy, etc.
  - homework, work, etc.
  - grammar, slang, vocabulary, etc.
- (g) LANGUAGES: Arabic, Chinese, English, Spanish, etc.
- (h) FIELDS OF STUDY: chemistry, engineering, history, literature, mathematics, psychology, etc.
- (i) RECREATION: baseball, soccer, tennis, chess, bridge, poker, etc.
- (j) ACTIVITIES: driving, studying, swimming, traveling, walking (and other gerunds)
- (k) NATURAL PHENOMENA: weather, dew, fog, hail, heat, humidity, lightning, rain, sleet, snow, thunder, wind, darkness, light, sunshine, electricity, fire, gravity, etc.



## 7-7 Basic Article Usage

### I. Using *A* or $\emptyset$ : Generic Nouns

|                           |   |   |
|---------------------------|---|---|
| Singular<br>Count<br>Noun | (a) <i>A banana</i> is yellow.*               | A speaker uses generic nouns to make generalizations. A generic noun represents a whole class of things; it is not a specific, real, concrete thing, but rather a symbol of a whole group.                                  |
| Plural<br>Count<br>Noun   | (b) $\emptyset$ <i>Bananas</i> are yellow.    | In (a) and (b): The speaker is talking about any banana, all bananas, bananas in general.   |
| Noncount<br>Noun          | (c) $\emptyset$ <i>Fruit</i> is good for you. | In (c): The speaker is talking about any and all fruit, fruit in general.<br>Notice that no article ( $\emptyset$ ) is used to make generalizations with plural count nouns, as in (b), and with noncount nouns, as in (c). |

### II. Using *A* or *Some*: Indefinite Nouns

|                           |                                 |   |
|---------------------------|---------------------------------|---|
| Singular<br>Count<br>Noun | (d) I ate <i>a banana</i> .     | Indefinite nouns are actual things (not symbols), but they are not specifically identified.   |
| Plural<br>Count<br>Noun   | (e) I ate <i>some bananas</i> . | In (d): The speaker is not referring to "this banana" or "that banana" or "the banana you gave me." The speaker is simply saying that she/he ate one banana. The listener does not know or need to know which specific banana was eaten; it was simply one banana out of all bananas.                         |
| Noncount<br>Noun          | (f) I ate <i>some fruit</i> .   | In (e) and (f): <b>Some</b> is often used with indefinite plural count nouns and indefinite noncount nouns. In addition to <b>some</b> , a speaker might use <i>two, a few, several, a lot of, etc.</i> , with plural count nouns, or <i>a little, a lot of, etc.</i> , with noncount nouns. (See Chart 7-4.) |

### III. Using *The*: Definite Nouns

|                           |  |   |
|---------------------------|--|---|
| Singular<br>Count<br>Noun | (g) Thank you for <i>the banana</i> .  | A noun is definite when both the speaker and the listener are thinking about the same specific thing.   |
| Plural<br>Count<br>Noun   | (h) Thank you for <i>the bananas</i> . | In (g): The speaker uses <b>the</b> because the listener knows which specific banana the speaker is talking about, i.e., that particular banana which the listener gave to the speaker. |
| Noncount<br>Noun          | (i) Thank you for <i>the fruit</i> .   | Notice that <b>the</b> is used with both singular and plural count nouns and with noncount nouns.   |

Usually *a/an* is used with a singular generic count noun. Examples: *A* window is made of glass. *A* doctor heals sick people. Parents must give *a* child love. *A* box has six sides. *An* apple can be red, green, or yellow.

However, **the** is sometimes used with a singular generic count noun (not a plural generic count noun, not a generic noncount noun). "Generic **the**" is commonly used with, in particular:

- (1) species of animals: **The blue whale** is the largest mammal on earth. **The elephant** is the largest land mammal.
- (2) inventions: Who invented **the telephone? the wheel? the refrigerator? the airplane?** The computer will play an increasingly large role in all of our lives.
- (3) instruments: I'd like to learn to play **the piano**. Do you play **the guitar?**

The is not used for the second mention of a generic noun. Compare:

- (1) What color is **a banana** (generic noun). **A banana** (generic noun) is yellow.
- (2) Joe offered me **a banana** (indefinite noun) or **an apple**. I chose **the banana** (definite noun).

### 7-8 General Guidelines for Article Usage

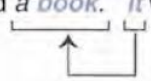
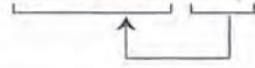
|   |  |
|---|--|
| <p>(a) <i>The sun</i> is bright today.<br/>Please hand this book to <i>the teacher</i>.<br/>Please open <i>the door</i>.<br/>Omar is in <i>the kitchen</i>.</p>   | <p>GUIDELINE: Use <b>the</b> when you know or assume that your listener is familiar with and thinking about the same specific thing or person you are talking about.</p>   |
| <p>(b) Yesterday I saw <i>some dogs</i>. <i>The dogs</i> were chasing <i>a cat</i>. <i>The cat</i> was chasing <i>a mouse</i>. <i>The mouse</i> ran into <i>a hole</i>. <i>The hole</i> was very small.</p>                         | <p>GUIDELINE: Use <b>the</b> for the second mention of an indefinite noun.* In (b): first mention = <i>some dogs, a cat, a mouse, a hole</i>; second mention = <i>the dogs, the cat, the mouse, the hole</i></p> |
| <p>(c) <b>CORRECT:</b> <i>Apples</i> are my favorite fruit.<br/><b>INCORRECT:</b> <i>The apples</i> are my favorite fruit.</p> <p>(d) <b>CORRECT:</b> <i>Gold</i> is a metal.<br/><b>INCORRECT:</b> <i>The gold</i> is a metal.</p> | <p>GUIDELINE: Do NOT use <b>the</b> with a plural count noun (e.g., <i>apples</i>) or a noncount noun (e.g., <i>gold</i>) when you are making a generalization.</p>  |
| <p>(e) <b>CORRECT:</b> (1) I drove <i>a car</i>. / I drove <i>the car</i>.<br/>(2) I drove <i>that car</i>.<br/>(3) I drove <i>his car</i>.</p> <p><b>INCORRECT:</b> I drove <i>car</i>.</p>  | <p>GUIDELINE: A singular count noun (e.g., <i>car</i>) is always preceded by:<br/>(1) an article (<i>a/an</i> or <i>the</i>); OR<br/>(2) <i>this/that</i>; OR<br/>(3) a possessive pronoun.</p>                  |

### 7-10 Using *A Few* and *Few*; *A Little* and *Little*

|   |  |
|---|--|
| <p>COUNT: (a) We sang <i>a few songs</i>.<br/>NONCOUNT: (b) We listened to <i>a little music</i>.</p>   | <p><b>A few</b> and <b>few</b> are used with plural count nouns, as in (a).<br/><b>A little</b> and <b>little</b> are used with noncount nouns, as in (b).</p>   |
| <p>(c) She has been here only two weeks, but she has already made <i>a few friends</i>.<br/>(Positive idea: <i>She has made some friends.</i>)</p> <p>(d) I'm very pleased. I've been able to save <i>a little money</i> this month.<br/>(Positive idea: <i>I have saved some money instead of spending all of it.</i>)</p>                                 | <p><b>A few</b> and <b>a little</b> give a positive idea; they indicate that something exists, is present, as in (c) and (d).</p>  |
| <p>(e) I feel sorry for her. She has (<i>very</i>) <i>few friends</i>.<br/>(Negative idea: <i>She does not have many friends; she has almost no friends.</i>)</p> <p>(f) I have (<i>very</i>) <i>little money</i>. I don't even have enough money to buy food for dinner.<br/>(Negative idea: <i>I do not have much money; I have almost no money.</i>)</p> | <p><b>Few</b> and <b>little</b> (without <b>a</b>) give a negative idea; they indicate that something is largely absent, as in (e).<br/><b>Very</b> (+ <b>few/little</b>) makes the negative stronger, the number/amount smaller, as in (f).</p> |

### 7-11 Singular Expressions of Quantity: *One, Each, Every*

|   |  |
|---|--|
| <p>(a) <i>One student</i> was late to class.<br/>(b) <i>Each student</i> has a schedule.<br/>(c) <i>Every student</i> has a schedule.</p>                                   | <p><b>One, each, and every</b> are followed immediately by singular count nouns (never plural nouns, never noncount nouns).</p>            |
| <p>(d) <i>One of the students</i> was late to class.<br/>(e) <i>Each (one) of the students</i> has a schedule.<br/>(f) <i>Every one of the students</i> has a schedule.</p> | <p><b>One of, each of, and every one of*</b> are followed by specific plural count nouns (never singular nouns; never noncount nouns).</p> |

| 8-1 Personal Pronouns  |  |  |  |   |
|--|--|--|--|---|
|  | Subject Pronoun                              | Object Pronoun                                 | Possessive Pronoun   | Possessive Adjective  |
| <b>Singular</b>  | <i>I</i><br><i>you</i><br><i>she, he, it</i> | <i>me</i><br><i>you</i><br><i>her, him, it</i> | <i>mine</i><br><i>yours</i><br><i>hers, his, its</i>   | <i>my</i> (name)<br><i>your</i> (name)<br><i>her, his, its</i> (name) |
| <b>Plural</b>  | <i>we</i><br><i>you</i><br><i>they</i>       | <i>us</i><br><i>you</i><br><i>them</i>         | <i>ours</i><br><i>yours</i><br><i>theirs</i>   | <i>our</i> (names)<br><i>your</i> (names)<br><i>their</i> (names)     |
| <p>(a) I read <i>a book</i>. <i>It</i> was good.</p>  <p>(b) I read <i>some books</i>. <i>They</i> were good.</p>  |  |  | <p>A PRONOUN is used in place of a noun. The noun it refers to is called the "antecedent."</p> <p>In (a): The pronoun <i>it</i> refers to the antecedent noun <i>book</i>.</p> <p>A singular pronoun is used to refer to a singular noun, as in (a). A plural pronoun is used to refer to a plural noun, as in (b).</p>  |   |
| <p>(c) <i>I</i> like tea. Do <i>you</i> like tea too?</p>  |  |  | <p>Sometimes the antecedent noun is understood, not explicitly stated.</p> <p>In (c): <i>I</i> refers to the speaker, and <i>you</i> refers to the person the speaker is talking to.</p>   |   |
| <p>(d) John has a car. <sup>s</sup> <i>He</i> drives to work.</p>  |  |  | <p>SUBJECT PRONOUNS are used as subjects of sentences, as <i>he</i> in (d).</p>  |   |
| <p>(e) John works in my office. <sup>o</sup> I know <i>him</i> well.</p> <p>(f) I talk <sup>o</sup> to <i>him</i> every day.</p>   |  |  | <p>OBJECT PRONOUNS are used as the objects of verbs, as <i>him</i> in (e), or as the objects of prepositions, as <i>him</i> in (f).</p>  |   |
| <p>(g) That book is <i>hers</i>.<br/><i>Yours</i> is over there.</p> <p>(h) <b>INCORRECT:</b> That book is <i>her's</i>.<br/><i>Your's</i> is over there.</p>  |  |  | <p>POSSESSIVE PRONOUNS are not followed immediately by a noun; they stand alone, as in (g).</p> <p>Possessive pronouns DO NOT take apostrophes, as in (h).</p> <p>(See Chart 7-2, p. 105, for the use of apostrophes with possessive nouns.)</p>   |   |
| <p>(i) <i>Her</i> book is here.<br/><i>Your</i> book is over there.</p>  |  |  | <p>POSSESSIVE ADJECTIVES are followed immediately by a noun; they do not stand alone.</p>  |   |
| <p>(j) A bird uses <i>its</i> wings to fly.</p> <p>(k) <b>INCORRECT:</b> A bird uses <i>it's</i> wings to fly.</p> <p>(l) <i>It's</i> cold today.</p> <p>(m) The Harbour Inn is my favorite old hotel. <i>It's been</i> in business since 1933.</p>                                  |  |  | <p>COMPARE: <i>Its</i> has NO APOSTROPHE when it is used as a possessive, as in (j).</p> <p><i>It's</i> has an apostrophe when it is used as a contraction of <i>it is</i>, as in (l), or <i>it has</i> when <i>has</i> is part of the present perfect tense, as in (m).</p> <p>NOTE: <i>It's</i> vs. <i>its</i> is a common source of error for native speakers of English.</p> |   |

| <b>8-4 Reflexive Pronouns</b>   |  |
|---|--|
| <b>Singular</b>   | <b>Plural</b>  |
| <i>myself</i><br><i>yourself</i><br><i>herself, himself, itself, oneself</i>      | <i>ourselves</i><br><i>yourselves</i><br><i>themselves</i>   |
| (a) Larry was in the theater. <i>I saw him.</i><br><i>I talked to him.</i>        | Compare (a) and (b): Usually an object pronoun is used as the object of a verb or preposition, as <b>him</b> in (a). (See Chart 8-1.)<br><br>A reflexive pronoun is used as the object of a verb or preposition when the subject of the sentence and the object are the same person, as in (b).* <b>I</b> and <b>myself</b> are the same person. |
| (b) <i>I saw myself</i> in the mirror. <i>I looked at myself</i> for a long time. |  |
| (c) <i>INCORRECT: I saw -me- in the mirror.</i>                                   |  |
| — Did someone email the report to Mr. Lee?<br>— Yes.<br>— Are you sure?           | Reflexive pronouns are also used for emphasis.<br><br>In (d): The speaker would say "I myself" strongly, with emphasis.<br><br>The emphatic reflexive pronoun can immediately follow a noun or pronoun, as in (d), or come at the end of the clause, as in (e).  |
| (d) — Yes. <i>I myself</i> emailed the report to him.                             |  |
| (e) — <i>I</i> emailed the report to him <i>myself</i> .                          |  |
| (f) Anna lives <i>by herself</i> .  | The expression <b>by + a reflexive pronoun</b> means "alone."  |

Sometimes an object pronoun is used as the object of a preposition even when the subject and object pronoun are the same person.

Examples: **I** took my books with **me**. **Bob** brought his books with **him**. **I** looked around **me**. **She** kept her son close to **her**.

| <b>8-6 Forms of Other</b> |   |  |   |
|---------------------------|---|--|---|
|                           | <b>Adjective</b>  | <b>Pronoun</b>                                   |   |
| Singular<br>Plural        | <i>another book</i> (is)<br><i>other books</i> (are)  | <i>another</i> (is)<br><i>others</i> (are)       | Forms of <b>other</b> are used as either adjectives or pronouns.<br><br>Notice:<br><ul style="list-style-type: none"> <li>• <b>Another</b> is always singular.</li> <li>• A final <b>-s</b> is used only for a plural pronoun (<b>others</b>).</li> </ul> |
| Singular<br>Plural        | <i>the other book</i> (is)<br><i>the other books</i> (are)  | <i>the other</i> (is)<br><i>the others</i> (are) |   |
| (a)                       | The students in the class come from many countries. One of the students is from Mexico. <i>Another student is</i> from Iraq. <i>Another is</i> from Japan. <i>Other students are</i> from Brazil. <i>Others are</i> from Algeria. |  | The meaning of <b>another</b> : "one more in addition to or different from the one(s) already mentioned."<br><br>The meaning of <b>other/others</b> (without <b>the</b> ): "several more in addition to or different from the one(s) already mentioned."  |
| (b)<br>(c)                | (b) I have three books. Two are mine. <i>The other book is</i> yours. ( <i>The other is</i> yours.)<br>(c) I have three books. One is mine. <i>The other books are</i> yours. ( <i>The others are</i> yours.)                     |  | The meaning of <b>the other(s)</b> : "all that remains from a given number; the rest of a specific group."  |
| (d)<br>(e)<br>(f)         | (d) I will be here for <i>another three years</i> .<br>(e) I need <i>another five dollars</i> .<br>(f) We drove <i>another ten miles</i> .  |  | <b>Another</b> is used as an adjective with expressions of time, money, and distance, even if these expressions contain plural nouns. <b>Another</b> means "an additional" in these expressions.  |

## 9-1 Basic Modal Introduction

Modal auxiliaries generally express speakers' attitudes. For example, modals can express that a speaker feels something is necessary, advisable, permissible, possible, or probable; and, in addition, they can convey the strength of those attitudes. Each modal has more than one meaning or use. See Chart 10-10, p. 204–205, for a summary overview of modals.

### Modal auxiliaries in English

|       |            |       |            |        |       |
|-------|------------|-------|------------|--------|-------|
| can   | had better | might | ought (to) | should | would |
| could | may        | must  | shall      | will   |       |

### Modal Auxiliaries

|  |   |   |   |
|--|---|---|---|
| I<br>You<br>He<br>She<br>It<br>We<br>You<br>They | + | {<br><i>can do it.</i><br><i>could do it.</i><br><i>had better do it.</i><br><i>may do it.</i><br><i>might do it.</i><br><i>must do it.</i><br><i>ought to do it.</i><br><i>shall do it.</i><br><i>should do it.</i><br><i>will do it.</i><br><i>would do it.</i> } | Modals do not take a final <b>-s</b> , even when the subject is <i>she, he, or it</i> .<br>CORRECT: <b>She can do it.</b><br>INCORRECT: She <del>can</del> s do it.   |
|  |   |   | Modals are followed immediately by the simple form of a verb.<br>CORRECT: <b>She can do it.</b><br>INCORRECT: She can <del>to</del> do it. / She can <del>does</del> it. / She can <del>did</del> it.<br><br>The only exception is <b>ought</b> , which is followed by an infinitive ( <b>to + the simple form of a verb</b> ).<br>CORRECT: He <b>ought to go to the meeting.</b> |

### Phrasal Modals

|  |   |
|--|---|
| <i>be able to do it</i><br><i>be going to do it</i><br><i>be supposed to do it</i><br><i>have to do it</i><br><i>have got to do it</i> | Phrasal modals are common expressions whose meanings are similar to those of some of the modal auxiliaries. For example: <b>be able to</b> is similar to <b>can</b> ; <b>be going to</b> is similar to <b>will</b> .<br><br>An infinitive ( <b>to + the simple form of a verb</b> ) is used in these similar expressions. |
|--|---|

## 9-6 Lack of Necessity and Prohibition: *Have To* and *Must* in the Negative

|   |   |
|---|---|
| <b>Lack of Necessity</b>  |   |
| (a) Tomorrow is a holiday. We <i>don't have to go</i> to class.<br>(b) I can hear you. You <i>don't have to shout</i> .*                      | When used in the negative, <b>must</b> and <b>have to</b> have different meanings.<br><br>Negative form: <b>do not have to = lack of necessity</b> .<br>The meaning in (a): <i>We don't need to go to class tomorrow because it is a holiday.</i> |
| <b>Prohibition</b>  |   |
| (c) You <i>must not tell</i> anyone my secret. Do you promise?  | <b>must not = prohibition (DO NOT DO THIS!)</b><br>The meaning in (c): <i>Do not tell anyone my secret. I forbid it. Telling anyone my secret is prohibited.</i><br>Negative contraction: <b>mustn't</b> . (The first "t" is silent: "muss-ənt.") |
| (d) <i>Don't tell</i> anyone my secret.<br>(e) You <i>can't tell</i> anyone my secret.<br>(f) You <i>'d better not tell</i> anyone my secret. | Because <b>must not is so strong</b> , speakers also express prohibition with imperatives, as in (d), or with other modals, as in (e) and (f).  |

## 9-5 Expressing Necessity: *Must, Have To, Have Got To*

### *Must, Have To*

- (a) All applicants **must take** an entrance exam.  
 (b) All applicants **have to take** an entrance exam.

**Must** and **have to** both express necessity. The meaning is the same in (a) and (b): *It is necessary for every applicant to take an entrance exam. There is no other choice. The exam is required.*

- (c) I'm looking for Sue. I **have to talk** to her about our lunch date tomorrow. I can't meet her for lunch because I have to go to a business meeting at 1:00.  
 (d) Where's Sue? I **must talk** to her right away. I have an urgent message for her.

In everyday statements of necessity, **have to** is used more commonly than **must**.  
**Must** is usually stronger than **have to** and can indicate urgency or stress importance.  
 The meaning in (c): *I need to do this, and I need to do that.*  
 The meaning in (d) is stronger: *This is very important!*  
 Because it is a strong word, **must** (meaning necessity) is relatively rare in conversation. It is usually found in legal or academic writing.

- (e) I **have to** ("hafta") be home by eight.  
 (f) He **has to** ("hasta") go to a meeting tonight.

NOTE: Native speakers often say "hafta" and "hasta," as in (e) and (f).

### *Have Got To*

- (g) I **have got to go** now. I have a class in ten minutes.  
 (h) I **have to go** now. I have a class in ten minutes.

**Have got to** also expresses the idea of necessity: (g) and (h) have the same meaning.  
**Have got to** is informal and is used primarily in spoken English.  
**Have to** is used in both formal and informal English.

- (i) I **have got to go** ("I've gotta go / I gotta go") now.

The usual pronunciation of **got to** is "gotta." Sometimes **have** is dropped in speech: "I gotta do it."

### *Past Necessity*

- (j) PRESENT OR FUTURE  
 I **have to / have got to / must study** tonight.  
 (k) PAST  
 I **had to study** last night.

**Had to** expresses past necessity.  
 In (j): **had to** = *needed to*: *I needed to study last night.*  
 There is **no other past form for must** (when it means necessity) or **have got to**.

Lack of necessity may also be expressed by **need not** + the simple form of a verb: You **needn't shout**. The use of **needn't** as an auxiliary is chiefly British except in certain common expressions such as You needn't worry.

**Ought to** is not commonly used in the negative. If it is, the **to** is sometimes dropped: You **oughtn't (to) leave** your keys in the car.

## 9-7 Advisability: *Should, Ought To, Had Better*

|  |  |
|--|--|
| <p>(a) You <i>should study</i> harder.<br/>You <i>ought to study</i> harder.</p> <p>(b) Drivers <i>should obey</i> the speed limit.<br/>Drivers <i>ought to obey</i> the speed limit.</p>      | <p><b>Should</b> and <b>ought to</b> both express advisability. Their meaning ranges in strength from a suggestion (<i>This is a good idea</i>) to a statement about responsibility or duty (<i>This is a very important thing to do</i>).</p> <p>The meaning in (a): <i>This is a good idea. This is my advice.</i><br/>In (b): <i>This is an important responsibility.</i></p>   |
| <p>(c) You <i>shouldn't leave</i> your keys in the car.</p>  | <p>Negative contraction: <b>shouldn't</b>.*</p> <p>NOTE: the /t/ is often hard to hear in relaxed, spoken English.</p>   |
| <p>(d) I <i>ought to</i> ("otta") <i>study</i> tonight, but I think I'll watch TV instead.</p>   | <p>Native speakers often pronounce <b>ought to</b> as "otta" in informal speech.</p>   |
| <p>(e) The gas tank is almost empty. We <i>had better stop</i> at the next gas station.</p> <p>(f) You <i>had better take</i> care of that cut on your hand soon, or it will get infected.</p> | <p>In meaning, <b>had better</b> is close to <b>should</b> and <b>ought to</b>, but <b>had better</b> is usually stronger. Often <b>had better</b> implies a warning or a threat of possible bad consequences.</p> <p>The meaning in (e): <i>If we don't stop at a service station, there will be a bad result. We will run out of gas.</i></p> <p>Notes on the use of <b>had better</b>:</p> <ul style="list-style-type: none"> <li>• It has a present or future meaning.</li> <li>• It is followed by the simple form of a verb.</li> <li>• It is more common in speaking than writing.</li> </ul> |
| <p>(g) You <i>'d better</i> take care of it.<br/>(h) You <i>better</i> take care of it.</p>  | <p>Contraction: <b>'d better</b>, as in (g).<br/>Sometimes in speaking, <b>had</b> is dropped, as in (h).</p>  |
| <p>(i) You <i>'d better not</i> be late.</p>   | <p>Negative form: <b>had better + not</b></p>  |

## 9-8 The Past Form of *Should*

|   |   |
|---|---|
| <p>(a) I had a test this morning. I didn't do well on the test because I didn't study for it last night. I <i>should have studied</i> last night.</p> <p>(b) You were supposed to be here at 10:00 P.M., but you didn't come until midnight. We were worried about you. You <i>should have called</i> us. (You did not call.)</p> | <p>Past form: <b>should have + past participle</b>.*</p> <p>The meaning in (a): <i>I should have studied = Studying was a good idea, but I didn't do it. I made a mistake.</i></p> <p>Usual pronunciation of <b>should have</b>: "should-əv" or "should-ə."</p> |
| <p>(c) My back hurts. I <i>should not have carried</i> that heavy box up two flights of stairs. (I carried the box, and now I'm sorry.)</p> <p>(d) We went to a movie, but it was a waste of time and money. We <i>should not have gone</i> to the movie.</p>   | <p>The meaning in (c): <i>I should not have carried = I carried something, but it turned out to be a bad idea. I made a mistake.</i></p> <p>Usual pronunciation of <b>should not have</b>: "shouldn't-əv" or "shouldn't-ə."</p>                                 |

### 9-9 Obligation: *Be Supposed To*

|   |   |
|---|---|
| <p>(a) The game <i>is supposed to begin</i> at 10:00.<br/>                 (b) The committee <i>is supposed to vote</i> by secret ballot.</p>   | <p><b>Be supposed to</b> expresses the idea that someone (<i>I, we, they, the teacher, lots of people, my father, etc.</i>) expects something to happen.<br/> <b>Be supposed to</b> often expresses expectations about scheduled events, as in (a), or correct procedures, as in (b).</p> |
| <p>(c) I <i>am supposed to go</i> to the meeting. My boss told me that he wants me to attend.<br/>                 (d) The children <i>are supposed to put away</i> their toys before they go to bed.</p> | <p><b>Be supposed to</b> also expresses expectations about behavior.<br/>                 The meaning is the same in (c) and (d): <i>Someone else expects (requests or requires) certain behavior.</i></p>  |
| <p>(e) Jack <i>was supposed to call</i> me last night. I wonder why he didn't.</p>  | <p><b>Be supposed to</b> in the past (<i>was/were supposed to</i>) expresses unfulfilled expectations.<br/>                 The meaning in (e): <i>I expected Jack to call, but he didn't.</i></p>  |

### 10-1 Degrees of Certainty: Present Time

|  |   |
|--|---|
| <p>— <i>Why isn't John in class?</i><br/>                 100% sure: He <i>is</i> sick.<br/>                 95% sure: He <i>must be</i> sick.<br/>                 50% sure or less: { He <i>may be</i> sick.<br/>                                           He <i>might be</i> sick.<br/>                                           He <i>could be</i> sick.<br/>                 NOTE: These percentages are approximate.</p> | <p><b>Degree of certainty</b> refers to how sure we are — what we think the chances are — that something is true.<br/>                 If we are sure something is true in the present, we don't need to use a modal. For example, if I say, "John is sick," I am sure; I am stating a fact that I am sure is true. My degree of certainty is 100%.</p> |
| <p>— <i>Why isn't John in class?</i><br/>                 (a) He <i>must be</i> sick. (Usually he is in class every day, but when I saw him last night, he wasn't feeling good. So my best guess is that he is sick today. I can't think of another possibility.)</p>  | <p><b>Must</b> expresses a strong degree of certainty about a present situation, but the degree of certainty is still less than 100%.<br/>                 In (a): The speaker is saying, "Probably John is sick. I have evidence to make me believe that he is sick. That is my logical conclusion, but I do not know for certain."</p>                |
| <p>— <i>Why isn't John in class?</i><br/>                 (b) He <i>may be</i> sick.<br/>                 (c) He <i>might be</i> sick.<br/>                 (d) He <i>could be</i> sick. (I don't really know. He may be at home watching TV. He might be at the library. He could be out of town.)</p>  | <p><b>May, might, and could</b> express a weak degree of certainty.<br/>                 In (b), (c), and (d): The meanings are all the same. The speaker is saying, "Perhaps, maybe,* possibly John is sick. I am only making a guess. I can think of other possibilities."</p>  |

\**Maybe* (one word) is an adverb: *Maybe he is sick.* *May be* (two words) is a verb form: *He may be sick.*



## 10-6 Ability: *Can* and *Could*

|  |   |
|--|---|
| (a) Tom is strong. He <i>can lift</i> that heavy box.<br>(b) I <i>can see</i> Central Park from my apartment.  | <b>Can</b> is used to express physical ability, as in (a).<br><b>Can</b> is frequently used with verbs of the five senses: <i>see, hear, feel, smell, taste</i> , as in (b).    |
| (c) Maria <i>can play</i> the piano. She's been taking lessons for many years.   | <b>Can</b> is used to express an acquired skill.<br>In (c): <i>can play</i> = <i>knows how to play</i> .  |
| (d) You <i>can buy</i> a hammer at the hardware store.   | <b>Can</b> is used to express possibility.<br>In (d): <i>you can buy</i> = <i>it is possible for one to buy</i> .   |
| COMPARE:<br>(e) I'm not quite ready to go, but you <i>can leave</i> if you're in a hurry. I'll meet you later.<br>(f) When you finish the test, you <i>may leave</i> . | <b>Can</b> is used to give permission in informal situations, as in (e). In formal situations, <b>may</b> rather than <b>can</b> is usually used to give permission, as in (f). |
| (g) Dogs <i>can bark</i> , but they <i>cannot/can't talk</i> .   | Negative form: <b>cannot</b> or <b>can't</b>  |
| (h) Tom <i>could lift</i> the box, but I <i>couldn't</i> .   | The past form of <b>can</b> meaning "ability" is <b>could</b> , as in (h).<br>Negative form: <b>could not</b> or <b>couldn't</b>  |

## 10-7 Using *Would* to Express a Repeated Action in the Past

|  |   |
|--|---|
| (a) When I was a child, my father <i>would read</i> me a story at night before bedtime.<br>(b) When I was a child, my father <i>used to read</i> me a story at night before bedtime. | <b>Would</b> can be used to express <i>an action that was repeated regularly in the past</i> . When <b>would</b> is used to express this idea, it has the same meaning as <b>used to</b> ( <i>habitual past</i> ). Sentences (a) and (b) have the same meaning. |
| (c) I <i>used to live</i> in California.<br>He <i>used to be</i> a Boy Scout.<br>They <i>used to have</i> a Ford.  | <b>Used to</b> expresses <i>a situation that existed in the past</i> , as in (c). In this case, <b>would</b> may not be used as an alternative. <b>Would</b> is used only for regularly repeated actions in the past.   |

## 10-8 Expressing Preference: *Would Rather*

|   |  |
|---|--|
| (a) I <i>would rather go</i> to a movie tonight <i>than study</i> grammar.<br>(b) I <i>'d rather study</i> history <i>than (study)</i> biology. | <b>Would rather</b> expresses preference.<br>In (a): Notice that the simple form of a verb follows both <b>would rather</b> and <b>than</b> .<br>In (b): If the verb is the same, it usually is not repeated after <b>than</b> . |
| — How much do you weigh?<br>(c) I <i>'d rather not tell</i> you.  | Contraction: <b>I would</b> = <b>I'd</b><br>Negative form: <b>would rather</b> + <b>not</b>  |
| (d) The movie was okay, but I <i>would rather have gone</i> to the concert last night.  | The past form: <b>would rather have</b> + <i>past participle</i> .<br>Usual pronunciation: "I'd rather-əv"   |
| (e) I <i>'d rather be lying</i> on a beach in India than <i>(be) sitting</i> in class right now.  | Progressive form: <b>would rather</b> + <b>be</b> + <b>-ing</b>  |

## 10-10 Summary Chart of Modals and Similar Expressions

| Auxiliary             | Uses  | Present/Future  | Past  |
|-----------------------|---|---|---|
| <i>may</i>            | (1) polite request<br>(only with "I" or "we") | <i>May I borrow</i> your pen?                                   |   |
|                       | (2) formal permission                         | You <i>may leave</i> the room.                                  |   |
|                       | (3) 50% or less certainty                     | — <i>Where's John?</i><br>He <i>may be</i> at the library.      | He <i>may have been</i> at the library.                             |
| <i>might</i>          | (1) 50% or less certainty                     | — <i>Where's John?</i><br>He <i>might be</i> at the library.    | He <i>might have been</i> at the library.                           |
|                       | (2) polite request ( <i>rare</i> )            | <i>Might I borrow</i> your pen?                                 |   |
| <i>should</i>         | (1) advisability                              | I <i>should study</i> tonight.                                  | I <i>should have studied</i> last night, but I didn't.              |
|                       | (2) 90% certainty<br>( <i>expectation</i> )   | She <i>should do</i> well on the test tomorrow.                 | She <i>should have done</i> well on the test.                       |
| <i>ought to</i>       | (1) advisability                              | I <i>ought to study</i> tonight.                                | I <i>ought to have studied</i> last night, but I didn't.            |
|                       | (2) 90% certainty<br>( <i>expectation</i> )   | She <i>ought to do</i> well on the test tomorrow.               | She <i>ought to have done</i> well on the test.                     |
| <i>had better</i>     | (1) advisability with threat of bad result    | You <i>had better be</i> on time, or we will leave without you. | ( <i>past form uncommon</i> )                                       |
| <i>be supposed to</i> | (1) expectation                               | Class <i>is supposed to begin</i> at 10:00.                     |   |
|                       | (2) unfulfilled expectation                   |   | Class <i>was supposed to begin</i> at 10:00, but it began at 10:15. |
| <i>must</i>           | (1) strong necessity                          | I <i>must go</i> to class today.                                | (I <i>had to go</i> to class yesterday.)                            |
|                       | (2) prohibition<br>( <i>negative</i> )        | You <i>must not</i> open that door.                             |   |
|                       | (3) 95% certainty                             | Mary isn't in class. She <i>must be</i> sick.                   | Mary <i>must have been</i> sick yesterday.                          |
| <i>have to</i>        | (1) necessity                                 | I <i>have to go</i> to class today.                             | I <i>had to go</i> to class yesterday.                              |
|                       | (2) lack of necessity<br>( <i>negative</i> )  | I <i>don't have to go</i> to class today.                       | I <i>didn't have to go</i> to class yesterday.                      |
| <i>have got to</i>    | (1) necessity                                 | I <i>have got to go</i> to class today.                         | (I <i>had to go</i> to class yesterday.)                            |
| <i>will</i>           | (1) 100% certainty                            | He <i>will be</i> here at 6:00.                                 |   |
|                       | (2) willingness                               | — <i>The phone's ringing.</i><br>I'll <i>get</i> it.            |   |
|                       | (3) polite request                            | <i>Will</i> you please help me?                                 |   |
| <i>be going to</i>    | (1) 100% certainty<br>( <i>prediction</i> )   | He <i>is going to be</i> here at 6:00.                          |   |
|                       | (2) definite plan<br>( <i>intention</i> )     | I'm <i>going to paint</i> my bedroom.                           |   |
|                       | (3) unfulfilled intention                     |   | I <i>was going to paint</i> my room, but I didn't have time.        |

| Auxiliary         | Uses   | Present/Future   | Past  |
|-------------------|--|--|---|
| <i>can</i>        | (1) ability/possibility                          | I <i>can run</i> fast.   | I <i>could run</i> fast when I was a child, but now I can't.            |
|                   | (2) informal permission                          | You <i>can use</i> my car tomorrow.  |   |
|                   | (3) informal polite request                      | <i>Can I borrow</i> your pen?  |   |
|                   | (4) impossibility<br>(negative only)             | That <i>can't be</i> true!   | That <i>can't have been</i> true!                                       |
| <i>could</i>      | (1) past ability                                 |  | I <i>could run</i> fast when I was a child.                             |
|                   | (2) polite request                               | <i>Could I borrow</i> your pen?<br><i>Could you help</i> me?               |   |
|                   | (3) suggestion<br>(affirmative only)             | — I <i>need help</i> in math.<br>You <i>could talk</i> to your teacher.    | You <i>could have talked</i> to your teacher.                           |
|                   | (4) 50% or less certainty                        | — <i>Where's John?</i><br>He <i>could be</i> at home.                      | He <i>could have been</i> at home.                                      |
|                   | (5) impossibility<br>(negative only)             | That <i>couldn't be</i> true!  | That <i>couldn't have been</i> true!                                    |
| <i>be able to</i> | (1) ability                                      | I <i>am able to help</i> you.<br>I <i>will be able to help</i> you.        | I <i>was able to help</i> him.  |
| <i>would</i>      | (1) polite request                               | <i>Would you please help</i> me?<br><i>Would you mind</i> if I left early? |   |
|                   | (2) preference                                   | I <i>would rather go</i> to the park than <i>stay</i> home.                | I <i>would rather have gone</i> to the park.                            |
|                   | (3) repeated action in the past                  |  | When I was a child, I <i>would visit</i> my grandparents every weekend. |
|                   | (4) polite for "want"<br>(with "like")           | I <i>would like</i> an apple, please.                                      |   |
|                   | (5) unfulfilled wish                             |  | I <i>would have liked</i> a cookie, but there were none in the house.   |
| <i>used to</i>    | (1) repeated action in the past.                 |  | I <i>used to visit</i> my grandparents every weekend.                   |
|                   | (2) past situation that no longer exists         |  | I <i>used to live</i> in Spain. Now I live in Korea.                    |
| <i>shall</i>      | (1) polite question to make a suggestion         | <i>Shall I open</i> the window?  |   |
|                   | (2) future with <i>I</i> or <i>we</i> as subject | I <i>shall arrive</i> at nine.<br>("will" = more common)                   |   |

### 11-1 Active vs. Passive

|   |   |
|---|---|
| <p>Active: (a) <sup>subject</sup> Mary <sup>verb</sup> helped <sup>object</sup> the boy.</p> <p>Passive: (b) <sup>subject</sup> The boy <sup>verb</sup> was helped by Mary.</p> | <p>In the passive, <i>the object</i> of an active verb becomes <i>the subject</i> of the passive verb: <b>the boy</b> in (a) becomes the subject of the passive verb in (b).</p> <p>Notice that the subject of an active verb follows <b>by</b> in a passive sentence. The noun that follows <b>by</b> is called the "agent." In (b): <b>Mary</b> is the agent.</p> <p>Sentences (a) and (b) have the same meaning.</p> |
| <p>Passive: (c) He <b>be</b> + <i>past participle</i></p> <p>He <i>is</i> helped by her.</p> <p>He <i>was</i> helped by her.</p> <p>He <i>will be</i> helped by her.</p>        | <p>Form of the passive: <b>be</b> + <i>past participle</i></p>  |
| <p>Active: (d) An accident <i>happened</i>.</p> <p>Passive: (e) (none)</p>  | <p>Only transitive verbs (verbs that can be followed by an object) are used in the passive. It is not possible to use intransitive verbs (such as <i>happen, sleep, come, seem, die</i>) in the passive. (See Appendix Chart A-1.)</p>  |

### 11-2 Tense Forms of the Passive

|   | Active                                | Passive  |
|---|---------------------------------------|--|
| (a) simple present                          | Mary <i>helps</i> the boy.            | The boy <i>is</i> helped by Mary.  |
| (b) present progressive                     | Mary <i>is helping</i> the boy.       | The boy <i>is being</i> helped by Mary.  |
| (c) present perfect*                        | Mary <i>has helped</i> the boy.       | The boy <i>has been</i> helped by Mary.  |
| (d) simple past                             | Mary <i>helped</i> the boy.           | The boy <i>was</i> helped by Mary.   |
| (e) past progressive                        | Mary <i>was helping</i> the boy.      | The boy <i>was being</i> helped by Mary.                                       |
| (f) past perfect*                           | Mary <i>had helped</i> the boy.       | The boy <i>had been</i> helped by Mary.  |
| (g) simple future                           | Mary <i>will help</i> the boy.        | The boy <i>will be</i> helped by Mary.   |
| (h) <i>be going to</i>                      | Mary <i>is going to help</i> the boy. | The boy <i>is going to be</i> helped by Mary.                                  |
| (i) future perfect*                         | Mary <i>will have helped</i> the boy. | The boy <i>will have been</i> helped by Mary.                                  |
| (j) <i>Was</i> the boy helped by Mary?      |                                       | In the question form of passive verbs, an auxiliary verb precedes the subject. |
| (k) <i>Has</i> the boy been helped by Mary? |                                       |  |

### 11-3 Using the Passive

|  |  |
|--|--|
| <p>(a) Rice <i>is grown</i> in India.</p> <p>(b) Our house <i>was built</i> in 1980.</p> <p>(c) This olive oil <i>was imported</i> from Crete.</p>                     | <p>Usually the passive is used without a <i>by</i>-phrase. The passive is most frequently used when it is not known or not important to know exactly who performs an action.</p> <p>In (a): Rice is grown in India by people, by farmers, by someone. It is not known or important to know exactly who grows rice in India.</p> <p>Examples (a), (b), and (c) illustrate the most common use of the passive, i.e., without the <i>by</i>-phrase.</p> |
| <p>(d) My aunt <i>made</i> this rug. (<i>active</i>)</p>   | <p>If the speaker knows who performs an action, usually the active is used, as in (d).</p>   |
| <p>(e) This rug <i>was made</i> by my aunt.<br/>That rug <i>was made</i> by my mother.</p> <p>(f) <i>Life on the Mississippi</i> <i>was written</i> by Mark Twain.</p> | <p>Sometimes, even when the speaker knows who performs an action, he/she chooses to use the passive with the <i>by</i>-phrase in order to focus attention on the subject of a sentence.</p> <p>In (e): The focus of attention is on two rugs.</p> <p>In (f): The focus is on the book, but the <i>by</i>-phrase is included because it contains important information.</p>   |

### 11-4 The Passive Form of Modals and Phrasal Modals

| Passive form:   | modal*                | + | be        | + | past participle                               |
|-----------------|-----------------------|---|-----------|---|---|
| (a) Tom         | <i>will</i>           |   | <i>be</i> |   | <i>invited</i> to the picnic.                 |
| (b) The window  | <i>can't</i>          |   | <i>be</i> |   | <i>opened.</i>                                |
| (c) Children    | <i>should</i>         |   | <i>be</i> |   | <i>taught</i> to respect their elders.        |
| (d)             | <i>May I</i>          |   | <i>be</i> |   | <i>excused</i> from class?                    |
| (e) This book   | <i>had better</i>     |   | <i>be</i> |   | <i>returned</i> to the library before Friday. |
| (f) This letter | <i>ought to</i>       |   | <i>be</i> |   | <i>sent</i> before June 1st.                  |
| (g) Mary        | <i>has to</i>         |   | <i>be</i> |   | <i>told</i> about our change in plans.        |
| (h) Fred        | <i>is supposed to</i> |   | <i>be</i> |   | <i>told</i> about the meeting.                |

| Past-passive form: | modal           | + | have been        | + | past participle                  |
|--------------------|-----------------|---|------------------|---|----------------------------------|
| (i) The letter     | <i>should</i>   |   | <i>have been</i> |   | <i>sent</i> last week.           |
| (j) This house     | <i>must</i>     |   | <i>have been</i> |   | <i>built</i> over 200 years ago. |
| (k) Eric           | <i>couldn't</i> |   | <i>have been</i> |   | <i>offered</i> the job.          |
| (l) Jill           | <i>ought to</i> |   | <i>have been</i> |   | <i>invited</i> to the party.     |

### 11-8 Participial Adjectives

|   |  |
|---|--|
| <p>— The problem confuses the students.<br/>(a) It is a <i>confusing</i> problem.</p> <p>— The students are confused by the problem.<br/>(b) They are <i>confused</i> students.</p> | <p>The <i>present participle</i> serves as an adjective with an active meaning. The noun it modifies performs an action.<br/>In (a): The noun <b>problem</b> does something; it <i>confuses</i>. Thus, it is described as a "confusing problem."</p> <p>The <i>past participle</i> serves as an adjective with a passive meaning.<br/>In (b): The students are confused by something. Thus, they are described as "confused students."</p> |
| <p>— The story amuses the children.<br/>(c) It is an <i>amusing</i> story.</p> <p>— The children are amused by the story.<br/>(d) They are <i>amused</i> children.</p>              | <p>In (c): The noun <b>story</b> performs the action.</p> <p>In (d): The noun <b>children</b> receives the action.</p>   |

### G Raise / Rise, Set / Sit, Lay / Lie

| Transitive   | Intransitive  |  |
|--|---|--|
| (a) <i>raise, raised, raised</i><br>Tom <i>raised his hand</i> .       | (b) <i>rise, rose, risen</i><br>The sun <i>rises</i> in the east. | <i>Raise, set, and lay</i> are <i>transitive</i> verbs; they are followed by an object.  |
| (c) <i>set, set, set</i><br>I <i>will set the book</i> on the desk.    | (d) <i>sit, sat, sat</i><br>I <i>sit</i> in the front row.        | <i>Rise, sit, and lie</i> are <i>intransitive</i> ; they are NOT followed by an object.*   |
| (e) <i>lay, laid, laid</i><br>I <i>am laying the book</i> on the desk. | (f) <i>lie,** lay, lain</i><br>He <i>is lying</i> on his bed.     | In (a): <b>raised</b> is followed by the object <b>hand</b> .<br>In (b): <b>rises</b> is not followed by an object.<br>NOTE: <b>Lay</b> and <b>lie</b> are troublesome for native speakers too and are frequently misused.<br><i>lay = put</i><br><i>lie = recline</i> |

## 17-2 Using Adverb Clauses to Show Time Relationships

|   |   |   |
|---|---|---|
| <i>after</i> *  | (a) <i>After she graduates</i> , she will get a job.<br>(b) <i>After she (had) graduated</i> , she got a job.   | A present tense, NOT a future tense, is used in an adverb clause of time, as in (a) and (c) (See Chart 4-3, p. 67, for tense usage in future time clauses.)   |
| <i>before</i> *   | (c) I will leave <i>before he comes</i> .<br>(d) I (had) left <i>before he came</i> .   |   |
| <i>when</i>   | (e) <i>When I arrived</i> , he was talking on the phone.<br>(f) <i>When I got there</i> , he had already left.<br>(g) <i>When it began to rain</i> , I stood under a tree.<br>(h) <i>When I was in Chicago</i> , I visited the museums.<br>(i) <i>When I see him tomorrow</i> , I will ask him. | <b>when</b> = at that time<br>Notice the different time relationships expressed by the tenses.  |
| <i>while</i><br><i>as</i>   | (j) <i>While I was walking home</i> , it began to rain.<br>(k) <i>As I was walking home</i> , it began to rain.   | <b>while, as</b> = during that time   |
| <i>by the time</i>  | (l) <i>By the time he arrived</i> , we had already left.<br>(m) <i>By the time he comes</i> , we will have already left.  | <b>by the time</b> = one event is completed before another event<br>Notice the use of the past perfect and future perfect in the main clause.   |
| <i>since</i>  | (n) I haven't seen him <i>since he left this morning</i> .<br>(o) I've known her <i>ever since I was a child</i> .  | <b>since</b> = from that time to the present<br>In (o): <b>ever</b> adds emphasis.<br><br>NOTE: The present perfect is used in the main clause.   |
| <i>until</i><br><i>till</i>   | (p) We stayed there <i>until we finished our work</i> .<br>(q) We stayed there <i>till we finished our work</i> .   | <b>until, till</b> = to that time and then no longer<br>( <b>Till</b> is used more in speaking than in writing; it is generally not used in formal English.)  |
| <i>as soon as</i><br><i>once</i>                                      | (r) <i>As soon as it stops raining</i> , we will leave.<br>(s) <i>Once it stops raining</i> , we will leave.  | <b>as soon as, once</b> = when one event happens, another event happens soon afterward  |
| <i>as long as</i><br><i>so long as</i>                                | (t) I will never speak to him again <i>as long as I live</i> .<br>(u) I will never speak to him again <i>so long as I live</i> .  | <b>as long as, so long as</b> = during all that time, from beginning to end   |
| <i>whenever</i><br><i>every time</i>                                  | (v) <i>Whenever I see her</i> , I say hello.<br>(w) <i>Every time I see her</i> , I say hello.  | <b>whenever</b> = every time  |
| <i>the first time</i><br><i>the last time</i><br><i>the next time</i> | (x) <i>The first time (that) I went to New York</i> , I went to an opera.<br>(y) I saw two plays <i>the last time (that) I went to New York</i> .<br>(z) <i>The next time (that) I go to New York</i> , I'm going to see a ballet.  | Adverb clauses can be introduced by:<br><br><div style="display: flex; align-items: center; justify-content: center;"> <span style="font-size: 2em; margin-right: 10px;">{</span> <div style="display: flex; flex-direction: column; align-items: center; gap: 5px;"> <span style="font-size: 0.8em; margin-right: 5px;">the</span> <span style="font-size: 0.8em; margin-right: 5px;">first</span> <span style="font-size: 0.8em; margin-right: 5px;">second</span> <span style="font-size: 0.8em; margin-right: 5px;">third, etc.</span> <span style="font-size: 0.8em; margin-right: 5px;">last</span> <span style="font-size: 0.8em; margin-right: 5px;">next</span> <span style="font-size: 0.8em; margin-right: 5px;">etc.</span> </div> <span style="font-size: 2em; margin-left: 10px;">}</span> <span style="margin-left: 10px;">time (that)</span> </div> |

### 17-3 Using Adverb Clauses to Show Cause and Effect

|                 |   |  |
|-----------------|---|--|
| <i>because</i>  | (a) <i>Because he was sleepy</i> , he went to bed.<br>(b) He went to bed <i>because he was sleepy</i> .   | An adverb clause may precede or follow the independent clause. Notice the punctuation in (a) and (b).  |
| <i>now that</i> | (c) <i>Now that I've finished the semester</i> , I'm going to rest a few days and then take a trip.<br>(d) Jack lost his job. <i>Now that he's unemployed</i> , he can't pay his bills. | <b>Now that</b> means "because now." In (c): <b>Now that I've finished the semester</b> means "because the semester is now over." <b>Now that</b> is used for present causes of present or future situations.  |
| <i>since</i>    | (e) <i>Since Monday is a holiday</i> , we don't have to go to work.<br>(f) <i>Since you're a good cook and I'm not</i> , you should cook the dinner.                                    | When <b>since</b> is used to mean "because," it expresses a known cause; it means "because it is a fact that" or "given that it is true that." Cause-and-effect sentences with <b>since</b> say, "Given the fact that X is true, Y is the result." In (e): "Given the fact that Monday is a holiday, we don't have to go to work." |
|                 | (g) <i>Since I came here</i> , I have met many people.  | NOTE: <b>Since</b> has two meanings. One is "because." It is also used in time clauses, as in (g). See Chart 17-2.   |

### 17-4 Expressing Contrast (Unexpected Result): Using *Even Though*

|  |  |
|--|--|
| (a) <i>Because</i> the weather was cold, I <i>didn't go</i> swimming.<br>(b) <i>Even though</i> the weather was cold, I <i>went</i> swimming.<br>(c) <i>Because</i> I wasn't tired, I <i>didn't go</i> to bed.<br>(d) <i>Even though</i> I wasn't tired, I <i>went</i> to bed. | <b>Because</b> is used to express expected results.<br><b>Even though</b> is used to express unexpected results.*<br>NOTE: Like <b>because</b> , <b>even though</b> introduces an adverb clause. |
|--|--|

### 17-9 Adverb Clauses of Condition: Using *In Case*

|  |   |
|--|---|
| (a) I'll be at my uncle's house <i>in case you (should) need to reach me</i> . | <b>In case</b> expresses the idea that something probably won't happen, but it might. <b>In case</b> means "if by chance this should happen."<br>NOTE: Using <b>should</b> in an adverb clause emphasizes the speaker's uncertainty that something will happen. |
|--|---|

### 17-10 Adverb Clauses of Condition: Using *Unless*

|  |  |
|--|--|
| (a) I'll go swimming tomorrow <i>unless it's cold</i> .<br>(b) I'll go swimming tomorrow <i>if it isn't cold</i> . | <b>unless = if . . . not</b><br>In (a): <i>unless it's cold</i> means "if it isn't cold."<br>Examples (a) and (b) have the same meaning. |
|--|--|

### 18-5 Using *Upon* + *-ing* in Modifying Adverbial Phrases

|   |   |
|---|---|
| (a) <i>Upon reaching</i> the age of 21, I received my inheritance.<br>(b) <i>When I reached</i> the age of 21, I received my inheritance. | Modifying adverbial phrases beginning with <b>upon</b> + <b>-ing</b> usually have the same meaning as adverb clauses introduced by <b>when</b> .<br>Examples (a) and (b) have the same meaning. |
| (c) <i>On reaching</i> the age of 21, I received my inheritance.  | <b>Upon</b> can be shortened to <b>on</b> .<br>Examples (a), (b), and (c) all have the same meaning.  |

| 18-4 Expressing Cause and Effect in Modifying Adverbial Phrases   |  |
|---|--|
| (a) <i>Because she needed</i> some money to buy a book, <i>Sue</i> cashed a check.<br>(b) <i>Needing</i> some money to buy a book, <i>Sue</i> cashed a check.<br>(c) <i>Because he lacked</i> the necessary qualifications, <i>he</i> was not considered for the job.<br>(d) <i>Lacking</i> the necessary qualifications, <i>he</i> was not considered for the job. | Often an <b>-ing</b> phrase at the beginning of a sentence gives the meaning of "because."<br>Examples (a) and (b) have the same meaning.<br><b>Because</b> is not included in a modifying phrase. It is omitted, but the resulting phrase expresses a cause-and-effect relationship, as in (b) and (d). |
| (e) <i>Having seen</i> that movie before, <i>I don't want</i> to go again.<br>(f) <i>Having seen</i> that movie before, <i>I didn't want</i> to go again.   | <b>Having</b> + <i>past participle</i> gives the meaning not only of "because" but also of "before."   |
| (g) <i>Because she was unable</i> to afford a car, <i>she</i> bought a bicycle.<br>(h) <i>Being unable</i> to afford a car, <i>she</i> bought a bicycle.<br>(i) <i>Unable</i> to afford a car, <i>she</i> bought a bicycle.   | A form of <b>be</b> in the adverb clause may be changed to <b>being</b> . The use of <b>being</b> makes the cause-and-effect relationship clear.<br>Examples (g), (h), and (i) have the same meaning.  |

| 19-1 Using <i>Because Of</i> and <i>Due To</i>  |  |
|---|--|
| (a) <i>Because the weather was cold</i> , we stayed home.   | <b>Because</b> introduces an adverb clause; it is followed by a subject and a verb, as in (a).                             |
| (b) <i>Because of the cold weather</i> , we stayed home.<br>(c) <i>Due to the cold weather</i> , we stayed home.  | <b>Because of</b> and <b>due to</b> are phrasal prepositions; they are followed by a noun object, as in (b) and (c).       |
| (d) <i>Due to the fact that the weather was cold</i> , we stayed home.  | Sometimes (usually in more formal writing) <b>due to</b> is followed by a noun clause introduced by <b>the fact that</b> . |
| (e) We stayed home <i>because of the cold weather</i> .<br>We stayed home <i>due to the cold weather</i> .<br>We stayed home <i>due to the fact that the weather was cold</i> . | Like adverb clauses, these phrases can also follow the main clause, as in (e).   |

| 20-9 Verb Forms Following <i>Wish</i>  |  |   |   |
|--|--|---|---|
| <p><b>Wish</b> is used when the speaker wants reality to be different, to be exactly the opposite.</p> |  |   |   |
|  | <b>"True" Statement</b>  | <b>Verb Form Following <i>Wish</i></b>  | <b>Wish</b> is followed by a noun clause. (See Chart 12-5, p. 253.) Past verb forms, similar to those in conditional sentences, are used in the noun clause.<br><br>For example, in (a): <b>would</b> , the past form of <b>will</b> , is used to make a wish about the future.<br><br>In (d): the simple past ( <b>knew</b> ) is used to make a wish about the present.<br><br>In (g): the past perfect ( <b>had come</b> ) is used to make a wish about the past. |
| A Wish about the Future  | (a) She <i>will not tell</i> me.<br>(b) He <i>isn't going to be</i> here.<br>(c) She <i>can't come</i> tomorrow. | I <i>wish</i> (that) she <i>would tell</i> me.<br>I <i>wish</i> he <i>were going to be</i> here.<br>I <i>wish</i> she <i>could come</i> tomorrow. |   |
| A Wish about the Present   | (d) I <i>don't know</i> French.<br>(e) It <i>is raining</i> right now.<br>(f) I <i>can't speak</i> Japanese.     | I <i>wish</i> I <i>knew</i> French.<br>I <i>wish</i> it <i>weren't raining</i> right now.<br>I <i>wish</i> I <i>could speak</i> Japanese.         |   |
| A Wish about the Past  | (g) John <i>didn't come</i> .<br>(h) Mary <i>couldn't come</i> .   | I <i>wish</i> John <i>had come</i> .*<br>I <i>wish</i> Mary <i>could have come</i> .  |   |



## 19-2 Cause and Effect: Using *Therefore*, *Consequently*, and *So*

|  |   |
|--|---|
| <p>(a) Al failed the test because he didn't study.<br/>         (b) Al didn't study. <i>Therefore</i>, he failed the test.<br/>         (c) Al didn't study. <i>Consequently</i>, he failed the test.</p>  | <p>Examples (a), (b), and (c) have the same meaning. <i>Therefore</i> and <i>consequently</i> mean "as a result." In grammar, they are called <i>transitions</i> (or <i>conjunctive adverbs</i>).<br/>         Transitions connect the ideas between two sentences. They are used most commonly in formal written English and rarely in spoken English.</p> |
| <p>(d) Al didn't study. <i>Therefore</i>, he failed the test.<br/>         (e) Al didn't study. He, <i>therefore</i>, failed the test.<br/>         (f) Al didn't study. He failed the test, <i>therefore</i>.</p> <p>POSITIONS OF A TRANSITION:<br/> <i>transition</i> + S + V (+ rest of sentence)<br/>         S + <i>transition</i> + V (+ rest of sentence)<br/>         S + V (+ rest of sentence) + <i>transition</i></p> | <p>A transition occurs in the second of two related sentences.<br/>         Notice the patterns and punctuation in the examples. A period (NOT a comma) is used at the end of the first sentence.* The transition has several positions in the second sentence. The transition is separated from the rest of the sentence by commas.</p>                    |
| <p>(g) Al didn't study, <i>so</i> he failed the test.</p>  | <p>In (g): <i>So</i> is used as a <i>conjunction</i> between two independent clauses. It has the same meaning as <i>therefore</i>.<br/> <i>So</i> is common in both formal written and spoken English. A comma usually precedes <i>so</i> when it connects two sentences, as in (g).</p>  |

## 19-3 Summary of Patterns and Punctuation

|                |   |   |
|----------------|---|---|
| Adverb Clauses | <p>(a) <i>Because it was hot</i>, we went swimming.<br/>         (b) We went swimming <i>because it was hot</i>.</p>  | <p>An <i>adverb clause</i> may precede or follow an independent clause.<br/>         PUNCTUATION: A comma is used if the adverb clause comes first.</p>   |
| Prepositions   | <p>(c) <i>Because of the hot weather</i>, we went swimming.<br/>         (d) We went swimming <i>because of the hot weather</i>.</p>  | <p>A <i>preposition</i> is followed by a noun object, not by a subject and verb.<br/>         PUNCTUATION: A comma is usually used if the prepositional phrase precedes the subject and verb of the independent clause.</p>   |
| Transitions    | <p>(e) It was hot. <i>Therefore</i>, we went swimming.<br/>         (f) It was hot. <i>We, therefore</i>, went swimming.<br/>         (g) It was hot. <i>We went swimming, therefore</i>.</p> | <p>A <i>transition</i> is used with the second sentence of a pair. It shows the relationship of the second idea to the first idea. A transition is movable within the second sentence.<br/>         PUNCTUATION: A period is used between the two independent clauses.* A comma may NOT be used to separate the clauses. Commas are usually used to set the transition off from the rest of the sentence.</p> |
| Conjunctions   | <p>(h) It was hot, <i>so</i> we went swimming.</p>  | <p>A <i>conjunction</i> comes between two independent clauses.<br/>         PUNCTUATION: Usually a comma is used immediately in front of a conjunction.</p>   |

## 19-4 Other Ways of Expressing Cause and Effect: *Such . . . That and So . . . That*

|  |  |
|--|--|
| (a) Because the weather was nice, we went to the zoo.<br>(b) It was <i>such nice weather that</i> we went to the zoo.<br>(c) The weather was <i>so nice that</i> we went to the zoo.   | Examples (a), (b), and (c) have the same meaning.  |
| (d) It was <i>such good coffee that</i> I had another cup.<br>(e) It was <i>such a foggy day that</i> we couldn't see the road.  | <b>Such . . . that</b> encloses a modified noun:<br><b>such + adjective + noun + that</b>  |
| (f) The coffee is <i>so hot that</i> I can't drink it.<br>(g) I'm <i>so hungry that</i> I could eat a horse.<br>(h) She speaks <i>so fast that</i> I can't understand her.<br>(i) He walked <i>so quickly that</i> I couldn't keep up with him.  | <b>So . . . that</b> encloses an adjective or adverb:<br><b>so + <math>\left\{ \begin{array}{c} \text{adjective} \\ \text{or} \\ \text{adverb} \end{array} \right\} + \text{that}</math></b> |
| (j) She made <i>so many mistakes that</i> she failed the exam.<br>(k) He has <i>so few friends that</i> he is always lonely.<br>(l) She has <i>so much money that</i> she can buy whatever she wants.<br>(m) He had <i>so little trouble</i> with the test <i>that</i> he left twenty minutes early. | <b>So . . . that</b> is used with <i>many, few, much, and little</i> .   |
| (n) It was <i>such a good book (that)</i> I couldn't put it down.<br>(o) I was <i>so hungry (that)</i> I didn't wait for dinner to eat something.  | Sometimes, primarily in speaking, <b>that</b> is omitted.  |

## 19-5 Expressing Purpose: Using *So That*

|  |   |
|--|---|
| (a) I turned off the TV <i>in order to enable my roommate to study in peace and quiet</i> .<br>(b) I turned off the TV <i>so (that) my roommate could study in peace and quiet</i> .             | <b>In order to</b> expresses <i>purpose</i> . (See Chart 15-1, p. 331.)<br>In (a): I turned off the TV for a purpose. The purpose was to make it possible for my roommate to study in peace and quiet.  |
| <b>So That + Can or Could</b>  |   |
| (c) I'm going to cash a check <i>so that I can buy my textbooks</i> .<br>(d) I cashed a check <i>so that I could buy my textbooks</i> .  | <b>So that</b> also expresses <i>purpose</i> .* It expresses the same meaning as <b>in order to</b> . The word "that" is often omitted, especially in speaking.<br><b>So that</b> is often used instead of <b>in order to</b> when the idea of ability is being expressed. <b>Can</b> is used in the adverb clause for a present/future meaning.<br>In (c): <b>so that I can buy</b> = <i>in order to be able to buy</i><br><b>Could</b> is used after <b>so that</b> in past sentences, as in (d).** |
| <b>So That + Will / Would or Simple Present</b>  |   |
| (e) I'll take my umbrella <i>so that I won't get wet</i> .<br>(f) Yesterday I took my umbrella <i>so that I wouldn't get wet</i> .<br>(g) I'll take my umbrella <i>so that I don't get wet</i> . | In (e): <b>so that I won't get wet</b> = <i>in order to make sure that I won't get wet</i><br><b>Would</b> is used in past sentences, as in (f).<br>In (g): It is sometimes possible to use the simple present after <b>so that</b> in place of <b>will</b> ; the simple present expresses a future meaning.  |

## 19-6 Showing Contrast (Unexpected Result)

All of these sentences have the same meaning. The idea of cold weather is contrasted with the idea of going swimming. Usually if the weather is cold, one does not go swimming, so going swimming in cold weather is an "unexpected result." It is surprising that the speaker went swimming in cold weather.

|                |  |  |
|----------------|--|--|
| Adverb Clauses | <i>even though</i><br><i>although</i><br><i>though</i>   | (a) <i>Even though it was cold</i> , I went swimming.<br>(b) <i>Although it was cold</i> , I went swimming.<br>(c) <i>Though it was cold</i> , I went swimming.  |
| Conjunctions   | <i>but . . . anyway</i><br><i>but . . . still</i><br><i>yet . . . still</i>                              | (d) It was cold, <i>but</i> I went swimming <i>anyway</i> .<br>(e) It was cold, <i>but</i> I <i>still</i> went swimming.<br>(f) It was cold, <i>yet</i> I <i>still</i> went swimming.  |
| Transitions    | <i>nevertheless</i><br><i>nonetheless</i><br><i>however . . . still</i>                                  | (g) It was cold. <i>Nevertheless</i> , I went swimming.<br>(h) It was cold; <i>nonetheless</i> , I went swimming.<br>(i) It was cold. <i>However</i> , I <i>still</i> went swimming.   |
| Prepositions   | <i>despite</i><br><i>in spite of</i><br><i>despite the fact that</i><br><i>in spite of the fact that</i> | (j) I went swimming <i>despite</i> the cold weather.<br>(k) I went swimming <i>in spite of</i> the cold weather.<br>(l) I went swimming <i>despite the fact that</i> the weather was cold.<br>(m) I went swimming <i>in spite of the fact that</i> the weather was cold. |

## 20-1 Overview of Basic Verb Forms Used in Conditional Sentences

| Situation                    | If-clause      | Result clause                       | Examples   |
|------------------------------|----------------|-------------------------------------|--|
| True in the Present/Future   | simple present | <i>will + simple form</i>           | If I <i>have</i> enough time, I <i>watch</i> TV every evening.<br>If I <i>have</i> enough time, I <i>will watch</i> TV later on tonight. |
| Untrue in the Present/Future | simple past    | <i>would + simple form</i>          | If I <i>had</i> enough time, I <i>would watch</i> TV now or later on.  |
| Untrue in the Past           | past perfect   | <i>would have + past participle</i> | If I <i>had had</i> enough time, I <i>would have watched</i> TV yesterday.   |

## 20-10 Using *Would* to Make Wishes about the Future

|   |   |
|---|---|
| (a) It is raining. I <i>wish it would stop</i> .<br>(I want it to stop raining.)<br>(b) I'm expecting a call. I <i>wish the phone would ring</i> .<br>(I want the phone to ring.) | <i>Would</i> is usually used to indicate that the speaker wants something to happen or someone other than the speaker to do something in the future. The wish may or may not come true (be realized). |
| (c) It's going to be a good party. I <i>wish you would come</i> .<br>(d) We're going to be late. I <i>wish you would hurry</i> .  | In (c) and (d): <i>I wish you would . . .</i> is often used to make a request.  |

## E Preposition Combinations with Adjectives and Verbs

|  |   |   |
|--|---|---|
| <p><b>A</b> <i>be</i> absent from<br/> <i>be</i> accused of<br/> <i>be</i> accustomed to<br/> <i>be</i> acquainted with<br/> <i>be</i> addicted to<br/> <i>be</i> afraid of<br/>           agree with<br/> <i>be</i> angry at, with<br/> <i>be</i> annoyed with, by<br/>           apologize for<br/>           apply to, for<br/>           approve of<br/>           argue with, about<br/>           arrive in, at<br/> <i>be</i> associated with<br/> <i>be</i> aware of</p>   | <p style="text-align: center;">dream of, about<br/> <i>be</i> dressed in</p> <p><b>E</b> <i>be</i> engaged in, to<br/> <i>be</i> envious of<br/> <i>be</i> equipped with<br/>           escape from<br/>           excel in, at<br/> <i>be</i> excited about<br/>           excuse for<br/> <i>be</i> exhausted from<br/> <i>be</i> exposed to</p> <p><b>F</b> <i>be</i> faithful to<br/> <i>be</i> familiar with<br/>           feel like<br/>           fight for<br/> <i>be</i> filled with<br/> <i>be</i> finished with<br/> <i>be</i> fond of<br/>           forget about<br/>           forgive for<br/> <i>be</i> friendly to, with<br/> <i>be</i> frightened of, by<br/> <i>be</i> furnished with</p> | <p><b>O</b> object to<br/> <i>be</i> opposed to</p> <p><b>P</b> participate in<br/> <i>be</i> patient with<br/> <i>be</i> pleased with<br/> <i>be</i> polite to<br/>           pray for<br/> <i>be</i> prepared for<br/>           prevent from<br/>           prohibit from<br/> <i>be</i> protected from<br/> <i>be</i> proud of<br/>           provide with</p> <p><b>Q</b> <i>be</i> qualified for</p> <p><b>R</b> recover from<br/> <i>be</i> related to<br/> <i>be</i> relevant to<br/>           rely (up)on<br/> <i>be</i> remembered for<br/>           rescue from<br/>           respond to<br/> <i>be</i> responsible for</p> |
| <p><b>B</b> believe in<br/>           blame for<br/> <i>be</i> blessed with<br/> <i>be</i> bored with, by</p>  | <p><b>G</b> <i>be</i> gone from<br/> <i>be</i> grateful to, for<br/> <i>be</i> guilty of</p> <p><b>H</b> hide from<br/>           hope for</p>  | <p><b>S</b> <i>be</i> satisfied with<br/> <i>be</i> scared of, by<br/>           stare at<br/>           stop from<br/>           subscribe to<br/>           substitute for<br/>           succeed in</p>  |
| <p><b>C</b> <i>be</i> capable of<br/>           care about, for<br/> <i>be</i> cluttered with<br/> <i>be</i> committed to<br/>           compare to, with<br/>           complain about, of<br/> <i>be</i> composed of<br/> <i>be</i> concerned about<br/> <i>be</i> connected to<br/>           consist of<br/> <i>be</i> content with<br/>           contribute to<br/> <i>be</i> convinced of<br/> <i>be</i> coordinated with<br/>           count (up)on<br/> <i>be</i> covered with<br/> <i>be</i> crowded with</p> | <p><b>I</b> <i>be</i> innocent of<br/>           insist (up)on<br/> <i>be</i> interested in<br/>           introduce to<br/> <i>be</i> involved in</p> <p><b>J</b> <i>be</i> jealous of</p>   | <p><b>T</b> take advantage of<br/>           take care of<br/>           talk about, of<br/> <i>be</i> terrified of, by<br/>           thank for<br/>           think about, of<br/> <i>be</i> tired of, from</p>   |
| <p><b>D</b> decide (up)on<br/> <i>be</i> dedicated to<br/>           depend (up)on<br/> <i>be</i> devoted to<br/> <i>be</i> disappointed in, with<br/> <i>be</i> discriminated against<br/>           distinguish from<br/> <i>be</i> divorced from<br/> <i>be</i> done with</p>   | <p><b>K</b> keep from<br/> <i>be</i> known for</p> <p><b>L</b> <i>be</i> limited to<br/> <i>be</i> located in<br/>           look forward to</p> <p><b>M</b> <i>be</i> made of, from<br/> <i>be</i> married to</p>  | <p><b>U</b> <i>be</i> upset with<br/> <i>be</i> used to</p> <p><b>V</b> vote for</p> <p><b>W</b> <i>be</i> worried about</p>  |

## E Preposition Combinations with Adjectives and Verbs

|  |   |   |
|--|---|---|
| <p><b>A</b> <i>be</i> absent from<br/><i>be</i> accused of<br/><i>be</i> accustomed to<br/><i>be</i> acquainted with<br/><i>be</i> addicted to<br/><i>be</i> afraid of<br/>agree with<br/><i>be</i> angry at, with<br/><i>be</i> annoyed with, by<br/>apologize for<br/>apply to, for<br/>approve of<br/>argue with, about<br/>arrive in, at<br/><i>be</i> associated with<br/><i>be</i> aware of</p>  | <p style="text-align: center;">dream of, about<br/><i>be</i> dressed in</p> <p><b>E</b> <i>be</i> engaged in, to<br/><i>be</i> envious of<br/><i>be</i> equipped with<br/>escape from<br/>excel in, at<br/><i>be</i> excited about<br/>excuse for<br/><i>be</i> exhausted from<br/><i>be</i> exposed to</p> <p><b>F</b> <i>be</i> faithful to<br/><i>be</i> familiar with<br/>feel like<br/>fight for<br/><i>be</i> filled with<br/><i>be</i> finished with<br/><i>be</i> fond of<br/>forget about<br/>forgive for<br/><i>be</i> friendly to, with<br/><i>be</i> frightened of, by<br/><i>be</i> furnished with</p> | <p><b>O</b> object to<br/><i>be</i> opposed to</p> <p><b>P</b> participate in<br/><i>be</i> patient with<br/><i>be</i> pleased with<br/><i>be</i> polite to<br/>pray for<br/><i>be</i> prepared for<br/>prevent from<br/>prohibit from<br/><i>be</i> protected from<br/><i>be</i> proud of<br/>provide with</p> <p><b>Q</b> <i>be</i> qualified for</p> <p><b>R</b> recover from<br/><i>be</i> related to<br/><i>be</i> relevant to<br/>rely (up)on<br/><i>be</i> remembered for<br/>rescue from<br/>respond to<br/><i>be</i> responsible for</p> |
| <p><b>B</b> believe in<br/>blame for<br/><i>be</i> blessed with<br/><i>be</i> bored with, by</p>   | <p><b>G</b> <i>be</i> gone from<br/><i>be</i> grateful to, for<br/><i>be</i> guilty of</p>  | <p><b>S</b> <i>be</i> satisfied with<br/><i>be</i> scared of, by<br/>stare at<br/>stop from<br/>subscribe to<br/>substitute for<br/>succeed in</p>  |
| <p><b>C</b> <i>be</i> capable of<br/>care about, for<br/><i>be</i> cluttered with<br/><i>be</i> committed to<br/>compare to, with<br/>complain about, of<br/><i>be</i> composed of<br/><i>be</i> concerned about<br/><i>be</i> connected to<br/>consist of<br/><i>be</i> content with<br/>contribute to<br/><i>be</i> convinced of<br/><i>be</i> coordinated with<br/>count (up)on<br/><i>be</i> covered with<br/><i>be</i> crowded with</p> | <p><b>H</b> hide from<br/>hope for</p> <p><b>I</b> <i>be</i> innocent of<br/>insist (up)on<br/><i>be</i> interested in<br/>introduce to<br/><i>be</i> involved in</p> <p><b>J</b> <i>be</i> jealous of</p>  | <p><b>T</b> take advantage of<br/>take care of<br/>talk about, of<br/><i>be</i> terrified of, by<br/>thank for<br/>think about, of<br/><i>be</i> tired of, from</p>   |
| <p><b>D</b> decide (up)on<br/><i>be</i> dedicated to<br/>depend (up)on<br/><i>be</i> devoted to<br/><i>be</i> disappointed in, with<br/><i>be</i> discriminated against<br/>distinguish from<br/><i>be</i> divorced from<br/><i>be</i> done with</p>   | <p><b>K</b> keep from<br/><i>be</i> known for</p> <p><b>L</b> <i>be</i> limited to<br/><i>be</i> located in<br/>look forward to</p> <p><b>M</b> <i>be</i> made of, from<br/><i>be</i> married to</p>  | <p><b>U</b> <i>be</i> upset with<br/><i>be</i> used to</p> <p><b>V</b> vote for</p> <p><b>W</b> <i>be</i> worried about</p>   |

# English for Aviation A-Z word list

| Word                              | Phonetics                 | Translation |
|-----------------------------------|---------------------------|-------------|
| <b>A</b> <b>abatement</b>         | [ə'beɪtmənt]              | _____       |
| <b>abdominal</b>                  | [æb'dɒmɪnəl]              | _____       |
| <b>abeam</b>                      | [ə'bi:m]                  | _____       |
| <b>abnormal</b>                   | [æb'nɔ:məl]               | _____       |
| to <b>abort</b>                   | [ə'bo:t]                  | _____       |
| <b>above</b>                      | [ə'baʊv]                  | _____       |
| <b>abroad</b>                     | [ə'brɔ:d]                 | _____       |
| <b>access hatch</b>               | ['ækses ,hætʃ]            | _____       |
| to <b>acknowledge</b>             | [ək'nɒlɪdʒ]               | _____       |
| <b>across</b>                     | [ə'krɒs]                  | _____       |
| to <b>adjust</b>                  | [ə'dʒʌst]                 | _____       |
| to <b>advise</b>                  | [əd'vaɪz]                 | _____       |
| <b>aerial</b>                     | ['eəriəl]                 | _____       |
| <b>aerobatic</b>                  | [,eərə'beɪtɪk]            | _____       |
| <b>aerosol</b>                    | ['eərəsɒl]                | _____       |
| <b>aft</b>                        | [ɑ:ft]                    | _____       |
| <b>aggressive</b>                 | [ə'ɡresɪv]                | _____       |
| <b>agony</b>                      | ['ægəni]                  | _____       |
| <b>ahead</b>                      | [ə'hed]                   | _____       |
| <b>aileron</b>                    | ['eɪləron]                | _____       |
| <b>air conditioning</b>           | ['eə kən,dɪʃənɪŋ]         | _____       |
| <b>air operator certificate</b>   | [,eə ɒpəreɪtə sə'tɪfɪkət] | _____       |
| <b>air worthiness certificate</b> | [,eə wɜ:ðɪnəs sə'tɪfɪkət] | _____       |
| <b>airborne</b>                   | ['eəbɔ:n]                 | _____       |
| <b>airprox</b>                    | ['eəprɒks]                | _____       |
| <b>airside</b>                    | ['eəsaɪd]                 | _____       |
| <b>aisle</b>                      | [aɪl]                     | _____       |
| <b>alarm</b>                      | [ə'lɑ:m]                  | _____       |
| to <b>allow</b>                   | [ə'ləʊ]                   | _____       |
| <b>alone</b>                      | [ə'ləʊn]                  | _____       |
| <b>alternate</b>                  | [ɔ:l'tɜ:nət]              | _____       |
| <b>altitude</b>                   | ['æltɪtju:d]              | _____       |
| <b>ambulance</b>                  | ['æmbjələns]              | _____       |
| <b>angle</b>                      | ['æŋɡl]                   | _____       |
| <b>angry</b>                      | ['æŋɡri]                  | _____       |
| <b>animal</b>                     | ['ænɪml]                  | _____       |
| <b>announcement</b>               | [ə'naʊnsmənt]             | _____       |
| <b>anticlockwise</b>              | [,æntɪ'klɒkwaɪz]          | _____       |
| to <b>appear</b>                  | [ə'piə(r)]                | _____       |
| <b>appendicitis</b>               | [ə,pendə'saɪtɪs]          | _____       |
| to <b>approach</b>                | [ə'prəʊtʃ]                | _____       |
| <b>appropriate</b>                | [ə'prəʊpriət]             | _____       |
| <b>approval</b>                   | [ə'pru:vəl]               | _____       |
| to <b>approve</b>                 | [ə'pru:v]                 | _____       |
| <b>apron</b>                      | ['eɪprən]                 | _____       |
| <b>aquaplaning</b>                | ['ækwə,pleɪnɪŋ]           | _____       |
| <b>arcing</b>                     | ['ɑ:kɪŋ]                  | _____       |
| <b>arm</b>                        | [ɑ:m]                     | _____       |
| <b>arrival</b>                    | [ə'rɑ:vəl]                | _____       |
| to <b>arrive</b>                  | [ə'rɑ:v]                  | _____       |
| <b>assembly</b>                   | [ə'sembli]                | _____       |
| to <b>assist</b>                  | [ə'sɪst]                  | _____       |
| <b>assistance</b>                 | [ə'sɪstəns]               | _____       |
| <b>asthma</b>                     | ['æsmə]                   | _____       |
| to <b>attempt</b>                 | [ə'tempt]                 | _____       |
| to <b>authorise</b>               | ['ɔ:θəraɪz]               | _____       |



| Word                 | Phonetics               | Translation |
|----------------------|-------------------------|-------------|
| centre               | ['sentə(r)]             | _____       |
| to change            | [tʃeɪndʒ]               | _____       |
| to check             | [tʃek]                  | _____       |
| to check out         | [,tʃek 'aʊt]            | _____       |
| chest pain           | ['tʃest ,peɪn]          | _____       |
| chimney              | ['tʃɪmni]               | _____       |
| chock                | [tʃɒk]                  | _____       |
| to choke             | [tʃəʊk]                 | _____       |
| circle               | ['sɜ:kəl]               | _____       |
| clarification        | [,klærəfi'keɪʃn]        | _____       |
| to clean             | [kli:n]                 | _____       |
| to clear             | [klɪə(r)]               | _____       |
| clear air turbulence | [klɪər ,eə 'tɜ:bjələns] | _____       |
| climate              | ['klaɪmət]              | _____       |
| to climb             | [klaɪm]                 | _____       |
| to climb out         | [,klaɪm 'aʊt]           | _____       |
| close                | [kləʊs]                 | _____       |
| cloud                | [klaʊd]                 | _____       |
| coastal              | ['kəʊstl]               | _____       |
| cockpit              | ['kɒkɪt]                | _____       |
| to collapse          | [kə'læps]               | _____       |
| collision            | [kə'lɪʒn]               | _____       |
| to come back         | [,kʌm 'bæk]             | _____       |
| to come from         | [,kʌm 'frɒm]            | _____       |
| to come in           | [,kʌm 'ɪn]              | _____       |
| comfortable          | ['kʌmfətəbl]            | _____       |
| communication        | [kə,mju:nɪ'keɪʃn]       | _____       |
| compacted            | [kəm'pæktɪd]            | _____       |
| compartment          | [kəm'pɑ:tmənt]          | _____       |
| compressed gas       | [kəm,prest 'gæs]        | _____       |
| computer             | [kəm'pjʊ:tə(r)]         | _____       |
| concern              | [kən'sɜ:n]              | _____       |
| condition            | [kən'dɪʃn]              | _____       |
| configuration        | [kən,figə'reɪʃn]        | _____       |
| to configure         | [kən'figə(r)]           | _____       |
| to confirm           | [kən'fɜ:m]              | _____       |
| conflict             | ['kɒnflɪkt]             | _____       |
| to confuse           | [kən'fju:z]             | _____       |
| congested            | [kən'dʒestɪd]           | _____       |
| congestion           | [kən'dʒestʃən]          | _____       |
| consciousness        | ['kɒnʃəsnəs]            | _____       |
| construction         | [kən'strʌkʃn]           | _____       |
| to contact           | ['kɒntækt]              | _____       |
| to contaminate       | [kən'tæmɪneɪt]          | _____       |
| to continue          | [kən'tɪnju:]            | _____       |
| to control           | [kən'trəʊl]             | _____       |
| convenient           | [kən'vi:niənt]          | _____       |
| to converge          | [kən'veɜ:dʒ]            | _____       |
| conveyor belt        | [kən'veɪə belt]         | _____       |
| cool                 | [ku:l]                  | _____       |
| to correct           | [kə'rekt]               | _____       |
| cough                | [kɒf]                   | _____       |
| course               | [kɔ:s]                  | _____       |
| cowling              | ['kəʊlɪŋ]               | _____       |
| crackling            | ['krækəlɪŋ]             | _____       |
| crash                | [kræʃ]                  | _____       |
| crest                | [krest]                 | _____       |
| crew                 | [kru:]                  | _____       |
| to cross             | [krɒs]                  | _____       |



|   | Word              | Phonetics             | Translation |
|---|-------------------|-----------------------|-------------|
|   | crosswind         | ['krɒswɪnd]           | _____       |
|   | crowded           | ['kraʊdɪd]            | _____       |
|   | cruising altitude | ['kru:zɪŋ ,æltɪtju:d] | _____       |
|   | crushing pain     | ['krʌʃɪŋ 'peɪn]       | _____       |
|   | curfew            | ['kɜ:fju:]            | _____       |
|   | customs           | ['kʌstəmz]            | _____       |
|   | cut               | [kʌt]                 | _____       |
| D | damage            | ['dæmɪdʒ]             | _____       |
|   | danger            | ['deɪndʒə(r)]         | _____       |
|   | dark              | [dɑ:k]                | _____       |
|   | daylight          | ['deɪlaɪt]            | _____       |
|   | debris            | ['debri:]             | _____       |
|   | to decide         | [dɪ'saɪd]             | _____       |
|   | to declare        | [dɪ'kleə(r)]          | _____       |
|   | decrease          | ['di:kri:s]           | _____       |
|   | de-icer           | [,di: 'aɪsə(r)]       | _____       |
|   | delay             | [dɪ'leɪ]              | _____       |
|   | to deliver        | [dɪ'lɪvə(r)]          | _____       |
|   | demolition        | [,demə'liʃn]          | _____       |
|   | dense fog         | [dens 'fɒg]           | _____       |
|   | to depart         | [dɪ'pɑ:t]             | _____       |
|   | to deploy         | [dɪ'plɔɪ]             | _____       |
|   | deposit           | [dɪ'pɒzɪt]            | _____       |
|   | depression        | [dɪ'preʃn]            | _____       |
|   | to descend        | [dɪ'send]             | _____       |
|   | descent           | [dɪ'sent]             | _____       |
|   | desert            | ['dezət]              | _____       |
|   | destination       | [,destɪ'neɪʃn]        | _____       |
|   | dew point         | ['dju: pɔɪnt]         | _____       |
|   | diabetic          | [,daɪə'betɪk]         | _____       |
|   | difficult         | ['dɪfɪkəlt]           | _____       |
|   | dim               | [dɪm]                 | _____       |
|   | direction         | [dɪ'rekʃn]            | _____       |
|   | disaster          | [dɪ'zɑ:stə(r)]        | _____       |
|   | to discover       | [dɪ'skʌvə(r)]         | _____       |
|   | to disembark      | [,dɪsm'bɑ:k]          | _____       |
|   | display           | [dɪ'spleɪ]            | _____       |
|   | distance          | ['dɪstəns]            | _____       |
|   | to distort        | [dɪ'stɔ:t]            | _____       |
|   | distress          | [dɪ'stres]            | _____       |
|   | to ditch          | [dɪtʃ]                | _____       |
|   | to diverge        | [daɪ'vɜ:dʒ]           | _____       |
|   | diversion         | [daɪ'vɜ:ʃn]           | _____       |
|   | to divert         | [daɪ'vɜ:t]            | _____       |
|   | document          | ['dɒkjumənt]          | _____       |
|   | dog               | [dɒg]                 | _____       |
|   | domestic          | [dɒ'mestɪk]           | _____       |
|   | downpour          | ['daʊnpə:(r)]         | _____       |
|   | downstream        | [,daʊn'stri:m]        | _____       |
|   | downwind          | [,daʊn'wɪnd]          | _____       |
|   | drag              | [dræg]                | _____       |
|   | drift             | [drɪft]               | _____       |
|   | drizzle           | ['drɪzl]              | _____       |
|   | drop zone         | ['drɒp zəʊn]          | _____       |
|   | drunk             | [drʌŋk]               | _____       |
|   | dry               | [draɪ]                | _____       |
|   | to dump           | [dʌmp]                | _____       |
|   | dust              | [dʌst]                | _____       |

|           | Word                  | Phonetics               | Translation |
|-----------|-----------------------|-------------------------|-------------|
| E         | ear drum              | [ˈɪədʒrʌm]              | _____       |
|           | earth tremors         | [ˈɜːθ ˌtreməz]          | _____       |
|           | edge                  | [edʒ]                   | _____       |
|           | electric              | [ɪˈlektɹɪk]             | _____       |
|           | elevator              | [ˈelɪvətə(r)]           | _____       |
|           | emergency             | [ɪˈmɜːdʒənsɪ]           | _____       |
|           | engine                | [ˈendʒɪn]               | _____       |
|           | environmental (noise) | [ɪnˌvaɪrənˈmentl ˈnɔɪz] | _____       |
|           | epileptic             | [ˌepɪˈleptɪk]           | _____       |
|           | to equip              | [ɪˈkwɪp]                | _____       |
|           | equipment             | [ɪˈkwɪpmənt]            | _____       |
|           | to escape             | [ɪˈskeɪp]               | _____       |
|           | to evacuate           | [ɪˈvækjuet]             | _____       |
|           | evening               | [ˈiːvnɪŋ]               | _____       |
|           | to examine            | [ɪgˈzæmɪn]              | _____       |
|           | excursion             | [ɪkˈskɜːʃn]             | _____       |
|           | to exit               | [ˈeksɪtː ˈegsɪt]        | _____       |
|           | to expedite           | [ˈekspeɪt]              | _____       |
|           | experience            | [ɪkˈspɪəriəns]          | _____       |
|           | to explain            | [ɪkˈspleɪn]             | _____       |
| explosive | [ɪkˈspləʊsɪv]         | _____                   |             |
| external  | [ɪkˈstɜːnl]           | _____                   |             |
| F         | face                  | [feɪs]                  | _____       |
|           | facility              | [fəˈsɪləti]             | _____       |
|           | to fail               | [feɪl]                  | _____       |
|           | failure               | [ˈfeɪljə(r)]            | _____       |
|           | to faint              | [feɪnt]                 | _____       |
|           | to fall off           | [ˌfɔːl ˈɒf]             | _____       |
|           | false alarm           | [ˌfɔːls əˈlɑːm]         | _____       |
|           | to falter             | [ˈfɔːltə(r)]            | _____       |
|           | fan blade             | [ˈfæn bleɪd]            | _____       |
|           | to fasten             | [ˈfɑːsn]                | _____       |
|           | fastening             | [ˈfɑːsnɪŋ]              | _____       |
|           | fault                 | [fɔːlt]                 | _____       |
|           | to feel               | [fiːl]                  | _____       |
|           | fighter training      | [ˈfaɪtə ˌtreɪnɪŋ]       | _____       |
|           | filter                | [ˈfɪltə(r)]             | _____       |
|           | fin                   | [fɪn]                   | _____       |
|           | final                 | [ˈfaɪnəl]               | _____       |
|           | to find               | [faɪnd]                 | _____       |
|           | fire                  | [ˈfaɪə(r)]              | _____       |
|           | fire engine           | [ˈfaɪə ɪkˌstɪŋɡwɪʃə(r)] | _____       |
|           | fire tender           | [ˈfaɪə ˌtendə(r)]       | _____       |
|           | fireworks display     | [ˈfaɪəwɜːks dɪˌspleɪ]   | _____       |
|           | first aid kit         | [ˌfɜːst ˈeɪd ˌkɪt]      | _____       |
|           | to fix                | [fɪks]                  | _____       |
|           | flag                  | [flæɡ]                  | _____       |
|           | flap                  | [flæp]                  | _____       |
|           | flash                 | [flæʃ]                  | _____       |
|           | flat bed              | [ˈflæt bed]             | _____       |
|           | flat tyre             | [ˌflæt ˈtaɪə(r)]        | _____       |
|           | to flicker            | [ˈflɪkə(r)]             | _____       |
|           | flight level          | [ˈflaɪt levl]           | _____       |
|           | flight plan           | [ˈflaɪt plæn]           | _____       |
|           | flock                 | [flɒk]                  | _____       |
| flood     | [flʌd]                | _____                   |             |
| flushed   | [flʌʃt]               | _____                   |             |
| foam      | [fəʊm]                | _____                   |             |
| to foam   | [fəʊm]                | _____                   |             |
| fog       | [fɒɡ]                 | _____                   |             |

| Word               | Phonetics                  | Translation |
|--------------------|----------------------------|-------------|
| forecast           | [ˈfɔ:kɑ:st]                | _____       |
| foreign            | [ˈfɒrən]                   | _____       |
| freefall           | [fri:'fɔ:l]                | _____       |
| frequency          | [ˈfri:kwənsi]              | _____       |
| fuel               | [ˈfju:əl]                  | _____       |
| fuel dumping       | [ˈfju:əl ˌdʌmpɪŋ]          | _____       |
| fuel efficient     | [ˌfju:əl rɪ'fɪʃnt]         | _____       |
| fuel flow          | [ˈfju:əl fləʊ]             | _____       |
| fuel leak          | [ˈfju:əl li:k]             | _____       |
| fuel pipe          | [ˈfju:əl paɪp]             | _____       |
| fuel pump          | [ˈfju:əl pʌmp]             | _____       |
| fuel tank          | [ˈfju:əl tæŋk]             | _____       |
| fuel tanker        | [ˈfju:əl tæŋkə(r)]         | _____       |
| fuselage           | [ˈfju:zələʒ]               | _____       |
| <b>G</b> gate      | [geɪt]                     | _____       |
| to get back        | [ˌget 'bæk]                | _____       |
| to get in          | [ˌget 'ɪn]                 | _____       |
| to get off         | [ˌget 'ɒf]                 | _____       |
| to get ready       | [ˌget 'redi]               | _____       |
| to get rid of      | [ˌget 'rɪd əv]             | _____       |
| to get to          | [ˈget ,tə]                 | _____       |
| glider             | [ˈglɑɪdə(r)]               | _____       |
| gravel             | [ˈgrævl]                   | _____       |
| to go around       | [ˌgəʊ ə'raʊnd]             | _____       |
| to go back         | [ˌgəʊ 'bæk]                | _____       |
| to go off          | [ˌgəʊ 'ɒf]                 | _____       |
| ground             | [graʊnd]                   | _____       |
| guess              | [ges]                      | _____       |
| <b>H</b> hail      | [heɪl]                     | _____       |
| halt               | [hɔ:lt]                    | _____       |
| hand               | [hænd]                     | _____       |
| handbook           | [ˈhændbʊk]                 | _____       |
| hang gliding       | [ˈhæŋ glɑɪdɪŋ]             | _____       |
| to hang on         | [ˌhæŋ 'ɒn]                 | _____       |
| hangar             | [ˈhæŋə(r)]                 | _____       |
| harm               | [hɑ:m]                     | _____       |
| hazard             | [ˈhæzəd]                   | _____       |
| head               | [hed]                      | _____       |
| heat resisitant    | [ˈhi:t rɪ,zɪstənt]         | _____       |
| heavy              | [ˈhevi]                    | _____       |
| heavy landing      | [ˌhevi 'ləndɪŋ]            | _____       |
| heavy plant        | [ˌhevi 'plɑ:nt]            | _____       |
| height             | [haɪt]                     | _____       |
| helicopter         | [ˈhelɪkɒptə(r)]            | _____       |
| hijack             | [ˈhaɪdʒæk]                 | _____       |
| to hit             | [hɪt]                      | _____       |
| holding area/point | [ˈhəʊldɪŋ ,eəriə] [ˌpɔɪnt] | _____       |
| hole               | [həʊl]                     | _____       |
| horizontal         | [ˌhɒrɪ'zɒntl]              | _____       |
| hot                | [hɒt]                      | _____       |
| hot air balloon    | [ˌhɒt 'eə bæ,lʊ:n]         | _____       |
| to hover           | [ˈhɒvə(r)]                 | _____       |
| hurricane          | [ˈhʌrɪkən]                 | _____       |
| to hurry           | [ˈhʌri]                    | _____       |
| to hurt            | [hɜ:t]                     | _____       |
| hydraulic          | [haɪ'drɔ:lɪk] [-'drɒl-]    | _____       |
| hypoxia            | [haɪ'pɒksɪə]               | _____       |
| ice                | [aɪs]                      | _____       |

|                       | Word                          | Phonetics                 | Translation |
|-----------------------|-------------------------------|---------------------------|-------------|
| <b>I</b>              | <b>icing</b>                  | [ˈaɪsɪŋ]                  | _____       |
|                       | <b>to identify</b>            | [aɪˈdentɪfaɪ]             | _____       |
|                       | <b>immediately</b>            | [ɪˈmiːdiətli]             | _____       |
|                       | <b>impact</b>                 | [ˈɪmpækt]                 | _____       |
|                       | <b>impossible</b>             | [ɪmˈpɒsəbl]               | _____       |
|                       | <b>to improve</b>             | [ɪmˈpruːv]                | _____       |
|                       | <b>in front of</b>            | [,ɪn ˈfrʌnt əv]           | _____       |
|                       | <b>in sight</b>               | [,ɪn ˈsaɪt]               | _____       |
|                       | <b>inboard</b>                | [ˈɪnbɔːd]                 | _____       |
|                       | <b>inbound</b>                | [ˈɪnbaʊnd]                | _____       |
|                       | <b>incapacitation</b>         | [,ɪnkəˌpæsiˈteɪʃn]        | _____       |
|                       | <b>incident</b>               | [ˈɪnsɪdənt]               | _____       |
|                       | <b>incoming</b>               | [ˈɪnkʌmɪŋ]                | _____       |
|                       | <b>inconvenient</b>           | [,ɪnkənˈviːniənt]         | _____       |
|                       | <b>increase</b>               | [ɪnˈkriːs]                | _____       |
|                       | <b>incursion</b>              | [ɪnˈkɜːʃn]                | _____       |
|                       | <b>to indicate</b>            | [ˈɪndɪkeɪt]               | _____       |
|                       | <b>indication</b>             | [,ɪndrɪˈkeɪʃn]            | _____       |
|                       | <b>industrial action</b>      | [ɪnˌdʌstriəl ˈækʃn]       | _____       |
|                       | <b>in-flight refuelling</b>   | [ɪnˌflaɪt riːˈfjuːəlɪŋ]   | _____       |
|                       | <b>inhaler</b>                | [ɪnˈheɪlə(r)]             | _____       |
|                       | <b>to injure</b>              | [ˈɪndʒə(r)]               | _____       |
|                       | <b>injury</b>                 | [ˈɪndʒəri]                | _____       |
|                       | <b>inner</b>                  | [ˈɪnə(r)]                 | _____       |
|                       | <b>inoperable</b>             | [ɪnˈɒpərəbl]              | _____       |
|                       | <b>insect</b>                 | [ˈɪnsekt]                 | _____       |
|                       | <b>to inspect</b>             | [ɪnˈspekt]                | _____       |
|                       | <b>inspection</b>             | [ɪnˈspekʃn]               | _____       |
|                       | <b>instead</b>                | [ɪnˈsted]                 | _____       |
|                       | <b>to instruct</b>            | [ɪnˈstrʌkt]               | _____       |
|                       | <b>instruction</b>            | [ɪnˈstrʌkʃn]              | _____       |
|                       | <b>insulin</b>                | [ˈɪnsjʊlɪn]               | _____       |
|                       | <b>insurance certificates</b> | [ɪnˈʃʊərəns səˌtɪfɪkətɪs] | _____       |
|                       | <b>to intend</b>              | [ɪnˈtend]                 | _____       |
|                       | <b>intention</b>              | [ɪnˈtenʃn]                | _____       |
|                       | <b>intercom</b>               | [ˈɪntəkɒm]                | _____       |
| <b>interference</b>   | [,ɪntəˈfɪərəns]               | _____                     |             |
| <b>to interpret</b>   | [ɪnˈtɜːprɪt]                  | _____                     |             |
| <b>intersection</b>   | [,ɪntəˈsekʃn]                 | _____                     |             |
| <b>into</b>           | [ˈɪntə]                       | _____                     |             |
| <b>in use</b>         | [,ɪn ˈjuːs]                   | _____                     |             |
| <b>investigation</b>  | [ɪnˌvestɪˈɡeɪʃn]              | _____                     |             |
| <b>to issue</b>       | [ˈɪʃuː]                       | _____                     |             |
| <b>J</b>              | <b>to jam</b>                 | [dʒæm]                    | _____       |
|                       | <b>jaw</b>                    | [dʒɔː]                    | _____       |
|                       | <b>jet blast</b>              | [ˈdʒet blɑːst]            | _____       |
|                       | <b>jetty</b>                  | [ˈdʒeti]                  | _____       |
|                       | <b>to join</b>                | [dʒɔɪn]                   | _____       |
| <b>junction</b>       | [ˈdʒʌŋkʃn]                    | _____                     |             |
| <b>K</b>              | <b>to keep up</b>             | [,kiːp ˈʌp]               | _____       |
|                       | <b>kerosene</b>               | [ˈkerəsiːn]               | _____       |
| <b>L</b>              | <b>label</b>                  | [ˈleɪbl]                  | _____       |
|                       | <b>labour</b>                 | [ˈleɪbə(r)]               | _____       |
|                       | <b>to land</b>                | [lænd]                    | _____       |
|                       | <b>landing gear</b>           | [ˈlændɪŋ ɡɪə(r)]          | _____       |
|                       | <b>landing light</b>          | [ˈlændɪŋ laɪt]            | _____       |
|                       | <b>landing roll</b>           | [ˈlændɪŋ rɒl]             | _____       |
| <b>landing weight</b> | [ˈlændɪŋ weɪt]                | _____                     |             |

| Word                    | Phonetics            | Translation |
|-------------------------|----------------------|-------------|
| <b>laser testing</b>    | [ˌleɪzə ˈtestɪŋ]     | _____       |
| <b>lawful</b>           | [ˈlɔːfl]             | _____       |
| <b>leading edge</b>     | [ˈliːdɪŋ ˌedʒ]       | _____       |
| <b>left</b>             | [left]               | _____       |
| <b>leg</b>              | [leg]                | _____       |
| <b>length</b>           | [leŋθ]               | _____       |
| <b>level bust</b>       | [ˌlevl ˈbʌst]        | _____       |
| <b>to level off</b>     | [ˌlevl ˈɒf]          | _____       |
| <b>life threatening</b> | [ˈlaɪf ˌθretnɪŋ]     | _____       |
| <b>lift</b>             | [lɪft]               | _____       |
| <b>light aircraft</b>   | [ˌlaɪt ˈeəkrɑːft]    | _____       |
| <b>lightning</b>        | [ˈlaɪtnɪŋ]           | _____       |
| <b>limit</b>            | [ˈlɪmɪt]             | _____       |
| <b>to line up</b>       | [ˌlaɪn ˈʌp]          | _____       |
| <b>list</b>             | [lɪst]               | _____       |
| <b>to load</b>          | [ləʊd]               | _____       |
| <b>load sheet</b>       | [ˈləʊd ʃiːt]         | _____       |
| <b>local</b>            | [ˈləʊkl]             | _____       |
| <b>lock</b>             | [lɒk]                | _____       |
| <b>long</b>             | [lɒŋ]                | _____       |
| <b>long haul</b>        | [ˈlɒŋ haʊl]          | _____       |
| <b>to look after</b>    | [ˌlʊk ˈɑːftə(r)]     | _____       |
| <b>to look up</b>       | [ˌlʊk ˈʌp]           | _____       |
| <b>to lose</b>          | [luːz]               | _____       |
| <b>loud</b>             | [laʊd]               | _____       |
| <b>low</b>              | [ləʊ]                | _____       |
| <b>to lower</b>         | [ˈləʊə(r)]           | _____       |
| <b>luggage</b>          | [ˈlʌɡɪdʒ]            | _____       |
| <b>M</b>                |                      |             |
| <b>to maintain</b>      | [meɪnˈteɪn]          | _____       |
| <b>maintenance</b>      | [ˈmeɪntənəns]        | _____       |
| <b>major</b>            | [ˈmeɪdʒə(r)]         | _____       |
| <b>malfunction</b>      | [ˌmælfʌŋkʃn]         | _____       |
| <b>manoeuvre</b>        | [məˈnuːvə(r)]        | _____       |
| <b>manual</b>           | [ˈmænjuəl]           | _____       |
| <b>manufacturer</b>     | [ˌmænjʊˈfæktʃərə(r)] | _____       |
| <b>marking</b>          | [ˈmɑːkɪŋ]            | _____       |
| <b>mast</b>             | [mɑːst]              | _____       |
| <b>material</b>         | [məˈtɪəriəl]         | _____       |
| <b>mechanical</b>       | [məˈkænikl]          | _____       |
| <b>medical kit</b>      | [ˈmedɪkl kɪt]        | _____       |
| <b>member</b>           | [ˈmembə(r)]          | _____       |
| <b>to mention</b>       | [ˈmenʃn]             | _____       |
| <b>message</b>          | [ˈmesɪdʒ]            | _____       |
| <b>middle</b>           | [ˈmɪdl]              | _____       |
| <b>midpoint</b>         | [ˈmɪdpɔɪnt]          | _____       |
| <b>minor</b>            | [ˈmaɪnə(r)]          | _____       |
| <b>to misinterpret</b>  | [ˌmɪsmɪˈtɜːprɪt]     | _____       |
| <b>to miss</b>          | [mɪs]                | _____       |
| <b>moist</b>            | [mɔɪst]              | _____       |
| <b>to monitor</b>       | [ˈmɒnɪtə(r)]         | _____       |
| <b>monsoon</b>          | [ˌmɒnˈsuːn]          | _____       |
| <b>N</b>                |                      |             |
| <b>navigation light</b> | [nævɪˈgeɪʃn ˌlaɪt]   | _____       |
| <b>near</b>             | [nɪə(r)]             | _____       |
| <b>next to</b>          | [ˈnekst tə]          | _____       |
| <b>no parking</b>       | [ˌnəʊ ˈpɑːkɪŋ]       | _____       |
| <b>noise</b>            | [nɔɪz]               | _____       |
| <b>normal</b>           | [ˈnɔːml]             | _____       |
| <b>nose</b>             | [nəʊz]               | _____       |
| <b>nose bleed</b>       | [ˈnəʊz bliːd]        | _____       |
| <b>nose gear</b>        | [ˈnəʊz ɡɪə(r)]       | _____       |

|               | Word                 | Phonetics                    | Translation |
|---------------|----------------------|------------------------------|-------------|
| O             | to obstruct          | [əb'strʌkt]                  |             |
|               | off course           | [,ɒf 'kɔ:s]                  |             |
|               | oil                  | [ɔɪl]                        |             |
|               | oil pressure         | ['ɔɪl preʃə(r)]              |             |
|               | on board             | [,ɒn 'bɔ:d]                  |             |
|               | on course            | [,ɒn 'kɔ:s]                  |             |
|               | on fire              | [,ɒn 'faɪə(r)]               |             |
|               | operable             | ['ɒpərəbl]                   |             |
|               | to operate           | ['ɒpəreɪt]                   |             |
|               | operation            | [,ɒpə'reɪʃn]                 |             |
|               | opposite             | ['ɒpəzɪt]                    |             |
|               | out of order/service | [,aʊt əv 'ɔ:də(r)] ['sɜ:vɪs] |             |
|               | outboard             | ['aʊtbɔ:d]                   |             |
|               | outer                | ['aʊtə(r)]                   |             |
|               | outer marker         | [,aʊtə 'mɑ:kə(r)]            |             |
|               | over                 | ['əʊvə(r)]                   |             |
|               | overcast             | [,əʊvə'kɑ:st]                |             |
|               | to overheat          | [,əʊvə'hi:t]                 |             |
|               | to overtake          | [,əʊvə'teɪk]                 |             |
|               | overweight           | [,əʊvə'weɪt]                 |             |
| oxygen bottle | ['ɒksɪdʒən ,bɒtl]    |                              |             |
| P             | to pack              | [pæk]                        |             |
|               | panel                | ['pænl]                      |             |
|               | panic                | ['pænik]                     |             |
|               | parachute jumping    | ['pærəʃu:t ,dʒʌmpɪŋ]         |             |
|               | parallel             | ['pærəlel]                   |             |
|               | parking space        | ['pɑ:kɪŋ ,speɪs]             |             |
|               | partly covered       | ['pɑ:tli ,kʌvəd]             |             |
|               | pass                 | [pɑ:s]                       |             |
|               | to pass              | [pɑ:s]                       |             |
|               | to pass out          | [pɑ:s 'aʊt]                  |             |
|               | patch                | [pætʃ]                       |             |
|               | path                 | [pɑ:θ]                       |             |
|               | paved                | [peɪvd]                      |             |
|               | permissible          | [pə'mɪsəbl]                  |             |
|               | permission           | [pə'mɪʃn]                    |             |
|               | to pick up           | [pɪk 'ʌp]                    |             |
|               | pier                 | [pɪə(r)]                     |             |
|               | pitot cover          | ['pi:təʊ ,kʌvə(r)]           |             |
|               | police               | [pə'li:s]                    |             |
|               | to pollute           | [pə'lu:t]                    |             |
|               | poor                 | [pɔ:(r)]                     |             |
|               | position             | [pə'zɪʃn]                    |             |
|               | possible             | ['pɒsəbl]                    |             |
|               | power                | ['paʊə(r)]                   |             |
|               | practice             | ['præktɪs]                   |             |
|               | precaution           | [pri'keɪʃn]                  |             |
|               | to prepare           | [pri'peə(r)]                 |             |
|               | pressure             | ['preʃə(r)]                  |             |
|               | pressurisation       | [,preʃərəɪ'zeɪʃn]            |             |
|               | priority             | [praɪ'ɒrəti]                 |             |
|               | procedure            | [pra'si:dʒə(r)]              |             |
|               | to proceed           | [pra'si:d]                   |             |
|               | to produce           | [prə'dju:s]                  |             |
|               | to prohibit          | [prə'hɪbɪt]                  |             |
|               | protection           | [prə'tekʃn]                  |             |
|               | to push back         | [,pʊʃ 'bæk]                  |             |
|               | to put on            | [,pʊt 'ɒn]                   |             |
|               | to put out           | [,pʊt 'aʊt]                  |             |
|               | pylon                | ['paɪlən]                    |             |

|          | Word                   | Phonetics                | Translation |
|----------|------------------------|--------------------------|-------------|
| <b>R</b> | <b>radio licence</b>   | [reɪdiəʊ ,laɪsns]        | _____       |
|          | <b>radius</b>          | [reɪdiəs]                | _____       |
|          | <b>radome</b>          | [reɪdəʊm]                | _____       |
|          | <b>rain</b>            | [reɪn]                   | _____       |
|          | <b>ramp</b>            | [ræmp]                   | _____       |
|          | <b>rapid exit</b>      | [ˌræpɪd 'ezɪt] [-'egsɪt] | _____       |
|          | <b>rather than</b>     | [ˈrɑːðə ,ðən]            | _____       |
|          | <b>to reach</b>        | [ri:tʃ]                  | _____       |
|          | <b>readable</b>        | [ˈriːdəbl]               | _____       |
|          | <b>readback</b>        | [ˈriːdbæk]               | _____       |
|          | <b>rear</b>            | [rɪə(r)]                 | _____       |
|          | <b>reasonable</b>      | [ˈriːznəbl]              | _____       |
|          | <b>to receive</b>      | [rɪ'siːv]                | _____       |
|          | <b>reception</b>       | [rɪ'sepʃn]               | _____       |
|          | <b>to reduce</b>       | [rɪ'djuːs]               | _____       |
|          | <b>to refuel</b>       | [ˌriː'fjuːəl]            | _____       |
|          | <b>region</b>          | [ˈriːdʒən]               | _____       |
|          | <b>to release</b>      | [rɪ'liːs]                | _____       |
|          | <b>to reload</b>       | [ˌriː'ləʊd]              | _____       |
|          | <b>to remain</b>       | [rɪ'meɪn]                | _____       |
|          | <b>to remove</b>       | [rɪ'muːv]                | _____       |
|          | <b>to repair</b>       | [rɪ'peə(r)]              | _____       |
|          | <b>to repeat</b>       | [rɪ'piːt]                | _____       |
|          | <b>to reply</b>        | [rɪ'plɑː]                | _____       |
|          | <b>to report</b>       | [rɪ'pɔːt]                | _____       |
|          | <b>to request</b>      | [rɪ'kwest]               | _____       |
|          | <b>to require</b>      | [rɪ'kwaɪə(r)]            | _____       |
|          | <b>to rescue</b>       | [ˈreskjʊː]               | _____       |
|          | <b>to reserve</b>      | [rɪ'zɜːv]                | _____       |
|          | <b>response</b>        | [rɪ'spɒns]               | _____       |
|          | <b>responsibility</b>  | [rɪ'spɒnsə'bɪlətɪ]       | _____       |
|          | <b>to retract</b>      | [rɪ'trækt]               | _____       |
|          | <b>to return</b>       | [rɪ'tɜːn]                | _____       |
|          | <b>right</b>           | [raɪt]                   | _____       |
|          | <b>rigid</b>           | [ˈrɪdʒɪd]                | _____       |
|          | <b>to rip</b>          | [rɪp]                    | _____       |
|          | <b>to rise</b>         | [raɪz]                   | _____       |
|          | <b>rise</b>            | [raɪz]                   | _____       |
|          | <b>to risk</b>         | [rɪsk]                   | _____       |
|          | <b>to roll</b>         | [rəʊl]                   | _____       |
|          | <b>rotation speed</b>  | [rəʊ'teɪʃn ,spiːd]       | _____       |
|          | <b>rough</b>           | [rʌf]                    | _____       |
|          | <b>route</b>           | [ruːt]                   | _____       |
|          | <b>routine</b>         | [ruː'tiːn]               | _____       |
|          | <b>rubber</b>          | [ˈrʌbə(r)]               | _____       |
|          | <b>rudder</b>          | [ˈrʌdə(r)]               | _____       |
|          | <b>rude</b>            | [ruːd]                   | _____       |
| <b>S</b> | <b>safe separation</b> | [ˌseɪf sepə'reɪʃn]       | _____       |
|          | <b>safety</b>          | [ˈseɪftɪ]                | _____       |
|          | <b>same</b>            | [seɪm]                   | _____       |
|          | <b>sandstorm</b>       | [ˈsændstɔːm]             | _____       |
|          | <b>scattered</b>       | [ˈskætəd]                | _____       |
|          | <b>screen</b>          | [skriːn]                 | _____       |
|          | <b>season</b>          | [ˈsiːzn]                 | _____       |
|          | <b>secure</b>          | [sɪ'kjʊə(r)]             | _____       |
|          | <b>security</b>        | [sɪ'kjʊərətɪ]            | _____       |
|          | <b>seizure</b>         | [ˈsiːʒə(r)]              | _____       |
|          | <b>self-build</b>      | [ˈselfbɪld]              | _____       |
|          | <b>separation</b>      | [ˌsepə'reɪʃn]            | _____       |
|          | <b>serious</b>         | [ˈsɪəriəs]               | _____       |

| Word                 | Phonetics                 | Translation |
|----------------------|---------------------------|-------------|
| service              | [ˈsɜːvɪs]                 | _____       |
| service hatch        | [ˈsɜːvɪs ˌhætʃ]           | _____       |
| to set               | [set]                     | _____       |
| setting              | [ˈsetɪŋ]                  | _____       |
| severe               | [sɪˈvɪə(r)]               | _____       |
| shingle              | [ˈʃɪŋɡl]                  | _____       |
| short haul           | [ˈʃɔːt haʊl]              | _____       |
| shortness of breath  | [ˌʃɔːtnəs əv ˈbreθ]       | _____       |
| to shudder           | [ˈʃʌdə(r)]                | _____       |
| to shut down         | [ˌʃʌt ˈdaʊn]              | _____       |
| sick                 | [sɪk]                     | _____       |
| side                 | [saɪd]                    | _____       |
| sign board           | [ˈsaɪn bɔːd]              | _____       |
| signal               | [ˈsɪɡnəl]                 | _____       |
| simulator            | [ˈsɪmjʊlətə(r)]           | _____       |
| to sink              | [sɪŋk]                    | _____       |
| situation            | [ˌsɪtʃuˈeɪʃn]             | _____       |
| to skid off          | [ˌskɪd ˈɒf]               | _____       |
| slat                 | [slæt]                    | _____       |
| slippery             | [ˈslɪpəri]                | _____       |
| slot time            | [ˈslɒt taɪm]              | _____       |
| slow                 | [sləʊ]                    | _____       |
| to slow down         | [ˌsləʊ ˈdaʊn]             | _____       |
| slush                | [slʌʃ]                    | _____       |
| to smell             | [smel]                    | _____       |
| smoke                | [sməʊk]                   | _____       |
| smoke hood           | [ˈsməʊk hʊd]              | _____       |
| to smuggle           | [ˈsmʌɡl]                  | _____       |
| snow                 | [snəʊ]                    | _____       |
| snowplough           | [ˈsnəʊpləʊ]               | _____       |
| space                | [speɪs]                   | _____       |
| spacing              | [ˈspeɪsɪŋ]                | _____       |
| to speed up          | [ˌspiːd ˈʌp]              | _____       |
| to spill             | [spɪl]                    | _____       |
| spillage             | [ˈspɪlɪdʒ]                | _____       |
| spoiler              | [ˈspɔɪlə(r)]              | _____       |
| spray                | [spreɪ]                   | _____       |
| to spray             | [spreɪ]                   | _____       |
| stack                | [stæk]                    | _____       |
| stairs               | [steəz]                   | _____       |
| to stall             | [stɔːl]                   | _____       |
| stand                | [ˈstænd]                  | _____       |
| standby              | [stændˈbaɪ]               | _____       |
| standing water       | [ˈstændɪŋ wɔːtə(r)]       | _____       |
| to start up          | [ˌstɑːt ˈʌp]              | _____       |
| to stay on           | [ˌsteɪ ˈɒn]               | _____       |
| to stay up           | [ˌsteɪ ˈʌp]               | _____       |
| to stick             | [stɪk]                    | _____       |
| stomach pain         | [ˈstʌmək peɪn]            | _____       |
| to stop              | [stɒp]                    | _____       |
| to stow              | [stəʊ]                    | _____       |
| straightaway         | [ˌstreɪtəˈweɪ]            | _____       |
| strap                | [stræp]                   | _____       |
| to strap             | [stræp]                   | _____       |
| to stream            | [striːm]                  | _____       |
| strike               | [straɪk]                  | _____       |
| strip                | [stri:p]                  | _____       |
| strong               | [strɒŋ]                   | _____       |
| structural failure   | [ˈstrʌktʃərəl ˌfeɪljə(r)] | _____       |
| subsidence inversion | [ˈsʌbsɪdəns ɪnˌvɜːʃn]     | _____       |
| substance            | [ˈsʌbstəns]               | _____       |



**Word**

**sudden**  
**sunrise**  
**sunset**  
**super jumbo**  
**surface**  
to **surge**  
to **surround**  
to **suspect**  
**sweeper**  
to **swerve**  
**switch**  
to **switch on**  
**system**

**Phonetics**

[ˈsʌdn̩]  
[ˈsʌnrʌɪz]  
[ˈsʌnsɛt]  
[ˈsuːpəˌdʒʌmbəʊ]  
[ˈsɜːfɪs]  
[sɜːdʒ]  
[səˈraʊnd]  
[səˈspekt]  
[ˈswiːpə(r)]  
[swɜːv]  
[swɪtʃ]  
[ˌswɪtʃ ˈɒn]  
[ˈsɪstəm]

**Translation****T**

**tail assembly**  
**tail strike**  
to **take off**  
**tanker**  
**technical**  
**temperature**  
**terminal building**  
**terrorism**  
**threshold**  
**thrust**  
**thunderstorm**  
**tidy**  
to **touch down**  
**tourism**  
**trailing edge**  
**training**  
**transfer**  
**transmission**  
to **travel**  
**treatment**  
**trip**  
**trolley**  
**tropical**  
to **troubleshoot**  
**truck**  
to **try**  
**tug**  
**turbulence**  
to **turn around**  
to **turn down**  
**turnaround**  
to **twitch**  
**typhoon**  
**tyre**  
**tyre debris**

[ˈteɪl əˌsɛmbli]  
[ˈteɪl straɪk]  
[ˌteɪk ˈɒf]  
[ˈtæŋkə(r)]  
[ˈteknɪkl]  
[ˈtɛmprətʃə(r)]  
[ˈtɜːmɪnəlˌbɪldɪŋ]  
[ˈtɛrərɪzəm]  
[ˈθreʃhəʊld]  
[θrʌst]  
[ˈθʌndəstɔːm]  
[ˈtaɪdi]  
[ˌtʌtʃ ˈdaʊn]  
[ˈtʊərɪzəm]  
[ˈtreɪlɪŋˌedʒ]  
[ˈtreɪnɪŋ]  
[trænsˈfɜː(r)]  
[trænsˈmɪʃn]  
[ˈtrævəl]  
[ˈtriːtmənt]  
[ˈtrɪp]  
[ˈtrɒli]  
[ˈtrɒpɪkl]  
[ˈtrʌbljuːt]  
[ˈtrʌk]  
[traɪ]  
[tʌg]  
[ˈtɜːbjələns]  
[ˌtɜːn əˈraʊnd]  
[ˌtɜːn ˈdaʊn]  
[ˈtɜːnəraʊnd]  
[ˈtwɪtʃ]  
[taɪˈfuːn]  
[ˈtaɪə(r)]  
[ˌtaɪə ˈdebriː]

**U**

**unauthorised**  
**under control**  
**undercarriage**  
**unlawful**  
**unload**  
**unreadable**  
**unruly**  
**unusual**  
**upper**  
**urgent**  
to **use**  
**usual**

[ʌnˈɔːθəraɪzd]  
[ˌʌndə kənˈtrəʊl]  
[ˈʌndəkærɪdʒ]  
[ʌnˈlɔːfl]  
[ˌʌnˈləʊd]  
[ʌnˈriːdəbl]  
[ʌnˈruːli]  
[ʌnˈjuːʒuəl]  
[ˈʌpə(r)]  
[ˈɜːdʒənt]  
[juːz]  
[ˈjuːʒuəl]

|           | Word                   | Phonetics            | Translation |
|-----------|------------------------|----------------------|-------------|
| <b>V</b>  | to vacate              | [və'keɪt] [ver'keɪt] | _____       |
|           | valid                  | ['vælɪd]             | _____       |
|           | vapour                 | ['veɪpə(r)]          | _____       |
|           | vehicle                | ['viːəkl]            | _____       |
|           | vertical               | ['vɜːtɪkl]           | _____       |
|           | vibration              | [vaɪ'breɪʃn]         | _____       |
|           | violent                | ['vaɪələnt]          | _____       |
|           | visibility             | [,vɪzə'bɪlətɪ]       | _____       |
|           | visible                | ['vɪzəbl]            | _____       |
|           | visual                 | ['vɪʒuəl]            | _____       |
|           | vital                  | ['vaɪtl]             | _____       |
|           | volcanic               | [vɒl'kænɪk]          | _____       |
| <b>W</b>  | to wait                | [weɪt]               | _____       |
|           | wake                   | [weɪk]               | _____       |
|           | warning light          | ['wɔːnɪŋ ,laɪt]      | _____       |
|           | water patches          | ['wɔːtə pætʃɪz]      | _____       |
|           | wear                   | [weə(r)]             | _____       |
|           | weather balloon        | ['weðə bə,lʊːn]      | _____       |
|           | well clear             | ['wel klɪə(r)]       | _____       |
|           | wet conditions         | ['wet kən,dɪʃnz]     | _____       |
|           | widespread             | ['waɪdspred]         | _____       |
|           | wind                   | [wɪnd]               | _____       |
|           | windscreen             | ['wɪndskriːn]        | _____       |
|           | windshear              | ['wɪndʃɪə(r)]        | _____       |
|           | winglet                | ['wɪŋlət]            | _____       |
|           | to witness             | ['wɪtnəs]            | _____       |
|           | work in progress (WIP) | [,wɜːk ɪn 'prəʊɡres] | _____       |
| works (n) | [wɜːks]                | _____                |             |
| wrong     | [rɒŋ]                  | _____                |             |

## GLOSSARY OF AVIATION TERMS

| Word   | Definition and examples   |
|--|---|
| <b>aft</b>                                     | an adjective referring to the back part of a plane. <i>Rear</i> is also used with the same meaning. It contrasts with <i>forward</i> . The words <i>before</i> and <i>after</i> are only used to talk about time relationships  |
| <b>A.C.</b>                                    | Alternating Current: the type of electrical power generated by the engine generators and characterised by frequency oscillation as opposed to D.C. (Direct Current).  |
| <b>a/c</b>                                     | abbreviation for <i>aircraft</i>  |
| <b>abeam the runway</b>                        | indicating that the runway is to the side of the aircraft, at a bearing of approximately 90° or 270° relative to the aircraft, i.e. to the right or the left  |
| <b>abort (v)</b>                               | to stop doing something or stop a process that you had intended to do or had already started to do, especially a take-off or landing: <i>take-off must be aborted before V1.</i>  |
| <b>ACAS</b>                                    | Airborne Collision Avoidance System: an aircraft system using Secondary Surveillance Radar (SSR) transponder signals, which operates independently of ground equipment to alert the flight crew about conflicting aircraft  |
| <b>A.C. bus</b>                                | an aircraft electrical power distribution point for alternating current to which several power circuits are connected   |
| <b>AC Essential feed</b>                       | the main alternating current power supply   |
| <b>access platform</b>                         | a platform mounted on wheels with steps which allows technicians to gain access to the higher parts of the aircraft   |
| <b>accretion rate</b>                          | the speed at which ice is accumulating; it is also referred to as the <i>accumulation rate</i> or <i>build-up rate</i>  |
| <b>acknowledge (v)</b>                         | to say that you have heard and understood. It is important that the controller listens carefully to pilot input on the nature of the emergency, requests clarification if in doubt, and gives the crew reassurance that their problem is understood. Requesting and providing clarification, paraphrasing, confirming and acknowledging all play a key role in such exchanges: <i>In case of radio failure, acknowledge by flashing headlights.</i> |
| <b>acid</b>                                    | used to describe a sharp, bitter (smell), especially of smoke or fumes  |
| <b>acute</b>                                   | 1) at a sharp angle, at an angle of less than 90°<br>2) severe: <i>acute pain</i>   |
| <b>ADF</b>                                     | Automatic Direction Finder: airborne radio navaid tuned to non-directional beacons; the intersection of two bearings provides the aircraft's position: <i>if the ADF needle points up, the NDB is ahead</i>   |
| <b>advance (v)</b>                             | to move forward the thrust or throttle levers to increase engine power; the contrary of <i>to retard</i> : <i>advance the thrust levers to TOGA (Take-off / Go-around)</i>  |
| <b>Advanced Visual Docking Guidance System</b> | another term for the Nose-in Guidance System or PAPA (Parallel Aircraft Parking Aid). Different technologies are used, but basically they all use a system of lights to guide the crew to the correct position for their aircraft type  |
| <b>advise (v)</b>                              | most often used in aviation in the sense of <i>to inform</i> or <i>to tell</i> , rather than <i>to recommend</i> : <i>advise intentions</i>   |
| <b>advisory</b>                                | information displayed to the crew which does not require immediate action or informational documents issued by the regulator or the manufacturer  |
| <b>aerodrome</b>                               | any place from which aircraft flight operations take place  |
| <b>affect (v)</b>                              | to have an effect or influence on something or someone: <i>It is well known that fatigue affects a pilot's alertness and performance</i>  |
| <b>affirm</b>                                  | yes: 'Confirm 8.33.' – 'Affirm. 8.33.'  |
| <b>against</b>                                 | 1) in relation to, compared with: <i>the airspeed against angle of attack ratio was a concern</i><br>2) in contact with: <i>the aircraft overran the end of the runway and came to a stop against the boundary fence.</i>   |
| <b>AGNIS</b>                                   | Azimuth Guidance for Nose-In Stand: one of the most popular forms of stand guidance, i.e. ways of guiding a plane to its correct position in the stand  |
| <b>ahead</b>                                   | in front of the aircraft: <i>there is traffic ahead at 10 o'clock.</i>  |

| Word                                   | Definition and examples   |
|--|---|
| <b>ahead of the aircraft</b>           | a desirable condition meaning that the flight crew can anticipate what the aircraft will do and what they should plan for in advance: <i>the crew must stay ahead of the aircraft at all times.</i>   |
| <b>aileron power control unit</b>      | a hydraulically powered servo-control which moves the ailerons on the outer wings   |
| <b>air conditioning pack</b>           | a large unit comprising an air cycle machine and pre-cooler which regulates bleed air from the engine compressor for use in conditioning the cabin air  |
| <b>Air Data Computer</b>               | ADC: a digital computer serving as a central source of information on the surrounding atmosphere and the aircraft flight through it. It provides the pressure altitude, outside air temperature, airspeed, Mach number and angle of attack data to the automatic flight control system, the flight instruments and other systems.                             |
| <b>Air Safety Report</b>               | a report written after an operational incident. Transparent, non-blaming reporting of incidents contributes significantly to improvements in safety and a better understanding of error chains  |
| <b>airborne</b>                        | 1) in the air<br>2) installed or carried on the aircraft: <i>The ADF is an airborne navaid</i>  |
| <b>airbridge</b>                       | a telescopic walkway for passengers to board and disembark from the aircraft directly from and to the terminal building; it is also referred to as a <i>jetway</i> or <i>jetty</i>  |
| <b>aircraft maintenance technician</b> | AMT: an aircraft mechanic or engineer who inspects and services the aircraft (engine oil levels, tyre pressure and wear, signs of fuel or hydraulic leaks, impact damage to the engine air intakes and wing leading edges etc.), performs any small repairs and makes entries in the aircraft technical logbook. These activities are <i>line maintenance</i> |
| <b>airframe</b>                        | another word for the aircraft structure or <i>fuselage</i> and wings; <i>hull</i> is also used  |
| <b>AIRPROX</b>                         | a situation in which the distance between aircraft and their relative positions and speed is such that their safety may be threatened. After such an incident a pilot or ATCO can file a report.  |
| <b>airstairs</b>                       | mobile stairs used at outlying stands for passengers to board and disembark   |
| <b>ALAR</b>                            | Approach and Landing Accident Reduction: more accidents occur during approach and landing than during any other phase of flight. The Flight Safety Foundation has gathered extensive research on this issue and published the ALAR Tool Kit.  |
| <b>alternate (n)</b>                   | an airport along or near the scheduled route to which the aircraft can divert and where it can land in case of an incident during the flight  |
| <b>alternative</b>                     | something you can choose to do instead of something else. It can be related to any aspect of the flight: routing, level, heading, timing etc: <i>We have two alternatives: uplift extra fuel or offload the last passengers.</i>  |
| <b>altimeter setting</b>               | standard pressure altitude with reference to sea level (QNH) or local pressure altitude at the airport elevation (QFE) set by the crew on their altimeter and critical, especially during descent and approach: <i>The altimeter setting is 1023. Confirm.</i>  |
| <b>altitude restriction</b>            | an obligation for the crew to not fly above or below a certain altitude at a given point or in a given area   |
| <b>amber transit lights</b>            | the amber lights neat the landing gear lever which are illuminated when the landing gear is moving between its extended and retracted positions and vice versa  |
| <b>ambient lighting</b>                | the general lighting of the cockpit provided by the dome light  |
| <b>amend (v)</b>                       | to modify or change something: <i>We wish to amend our flight plan.</i>   |
| <b>AMT</b>                             | See <i>aircraft maintenance technician</i>  |
| <b>analog(ue)</b>                      | technology based on continuous variables rather than digital binary inputs: <i>Most analog(ue) instruments have been replaced by digital displays.</i>  |
| <b>angled exit / turn-off</b>          | exits designed to facilitate aircraft vacating the runway at speed, hence the term <i>high-speed turnoff</i> , and performing a rolling start for take-off  |
| <b>angle of attack</b>                 | AOA or $\alpha$ : the angle between the chord line of the wing of an aircraft and the vector representing the relative motion between the aircraft and the atmosphere. Information from the angle of attack sensor, or alpha probe, is used to trigger a stall warning.   |
| <b>anomaly</b>                         | an unusual, incorrect or abnormal event: <i>we experienced an oil pressure indication anomaly on Engine Number 3.</i>   |
| <b>ANSP</b>                            | Air Navigation Service Provider: organisation providing air traffic control within a given region for example, Aerothai, Airways NZ, DFS, FANA, FAA, NAV Canada, NATS, PANSAs, ENAV etc.  |
| <b>anti-ice / anti-icing</b>           | all the pneumatic systems which prevent the accumulation of ice on the wing leading edges and engine air intakes: <i>wing anti-ice, engine anti-ice</i>   |

| Word                              | Definition and examples  |
|-----------------------------------|--|
| <b>Antonov</b>                    | Russian aircraft manufacturer. The Antonov 124 and 225 are currently among the world's largest cargo aircraft; the Antonov 225 has a maximum take-off weight of approximately 600 tonnes   |
| <b>approach charts</b>            | instrument approach charts show holding procedures, instrument approach procedures and missed approach procedures. In addition to the plan and profile views of various instrument procedures, the charts provide a wealth of other information: obstacle location and clearance height (OCH); ground speeds versus rates of descent; VOR-DME, LOC, G/S, IAF identifiers and frequencies; transition altitudes and levels; airfield elevation in feet and metres; Tower, Approach, Ground and ATIS radio frequencies; the location of outer, middle and inner markers, fixes and missed approach point; ILS minima; minimum safe /descent altitudes; final approach course; decision height / altitude; threshold crossing heights (TCH); missed approach procedure etc. |
| <b>Approach Control frequency</b> | the frequency used by the Approach controllers at a given airport as distinct from the Tower or Ground frequencies   |
| <b>approach gate</b>              | an imaginary point used as a basis for vectoring the aircraft to the final approach course. The gate will be established along the final approach course 1 mile from the final approach fix on the side away from the airport and will be no closer than 5 miles from the landing threshold  |
| <b>approach segments</b>          | the parts of an instrument approach: arrival, initial approach, intermediate approach, final approach and missed approach segments   |
| <b>apron</b>                      | the paved area around the terminal buildings, hangars and cargo terminals where aircraft park  |
| <b>APU</b>                        | Auxiliary Power Unit: a small gas turbine engine, usually located in the tail cone, which is used on the ground when the engines are shut down to generate electricity, to provide air conditioning and high pressure air to start the engines. The APU can also be used in flight up to 25,000 feet for back-up electrical power in the event of an engine failure  |
| <b>aquaplaning</b>                | when an aircraft's wheels are partially supported by standing water on the runway and not fully in contact with the runway surface so that braking and steering are inefficient  |
| <b>arc</b>                        | the ground track of an aircraft flying a constant DME distance from a navaid to intercept the ILS localizer inbound course. The <i>DME arc</i> is often used to transition from en route to intermediate approach.   |
| <b>Are you visual?</b>            | 'Have you got the runway in sight?'  |
| <b>Area Control (Centre)</b>      | ACC: ATCOs responsible for planes overflying a large area of airspace en route at altitude   |
| <b>area navigation</b>            | RNAV: <i>area navigation</i> allows pilots to fly on a direct course using, but not actually overflying, ground-based radio aids. RNAV systems can provide distance to waypoints in nautical miles, crosstrack deviation from the selected course, groundspeed in knots and time-to-waypoints: <i>LORAN-C and GPS are forms of area navigation.</i>  |
| <b>arm (v)</b>                    | to place a device in an active mode so that it is ready to operate: <i>arm the Vertical Speed mode on the FCU / MCP; the cabin attendant armed the escape slide</i>  |
| <b>asap</b>                       | as soon as possible: immediately, very quickly   |
| <b>assess (v)</b>                 | to evaluate: <i>After a major failure, the crew must assess the situation</i>  |
| <b>assigned level</b>             | the flight level to which a flight has been cleared by ATC   |
| <b>asymmetry</b>                  | unequal position or force on the two sides of the aircraft; <i>flap asymmetry, asymmetric thrust</i>   |
| <b>ASU</b>                        | Air Start Unit: ground support vehicle which compresses air and delivers it to the aircraft engine if the APU is not available   |
| <b>at time</b>                    | mentioned prior to a given time to avoid confusion with any other value: <i>request descent at time 45</i>   |
| <b>ATIS</b>                       | Automatic Terminal Information Service: a continuous broadcast of recorded non-control information in selected high-activity terminal areas. The report is identified by a sequence of letters (...Kilo, Lima, Mike, etc.) For example, "Hong Kong Arrival Information Kilo at 17:05Z; Runway 07 closed for maintenance; Wind 340°, 15 knots; Visibility 8 km ..."   |
| <b>ATR</b>                        | a twin-engine turboprop regional transport manufactured by a consortium of Alenia Aeronautica and EADS. There are two versions: the ATR 42 and larger ATR 72.  |
| <b>attitude</b>                   | the position of the aircraft in relation to the three axes: pitch, roll and yaw. Attitude is conventionally displayed on the Attitude Director Indicator (ADI) or artificial horizon, now often incorporated into the Primary Flight Display (PFD).  |
| <b>audio warning</b>              | a standardised sound (repetitive chime, single stroke chime, clacker, cavalry charge, woofer) which draws the crew's attention to an anomaly: <i>the ENG 1 red fire warning light came on accompanied by the repetitive chime audio warning.</i>   |

| Word                              | Definition and examples   |
|-----------------------------------|---|
| <b>autobrake</b>                  | a computer-assisted system which controls and monitors landing gear brake applications in order to achieve maximum braking efficiency: <i>the PF selects an autobrake MIN, MED or MAX setting according to the runway conditions.</i>   |
| <b>auto-flight system</b>         | AFS: the combination of autopilot, autothrottle / autothrust, flight director, autoland systems etc. used to control the flight through the Flight Management System (FMS)  |
| <b>autoland</b>                   | an autopilot function which enables the aircraft to be landed automatically. ILS installations now often support fully automatic “hands-off” autoland approaches to below 50 feet above the runway threshold in visibility, or Runway Visual Ranges (RVR) as low as 200 metres or less  |
| <b>Automatic Direction Finder</b> | ADF: a flight instrument which indicates the direction from which the signal from a non-directional beacon is coming, i.e. a relative bearing   |
| <b>Autopilot</b>                  | AP: a computerised system which provides the flight controls with orders: <i>The FAA wants new software installed on Boeing 777s to prevent crews from inadvertently engaging the autopilot before takeoff.</i>   |
| <b>autothrottle</b>               | ATHR, an automatic engine power control system: <i>When using the autothrottle during autoland, position command speed to VREF +5 knots</i>   |
| <b>autothrust</b>                 | computerised system which provides the engines with orders: <i>The autothrust was disconnected by the PF to prevent another overspeed condition</i>   |
| <b>aviation English</b>           | <i>Aviation English</i> is broader than ICAO standard phraseology, but it is the language used by pilots and controllers in an operational context. In the ICAO context, fuel prices, low-cost airlines, aerobatics or the four forces of flight are not <i>Aviation English</i> . Non-aviation English would also include vocabulary from completely unrelated fields, idiomatic language, slang, etc.   |
| <b>avionics bay</b>               | the under-floor avionics compartment where computers and other electronic equipment are located (Airbus). Boeing call this compartment the main equipment centre.   |
| <b>avoidance</b>                  | the action of distancing oneself from an obstacle, danger etc   |
| <b>avoiding action</b>            | an announcement by the controller to alert the crews that they must modify their flightpath to avoid coming into conflict with other traffic  |
| <b>axle</b>                       | a shaft on which one or more landing gear wheels are mounted  |
| <b>back course</b>                | a procedure when a reverse ILS localizer signal can be used for an approach   |
| <b>backtrack (v)</b>              | having landed on the runway in use, to turn 180° and proceed along the runway in the opposite direction or having entered the runway lower down, to taxi to the end of the runway and turn 180° in order to have a longer take-off run: <i>backtrack Runway 27R</i>   |
| <b>baggage cart</b>               | small towed vehicle for transporting baggage  |
| <b>bank (n)</b>                   | angle at which the aircraft is inclined about its longitudinal axis: <i>bank angle, turn and bank indicator</i>   |
| <b>base leg</b>                   | the part of a conventional landing circuit when the aircraft turns off the downwind leg and flies perpendicular to the extended runway centreline before joining the glidepath  |
| <b>base turn</b>                  | a specified outbound track followed by a turn of more than 180° to intercept the inbound track  |
| <b>bearing</b>                    | 1) the angular direction of a distant point measured in degrees clockwise from a local meridian or other reference. Usually relative bearings are described clockwise from 000° to 360°<br>2) a surface that supports and reduces friction between moving parts. Types of bearing include ball, roller and needle bearings  |
| <b>BECMG</b>                      | becoming (METAR): <i>BECMG 0812/0815 21015KT PROB30</i>   |
| <b>belligerent</b>                | aggressive, rude, provocative, violent: <i>the cabin crew are dealing with some very belligerent football fans who are abusing the other passengers</i>   |
| <b>belt conveyor</b>              | baggage loader with rotating rubber belt used to load the bulk cargo compartment, hold 5  |
| <b>below minima / minimums</b>    | being below the limits of vertical and horizontal visibility for which the airport, aircraft and crew are certificated  |
| <b>best practice</b>              | technique, procedure or process regarded as most efficient and appropriate: <i>all training should adopt best practice</i>  |
| <b>bird strike</b>                | impact by a bird. Birds can hit the aircraft at different points. Effects will depend on the location of the impact and the size and number of the birds (See Units 5 and 6). The ingestion of large birds may cause engine stall or failure. Although windshields are tested for bird strikes, large birds can crack or break windshields impairing vision and affecting cabin pressurisation. The crew will need to make a precautionary landing. |
| <b>black-hole effect</b>          | spatial disorientation and erroneous perception of altitude caused by a dark approach area and bright lights beyond the active runway   |

| Word                        | Definition and examples  |
|-----------------------------|--|
| <b>blade</b>                | a radial aerofoil designed to rotate about an axis: <i>the bird ingestion caused some minor damage to the fan and 2<sup>nd</sup> stage LP compressor blades</i>  |
| <b>blank (v)</b>            | to stop displaying data, to become dark: <i>the power failure caused the First Officer screens to blank momentarily</i>  |
| <b>blast fence</b>          | long barrier which diverts efflux behind parked or taxiing aircraft: <i>blast fences are often installed between the aircraft stands and the terminal buildings</i>  |
| <b>bleed air</b>            | hot air taken from the engine compressor for air conditioning, anti-icing, hydraulic reservoir pressurisation etc.   |
| <b>blind spot</b>           | a point on a radar screen where information is not displayed or an area outside the aircraft hidden from the pilot by the airframe   |
| <b>blocked transmission</b> | a transmission that fails to get through, typically because of a technical fault   |
| <b>blow-out (n)</b>         | a tyre burst: <i>The blow-out left some rubber debris 600 metres from the threshold of Runway 17 Left.</i>   |
| <b>board (v)</b>            | to go on the aircraft, to <i>enplane</i> : <i>The passengers are boarding from Gate 27.</i>  |
| <b>bogged down</b>          | stuck in the mud, damp earth or sand: <i>a tug is required to tow the Regional Jet which is bogged down off Taxiway Lima.</i>  |
| <b>bomb scare</b>           | threat or fear that there may be a bomb on a plane or on the ground  |
| <b>bomb warning</b>         | a threat of a bomb on board or on the ground; a <i>bomb scare</i> . Even bomb scares which do not seem credible have to be taken seriously and the aircraft must divert and land as soon as possible.  |
| <b>bound for</b>            | flying to: <i>Air India 389 is bound for Dubai</i>   |
| <b>bowser</b>               | vehicle which pumps fuel from an underground fuel distribution system. Aircraft are refuelled either by <i>tankers</i> or <i>bowsers</i> .   |
| <b>braking action</b>       | a measure of likely adhesion of tyres to the runway, braking efficiency, which can be characterised as 'good', 'medium' or 'poor'  |
| <b>braking coefficient</b>  | a measurement of braking efficiency based on the friction coefficient of the runway, i.e. if the runway surface is wet or icy, it will be slippery, there will be less friction and the braking coefficient will be low  |
| <b>break</b>                | standard radiotelephony phraseology which indicates a separation between messages  |
| <b>breakdown</b>            | failure, disintegration, collapse: <i>Radio malfunction and inadequate language proficiency can both result in a breakdown in communication.</i>   |
| <b>bright</b>               | with intense light: <i>the lights can be set to BRT (bright) or DIM; if the runway lights are too bright they can cause glare</i>  |
| <b>broken</b>               | BKN: cloud cover of between 0.5 and 0.9 (i.e. 50% and 90%) of the sky: <i>METAR KMWN 14225Z 32026KT 120SM BKN/// FEW180 SCT210</i>   |
| <b>broken up</b>            | an interrupted transmission  |
| <b>bruise</b>               | A mark on the skin caused by a blow: <i>Some passengers suffered minor cuts and bruises when the flight encountered turbulence</i>   |
| <b>buffeting</b>            | the effects of being knocked around by turbulence or the rapid oscillation of flight control surfaces  |
| <b>build-up</b>             | accumulation, accretion, growth  |
| <b>build up (v)</b>         | to accumulate, to increase in amount: <i>Ice is building up on our wing leading edges</i>  |
| <b>bulk cargo</b>           | cargo which is not placed in a container, but loaded into hold 5 and maintained in position by nets  |
| <b>bumpy</b>                | turbulent: <i>we are having a bumpy ride at our present level</i>  |
| <b>bus control unit</b>     | a computer controlling the connection of the electrical busbars  |
| <b>busy</b>                 | with a lot of activity and traffic movements: <i>Beijing Capital is a busy airport</i>   |
| <b>buttoned up</b>          | an example of aviation jargon, meaning doors and panels closed. It is unacceptable aviation English.   |
| <b>bypass mode</b>          | a condition in which an ILS transmitter circuit is shunted and is not transmitting an operational signal to approaching aircraft   |
| <b>cabin altitude</b>       | the atmospheric pressure in the cabin. Air pressure is artificially maintained at approximately 6,000-8,000 feet inside the cabin. Flying for prolonged periods above 10,000 feet may cause hypoxia, altitude sickness, decompression sickness and acute earache and intestinal pain. Oxygen masks are deployed automatically if cabin altitude reaches 14,000 feet. |
| <b>cabin attendant</b>      | flight crew member in charge of looking after the safety and comfort of the passengers   |

| Word                           | Definition and examples   |
|--------------------------------|---|
| <b>cabin depressurisation</b>  | loss of cabin pressurisation and an increase in cabin altitude; the cabin altitude, normally maintained at between 6,000 and 8,600 feet, increases and at 14,000 feet cabin altitude the passenger oxygen masks are automatically deployed in the cabin. Cabin depressurisation is a perfectly manageable failure, but will result in the passenger oxygen masks dropping, an unscheduled descent, poor communication as the crew will be wearing their oxygen masks and possibly injuries (concussion, broken ribs, bruises, cuts) among the passengers and cabin crew who did not have their seat belts fastened. |
| <b>calibrated airspeed</b>     | CAS: the indicated airspeed (IAS) corrected for airspeed indicator errors   |
| <b>call-out / callout</b>      | a spoken data read-out by a crew member or an automatic synthetic voice: <i>The First Officer made airspeed call-outs during approach</i>   |
| <b>callsign</b>                | identification used to contact each flight for example <i>Qantas 358</i>  |
| <b>Captain probe heat</b>      | a system of electrical resistances inside the angle of attack sensor, pitot probe, static port etc. which supply the captain's instruments with attitude, airspeed and altitude data. The heating prevents the probes from being obstructed or seized up by ice   |
| <b>capture (v)</b>             | to intercept the glide path; when an aircraft <i>captures</i> a glide path, the ILS system on board detects the localizer and glide slope ground transmitter signals and the aircraft's descent to the runway is automatically controlled under the crew's supervision  |
| <b>cargo terminal</b>          | building used for storage and handling of containers, pallets etc. See also <i>freight terminal</i> .   |
| <b>carry out (v)</b>           | to do, especially a standard procedure: <i>the First Officer is carrying out an external inspection</i>   |
| <b>CAT III conditions</b>      | conditions when visibility is very poor and aircraft require ILS automation for (take-off and) landing operations: <i>when shooting a CAT II or III approach the PF must make callout of 'CAT 3 dual (or single)' or 'CAT 2' based on FMA information.</i>  |
| <b>CAT IIIC</b>                | Category three C: the crew, aircraft and aerodrome are qualified and equipped to land in conditions with theoretically 0 feet vertical Decision Height and 0 feet longitudinal visibility   |
| <b>catering truck</b>          | elevator truck for delivering meal trays, drinks, newspapers etc  |
| <b>caution</b>                 | 1) a crew alert symbolised by the colour amber and less urgent than a red warning: <i>the master caution light came on and the single-stroke chime sounded</i><br>2) RT recommendation to proceed with additional care: <i>taxi with caution</i>  |
| <b>CAVOK</b>                   | Ceiling and Visibility OK, pronounced 'CAV-O-KAY':. <i>TAF SCAR 142230Z 1500/1524 25005KT CAVOK TN18</i>  |
| <b>CB</b>                      | cumulonimbus cloud formation  |
| <b>ceiling</b>                 | 1) bottom of cloud cover 2) aircraft's highest operating altitude 3) top of the cabin   |
| <b>centre pedestal</b>         | a large standing panel between the two pilots which contains the thrust / throttle levers, radio and navigation control panels: <i>the RMP is located on the centre pedestal.</i>   |
| <b>CFIT</b>                    | Controlled Flight Into Terrain: <i>CFIT</i> happens when an aircraft, which is airworthy and under the control of the flight crew, is flown unintentionally into terrain, obstacles or water, usually without the crew being aware.   |
| <b>challenge-response call</b> | a pilot-to-pilot exchange which consists of a request for confirmation and a response; in this way, each action and condition is double-checked: <i>'Climb' - 'Climb set'; '80 knots' - 'Checked'</i>   |
| <b>chart</b>                   | map used for navigation: <i>arrival chart</i>   |
| <b>checklist</b>               | A series of checks performed and confirmed orally by two crew members; one reads out the action to be performed, the other performs the action and confirms aloud that it has been performed. <i>Checklists</i> are typically performed at specific phases in the flight ('Before descent' <i>checklist</i> ) or in abnormal or emergency situations ('Engine fire' <i>checklist</i> ). They are contained in the Quick Reference Handbook.   |
| <b>chime</b>                   | audio warning: <i>single-stroke chime, repetitive chime</i>   |
| <b>chocks</b>                  | rubber or wooden blocks placed against the aircraft wheels to prevent aircraft movement: <i>Are the chocks in place?</i>  |
| <b>chute</b>                   | a rapid-inflation pneumatic channel to enable passengers and crew to evacuate quickly, it is also referred to as an <i>escape slide</i>   |
| <b>circuit breaker</b>         | an electrical protecting safety device which opens a circuit in case of an excessive flow of current. Most circuit breakers are located on the cockpit overhead panel and rear cockpit bulkhead.  |
| <b>circuits and bumps</b>      | a training exercise by which pilots practise approaches, touch down on the runway, but do not roll out and stop; also referred to as <i>touch and go</i>  |
| <b>Citation</b>                | an American twin engine business jet  |
| <b>clean speed</b>             | the aircraft airspeed with flaps, slats and landing gear retracted  |



| Word                                  | Definition and examples  |
|---------------------------------------|--|
| <b>clear</b>                          | 1) CLR: no cloud cover: <i>METAR KANB 172253Z 35008KT 10SM CLR 08/M06</i><br>2) easy to understand, both in terms of vocabulary and pronunciation: <i>the briefing was very clear</i>  |
| <b>clear (v)</b>                      | to remove an obstacle: <i>the snow ploughs are clearing the snow from the runway and taxiways</i>  |
| <b>clear air turbulence</b>           | CAT: significant turbulence where no clouds are present, normally at high altitude near a jetstream  |
| <b>clearance</b>                      | 1) phraseology referring to authorisation: <i>expect onward clearance at time 38</i><br>2) removal of an obstacle: <i>snow clearance is under way</i><br>3) distance between a moving object and a potential obstacle: <i>monitor our wing tip clearance; the engine ground clearance on the B737 is quite small</i> |
| <b>cleared</b>                        | given permission: <i>cleared ILS approach Runway 03L</i>   |
| <b>climb-out (n)</b>                  | the initial climb from the airport of departure  |
| <b>coast guards</b>                   | members of a state service in charge of protecting territorial   |
| <b>cockpit voice recorder</b>         | CVR: an automatic recycling recorder storing all crew radio and intercom traffic, including crew speech and background noise: <i>The crew can only erase the CVR recording after engine shut-down.</i>   |
| <b>collapse (v)</b>                   | to break down, to fold, to lose rigidity and strength: <i>the nose landing gear collapsed</i>  |
| <b>come into conflict (v)</b>         | to be at or near the same flight level heading towards each  |
| <b>commander</b>                      | the captain of an aircraft   |
| <b>complete (v)</b>                   | to finish a process: <i>checklist completed</i>  |
| <b>compliance</b>                     | being in agreement or in accordance with: <i>each operator shall demonstrate compliance with the requirements</i>  |
| <b>component</b>                      | 1) part of an aircraft system: <i>a valve, a pump, a control unit</i><br>2) a constituent or contributing part, a factor: <i>clear, concise communication is an essential component of safety</i><br>3) a coordinate of a vector: <i>crosswind component</i>   |
| <b>compound (v)</b>                   | to make more difficult or more serious, to intensify: <i>the poor visibility only compounded the difficulty of a single-engine approach</i>  |
| <b>concerned</b>                      | worried, preoccupied: <i>the crew is concerned about the weather at destination</i>  |
| <b>concise</b>                        | short, efficient, not wasteful, not containing unnecessary information. Being concise is essential in radio communications, because pilots and ATCOs often have to communicate information fast  |
| <b>concussion</b>                     | blow to the head: <i>one of the passengers was in the aisle when we encountered the turbulence and is suffering from concussion.</i>   |
| <b>conditional clearance</b>          | when a clearance is given by a controller conditional upon another traffic movement (departure or arrival) occurring first. For example: <i>'Cathay Pacific 396, behind Boeing 777 on short final, line up behind.'</i>  |
| <b>confirm</b>                        | phraseology for 'I request clarification or verification': <i>confirm runway vacated</i>   |
| <b>conflicting traffic</b>            | traffic at or near the same flight level heading towards each other  |
| <b>confusion</b>                      | the state of being unsure in one's mind, of being <i>confused</i> : <i>runway confusion is a well-documented error</i>   |
| <b>congested</b>                      | busy, blocked: <i>there are several additional diverted flights and the apron is very congested</i>  |
| <b>contact(v)</b>                     | phraseology for establish communications with: <i>contact Tower 118.75</i>   |
| <b>contaminated</b>                   | degraded by the presence of another substance: <i>runways can be contaminated by snow, ice or standing water; fuel is sometimes contaminated with water or oil.</i>  |
| <b>contextual</b>                     | related to the circumstances or context of a situation   |
| <b>contingency plan</b>               | a plan B; a pre-prepared plan to be implemented in case events do not take place as initially planned: <i>we need a contingency plan in case we have to divert</i>   |
| <b>contradictory</b>                  | showing different information: <i>the Captain and First Officer airspeed displays were contradictory</i>   |
| <b>contributing factor</b>            | one of several factors that lead to an event: <i>A lack of English language proficiency was a contributing factor in several high-profile accidents</i>  |
| <b>control tower</b>                  | a tall ATC building with overall visibility of the airport   |
| <b>controlled airspace</b>            | an airspace of defined dimensions within which air traffic control service is provided to controlled flights. It is divided into different classes according to altitude   |
| <b>Controlled Flight Into Terrain</b> | CFIT happens when an aircraft, which is airworthy and under the control of the flight crew, is flown unintentionally into terrain, obstacles or water, usually without the crew being aware.   |

| Word                            | Definition and examples   |
|---------------------------------|---|
| <b>converge (v)</b>             | to move towards each other  |
| <b>converging</b>               | flight paths which are heading towards each other   |
| <b>conveyor belt loader</b>     | rotating rubber belt for loading bulk cargo   |
| <b>copy (v)</b>                 | phraseology for to hear and understand  |
| <b>correction</b>               | phraseology which indicates that an error has been made by the person making the transmission and that correct information will follow: <i>climb to reach Flight Level 290 at time 58. Correction at time 55.</i>   |
| <b>cowl panel</b>               | part of the engine cowling, the fairing which surrounds and protects the engine and provides an optimum aerodynamic profile   |
| <b>cowling</b>                  | the panels (cowls) surrounding the engine; it is the main part of the engine nacelle.   |
| <b>crabbing</b>                 | flying with drift due to crosswind  |
| <b>cracked</b>                  | damaged with small fissures: <i>the outer pane of the left hand windshield appears to be slightly cracked</i>   |
| <b>crew minibus</b>             | small bus to take crew to and from aircraft: <i>we are still waiting for the crew minibus to pick us up</i>   |
| <b>crew resource management</b> | CRM: a branch of human factors which analyses the ways in which team work and good communication can reduce the effects of human error. CRM training has become part of mainstream pilot training. See James Reason's seminal works in this field: <i>Human Error</i> (1990) and <i>Managing the risks of organisational accidents</i> (1997)   |
| <b>critical</b>                 | crucial, decisive, essential. This word often refers to the turning point in a series of events: <i>effective monitoring and communication are especially critical for safety during approach; safety-critical</i>  |
| <b>cross (v)</b>                | 1) to fly over: <i>cross NES at Flight Level 250</i><br>2) to move from one side to the other: <i>request cross Runway 29 Left</i>  |
| <b>crossbleed valve</b>         | a valve which is part of the pneumatic system and allows hot 'bleed' air taken from each engine compressor for air conditioning purposes etc. to be transferred from one side of the aircraft to the other  |
| <b>crosscheck (v)</b>           | to check one piece of information from two sources: <i>crosscheck the pressure altitude on the Captain's and First Officer's instruments</i>  |
| <b>crossfeed valve</b>          | a valve which allows fuel to be transferred from one wing to another  |
| <b>crosswind</b>                | a wind blowing in a direction perpendicular to the direction of travel of the aircraft  |
| <b>cumuliform cloud</b>         | cloud formation made of a large aggregate or mass of cloud  |
| <b>cumulonimbus</b>             | CB: a type of cloud characterised by its density, large size and height, its tendency to create stormy conditions and the hazard it represents for aircraft. It often has a characteristic 'anvil' shape  |
| <b>current Information K</b>    | ATIS Information Kilo in a series of updates (...India, Juliet, Kilo...) so that pilots can check easily that they have the most recent meteorological information about the airport: <i>Cleveland Hopkins Information Kilo, 1755 Zulu Automated Weather, Wind 260 at 15 gust 19, Visibility 6, light snow, 2,600 broken, 3,500 overcast, Temperature -5, Dewpoint -11, Altimeter 2999.</i> |
| <b>customer service manager</b> | the chief cabin attendant on board a large aircraft   |
| <b>damper</b>                   | a hydraulic shock absorber  |
| <b>Dash 8</b>                   | a twin engine turboprop regional transport aircraft   |
| <b>debris</b>                   | the general name for objects which are where they shouldn't be: <i>Debris on the ground can be extremely dangerous for aircraft</i>   |
| <b>decision altitude</b>        | DA: the altitude at which the flight crew must decide to land or go around  |
| <b>decision height</b>          | DH: the height above the ground shown on the radio altimeter in final approach at which the pilot must decide to land or go around: <i>'100 above' - 'Continuing'</i>   |
| <b>decrab (v)</b>               | to re-align the aircraft on the runway centreline in crosswind conditions immediately before touchdown  |
| <b>de-energize (v)</b>          | to remove electrical power, to switch off   |
| <b>deflated</b>                 | a tyre, escape slide or other inflatable device which is missing air / gas or empty: <i>Will you change one of our RH main gear tyres; it looks a little deflated.</i>  |
| <b>deflect (v)</b>              | to move along a pre-defined arc: <i>the rudder deflects from left to right</i>  |
| <b>degradation</b>              | worsening: <i>there has been a degradation in our roll control; the spoilers are responding more slowly.</i>  |
| <b>degraded mode</b>            | <i>in degraded mode</i> means operating at a reduced capacity or in a mode with fewer capabilities  |

| Word                                | Definition and examples  |
|-------------------------------------|--|
| <b>de-icing</b>                     | ice removal performed by the airport services in cold weather either by aircraft passing under a gantry or by special tankers with hydraulic platforms which spray de-icing fluid onto the wings, flight control surfaces, empennage and fuselage.   |
| <b>de-icing station</b>             | a designated location where aircraft are de-iced in cold weather before departure  |
| <b>de-icing truck</b>               | vehicle with tank and hydraulic platform for spraying aircraft   |
| <b>delaying action</b>              | phraseology for holding or orbiting to slow down the progress of a flight: <i>Air China 473, delaying action: turn left heading 150</i>  |
| <b>deteriorate (v)</b>              | to become worse: <i>the weather is deteriorating at Bangkok</i>  |
| <b>determine (v)</b>                | to work out, to calculate: <i>we must determine our fuel endurance</i>   |
| <b>dew point / dewpoint</b>         | the temperature at which condensation begins in cooling air. The dew point varies with different levels of atmospheric pressure, air humidity, etc: <i>Temperature 11, Dewpoint 9</i>  |
| <b>digital flight data recorder</b> | DFDR / FDR: a device for automatically recording information on aircraft operation (altitude, airspeed, vertical acceleration, heading, elapsed time, attitude, flight control surface position and engine speed). Such recorders are designed to survive crash accelerations, impacts, crushing and fire and often carry underwater transponders or beacons   |
| <b>dim</b>                          | of light with low intensity: <i>the dials and displays are easier to see if the ambient lighting is dim</i>  |
| <b>Direct Madras</b>                | phraseology for flying directly to Madras or towards the Madras beacon without passing via another waypoint  |
| <b>discharge (v)</b>                | to release pressure, to trigger, to activate; especially used about the fire extinguishers and cabin pressure  |
| <b>disconnect (v and n)</b>         | 1) to stop or interrupt a connection; to switch off<br>2) disconnection: <i>the pilot disconnected the autopilot with the instinctive disconnect pushbutton and took over control of the aircraft</i>  |
| <b>discretion</b>                   | 'at your discretion': timing or navigation is to be decided by the pilot   |
| <b>disengage (v)</b>                | to de-activate or place in neutral an automatic function; it may, however, remain <i>armed</i> . i.e. ready to operate   |
| <b>disorientation</b>               | loss of a sense of one's position in space: <i>spatial disorientation may be caused by whiteout</i>  |
| <b>dispatch (n)</b>                 | 1) the airport service which is responsible for liaising with the crew about operational matters: <i>ask Dispatch for an updated weight and balance sheet</i><br>2) the Flight Ops department of an airline which plans and monitors each flight and provides operational information in abnormal situations: <i>when the flight crew encountered volcanic ash they contacted their company dispatch</i> |
| <b>dispatcher</b>                   | the airport agent who provides the weight and balance sheet which must be checked and signed by the captain. The weight and balance sheet contains updated information about the aircraft payload (passengers, baggage, cargo and fuel) and its location. This allows the aircraft's centre of gravity, which must be within certain limits for safe take-off and flight, to be calculated               |
| <b>disregard (v)</b>                | to decide not to comply with or ignore an instruction, information or recommendation etc. Flight crews may disregard controller instructions in certain situations, for example to resolve a TCAS Resolution Advisory.   |
| <b>distraction</b>                  | something which disturbs mental concentration and attention: <i>a cabin attendant entering the flight deck when crew workload is high will be a distraction</i>  |
| <b>ditching</b>                     | alighting on water in an emergency: <i>the successful ditching in the Hudson River of US Air 1549 has become famous in aviation history</i>  |
| <b>diverging</b>                    | moving or heading in two different directions  |
| <b>divert (v)</b>                   | to make a change in the flight plan, often to fly to an alternate destination; <i>diversion</i>  |
| <b>DME</b>                          | Distance Measuring Equipment: a transmitter which will be located on the airport and provide distance information for the aircraft during approach by timing the delay of VHF or UHF radio signals   |
| <b>DME arc</b>                      | a segment of a circle which is flown as a transition from en-route flight to begin an instrument (ILS) approach using a set distance from a DME transmitter  |
| <b>DME1</b>                         | one of the two Distance Measuring Equipment systems which measure the time signals transmitted from the aircraft take to reach a ground station and return to the aircraft. This is converted into distances in nautical miles and is one means of calculating the aircraft's position   |
| <b>do-list</b>                      | a series of actions to be performed in the form of a procedure; it may be performed by one crew member, technician or controller. It is often used for routine actions   |
| <b>dome light</b>                   | a cockpit ceiling light  |

| Word                           | Definition and examples   |
|--------------------------------|---|
| <b>don (v)</b>                 | to put on a mask or life vest   |
| <b>dot</b>                     | point on the localizer and glideslope scales which indicates the degree of deviation left or right / above or below during approach   |
| <b>downdraught / downdraft</b> | a downward movement of air caused by a descending body of cool air  |
| <b>downwind</b>                | in a direction away from the source of the wind, 180° from the landing direction: <i>the pilot is flying the downwind leg and is about to make the base turn</i>  |
| <b>drainage grate</b>          | metal grills on ground to evacuate rain water   |
| <b>drift (n)</b>               | gradual lateral movement off course usually caused by a crosswind   |
| <b>drift correction</b>        | the action by which the pilot corrects the horizontal flight path by bringing the aircraft back onto the extended runway centreline or localizer beam   |
| <b>drift-down (n)</b>          | losing height gradually   |
| <b>drifting snow</b>           | DRSN: snow that has been blown by the wind to form a deep deposit   |
| <b>drive motor</b>             | an electrical motor which moves containers etc. into position   |
| <b>drizzle</b>                 | DZ: very light but constant rain  |
| <b>drop (v)</b>                | to decrease, to go down: <i>the oil pressure is dropping</i>  |
| <b>due</b>                     | used as a preposition meaning <i>due to / because of</i> : <i>all departures are delayed due snow clearance</i>   |
| <b>dump (v)</b>                | to discharge fuel in flight in order to reduce the aircraft's weight; to <i>jettison</i> : <i>we are over our MLW (Maximum Landing Weight) and need to dump 2 tonnes of fuel</i>  |
| <b>Dutch roll</b>              | aircraft oscillating from side to side: <i>our Yaw Damper system is inoperative and we are experiencing some Dutch roll</i>   |
| <b>duty time</b>               | the time during which a crew is scheduled and authorised to work  |
| <b>eastbound</b>               | moving towards the east: <i>eastbound flights from Beijing to Tokyo</i>   |
| <b>EGPWS</b>                   | Enhanced Ground Proximity Warning System: a system providing crews with forward warning of the risk of collision with terrain in sufficient time for them to take avoiding action. EGPWS or TAWS ( <i>Terrain Awareness and Warning System</i> ) is combined with a <i>Global Positioning System (GPS)</i> for greater accuracy in remote areas |
| <b>EGT</b>                     | Exhaust Gas Temperature: one of the principal engine parameters monitored by the crew with N1 and N2 or EPR   |
| <b>electronic racks</b>        | shelves used to house computers in the avionics bay / main equipment centre   |
| <b>elevation</b>               | elev: vertical distance above sea level: <i>airfield elevation</i>  |
| <b>elevator</b>                | 1) flight control surface located on the horizontal stabilizer trailing edge, which controls the aircraft on the pitch axis; servo actuators move the elevators.<br>2) hydraulic ground loader used to raise containers   |
| <b>eleven o'clock</b>          | a direction, not a time (which would be pronounced eleven hundred hours) used to locate objects in space. <i>12 o'clock</i> means straight ahead, so <i>11 o'clock</i> means a little to the left.  |
| <b>Embraer 190/195</b>         | a series of narrow-body, twin-engine, medium-range, jet airliners produced by the Brazilian manufacturer Embraer  |
| <b>emergency</b>               | any unplanned, threatening situation which requires immediate action  |
| <b>emergency code</b>          | 4-digit international transponder signals used by the crew to alert ATC in the event of an emergency. 7500 indicates unlawful interference, 7600 lost communication and 7700 a general emergency.   |
| <b>emergency descent</b>       | rapid descent using following a cabin depressurisation  |
| <b>emergency exit</b>          | door or hatch fitted with an escape slide to allow the aircraft to be evacuated in 90 seconds in the event of an emergency: <i>the passengers on USAir Flight 1549 used mainly the overwing emergency exits to evacuate the aircraft after the ditching</i>   |
| <b>empennage</b>               | the tail section of an aircraft, consisting of the fin, the tailplane and the part of the fuselage to which they are attached   |
| <b>en route</b>                | on the way, in flight between two points: <i>we are at FL 310 en route to Punta Arenas</i>  |
| <b>en-route charts</b>         | charts providing detailed information for IFR flight in upper airspace: <i>navaids, tracks, navigational fixes, waypoints, sectors, standard airways, airport locations, minimum altitudes etc.</i>   |
| <b>encounter (v)</b>           | to meet, to experience: <i>we encountered severe windshear from 500 feet to touchdown</i>   |
| <b>endurance</b>               | time an aircraft can fly without refuelling: <i>we have 35 minutes (fuel) endurance</i>   |

| Word                            | Definition and examples  |
|---------------------------------|--|
| <b>engine run-up</b>            | operating the engine on the ground over its full power range for testing purposes after an engine change or repair   |
| <b>engine run-up area / pad</b> | remote location where aircraft engines can be tested   |
| <b>engine stall margin</b>      | the difference between the gas turbine operating line and the stall line   |
| <b>Engineering</b>              | the technical department, responsible for aircraft maintenance: <i>we will need to call Engineering to inspect our rear fuselage after a tail strike at take-off</i>   |
| <b>enplane (v)</b>              | to go on board the aircraft; to <i>board</i>   |
| <b>enunciation</b>              | clear pronunciation of sounds to maximise understanding: <i>a simple way to improve enunciation is to exaggerate normal mouth movements</i>  |
| <b>EPR indication</b>           | Engine Pressure Ratio: indication of the ratio between engine turbine discharge pressure and compressor inlet pressure, which is used on certain engines   |
| <b>erroneously</b>              | by mistake, by error: <i>'1023' was entered erroneously instead of '1013' when the altimeter was set</i>   |
| <b>escape slide</b>             | a rapid-inflation pneumatic channel to enable passengers and crew to evacuate quickly also referred to as a <i>chute</i> : <i>inflatable escape slides can also be used as life rafts in case of ditching</i>  |
| <b>established in cruise</b>    | in level flight at its maximum or cruise altitude, which is typically between 35,000 and 41,000 feet   |
| <b>ETA</b>                      | Estimated Time of Arrival: the time at which an aircraft is expected to arrive at its destination or pass a waypoint   |
| <b>ETD</b>                      | Estimated Time of Departure: the time at which an aircraft is expected to depart   |
| <b>ETOPS</b>                    | Extended Twin Operations: the use of <i>long-haul</i> , twin-engine aircraft over the sea, desert or arctic regions where there is no suitable airport within 60 minutes of flight which can be used in case of a diversion being necessary following the loss of an engine. A more facetious interpretation of the acronym 'ETOPS' is 'Engines Turning Or Passengers Swimming'!   |
| <b>evacuation</b>               | exiting the aircraft in an emergency, often via the emergency escape slides  |
| <b>evaluate</b>                 | to judge, to assess, to analyse, to decide about: <i>in the event of a system failure or structural damage the flight crew must evaluate the situation before making a decision.</i>   |
| <b>exceed (v)</b>               | to go beyond or over, to go too far: <i>the crew have exceeded their legal duty time; you must not exceed 250 knots below 10,000 feet in this area</i>   |
| <b>exhaust</b>                  | the rear engine section which expels engine gases: <i>exhaust gas temperature</i>  |
| <b>exit (v)</b>                 | to leave, to go out of, to vacate: <i>the flight exited the runway via B3</i>  |
| <b>expect (v)</b>               | used by ATC with a time or location reference for a clearance to be given later in the flight. It is important that it is not confused with a current clearance: <i>expect onward clearance at 54</i>  |
| <b>expectation bias</b>         | the belief that you know in advance what you will see or hear, which affects what you actually think you see or hear. Expectation bias in ATC means that there is a strong belief or mindset that a particular outcome will happen, or there is a particular cause for a situation, even when there is evidence to the contrary. Expectation bias is reinforced by previous experience of situations which have features in common with the current situation. |
| <b>expedite (v)</b>             | to perform as quickly as possible: <i>we have a pressurisation problem and need to expedite our descent</i>  |
| <b>explosive device</b>         | bomb   |
| <b>extend (v)</b>               | 1) to deploy or move down and out flaps, slats or landing gear: <i>the flaps are extended to the 25° position</i><br>2) to cover an area of land or sky: <i>the cloud cover extends for 200 miles</i>  |
| <b>extend the RAT (v)</b>       | to deploy the Ram Air Turbine, a small electrical generator driven by a propeller, which is lowered into the airstream below the wing to provide essential electrical (and hydraulic) power in the event of multiple engine-driven generator failures  |
| <b>extended threshold</b>       | the end of the runway beyond the operational threshold which is usually only used for additional stopping distance in an emergency   |
| <b>extinguish (v)</b>           | to stop or put out a fire: <i>we have managed to extinguish the fire and have the situation under control</i>  |
| <b>facilitate (v)</b>           | to make easier, to support: <i>computerisation facilitates revising and updating documentation</i>   |
| <b>F/O</b>                      | First Officer or co-pilot  |
| <b>FAF</b>                      | Final Approach Fix: the fix or reference point from which the final IFR approach to an airport is executed and which identifies the beginning of the final approach segment  |

| Word                            | Definition and examples  |
|---------------------------------|--|
| <b>failure</b>                  | an inoperative state or the process of becoming inoperative: <i>a temperature sensor failure</i> ;<br>2) an omission or the inability to perform an action: <i>there was a failure by the crew to use the Standard Operating Procedures</i>  |
| <b>far end</b>                  | The end of a runway at the opposite end from where the aircraft touches down or starts its take-off run  |
| <b>fast landing</b>             | a landing made above the usual landing speed of the aircraft either because of adverse wind conditions or because the flaps are not fully extended. This will probably result in a <i>hard landing</i> .   |
| <b>FBO</b>                      | Fixed Base Operator: an American term for an airport operator  |
| <b>feet per minute</b>          | fpm: a unit of measurement for rate of climb or descent: <i>we are descending at 1,500 feet per minute</i>   |
| <b>ferry flight</b>             | a flight whose purpose is to reposition an aircraft to another location and not to transport a payload: <i>the crew are making a ferry flight to Casablanca so that there is an aircraft in place to ensure the Casablanca-Paris flight tomorrow</i>   |
| <b>few</b>                      | 0.25 or less of the sky covered by clouds  |
| <b>field</b>                    | another term for the <i>aerodrome</i> or <i>airport</i> ; <i>airfield</i> is also used   |
| <b>fighter</b>                  | military combat aircraft: <i>the Sukhoi Su-27, the F-15 and the Dassault Rafale are all jet fighters</i>   |
| <b>filter clog</b>              | the blocking by particles of a fuel or hydraulic filter  |
| <b>final</b>                    | inbound to the active runway; typically 4 miles from touchdown   |
| <b>final approach track</b>     | the heading flown by the crew during the final approach: <i>the final approach track to Runway 24 at Aomori is 231degrees</i>  |
| <b>finger</b>                   | extension from main terminal building extending into the apron and containing gates: <i>Terminal 3 has six fingers and forty eight gates</i>   |
| <b>FIR</b>                      | Flight Information Region: an airspace of defined dimensions within which flight information and alerting services are provided by an air traffic control centre: <i>en route from Lagos to Cairo you fly over the N'Djamena, Khartoum and Cairo FIRs</i>  |
| <b>fire extinguishing agent</b> | a fire extinguishing chemical: <i>AGENT 1 discharged</i>   |
| <b>fire engine</b>              | vehicle for spraying an extinguishing agent or water: <i>request a fire engine standing by in case our brakes need cooling</i>   |
| <b>fire extinguisher squib</b>  | an explosive cartridge which discharges a fire extinguisher and releases the fire extinguishing agent; also referred to as a <i>cartridge</i>  |
| <b>fire station</b>             | base for fire service and their fire-fighting equipment  |
| <b>first aid kit</b>            | materials used to administer basic medical attention: <i>a first aid kit is stowed in the overhead rack</i>  |
| <b>fix</b>                      | a radio beacon that a pilot can use to identify the aircraft's position and direction: <i>VOR/DME fix, initial approach fix (IAF), final approach fix (FAF)</i>  |
| <b>FL 100</b>                   | 'Flight Level one zero zero' is correct ICAO standard phraseology. However, given the well-documented cases of confusion which have occurred between 'FL 110' and 'FL 100', the UK CAA and other European ANSPs have decided to adopt 'hundred' for all levels ending in '00' (FL 100: Flight Level one hundred; FL 200: Flight Level two hundred etc.) rather than 'zero zero'. For this and the other differences between ICAO and UK phraseology notified to ICAO, see CAA CAP 413 Radiotelephony Manual, Appendix 1. |
| <b>flag</b>                     | 1) red indicator which shows that an instrument is not supplied or that the indication is unreliable<br>2) red warning placed on the outside of the aircraft to show that ground safeties are installed which must be removed before flight  |
| <b>flameout / flame-out</b>     | a loss of combustion in a gas turbine engine   |
| <b>flap asymmetry</b>           | when the flaps are not extended the same amount on both wings: <i>A B737 flap asymmetry occurred on final approach to a short runway. The Captain requested vectors to a nearby airport with a longer runway</i>   |
| <b>flaps-up landing</b>         | occurs when the crew is not able to extend the high-lift flaps. This results in the minimum speed of the aircraft being higher and so the aircraft landing at a higher speed and probably requiring a longer stopping distance   |
| <b>flare</b>                    | the final nose-up pitch movement of a landing airplane. The landing flare is a manoeuvre that enables a pilot to reduce an airplane's vertical speed without applying engine power.  |

| Word                            | Definition and examples   |
|---------------------------------|---|
| <b>Flight Control Unit</b>      | FCU: a control panel on the glareshield which, on an Airbus aircraft, fulfils the same function as a <i>Mode Control Panel (MCP)</i> on a Boeing aircraft, i.e. entering altitude, heading, speed, vertical speed (rate of climb / descent) values into the autopilot and autothrust / autothrottle   |
| <b>flight crew</b>              | captain, first officer, and occasionally flight engineer working as a team  |
| <b>flight deck</b>              | compartment from which the crew fly the aircraft; <i>cockpit, flight compartment, control cabin</i>   |
| <b>flight idle</b>              | lowest engine power setting and r.p.m at which the engine can safely operate in flight: <i>the engine should go from flight idle to take-off power in 6 seconds for a missed approach</i>   |
| <b>flightpath / flight path</b> | trajectory of the aircraft in the vertical and horizontal planes: <i>the aircraft's flightpath can be reconstituted from DFDR data</i>  |
| <b>flight plan</b>              | specified information relating to the whole or portion of an intended flight: <i>we filed our flight plan at 06:38; we wish to amend our flight plan</i>  |
| <b>flock</b>                    | group of birds: <i>a flock of seagulls has been reported near the threshold of Runway 19L.</i>  |
| <b>flow</b>                     | the movement of one flight after another, the number of aircraft passing through a given airspace   |
| <b>flow control valve</b>       | a valve which regulates fuel supply to the engines and APU  |
| <b>flow management</b>          | making the best use of airspace capacity to meet the demands of the traffic at any given time. It may result in aircraft being delayed, holding or being re-routed by ATC: <i>The Eurocontrol Central Flow Management Unit protects controllers from overload by making sure that only a manageable number of aircraft are flying at one time.</i>  |
| <b>FMS</b>                      | Flight Management System: an aircraft computer system that uses a large data base to 1) allow routes to be pre-programmed; 2) interface with the AFCS (Automatic Flight Control System) i.e. autopilot and flight director; 3) memorise and update navigation aids; 4) provide information to the EFIS (Electronic Flight Instrument System) for PFD and ND displays  |
| <b>foam carpet</b>              | a layer of foam put down on the runway by fire tenders to cushion the impact of an aircraft making a wheels-up landing.   |
| <b>foam crash tender</b>        | vehicle for spraying fire extinguishing foam  |
| <b>focus (v)</b>                | to pay attention or concentrate on a particular point, subject or situation: <i>the crew of Eastern Airlines Flight 401 were all too focused on the landing gear indicator and failed to notice that their aircraft was descending into the Everglades</i>  |
| <b>FOD</b>                      | foreign object damage: damage to the aircraft from stray objects on the ground or birds in flight   |
| <b>follow-me car</b>            | a car used to guide taxiing aircraft  |
| <b>forecast</b>                 | estimation of future weather  |
| <b>foreign object</b>           | the general name for something which should not be there: a bird, a plastic bag, metal debris etc. are all <i>foreign objects</i> which can damage the aircraft   |
| <b>fpm</b>                      | feet per minute: unit of measurement of rate of climb and descent: <i>the aircraft is descending at 1,200 fpm</i>   |
| <b>freezing level</b>           | the altitude at which the temperature in the atmosphere drops to 0° C   |
| <b>freight terminal</b>         | a building used for the storage and handling of containers, pallets etc. their dispatch to specific aircraft and their loading onto cargo flights. See also <i>cargo terminal</i> .   |
| <b>freighter</b>                | a plane for carrying heavy <b>freight</b> , such as industrial equipment, raw materials, livestock, food, parcels and goods   |
| <b>frequency congestion</b>     | radio saturation which occurs when there are too many transmissions on the same radio frequency; the pilot may have to wait for a break in transmissions to pass a message and may have to wait for a response from the ATCO. Congestion can result in important information (clearances, flight levels, headings, times etc.) being lost or only partially heard, conditional clearances and advice to expect being taken as clearances, pilots not being able to pass urgent information, information intended for one flight being adopted by another and a general loss of communication quality with the ensuing stress. |
| <b>friction tester</b>          | vehicle which can measure the braking coefficient of a runway   |
| <b>fuel emergency</b>           | running short of fuel. Fuel emergencies do not usually occur suddenly, but are the result either of incorrect automatic or manual fuel management or prolonged holding. Avianca Flight 052 remains the classic case of a fuel emergency where inadequate communication, non-standard phraseology and poor language skills by the crew led to fuel exhaustion on all four engines. Different degrees of urgency (distress – pan calls; and emergency – Mayday) are at the crew's disposal once they have communicated their fuel endurance to ATC.   |
| <b>fuel farm</b>                | place where fuel tanks are located and tankers are housed and replenished   |

| Word                             | Definition and examples  |
|----------------------------------|--|
| <b>fuel hydrant</b>              | underground fuel supply point  |
| <b>fuel manifold</b>             | an aircraft fuel distribution line to which a nozzle is attached   |
| <b>fuel tanker</b>               | vehicle containing aircraft fuel   |
| <b>full-stop landing</b>         | a normal landing which ends with the aircraft stopping and exiting the runway rather than doing a training exercise of touch and go  |
| <b>fumes</b>                     | chemical or industrial gases   |
| <b>fuselage</b>                  | The fuselage is the main body of a plane (i.e. excluding the wings, tail, landing gear, etc.).   |
| <b>gain on (v)</b>               | to reduce the distance between an aircraft and the aircraft ahead: <i>you are still gaining on the turboprop ahead of you</i>  |
| <b>galley</b>                    | the part of the plane where the cabin attendants store and prepare food and drinks   |
| <b>gantry</b>                    | a metal framework shaped like a bridge used for de-icing at the airport  |
| <b>garbled</b>                   | unclear, inaudible, typically because of technical problems: <i>say again, your last transmission was garbled</i>  |
| <b>gate</b>                      | parking stand directly connected to the airport terminal by an airbridge: <i>we are pushing back from Gate 36; will you have an ambulance standing by at the gate?</i>   |
| <b>gear</b>                      | the landing gear, i.e. the wheels and the mechanisms connected to them: <i>V2 ... positive rate .... gear up ; the gear is retracted</i>   |
| <b>general aviation pilot</b>    | a pilot who flies a light aircraft for pleasure and holds a PPL (private pilot's license)  |
| <b>general aviation terminal</b> | terminal for private, business and leisure aviation  |
| <b>generator overload</b>        | a condition which occurs when an excessive amount of electricity is being taken from the generator   |
| <b>give way (v)</b>              | to let another aircraft pass first during ground movements: <i>give way to the 787 passing from right to left</i>  |
| <b>glare</b>                     | bright reflected or refracted light  |
| <b>glareshield</b>               | cockpit panel above the main instrument panels and below the windshield which protects the instruments from reflection and on which the automatic flight control panel is located  |
| <b>glide path</b>                | the flight path of an aircraft during approach, especially when making an ILS landing. Also <i>glidepath, glideslope</i> .   |
| <b>glideslope</b>                | See <i>glide path</i> .  |
| <b>glideslope antenna</b>        | ILS aerial connected to a transmitter of a radio beam providing vertical flight path guidance  |
| <b>GNSS</b>                      | Global Navigation Satellite System: the underlying technology behind the GPS GNSS Landing System, which combines satellite and local data to provide very accurate navigational positioning for landing  |
| <b>go ahead (v)</b>              | This can mean 1) move forward, or 2) do what you intended to do. It is a dangerously ambiguous phrase and should be avoided in aviation communication.   |
| <b>go-around (n)</b>             | a missed approach, discontinuing an approach, pulling up and performing a traffic pattern or circuit: <i>if we are not visual at 250 feet, we will perform a go-around</i>   |
| <b>go around (v)</b>             | to discontinue an approach: <i>if we are not visual at 250 feet, we will go around</i>   |
| <b>go visual (v)</b>             | to have the runway in sight and no longer be dependent only on instruments   |
| <b>go-around thrust</b>          | Take-off / Go-around thrust (TOGA on Airbus); this is the maximum engine power setting   |
| <b>GPU</b>                       | ground power unit: independent electrical generator designed to provide an engine with electrical power during turnaround when the aircraft engines and APU are shut down  |
| <b>grab (v)</b>                  | to seize, to get hold of: <i>grab the handle and pull it down</i>  |
| <b>green system</b>              | one of the three hydraulic systems (green, blue, yellow) on Airbus aircraft. Boeing identify their hydraulic systems numerically   |
| <b>ground (v)</b>                | 1) to connect to the electrical ground or earth: <i>the aircraft must be grounded during refuelling</i><br>2) to prevent or prohibit from taking off: <i>the fleet has been grounded by the CAA until the inspections have been carried out.</i> |
| <b>ground handler</b>            | airport agent who usually installs and removes wheel chocks and supervises the push-back of the aircraft with a tractor / tow vehicle / tug  |
| <b>ground handling personnel</b> | airport staff including the dispatcher, the loadmaster, baggage handlers, mechanics or engineers, the tug driver, caterers, water servicing staff, waste water staff, refuelling agent, cleaners etc.  |



| Word                                   | Definition and examples  |
|--|--|
| <b>Ground Proximity Warning System</b> | GPWS: an airborne system which alerts the flight crew that they are approaching terrain or that their sink rate is excessive. If the GPWS detects a flightpath deviation 'pull up', 'sink rate', terrain' or 'glide slope' audio warnings are triggered.   |
| <b>GSE</b>                             | Ground Service Equipment: combination of GPUs, ASUs, tow vehicles, tow-bar etc.  |
| <b>gusty</b>                           | <i>gusty</i> conditions are when the wind speed changes suddenly   |
| <b>hail</b>                            | GR (French, <i>grêle</i> ): precipitation in the form of compacted ice and snow: <i>hail storms can cause significant structural damage</i>  |
| <b>hand signals</b>                    | signals given by marshaller to give instructions to pilot  |
| <b>handle (v)</b>                      | to deal with or to manage a situation: <i>flight crew are trained to handle unexpected and abnormal situations</i>   |
| <b>handoff (n)</b>                     | a transfer of a flight from one controller or area to another: also <i>handover</i>  |
| <b>handover(n)</b>                     | a transfer of a flight from one controller or area to another; also a verb, to <i>hand over</i> (v). See also <i>handoff</i> .   |
| <b>hangar</b>                          | shelter for housing aircraft on ground: <i>scheduled A, B and C checks are performed in the hangars</i>  |
| <b>hard copied</b>                     | written in note from a radio transmission. More complex clearances, instructions and terminal information are <i>hard copied</i> by the crew in the form of written notes.   |
| <b>hardly (adv)</b>                    | scarcely, almost not at all: <i>there was hardly any damage caused to the fuselage when the catering truck skidded on the ice and failed to stop in time</i>   |
| <b>hazardous</b>                       | dangerous, representing a threat, a danger or a risk: <i>the ramp area is hazardous during turnaround and staff wear high-visibility vests</i>   |
| <b>haze</b>                            | HZ: fine dust or vapour causing an unclear, clouded atmosphere   |
| <b>heading</b>                         | HDG: the angle between the horizontal reference datum (compass north, magnetic north or true north) and the longitudinal axis of the aircraft: <i>turn left heading 230</i> . It is not to be confused with the track which is either 1) the path of the aircraft over the Earth's surface from take-off to touchdown, or 2) the angle between a reference datum and the actual flight path. |
| <b>heads-down</b>                      | of a crew member who is focused on the flight instruments rather than looking outside the aircraft   |
| <b>headwind</b>                        | a wind blowing in a direction opposite to the direction of travel of the aircraft. Its opposite is <i>tailwind</i> .   |
| <b>hearback error</b>                  | a failure to notice when one's own error is correctly repeated by the interlocutor   |
| <b>hectoPascal (hPa)</b>               | the most common unit of atmospheric pressure; in the plural, it does not take an 's': 1021 hectoPascal. It is the equivalent of millibars (mb), which is still referred to in many countries. Inches of Mercury (in.Hg) is used in the United States. 1 in.Hg = 3.386 hPa  |
| <b>Hercules</b>                        | a Lockheed C-130, four engine turboprop military transport plane   |
| <b>HF</b>                              | High Frequency: the high radio frequencies (3 MHz to 30 MHz). HF radio bands are less used than VHF (30 MHz to 300 MHz) in aeronautical radio communication, but they are not limited by the line-of-sight characteristic of VHF, so may sometimes be convenient at low altitudes.   |
| <b>higher</b>                          | a higher flight level: <i>request higher due icing conditions at this level</i>  |
| <b>high-speed approach</b>             | an approach at a higher than normal airspeed using a flaps-up (clean) aircraft configuration for longer in the early stages in order to expedite arrival   |
| <b>high-speed exit</b>                 | angled taxiway allowing aircraft to vacate runway without decelerating completely  |
| <b>high-speed tug</b>                  | tow vehicle used to tow aircraft over long distances: <i>request a high-speed tug to tow us to the maintenance area</i>  |
| <b>hijacker</b>                        | terrorist who tries to take control of an aircraft and its crew in order to obtain demands, make a political statement using threats, or to deliberately crash the plane: <i>the transponder code 7500 is used in the event of a hijacker on board</i>   |
| <b>HIRL</b>                            | High Intensity Runway Lighting. The brightness of runway lighting can be adjusted by the Tower according to the atmospheric conditions and time of day   |
| <b>hold (n)</b>                        | 1) the holding pattern followed by aircraft typically while waiting to descend and land. It is also called a <i>stack</i> in the US: <i>taxi into position and hold ; hold position</i> 2) the series of underfloor cargo compartments in an aircraft: <i>bulk cargo and animals are loaded into hold 5</i>  |
| <b>hold short of (v)</b>               | to stop and wait just before you get to a location: <i>hold short of Runway 33 Left</i>  |
| <b>holding pattern identifier</b>      | a three-letter code identifying the location of a particular hold or holding pattern by the beacon it refers to: <i>LAM is the holding pattern identifier for Lambourne to the east of London Heathrow.</i>  |

| Word                                  | Definition and examples  |
|---------------------------------------|--|
| <b>holding point / position</b>       | a place indicated by painted ground markings, illuminated signage and (often) stop bars where aircraft stop until they are authorised to enter the runway: <i>taxi holding point Lima 1 Runway 08 via taxiways Charlie and Hotel</i>   |
| <b>horizontal separation</b>          | the horizontal distance between two aircraft, which is measured in metres or kilometres  |
| <b>horizontal stabilizer</b>          | a horizontal part of the empennage at the rear of the plane, which can be trimmed, i.e. deflected to a position in which it produces the least aerodynamic resistance; it is also referred to as the <i>tailplane</i> or <i>THS (trimmable horizontal stabilizer)</i>  |
| <b>hot section</b>                    | the section of the engine comprising the combustion chamber, high and low pressure turbines and exhaust  |
| <b>hot spot</b>                       | intersection indicated on an aerodrome chart where the risk of collisions and incursions is high   |
| <b>how do you read?</b>               | 'how clear is my transmission?'  |
| <b>human remains</b>                  | corpse, dead body transported in a coffin  |
| <b>hurt (v)</b>                       | to injure, to harm, to cause pain: <i>one of the passengers was hurt when he fell on the icy steps and cut his leg</i>   |
| <b>humming</b>                        | a low buzzing noise  |
| <b>hydraulic problems</b>             | malfunctions or failures (leaks, loss of pressure, filter clogging, pump failure etc.) on a hydraulic system. Several aircraft systems depend on hydraulic power: flight controls, landing gear, brakes, thrust reversers. However, most commercial aircraft have triplexed hydraulic systems, i.e. three separate hydraulic systems, at least two of which supply each hydraulically driven component. However, the complete loss of a system can cause the secondary flight controls (flaps, slats) to be downgraded and also affect aircraft braking. If the flaps are not fully extended, the aircraft will land faster and so will require a longer stopping distance. If there is not full braking capability, braking will be less effective and again the stopping distance will be increased. |
| <b>hypoxia</b>                        | an inadequate amount of oxygen being supplied to the brain, for example at high altitude in the event of cabin depressurisation. In the case of rapid decompression at 40,000 feet the resulting hypoxia will mean that the time of useful consciousness will be about 20 seconds; it is therefore essential to don oxygen masks and initiate an emergency descent immediately.  |
| <b>Hz</b>                             | Herz: a unit of measurement of frequency   |
| <b>IAF</b>                            | See <i>initial approach fix</i>  |
| <b>ice patches</b>                    | intermittent ice cover on the ground   |
| <b>IDG</b>                            | Integrated Drive Generator: The main source of A.C. (alternating current) electrical power on the aircraft; it is a combination of a constant speed drive and an electrical generator driven by the engine through the accessory gearbox.  |
| <b>idle</b>                           | the minimum smooth engine operating speed: <i>flight idle, ground idle</i>   |
| <b>idling</b>                         | operating an engine at its minimum smooth rotating speed   |
| <b>in.Hg</b>                          | inches of mercury: unit of measurement of barometric pressure in the United States. 1 in.Hg = 3.386 hPa. See also <i>hectoPascal</i> .   |
| <b>ILS</b>                            | Instrument Landing System: a system which uses radio transmitter signals to guide an aircraft down, typically when visibility is poor. ILS consists of the glideslope (G/S), localizer (LLZ) and Locator (LOC)   |
| <b>ILS CAT II, CAT III, CAT IIIIC</b> | the various degrees of automation which aircraft and airports are equipped with, and flight crew are qualified to use. These categories involve different landing minima, i.e. vertical and horizontal visibility.   |
| <b>ILS critical area</b>              | an area which an ATCO may instruct an aircraft to hold short of in order to avoid interference with an ILS signal  |
| <b>Instrument Landing System</b>      | ILS: a system which uses radio transmitter signals to guide a aircraft down, typically when visibility is poor. ILS consists of the glideslope (G/S), localizer (LLZ) and Locator (LOC).   |
| <b>ILS Transmitters</b>               | the localizer and glideslope transmitters. The localizer transmitter is aligned with the runway centreline within the airport perimeter some distance from the runway threshold. The glideslope antenna is located perhaps some 100 metres to the left or right of a runway to the side of the touchdown zone.   |
| <b>IMC</b>                            | Instrument Meteorological Conditions: weather conditions (cloud, fog) which make it impossible to fly visually (VMC) and so which require the crew to use their instruments to fly   |
| <b>in accordance with</b>             | IAW: in agreement with, in compliance with, following  |
| <b>in line</b>                        | queuing, stopped, standing by: <i>we are in line on Taxiway Golf behind a Cathay Pacific 747 and an Etihad A330 number three for departure</i>   |

| Word                                      | Definition and examples   |
|---|---|
| <b>inadequate</b>                         | not good enough, not of a sufficient quantity: <i>there was inadequate warning of the trench being dug along the side of the taxiway</i>  |
| <b>inadvertently</b>                      | unintentionally, without being aware: <i>the crew inadvertently strayed onto the active runway</i>  |
| <b>inboard / outboard spoilers</b>        | the spoilers on the upper surface of the wing; there are several surfaces and they are commonly identified as inboard or inner and outboard or outer spoilers.  |
| <b>inbound</b>                            | used to describe an aircraft which is flying towards a point, towards a fix, arriving, approaching: <i>we are flying inbound heading 22; track inbound to the Norfolk VOR on the 193° radial.</i>   |
| <b>incapacitated</b>                      | unconscious or too ill to function properly: <i>the Captain was incapacitated as the result of a stroke (obstruction of an artery to the brain)</i>   |
| <b>increase (v)</b>                       | to become or make greater or more: <i>increase speed by 20 knots</i>  |
| <b>indicated airspeed</b>                 | IAS: the relative velocity between the aircraft and the surrounding air: <i>the indicated airspeed is displayed on the airspeed scale of the PFD</i>  |
| <b>indication</b>                         | the readings on the various flight instruments  |
| <b>indication oscillations</b>            | variations in the display which may be caused by instrument malfunctions rather than actual changes in the parameters   |
| <b>indication problem</b>                 | an erroneous or spurious indication is being given when there is not necessarily anything wrong with the system itself  |
| <b>induce (v)</b>                         | to cause something to happen: <i>the crew's familiarity with this approach induced a sense of complacency</i>   |
| <b>inertial navigation system</b>         | INS: a system of laser gyros and accelerometers which sense all aircraft movements on all three axes and so calculates the aircraft's present position to a high degree of accuracy   |
| <b>INS</b>                                | See <i>inertial navigation system</i> .   |
| <b>in-flight turnback</b>                 | when the crew decides to return to the airport of departure. This is dangerous because the aircraft is likely to be full of fuel and therefore over its <i>maximum landing weight</i> : the certified value above which fuel must be jettisoned or burnt off if landing becomes urgently necessary and structural damage is to be avoided |
| <b>Information Kilo, Lima, Mike etc.</b>  | identifies a specific ATIS (Automatic Terminal Information Service) broadcast in a series A, B, C, D etc. giving up-to-date information about conditions at the airport   |
| <b>ingest (v)</b>                         | to suck or pull into, to swallow, to suck a bird into the engine: <i>Canada geese were ingested into both engines at 3,000 feet, causing a dual engine loss on USAir Flight 1549</i>  |
| <b>initial approach fix</b>               | IAF: the point from which the initial segment of an ILS approach begins.  |
| <b>initiate (v)</b>                       | to commence, to start a procedure or manoeuvre: <i>we will be initiating descent in two minutes</i>   |
| <b>injury</b>                             | hurt done to a person's body: <i>cuts, bruises, fractures, concussion, bleeding are all forms of injury</i>   |
| <b>inoperative</b>                        | a general term meaning that a system or part cannot operate correctly, also <i>inop, unserviceable</i>  |
| <b>INS check point</b>                    | remote location with well-defined geographical coordinates where an aircraft's inertial navigation system (INS) can be reset  |
| <b>INS warning</b>                        | a warning about a malfunction in the Inertial Navigation System, i.e. the main system using gyros and geographical coordinates to calculate the aircraft's precise position   |
| <b>instinctive disconnect push button</b> | small red pushbutton on the control wheel or sidestick used to disconnect the autopilot quickly   |
| <b>instrument approach procedure</b>      | IAP: the procedure for a given ILS approach   |
| <b>intend (v)</b>                         | 1) to plan to do something: <i>we intend to maintain our present heading</i><br>2) to wish to send a message to a specific aircraft: <i>that clearance was intended for Japan Air 465</i>   |
| <b>intention</b>                          | what you plan or wish to do: <i>advise intentions</i>   |
| <b>intercept (n)</b>                      | joining a path, trajectory or navigation beam: <i>fly the DME arc to intercept the ILS</i>  |
| <b>intercept heading</b>                  | the heading the crew must follow in order to capture and follow the ILS or visual approach flight path  |
| <b>intercept ILS (v)</b>                  | to capture the localizer and glideslope radio transmitter beams which guide the aircraft during an ILS approach   |
| <b>intermittent</b>                       | of a phenomenon which appears and disappears: <i>we have had intermittent signal loss, but it seems to be operating normally now</i>  |
| <b>interpretation</b>                     | a way of understanding something: <i>people's interpretation of different cultural behaviour varies</i>   |

| Word                                  | Definition and examples   |
|---------------------------------------|---|
| <b>intersection</b>                   | crossing of taxiways, runways or taxiways and runways   |
| <b>intoxicated</b>                    | under the effects of drugs or alcohol, drunk: <i>there is a very intoxicated and belligerent passenger in the rear</i>  |
| <b>isolate (v)</b>                    | to shut off the electrical, hydraulic, fuel or pneumatic supply to a failed component: <i>we have isolated the leak</i>   |
| <b>item</b>                           | a point, a piece of information or an action: <i>the checklist consists of six items</i>  |
| <b>jammed</b>                         | blocked in position, especially used about the flaps, slats and servocontrols: <i>the trailing edge flaps seem to be jammed in the 15-degree position</i>   |
| <b>Jeppesen charts</b>                | charts used by pilots worldwide; they represent a very high quality of cartography. The chart used as a model in Unit 8 Exercise 19a is an arrival chart for an ILS or LOC approach to Runway 16C at Seattle International Airport, Washington State, USA. Different charts exist for each arrival and type of arrival. Other Jeppesen charts include Standard Instrument Departures (SID), airport charts, approach charts, route plotting charts, VFR charts and high level en-route charts for larger regions. Many charts have a validity of only two weeks and must be constantly updated. Electronic charts are becoming more and more common. In addition to the cartographic and flight path information in the middle of the page, the chart contains a wealth of information about the airport and its facilities: radio frequencies, airport elevation, minimum safety altitudes, missed approach points and holdings, location and altitude of obstacles, transition altitudes and levels, RVR, minima etc. |
| <b>jet streams</b>                    | high altitude, fast-moving currents of air  |
| <b>jettison (v)</b>                   | to discharge fuel in flight in order to reduce the aircraft's weight; to <i>dump</i>  |
| <b>jetty</b>                          | a telescopic walkway for passengers to disembark from and board the aircraft directly to and from the terminal building; also <i>airbridge</i> or <i>jetway</i>   |
| <b>jetway</b>                         | a telescopic walkway for passengers disembark from and board the aircraft directly to and from the terminal building; also <i>airbridge</i> or <i>jetty</i>   |
| <b>join downwind Runway 21</b>        | an instruction to make an approach to Runway 21 facing the wind   |
| <b>joining clearance</b>              | authorisation to join a circuit prior to approach and landing   |
| <b>key in (v)</b>                     | to enter data into a computer system using a keyboard: <i>Key in the coordinates of our alternate.</i>  |
| <b>known traffic</b>                  | traffic whose flight details and intentions are known by the controller through direct communication  |
| <b>kt</b>                             | knots: nautical mile per hour: <i>The aircraft is flying at 290 kt</i>  |
| <b>land long (v)</b>                  | to land after the target / touchdown zone: <i>They landed long because of the windshear and heavy rain</i>  |
| <b>land short (v)</b>                 | to land before the target / touchdown zone  |
| <b>landing distance available</b>     | LDA: the actual length of runway which can be used for landing and roll-out. This is a key consideration for pilots when considering which alternate airport to choose for a diversion, especially towards the beginning of a flight when the aircraft is heavy with fuel and if, for example, one engine is operating at idle resulting in the thrust reversers being unavailable or only partly available. All these factors will increase the landing distance required with the necessary safety margin and may be compounded by a wet or icy runway surface, which will reduce the braking coefficient and increase the stopping distance. In addition, the LDA may be reduced due to work being carried out on the runway   |
| <b>landing sequence</b>               | the series of manoeuvres (outbound track, base turn, inbound track) prior to landing  |
| <b>laser gyro</b>                     | a system which senses rotation by measuring the frequency shift of laser light in a closed circuit  |
| <b>late flare</b>                     | a late flare occurs when the aircraft passes the runway touchdown target area before it is rotated.   |
| <b>lateral distance</b>               | related to the aircraft's horizontal movement (heading, course, track) and the localizer part of the ILS  |
| <b>lateral track offset procedure</b> | the fact that in RVSM conditions aircraft often fly a few miles to the left or right of the actual route in order to increase separation  |
| <b>layer</b>                          | thickness, stratum, coat of material or cloud: <i>a layer of paint</i> ; <i>the cloud layer extends for 15 miles</i>  |
| <b>leading edge</b>                   | the forward part of the wing, engine blades or stabilizers: <i>the leading edge slats are extended</i>  |
| <b>leakage</b>                        | unintentional flow of fluid from a container or system which can be measured in drops per minute: <i>We appear to have a fuel leakage from the inner left hand tank</i>   |
| <b>leg</b>                            | 1) part of a long-haul journey, where the plane stops to refuel one or more times on the way: <i>The first leg of the journey is from Beijing to Anchorage; we then fly on to Washington.</i><br>2) a phase of a circuit or traffic pattern: <i>departure, crosswind, downwind and base legs</i>  |
| <b>legal working time</b>             | the maximum number of hours that a crew may work without a break. This is an important safety issue, as tired crews are much more likely to make mistakes. In the event of long delays, a crew may exceed its legal working time and be unable to ensure a flight.  |

| Word                               | Definition and examples   |
|------------------------------------|---|
| <b>Level 160</b>                   | a flight level, corresponding approximately to a height of 16,000 feet. Flight levels are calculated based on atmospheric pressure read by a barometer at ISA (International Standard Atmosphere), i.e. 1013 hectoPascal, rather than actual distance above the ground or sea.  |
| <b>level change</b>                | climbing or descending  |
| <b>LH</b>                          | Left Hand; in aviation 'Left Hand' / 'Right Hand' are generally used to avoid confusion with 'right' meaning 'correct' and 'left' meaning 'remaining'.  |
| <b>lift dumper</b>                 | a function of the ground spoilers on the upper surface of the wing during landing to reduce the lift of the wing and improve wheel brake traction, the <i>lift dumper</i> mode of the spoilers is armed before landing  |
| <b>light chop</b>                  | mild turbulence   |
| <b>likely</b>                      | probable: <i>It is likely that we will have to hold on arrival: ATC have announced heavy traffic</i>  |
| <b>line maintenance</b>            | aircraft maintenance performed at the flight line or ramp between two flights   |
| <b>line mechanic</b>               | an aircraft mechanic or engineer who inspects and services the aircraft (engine oil levels, tyre pressure and wear, signs of fuel or hydraulic leaks, impact damage to the engine air intakes, fan blades and wing leading edges etc.), performs any small repairs and makes entries in the aircraft technical logbook. This is line maintenance. |
| <b>line up (v)</b>                 | to align the aircraft on the runway centreline ready for take-off: <i>line up and wait</i>  |
| <b>line-up check</b>               | this check performed by the flight crew involves checking the identity of the runway and the departure clearance  |
| <b>load shed</b>                   | the disconnection of non-essential electrical power users (notably the galley) if there are electrical generation failures in order to give priority to the essential systems   |
| <b>loadmaster</b>                  | person in charge of a team of handlers loading and unloading cargo and baggage. Baggage loading devices are one of the main causes of damage to the aircraft during turnaround  |
| <b>local time</b>                  | LT: time used at a given geographical location or in a time zone as opposed to Universal Coordinated Time or GMT  |
| <b>localizer antenna</b>           | ILS aerial connected to a transmitter providing directional guidance  |
| <b>localizer beam front course</b> | the course indicated by the localizer transmitter antenna along the approach path of the aircraft   |
| <b>log book</b>                    | a record of all technical incidents and maintenance action carried out on a given aircraft, signed by the crew and technicians and kept on the flight deck; also referred to as the aircraft <i>technical log</i>   |
| <b>long haul</b>                   | long distance or long range: <i>4-engine and ETOPS aircraft are operated on long haul flights</i>   |
| <b>long straight-in approach</b>   | an approach which does not involve a turn and during which the crew has time to stabilise   |
| <b>long way round</b>              | a change of heading in which the aircraft turns more than 180°.   |
| <b>loose</b>                       | not correctly attached or secured, detached, unfastened: <i>there are loose pieces of plastic blowing around the apron - one of the pallets is loose.</i>   |
| <b>loss</b>                        | when you do not have something you had before, because it is unavailable, not working, or destroyed: <i>We experienced a loss of power; the fire resulted in a complete hull loss.</i>  |
| <b>low ceiling</b>                 | the height of the first of cloud cover at a short distance from the ground  |
| <b>low pass</b>                    | a flight at low altitude in landing configuration above the aerodrome usually so that the Tower controllers can check whether the landing gear seems correctly extended and locked down   |
| <b>lower cargo deck</b>            | space below the cabin floor which is divided into a forward and aft cargo hold and which on larger aircraft may be subdivided into compartments. The holds / compartments are subdivided into bays each one of which corresponds to the size of a ULD or container.   |
| <b>lower level</b>                 | a lower flight level which the crew wishes to descend to for operational, technical or meteorological reasons   |
| <b>LP</b>                          | low pressure. N1 is the parameter of the LP compressor rotation speed expressed as a percentage   |
| <b>Mach number</b>                 | the ratio of the speed of the aircraft to the speed of sound: <i>The aircraft is flying at Mach 0.89</i>  |
| <b>magnetic track</b>              | a track / course using the Earth's magnetic field. Given the fluctuations in magnetic field in the polar regions, magnetic navigation cannot be used here   |
| <b>main equipment centre</b>       | the under-floor avionics compartment where computers and other electronic equipment are located (Boeing); on Airbus aircraft this is referred to as the avionics bay  |

| Word                               | Definition and examples   |
|------------------------------------|---|
| <b>main gear</b>                   | MLG: the main landing gear which is located under the inner wing and, in very large aircraft, under the centre fuselage. It consists of wheels mounted on axles connected by a boggy which is attached to the gear leg through a shock absorber. The gear is maintained rigid, retracted and extended by a series of struts, braces and actuators.                      |
| <b>maintain (v)</b>                | 1) to continue to follow, or work within, certain conditions: <i>maintain Flight Level 290 until further advised</i><br>2) to make sure that certain conditions continue: <i>ATC must maintain separation</i>   |
| <b>maintain own separation (v)</b> | the crew uses its vision of other aircraft to keep the necessary distance from other traffic  |
| <b>manage (v)</b>                  | 1) to succeed in doing something: <i>we managed to isolate the failure</i><br>2) to control a situation: <i>ATC manages traffic flow</i>  |
| <b>mandatory</b>                   | obligatory, compulsory, regulatory; something which you must do: <i>the CAA's requirements are mandatory</i>  |
| <b>manoeuvrability</b>             | refers to the extent to which an aircraft can manoeuvre, i.e. move around, get into the right position: <i>manoeuvrability may be reduced if there are flight control problems</i>  |
| <b>manoeuvring surface</b>         | an area where aircraft move on the ground and which should be clear of all obstacles and other vehicles   |
| <b>marking</b>                     | indication painted horizontally onto the runway or taxiway: <i>holding points are identified by continuous and broken yellow markings</i>   |
| <b>marshaller</b>                  | a person in charge of guiding the aircraft to its stand using hand signals: <i>marshalls often use bats or lighted batons to give signals</i>   |
| <b>maximum landing weight</b>      | MLW: the weight at which an aircraft can land without risking structural damage   |
| <b>MD-83</b>                       | a McDonnell Douglas narrow-body jet aircraft of an older generation (1990s) with twin engines mounted on the rear fuselage; it was derived from the earlier DC-9 and resulted in the later MD-90 series   |
| <b>meal tray</b>                   | flat support containing food: <i>catering delivered 139 standard and 21 vegetarian meal trays</i>   |
| <b>mean sea level</b>              | msl: the average height of the sea surface  |
| <b>measured</b>                    | calm, controlled, regular: <i>RT delivery should be clear, concise and measured</i>   |
| <b>medium haul</b>                 | medium range flight: medium haul flights usually last from between three to five hours  |
| <b>met office</b>                  | <i>meteorological office</i> : an organisation gathering and distributing updated weather reports and forecasts: <i>the met office has announced the likelihood of electric storms in the vicinity of Adis Ababa</i>  |
| <b>metal debris</b>                | parts which may become detached from aircraft during take-off and landing; they can have devastating effects as was shown by the Air France Concorde accident at Charles de Gaulle  |
| <b>MEL</b>                         | Minimum Equipment List: a list of instruments and equipment on an aircraft which must be serviceable before the aircraft can be dispatched: if they are in doubt, the flight crew refers to the MEL. The MMEL (Master Minimum Equipment List) provides a list of equipment which are allowed to be inoperative under certain conditions when the aircraft is dispatched |
| <b>MET / met</b>                   | meteorology / meteorological, relating to the weather: <i>met office, met report</i>  |
| <b>METAR</b>                       | a weather report from an airport or weather station often used by pilots as a print-out during the pre-flight briefing. It can be obtained for any location in the world and is usually updated hourly  |
| <b>microburst</b>                  | a dangerous vertical gust of wind   |
| <b>millibars</b>                   | unit of atmospheric pressure measurement which refers to the same unit value as hectoPascal   |
| <b>minima</b>                      | the lower limits of visibility for a given aircraft at a given approach depending on its onboard equipment: <i>The aircraft landed at Perth Airport in weather conditions that were below the prescribed landing minima for the instrument approach.</i>  |
| <b>minimum approach speed</b>      | the fact that each aircraft type (B737, A320 etc.) will have a minimum speed at which it can safely fly in a given configuration, i.e. clean configuration (all flaps and gear retracted) and then with flaps and slats extended to different degrees (5°, 15°, 25° etc.) and the gear extended. This speed will decrease as the flaps, slats and gear are extended.    |
| <b>Minimum Descent Altitude</b>    | MDA: the altitude in the terminal area (around the airport) below which no aircraft must descend unless it is on its approach path. In some airports, the MDA will be different in different directions depending on the terrain  |
| <b>miss (n)</b>                    | a near-collision, an airprox: <i>It was a near miss, as separation was reduced to 650 feet vertically and 1,200 metres horizontally.</i>  |

| Word                             | Definition and examples   |
|----------------------------------|---|
| <b>missed approach</b>           | when a aircraft approaches an airport in order to land, but does not actually land, typically because of low visibility, an obstacle on the runway etc. and goes around to make another approach  |
| <b>missed approach point</b>     | MAP: last point (altitude and distance from threshold) at which the crew should decide to land or go around   |
| <b>missing</b>                   | absent, not present, lost: <i>the pitot covers are missing</i> . In the case of radio communication, it can mean 'not transmitted or heard': <i>part of the transmission was missing</i>  |
| <b>misunderstanding</b>          | understanding incorrectly: <i>there was a misunderstanding between the pilot and the controller and the crew continued their descent</i> .  |
| <b>mitigate (v)</b>              | to make less serious: <i>the crew made a long approach to mitigate the risk of landing long</i>   |
| <b>mobile lounge</b>             | telescopic vehicle able to transport passengers and enable them to board directly at outlying stands  |
| <b>Mode Control Panel</b>        | MCP: a control panel on the glareshield which, on a Boeing aircraft, fulfils the same function as a <i>Flight Control Unit (FCU)</i> on an Airbus aircraft, i.e. entering altitude, heading, speed, vertical speed (rate of climb / descent) values into the autopilot and autothrust / autothrottle  |
| <b>molten</b>                    | fused or melted: <i>molten plastic and metal were found at the scene of the fire</i> .  |
| <b>monitor (v)</b>               | 1) to listen to the frequency<br>2) to watch indications over time: <i>monitor the Engine 2 parameters</i>  |
| <b>mountain wave effect</b>      | the result of a powerful air mass immediately downstream of a transverse mountain range, rotating about a horizontal axis   |
| <b>MSA</b>                       | Minimum Safe Altitude: altitude in the terminal area below which aircraft should not descend except on approach   |
| <b>mud</b>                       | soft wet earth  |
| <b>N1</b>                        | engine low pressure compressor (and fan) rotation speed expressed as a percentage: <i>97% N1 is a typical value</i>   |
| <b>N2</b>                        | engine high pressure compressor rotation speed  |
| <b>nautical mile</b>             | NM: 1,853.18 metres. Compare <i>statute mile</i> , 1,609.34 metres.   |
| <b>navaid</b>                    | various radio navigation aids: DME (Distance Measuring Equipment), NDB (Non-Directional Beacon), ADF (Automatic Direction Finder), VOR (VHF Omnidirectional Range), ILS (Instrument Landing System: localizer and glideslope), VORTAC (VOR + Tacan), GPS (Global Positioning System), GNSS (Global Navigation Satellite System), RNAV (Area Navigation) |
| <b>navigation accuracy check</b> | the crew's practice of crosschecking different navigation instruments and sources against each other in order to make sure their data is correct  |
| <b>Navigation Display</b>        | ND: one of the main pilot instruments which provides compass heading, navigational and weather radar return data; it is located in front of each pilot next to the PFD (Primary Flight Display)   |
| <b>near (v)</b>                  | to approach, to come closer: <i>we are nearing our top of climb (cleared cruise flight level) and will be levelling off in 1 minute</i>   |
| <b>negative</b>                  | contradicts a previous statement by the other speaker; no; permission not granted; this is not correct; not capable: <i>'Are you going around?'</i> <i>'Negative'</i>   |
| <b>no deviation signal</b>       | in this case (NZ 60) no information is displayed; this should not be confused with <i>zero deviation signal</i> , which means that there is a signal which shows the aircraft to be correctly aligned   |
| <b>no-go item</b>                | a component or system on the Minimum Equipment List (MEL) which, if it is unserviceable, prevents the aircraft from being dispatched for a flight   |
| <b>no show (n)</b>               | a passenger who is booked on a flight, but does not check in  |
| <b>no-entry sign</b>             | airport sign which indicates that a taxiway etc. is closed or unserviceable. A no-entry sign is a white rectangle on a red circular background.   |
| <b>noise</b>                     | 1) unwanted signals within an electronic system: <i>We're getting a lot of noise on the tower frequency</i><br>2) sound: <i>What was that noise from the cabin?</i>   |
| <b>Non-Directional Beacon</b>    | NDB: a ground-based beacon with a given Morse identifier used by the pilot in conjunction with the ADF in order to establish his / her position: <i>with the spread of VOR and GPS, NDBs tend to be used less</i>   |
| <b>non-emergency evacuation</b>  | leaving the aircraft as a precautionary measure while the aircraft is not at its parking stand  |
| <b>non-precision approach</b>    | an instrument approach which uses horizontal guidance (Localizer, DME, VOR, NDB etc.), but not vertical guidance (glideslope)   |
| <b>northerly</b>                 | in or from the north: <i>they are flying a northerly route</i>  |

| Word                             | Definition and examples  |
|----------------------------------|--|
| <b>nose gear</b>                 | NLG: the wheels, leg, steering system etc. at the front of the aircraft. The taxi and take-off lights are mounted on the nose gear. A safety pin is inserted in the nose gear during turnaround until the tow-bar has been disconnected.   |
| <b>nose-down correction</b>      | the action by which the pilot pitches down to lose altitude or increase speed  |
| <b>nose-in</b>                   | a type of stand directly in contact with the airport passenger terminal; parking or docking is usually assisted by an automatic system   |
| <b>nose-up elevator</b>          | refers to when the pilot pulls on the control wheel or stick in order to raise the nose of the aircraft by acting on the elevators   |
| <b>NOSIG</b>                     | no significant change for the next two hours in a METAR  |
| <b>NOTAM</b>                     | Notice to Airmen: document giving information about changes to aeronautical facilities, services, procedures or hazards. NOTAM are available in the form of Pre-Flight Information Bulletins (PIB) using a live database.  |
| <b>notify (v)</b>                | to inform, to advise, to tell: <i>Notify all incoming flights of the recent reports of windshear near the threshold</i>  |
| <b>Number 1</b>                  | used by ATC to inform a flight crew that they are the first in line to depart or on approach   |
| <b>oblique exit / turn-off</b>   | exits designed to facilitate aircraft vacating the runway at speed, hence the term 'high-speed turnoff', and performing a rolling start for take-off   |
| <b>obscuration</b>               | decreased visibility caused by fog, smoke, sandstorm etc.  |
| <b>obscure (v)</b>               | to hide or conceal from view: <i>the markings were obscured by a layer of sand</i>   |
| <b>occur (v)</b>                 | to happen, to take place: <i>a bird strike occurred during climb-out</i>   |
| <b>offload (v)</b>               | to remove from the aircraft: <i>as the passenger did not show up at the gate, his baggage had to be identified and offloaded</i>   |
| <b>offset (v)</b>                | to shift or displace to the side of a central axis: <i>crews cannot offset their flight paths in RVSM conditions if parallel route centrelines are less than 30 nm apart</i>   |
| <b>omit (v)</b>                  | to fail or forget to do something: <i>the controller omitted to use the complete callsign</i>  |
| <b>on board</b>                  | on the aircraft: <i>we have 358 passengers on board (POB)</i>  |
| <b>on hold</b>                   | waiting for authorisation or clearance   |
| <b>on runway heading</b>         | flying on a heading which is an extension of the runway centreline   |
| <b>on time</b>                   | in accordance with the schedule, not late or early, on schedule: <i>the flight arrived on time</i>   |
| <b>onward clearance</b>          | a clearance to pursue the flight after a waypoint or holding action: <i>expect onward clearance at 09</i>  |
| <b>operate (v)</b>               | 1) to cause to function, to run, to keep in operation: <i>Singapore Airlines operates a fleet of A380s; after the bird ingestion, the crew operated the engine at flight idle</i><br>2) to be enforced, to apply: <i>when RVSM operate, vertical separation is reduced to 1,000 feet</i> |
| <b>opposite</b>                  | in the contrary direction or location: <i>there is traffic in the opposite direction 2,000 feet above</i>  |
| <b>OPS</b>                       | Operations, flight ops   |
| <b>orbit (v)</b>                 | to perform a 360° circuit usually in order to delay: for safety reasons, the ATC will tell the pilot whether to orbit left or right.   |
| <b>out of phase</b>              | not following, in harmony or aligned with something else   |
| <b>outbound destination sign</b> | airport sign which indicates the direction to common taxi routes   |
| <b>outbound track</b>            | flight away from a navaid fix  |
| <b>outer marker</b>              | an ILS marker beacon usually on the runway centreline, often coinciding with the final approach fix, approximately 4 to 7 miles from the runway threshold  |
| <b>outer taxiway</b>             | continuous taxiway between apron and inner taxiways and runways allowing aircraft to circumnavigate (taxi around) the terminals for easier access  |
| <b>outer windshield panel</b>    | external layer of a windshield; aircraft windshields comprise up to five separate layers, incorporate gold heating filaments and may weigh up to 80kg.   |
| <b>outflow valve</b>             | a valve which regulates cabin pressure by controlling the amount of air which is allowed to flow out of the cabin. They are large door-type valves which are quite visible on the outside of the fuselage  |
| <b>outgoing flight</b>           | departing flight   |
| <b>outlying stand</b>            | parking position which is not directly connected to terminal; <i>remote stand</i>  |
| <b>overcast</b>                  | OVC: complete cloud cover, 0.9+ (i.e. over 90%) cloud cover  |



| Word                              | Definition and examples  |
|-----------------------------------|--|
| <b>overfly (v)</b>                | to fly over: <i>aircraft overfly waypoints and beacons</i>   |
| <b>overhead</b>                   | immediately above: <i>we are overhead the field</i>  |
| <b>overhead panel</b>             | an instrument panel above the pilots' heads in the cockpit which contains most of the system control panels on aircraft with a two-man crew  |
| <b>over-reliance</b>              | depending on somebody or something too much, which creates dangers when that person or thing is unavailable or wrong   |
| <b>override (v)</b>               | to give a manual order which has priority over an automatic order: <i>the crew can always override the automation manually and take control</i>  |
| <b>overshoot (v)</b>              | to fail to stop before the runway exit or the runway threshold   |
| <b>overshoot windshear</b>        | windshear characterized by an increase in aircraft airspeed  |
| <b>oversight</b>                  | 1) As an uncountable noun, <i>oversight</i> means supervision, from the verb 'to oversee': <i>The Federal Aviation Authority has oversight of air traffic control and safety regulation within US airspace.</i><br>2) As a countable noun, an <i>oversight</i> is something that has been forgotten or missed: <i>Not removing the pitot covers was an oversight by maintenance.</i> |
| <b>P</b>                          | in excess of , greater than the highest reportable sensor in a TAF: <i>FM191600 24012KT P6SM SKC, i.e. in excess of 6 statute miles</i>  |
| <b>pack controller</b>            | an electronic device which regulates airflow and temperature within the air conditioning pack / air cycle machine, which adjusts the temperature of hot engine compressor bleed air for use in the aircraft  |
| <b>pallet</b>                     | flat wooden trays transporting goods   |
| <b>Pan-pan, pan-pan, pan-pan"</b> | a 'pan' call indicates an urgency call which concerns the safety of the aircraft, but does not require immediate assistance. It is a lesser degree of urgency than the distress call 'Mayday'.   |
| <b>paperwork</b>                  | filling in forms, records, documents, reports etc.   |
| <b>PAPI</b>                       | Precision Approach Path Indicator: a series of lights leading to the runway threshold which enable pilots to control their rate of descent visually  |
| <b>parameter</b>                  | a basic definable value or quantity which can be expressed numerically: %, °C, kts, ft, psi, rpm, fpm etc.   |
| <b>parking brake</b>              | wheel brake applied from the flight deck by means of a handle and used on the ground at the stand until the chocks are in place or for emergency braking as a last resort  |
| <b>pass (v)</b>                   | to go through or by: <i>report passing PAR / Flight Level 160</i>  |
| <b>pass through (v)</b>           | to cross, to move from one side to the other: <i>we are passing through some dense cloud</i>   |
| <b>pass your message (v)</b>      | to transmit or give your message   |
| <b>passenger address</b>          | PA: a communication system for the flight and cabin crew to talk to all the passengers or the communication itself   |
| <b>passenger coach</b>            | bus for transporting passengers to and from aircraft   |
| <b>passenger steps</b>            | mobile stairs used for boarding and disembarking at outlying stands  |
| <b>passenger terminal</b>         | building for passenger check-in, security, immigration, etc.   |
| <b>pattern</b>                    | a circuit of procedural turns: <i>traffic pattern, holding pattern</i>   |
| <b>paving</b>                     | the hard surface of all parts of the apron, runways and taxiways   |
| <b>pax</b>                        | a common abbreviation for passengers: <i>We have 164 pax on board</i>  |
| <b>payload</b>                    | 1) carrying capacity of an aircraft<br>2) the part of the useful load from which revenue is derived  |
| <b>penalty</b>                    | a reduction in aircraft or system performance caused by a failure: <i>we have a 20-knot speed penalty due to the engine malfunction</i>  |
| <b>perform (v)</b>                | to do, to carry out, to execute a procedure: <b>we will perform a missed approach</b>  |
| <b>perform a 360 (v)</b>          | to make a complete turn or traffic pattern, to orbit, usually as a delaying action   |
| <b>perimeter fencing</b>          | security barrier around the outer limit of airport   |
| <b>perishable goods</b>           | items such as fresh food which must be kept under specific conditions to protect them from spoiling too soon   |
| <b>PF</b>                         | pilot flying: the pilot who is actually doing the hands-on flying of the aircraft at a given moment. Captain and First Officer takes these roles in turn   |

| Word  | Definition and examples   |
|---|---|
| <b>pick up (v)</b>                                | 1) to detect something heard on the frequency, the Lan Chile crew <i>picked up</i> the pan call from the TAROM flight and relayed it to ATC<br>2) In a more technical sense, it refers to sensors, detectors etc. detecting a signal, movement, vibration, temperature etc.   |
| <b>pier</b>                                       | long corridor connecting airport terminal with gates  |
| <b>pilot in command</b>                           | the pilot flying (PF), the pilot in control of the aircraft   |
| <b>PIREP</b>                                      | pilot reports: Weather information from official sources is complemented by live updates from pilots about weather conditions they encounter en route or during approach and landing  |
| <b>pitch attitude</b>                             | the angle between the aircraft's longitudinal axis and the horizontal plane   |
| <b>pitch-down input</b>                           | the action of the pilot pushing on the control column or stick  |
| <b>pitch-down movement</b>                        | a nose-down movement of the aircraft attitude   |
| <b>pitot heat</b>                                 | refers to the electrical heating of the various air data probes: pitot probe, angle of attack sensor, static port etc.  |
| <b>Please give us five miles behind the heavy</b> | a request by the pilot for a horizontal separation of five miles between himself and the preceding wide-body aircraft in order to avoid the effects of wake   |
| <b>PNF</b>  | <i>Pilot Not Flying or Pilot Non-Flying</i> : the pilot who is monitoring the PF, entering data, communicating with ATC etc. Captain and First Officer takes these roles in turn.   |
| <b>poor</b>                                       | of bad quality, insufficient: <i>poor visibility, poor braking action</i>   |
| <b>position report</b>                            | the fact that the crew regularly informs ATC of their current position: <i>resume position reporting</i>  |
| <b>post-incident analysis</b>                     | a study conducted after an event: <i>a post-incident analysis revealed that the crew had not performed a full approach briefing</i>   |
| <b>power cut</b>                                  | loss of electrical power supply: <i>a series of power cuts has affected the continuity of the radar</i>   |
| <b>power setting</b>                              | the position of the engine thrust /throttle levers: <i>the PF selected a Maximum Continuous Thrust power setting</i>  |
| <b>power transient</b>                            | a temporary electrical surge or impulse, causing a sudden peak of variables and very short power cuts, especially at power up   |
| <b>precautionary landing</b>                      | an anticipated landing decided on by the crew in order to manage an abnormal situation (technical failure, illness etc.) but which is not an emergency: <i>due to the failure of engine 1, we have decided to return to Bogota and make a precautionary landing</i>   |
| <b>precipitation</b>                              | moisture released from the atmosphere and falling as rain, snow, hail etc.  |
| <b>prevention</b>                                 | action to stop or avoid something: <i>accident prevention has developed greatly over the past few years and has resulted in improved safety statistics</i>  |
| <b>previous</b>                                   | the one before: <i>there was an electrical power incident on the previous leg which we entered in the aircraft technical log</i>  |
| <b>primary radar target</b>                       | a blip (symbol) displayed on controller's radar screen  |
| <b>primary surveillance radar</b>                 | PSR: a radar system which operates independently of the target: unlike <i>Primary Surveillance Radar</i> , SSR (Secondary Surveillance Radar) uses a transponder onboard the aircraft to obtain a return.   |
| <b>PRO</b>  | probability (METAR)   |
| <b>probe heat</b>                                 | the electrical anti-icing of the air data probes (pitot probe, static ports, angle of attack sensors, outside air temperature sensors) which are located on the outside of the forward fuselage. The failure of the probe heat system on the A330 is suspected as being a contributory factor to the loss of Air France Flight 447 over the South Atlantic in June 2009. If the probes become obstructed with ice, the flight crew can lose all altitude, airspeed and angle of attack information and the computers which receive this information will generate erroneous outputs |
| <b>probes</b>                                     | air data probes: pitot probe, static port, angle of attack sensor, temperature sensors. There are three sets of probes: one usually connected to the captain's instruments, one to the first officer's and a standby set which can be used if either of the others fails or for crosschecking   |
| <b>proceed (v)</b>                                | to continue, to carry on, to go towards, to go forward: <i>track 280 degrees magnetic to GAN before proceeding on course</i>  |
| <b>progressive taxi instructions</b>              | gradual or step-by-step instructions for taxiing: <i>progressive taxi instructions are recommended when taxiing is complex</i>  |
| <b>prolonged</b>                                  | long, over a long period of time: <i>we were in radio silence for prolonged periods</i>   |

| Word  | Definition and examples   |
|---|---|
| <b>PSU</b>                                  | Passenger Service Unit: component located on the lower side of the overhead baggage racks above the passengers' heads and containing oxygen masks, air gasper outlets, 'no smoking' and 'fasten seat belt' signs  |
| <b>published speed</b>                      | the reference speed which is published in the flight manual for this phase of operations  |
| <b>pull in (v)</b>                          | to move to the side of the road / taxiway, etc., to allow another vehicle to pass; also <i>pull over</i>  |
| <b>purser</b>                               | the chief cabin attendant on medium size narrow-body aircraft   |
| <b>push-back</b>                            | moving the aircraft back away from its parking stand so that the crew can start the engines and taxi: <i>request push-back – push-back approved</i>   |
| <b>pylon</b>                                | 1) a structure used to mount engines to the underside of an aircraft wing<br>2) a tall steel structure to which wires carrying electricity are fixed so that they are safely held high above the ground: <i>there is a row of pylons rising to 150 feet on final approach to the left of the centreline</i>   |
| <b>QNH</b>                                  | an atmospheric pressure altitude setting with reference to mean sea level within a certain defined region; also referred to as 'Q' in METAR: Q0994, Q1023   |
| <b>Quick Engine Change</b>                  | QEC: the replacement of an aircraft engine in the field   |
| <b>Quick Reference Checklist / Handbook</b> | QRC / QRH: concise document listing actions to be performed in abnormal situations  |
| <b>quiet hours</b>                          | the time, typically 23:00–06:00, when aircraft movements to and from the airport are restricted or prohibited to avoid disturbance by noise: <i>we need to expedite our departure or we will be into quiet hours on arrival</i>   |
| <b>radar antenna</b>                        | portion of radar system used to radiate and intercept signals   |
| <b>radar coverage</b>                       | the area or scope reached by a radar  |
| <b>radar return</b>                         | the reflection of the beam off the 'target' (the aircraft) which causes a 'blip' or display on the controller's screen or a weather contour on the aircraft's weather radar   |
| <b>radar surveillance approach</b>          | a type of radar instrument approach provided by ATC; only an operational radio transmitter and receiver are required. The radar controller vectors the aircraft to align it with the runway centreline  |
| <b>radar vectors</b>                        | heading, altitude and airspeed instructions given by ATC using secondary surveillance radar: <i>radar vectors are given to arriving flights to enable them to intercept an approach aid</i>   |
| <b>radial</b>                               | a magnetic bearing from a navigation aid: <i>a fix may be the intersection of two VOR radials; proceed to PRL along the 238 degree radial FROM PRL</i>  |
| <b>radio altitude</b>                       | an altitude above the ground displayed by the radio altimeter during the last 2,500 feet of the approach  |
| <b>Radio Management Panel</b>               | RMP: a control panel located on the centre pedestal between the two pilots which allows them to tune to different VHF and HF radio frequencies as well as to various navigation aids. There is an ACTIVE and a STANDBY window which enables a new frequency to be pre-tuned and then selected when needed   |
| <b>radio operator</b>                       | initially, aircraft were flown by a five-man crew: captain, first officer, flight engineer, radio operator (whose language skills were often better than those of the rest of the crew) and navigator. With the advances of navigational technology and aircraft system automation, these five-man crews have gradually been reduced to the two pilots on modern aircraft.  |
| <b>radio silence</b>                        | not using the frequency in the event of another aircraft being in an emergency. Silence is twofold: first, it means instructing other aircraft and controllers on the frequency to maintain radio silence, if necessary, ('Stop transmitting') so that the frequency is fully available for the aircraft in distress; secondly, it is keeping the controller's transmissions to a minimum so as not to disturb the flight crew. |
| <b>radome</b>                               | a conical protective cover in composite material over the weather radar antenna and forming the nose of the aircraft: <i>the radome was damaged by the lightning strike</i>   |
| <b>ramp</b>                                 | area around the terminal buildings where aircraft are parked and serviced. Also <i>apron</i> .  |
| <b>ramp supervisor</b>                      | person in charge of a team of handlers loading and unloading cargo and baggage in case of any special cargo. Baggage loading devices are one of the main causes of damage to the aircraft during turnaround.  |
| <b>range</b>                                | 1) the distance that can be covered by an aircraft without refuelling: <i>the maximum range of the B777-200ER is 7,700 nautical miles</i><br>2) the distance that can be covered by a radar / radio / navigation aid signal or an instrument: <i>the weather radar can be set to ranges of up to 320 nautical miles.</i>  |

| Word                                 | Definition and examples  |
|--------------------------------------|--|
| <b>RAT</b>                           | Ram Air Turbine: a small electrical generator driven by a propeller, which is lowered into the airstream below the wing to provide essential electrical (and hydraulic) power in the event of multiple engine driven generator failures  |
| <b>reach (v)</b>                     | to arrive at a given point: <i>the aircraft levelled off on reaching its top of climb</i>  |
| <b>read (v)</b>                      | to hear and understand: <i>how do you read me?</i>   |
| <b>readback</b>                      | an instruction to make the interlocutor acknowledge specific instructions or information: <i>The readback was both incomplete and given with the wrong stop altitude; the ATCO had corrected the omission but missed the stop altitude error</i>   |
| <b>readback error</b>                | a failure to correctly repeat all or part of message to verify accuracy  |
| <b>readback/<br/>hearback error</b>  | a failure to notice and correct a readback error   |
| <b>readout</b>                       | 1) data which is displayed visually: <i>the FOB (Fuel On Board) readout is showing 38 tonnes</i><br>2) data said / played audibly: <i>the PNF made a radio altitude readout during approach</i>  |
| <b>reclear (v)</b>                   | to modify a previous ATC clearance: <i>recleared Flight Level 310; rest of clearance unchanged</i>   |
| <b>recovery</b>                      | 1) the completion of a flight manoeuvre and return to straight and level flight 2) the return to normal operation, for example the restarting of engine of the regaining of a previously lost system   |
| <b>recycle (v)</b>                   | to perform a complete flight control, landing gear or door operation: <i>extend-retract-extend, close-open-close etc.</i>  |
| <b>red cap</b>                       | airport agent who provides the weight and balance sheet which must be checked and signed by the captain. The weight and balance sheet contains updated information about the aircraft payload (passengers, baggage, cargo and fuel) and its location. This allows the aircraft's centre of gravity, which must be within certain limits for safe take-off and flight, to be calculated |
| <b>reference speed</b>               | Vref: the speed at which the aircraft should be flying in a given configuration  |
| <b>refraction</b>                    | the deflection of a light ray from a straight path, which causes visual distortion   |
| <b>reject (v)</b>                    | to refuse, to abandon: <i>the crew rejected take-off at 70 knots</i>   |
| <b>relay (v)</b>                     | to pass on or transmit information: <i>Will you relay our situation to our company Ops, please?</i>  |
| <b>reliability</b>                   | probability that equipment will operate correctly for a specified period of time   |
| <b>relief crew</b>                   | a flight crew on the ground or on board who replaces a crew at the end of their period of duty   |
| <b>relieve(v)</b>                    | 1) to remove pressure, strain or pain: <i>Good ground support during turnaround can relieve pressure on flight crews.</i><br>2) to take over from someone: <i>Regulations state that controllers must be relieved after an eight-hour shift and that there must be at least ten hours between shifts.</i>  |
| <b>relight (v)</b>                   | to restart an engine (past: relit), <i>We are trying to relight our stalled engine</i>   |
| <b>reluctance</b>                    | a lack of willingness, often because of fear of embarrassment or simply to save time and effort: <i>The First Officer showed a lot of reluctance to question the Captain's decision</i>  |
| <b>remote stand</b>                  | parking position which is not directly connected to the terminal; <i>outlying stand</i>  |
| <b>repair station</b>                | a technical facility where certain types of aircraft, engines and equipment can be repaired and maintained   |
| <b>report (n)</b>                    | a verbal or written account of an incident: <i>Pilots and controllers file reports on any airprox they encounter</i>   |
| <b>report (v)</b>                    | to pass requested information: <i>report airborne</i>  |
| <b>report short final</b>            | the pilot is instructed by ATC to advise them when he / she is on the last section of the approach   |
| <b>report vacating /<br/>vacated</b> | an instruction from ATC requesting the crew to report that they are leaving or exiting a runway or parking stand   |
| <b>reporting point</b>               | a specific location in relation to which the position of an aircraft should be reported  |
| <b>request (v)</b>                   | In radiotelephony, this means 'I would like to know' or 'I would like to obtain': <i>request departure instructions</i>  |
| <b>require (n)</b>                   | to need: <i>we require 117 tonnes of fuel for our next leg</i>   |
| <b>rescue (v)</b>                    | to save, to recover, to free from danger: <i>search and rescue; all the passengers and crew were rescued from the icy water</i>  |

| Word   | Definition and examples   |
|--|---|
| <b>Resolution Advisory</b>                     | RA: a message delivered by the TCAS instructing the crew to climb or descend. An RA requires the crew to take immediate action. If there is a conflict between an ATC instruction and a TCAS Resolution Advisory, the crew must obey the Resolution Advisory. If the TCAS instructs the crew of one aircraft to descend, and ATC also instructs the non-TCAS equipped aircraft to descend, the TCAS will give the crew a contrary instruction after a few seconds in order to avoid collision |
| <b>response time</b>                           | time taken by a human being or a machine to react to a situation or input   |
| <b>resume (v)</b>                              | to start using or doing again, to return to again after an interruption: <i>resume own navigation direct CHN</i>  |
| <b>resuscitation</b>                           | bringing someone back to consciousness  |
| <b>retard (v)</b>                              | to pull back the throttle / thrust lever(s) on the centre pedestal to reduce the engine speed and the resulting thrust; to throttle back; just prior to touchdown the automatic system in the flight deck says 'retard, retard'.  |
| <b>retract the gear (v)</b>                    | to set the landing gear lever on the right centre part of the instrument panel to UP; the landing gear is unlocked, folds and enters the landing gear bays: <i>the landing gear bay doors open to allow the landing gear to retract</i>   |
| <b>reverse thrust</b>                          | engine thrust whose direction is changed during the landing roll-out by a translating cowl, doors or buckets in order to reduce aircraft speed and assist the wheel braking   |
| <b>revert (v)</b>                              | to return to: <i>revert to flight plan call sign</i>  |
| <b>RH</b>                                      | Right Hand; 'Right hand' / 'Left hand' are generally used to avoid confusion with 'right' meaning 'correct' and 'left' meaning 'remaining'.   |
| <b>ride (n)</b>                                | jargon for <i>flight</i> : <i>we are having a smooth ride</i>   |
| <b>right green arrow</b>                       | the green arrow (or indicator light) which shows that the right hand main gear is extended and locked down  |
| <b>rim</b>                                     | the outer lip of a wheel, which holds the tyre in place   |
| <b>risk factor</b>                             | an aspect which can be a source of danger or threat: <i>Poor visibility, crew fatigue, failure to follow SOPs are all potential risk factors during approach and landing</i>  |
| <b>risk management</b>                         | identification, assessment and prioritization of risks followed by coordinated use of resources to minimize them  |
| <b>roger</b>                                   | 'I have received all your last transmission'. <i>Roger</i> is not to be used in reply to a question which requires a direct answer or readback  |
| <b>roll through (v)</b>                        | to taxi past, to fail to stop at: <i>the crew inadvertently rolled through the stop bar</i>   |
| <b>rollout / roll-out (n)</b>                  | 1) an aircraft's ground roll along the runway after touchdown; 2) returning to level flight   |
| <b>RT loading</b>                              | the degree of saturation of radio frequency   |
| <b>RTF / R/T</b>                               | radiotelephony: transmission of speech by radio: <i>both standard phraseology and plain language are used in RT</i>   |
| <b>rudder deflection</b>                       | the movement of the rudder from side to side: <i>rudder deflection is reduced at high speed.</i>  |
| <b>run away (v)</b>                            | to increase in an uncontrolled manner: <i>The temperature indications seem to be running away.</i>  |
| <b>runaway (n)</b>                             | a situation where something increases in an uncontrolled manner or moves out of control: <i>thermal runaway, stabilizer runaway</i>   |
| <b>run up (v)</b>                              | to test the engine at full power: <i>we need to run up the engines after the inspection; engine run-up (n)</i>  |
| <b>runway</b>                                  | the paved surface designed for aircraft take-off and landing. Runways have different designated orientations (QFU) such as 05L / 23R 180° apart and are generally some distance from the terminal buildings. The runways may be parallel, offset or intersecting  |
| <b>runway centreline lighting</b>              | lighting along the longitudinal axis of runway  |
| <b>runway centreline marking</b>               | a series of painted marks showing the runway centreline   |
| <b>runway confusion</b>                        | a pilot approaching, entering, or landing on the wrong runway   |
| <b>runway edge lighting</b>                    | white lights, usually on stalks, on each side of the  |
| <b>runway exit</b>                             | a short taxiway which allows aircraft to leave a runway   |
| <b>runway exit sign</b>                        | an airport sign which indicates an approaching taxiway to vacate a runway   |
| <b>runway holding point / position marking</b> | painted markings of continuous and broken yellow lines which indicate where aircraft must hold until cleared onto a runway  |

| Word                                | Definition and examples   |
|-------------------------------------|---|
| <b>runway incursion</b>             | when an aircraft, vehicle, pedestrian or animal inadvertently enters an active runway   |
| <b>rupture (n)</b>                  | a break or failure  |
| <b>rushed</b>                       | in a hurry, in haste, too fast to do things properly: <i>rushed decisions and actions often lead to errors and inattention</i>  |
| <b>RVR</b>                          | Runway Visual Range: a value representing the horizontal distance a pilot will see centreline or edge lights or runway markings down the runway from the approach end measured from three points on the runway: threshold, mid point and stop end: <i>R12/1200</i> , i.e. RVR Runway 24 1,200 metres  |
| <b>RVSM</b>                         | Reduced Vertical Separation Minima: the reduction of vertical separation from 2,000 to 1,000 feet with aircraft flying in opposite directions every 1,000 feet in order to accommodate more aircraft in the same airspace   |
| <b>Saab 340</b>                     | a small Swedish twin turboprop regional transport, still in operation, but no longer in production.   |
| <b>safety</b>                       | the protection of people from harm, injury, danger and death: <i>safety audit, safety management system, passenger safety: Aviation safety is the reason behind ICAO's Language Proficiency Requirements.</i>   |
| <b>Saint Elmo's fire</b>            | a visible discharge on blades, windshields, etc. caused by the build-up of electrical potential   |
| <b>satellite</b>                    | a terminal building at an airport, attached to a larger terminal, which is located to bring passengers nearer to the gates  |
| <b>say again</b>                    | is used when a transmission has not been heard or understood or the listener is not sure of the content; <i>'I say again'</i> announces a repetition or a rephrasing  |
| <b>scan (v)</b>                     | to look systematically over a given area: <i>the First Officer scanned the instruments and control panels; the crew scanned the sky for any traffic</i>   |
| <b>scattered</b>                    | SCT: showers or clouds which are distributed irregularly: <i>PAEL 182245Z 30010KT 25SM SCT050</i>   |
| <b>scheduled</b>                    | planned at a specific time, regular: <i>Both scheduled and charter flights use the airport.</i>   |
| <b>scissor lift loader</b>          | telescopic loader for raising containers and pallets to the cargo compartments  |
| <b>scratch (n and v)</b>            | a shallow line or incision in the surface of a material; to make a shallow line with a sharp object   |
| <b>seal</b>                         | part of a union which prevents fluid leaking out  |
| <b>secondary surveillance radar</b> | SSR: an ATC radar system which detects and measures the position of aircraft as well obtaining its identity and altitude by means of a transponder onboard the aircraft: <i>Mode S is a Secondary Surveillance Radar (SSR) with a selective interrogation of aircraft and a unique 24-bit worldwide address which removes the risk of confusion due to overlapping signals.</i> |
| <b>sector</b>                       | defined area of airspace controlled by specific controllers   |
| <b>secure (v)</b>                   | to fasten, to attach, to hold in position, to make safe: <i>Have you made sure that the load is secured?</i>  |
| <b>security</b>                     | protection against crime, theft, terrorism: <i>the security services are standing by at the ramp in case they need to board the aircraft</i>  |
| <b>seepage</b>                      | a very slow fluid leak  |
| <b>seize (v)</b>                    | 1) to block, lock or jam: <i>the flap linkage appears to be seized up</i><br>2) to grab or take hold of: <i>seize the handle and turn clockwise</i>   |
| <b>sensory memory</b>               | memory of visual, auditory or tactile (touch) impressions   |
| <b>separate (v)</b>                 | to maintain a safe distance between aircraft. An aircraft in difficulty will need more airspace; manoeuvring may be slower and more difficult; the crew need to be able to concentrate on handling the failure and not on possible conflicts with other aircraft: <i>ATC must separate the aircraft in distress from other traffic</i>  |
| <b>separation</b>                   | the distance between aircraft, which is carefully monitored and controlled by ATCOs: <i>reduced vertical separation minima</i>  |
| <b>sequencing</b>                   | air traffic controller's action placing aircraft in order with a safe separation during approach  |
| <b>servicing</b>                    | light maintenance and replenishment (fuel, water, waste, catering) during turnaround  |
| <b>set (v)</b>                      | to position precisely: <i>set the altimeter to 1019 hPa</i>   |
| <b>setting</b>                      | value entered, calibration, position of flight control surface, engine, system or instrument: <i>the altimeter setting is 1007 hPa; reduce the engine power setting</i>   |
| <b>setup</b>                        | preparation, calibration, selection   |
| <b>severely (adv)</b>               | badly, considerably, seriously: <i>the lower wing surface was severely damaged by the burst tyre</i>  |
| <b>shallow mist</b>                 | MIBR (French, <i>mince brume</i> ): a thin layer of mist near the ground, usually in the early morning, above which the aircraft climbs quickly   |

| Word                             | Definition and examples  |
|----------------------------------|--|
| <b>shed (v)</b>                  | to disconnect certain heavy non-essential electrical loads such as the galley  |
| <b>shift (n)</b>                 | 1) a change of wind direction: <i>there has been a shift in the wind which is now blowing from the north-east</i><br>2) a period of working time: <i>the next shift is ready to take over</i>  |
| <b>shift handover</b>            | the moment one group of controllers is replaced by another or one control centre passes control to another   |
| <b>short circuit</b>             | an inadvertent electrical connection which can cause an electrical failure, a circuit breaker to open or an electrical fire  |
| <b>short final</b>               | the last part of the approach before touchdown, typically from the inner marker, or some 2 nautical miles, to the threshold  |
| <b>shortly</b>                   | soon, in a short time: <i>we will be landing shortly</i>   |
| <b>Short Term Conflict Alert</b> | a ground-based safety net intended to assist the controller in preventing collision between aircraft by generating ...an alert of a potential or actual infringement of separation minima  |
| <b>shutdown (n)</b>              | reducing engine or APU power to zero, stopping engine operation  |
| <b>SID</b>                       | Standard Instrument Departure, a pre-planned, coded ATC IFR departure routing  |
| <b>sign</b>                      | an indication mounted vertically on a signpost and illuminated at night  |
| <b>sill</b>                      | lower part of the doorway: <i>the door sill scuff plate was slightly damaged by the catering truck</i>   |
| <b>sink rate</b>                 | the rate of descent of a body in free fall   |
| <b>skid (v)</b>                  | to move in an uncontrolled way, typically because the surface is slippery (due to oil, ice, standing water etc.) or because it was going too fast to grip the surface  |
| <b>skin</b>                      | the fuselage, wing and empennage panels which make up the outer airframe of the aircraft   |
| <b>slant visibility</b>          | the fact of seeing something at an angle rather than head on which causes distortion   |
| <b>slide</b>                     | a rapid-inflation pneumatic channel to enable passengers and crew to evacuate quickly; also referred to as a <i>chute</i> : <i>one of the slides failed to deploy</i>  |
| <b>slightly(adv)</b>             | a little, a small amount: <i>the door is only slightly damaged</i>   |
| <b>slippery</b>                  | which is likely to cause sliding or skidding: <i>the runway is slippery when wet</i>   |
| <b>slope</b>                     | a gradient, angle to the horizontal: <i>the aircraft is descending on a 3-degree slope</i>   |
| <b>slot time</b>                 | allocated take-off times for flights: <i>we must push back in the next 5 minutes or we will miss our slot time</i>   |
| <b>smoke</b>                     | fumes caused by combustion. Both smoke and fire remain number one hazards on board the aircraft. Response time is critical. The crew's priority is to land as soon as possible while trying to contain and extinguish the fire. The flight crew will be working under a lot of stress. Communication will be less clear as they crew will be wearing masks. It will be necessary to make an emergency evacuation using the escape slides as soon as the aircraft is on the ground.   |
| <b>smooth tops</b>               | cloud tops with no irregularities  |
| <b>snow blower</b>               | vehicle which clears runways of snow by blowing  |
| <b>snow flurries</b>             | sudden rapid falls of snow   |
| <b>snow plough</b>               | vehicle which removes snow from runways with a large blade   |
| <b>spacing</b>                   | a safe distance between aircraft. A key role of an ATCO is to maintain spacing at all times. See also <i>separation</i> .  |
| <b>speed bugs</b>                | small plastic markers, now often replaced by digital displays, which are set manually or automatically around / along the airspeed indicator scale to give the crew easily visibly references to critical airspeeds during take-off and approach: V1 or decision speed, when the pilot must decide to take off or reject take-off; V2 take-off safety speed at which the aircraft can be safely airborne with one engine shut down; various flap retraction / extension speeds; Vref, final approach speed. They are also referred to as <i>V-bugs</i> . |
| <b>Speedbird</b>                 | the callsign for British Airways   |
| <b>speedbrakes</b>               | upper wing flight control surfaces, or spoiler function, which decrease airspeed in flight   |
| <b>split sector</b>              | controlled airspace divided vertically (by flight level) or horizontally to accommodate high traffic, preferably using different radio frequencies   |
| <b>spurious</b>                  | referring to an indication, message or warning, not based on true facts, and which may in fact be the result of a problem with the warning system  |
| <b>squall</b>                    | SQ: a sudden violent wind often with rain or snow  |

| Word                                 | Definition and examples   |
|--------------------------------------|---|
| <b>squawk (n and v)</b>              | a transponder identifier code which enables an ATC to identify each aircraft on radar screens. "Squawk 6422" means "select transmission code 6422". Pilots may sometimes use the expression 'Squawking 6422', with squawk as a verb in the present continuous.  |
| <b>stabilized approach</b>           | to be on the glidepath at the correct airspeed, in the correct configuration (flaps, slats, gear) and to have completed the checklists  |
| <b>stabilizer</b>                    | horizontal and vertical surfaces mounted on the aircraft tail, also called the <i>empennage</i> ; the elevators are installed on the horizontal <i>stabilizer</i> or <i>tailplane</i> , which is usually trimmable, i.e. its angle can be adjusted to minimize drag and optimize aerodynamic efficiency. The vertical stabilizer is also referred to as the <i>fin</i>  |
| <b>stabilizer trim runaway</b>       | a malfunction which occurs when the Trimmable Horizontal Stabiliser (THS), or tailplane, on the aircraft tail fails to stop at the selected position and continues to deflect up or down  |
| <b>stack</b>                         | a superimposed series of holding patterns at assigned flight levels   |
| <b>stall</b>                         | a sudden breakdown of fluid flow around the aerofoil (wing) or in an engine: <i>stall can result in the aircraft losing stability and lift and in engine failure</i>  |
| <b>stand (n)</b>                     | the place where the aircraft parks, where passengers board and disembark.   |
| <b>stand by</b>                      | Wait and I will call you  |
| <b>standard operating procedures</b> | SOP: specific procedures defined by an airline to respond to all contingencies  |
| <b>standard pressure setting</b>     | the altimeter setting used universally above the transition level or altitude: it is 1013.25 hPa or 29.92 in Hg   |
| <b>standby (adj)</b>                 | STBY: alternate, backup, redundant or precautionary system, instrument or mode of operation: <i>The Radio Management Panel has ACTIVE and STANDBY windows</i>   |
| <b>static discharger</b>             | an electrical conductor on the outer trailing edges of the wings and stabilizers designed to discharge static electricity which accumulates in the aircraft during the flight or as the result of a lightning strike; also referred to as a <i>wick</i>   |
| <b>status</b>                        | the present condition: <i>what is the status of your engine?</i>  |
| <b>statute mile</b>                  | SM: 1,609.34 metres, land mile. Compare <i>nautical mile</i> (1,853.18 metres).   |
| <b>step climb (n)</b>                | gaining altitude by a series of steps, i.e. periods of level flight, between phases of climbing   |
| <b>step-down fix</b>                 | an identified point permitting descent in a segment of an ILS approach once an obstacle has been overflown  |
| <b>steps</b>                         | stairs used by technicians  |
| <b>sterile cockpit</b>               | cockpit environment in which there are no audio or visual distractions from the piloting tasks: <i>a sterile cockpit is one of the prerequisites of a safe working environment</i>  |
| <b>stick shaker</b>                  | an aircraft stall warning system which when triggered by the angle of attack sensor causes the stick or control column to vibrate so that the pilot gives a nose-down order   |
| <b>sticking mike</b>                 | a microphone which is blocked in the open position  |
| <b>stop bar</b>                      | a series of lights indicating whether access to a runway is authorised or not: <i>do not proceed if the stop bar lights are red</i>   |
| <b>stopway</b>                       | additional paved area beyond the normal end of the runway to allow for aircraft overrunning in an emergency   |
| <b>straight ahead</b>                | in a straight line, often on the extended runway centreline: <i>climb straight ahead</i>  |
| <b>straight-in</b>                   | an instrument approach in which the final approach is begun without a prior procedure turn. In VFR, <i>straight-in</i> means the entry of a traffic pattern by interception of the extended runway centreline without executing any portion of a traffic pattern.   |
| <b>stratiform cloud</b>              | a stratified or layered cloud   |
| <b>stray (v)</b>                     | to enter an area or airspace by mistake: <i>the pilot was distracted and strayed onto the active runway</i>   |
| <b>strength</b>                      | force, volume or loudness of a radio transmission: <i>signal strength varied during the storms</i>  |
| <b>stretcher</b>                     | a collapsible canvas bed for carrying an injured person: <i>we will need a stretcher to carry off the injured passenger</i>   |
| <b>strip</b>                         | 1) a piece of paper or cardboard, or an electronic equivalent, which enables a controller to record basic data about a flight and manage flow control. Before the development of hi-tech visual displays, these strips were the main source of information for ATCOs. They are still used as a backup system in case the electronic systems fail.<br>2) <i>Strip</i> can also refer to an airstrip or small runway. |



| Word                                      | Definition and examples  |
|---|--|
| <b>stuck</b>                              | blocked in one position, unable to move: <i>the microphone selector is stuck</i>   |
| <b>suitable</b>                           | appropriate, convenient: <i>we need to divert to a suitable alternate</i>  |
| <b>sudden</b>                             | unexpected, rapid: <i>there has been a sudden change in wind velocity</i>  |
| <b>supply line</b>                        | hydraulic, fuel or pneumatic piping or electrical wiring which gives a source of energy  |
| <b>support</b>                            | providing information and services. In an unexpected situation caused by a technical failure, the crew will need additional information about alternate airports, weather conditions, runway surface conditions, priority landing, emergency services on the ground, airport facilities etc.   |
| <b>surface movement radar</b>             | a radar system to monitor aircraft movements on the ground   |
| <b>surface wind</b>                       | wind measured near ground level  |
| <b>surge</b>                              | a sudden irregular flow of fluid, especially in the engine, electrical or hydraulic system, which causes a malfunction; in the case of an engine, this results in an engine stall  |
| <b>surge (n)</b>                          | a breakdown of airflow resulting from local stall and often accompanied by a muffled bang and an increase in turbine temperature   |
| <b>surge margin</b>                       | the parameter that is the difference between the operating RPM and the RPM at which the compressor blades will stall at any altitude and for transient slam acceleration   |
| <b>surveillance minimum altitude area</b> | a designated area in the vicinity of an aerodrome, in which the minimum safe levels allocated by a controller vectoring IFR flights with radar equipment have been predetermined   |
| <b>surveillance radar approach</b>        | an approach guided by primary radar determining position, track and (with secondary surveillance radar) the identity of an aircraft  |
| <b>sweep (v)</b>                          | to move over a wide area in a large arc: the weather radar antenna sweeps an area of +/- 45 degrees ahead of the aircraft; the windshield wipers sweep the windshield clear of rain  |
| <b>sweeper</b>                            | vehicle with rotary brush for removing dirt and debris   |
| <b>switch (v)</b>                         | to transfer, to move from one position or selection to another: <i>Can you switch to the Tower frequency?</i>  |
| <b>System 1</b>                           | <i>System 1</i> refers to the fact that nearly all systems are 'duplexed', i.e. there are two systems operating in parallel. In the case of instrumentation, System 1 usually provides the captain with information and System 2 the first officer.  |
| <b>TAF</b>                                | Terminal Aerodrome Forecasts: TAFs use a similar format and coding to METARs, but provide weather forecast information, rather than current weather reports, for a five-mile radius around a given point   |
| <b>tailpipe</b>                           | the exhaust section of the engine aft of the turbine   |
| <b>tailwind</b>                           | a wind blowing in the same direction as the direction of travel of the aircraft. Its opposite is <i>headwind</i> .   |
| <b>take-off point</b>                     | a position on the runway, beyond which an aircraft is travelling too fast to slow down again safely, and therefore must take off   |
| <b>take-off roll</b>                      | the process of accelerating down the runway in order to take off   |
| <b>take over (v)</b>                      | to replace someone in the function they are performing: <i>the next shift will take over at 18:00.</i>   |
| <b>task sharing</b>                       | dividing the workload between crew or team members in a systematic and integrated way  |
| <b>target</b>                             | 1) point which you aim at, which you wish to reach or hit: <i>There is a white painted touchdown target on the runway; A target speed can be set on the speed scale</i><br>2) a radar echo displayed on the screen   |
| <b>taxi location sign</b>                 | airport sign which indicates the taxiway that an aircraft is currently on  |
| <b>taxiway</b>                            | paved way for aircraft to move to and from the terminals and different parts of the airport  |
| <b>taxiway ending marking</b>             | painted markings consisting of striped lines on the far end of an intersection indicating the end of a taxiway   |
| <b>TCAS</b>                               | Traffic Collision Avoidance System: TCAS is a communication between aircraft equipped with an appropriate transponder. Each TCAS-equipped aircraft "interrogates" all other aircraft in a determined range about their position, and all other TCAS-equipped aircraft reply to other interrogations. This interrogation-and-response cycle may occur several times per second. Through this constant back-and-forth communication, the TCAS system builds a three dimensional map of aircraft in the airspace, incorporating their bearing, altitude and range. Then, by extrapolating current range and altitude difference to anticipated future values, it determines if a potential collision threat exists. |

| Word                                | Definition and examples  |
|-------------------------------------|--|
| <b>TCAS Advisory</b>                | a message given by the Traffic Collision Avoidance System warning the crew of the presence of another aircraft with which there may be conflict; there are two levels of message:<br>1) Traffic Advisory (TA), which does not require immediate crew action, and<br>2) Resolution Advisory (RA) which does, and supersedes any ATC instruction   |
| <b>TCAS Resolution Advisory</b>     | TCAS RA: an automatically-generated warning such as ' <i>descend, descend</i> ' requiring immediate crew action  |
| <b>technical log</b>                | a record of all technical incidents and maintenance action carried out on a given aircraft, signed by the crew and technicians and kept on the flight deck; also referred to as the <i>log book</i>  |
| <b>terrain</b>                      | any rising ground, north, south, east or west. Its height and direction are important. Terrain determines the value of the <i>Minimum Safe Altitude (MSA)</i> or <i>Minimum Descent Altitude (MDA)</i> in the aerodrome area.  |
| <b>thoroughly</b>                   | completely, rigorously, methodically   |
| <b>threat (n)</b>                   | 1) a suggestion that something unpleasant or violent will happen: <i>there is a threat of airport closures caused by the strike; the threat of tropical storms</i><br>2) a danger: <i>Bird strikes remain a serious threat to aircraft safety</i>  |
| <b>threaten (v)</b>                 | 1) to give signs or warnings of harm or danger: <i>Windshear can threaten the stability of aircraft on final approach</i><br>2) to force someone to act under duress: <i>the terrorist is threatening the crew</i>   |
| <b>three greens</b>                 | the green arrows or indicator lights on the landing gear display which indicate that the landing gear is extended and correctly locked down  |
| <b>threshold</b>                    | the beginning of the runway  |
| <b>throttle back (v)</b>            | to pull back the throttle / thrust lever(s) on the centre pedestal to reduce the engine speed and the resulting thrust; to <i>retard</i>   |
| <b>throttles</b>                    | levers on the centre pedestal which control engine thrust  |
| <b>thrust (n)</b>                   | the propulsive force generated by an aircraft engine; the other three forces which act on an aircraft are lift, weight and drag  |
| <b>THS</b>                          | Trimable Horizontal Stabilizer: a horizontal surface mounted on the aircraft tail on which the elevators are installed; its angle can be adjusted to minimize drag and optimize aerodynamic efficiency. It is also called a <i>tailplane</i> or <i>empennage</i> .   |
| <b>thud</b>                         | a deep, dull noise caused by an impact: <i>the cabin crew heard a thud shortly before lift-off; we are wondering whether a tyre had burst</i>  |
| <b>tight</b>                        | 1) In the case of a tank, a pipe or a join between mechanical parts, secure or leakproof: <i>The join between the two fuel hoses was tight enough.</i><br>2) in the case of a nut or a fastener, difficult to turn: <i>These nuts are tight, can you loosen them?</i><br>3) in the case of a turn, with a short radius or a small angle: <i>Small aircraft can land even straight after a tight turn</i> |
| <b>tight circuit</b>                | a traffic pattern turn with a short radius   |
| <b>timely</b>                       | at the right time: <i>the controller made a timely decision and instructed the aircraft to climb immediately</i>   |
| <b>TMA</b>                          | Terminal Control Area / Terminal Manoeuvring Area: airspace around an airport used for departures and arrivals   |
| <b>toilet servicing truck</b>       | truck with tank for emptying aircraft waste  |
| <b>tolerance</b>                    | the range of values within which a system can operate correctly: <i>The A.C. power supply has a tolerance of +/- 2 volts</i>   |
| <b>torching</b>                     | flames coming from the engine exhaust duct due to the presence of fuel which has not been burnt  |
| <b>touch and go (n)</b>             | a training exercise by which pilots practise approaches, touch down on the runway, but do not roll out and stop; also referred to as <i>circuits and bumps</i>   |
| <b>touchdown aim point / target</b> | area on runway materialised by white paint on which pilot intends to land  |
| <b>touch-down speed</b>             | the airspeed at which the aircraft makes contact with the ground on landing: <i>The touchdown speed of the B747 is approximately 160-170 knots.</i>  |
| <b>touchdown zone</b>               | area after threshold where aircraft usually touch down initially on landing  |
| <b>tow vehicle</b>                  | a vehicle used especially during pushback to move an aircraft backwards from the stand or to pull it to another location at the airport. It is also referred to as a <i>tug</i> or <i>tractor</i>  |
| <b>tow-bar</b>                      | bar connecting the aircraft nose gear to a tow vehicle for pushback and towing   |

| Word                       | Definition and examples  |
|----------------------------|--|
| <b>track</b>               | 1) the path of the aircraft over the Earth's surface from take-off to touchdown<br>2) the angle between a reference datum and the actual flight path   |
| <b>track (v)</b>           | to fly along a radial etc., to join a navaid or ILS fix  |
| <b>tractor</b>             | a towing vehicle, used especially during pushback, i.e. moving a plane backwards from the stand. It is also referred to as a <i>tug</i> or <i>tow vehicle</i>  |
| <b>traffic</b>             | aircraft in movement   |
| <b>Traffic Advisory</b>    | TA: A TCAS message informing the crew of the presence of traffic in their vicinity. A TA does not require crew action. This allows them time to seek the traffic visually and question ATC   |
| <b>traffic circuit</b>     | a predefined flight movement used either for holding or to prepare an approach   |
| <b>traffic conflict</b>    | when two aircraft are at altitudes or on headings which, if maintained, could result in an airprox or a collision  |
| <b>traffic on the roll</b> | an aircraft is moving on the runway  |
| <b>traffic pattern</b>     | a predefined flight movement used either for holding or to prepare an approach; a <i>circuit</i>   |
| <b>trailing edge</b>       | the rear edge of the wing, stabilisers and engine blades: <i>trailing edge flaps</i>   |
| <b>transient parking</b>   | a place for planes to park temporarily   |
| <b>transit (v)</b>         | to pass through  |
| <b>transition altitude</b> | the altitude at which the altimeter setting is changed from local atmospheric pressure to 1013 hPa and vice versa  |
| <b>transition level</b>    | the flight level at which flight crews reset their altimeters from local atmospheric pressure (QNH or QFE) to standard atmospheric pressure at sea level (1013 hPa) and vice versa. Below this point altitude rather than level is used by pilots and controllers.   |
| <b>transponder</b>         | a radio device which when triggered sends out a pre-coded reply on the same wavelength. ATC allocates Modes A and B four-digit numbers to provide aircraft identification. Mode C gives auto-reading from the encoding altimeter   |
| <b>trench</b>              | a long hole, typically dug in order to lay underground pipes or cables   |
| <b>trend</b>               | tendency, general movement or direction in development: <i>a trend forecast shall supersede, during the validity of the trend, the aerodrome forecast (TAF) for the aerodrome concerned</i>  |
| <b>trigger (v)</b>         | to cause, to initiate, or to activate a system response or reaction: <i>The angle of attack sensor will send a signal to trigger a stall warning</i>   |
| <b>trim fuel valve</b>     | a valve which allows fuel to flow from the <i>trim tank</i> to the main fuel tanks in the wings and wing centre box (between the wings)  |
| <b>trim tank</b>           | auxiliary fuel tank in the tail. Some long-range aircraft have fuel tanks in the horizontal stabilizer; the weight of this fuel is used to regulate the aircraft's centre of gravity (C.G.)  |
| <b>triple seven</b>        | a Boeing 777 wide-body, twin engine, long-range jet airliner   |
| <b>triplexed</b>           | systems which consist of three independent subsystems, each of which can ensure operation in the event of one or two of the other subsystems failing   |
| <b>tug</b>                 | a towing vehicle, used especially during pushback. It is also referred to as a <i>tractor</i> or <i>tow vehicle</i> : <i>We are waiting for the tug to arrive so that we can push back</i>   |
| <b>turboprop</b>           | an aircraft with propellers which are driven by a gas turbine (ATR 72, Dash 8, Fokker 50, Saab 2000, C-135, A400M)   |
| <b>turnaround</b>          | the time between the arrival of a flight at its parking stand and its departure for the next flight; it is a period when the flight crew's attention is turned to a whole series of activities (servicing, unloading, loading, refuelling, catering, engineering, boarding etc.) where the airport ground staff is involved and contact with Air Traffic Control is limited. However, the flight crew also communicate with different categories of ground staff both by radio / interphone and face to face in situations where safety is an ongoing concern and the operational time constraints to depart on time create what is a potentially stressful environment. |
| <b>TWY</b>                 | taxiway  |
| <b>U/S</b>                 | unserviceable, not operational, out of order   |
| <b>ULD</b>                 | Unit Load Device: a pallet or container which can be loaded onto a plane as a single unit  |
| <b>unable</b>              | 'I cannot comply with your request, instruction or clearance'; 'unable' is usually followed by a reason.   |
| <b>unambiguous</b>         | having only one possible meaning. If a word or sentence is <i>ambiguous</i> , it may be interpreted in several ways  |
| <b>unaware</b>             | not knowing, not realizing: <i>The cockpit crew were unaware of the situation in the cabin</i>   |

| Word                          | Definition and examples   |
|-------------------------------|---|
| <b>unconsciousness</b>        | being without awareness   |
| <b>under control</b>          | controlled, not out of hand: <i>Following the engine flame-out, the captain announced that the situation was under control</i>  |
| <b>undershoot windshear</b>   | windshear characterized by a decrease in aircraft airspeed  |
| <b>union</b>                  | connector or fitting which attaches one piece of piping to another  |
| <b>unlawful interference</b>  | hijackers or terrorists attempting to take control of or threaten the safety of the aircraft. There is a specific code (7500) to alert the ground of any attempted hijacking as the flight crew may not be able or wish to communicate orally. There may be unexplained and unscheduled changes to the aircraft's course if the crew is threatened and is complying with the hijacker(s). Threatened in this way, the crew may not reply, or may not reply normally, to ATC and may not follow ATC instructions |
| <b>unruly</b>                 | aggressive, belligerent, badly behaved: <i>we have a group of unruly football fans on board</i>   |
| <b>unserviceable</b>          | which cannot be used on the aircraft and must be replaced or repaired. Also <i>U/S</i> .  |
| <b>updated</b>                | in the most recent version: <i>make sure that the charts you use have been updated</i>  |
| <b>updraught</b>              | an ascending current of air   |
| <b>uplift (v)</b>             | to take fuel on board the aircraft, to <i>refuel</i> : <i>we need to uplift 69 tonnes of fuel</i>   |
| <b>upper level winds</b>      | winds blowing at altitudes typically between 23,000 and 39,000 feet for the polar jet streams and at higher levels for the subtropical jet streams. They blow from west to east and, as a result, make eastbound flying times across the North Atlantic approximately one hour shorter than the westbound ones.   |
| <b>upwind end</b>             | the end of a runway which is the opposite end from where an aircraft starts its take-off roll   |
| <b>urgent</b>                 | requiring immediate attention: <i>if it is urgent, make it sound urgent</i>   |
| <b>U/S</b>                    | Abbreviation for <i>unserviceable</i> .   |
| <b>UTC</b>                    | Universal Coordinated Time: for most purposes, the same as <i>GMT</i> (Greenwich Mean Time), also referred to as <i>Zulu</i> in radiotelephony  |
| <b>V1</b>                     | the decision speed, i.e. the speed at which the pilot must decide to continue or abandon take-off   |
| <b>vacate (v)</b>             | to exit or leave the runway: <i>report vacated</i>  |
| <b>vectoring</b>              | issuing headings to aircraft to provide navigation guidance   |
| <b>vectoring ILS approach</b> | involves the controller using radar to instruct the pilot about the headings and altitudes to fly to capture the ILS glidepath.   |
| <b>veer (to)</b>              | 1) to move off course, to change direction, to move diagonally away from the centreline or correct path<br>2) for the wind to change direction clockwise  |
| <b>vertical separation</b>    | the vertical distance between two aircraft, which is measured in feet, but in metres / kilometres in Russia, China and the CIS  |
| <b>vertical speed mode</b>    | <i>V/S</i> : the basic pitch autopilot mode   |
| <b>VFR traffic</b>            | a flight following Visual Flight Rules, i.e. in this case, making an approach using visual references rather than flying on the instruments (IFR) making an ILS approach  |
| <b>via</b>                    | passing by or through: <i>taxi to holding position via November and Lima</i>  |
| <b>vicinity</b>               | surroundings, neighbourhood: <i>there is VFR traffic in the vicinity of the aerodrome</i>   |
| <b>visual</b>                 | <i>to be visual</i> means to have something in sight, to see something, especially the runway: <i>Are you visual yet?</i>   |
| <b>visual approach</b>        | an approach to a given runway where the pilot relies on visual references such as <i>VASI</i> (Visual Approach Slope Indicator), <i>PAPI</i> (Precision Approach Path Indicator) and topography rather than using the Instrument Landing System   |
| <b>visual contact</b>         | when something is visible; the expression 'We are visual' is also used  |
| <b>visual references</b>      | topographical features, markings and lights which contribute to situational awareness; also <i>visual cues</i>  |
| <b>visual separation</b>      | the separation between two aircraft based on the pilots' visual contact rather than a distance imposed by ATC   |
| <b>VOR</b>                    | <i>VHF Omnidirectional Range</i> : a type of ground-based navigation transmitter which sends signals in all directions to enable aircraft to identify their position. The intersection of two <i>VOR</i> radials provides the aircraft's position.  |

| Word                                | Definition and examples  |
|-------------------------------------|--|
| <b>VOR calibration</b>              | periodic checking and resetting of VOR transmitters  |
| <b>VOR-DME approach</b>             | an approach using a combination of two types of navaid: VHF Omnidirectional Range and Distance Measuring Equipment   |
| <b>Vref</b>                         | the speed or velocity at which the aircraft should be flying in a given configuration  |
| <b>VSI</b>                          | Vertical Speed Indicator: instrument which displays the vertical speed, or rate of climb or descent, of the aircraft in feet per minute: <i>the PNF using the VSI after lift-off to call 'positive rate'.</i>  |
| <b>wake turbulence</b>              | a downdraught caused by the movement of a large aircraft through the air. For this reason, ATC usually provides additional horizontal separation after the passage of particularly large aircraft; also <i>wake vortex</i>   |
| <b>walkaround inspection</b>        | an external check of the aircraft made by the first officer at the stand between two flights; he makes sure that there is no apparent damage   |
| <b>wander (v)</b>                   | to move or enter unintentionally: <i>The crew was unfamiliar with the airport and wandered onto the active runway.</i>   |
| <b>warning</b>                      | a crew alert symbolised by the colour red and requiring immediate crew action. <i>We have an engine fire warning</i>   |
| <b>water servicing truck</b>        | truck for replenishing aircraft's potable water supply   |
| <b>waypoint</b>                     | a point on the journey to the final destination, i.e. a pilot may fly from Warsaw to London by flying first via Berlin and then Amsterdam  |
| <b>We 'may' request a diversion</b> | ATC has responded to utterances like this as full emergencies on several occasions due to the fact that they did not pick up the fact that the flight crew had used the modal verb 'may' or 'might' in a statement   |
| <b>wear (n)</b>                     | damage from being used regularly, as in clothes, paint, mechanical parts etc. that gradually deteriorate as they get older: <i>There is a lot of wear on the wingtips</i>  |
| <b>wear (v)</b>                     | 1) to have clothing, etc. on your body: <i>Marshallers must wear ear protection on the ramp at all times.</i><br>2) to become weaker, damaged or thinner because of continuous use: <i>It is the moving parts within the engine which wear most quickly.</i>   |
| <b>wear out (v)</b>                 | to become obsolete, unserviceable or need replacement, because of wear: <i>These tyres seem to wearing out very quickly: I wonder if they are correctly aligned?</i>   |
| <b>weather bureau</b>               | station gathering and distributing updated weather reports and forecasts. See also <i>met office</i> .   |
| <b>weather radar returns</b>        | the coloured patterns or outlines from the weather radar antenna displayed on the cockpit ND. Aircraft are fitted with weather radar systems using a radar antenna in the radome covering a range of up to several hundred miles. Crews use the colour-coded displays provided by this system to detect the presence of weather systems (cumulonimbus clouds, thunderstorms and resulting turbulence) in order to request a change of flight path if necessary |
| <b>weight and balance print-out</b> | a document recording distribution of weight and CG (centre of gravity) at take-off; also referred to as the <i>weight and balance sheet</i>  |
| <b>weight and balance sheet</b>     | document recording and allowing the checking of the aircraft weight, load distribution and centre of gravity   |
| <b>westbound</b>                    | moving towards the west: <i>westbound air traffic from London to New York</i>  |
| <b>wheelchair</b>                   | light chair with wheels for invalids   |
| <b>whiteout</b>                     | the phenomenon of spatial disorientation caused by the intense glare of a snowy landscape  |
| <b>wick</b>                         | <i>static discharger</i> located on trailing edges to discharge electrical charges built up in the airframe  |
| <b>wide body</b>                    | large transport aircraft with two cabin aisles such as the B747, B767, B777, A330, A340, A380  |
| <b>width</b>                        | the distance from one side to the other: <i>45 metres is a typical runway width</i>  |
| <b>wilco</b>                        | <i>Wilco</i> means 'I understood your message and will comply with it'. <i>Wilco</i> should not be used in reply to a question which requires a direct answer or readback.   |
| <b>window heat</b>                  | the electrical resistances in the windshield and side cockpit window panels which prevent the formation of ice and condensation  |
| <b>windshear</b>                    | a large local wind gradient, i.e. sudden changes in wind speed and direction which may cause aircraft to lose airspeed and altitude and are especially dangerous close to the ground during approach and landing   |
| <b>windsock</b>                     | a fabric sleeve hung from a mast to give a rough indication of the local wind strength / direction   |
| <b>within</b>                       | inside defined limits or boundaries: <i>within controlled airspace, within the aircraft's flight envelope</i>  |

| Word                         | Definition and examples  |
|------------------------------|--|
| <b>words twice</b>           | 'Communication is difficult. Please send every word twice' or 'Since communication is difficult, every word in this message will be sent twice'.   |
| <b>working memory</b>        | a model to describe how we use short-term memory to manipulate information   |
| <b>workload</b>              | the quantity of work to be performed in a particular time frame: <i>Climb, approach and landing are periods of high crew workload</i>  |
| <b>worn</b>                  | Weaker, damaged or thinner because of continual use: <i>The painted taxiway markings appear to be very worn.</i>   |
| <b>yaw control</b>           | the control of the aircraft about the vertical axis managed mainly by the rudder   |
| <b>yaw damper</b>            | a flight control system which sends inputs to the rudder in order to counter the effects of turbulence and avoid the aircraft oscillating from side to side, which is called <i>Dutch roll</i> . If the yaw damper fails the aircraft may suffer from Dutch roll |
| <b>yellow system</b>         | one of the three hydraulic systems (green, blue, yellow) on Airbus aircraft. Boeing identify their hydraulic systems numerically   |
| <b>yoke</b>                  | another word for the control wheel which controls the ailerons on a conventional aircraft  |
| <b>Z</b>                     | Zulu: Coordinated Universal Time: <i>15:45Z</i>  |
| <b>zero deviation signal</b> | a signal which indicates that the aircraft is correctly aligned on the ILS; this should not be confused with <i>no deviation signal</i> , which means that no information is displayed   |

# Aviation Vocabulary

For LPR purposes

Ali Erfanian

1

to **give off** display smoke trails



2

**Aerobatics** is the practice of flying maneuvers involving aircraft attitudes that are not used in normal flight.  
to **perform aerobatic maneuver**



3

The **air-stair** door is open/deployed.



4

**passenger stair truck**  
**passenger stairs**



5

**ahead**  
*same direction traffic, 20 miles ahead*



6



### arrow

Follow the arrows to the apron.



7



### Barrier



8



### Hook Barrier



### Net Barrier



9



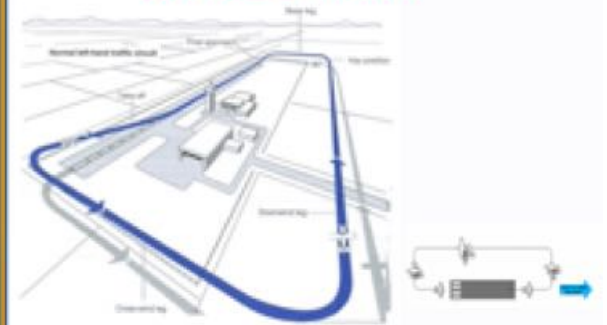
### Jet Blast Barrier Blast Wall Blast Fence



11



### Traffic Circuit Traffic Pattern



12





## To Come Nose to Nose



13

## Clean Configuration



14

## the aircraft has adopted Landing Configuration



15

## crew



16

## Engine



The engine is switched off.

The engine is running.

The pilot tried to relight the engine.

The pilot couldn't start the engines.

17

## helipad



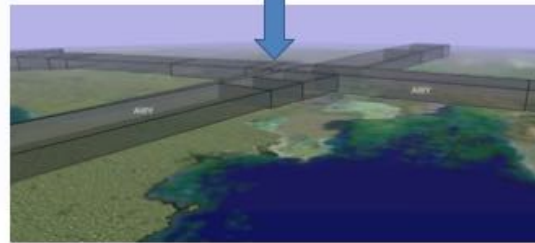
18

## heliport



19

## intersection



20

## Airport layout



21

## parallel



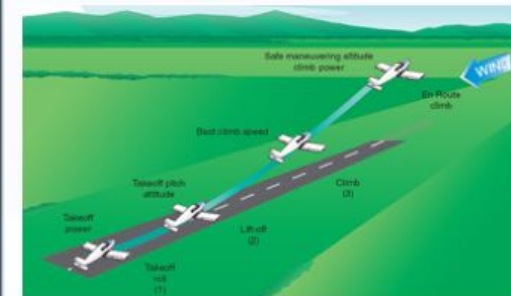
22

The aircraft are standing in the **queue** for departure.



23

## Take-off roll (landing roll)



24

**Airstrip**  
Grass Airstrip



25

**balloon**



26

**high ground**  
mountainous area



27

**coast**



28

**island**



29

**lake**



30

**compass**



31

**Flight deck (cockpit)**



32

**HUD: Head-up Display  
B787**



33

**power line**



34

**ridge**



35

**summit**



36

**river**



37

**valley**



38

**woods**



39

**Attitude indicator**



40

**Heading indicator**



41

**Turn coordinator**



42

## Vertical speed indicator



43

## Cylinder Head Temperature (CHT)



44

## Oil pressure gauge



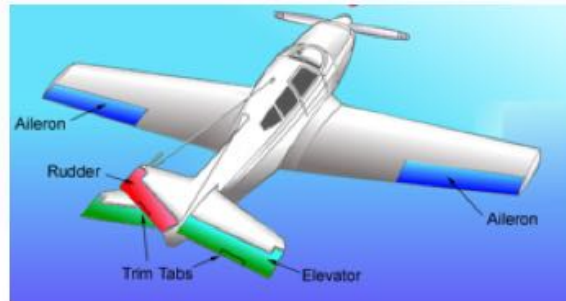
45

## Dipstick



46

## Flight control surfaces



47

## flashlight torch



48

## Glass cockpit



49

## Analog cockpit



50

## Mid-air collision



51

## bulkhead



52

## Rear pressure bulkhead



53

## cage



54

**airport concourse**



55

**container**



56

**fork-lift truck**



57

**Grass margin**



58

**hinge**



59

**hose**



60



## life jacket



61

## overhead locker, hatrack, overhead storage bin, stowage



62

## Legroom, Leg rest



63

## headrest headrest cover



64

## Reclining seats



65

## passenger service unit



loud speakers, attendant call button, reading lights, seat and seat row numbering

66

**seat tray table  
seatback storage**



67

**Mechanical**



68

**hydraulic**



69

**Fly-by-wire**



70

**Twisted nose gear  
at 90 degree angle**



71

**Smashed windshield  
shattered windshield**



72

### Cracked windshield



73

### flip switch push button switch



74

### Dented fuselage



75

### Torn-off fuselage



76

### Torn fuselage



77

### Buckled landing gear



78

## Corroded fuselage



79



Rotary wing



fixed wing

80

**Airside** the area beyond passport and customs control in an airport terminal.



81

**Aisle** a long passage between rows of seats



82

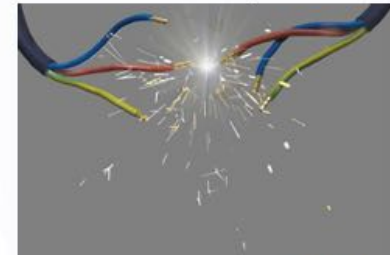
**A double-aisle cabin seating configuration**



An eight abreast seating cabin broken by two aisles

83

**Arcing/sparkling** a luminous electrical discharge between two points



Chafed wires may lead to **sparks**.

84

## Spark Plug



85

## Congested/Assembly/Crowded



86

## Runway Excursion (Skid off the runway)



87

## Engineered Material Arresting System (EMAS)



88

## Runway Incursion



89

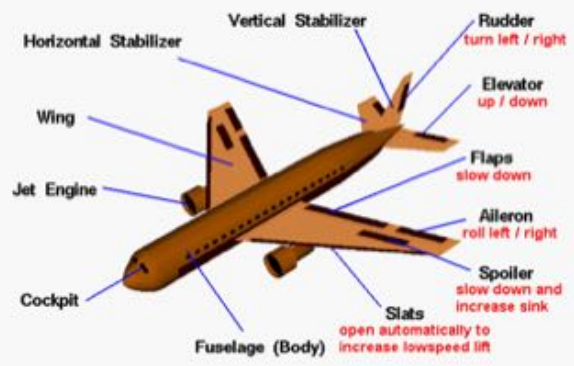
## Spoilers air brakes, speed brakes lift dumpers



On landing, flaps are fully **extended down**,  
with spoilers also fully **raised**.

90

## slat (leading edge flaps)



Flaps and slats prolong chord to increase lift.

91

## Horizontal Stabilizer tailplane



92

## Vertical Stabilizer fin



93

## wing root fairing



94

## flap track fairings



95

## wing static dischargers



96

## Empennage Tail assembly



97

## Pitch



The nose is **raised** (nose up) or **lowered** (nose down).

98

## Roll



99

## Yaw

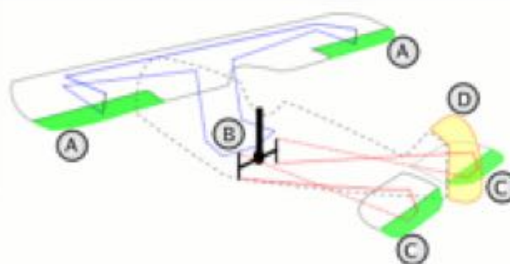


The rudder is the rearmost (or aft-most) part of the vertical stabilizer

100

## Flight Control Surfaces

Ailerons, Rudder, Elevators



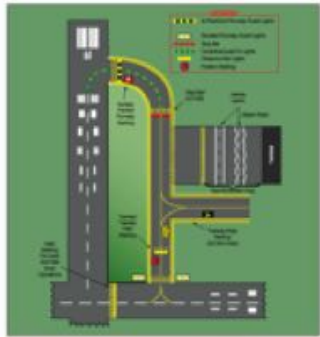
101

Window Seat  
Middle Seat  
Aisle Seat



102

## Airport Marking



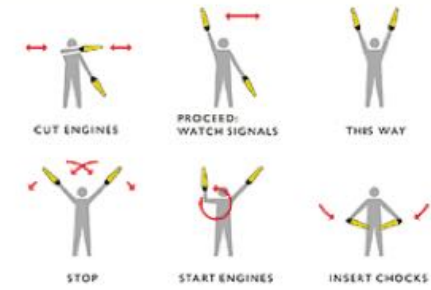
103

## Signage



104

## Signal



105

## Navigation Lights



starboard

port

106

## Landing Lights



107

## Anti-collision Light



108



### VASIS/PAPI

Obstruction clearance to roughly 3.4 miles, within 10 degrees of runway centerline

Obstruction clearance to roughly 4 miles, within 10 degrees of runway centerline

**Precision Approach Path Indicator**  
**Visual Approach Slope Indicator**

109

### Engine Position Number

**Twin-engined aircraft**  
#1 - **port** - on the left  
#2 - **starboard** - on the right

110

### Engine Position Number

**Three-engined aircraft**  
#1 - port - on the left  
#2 - centre - on the centerline  
#3 - starboard - on the right

111

### Engine Position Number

**Four-engined aircraft**  
#1 - port outer - on the left furthest from the fuselage  
#2 - port inner - on the left nearest to the fuselage  
#3 - starboard inner - on the right nearest to the fuselage  
#4 - starboard outer - on the right furthest from the fuselage

112

### Engine Position Number

**Six-engined aircraft**  
#1 - port outer - on the left furthest from the fuselage  
#2 - port middle - on the left between #1 and #3  
#3 - port inner - on the left nearest to the fuselage  
#4 - starboard inner - on the right nearest to the fuselage  
#5 - starboard middle - on the right between #4 and #6  
#6 - starboard outer - on the right furthest from the fuselage

**An-225 has anhedral wings**

113

### anhedral/dihedral angle

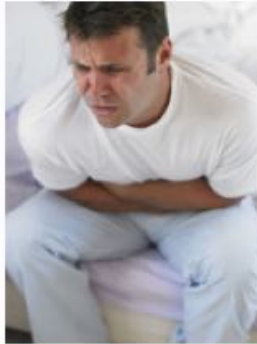
114

The Boeing-built **B-52**  
**Big Ugly Fat Fellow**, or **BUFF**



115

**Abdominal pain**



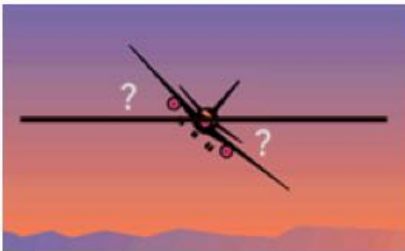
116

to board/to embark  
**OPP: disembark**



117

**Bank angle**



118

**Bird Ingestion**



119

**bird strike**  
birds **hit/impact** the fuselage



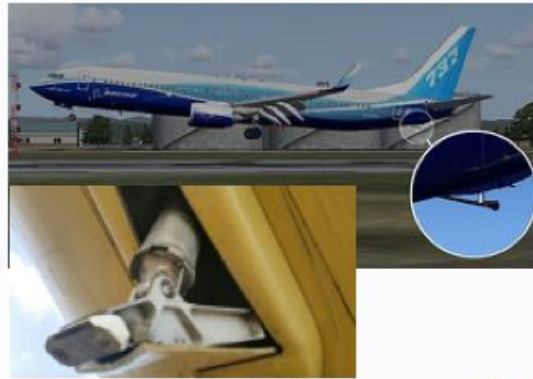
120

### Tail strike



121

### Tail skid



122

### prop strike propeller (blade) strike



123

to do a  
Belly-flop/belly landing/wheels up landing/  
gear-up landing/no-gear landing



The aircraft landed with gear up.

124

### Porpoise landing Bounced landing



what should you do if you start to porpoise a landing? Immediately executing a go-around is the safest thing to do.

125

### Jam/stuck (Jammed/stuck Landing Gear)



126

## Monoplane/Biplane



127

## to Backtrack Backtracking



128

## Fuel dumping/jettisoning



Static wicks

129

## Fuel leak



130

## Refueling



131

## Fire engine or Engine fire?

### Engine fire



132

# Fire engine or Engine fire?

## Fire engine

Fire-retardant liquid



133

An **airport crash tender** (known in some countries as an **airport fire tender**) is a specialized fire engine designed for use in aircraft rescue and firefighting at aerodromes.



134

## Fire Extinguisher



135

## Shoulder Strap harness



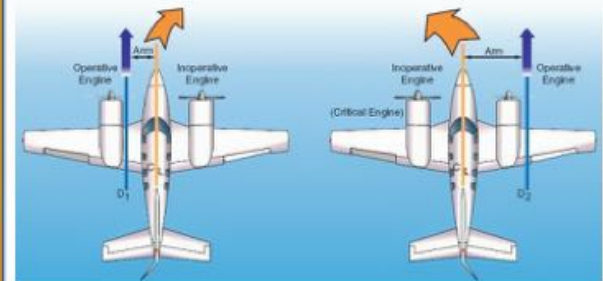
136

## Winglet/sharklet wing tip fence



137

## asymmetrical thrust



138

138

## Radome



139

## Rotor & Skid



140

## Escape Slide Escape chute



141

## Evacuate aircraft evacuation emergency evacuation



142

## Decompression depressurization loss of pressurization



143

## positive pressure relief valve



Excessive air pressure in the fuselage forces the **spring-loaded doors** to open, venting excess pressure outside **(to expell)**.

144

### Negative pressure differential relief doors



Excess pressure outside the fuselage forces the doors to open inward venting air inside the fuselage *(to draw in)*.

145

### Chock



146

### Choke



147

### Contaminated jet fuel contamination



148

### Conveyor Belt carousel



149

Workers are searching through **debris** surrounding the fuselage of American Airlines Flight 331, which overshot the runway



The wreckage of the aircraft (an aircraft wreck)

Surrounding debris

150

## Amphibious

able to operate both on land and water



151

## A380: Super Jumbo (twin deck, double decker)



152

## B747 Jumbo Jet



153

153

## B787 Dreamliner



154

154

## Engine Cowling ENGINE POD/NACELLE



155

## Pylon



156



## Pylon



157

## Leading/trailing edge



158

## Main gear + nose gear UNDER CARRIAGE



Nose landing gear and main landing gear are retracted into their respective **bays (wells)** during flight.

159

## triple **bogie** main gear of a Boeing 777



When more than two wheels are attached to a landing gear strut, the attaching mechanism is known as a **bogie**.

160

## Burn off

If the a/c is not equipped with fuel dump mast, it may be forced to ..... fuel.

161

## fell off (fall off)

During take-off a piece of the wing ..... the plane.

162

## halt

After the aircraft belly-flopped on the foamed runway, it came to a ..... on the stop way.

163

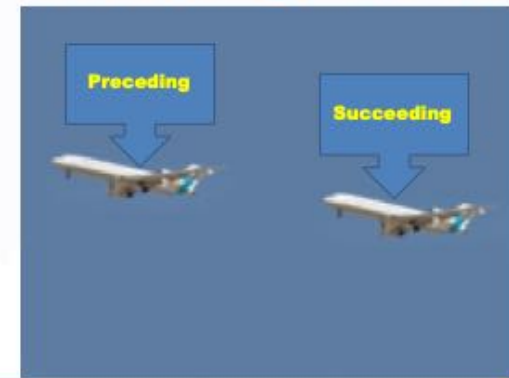
## Burst Eardrum



In case of explosive decompression your eardrum(s) may burst.

164

## Succeeding aircraft Preceding aircraft



165

## Burst tyre/tire



166

## Flat tyre/tire under inflated over inflated



Rim



Under-inflation    Correct    Over-inflation

167

## Tire debris



168

## worn (out) tires bald tires (insufficient tread)



169

## tire treads



Radial

CB: Center rib

CD Center rib with deflector

A flange is provided on the sidewall to deflect runway water away from the engines.

170

## Aquaplaning/Hydroplaning

Hydroplaning occurs when a layer of water gets between the tire and the surface of the road.



Poor runway friction and aquaplaning caused E135's excursion. OMG! The aircraft is aquaplaning.

171

## Slick/Slippery



172

## Smoke hood PBE: Protective Breathing Equipment



173

## Lightning



174

## Overshoot (after landing) overrun (after take off) [under shoot]



175

The pilot's decision to **ditch** the aircraft in the Hudson river was really wise.



176

## Ram Air Turbine (RAT)



to extend the RAT

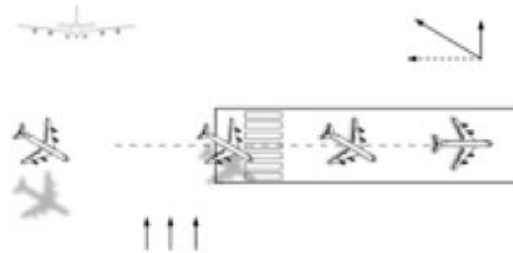
177

## Vapor Trail Contrail Condensation trail



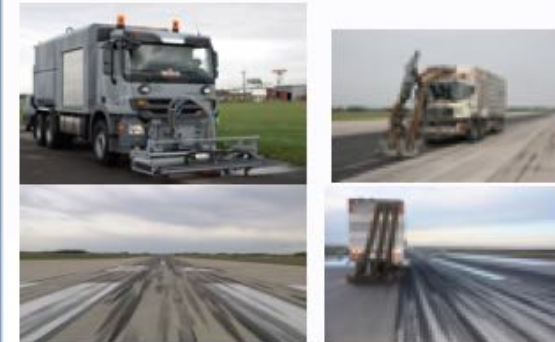
178

## Crosswind landing Crab landing



179

## Rubber Deposit (Removal)



180

The flap is **deployed/extended**



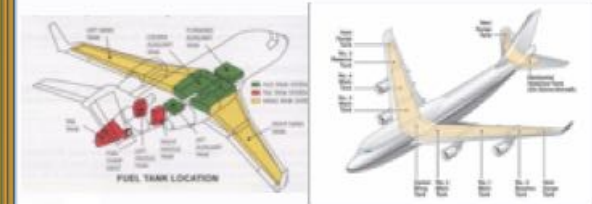
181

**Dense**  
----- fog



182

**Fuel tank**



183

**Fuel tanker**



184

**Runway foaming**  
to foam the first third of the runway



185

**Flatbed truck**



186

## Flock of birds



187

## To Pass out/to Faint



188

## Snowplow/Snowplough



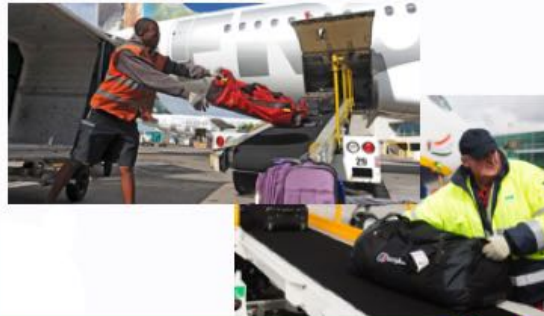
189

## Mast (is erected)



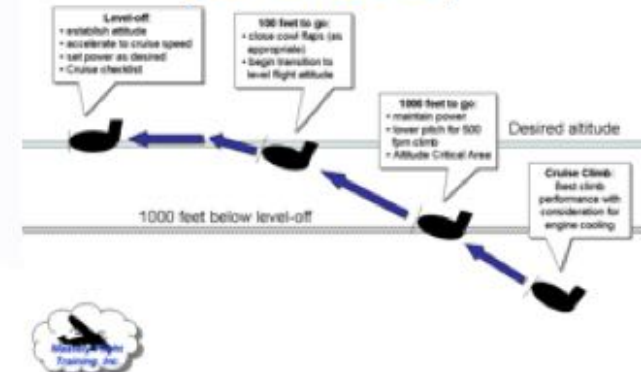
190

## Luggage(Brit)/Baggage(Am) Baggage handler



191

## Level off (Level Bust)



192

## Intercom

**PA: Public Address/Announcement**



Pilots can use the PA to impart information and entertain.  
to make a PA

193

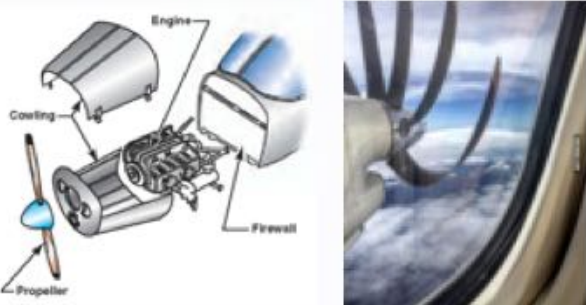
## Jet Fuel Kerosene



194

## Propeller

One propeller blade **is bent**.  
A **spinning** propeller.




195

## Fan Blades



196

## Crane Tower Crane



197

## Oil Platform Oil rig



198

## Glider



199

## Hail



200

## Hole

The plane landed safely after a bomb blew this **hole** in the fuselage.



A punctured hole in the skin

201

A **rupture** in the fuselage  
The impact **ruptured** the fuselage.



202

## Hover



203

## Hand needle



An Altimeter has three **hands**.  
The fastest moving hand reads in **Hundreds of Feet**.  
The shortest hand reads in **Thousands of Feet**.  
The longest hand, which moves the slowest, reads in **Tens of Thousands of Feet**.

204



## Jet Blast



205

## non-retractable landing gear



206

## Seaplane / Floatplane



207

## Push Back

The aircraft was **towed** back to the hangar.

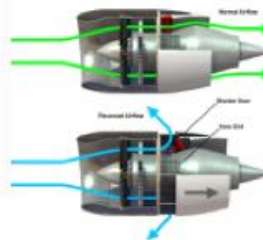


**Push back tug**  
**push back truck**



208

## Jet Engine Thrust Reverser



209

jet bridge

jet way

loading bridge

aerobridge

air bridge

air jetty

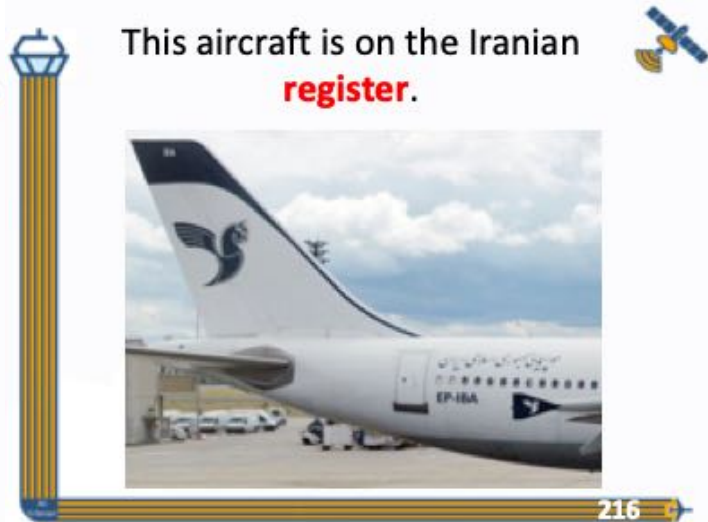
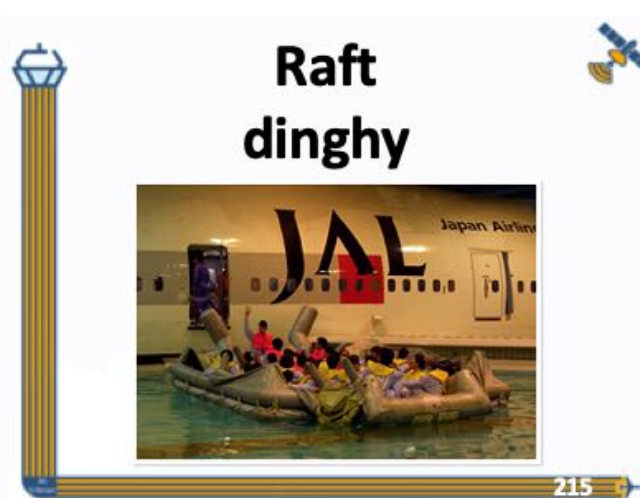
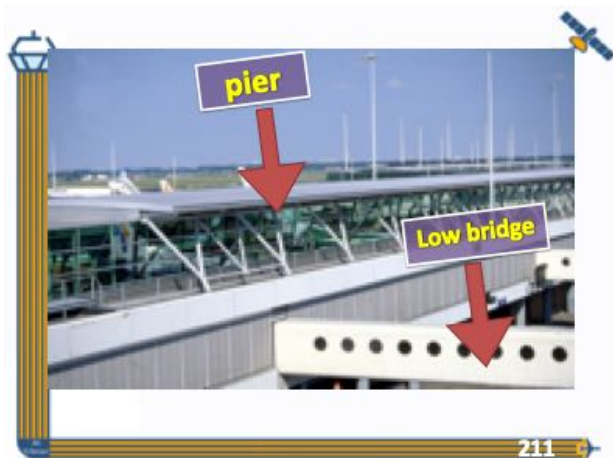
portal

passenger walkway

passenger boarding bridge



210



## A high-wing twin turboprop aircraft



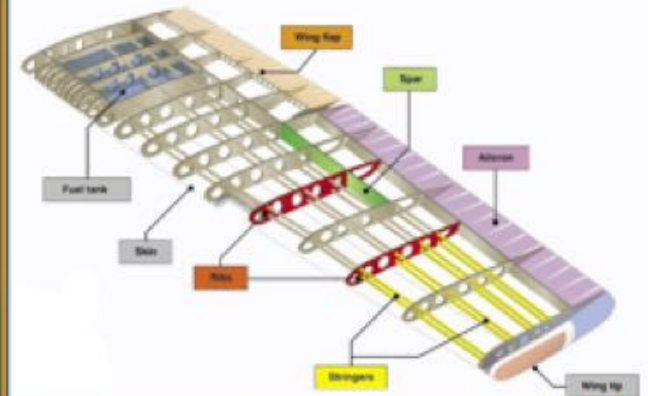
217

## strut



218

## ribs, spar, stringers



219

## Damage/injure/Casualty

The passengers seems to have landed without injury.



**Casualty:** Someone hurt or killed in an accident



220

## to go off

The warning was going off all the time and was distracting the crew.



221

## Stationary/moving



222

a **dip** in the runway



**Opposite:**  
runway crest



223

**Depression (in the ground)**



224

a **mock-up** aircraft



225

pilot **incapacitation**



226

**Stretcher**

The pilot is being **stretched** into the ambulance.



227

**Rivet**

Wings are made of aluminum alloy panels riveted together.  
An aircraft rivet is found on runway during the inspection.  
The head of the rivet is not **flush with** the surface.



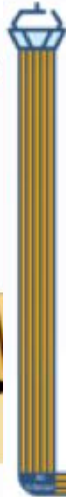
228



**Hollow  
Solid**



229



**make a  
Low pass/Low approach**



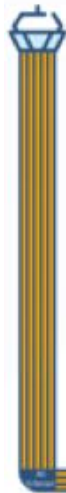
230



**collapsed gear**



231



**Brace position  
Bracing or crash position**

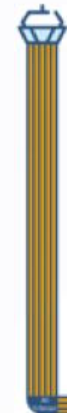


232



**Chimney**

233



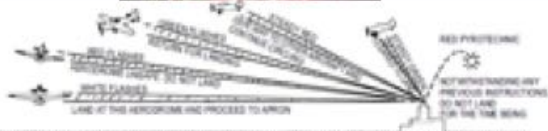
**Epilepsy** 'epilepsi  
**Epileptic** epi'leptik



234



## Pyrotechnic/fireworks display



235

## Flag carrier

Australia - Qantas  
Austria - Austrian Airlines  
Bahrain - Gulf Air  
Finland - Finnair  
France - Air France  
Germany - Lufthansa  
Netherlands - KLM  
India - Air India  
Italy - Alitalia  
Korea - Asiana  
Russia - Aeroflot  
UAE - Emirates  
UK - British Airways



Iran-Air is the ..... airline of the country.

236

## Industrial action (Brit) Job action (Am)



237

## Sweeper



238

## (off/on shore) Oil Platform Oil Rig



239

## Hover 'hɒvər



240

# Inspect/Inspection



241

# Aircraft de-icer de-icing/anti-icing



242

| Middle East Fleet   |  |
|---|--|
|  | Boeing 747-400<br>Aircraft model: Boeing 747-400<br>Aircraft registration: A6-EDP<br>Aircraft type: Boeing 747-400       |
|  | Boeing 777-300ER<br>Aircraft model: Boeing 777-300ER<br>Aircraft registration: A6-EDP<br>Aircraft type: Boeing 777-300ER |
|  | Airbus A350-900<br>Aircraft model: Airbus A350-900<br>Aircraft registration: A6-EDP<br>Aircraft type: Airbus A350-900    |

**fleet**

243

# in-flight refueling



244

# air-miss/near miss



245

# Health Problems

What's wrong? What's the matter?  
I have...



asthma



a backache



a broken leg



a cold



a cough



an earache



a fever



the flu



a headache



heartburn



(the) measles



a rash



a sore throat



a stomachache (US)  
a stomach ache (Brit)



sunburn



a toothache

# Submerge

to go under the surface of water, or to put something under water or another liquid



# Taildragger landing gear

two main wheels forward of the center of gravity and a small wheel or skid to support the tail



# Deicing boots

(Permit a mechanical deicing in flight.)



# A lot of high rise buildings





To dispose a bomb



251

air marshal = sky marshal

**ACM:** Additional Crew Member

*plain-clothes security officer onboard a flight*



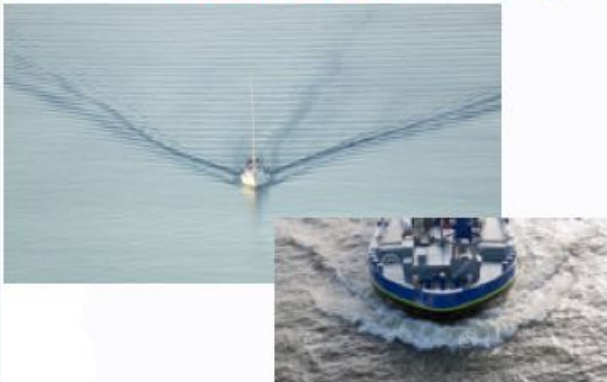
252

The screen is flickering.



253

Bow wave



254

Good Luck